

Date of Report:**11/12/2020**

DOLAN FIRE BURNED-AREA REPORT

Los Padres National Forest
Monterey Ranger District
October 13, 2020



The US Forest Service Burned Area Emergency Response (BAER) team assesses the threats to life, property, cultural and natural resources from post-fire changes to the watershed that can cause erosion, sedimentation, rockfall, flooding, and debris flows. BAER members analyzed the entire Dolan Fire footprint for changes in watershed response and shared their data through Monterey County Offices of Emergency Services (OES) website for all entities affected by the fire. This report is a **brief synopsis** of BAER findings and the Forest Service's internal request for funding to treat values at risk **on Forest Service lands only**. It includes a summary of the technical reports generated by the BAER team and potential pre-rain mitigations for values managed by the Forest Service. Complete technical reports and maps are available through the OES. Information generated by the BAER team is crucial for further analysis by other agencies affected by the fire to examine their values at risk occurring off-Forest. Pre-rain mitigation treatments on non-Forest lands are the responsibility of the managers/owners of those values. The Forest Service will cooperate with other agencies to implement treatments if they must occur on lands managed by the Forest Service and will continue to coordinate with OES to provide technical support and information.

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 **#1** (all new information is presented in Red font)
☐ Updating the initial funding request based on more accurate site data or design analysis

PART II - BURNED-AREA DESCRIPTION**A. Fire Name: Dolan****B. Fire Number: CA-LPF- 002428****C. State: California****D. County: Monterey****E. Region: 5****F. Forest: Los Padres****G. District: Monterey****H. Fire Incident Job Code: P5NF6M (0507)****I. Date Fire Started: August 18, 2020****J. Date Fire Contained: 98% as of 10/13/2020****K. Suppression Cost: Approximately 50 million as of 09/29/20****L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

1. Fireline repaired (miles): Not started as of 10/06/2020 due to initial attack demand for equipment
2. Other (identify): 32 miles of dozer line created, and 7 miles handline created on USFS lands.

M. Watershed Numbers:

Table 1: Acres Burned by Watershed (HUC 7 level and HUC 5 level) Unburned acres within the fire perimeter were not included in acres burned.*

HUC 5 and 7#	Watershed Name	Total Acres	Acres Burned (L, M, H SBS)	% of Watershed Burned
18060006020103	Mcway Canyon	4,470	3,725	83%
18060006020104	Hot Springs Canyon	6,725	5,851	87%
18060006020201	Big Creek	7,001	6,790	97%
18060006020202	Devils Canyon	7,298	6,458	88%
18060006020204	Vicente Creek	4,657	3,918	84%
18060006020203	Limekiln Creek	6,589	5,522	84%
18060006020301	Mill Creek	5,756	5,094	89%
18060006020302	Prewitt Creek	7,587	1,678	22%
1806000511*	Arroyo Seco*	192,548	21,152	11%
1806000506*	San Antonio*	221,176	34,796	16%
1806000505*	Nacimiento*	238,418	18,598	8%

N. Total Acres Burned:*Table 2: Total Acres Burned by Ownership*

OWNERSHIP	ACRES
NFS	82,311.1
OTHER FEDERAL – FORT HUNTER LIGGET	29,062.86
STATE	1,879.39
PRIVATE	11,073.64
TOTAL	124,326.99

O. Vegetation Types:

Extreme variation in annual rainfall and temperatures following elevational gradients and coastal/inland gradients dictate equally variable vegetative gradients from wet coastal riparian redwood forests to sparse chamise chaparral inland. Dominant vegetation types on the coast also include tanoak, California laurel, and live oak forests with open understories under thick canopies or a chaparral understory under open canopies. Extensive annual grasslands occur on the coastal slopes and ridgelines with scattered pocket of ponderosa pine intermixed. North facing slopes near the crest are dominated by mixed conifer and oak stands in the wettest area and mixed chaparral in drier areas. Extensive chamise chaparral covers the majority of the higher elevation inland portions of the burn while valley oak savanna habitats dominated lowland valleys. Riparian willow, cottonwood, sycamore, and alder habitats follow the drainages along the Arroyo Seco, San Antonio, and Nacimiento Rivers.

P. Dominant Soils:

The majority of the soils across the burned area are loamy, shallow to moderately deep, have between 0 to 35 percent rock cover at the soil surface and between 15 to 60 percent rock throughout the soil profile, occur on steep slopes, and are generally susceptible to high run-off and erosion. The table below displays the dominant soil map unit names, select soil qualities, acres, and percent extent within the burned area on NFS lands.

Soil Map Unit Name	Select Soil Qualities	Acres on NFS Lands*	% Extent of Map Unit within Burned Area on NFS Lands
Cieneba-Rock Outcrop Complex	Loamy, Shallow, Erosive	12,238	14
Cieneba-Sur-Rock Outcrop Complex	Loamy, Rocky, Erosive	5,518	7
McMullin-Plaskett Complex	Loamy, Rocky, Shallow, Erosive	7,756	9
Rock Outcrop-Xerorthent Association	Loamy, Rocky, Shallow, Erosive	25,105	30
Sur-Junipero Complex	Loamy, Rocky, Erosive	15,810	19
Totals		66,427	79

*Acres are estimates based on the size of the fire at the time of analysis. Acreage estimates may vary slightly due to rounding error and method of geospatial analysis.

Q. Geologic Types:

The Dolan Fire occurred in the Santa Lucia Mountain Range, within the Coast Ranges geomorphic province. The Santa Lucia Mountain Range is about 140 miles long, extending from Carmel in the north (Monterey

County) to the Cuyama River in the south (San Luis Obispo County). The physiography of the Santa Lucia mountains is characterized by northwest-trending, steep-sided, sharp-crested ridges that paralleling the numerous faults that transect the area and are separated by youthful V-shaped valleys (Pearson and Fillo, 1967). All associated watersheds flow directly or indirectly into the Pacific Ocean. The topography is complex, however, reflecting active uplift and deformation, a variety of lithological types, rapidly incising stream networks and highly unstable slopes. Stream channels and hillslopes are very steep, with average hillslope gradients exceeding 60% in some sub-watersheds. The coastal side of the range rises directly from the shoreline, with oceanfront ridges rising directly 4,000 to 5,000 feet to the crest ridge.

The basement rocks of the Santa Lucia Range, within the burned area are predominately comprised of Paleozoic Salinia Block ("Salinian Block") metamorphics. Other rocks in the area, to a lesser degree, include: Cretaceous Great Valley Group, Mesozoic Franciscan rocks, and alluvium.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERRENIAL	56
INTERMITTENT	90
EPHEMERAL	645
OTHER (DEFINE)	

S. Transportation System:

Trails: National Forest (miles): 76

Other (miles): Short segments in State Parks along coast.

Roads: National Forest (miles): 51

Other (miles): 34

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	Other Federal (List Agency)	Private	State	Total	% within the Fire Perimeter
Unburned	6,610.53	3,883.27	90.94	56.21	10,640.95	8.5
Low	27,813.99	10,643.92	5,389.61	1,223.82	45,071.34	36.25
Moderate	37,927.69	12,451.97	5,285.07	589.62	56,254.35	45.25
High	9,958.89	2,083.70	308.02	9.74	12,360.35	10
Total	82,311.10	29,062.86	11,073.64	1,879.39	124,326.99	

B. Water-Repellent Soil (acres on NFS lands): ~40,500 acres

C. Soil Erosion Hazard Rating (acres & % extent on NFS lands):

Slight: 135 (<0.5%)

Moderate: 3,120 (4%)

Severe: 81,612 (96%)

D. Erosion Potential:

Soil map units on NFS lands across the Dolan Fire with the following were identified: A) inherent susceptibility to high soil erosion given their properties, B) large predicted increases in soil loss from pre-fire conditions, and C) occupy a considerable extent (>5%) of the burned area. The soil map unit which has the greatest

concern for high erosion potential post-fire is the Rock Outcrop-Xerorthent Association which makes up approximately 30 percent of the burned area on NFS land, has a high run-off potential, a severe erosion hazard rating, and exhibited an increase in soil loss per modeling from 7 tons per acre to 97 tons per acre. For some context, 150 tons per acre soil loss is roughly equivalent to losing a one-inch layer of soil over an acre. High soil erosion potential map units make up more than three quarters of the burned area on NFS lands. More information about these units can be referenced in the table below.

Map Unit Name	Slope Range	Run-off Potential	Erosion Hazard	Pre-fire Soil Loss (tons/acre)	Post-fire Soil Loss (tons/acre)	Low SBS Acres* (%)	Moderate SBS Acres* (%)	High SBS Acres* (%)
Cieneba-Rock Outcrop complex	50-75%	High	Severe	31	75	2,037 (2%)	7,901 (9%)	1,403 (2%)
Cieneba-Sur-Rock Outcrop complex	50-85%	High	Severe	0.1	44	1,987 (2%)	2,672 (3%)	397(<0.5%)
McMullin-Plaskett Complex	30-75%	High	Severe	1.6	38	1,673 (2%)	2,857 (3%)	2,803 (3%)
Rock Outcrop-Xerorthent Association	30-75%	High	Severe	6.8	97	6,967 (8%)	13,094 (16%)	2,164 (3%)
Sur-Junipero Complex	50-85%	Moderately Low	Severe	0.1	45	6,293 (8%)	6,255 (7%)	2,078 (2%)
Totals						18,957 (22%)	32,779 (38%)	8,845 (10%)

*Acres are estimates based on the size of the fire at the time of analysis. Acreage estimates may vary slightly due to rounding error and method of geospatial analysis.

E. Sediment Potential:

The ERMIT model “predicts the probability of a given depth of runoff and sediment yield from a single rainfall or snowmelt event on unburned, burned, and recovering forest, range, and chaparral hillslopes” (Robichaud et al., 2007). The sedimentation rates reported below have a 10% probability that sediment yield will be exceeded.

The predicted unburned, pre-fire sedimentation rate averaged across the fire on NFS lands is approximately 2.5 tons per acre, with a 10% probability of exceedance.

The predicted post-fire sedimentation rate averaged across the fire on NFS lands is approximately 31.5 tons per acre, with a 10% probability of exceedance.

F. Estimated Vegetative Recovery Period (years):

Vegetative recovery primarily depends upon annual precipitation which can be extremely variable, but on average the Big Sur Coast fire-adapted ecosystems recover rapidly, often exceeding 60% ground cover in one growing season of average rainfall. However, dangerous debris flow potential can linger for 2-3 years and should be evaluated during the second and third winters following the burn. By 5 -7 years post burn erosion and runoff rates as well as debris flow potential approaches pre-burn levels.

G. Estimated Hydrologic Response (brief description):

The Dolan Fire took place in a region that experiences moist winters and dry summers. Elevation within the burned area perimeter ranges from 208 ft. to 5,872 ft and causes a rain shadow effect as storms move over the range from the west (coastal) to east (inland). This orographic uplift of storm systems off the Pacific can cause rainfall rates to increase over the western watersheds with decreasing precipitation amounts to the east. Thus, precipitation throughout the burn area ranges from about 48 inches per year near the coast to 23 inches per year further inland, with the bulk of the precipitation occurring from October through April. Precipitation is rain dominated by frontal storms which account for nearly all moisture, with infrequent thunderstorms occurring in summer and fall. Historically, major flooding has occurred when a weather system dubbed the “Pineapple Express” taps into subtropical moisture from the latitudes of the Hawaiian Islands. These warm and long duration

storm events will cause major deluges and torrential rains leading to catastrophic flooding across the region. Stream channels in the burn area have the potential to flash flood when these events are coupled (e.g., burned area and above normal precipitation, (Warrick, 2008)).

Hydrologic Processes: The Dolan Fire area has burned several times in recorded history with the most recent fires being the Sobranes in 2016, Indian-Basin Complex in 2008, Kirk Fire in 1999, and Wildfire in 1996. These fires have historically burned vast amounts of land area (10's of 100's thousand acres) within this region and the Dolan fire is another iteration of southern California's fire regime. We can use past hydrological responses from the previous fires to gauge how the Dolan fire might respond hydrologically. Hydrological response from past fires depended significantly on post fire precipitation (Warrick et al, 2008). That is to say, when the area experienced above normal precipitation the watersheds responded with flooding but when followed by a normal precipitation season the watersheds responded a little more than a normal flow regime (Warrick et al, 2008). Therefore, the Dolan Fire hydrologic processes can be expected to respond in a similar way.

Fire causes impacts to several hydrologic processes including reduction in interception, transpiration, and infiltration, and increases in soil moisture and the rate of runoff (due to lack of litter and decreased surface roughness). Removal of vegetation and changes to soil such as increases in hydrophobicity, changes in soil structure, and removal of duff, organic matter, and roots alters these processes and ultimately lead to increases in runoff, peak flows and erosion. These alterations are typical of soils classified as having incurred moderate to high soil burn severity.

Given the large percentage of moderate and high soil burn severity on the steep slopes in the Dolan Fire, watershed response will be high in most catchments (Table 6). Increases in runoff and bulking of flows across the burn area at selected pour points are expected to be 130% to 375% compared to normal. In coastal catchments, dry ravel is pre-loading transport dominated channels where the ocean or the highway are the first depositional locations. Any sediment and woody debris in those channels will be mobilized in post-fire flows increasing runoff volume and possibly impacting access. Inland watersheds have steep headwaters with well-scoured, bedrock channels. Dry ravel, lack of ground cover and surface roughness, and reduced infiltration especially in the moderate and high soil burn severity will result in high watershed response. Inland watershed stream channels transition to lower gradient braided channels downstream of the burn area. Some riparian areas were heavily vegetated prior to the fire (mixed conifer, oak, alder, and sycamore). Many drainages were either unburned or had low soil burn severity and it is anticipated that remaining riparian vegetation will help attenuate smaller flows. Larger flows have been known to entrain riparian vegetation, transporting it downstream as increased bulk.

Table 6: Modeled pre- and post-fire flows at select pour points for the 2-yr peak flows.

PP#	Modeled Pour Point	% of Mod & High SBS	2 yr. RI Peak Flow			Flood Hazard Rating
			Pre-Fire Q (CFS)	Post-Fire Q (CFS)	Percent increase in Q	
PP1	Arroyo Seco*: Picnic Area	22%	7,220	9,479	131%	Moderate
PP2	San Antonio Creek: Merle Ranch	83%	636	2,386	375%	High
PP3	Nacimiento River: Nacimiento CG	87%	351	1,242	354%	High
PP4	Negro Creek: Ponderosa CG	42%	342	834	244%	High
PP5	Anderson Creek	54%	139	382	275%	High
PP6	Big Creek	56%	1,410	3,490	248%	High
PP7	Limekiln Creek	21%	456	1,061	233%	High
PP8	Rat Creek*	57%	12	29	254%	High
PP9	Forest Access 31.64 Hwy1	38%	10	31	310%	High

Channel crossings, floodplains, and depositional fans have an inherent risk of flooding which will be exacerbated by the fire. Increased runoff and sediment delivery (ex. surface erosion, sediment-laden flows, and debris flows) can overwhelm drainage control structures and divert flow down alternate paths. Aggradation can increase probability of lateral channel migration, braiding, and flooding. Lateral channel migration can erode cut banks and undercut slopes, including terraces where infrastructure such as homes and roads might be located. Changes in hydrologic processes can also lead to slope instability and result in post-fire debris flows, mudflows, and other mass wasting (as described under geologic response).

Watershed response in the burn area will pose a very high risk to life, safety, and infrastructure. The combination of increased flows, sediment loads, and woody debris increase the volume of post-fire flows, which could negatively impact culverts, constructed channel ways, and other infrastructure designed to pass “normal” flows. It is important to note that downstream areas that experience regular flooding or difficulty controlling drainage during small storms will be very likely to experience flooding and/or failure in post-fire storms. Bulking and increased flows may cause channels to flood, divert, or migrate to areas that do not usually flood.

Water Quality: Wildfires primarily affect water quality through increased sedimentation. As a result, the primary water quality constituents or characteristics affected by this fire include color, sediment, suspended material, and turbidity. Floods and debris flows can entrain large material, which can physically damage infrastructure. The loss of riparian shading and the sedimentation of channels by floods and debris flows may increase stream temperature. Fire-induced increases in mass wasting along with extensive vegetation mortality can result in increases in floatable material such as large woody debris. Post-fire delivery of organic debris to stream channels can potentially decrease dissolved oxygen concentrations in streams. Fire-derived ash inputs can increase pH, alkalinity, conductivity, and nutrient flux (e.g. ammonium, nitrate, phosphate, and potassium), although these changes are generally short lived.

Nacimiento and San Antonio reservoirs have sizable watersheds with the fire burning a portion (18-23%) of the total acreage. Increases in post-fire runoff to the reservoirs will be measurable compared to normal flows but the reservoirs are more than 15 miles downstream. While ash, fine sediment and woody debris may be delivered to the reservoir in first winter storms, larger sediment will take much longer to be transported through the system. Pools and low-lying riparian areas downstream of the burn area are likely to experience sedimentation.

Debris Flow Potential

Based on USGS debris flow modeling regarding a peak 15-minute rainfall intensity of 24 millimeters per hour (0.95 inch/hr.), probabilities of debris flow initiation in the burn area are relatively high (60-100%) in large portions of the burn landscape, which mostly corresponds to areas that experienced a moderate to high soil burn severity. Other areas of the burn landscape that are either relatively flat and/or experienced low soil burn severity present lower probabilities (0-40%) of initiation of debris flows. Regarding predicted volumes of debris flows in the burn area, much of this landscape is predicted to produce debris flows ranging from <1,000 – 10,000 cubic meters. Relatively few drainages are predicted to produce larger debris flows of 10,000-100,000 cubic meters, but unfortunately some of these could impact some major VAR's, as portions of the Julia Pfeifer Burns State Park and the Limekiln State Park, portions of the Big Creek Reserve and some major road infrastructure. Examining the combined hazard maps presented by the USGS debris flow models, reveals large areas of the burn landscape presenting a moderate to high combined hazard, once again, corresponding to areas that experienced a moderate to high soil burn severity. Other areas that present a low combined hazard represent for the most case areas that experienced a low soil burn severity and/or low gradient slopes or relatively flat areas.

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 debris flows, flooding, rock falls, **HazMat Materials** etc., the BAER team identified a serious risk to the public, employees, special use permittees, and cooperators in the Dolan Fire area. FS critical values (such as roads, trails, recreation areas, campgrounds, etc) are in flood prone areas, at the base of steep, unstable slopes or in the steep unstable headwaters that are also at risk of post-fire debris flows, rock fall, increased runoff, and hazard trees. Use of these areas would put life and safety at risk to post-fire threats. Post-fire watershed response may not threaten all infrastructure downstream and downslope of the burn area; however, it is very likely to impact ACCESS roads. Impacts to access could leave forest users stranded, possibly exposed to poor weather, in areas with poor cell coverage, and/or areas subject to rockfall, flooding, and debris flows, especially if they try to evacuate or pass through during storms. Impacts from the post-fire environment on human life and safety is considered VERY LIKELY with MAJOR consequences. This results in a VERY HIGH risk to human life and safety from post-fire threats. Part of this risk includes the potential for hazardous materials to move off-site from the Nacimiento Station and the Merle Ranch structures that burned which may enter waterways used for recreation, **agricultural and domestic supply**.

Closure of the burn area and at-risk downstream areas are recommended to prevent long-term exposure to risk and protect life and safety. Installation of burned area warning signs is recommended to warn users passing through the area on main roads of the potential hazard. Because of the VERY HIGH risk of these post-fire threats, it is recommended that the burned area closure applies to the public, FS staff before and during storm events, and trails and roads leading into the burn area. Anyone who attempts to access channels and low-lying areas within the burned area prior to or during a storm is at a VERY HIGH risk of injury or death. Risks associated within the burn scar should be re-evaluated prior to lifting the closure.

Hazardous materials resulting from burned buildings at the Nacimiento Fire Station and the Merle Ranch are now friable and can move into the air and watersheds. These hazmats can be unhealthy if respirated or ingested by recreationists/Forest Service personnel near the buildings or recreating in the camping areas along Nacimiento and San Antonio Creeks.

2. Property (P):

The BAER team that there is high to very high risk of damage to critical road and trail infrastructure from post-fire erosion and loss of water control that will require preventative work to help maintain proper drainage. This structure loss is also associated with access issues noted in the human life and safety section above that apply to the Nacimiento Ferguson, North and South Coast Ridge Roads, Cone Peak Road, the Arroyo Seco/Indians Road, and the front and backcountry trails and campgrounds.

3. Natural Resources (NR):Soil Productivity:

It was determined that there is a likely probability of some damage or loss to soil productivity, but the magnitude or consequence was deemed minor which rates risk as **Low**. Therefore, no treatments are being recommended to specifically address soil productivity as a critical value.

Typically, treatments such as mulching or seeding for BAER emergency hillslope stabilization are done primarily to provide point protection against unacceptable risk to human life, safety, and property where post-fire hazard warning signage or area closure are not deemed enough mitigation action against the risk. It was determined by the BAER team that no emergency hillslope mulching stabilization treatments would be necessary or effective and the unacceptable risk to human life, safety, and property could be adequately addressed through treatments like post-fire hazard warning signage, area closures, and some select road treatments, amongst others. Studies of past seeding efforts in this area have shown no significant reduction in erosion, watershed response, or debris flow potential compared to the robust natural recovery, and can increase fine fuel loading/fire potential in subsequent years, competes with and slows natural recovery that best protects the soil, and may introduce noxious weeds into the burned area, as well as increasing fiscal and safety costs.

Expected increases in soil erosion, especially modeled values, aren't the only factors to consider when assessing potential impacts to soil productivity (i.e. ecosystem response or recovery) post-fire. The ecosystem type, fire frequency, and historical recovery are also important variables to consider when assessing overall risk to soil productivity from a single wildfire event.

A large majority of the existing vegetation impacted by the Dolan Fire is a chaparral ecological type. Chaparral is considered to be well adapted to fire and regenerates successfully after fire. Fire in this region of the Monterey Ranger District on the Los Padres NF is becoming more frequent with eight significant wildfires, including the Soberanes 2 (2016), Tassajara (2013), Basin Complex (2008), Kirk (1999), Sur (1996), Molera (1989), Bottcher (1986), and Marble-Cone Complex (1977), in the past 45 years not including the Dolan Fire. With a major wildfire event occurring roughly every 5 years in this part of California, it seems reasonable to assume that these chaparral types will be experiencing a more frequent fire return interval into the future. Chaparral ecosystems are adapted to fire, but eventually shorter burn intervals convert these ecosystems into grassland or other finer fuel/colonizer type habitats.

Overall, detrimental impacts to soil productivity as a by-product of soil loss in certain areas within the fire perimeter are expected, but these impacts will be localized and recoverable with time. Given more than two-thirds of the existing vegetation is chaparral and its ability to regenerate successfully after fire, vegetative ground cover should recover relatively well within 2 to 7 years across a large portion of the landscape impacted by the Dolan Fire.

Fish, Wildlife, and Native Vegetation

Impacts to California condors are a the most serious wildlife concern of this assessment. In addition to the known fatalities of two condor chicks, and potential further fatalities of nine other adults and juveniles the Condor Recovery Program suffered the loss of the Big Sur Coast Release Facility (operated by Ventana Wildlife Society) which impairs the Recovery Program from implementing certain recovery actions involving the release, feeding, capture, tagging and processing of condors. Further, the recurrence of large wildfires (2008 Basin-Indians Fire, 2016 Soberanes Fire and 2020 Dolan Fire) in the home range of the Central Coast population within a short timeframe is cause for concern regarding the cumulative loss of roosting habitat within the Santa Lucia Range. While none of these issues are correctable through the BAER process, they are nevertheless a cause for concern regarding the conservation of the species. Further investigation of these issues and potential solutions are warranted.

Smith's blue butterfly and their habitat are also known to be impacted both by the fire and post-fire effects. Landslides and mass wasting events which are more likely after wildfires, could alter areas of suitable habitat

and impair their use. By identifying and mapping suitable habitats on federal lands LPNF staff will be able to monitor both impacts to this habitat from the fire and the recovery.

While negative impacts to both California red-legged frog and SCCC steelhead, and their respective critical habitats are considered possible, it is considered unfeasible for BAER treatments to effectively prevent the sedimentation and debris flows which are expected to result. Treatment of all possible federal acres would only reduce impacts for geology, hydrology, and soils characteristics to a slight degree. This is particularly the case with steelhead critical habitat, which is only present in short segments on federal lands on Devil's Canyon Creek, Vincente Creek, South Fork Santa Lucia Creek and Mill Creek. Steep slopes (< 60%) and geological features in many parts of the watersheds for these stream systems make them untreatable. CRLF populations within the area affected by the fire are sporadically distributed. The species is known to occur in certain coastal streams to the north (Sycamore Canyon) and south (San Carpoforo Creek of the area impacted by the Dolan Fire, and is considered likely to be present in several other stream systems (Prewitt Creek, Mill Creek, Big Creek etc.) where populations may be impacted by post-fire effects.

Stream systems in the eleven affected watersheds are expected to be moderately impacted, as a result of post-fire effects. Natural recovery of these systems is projected to take 3-5 years, while sediment loads and debris flows are pushed downstream towards the ocean, and hydrophobic soils are broken down. However, recovery times are highly dependent on local precipitation. As elevated sediment loads and debris flows are processed through the river systems, breeding pools and emergent vegetation (CRLF) and deeper pools and redds (steelhead) are expected to reestablish along the river channels.

Following the fire, it is recommended that biological surveys for California red-legged frog steelhead and Smith's blue butterfly and their habitats are conducted. This will help inform biological staff on the Los Padres NF regarding whether natural recovery is occurring as anticipated, or whether additional conservation measures might be necessary.

Hazmats from the Nacimiento Station and Merle Ranch burned buildings can enter Nacimiento Creek and San Antonio Creek and affect native species there.

Native Vegetation

Over 32 miles of dozer line were placed on Los Padres National Forest lands. Because 87% of the Monterey Ranger District is wilderness, it is often necessary to place a small amount of strategic dozer line in the wilderness. If these are new lines that have never been placed before, it is crucial to prevent further spread of noxious and invasive weeds into these areas. The following species are of most concern.

Many noxious weeds are known to occur within the Dolan Fire area, but there are five that dominate the landscape (Table 1).

Table1. Most Common Noxious Weeds Known in and Adjacent to the Dolan Fire Area

Scientific Name	Common Name
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Centaurea melitensis</i>	Tocalote
<i>Centaurea solstitialis</i>	Yellow starthistle
<i>Cortaderia jubata</i>	Jubata grass
<i>Delairea odorata</i>	Cape ivy
<i>Genista monspessulana</i>	French broom
<i>Tamarix ramosissima</i>	Tamarisk

Short species summaries for each of these weeds are located in Appendix A

Italian thistle is known from the northeastern side of the fire near Chew's Ridge off both private and public land where much dozer line was constructed. A large section of dozer line and some hand line were constructed from this area through the Ventana Wilderness. Italian thistle is also found along the coast on the western side of the fire.

Tocalote is found north of the Indians Special Interest Area where dozer lines constructed into the Ventana Wilderness north along the Arroyo Seco River were started. It is also found at the northern end of these dozer lines in the Arroyo Seco area. Tocalote is known to be in the Piney area on the northeast side of the fire area which is where dozer lines were constructed west into the Chew's Ridge area into the Ventana Wilderness.

Yellow starthistle is known primarily and in large infestations from the southeastern side of the fire adjacent to Fort Hunter Liggett (FHL) military reservation. Approximately 25% of FHL is severely (25-100% canopy) infested with yellow starthistle. Records indicate that yellow starthistle was spreading on FHL in the early 1940s, control measures began in 1955, and yellow starthistle was considered "almost uncontrollable" by 1958. Every road used for travel by vehicles and equipment to and from suppression activities is lined with yellow starthistle. Every turnout or ground suitable for driving a vehicle or landing a helicopter is infested with yellow starthistle. From this location dozer and hand lines were constructed north along the Arroyo Seco River Valley through the Ventana Wilderness and west through the Santa Lucia Mountains through the Ventana Wilderness and several Forest Service Sensitive Plant populations.

Jubata grass is found along Highway 1 on the coast and could spread into the foothills where there is any ground disturbance.

Cape ivy is in Brazil Ranch at the extreme northwest edge of the forest in the area affected by the fire and suppression activities. It is also found along Highway 1 on the coast.

French broom is known from several locations on the Monterey District including Botcher's Gap, Big Sur and the valley walls above, North Coast Ridge Road, Arroyo Seco, and in the Carmel Valley on the north perimeter of the district.

Yellow starthistle is also found south of Anderson Peak on the North Coast Ridge Road. From here, dozer line was constructed into the Ventana Wilderness east which connected to the dozer line coming out of Fort Hunter Liggett. Also connecting to the dozer lines coming out of Fort Hunter Liggett are the yellow starthistle infestation found in the Arroyo Seco area to the north. Finally, yellow starthistle is also found in the Piney area on the northeast side of the fire leading into the Ventana Wilderness in the Chew's Ridge area. The primary concern with BAER is the spread of noxious weeds from travel corridors into wilderness areas via sections of dozerline. Sections of dozerline are always initiated off of travel corridors, and noxious weeds are generally not common within the actual wilderness areas once you get outside of the road corridor buffer. We are trying to prevent the spread of noxious weeds into annual grasslands and coastal chaparral further into the wilderness areas.

Tamarisk is found in riparian habitats along the Arroyo Seco River. This infestation is currently very small but may continue to grow if not removed. Tamarisks seeds could also be carried to other areas, particularly up into side drainages of the Arroyo Seco River where dozer lines were placed. This issue was exacerbated since no weed washing of equipment occurred during the incident.

Hydrologic Function:

Fire impacts proper functioning of hydrologic processes with the greatest and longest lasting impacts occurring from high soil burn severity and anthropogenic activities (such as failure of drainage control on roads). Fire impacts within moderate, low, and very low burn areas are recoverable and expected to diminish as vegetation reestablishes resulting in a LOW risk determination. The greatest threats to recovery are threats from mass wasting, OHV incursion, and failure of infrastructure to control drainage (including roads and trails). Slope failure,

increased sediment delivery, and mobilization of woody debris increase the risk of channel diversions down roads and ditches. Channel diversion could lead to complete road prism (or infrastructure) loss and irrecoverable damage to hillslopes. Threats of loss of drainage control on roads is **LIKELY** and could lead to long-term or **MODERATE** consequences resulting in a **HIGH**-risk determination.

Water Quality impacts from Hazmat:

Hazmat resulting from burned infrastructure could pose a risk to water quality if mobilized. The fire burned over mechanical equipment, vehicles, storage buildings, and residential structures (Merle Ranch and FS fire station). Typically, when residential structures burn, the ash and residual materials (refuse) is considered hazardous to humans and the environment per the State of California EPA environmental regulations and must be treated and disposed as hazardous materials. Several cubic yards of refuse are left exposed and ready to be mobilized off site when storm runoff occurs and could impact riparian habitat and groundwater. High precipitation levels in this area increase the risk of transport off-site. It is **POSSIBLE** that material would be transported to stream channels and the consequences could be **MAJOR**, resulting in a **HIGH** level of risk to human life and safety and water quality.

4. Cultural and Heritage Resources:

Cultural resources and their spatial associations may be altered by fire and the conditions that arise within the post-fire environment. Deteriorated soil conditions and exposure resulting from the Dolan Fire have the potential to directly and indirectly impact cultural resources located on Forest Service managed lands. Post-fire soil erosional threats to cultural resources in high to moderate severity burns have been well documented from past fires in this area. Post-fire erosional threats include: the development of gulying or rilling that can expose and remove buried cultural deposits or burials; increased levels of sheet-wash that erodes archaeological features and/or removes artifacts from site locations; and fire-killed trees that fall and up-root may result in the destruction of archaeological features/architecture and expose subsurface archaeological deposits. Increased site access and visibility also raises the risk of looting and vandalism. Loss of archaeological materials can be expected as a result of this increased visibility and access, cultural sites within the burn area have a history of being vandalized and/or looted.

B. Emergency Treatment Objectives:

To allow safe passage of water to protect road and trail infrastructures, watersheds, and cultural sites from accelerated sheet and rill erosion and to prevent the movement of hazardous materials from burned structures. Also, to protect watersheds from the spread of noxious weeds. Risk determination is dependent on the design storm selected and downstream values at risk. By using a set of average storms (2 and 10-year events) emergency planning measures can be designed to mitigate and minimize anticipated risks. Using a 2-year design storm the values at risk can be evaluated to see how sensitive the watershed is and to determine if an emergency exists for a typical winter storm.

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

Land: N/A

Channel: N/A

Roads/Trails: 80%

Protection/Safety: 80%

Table 6: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land	85%	80%	75%
Channel	N/A	N/A	N/A
Roads/Trails	95%	90%	85%
Protection/Safety	95%	90%	85%

- Market Resource Values (direct losses and loss of use): \$1,645,000
- Dolan Fire Treatment Cost: \$592,797
- Benefit/cost ratio = 2.8

☐ Soils ☐ Hydrology ☐ Engineering ☐ GIS ☐ Archaeology
☐ Weeds ☐ Recreation ☐ Fisheries ☐ Wildlife
☐ HazMat
 specialist &
 Other:

Email: KevinCooper@ResoluteAssoc.com **Phone(s)** 805-459-4281

Email: jonathan.schwartz@usda.gov **Phone(s):** 805-698-9752

Skill	Team Member Name
<i>Team Lead(s)</i>	Kevin Cooper
<i>Soils</i>	Eric Robertson, Robert Ballard
<i>Hydrology</i>	Emily Fudge
<i>Engineering</i>	Foster Kuramata
<i>GIS</i>	David Patterson
<i>Archaeology</i>	Steven Galbraith
<i>Weeds</i>	Patrick Lieske
<i>Recreation</i>	Mike Heard
<i>Geology</i>	Jonathan Schwartz
<i>HazMat Specialist</i>	Belinda Walker

H. Treatment Narrative:**Land Treatments:****Noxious Weed EDRR****A. Treatment Type**

The treatment is noxious weed detection surveys of all roads, dozer lines, drop points, and safety zones affected by the Dolan Fire on NFS lands. These areas will be surveyed for evidence of introduction or spread of noxious weeds. If any new or outlying populations are found, these will be mapped and documented for future treatment and where possible hand treatments will be applied at the same time the surveys are conducted. Over 32 miles of dozer lines were established on the Los Padres National Forest during this fire, some of it in wilderness areas where a small amount of strategic line was necessary to help stop the fire spread. Over 87% of the Monterey District is in designated wilderness.

B. Treatment Objective

Evaluate and control the potential for noxious weed establishment and spread, in all areas affected by the Dolan Fire suppression activities.

C. Treatment Description

Inspect all areas and monitor for newly established weed occurrences or the introduction of new non-native invasive species. Monitoring will include documentation and hand pulling small new weed occurrences at the time of inspection. New weed occurrences will be pulled to root depth, placed in sealed plastics bags, and properly disposed. Additionally, tamarisk infestations can be treated with herbicide as per the soon to be completed tamarisk removal environmental impact statement (EIS). Tamarisk surveys will only be conducted concurrently and along the same dozer lines that will be inspected for other noxious weeds.

Documentation of new infestations will include:

- GPS negative and positive inspection results
- Incorporate data into GIS spatial database - NRIS
- Establish photo points
- Map perimeter of new infestation
- Estimate number of plants per square meter
- Treatment method
- Dates of treatment
- Evaluate success in subsequent inspection

Inspections and monitoring should be accomplished during April/August 2021. Based upon the first year's survey, additional surveying may be requested for up to three years. BAER funding is only requested for the first year after fire.

D. Treatment Cost

GS –11 Botanist/Resource Officer	\$358/day x 7 days =	\$2,506
GS – 9 Botanist/Biologist (2)	\$291/day x 1.5 pay periods (15 days) x 2 =	\$8,730
GS – 5 Bio Tech (2)	\$225/day x 1.5 pay periods (15 days) x 2 =	\$6,750
Mileage:	1500 miles @ 0.45/mile =	\$675
Per Diem	15 days @ \$216/day =	\$3,240
Total Cost Estimate for FY 2021 =		\$21,901

Channel Treatments: None**Roads and Trail Treatments:**Roads**A. Treatment Type:**

The following proposed acceptable and economical BAER road treatments as related to life and safety to mitigate the emergency in the Dolan Fire burn area include culvert inlet basin cleaning; drainage structure cleaning; upsizing over side drains and installing debris fence. Install road closed signs where necessary and install Caution Burned Area signs at main entry points and inspect road after damaging storms for rock slides and debris flows, identify problem areas, respond as needed with personnel and heavy equipment.

B. Treatment Objective:

Minimize the risk of road failure in the burn area through the placement and maintenance of effective water control measures. Prevent the channeling of water on roads. Ensure the diversion of runoff in controlled intervals to reduce erosion and further watershed degradation. Storm inspection and response monitors and maintains the function of drainage features, and ensure road access for the public, FS administration, emergency vehicles, permittees, and private in-holders.

C. Treatment Description:

Drainage Work – Upsize Overside Drains. This is to direct runoff away from the road prism to handle increased flow or debris expected as a result of the fire. North Coast Ridge Road and South Coast Ridge Road.

Culvert Work –

1. Culvert Plugging Protection. Clean inlet and basins modify vulnerable culverts with risers or slotted drop inlets. Nacimiento-Ferguson; Cone Peak; Arroyo Seco-Indians Roads
2. Culvert Plugging Protection. Clean inlet and basins install a 20' debris fence in the best location 3' - 10' near the mouth of the existing culvert where more than runoff such as debris will occur due to the burn areas.

Pre-Storm Treatment, Storm Inspection and Response

- Pre-storm treatment: involves cleaning catch basins or structures, as and is intended to help ensure road drainage performs optimally and to improve structure performance under increased runoff and debris. This work will be accomplished using Monterey County and Force Account on Nacimiento-Ferguson and between Memorial and Escondido Campgrounds on Indians Road. Much of the pre-storm will be in lieu of contracting as part of the installation of debris fence and risers.
- Inspection: ensures that culverts do not remain plugged after seasonal storm events and contribute to severe road and resource damage. Typically, a crew of 2 people drive the roads to check for sediment and debris accumulations at culverts and other structures. The Crew is responsible for cleaning culvert inlets and other structures, by hand or mechanically if problems are identified.
- Response: ensures that when there is more debris than the inspection can manage, a crew will be available to clean the roads; clear the inlet; OSD's and debris fences if necessary. includes approximately 43 miles of NFSR within the burned area.

Total request is for **\$206,535**. Locations: NFSR 22S05.1 North Coast Ridge Road and 22S05.4 South Coast Ridge Roads; 22S01 Nacimiento-Ferguson; 22S05.3 Cone Peak and 19S09 Arroyo-Seco – Indians Roads.

Item: Storm Patrol Nac-Ferg 15 miles and Memorial Park – Escondido CG's 3 miles – County Maintained	Unit	# of Units	Unit Cost	Total
Pre-storm Treatment	Day	5	\$6,500	\$32,500
Storm Inspection and Minor Cleanup	Day	8	\$3,000	\$24,000
Storm Response Major Cleanup	Day	6	\$8,000	\$48,000
Subtotal				\$104,500
Grant and Agreement Prep	%	LS	5%	\$5,225
Total				\$109,725

Item: Storm Patrol 26 miles FHL and Other Maintained	Unit	# of Units	Unit Cost	Total
Pre-storm Treatment	Day	5	\$8,600	\$43,000
Storm Inspection – FS FPO	Day	3	\$400	\$1200
Storm Response	Day	6	\$8,000	\$48,000
Subtotal				\$92,200
Grant and Agreement Prep	%	LS	5%	\$4,610
Total				\$96,810

Road Drainage Structure Replacement/Improvements: Road drainage structure improvements involves replacing existing deficient structures and installation of additional drainage structures to help ensure road drainage performs optimally and to improve drainage performance under increased runoff and debris. The work of cleanout of the inlet and riser installation and OSD replacement/installation will be accomplished using contractor equipment and labor. The proposed treatments are designed to be the minimal treatment necessary to reduce the risk of road failure to an acceptable level. These treatments are located on the segments of road within the burned area. Total request is for **\$109,250**

Locations: NFSR 22S05.1 North Coast Ridge Road and 22S05.4 South Coast Ridge Road - OSD's; 22S01 Nacimiento-Ferguson; 22S05.3 Cone Peak and 19S09 Arroyo-Seco – Indians Roads – Riser and Debris Fence.

Item: Drainage	Unit	# of Units	Unit Cost	Total
Upsize and Install 18" OSD, w/10' Flume	Each	5	\$2,500	\$12,500
Clean Inlet and Install Steel Drop Inlet w/riser size varies	Each	15	\$3,000	\$45,000
Clean Inlet and Install 20' Debris Fence w/ 4 posts 5'-10' away from inlet	Each	119	\$315	\$37,500
Subtotal				\$95,000
Mob, Contract Prep, Admin & Implementation	%	LS	15%	\$14,250
Total				\$109,250

Road Caution Signs

This treatment will install burned area caution signs at key road entry points to warn forest administrative users, visitors, permittees and in-holders about the potential hazards that exist within the burned area and will be consistent with the language provided in the BAER Treatments Catalog. To be placed in coordination with the trail signs. A Forest Service employee will inspect the signs for visibility, damage, or loss and replace as needed.

Total request is for **\$4,623.**

Item: Signs	Unit	# of Units	Unit Costs	Total
Road Closure Signs and Posts	Each	5	\$250	\$1,250
Falling Rock and Debris Signs and Posts	Each	8	\$300	\$2,400
Installation 2 Labors and Vehicle	LS	1	\$370	\$370
Subtotal				\$4020
Contract Prep, Admin & Implementation	%	LS	15%	\$603
Total				\$4,623



<https://www.rockartsigns.com/d72/search/node/92-2691>

Total Cost

Item	Unit	# of Units	Unit Costs	Total
Upsize and Install 18" OSD, w/10' Flume	Each	5	\$2,500	\$12,500
Clean Inlet and Install Steel Drop Inlet w/riser size varies.	Each	15	\$3,000	\$45,000
Clean Inlet and Install 20' Debris Fence w/ 4 posts 3'-10' away from inlet	Each	119	\$315	\$37,500
13 Signs and Installation	LS	1	\$4,623	\$4,623
Mob, Contract Prep, Admin & Implementation	%	LS	15	\$14,250
Pre-storm Treatment-County Maintained Paved Road, 18 Miles	Days	5	\$6,500	\$32,500
Pre-Storm Treatment-FHL and FS Maintained, Native Material, 26 Miles	Days	5	\$8,600	\$43,000
Storm Inspection-Minor Cleanup County with Equipment Paved, 18 Miles	Days	8	\$3,000	\$24,000
Storm Inspection-FS FPO Mostly Closed Roads, Native Material, 26 Miles	Days	3	\$400	\$1,200
Storm Response-County, FHL and FS	Days	12	\$8,000	\$96,000
Grant and Agreement Prep	LS	1	5%	\$9,835
Total				\$320,408

Road Treatment Discussion/Summary/Recommendations.

- Cost estimates for this area are often more expensive than fires located in Southern California or near metropolitan areas due to materials (OSD's, risers, etc.) being easier attainable and roads often more accessible due to the forest being nearby. Therefore, the delivery costs and mobilization may be higher due to remoteness. With these factors an estimate was provided by actual costs using previous task

orders from other reports of past years. This should be relatively close knowing the remoteness of this area.

- Monterey County Roads Department and Fort Hunter Liggett Military Base maintain the majority of these roads for the Forest Service and each have their own equipment to provide said services. Method to consider to pay the County and Fort Hunter Liggett pre-storm treatment, storm inspection and storm response could be Grants and Agreement. Roads not maintained by Monterey County or FHL are North Coast Ridge Road and Arroyo Seco-Indians Road beyond Escondido CG north to Arroyo Seco. These Forest Service roads are native material, all County maintained roads are paved.

Trails

Human Life and Safety Treatments pertinent to Forest Service Recreation Sites and Trails:

- Protect the public from injury or death resulting from exposure to post-fire hazards such as flooding, high water flow, rock fall, falling trees, and debris.

Developed Recreation Sites:

- Protect recreation site infrastructure from damage due to flooding, debris flows, and falling trees.

System Trails:

- Protect trail infrastructure from loss of water control and subsequent damage.

Treatment Narrative

Recreation Site Treatments:

Recreation Site Treatments: To mitigate the threat of damage to recreation site infrastructure at Nacimiento Campground, Ponderosa Campground, and the Arroyo Seco Day Use Area due to flooding and debris flows, it is proposed to move low-lying infrastructure to high ground. To mitigate the threat of damage to recreation infrastructure at Escondido Campground due to compromised trees, it is proposed to remove the hazard trees. This work will be accomplished by a Force Account or AD crew with an AD project manager. The total request is for \$11,726 as shown in the table below.

Item	Unit	Unit Cost	# of units	Total Cost
Project labor (six person crew)	week	\$7,500	1	\$7,500
Per Diem (six person crew)	week	\$2,052	1	\$2,052
Project manager	week	\$1,602	1	\$1,602
Project manager travel	week	\$572	1	\$572
Total				\$11,726

Trail Treatments:

To mitigate the threat of loss of trail tread due to erosion on steep segments and/or overtopping of the trail at drainage crossings on the upper 2.4 miles of the Vicente Flat Trail, the upper 1.5 miles of the San Antonio Trail, and the lower 0.5 mile of the Cone Peak Trail, it is proposed to improve or install approximately 60 drains/mile, armor all drainage crossings, and log out / remove hazard trees for worker protection. This work will be accomplished by a Force Account or AD crew with an AD project manager. The total request is for \$23,452 as shown in the table below.

Item	Unit	Unit Cost	# of units	Total Cost
Project labor (six person crew)	week	\$7,500	2	\$15,000
Per Diem (six person crew)	week	\$2,052	2	\$4,104
Project manager	week	\$1,602	2	\$3,204
Project manager travel	week	\$572	2	\$1,144
Total				\$23,452

Protection/Safety Treatments:

To mitigate the threat to human life and safety from post-fire hazards, it is recommended that all Forest Service recreation sites and trails affected by the Dolan Fire be closed until at least the end of the first winter following the fire. This may be done as part of a general area closure. If that is the case, or if the roads in the burned area are closed, then the only location where a trailhead sign will be required is at the Kirk Creek Trail on Highway 1. In order to promote compliance with the closure, it is recommended that all closure signs clearly state the reasons for the closure.

Prior to lifting the closure, it is recommended to inspect the all recreation sites and trails to determine if they can safely be opened and to install warning signs at all trails leading into the burned area. These inspections can be done by District volunteers at no cost to the agency. Estimated cost for the warning signs is \$172.

Item	Unit	Unit Cost	# of units	Total Cost
Trailhead warning signs	project	\$172	1	\$172
Total				\$172

Hazmat Stabilization:

It was determined that there is a HIGH risk of hazmat negatively affecting water quality and human life and safety. To mitigate that impacts to water quality and human life and safety, stabilization treatments for hazmat within the burn area is recommended. Forest personnel are not allowed to conduct hazardous waste removal or stabilization activities; therefore, a licensed contractor is required to conduct the work. The treatment consists of placing hydro mulch on top of burned ash and refuse to protect from direct rainfall impacts, slow runoff and install silt fencing and absorbent chemical booms placed below direct overland flow pathways to prevent refuse from moving off-site. This treatment is necessary in the near term as final clean up actions will likely take a long period of time or may not be completed before runoff producing storms occur. Estimates for contract specifications are based on current Region 5 IDIQ rates for Hazardous Materials emergency cleanup actions. Total request is for **\$49,997.50**.

Item	Units	Unit Cost	# of Units	Total Cost
Contract Details				\$
• Project Manager	4	1	1200	4,800
• Field Technicians	4	4	550	8,800
• Vehicles	4	4	500	8,000
• Administrative Contract	3	1	550	1,650
• Mobilization	2	1	1250	2,500
• Demobilization	2	1	1250	2,500
• Contingency	1	1	2000	2,000
• Hydro Mulch Equipment	1	1	5400	5,400
• Subtotal				35,650

Item	Units	Unit Cost	# of Units	Total Cost
• Overhead 15%				5,347.50
Contact total				40,997.50
Other Costs				
• FS Staff (contract COR)	10	1	500	5,000
• FS Project Manager	8	1	500	4,000
Other subtotal				9,000
Total				\$49,997.50

Per BAER Guidance, "Removal of hazardous materials (containers, contaminated ash/debris/soil) should only be considered in rare situations where the material is FS-owned and when preventative or control actions will not be effective, when removal is more cost-effective, or legally required." In the case of Nacimiento Guard Station and Merle Ranch, removal and disposal of hazmat/contaminated ash/debris/soil is recommended for the following reasons:

Nacimiento Guard Station: The hazardous materials contamination created during the Dolan fire is located on a ridge and can enter Nacimiento Creek. Nacimiento Creek flows into Nacimiento Reservoir.

Merle Ranch: The hazardous materials contamination created during the Dolan fire is located within 100 feet of the North Fork of the San Antonio River and within the 25, 50, and 100-year floodplains.

Both reservoirs are used as a source of domestic and agriculture water and for recreation (swimming, boating, fishing and water skiing).

Because of the location of the hazardous materials, none of the stabilization methods contained in the 2006 BAER catalogue will: (1) prevent the infiltration of rainwater into the hazmat contamination created during the fire, (2) prevent runoff into the creeks below and (3) prevent hazardous materials contamination from being washed downstream during heavy rainfall or flood events.

Recommendations for the portions of the Nacimiento Guard Station, Merle Ranch and Santa Lucia Guard Summer Home Tract that were destroyed by the Dolan Fire included in this section.

1. Remove and properly dispose of burned hazardous building materials (asbestos, lead based paint, treated wood etc.) and hazardous materials containers (propane bottles, aerosol cans etc) in burn ash and debris piles to protect downstream drinking water quality and human health of employees.

Remove and dispose of burned heavy equipment, generators and vehicles to prevent releases of hazardous materials from burned equipment and vehicles that will be transported to downstream sources of drinking water during heavy rainfall.

Ash/debris/soil contaminated with hazardous materials is likely to become airborne during windy periods at the burned areas and should be removed from the site and properly disposed. Sample ash/debris/soil in the burned areas to ensure proper removal and disposal. **Analyze the burn ash for metals, asbestos, polychlorinated biphenyls, pesticides, polycyclic aromatic hydrocarbons (PAHs) including dioxins and volatile organic compounds.**

This ash/debris/soil is located upgradient of creeks that flow into reservoirs used as a domestic water supply.

Use a licensed hazardous waste disposal company to dispose of contaminated ash/debris soil and hazardous materials containers in accordance with state of California requirements.

2. Contain and cover (in accordance with Federal, state and local regulations) non-hazmat burned debris located in the footprint of the buildings to prevent the debris from being washed off site and transported downstream of the burned station, ranch and summer home tract via heavy rainfall/flood events and to prevent the infiltration of water during precipitation events. Inspect (annually or after major weather events) non-hazmat burned debris left in place to ensure containment measures are working as required.
3. Disconnect water pipes leading to burned buildings. Thousands of gallons of water will be wasted if the water supplied to these locations is not disconnected. Prevent contaminated hazardous materials and ash from entering damaged drinking water system pipe. Replace drinking water pipe that was damaged/destroyed. Disinfect/flush newly installed drinking water pipe as required by federal, state and local laws and regulations.
4. Empty and dispose of fire-damaged and inoperable propane tanks observed in burn areas.
5. Ensure electrical systems servicing burned buildings are de-energized.
6. Follow federal and state environmental requirements when demolishing burned buildings. See discussion below.

The demolition contractors must be licensed in California (A or C-21) and experienced in performing decommissioning and demolition work in California. Demolition Contractor or Subcontractors performing hazardous materials work for lead, asbestos etc. must possess current and valid certification and licensing required by the State of California. Contractor's transporting hazardous waste must be licensed by State of California to transport hazardous waste.

Numerous plans are required when demolishing buildings. Required plans include demolition plan, storm water pollution prevention plan, hazardous materials plan (for hazardous materials that were overlooked during hazmat removal operations) dust control, debris management plan, safety plan, fire plan and spill plans.

Hazardous materials and waste surveys must be prepared to identify waste streams that may include the following: asbestos containing materials, polychlorinated biphenyls, lead-based paint, mercury, and hazardous wastes. Hazardous materials that were inadvertently missed during the emergency stabilization treatment phase must be removed prior to demolition of the burned structures.

Federal and state law require the following notifications: state air pollution control agency (asbestos), federal environmental protection agency (asbestos), State of California (lead-based paint removal/disposal, federal and state emergency response agencies if contractor causes release (spill) during demolition activities.

State law requires all hazardous materials be removed prior to demolition. Hazardous materials removed from buildings must be performed by properly trained and licensed workers.

Hazardous waste must be properly labelled and stored on site until transported to disposal facility. Hazardous waste must be transported by a California licensed hazardous waste hauler. Obtain temporary EPA id number for transport of hazardous wastes.

Site restoration requirements should be included in demolition contract. Backfill and compaction requirements should be specified prior to the start of the demolition project. The site should be contoured after demolition activities are completed to prevent erosion. Replanting design schemes should be developed before demolition project begins (consult forest specialists on replanting requirements).

Federal and state hazardous waste laws require submittal of a biennial hazardous waste report if during demolition the Forest generates more than 1,000 kg (2,200 lbs.) of Resource Conservation Recovery Act non-acute hazardous waste or more than 1kg (2.2 lbs.) of Resource Conservation Recovery Act acute hazardous waste.

APPROXIMATE COSTS* FOR RECOMMENDED BAER EMERGENCY STABILIZATION TREATMENTS

Item	Unit	Unit Cost	# of Units	Cost
Mobilization	Lump Sum	\$3000	1	\$3000
Health and Safety Plan	Lump Sum	\$5000	1	\$5000
Hazmat Testing (Ash, Burned Debris, Soil)	Lump Sum	\$7500	1	\$7500
Removal/Disposal of Large Propane Tank Located Next to Barracks (Nacimiento Guard Station)	Each	\$700	1	\$700
Removal/Disposal of Hazmat Containers and Contents (Nacimiento Guard Station/Merle Ranch)	Lump Sum	\$10000	1	\$10000
Removal/Disposal of the Contaminated Ash/Debris/ Soil (Nacimiento Guard Station/Merle Ranch)	Lump Sum	\$30000	1	\$30000
Removal/Disposal of Heavy Equipment, Generators and Vehicles (Nacimiento Guard Station)	Lump Sum	\$15000	1	\$15000
Containment of Non-Hazmat burned Debris (Nacimiento Guard Station/Merle Ranch)	Lump Sum	\$50000	1	\$50000
COR (Hazmat Specialist)	Per Day	\$750	10	7,500
Vehicle Costs	Miles	TBD	TBD	TBD
Total:				128,700
Removal and Disposal of Hazmat, Propane Tanks and Generators (Recreation Residences) – Non-Forest Service Costs (3 Locations)	Lump Sum	\$12000	1	\$12000

* Given the focus of this assessment, the only costs included in this table are costs to implement the recommended BAER emergency stabilization treatments. Demolition costs are not included in this table. Costs are included for non-Forest Service burned building for informational purposes.

Cultural ResourcesSite Stabilization:(a) Treatment Type: Erosion control.(b) Treatment Objective: Mitigate increased erosion on exposed archaeological deposits associated with soil burn severity and storm events.(c) Treatment Description: Installation of erosion protection material on dense concentrations of artifacts within high at-risk archaeological sites.(d) Risk Assessment Process: Exhibit 2 of Interim Directive No.: 2520-2010-1 was used to evaluate the Risk Level for each valued identified during Assessment.Result = *Very High*(e) Treatment Cost:

Line Item	Units	Unit cost	SULT \$
GS-9 Archaeologist	10 days	\$360	\$3,600.00
GS-5 Recreation Tech	10 days	\$250	\$2,500.00
GSA Vehicle Mileage	1,000 miles	\$0.44/Mile	\$440.00
Coir Fiber Wattles 10' x 12"	5	\$260	\$1,300.00
Coir Fiber Mats	5	\$160	\$800.00
Wooden Stakes	3	\$14.75	\$44.25
Ground Staples	1	\$48.25	\$48.25
Total			\$8,732.50

Protection of Exposed Historic Structures (Adobes):(a) Treatment Type: Protective covering.(b) Treatment Objective: To protect historic adobe structures that are contributing elements to National Register eligibility at site 51-356 from inclement weather.(c) Treatment Description: Placement of weather resistant canvas tarps over exposed adobe, stake to ground and bind with rope.(d) Risk Assessment Process: Exhibit 2 of Interim Directive No.: 2520-2010-1 was used to evaluate the Risk Level for each valued identified during Assessment.Result = *Very High*(e) Treatment Cost:

Line Item	Units	Unit cost	SULT \$
GS-9 Archaeologist	5 days	\$360	\$1,800.00
GS-5 Recreation Tech	5 days	\$250	\$1,250.00
GSA Vehicle Mileage	250 miles	\$0.44/Mile	\$110.00
Canvas tarps 20'x30'	3	\$529	\$1,587.00
Poly-combo 3/8 rope 600'	1	\$122.95	\$122.95
10" black steel stakes	1 bucket	\$99.95	\$99.95
Total			\$4,969.90

Exposed Cultural Resources - Signage:(a) Treatment Type: Signage.(b) Treatment Objective: Inform public of cultural resource protection laws and to provide an avenue to prosecute looters within the burn area; to prevent the destruction of important cultural resources.(c) Treatment Description: Install 11" x 16" metal educational signs that inform the public about the importance of cultural resources and the laws protecting them. Signs will be both in English and Spanish and placed with other signage at trailheads and campgrounds. Informational signs increase the viability of criminal prosecution through the Archaeological Resource Protection Act of 1979 (ARPA). Forest Service Law Enforcement will be contacted to respond to any illicit activities pertaining to cultural resources.

(d) Risk Assessment Process: Exhibit 2 of Interim Directive No.: 2520-2010-1 was used to evaluate the Risk Level for each valued identified during Assessment.

Result = *Very High*

(e) Treatment Cost:

Line Item	Units	Unit cost	SULT \$
GS-9 Archaeologist	5 days	\$360	\$1,800.00
GS-5 Recreation Tech	8 days	\$250	\$2,000.00
GSA Vehicle Mileage	1,000 miles	\$0.44/Mile	\$440.00
11" x 16" Metal Signs	30	\$45	\$1,350.00
Metal signposts	10	\$35	\$350.00
Total			\$5,940.00

Post-BAER Treatment Monitoring:

(a) Treatment Type: Monitoring.

(b) Treatment Objective: Assess effectiveness of BAER treatments.

(c) Treatment Description: Monitor the effectiveness of BAER treatments. Ensure treatments remain in place during the rainy season and may include additional stabilization efforts if warranted. Accessible sites in areas of installed signage will be monitored for evidence of looting and vandalism,

(d) Risk Assessment Process: Exhibit 2 of Interim Directive No.: 2520-2010-1 was used to evaluate the Risk Level for each valued identified during Assessment.

Result = *Very High*

(e) Treatment Cost:

Line Item	Units	Unit cost	SULT \$
GS-9 Archaeologist	10 days	\$360	\$3,600.00
GS-5 Recreation Tech	10 days	\$250	\$2,500.00
GSA Vehicle Mileage	800 miles	\$0.44/Mile	\$325.00
Total			\$6,452.00

Totals

Line Item	SULT \$
BAER Treatments	\$19,642.40
Post-Implementation Treatment Monitoring	\$6,452.00
Total	\$26,094.40

I. Monitoring Narrative:


Recreation and Trail Treatments:

It is proposed District volunteers will conduct routine patrols in the burned area to monitor effectiveness of the closure and to educate visitors on the hazards. It is also proposed that volunteers conduct post-storm patrols on trails that receive treatments in order to gauge the effectiveness of the treatments. This approach has proven to be of value in previous fires and results in no cost to the agency.

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

A. Land Treatments							
Invasive Weed Detection Survey	project	\$21,901	1	\$21,901	\$0		\$
<i>Subtotal Channel Treatments</i>				<i>\$21,901</i>	<i>\$0</i>		<i>\$</i>
B. Channel Treatments - none							
<i>Subtotal Channel Treatments</i>				<i>\$0</i>	<i>\$0</i>		<i>\$</i>
C. Road and Trails							
Road Stormproofing	project	\$109,250	1	\$109,250	\$0		\$
Road Storm Access	project	\$206,535	1	\$206,535	\$0		\$
Trail Stormproofing	project	\$23,452	1	\$23,452	\$0		\$
Rec site protection	project	\$11,726	1	\$11,726	\$0		\$
<i>Subtotal Road & Trails</i>				<i>\$350,963</i>	<i>\$0</i>		<i>\$</i>
D. Protection/Safety							
Heritage Protection	project	\$26,094	1	\$26,094	\$0		\$
Hazmat Stabilization	project	\$49,998	1	\$49,998	\$0		\$
Hazmat Removal	project	\$128,700	1	\$128,700	\$0		\$
Closure Signs - Roads	project	\$4,623	1	\$4,623	\$0		\$
Closure Signs - Trails	project	\$172	1	\$172	\$0		\$
<i>Subtotal Protection</i>				<i>\$209,587</i>	<i>\$0</i>		<i>\$</i>
E. BAER Evaluation							
Assessment Team	0520	H5BAER	---	---	\$113,790	---	\$
			---	---		---	\$
<i>Subtotal Evaluation</i>				<i>---</i>	<i>\$113,790</i>	<i>---</i>	<i>\$</i>
F. Monitoring							
	ea	\$0	1	\$0	\$0		\$
<i>Subtotal Monitoring</i>				<i>\$0</i>	<i>\$0</i>		<i>\$</i>
G. Totals				\$582,451	\$0		\$
Total for this interim request				\$582,451			

PART VII - APPROVALS

1. 
 Forest Supervisor

November 12, 2020
 Date

BAFR - Forest Service Values At Risk Tracking Table

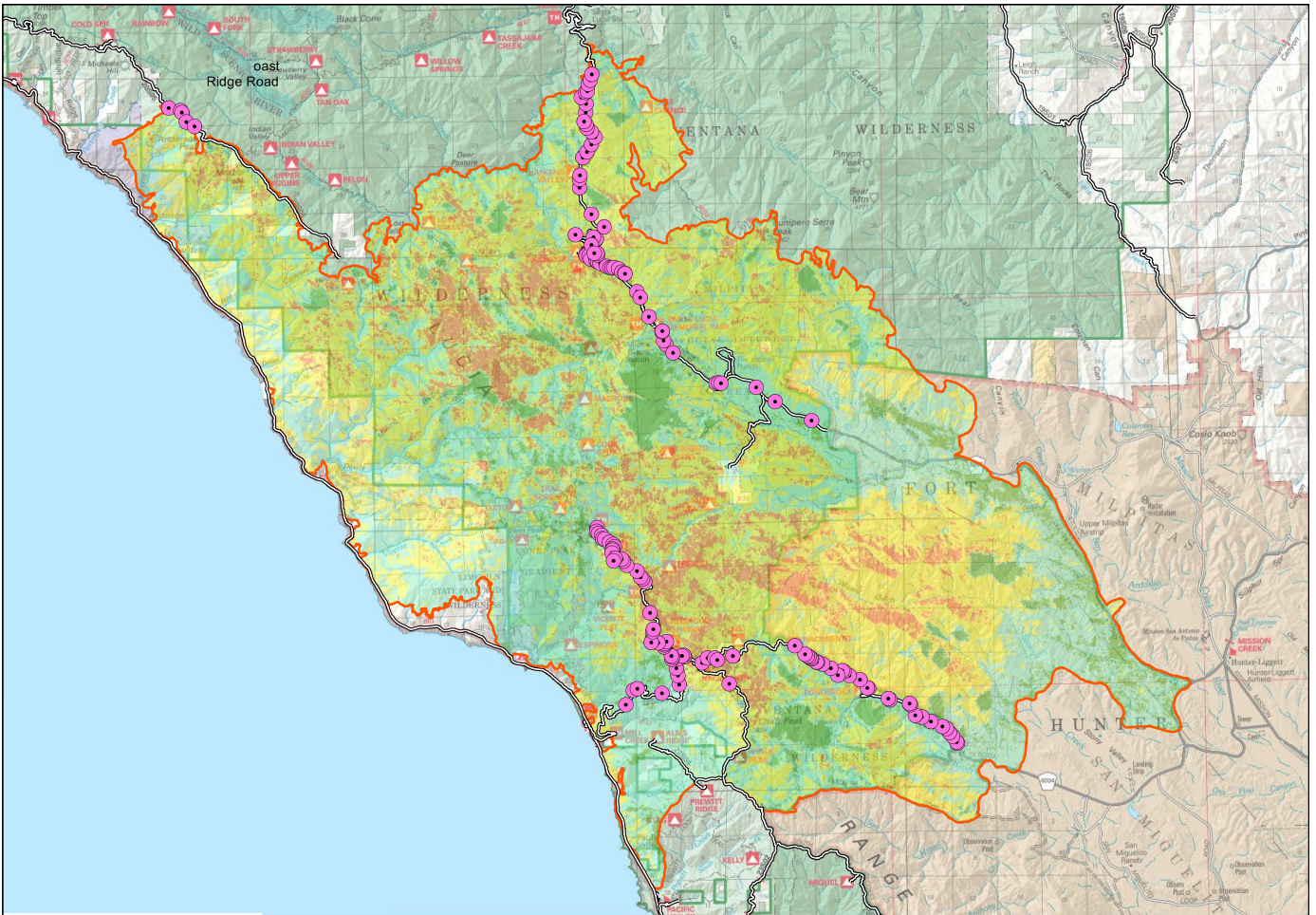
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Appendix B. Benefit Cost Analysis

Thomas Fire Benefit Cost Analysis:										
Total benefits of resources for whole fire FS lands:										
All Resource	Value \$									
Roads at risk	\$2,500,000									
Trails	\$550,000									
Water quality	\$500,000									
Soil productivity	\$400,000									
Threatened and Endangered Species (fish and wildlife)	\$1,000,000									
Native Plant Communities near invasives	\$500,000									
Heritage Resources	\$500,000									
Public safety	\$1,000,000									
Heritage resources are not a market value.										
Human life and/or safety is not a market value. Estimated cost of injury accident.										
Probability of loss without and with treatments:										
All Resource	Probability loss no treatments:				Probability loss w/ treatments:			Reduction in probability of loss		
Roads at risk	50%				30%			20%		
Trails	60%				20%			40%		
Water quality	20%				10%			10%		
Soil productivity	60%				35%			25%		
Threatened and Endangered Species (fish and wildlife)	40%				30%			10%		
Invasive Plants	40%				20%			20%		
Heritage Resources	20%				5%			15%		
Public safety	70%				20%			50%		
Total cost of treatments on Forest Service:										
Click red icons for notes.										
Line Items	Units	Unit Cost	# of Units	BAER \$	Spent \$	# of Units	Fed \$	# of Units	Non Fed \$	Money Left Total \$
A. Land Treatments										
Invasive Weed Detection Survey	project	\$26,100	1	\$26,100	\$0		\$0		\$0	\$26,100
Subtotal Channel Treatments				\$26,100	\$0		\$0		\$0	\$26,100
B. Channel Treatments - none										
Subtotal Channel Treatments				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
Road Stormproofing	project	\$109,250	1	\$109,250	\$0				\$0	\$109,250
Road Storm Access	project	\$206,535	1	\$206,535	\$0				\$0	\$206,535
Trail Stormproofing	project	\$23,452	1	\$23,452	\$0		\$0		\$0	\$23,452
Rec site protection	\$11,726		1	\$11,726	\$0		\$0		\$0	\$11,726
Subtotal Road & Trails				\$350,963	\$0		\$0		\$0	\$350,963
D. Protection/Safety										
Heritage Protection	project	\$26,094	1	\$26,094	\$0		\$0		\$0	\$0
Hazmat Stabilization	project	\$49,998	1	\$49,998	\$0		\$0		\$0	\$0
Closure Signs - Roads	project	\$4,623	1	\$4,623	\$0		\$0		\$0	\$0
Closure Signs - Trails	project	\$172	1	\$172	\$0		\$0		\$0	\$0
Subtotal Protection				\$80,887	\$0		\$0		\$0	\$80,887
E. BAER Evaluation										
Assessment Team	0520	H5BAER	—	—	—	—	\$0	—	\$0	\$0
Subtotal Evaluation	—	—	—	—	\$0	—	\$0	—	\$0	\$0
F. Monitoring										
	ea	\$0	-	\$0	\$0		\$0		\$0	\$0
	ea	\$0	-	\$0	\$0		\$0		\$0	\$0
	ea	\$0	-	\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals										
					\$0		\$0		\$0	\$457,950
Total for this request										
Roads at risk		\$500,000			\$177,850		2.8	yes		
Trails		\$220,000			\$188,201		1.2	yes		
Water quality		\$50,000.00			\$0	✓	#DIV/0!			
Soil productivity		\$100,000			\$0	✓	#DIV/0!			
Threatened and Endangered Species (fish and wildlife)		\$100,000			\$3,000		33.3	yes		
Invasive Weeds		\$100,000			\$26,100		3.8	yes		
Heritage Resources		\$75,000			\$25,508		2.9	yes		
Public safety		\$500,000			\$172,138		2.9	yes		
		\$1,645,000			\$592,797		2.8			

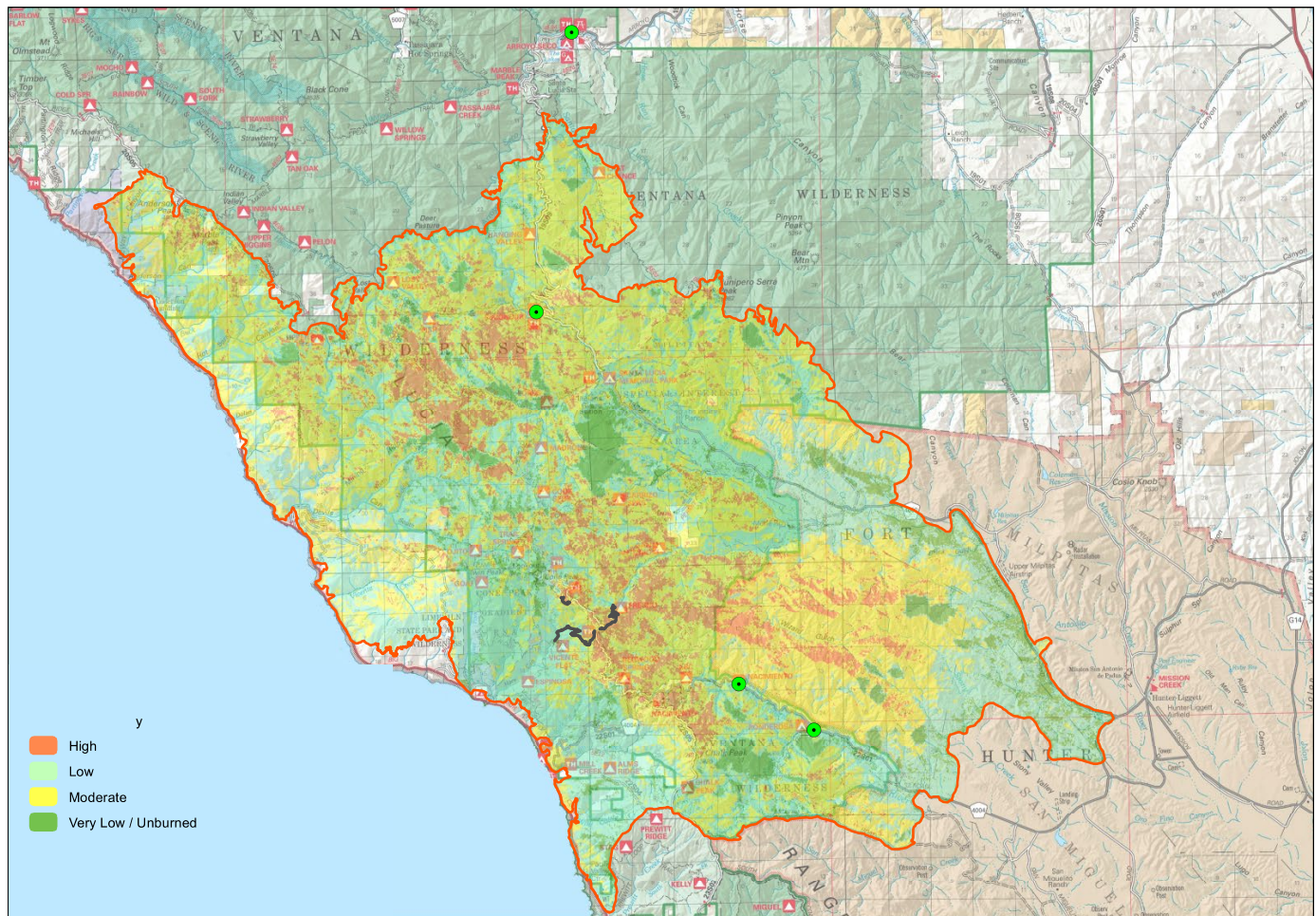
Appendix C. Treatment maps

Road Treatments



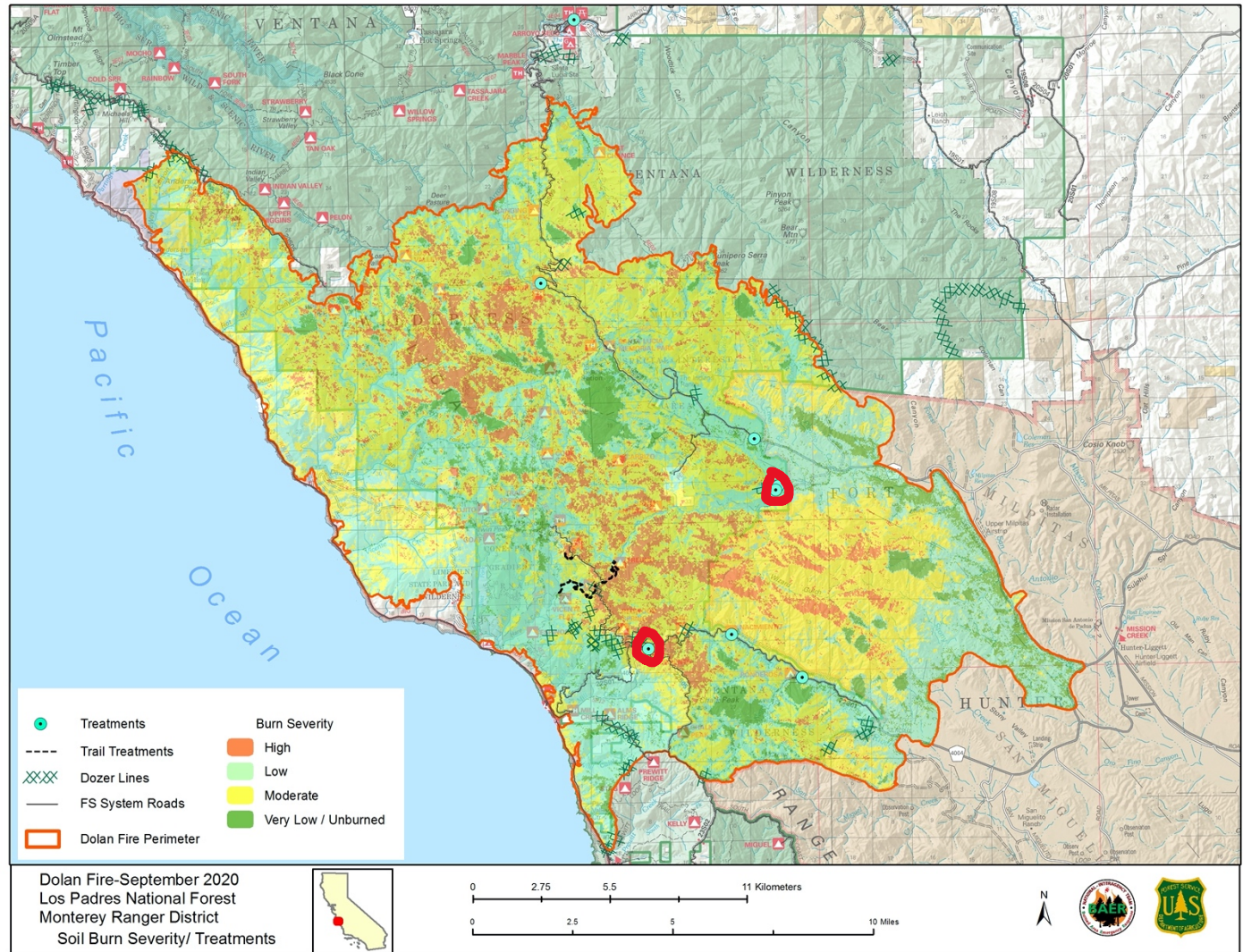
Road treatment areas are denoted by a magenta dot along USFS roadways.

Recreation treatments



Trails that can be worked on are indicated by the black lines. The red dot indicates the location of Escondido Camp where there are dangerous trees. Funding for their removal is not requested in this report and will be attained via other appropriate avenues.

Dozer lines and Hazmats



Dozer lines are indicated by green Xs. Red circles indicate hazmats at Nacimiento Station (southerly circle) and Merle Ranch (northerly circle).