

BURNED-AREA REPORT
(Reference FSH 2509.13)



McCormick Fire, looking at No Name Drainage and High Severity Burn

Executive Summary

The Summit Complex consists of four fires on the Summit Ranger District of the Stanislaus National Forest. The McCormick Fire (4,426 acres) is located along a high, steep south facing slope along the Clark Fork River just upslope of two well used recreation roads - the toe slope Fence Creek and Clark Fork roads. The Douglas Fire (311 acres) is located south of Douglas picnic area and Eureka Campground on Highway 108. The Willow fire (100 acres) is located west of Groundhog Meadow and bound by Hammill Canyon Loop Road. The Bumpers Fire (120 acres) is located near Bumpers Flat on the west side of Donnell Reservoir. The focus of the BAER assessment was the McCormick Fire since it proved to numerous values at risk. The three smaller fires had only two values at risk among them.

The McCormick Fire rises up to 3000 feet above the Fence and Clark Fork roads. Elevation within the fire ranges from about 5,600 to 8,600 feet. Pre-fire vegetation consisted of mixed conifer in the glacial deposits on the lower third of the slope while the upper slope consisted of mountain chaparral, mostly mature green leaf manzanita. The lower slopes burned with mostly moderate and low soil burn severity while the chaparral burned almost entirely off under high and moderate soil burn severity, as shown in the photo above.

The BAER team soil, water and geologic analysis of the McCormick fire concluded that there is a high risk to life and safety and property along the six mile distance of the mostly level Clark Fork and Fence Creek roads. Based upon soil, water and geologic modeling and field observations there are clearly threats from expected

substantial increases in runoff and hyper-concentrated sediment flows, and though with a lesser probability, very dangerous debris flows. The fire area has had only minor fire history over the past 100 years. The mountain chaparral produced both the highest hydrophobicity recalled in the fire history of the forest and revealed an extensive amount of stored sediment beneath it.

The Clark Fork road is paved and maintained by Tuolumne County. The native surface Fence Creek road is a forest system road. Both roads host moderate to heavy recreational traffic during all but winter months when they are under snow closure. However, risk to life and safety remains during the spring and fall since they are part of the wet season, and summer thunderstorms are common. To mitigate the risk to life and safety the winter closure gates can also be closed at other times of year when threats are expected. It will take a coordinated effort by the forest and Tuolumne County to successfully manage the risk to life and safety, and the condition of the two principal roads.

Road damage is very likely, especially on the Clark Fork road which lies beneath the highest area of risk of sediment and debris flows. It has already experienced sediment flows during a small but intense thunderstorm in mid-September. Road treatments for the Fence Creek road are proposed to mitigate the risk. The Fence Creek Campground along the Fence Creek road is also at a very high risk of sediment flows.

Other values at risk on the McCormick Fire include cultural resources and the threat of introduction/spread of invasive plant species. Mitigation treatments are planned.

PART I - TYPE OF REQUEST

A. Type of Report

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

B. Type of Action

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
- ☐ 2. Interim Report
 - ☐ Updating the initial funding request based on more accurate site data or design analysis
 - ☐ Status of accomplishments to date
- ☐ 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Summit Complex Fire

B. Fire Number CA-STF-002655

C. State: CA

D. County: Alpine and Tuolumne

E. Region: 5

F. Forest: Stanislaus National Forest

G. District: Summit District

H. Fire Incident Job Code:

I. Date Fire Started 7/31/2017

J. Date Fire Contained: expected 10-31-17

K. Suppression Cost: 1.5 million (prior to Sept 15)

- L. Fire Suppression Damages Repaired with Suppression Funds
- Fireline waterbarred: 1.7 miles of Forest Service Dozerline
 - Fireline seeded (miles): None
 - Other (identify): None

M. Watershed Number:

180400100402, Mill Creek-Middle Fork Stanislaus River
180400100205, Douglas Creek-Middle Fork Stanislaus River
180400100102, Lower Clark Fork
180400100401, Niagara Creek-Middle Fork Stanislaus River
180400100501, Upper South Fork Stanislaus River

N. Total Acres Burned: Total 4941 NFS Acres 4941 (Other Federal 0 State 0 Private 0)

O. Vegetation Types: Sierran Mixed Conifer, Red Fir, Montane Chaparral, Jeffrey Pine

P. Dominant Soils: Granitic, coarse grained soils are developed on glacial, colluvial and bedrock materials found in the McCormick Fire. Soil names are Lithic Xerumbrepts, Gerle and Gerle Bouldery family. Similar soils are found in the Douglas Fire, including rock outcrop and some volcanic Inville family, deep soils. The Willow fire is mostly burning on Inville family, deep soils.

Q. Geologic Types: The McCormick Fire area is underlain with igneous, intrusive rocks from the Granodiorite of Kinney Lakes (Kkl), the Granodiorite of Topaz Lake (Ktl), andesite lahars from the Relief Peak Formation (Trp), and Glacial Deposits (Qg) consisting of moraines of late Pleistocene (see Figure 1). Glacial moraine deposits were observed off roads throughout the fire area.

R. Miles of Stream Channels by Order or Class:

Perennial 9.3 miles Intermittent 5.7 miles Ephemeral xxx miles

S. Transportation System

Trails: 0.3 miles

Roads: 7.3 miles of NFS roads; 2.5 miles of Tuolumne County

PART III - WATERSHED CONDITION

A. Burn Severity (acres) by ownership Table 2:

McCormick	<u>775</u> (Unburned\VeryLow)	<u>1426</u> (low)	<u>1164</u> (moderate)	<u>1062</u> (high)	4426 (total)
Douglas	<u>187</u> (Unburned\VeryLow)	<u>93</u> (low)	<u>31</u> (moderate)	<u>0</u> (high)	311 (total)
Willow	<u>60</u> (Unburned\VeryLow)	<u>30</u> (low)	<u>1</u> (moderate)	<u>0</u> (high)	90 (total)
Bummers	<u>33</u> (Unburned\VeryLow)	<u>80</u> (low)	<u>1</u> (moderate)	<u>0</u> (high)	114 (total)

Summit Complex:

1055 (Unburned\VeryLow) 1629 (low) 1197 (moderate) 1062 (high) 4941 (total)

Table 1 - Soil Burn Severity for the McCormick Fire

BURN SEVERITY	ACRES	%
HIGH	1061.9	24.0
MODERATE	1163.6	26.3
LOW	1426.2	32.2
UNBURNED\VERY LOW	774.8	17.5
Grand Total	4426.5	100.0

B. Hydrophobic Soils: 2,130; 48% of McCormick Fire

Hydrophobic soil conditions were common within moderate and high burn severity areas and rare in low burn severity areas. The hydrophobic layer was deeper and more continuous in the high severity areas. 70% of the high severity and 50% of the moderate burn severity was hydrophobic. Hydrophobic conditions (strong enough to affect infiltration and runoff) are expected to exist in approximately 50% of the McCormick Fire. The Willow and Douglas Fires are almost all low severity to unburned with little hydrophobic condition.

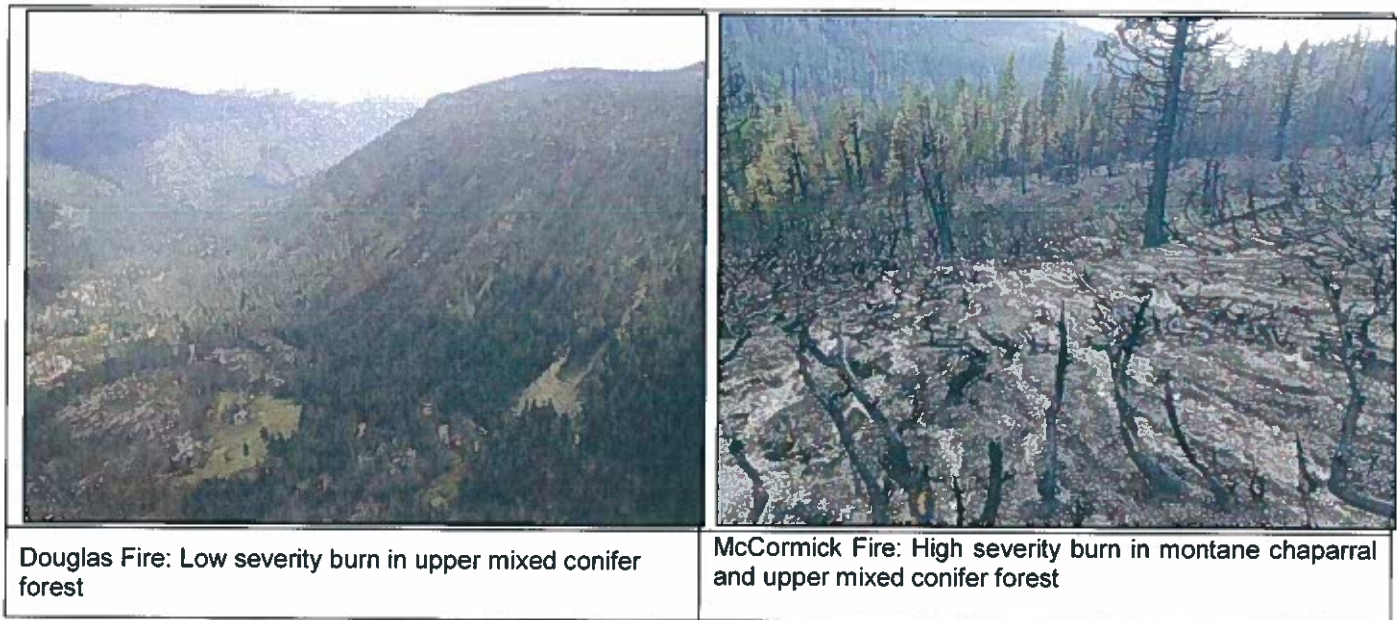
C. Soil Erosion Hazard Rating:

Site-specific erosion hazard rating (EHR) was not calculated for soils in this fire but is estimated at high or very high on soils with high soil burn severity.

 x (low) x (moderate) x (high)

D. Erosion Potential: 9.6 tons/acre (2 year runoff event)**E. Sediment Potential: 4,585 cubic yards / square mile (2 yr runoff event)****F. Debris Flow Potential: Debris flow potential has been exacerbated as a result of the fire.****PART IV - HYDROLOGIC DESIGN FACTORS**

- A. Estimated Vegetative Recovery Period, (years): 5 – 7
- B. Design Chance of Success, (percent): 80
- C. Equivalent Design Recurrence Interval, (years): 2
- D. Design Storm Duration, (hours): 6
- E. Design Storm Magnitude, (inches): 1.74
- F. Design Flow, (cubic feet / second/ square mile): 16
- G. Estimated Reduction in Infiltration, (percent): 25
- H. Adjusted Design Flow, (cfs per square mile): 45



Description of Soil Burn Severity

The McCormick Fire was mapped as 50% moderate to high soil burn severity and 50% low to very low soil burn severity (see Appendix A). McCormick was 24% high, 26% moderate, 32% low, and 17% very low/unburned. The high soil burn severity occurred in large patches of montane chaparral on mid to upper slopes. In general, the eastern end of the McCormick Fire burned hotter than the western end. The Douglas, Willow and Bummers Fires were burned at low severity.

Watershed Response

Watershed response will reflect the burn severity, steepness of terrain and the size of post-burn storm events. These factors along with soil types become inputs to models that estimate water, sediment and debris flows. The McCormick Fire has been analyzed by watersheds or pour points at several different locations different locations in or downstream of the fire area. The task is to estimate post-burn runoff and sediment to areas of concern and compare with pre-burn values.

The Hydrologic and Erosion Response:

Modeling estimates of post-fire peak flow increases ranged from 1.2 to 4.1 times pre-fire estimates (Table 2). Five crossings show substantial increase in flows. All creeks are expected to have a significant increase in sand delivered to road crossings. The water and sediment yield modeling assumes an average 2 year storm event, not worse case scenario. Larger rain events have the potential to increase the risk of flooding and sedimentation. Table 2 shows modeled results by individual drainage.

Table 2: Predicted runoff and sediment response - McCormick Fire (2 year average event)

Watershed	Watershed Acres	Pre-Fire Sediment (cu yds)	Post-Fire Sediment (cu yds)	Pre-Fire Peak flow (cfs)	Post-Fire Peak flow (cfs)	Peak flow Increase (times)
			100% delivery ¹			
9/13/17 Slide on Clark Fork Road	36	6	302	1.5	6	4.1
Little Teton Creek at Clark Fork Road	1106	77	2,080	31.4	44.5	1.4
Cottonwood Creek at Clark Fork Road	200	26	871	7	13.4	2
Unnamed Intermittent at Clark Fork Road	413	170	3,401	13	39.6	3.1

Cloudburst Creek at Clark Fork Road	383	164	3,376	12	38.2	3.1
Fence Creek at Fence Creek Road	1263	115	3,331	12	43.4	3.6
Unnamed Intermittent next to Fence Creek Campground at Fence Creek Road	89	8	651	3.5	13.4	3.9
Drew Creek at Fence Creek Road	1263	147	3,220	35	47.3	1.4
Intermittent Tributary to McCormick Creek at Fence Creek Road	144	48	913	5	12.1	2.3
McCormick Creek at Fence Creek Road	2916	187	4,515	77	92.8	1.2
Montgomery Meadow	248	8	764	9	16	1.8

¹ Assume 100% delivery. What is eroded off the hillslope makes it down to the culvert or pourpoint.

The Erosion Risk Management Tool (ERMiT) was used to predict hillslope erosion and sediment production. (see Appendix B). Fire wide erosion average for the McCormick Fire is as follows:

- 10 tons/acre (range 7.2 – 16.4) for the 2 year runoff event and
- 40 tons/acre (range 35.6 – 68.5) for the 10 year runoff event

For comparison the fire wide erosion average on the Rim Fire was less than 4 ton/acre.

Geologic Response:

The United States Geologic Survey conducted a debris flow assessment of the McCormick Fire area that shows debris flow hazard classes and probability of debris flows. The 10 year event was used to evaluate debris flow potential for the fire area. Several small catchments (drainages) were modeled as having a 40-60% probability of a debris flow with a possible debris flow volumes of 1000-10,000 m³. These catchments include the catchment above Fence Creek Campground and two catchments at Site 4 and just to the catchment to the west of Site 4.

An isolated storm hit the burned area on September 13, 2017. This intense, short-duration storm caused erosion and sedimentation within the burn area and is an indicator of the potential for sediment to erode from the hillslopes, and plug culverts and overtop the Clark Fork Road in future storms. One major slide occurred across the road at an unmapped drainage west of Little Teton Creek. This slide was over 3 feet deep and required heavy equipment to clear the roadway (Figure 1).



Figure 1: Cleared slide (hyper-concentrated sediment flow) across Clark Fork Road resulted from September 13, 2017 rain event.

PART V - SUMMARY OF ANALYSIS

Values at Risk Protocol

The BAER team looked at critical BAER values, i.e., human life, property and natural and cultural resources:

- **Human life and safety** on or in close proximity to burned NFS lands.
- Buildings, water systems, utility systems, road and trail prisms, dams, wells or other significant **investments** on or in close proximity to the burned NFS lands.
- **Water** used for municipal, domestic, hydropower, or agricultural supply or waters with special state or federal designations on or in close proximity to the burned NFS lands.
- **Soil productivity and hydrologic function** on burned NFS lands.
- Critical habitat or suitable occupied habitat for **federally listed threatened or endangered terrestrial, aquatic animal or plant species** on or in close proximity to the burned NFS lands.
- Native or naturalized communities on NFS lands where **invasive species** are absent or present in only minor amounts.
- **Cultural** resources on NFS lands which are listed on or potentially eligible for the National Register of Historic Places.

The risk matrix below (Exhibit 2 of Interim Directive No.: 2520-2010-1) was used to evaluate the "Risk Level" for each value identified during Assessment. Treatments are generally recommended where the risks are high or very high.

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

An Emergency Determination is made where risk is determined to be unacceptable. The section below describes in narrative form the critical values found in the Summit Complex Fires. The individual specialist reports have more detailed analysis of the threat or risk to specific locations in the fire.

The VAR worksheet (see Appendix C) displays the BAER values, level of risk, and possible treatments in a table format.

Emergency Determination

A. Threats to Critical VARs

Geologic Threats to Life and Property– Based on field investigations and modeling of expected post-fire debris flows, there is a substantial risk to critical values (human life and property) along Clark Fork Road within the burn area. Rock fall hazard is present on the upper Fence Creek Road at the switchbacks. An emergency exists at Site 4, Site 7 and Site 12. In addition an emergency may exist at Sites 6, 9 and 11.

- The red colored basin areas and red stream segments on the debris flow hazard map indicate significant risk of debris flows. (see Appendix D).

Clark Fork Road- Based on field investigations and modeling of expected post-fire peak flows, erosion, and debris flows and/or sediment potential, there is a substantial risk to critical values (human life and property) along Clark Fork Road within the burn area.

- Probability of Damage = Possible (human life and safety); Very Likely (property)
- Magnitude of Consequences = Major (human life and safety); Moderate (property)
- Risk = High (human life and safety); Very High (property)
- Emergency Determination = **the above risk assessment is advisory to Tuolumne County.**

The Clark Fork Road is one way in and one way out and is a popular destination for recreationists and visitors to developed campgrounds, i.e., Liahona Camp, Peaceful Pines, and Clark Fork Horse Camp. If roads were blocked during storms, emergency access will be difficult. Tuolumne County has responsibility for maintenance and closure of the Clark Fork Road.

6N75Y- Based on field investigations and modeling of expected post-fire peak flows, erosion, debris flows and/or sediment production, there is a very high risk to critical values (human life and property) along 6N75Y.

- Probability of Damage = Likely
- Magnitude of Consequences = Major
- Risk = Very High
- Emergency Determination = **Yes**

Fence Creek Road- Based on field investigations and modeling of expected post-fire peak flows, erosion, and sediment production, there is a very high risk to critical values (human life and property) along Fence Creek Road.

- Probability of Damage = Likely
- Magnitude of Consequences = Major
- Risk = Very High
- Emergency Determination = **Yes**

Fence Creek Campground- Based on field investigations and modeling of expected post-fire peak flows, erosion, and sediment production, there is an intermediate risk to human life and a high risk to property in the Fence Creek Campground.

- Probability of Damage = Possible (human life); Likely (property)
- Magnitude of Consequences = Moderate (human life and property)
- Risk = Intermediate (human life); High (property)
- Emergency Determination = **Yes**

Montgomery Meadow- Based on field investigations and modeling of expected post-fire peak flows, erosion, and sediment production, there is a low risk to degradation of hydrologic function and a low risk to soil productivity in Montgomery Meadow. While damage is possible the magnitude of consequences is expected to be minimal and recoverable unless unexpected storm damage occurs. The forest will monitor the site until winter conditions prohibit access.

- Probability of Damage = Possible
- Magnitude of Consequences = Minor
- Risk = Low
- Emergency Determination = **No.** Forest will monitor meadow hydrologic function in 2018.

Water Quality- Based on field investigations, there is a low risk of impacts to the beneficial uses of water in the Stanislaus River basin.

- Probability of Damage = Very Likely (smaller drainages); Possible (Clark Fork and MF Stanislaus River)
- Magnitude of Consequences = Minor
- Risk = Low
- Emergency Determination = **No**

Floatable debris (ash, burned wood) and increased fine sediment from accelerated hillslope erosion delivered to streams can cause elevated nutrients, suspended sediment, turbidity, and accumulation of fines in pool

habitat. In addition, accelerated surface and fill erosion on forest roads may result in delivery of fine sediment to stream channels. Office review indicated that the percentage of the Clark Fork River and the Middle Fork Stanislaus River watershed that burned was low (6% and 3%, respectively). Because this was such a small percentage, modeling was not conducted at this scale. Field review showed both rivers flowing clear despite recent storm events that caused sediment movement in smaller drainages. The Clark Fork and Middle Fork Stanislaus Rivers are large streams that have adequate flow and transport capacity to dilute and move downstream increased debris and fine sediment loads transmitted from the fire area. Reach-scale water quality and aquatic habitat in the smaller streams which drain into the Clark Fork and Middle Stanislaus Rivers would be affected by increased nutrients, suspended sediment and debris, increased turbidity, and increased fine sediment in pools; however, these effects are expected to be minor and short-term in duration and occur during storms or snow melt in the first 1 - 2 years after the fire.

Cultural Resources- A total of 18 heritage sites were visited by the BAER team archaeologists in the McCormick Fire. Four sites have the potential for erosion. Selecting cultural resources to assess was a three step process. The first step was to choose sites that are eligible or potentially eligible for listing on the National Register of Historic Places based on criteria as described in 36 CFR 60.4. The second step was considering those sites that are inheritably at greater risk of destruction due to the characteristics they possess (e.g. artifact scatters, structures, and foundations). The third step was overlaying the known burn intensity, slope, and stream shed information in a GIS with the locations of the various cultural resources.

- **1 was identified needing emergency treatment** (e.g., 05-16-53-0552). The site is at a high risk for large sediment/ water overflow from the unnamed drainage bisecting the site. Probability of damage is **very likely**; Magnitude of Consequences is **major**; Risk is **very high**.
- **3 sites were identified for monitoring** (e.g., 05-16-53-0106, 05-16-53-0107, 05-16-53-0113). Probability of damage is **possible**; Magnitude of Consequences is **major**; Risk is **very high**.

In addition, 5 sites within the burn area were not visited due to a lack of potential BAER issues or could not be relocated. The BAER hydrologist is not recommending a physical treatment in Montgomery Meadow (low risk), therefore mitigation for a BAER treatment is unnecessary.

Soil Resource- Based on field investigations and modeling of expected erosion, there is a high risk to soil productivity on significant portions of the McCormick Fire. The Douglas, Willow and Bummer Fires have almost no moderate or high soil burn severity and have a low risk. The McCormick Fire risk rating is as follows:

- Probability of Damage = **Likely**
- Magnitude of Consequences = **Moderate**
- Risk = **High**
- Emergency Determination = **Yes, no effective treatment (steep slopes)**

See treatment narrative for details.

Botany Resource-

- Probability of Damage = **Likely** (McCormick); **Likely** (Willow); **Unlikely** (Douglas and Bummers)
- Magnitude of Consequences = **Moderate** (all fires)
- Risk = **High** (McCormick & Willow); **Low** (Douglas and Bummers)
- Emergency Determination = **Yes** (McCormick & Willow); **No** (Douglas and Bummers)

McCormick: Approximately 10 miles of equipment trafficking (includes dozer line, bladed roads, and roads not bladed but with heavy use by uncleaned equipment). Other disturbance includes 3.3 miles of handline and 3.25 acres of Camp Liahona, and the helispot areas. The helispot and Cottonwood Day Use Area were used to store material taken from the road slide. See the McCormick Weed Treatment Map (Appendix E) for the footprint of disturbed ground now susceptible to invasive plants, primarily bull thistle and possible Canada thistle.

- Camp Liahona where the dozer line went through bull thistle and where there was a lot of traffic. Weeds from there can go up Arnot Creek and into the wilderness with prevailing winds.
- Clark Fork Road- this is a fairly straight shot up Clark Fork that can again carry weeds into the wilderness. It is an open wind corridor and it had a lot of mechanized work as we saw. Some of the deposition over this winter may carry bull thistle from the Corral Road.
- Fence Creek can send weeds to a number of meadows and two wilderness trailheads there. There were many dozer and hand lines at the western end of the fire. The risk of spreading weeds was quite low pre-fire in the Fence Creek area. However, streams and meadows where bull thistle can persist is now a threat because of the uncertainty of importing seeds on dirty equipment. So surveying all of those lines can help prevent establishment in a relatively weed free area mainly surrounded by wilderness.

The native communities are at **high risk** of compromised landscape ecological integrity from invasive non-native plant population expansion and new population establishment. This BAER emergency can be mitigated by detecting and treating known populations to limit fire- and fire-activity related population growth. The probability of damage is **likely with moderate consequences** to the landscape in the first year after fire.

Willow Fire: At Willow Fire, the risk is somewhat lower for weed establishment away from the fire, but the intermediate wheatgrass along 14 miles of road used by suppression activities (including blading and smoothing the road) can spread away from roads even without disturbance. So if introduced, it is likely over time to affect the openings that the Yosemite toad favors when not breeding. The aquatic biologist was consulted and considered the risk of habitat degradation to be low to intermediate, depending on actual spread rate (hard to quantify with certainty).

The Douglas Fire had hand line on steep slopes. However there are no known weeds at that site and the fire was low severity, so weed spread and weed establishment is unlikely.

- In all of these situations, getting NEPA to herbicide the weeds isn't an option- wilderness and critical habitat. So early detection/rapid response is the main way to prevent a loss of resources.

Aquatics Biology

The Willow Fire perimeter is within one mile of known occurrences of Yosemite toad (Federally Threatened) and Sierra Nevada yellow-legged frog (Federally Endangered). The fire perimeter, and most of the area affected by suppression efforts, is within Critical Habitat (Unit 2, Leavitt Lake/Emigrant) designated for the toad. Due to the small size of the fire, low fire severity, limited amount of area affected by the fire in the Willow Creek watershed, and large distances between the fire area and the nearest perennial stream courses, there is no risk to individual Sierra Nevada yellow-legged frogs, frog populations, or the habitats they rely upon. The other suppression-related impacts were minimal in impact and are not expected to affect the known frog population or its needed habitats.

The fire perimeter is within the dispersal distance of Yosemite toad, which can be greater than a mile from breeding sites. The fire area is not hydrologically connected to any known breeding habitat and post-fire effects will have no effect on this habitat type. Non-breeding habitats utilized by adult toads includes underground spaces frequently created by burrowing rodents. Based on radio-telemetry data collected on the Sierra National Forest, the occupied burrows are typically located in areas with very low to no canopy cover and sparse vegetative ground cover. These habitats can occur in disturbed places (examples, road cuts and shoulders of the road) or in natural openings (that resemble dry meadows) that occur between patches of forest cover or adjacent to wet meadows. There is very low to no risk that post-fire processes could affect suitable non-breeding habitats or the integrity of the Critical Habitat. However, some of the suppression actions have the potential to impact non-breeding habitats. The primary risk of habitat degradation is associated with the spread of invasive plants whereby the sparse, open habitats could be subject to invasion, especially in areas that are frequently disturbed. These areas include road prism and shoulders and slopes downhill of the shoulders. The risk of habitat degradation is considered to be low to intermediate and largely depends on the species of "weeds" and their mechanisms of spread. Intermediate risk is applied to invasive plants that have the potential to rapidly colonize an area with dense aggregations of vegetation. Minor risk is applied to

invasives that may not spread readily or have low density populations of vegetation once established on the landscape. The other known suppression actions (road grading, roadside brushing, controlled back fire, parking, drafting) are not expected to have a measurable impact on toad populations or habitats. There was no suitable habitat for either the Yosemite toad or Sierra Nevada yellow-legged frog in or downstream of the areas affected by the McCormick and Douglas fires.

B. Emergency Treatment Objectives

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

Land 90 % Channel na % Roads/Trails 90 % Protection/Safety 80 %

D. Probability of Treatment Success

	1	3	5
Land	90%	90%	n/a
Channel	n/a	n/a	n/a
Roads	90%	90%	90%
Protection/Safety	90%	90%	n/a

E. Cost of No-Action (Including Loss): See Appendix F: Summary of cost-risk analysis.

F. Cost of Selected Alternative (Including Loss): See Appendix F: Summary of cost-risk analysis.

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input checked="" type="checkbox"/> Geology	<input type="checkbox"/> Range	<input type="checkbox"/> Public Information
<input type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input type="checkbox"/> Inter-agency coordinator
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input type="checkbox"/> NRCS
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

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Rusty LeBlanc – Roads Engineer
Kathy Strain – Heritage
James Moak – Heritage trn.
Kimberly Stahl – Heritage trn.

H. Treatment Narrative

Based on the expected significant watershed response from the McCormick Fire, the principal fire in the Summit Complex, the BAER Assessment team determined that there are risks that require several emergency treatments to mitigate the threat to life and safety, property and natural and cultural resources. For the smaller fires, the Willow fire has one emergency related to noxious weeds, the Douglas Fire has one life and safety emergency, and the Bummers fire has no known BAER emergencies.

The emergency response to the Summit Complex Fire includes all three strategies listed in FSM 2523.2 (Interim Directive 04/06/2017). In order of preference, these are:

Natural Recovery – There are no practical or effective treatments on the McCormick Fire to mitigate the emergency from the hillslopes immediately above the Clark Fork and Fence Creek roads which undersling the lower fire boundary. Immediate ground cover application, such as mulching, intended to minimize the substantial erosion and sedimentation that is very likely to impact those roads, is not feasible. Slope gradients in high and moderate soil burn severity areas are 50% and greater with slope lengths up to about 5,000 feet. As such, Tuolumne County Public Works has been advised of the risks associated with this condition along their Clark Fork road.

Hillslope erosion and sedimentation is not a BAER emergency on the three smaller fires due the low soil burn severity throughout them.

Administrative Closures – Three administrative closures are planned to mitigate risk of life and safety, all on the McCormick Fire. The gates at the entrance to the Fence Creek road and the Fence Creek campground will be closed. Tuolumne County's gate on the Clark Fork road has an annual winter closure, and may be closed sooner if storms present a threat to people driving on the road.

Other Treatments – Emergency treatments for roads, cultural resources (archeology) and natural resources (botany) will be conducted.

See the appendix section for treatment maps.

Treatments to Mitigate the Emergency

Protection and Safety Treatments

To protect life and safety from threats of rockfall, hazard trees, flooding, and sediment or debris flows from the McCormick Fire the following administrative closures are planned.

Clark Fork Road - Tuolumne County's gate on the Clark Fork road is currently open but has an annual winter closure. Earlier closure this fall or closures into 2018 and beyond, if needed, will require a coordinated effort between the county and the Forest Service. A Forest Service interagency coordinator should be assigned to help assure that this emergency response is implemented effectively.

Fence Creek Road - The Fence Creek road gate is currently closed. If it is opened to the public before winter it should be closed during fall storms that pose a risk to safety of road users.

Fence Creek Campground - The entry gate to the Fence Creek campground is currently closed. If it is opened to the public before winter it should be closed during fall storms that pose a risk to safety of road users.

The frequency and length of time the roads and the campground above may have closures at times other than the annual winter closures is dependent on how long the life and safety threats exist. This could be one year, or longer. Closures could be non-winter season long or intermittent during those times.

In addition to administrative closures, signage will be conducted in the above areas to warn users that threats to life and safety may be present even when the above roads are open. An additional warning sign will be placed in the Douglas Fire just across the river bridge on forest road 6N40Y. Signage costs are included in the road treatment costs below.

The estimated cost of a Forest Service interagency coordinator to work with Tuolumne County on administrative closures of the Clark Fork road is \$3500.

Road Treatments

Road treatments are planned along three roads – the Fence Creek road (6N06), the Fence Creek Campground road (6N82Y) and the “Corral” road (6N75Y) paralleling the Clark Fork road.

Treatments include installing critical dips (13), fillslope rip-rap (12 tons), and CMP metal end sections (3). Also included is restoring drainage function (5.5 miles) and storm inspection and response (2.2 miles). Much of this work is focused on the Fence Creek road switchback area on the western end of the McCormick fire where the road is steep and is near/downslope of high soil burn severity. A smaller amount of treatments are on 6N75Y and 6N82Y. See the Roads-Engineering specialist report for details and treatment specifications. See Appendix E for road treatment map.

The estimated cost of the road treatments (including signage) is \$46,833.

Land Treatments

Land treatments include archeology treatments in the McCormick Fire, and botany treatments in the McCormick and Willow Fires.

Archeology

One previously recorded pre-historic site will be treated. It is unique for its variable stone tool components which indicate widespread travel, trading and cultural interaction. The site is located immediately next to a stream channel that during a short duration high intensity thunderstorm just before the BAER team's field work deposited a large amount of sediment on the floodplain that almost inundated the site. The treatment is to accomplish data recovery of the site components. The BAER team considered treatment options of a sand bag levee and/or silt fence deflectors, but observation and sediment modeling showed those treatments would fail to keep the site protected from additional sedimentation and/or erosion this winter.

The estimated cost for this treatment is \$3,500.

Botany

The botany treatment consists of early detection and rapid response (EDRR) for invasive non-native plant species.

On the McCormick Fire the EDRR treatment includes 13.6 miles of linear features (2.5 miles of bladed paved road, 6.2 miles of native surface road, 1.7 miles of dozer line, and 3.2 miles of handline), and 3.25 areal acres

(Camp Liahona and the Brightman helispot). EDRR is a proven effective BAER treatment for mitigating introduction of weeds and spread of existing weed populations.

On the Willow Fire the EDRR treatment consists of 14 miles of forest road 4N12 (also known as the Herring Creek loop road). While the Willow Fire is the smallest of the Summit Complex fires, fire suppression road use covered the full length of 4N12, using heavy equipment to prepare the road surface as needed for firefighting vehicles.

The line item costs of the above treatments are shown in part VI of the 2500-8. The weed treatment map is in the Appendix E, and the cost worksheet is in the Botany specialist report folder.

The estimated cost of the botany EDRR treatments is \$10,495 for the McCormick fire and the cost for the Willow fire is \$5,600, for an overall total of \$16,095.

Channel Treatments

No channel treatments are prescribed.

I. Monitoring Narrative

(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)


No monitoring is proposed for the Summit Complex at this time.


This report is an initial funding request based on a rapid assessment. If additional treatment needs are identified through more site specific on the ground investigation in cooperation with interested agencies, and noxious weed detection surveys, interim requests for additional funding will be filed. These funding requests will identify the purpose for each treatment, and specific treatment specifications, locations, and number of each treatment.

Part VI – Emergency Stabilization Treatments and Source of Funds

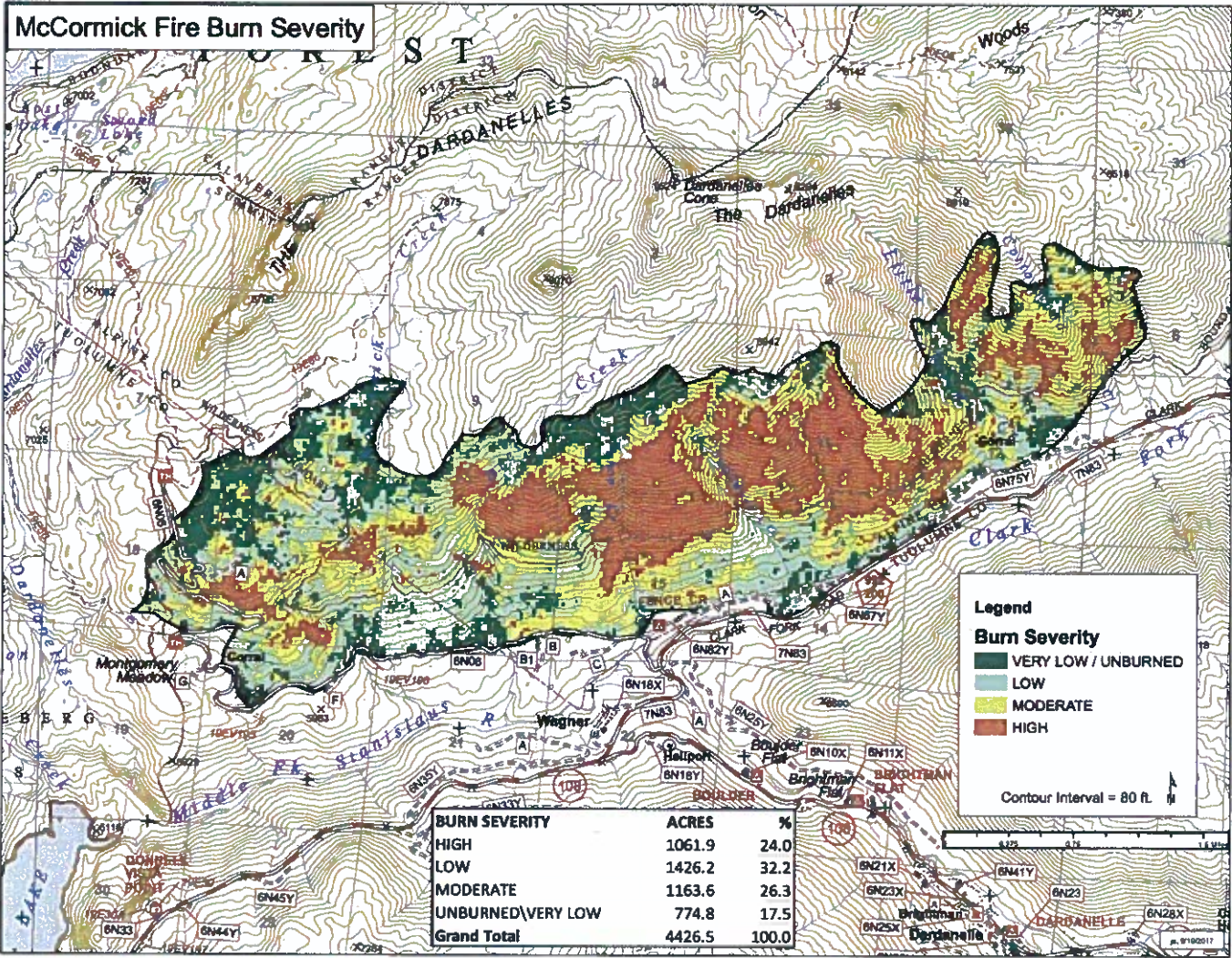
			NPS Lands				Other Lands			All
Line Items	Units	Unit Cost	# of Units	BAER \$	Other \$	# of units	Fed \$	# of Units	Non Fed \$	Total \$
A. Land Treatments										
Invasive weeds - roads, dozer & hand lines	mi	548	27.6	\$15,125	\$0		\$0		\$0	\$15,125
Invasive weeds - disturbed areas	ac	300	3.25	\$975			\$0		\$0	\$975
Cultural site data recording	ea	3500	1	\$3,500	\$0		\$0		\$0	\$3,500
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$19,600	\$0		\$0		\$0	\$19,600
B. Channel Treatments										
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Channel Treat.				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
Critical dips	ea	500	14	\$7,000	\$0		\$0		\$0	\$7,000
Fillslope rip rap	ton	750	2	\$1,500	\$0		\$0		\$0	\$1,500
CMP flared metal end sections	ea	2500	4	\$10,000			\$0		\$0	\$10,000
Storm inspection/response - 2 events @ 2.2 miles ea	mi	1500	4.4	\$6,600			\$0		\$0	\$6,600
Restore drainage function	mi	1000	6	\$6,000			\$0		\$0	\$6,000
Mobilize/implement work (30% lines 15-19)	ls	9333	1	\$9,333			\$0			\$9,333
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Road & Trails				\$40,433	\$0		\$0		\$0	\$40,433
D. Protection/Safety										
Warning signs and gates	ls	6400	1	\$6,400	\$0		\$0		\$0	\$6,400
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Protection/Safety				\$6,400	\$0		\$0		\$0	\$6,400
E. BAER Evaluation										
Salary and travel	project	55,000	1	\$55,000			\$0		\$0	\$0
Coordination Lead	days	350	10	\$3,500						\$3,500
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
Subtotal Evaluation				\$3,500	\$0		\$0		\$0	\$3,500
F. Monitoring										
Coordination Lead				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals				\$69,933	\$0		\$0		\$0	\$69,933
Previously approved										
Total for this request				\$69,933						

PART VII - APPROVALS

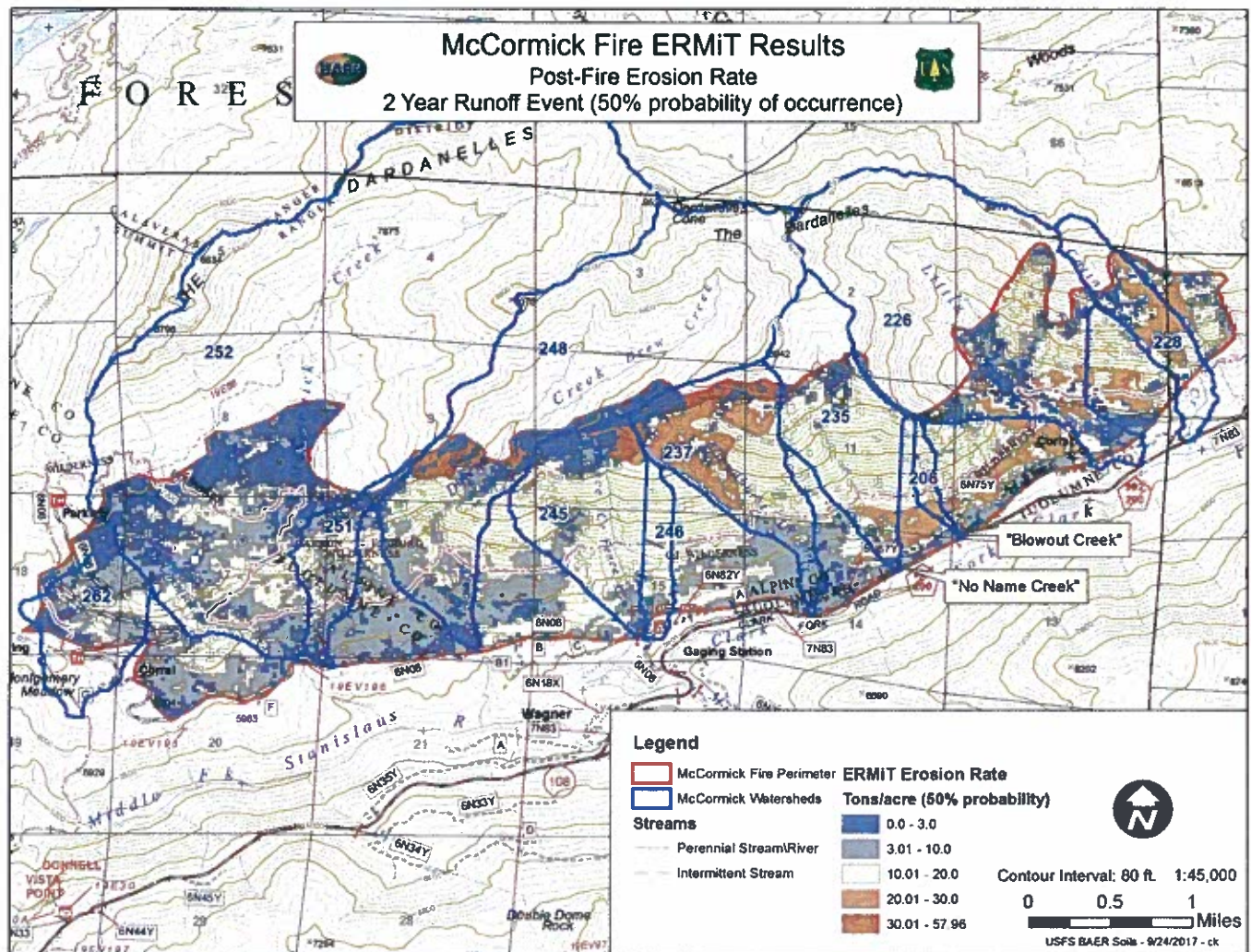
1. 
Stanislaus NF Forest Supervisor (signature) 9/29/17
Date

3. 
Regional Forester (signature) 10/07/2017
Date

Appendix A: Soil Burn Severity Map:



Appendix B- Erosion modeling results



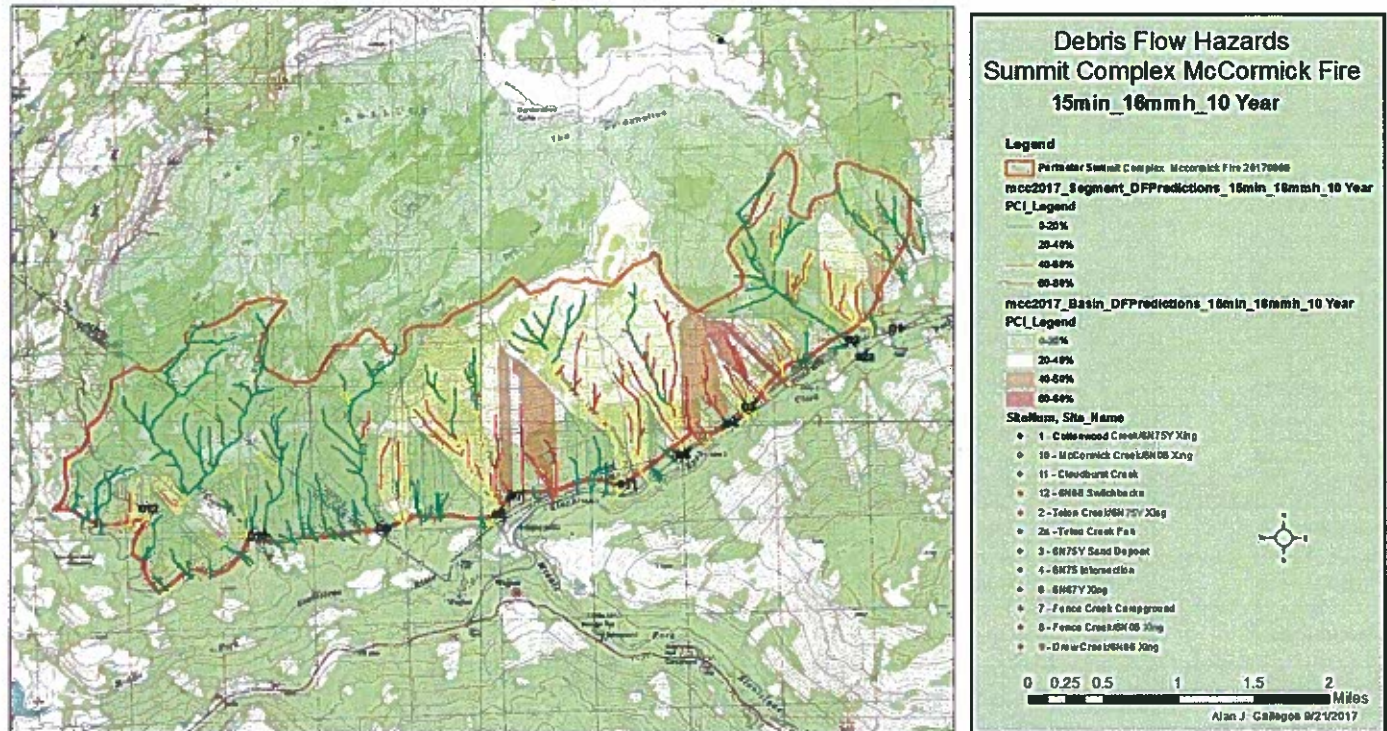
Appendix C: VAR Table

SUMMIT COMPLEX FIRE

Critical Values at Risk assessment table

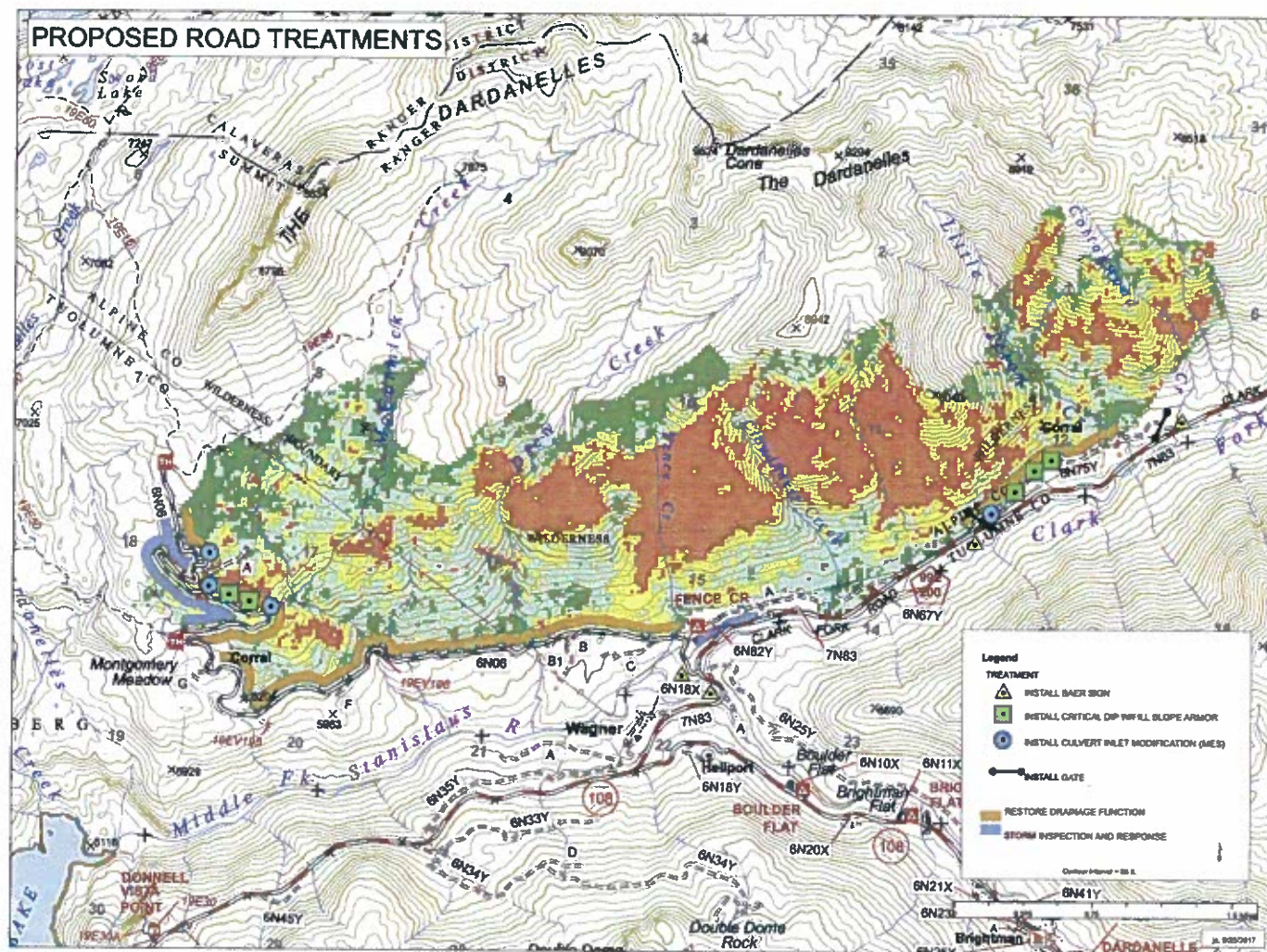
Critical Value	Resource	Value at Risk	Threats	Ownership	Probability of Damage	Magnitude of Consequence	Risk	Forest Service Treatment
Human Life & Safety	Wtr/Soil	Fence Creek Rd (6N06)	flooding, erosion, & sediment	FS	Likely	Major	Very High	Road Closure & Warning Signs
Human Life & Safety	Geology	Site 8 (Fence Creek)	Debris Flows	FS	Possible	Moderate	Intermediate	Warning Signs
Human Life & Safety	Geology	Site 9 (Drew Creek & 6N06)	Debris Flows	FS	Possible	Moderate	Intermediate	Warning Signs
Human Life & Safety	Geology	Site 12 (6N06 Switchbacks)	Rockfall	FS	Likely	Moderate	High	Warning Signs
Human Life & Safety	Wtr/Soil/Geo	Clark Fork Rd	flooding, erosion, & sediment	Tuolumne County	Possible	Major	High	Advise Tuolumne County of Risk
Human Life & Safety	Geology	Site 6 (catchment above 6N67Y & Clark Fork Road)	Debris Flows	Tuolumne County	Possible	Moderate	Intermediate	Warning Signs
Human Life & Safety	Geology	Site 11 (Cloudburst Cr & Clark Fork Rd)	Debris Flows	Tuolumne County	Possible	Moderate	Intermediate	Advise Tuolumne County of Risk
Human Life & Safety	Wtr/Soil/Geo	6N75Y	flooding, erosion, & sediment	FS	Likely	Major	Very High	Install Gate @ both ends of road
Human Life & Safety	Geology	Site 1 (6N75Y & Cottonwood)	Debris Flows	FS	Possible	Minor	Low	No treatment
Human Life & Safety	Geology	Site 2 & 2a (6N75Y)	Debris Flows	FS	Possible	Moderate	Intermediate	Warning Signs
Human Life & Safety	Geology	Site 3 (6N75Y)	Debris Flows	FS	Possible	Minor	Low	No treatment
Human Life & Safety	Geology	Site 4 (6N75Y)	Debris Flows	FS	Likely	Moderate	High	Warning Signs or Close road
Human Life & Safety	Wtr/Soil/Geo	Fence Creek Campground & 6N82Y	flooding, erosion, & sediment	FS	Possible	Moderate	Intermediate	Closure signs & close gate
Human Life & Safety	Geology	Site 7 (catchment above Fence Cr. Campground)	Debris Flows	FS	Likely	Moderate	High	Close camp sites 33 & 34
Human Life & Safety	Wtr/Soil/Geo	6N40Y	flooding, erosion, & sediment	FS	Possible	Major	High	Warning Signs (Douglas Fire)
Cultural Resources	Archeology	site 53-552	flooding, erosion, sediment, debris flow	FS	Likely	Major	Very High	Data recovery
Cultural Resources	Archeology	sites 53-106,107,113	erosion	FS	Unlikely	minor	Low	No treatment
Cultural Resources	Archeology	Other sites monitored	erosion	FS	Unlikely	minor	Very low	No treatment
Natural Resources	Botany	Native Plant Recovery - McCormick Fire	Spread/introduction of noxious weeds	FS	Likely	Moderate	High	Early Detection & Rapid Response
Natural Resources	Botany	Native Plant Recovery - Willow Fire	Spread/introduction of noxious and invasive weeds - alteration of critical habitat	FS	Likely	Moderate	High	Early Detection & Rapid Response
Natural Resources	Botany	Native Plant Recovery - Douglas Fire	Spread/introduction of noxious weeds	FS	Unlikely	Moderate	Low	No treatment
Property	Developed Rec	Fence Creek Campground	flooding, erosion	FS	Likely	Moderate	High	Campground or Campsite Closure
Property	Engr/wtr	Clark Fork Road	flooding, erosion	Tuolumne County	Very Likely	Moderate	Very High	Advise Tuolumne County of Risk
Property	Engr/Wtr	6N75Y Road	flooding, erosion, sediment	FS	Likely	Moderate	High	Restore Drainage Function
Property	Engr/Geo	6N75Y Road	debris flows	FS	Possible	Moderate	Intermediate	Warning signs & install 2 gates
Property	Engr/Wtr	6N06 Road (Fence Creek Rd)	flooding, erosion	FS	Likely	Moderate	High	Restore Drainage Function
Property	Engr	6N82Y Road	flooding, erosion, sediment	FS	Likely	Moderate	High	Storm Inspection & Response
Natural Resources	Water	Beneficial Uses _ Montgomery Meadow	Sedimentation, erosion, meadow habitat loss	FS	Possible	Minor	Low	None recommended. Forest will monitor in 2018
Natural Resources	Water	Beneficial Uses _ Stanislaus River & Clark Fork Stanislaus	Sedimentation	FS	Possible	Minor	Low	No treatment
Natural Resources	Water	Beneficial Uses _ Small tributaries to Stanislaus River	Sedimentation	FS	Very Likely	Minor	Low	No treatment
Natural Resources	Soils	Soil Productivity	erosion	FS	Likely	Moderate	High	Treatment not effective, slopes too steep
Natural Resources	Soils	Soil Productivity _ Montgomery Meadow	erosion & sediment deposition	FS	Possible	Minor	Low	No treatment

Appendix D: Debris Flow Hazard Map

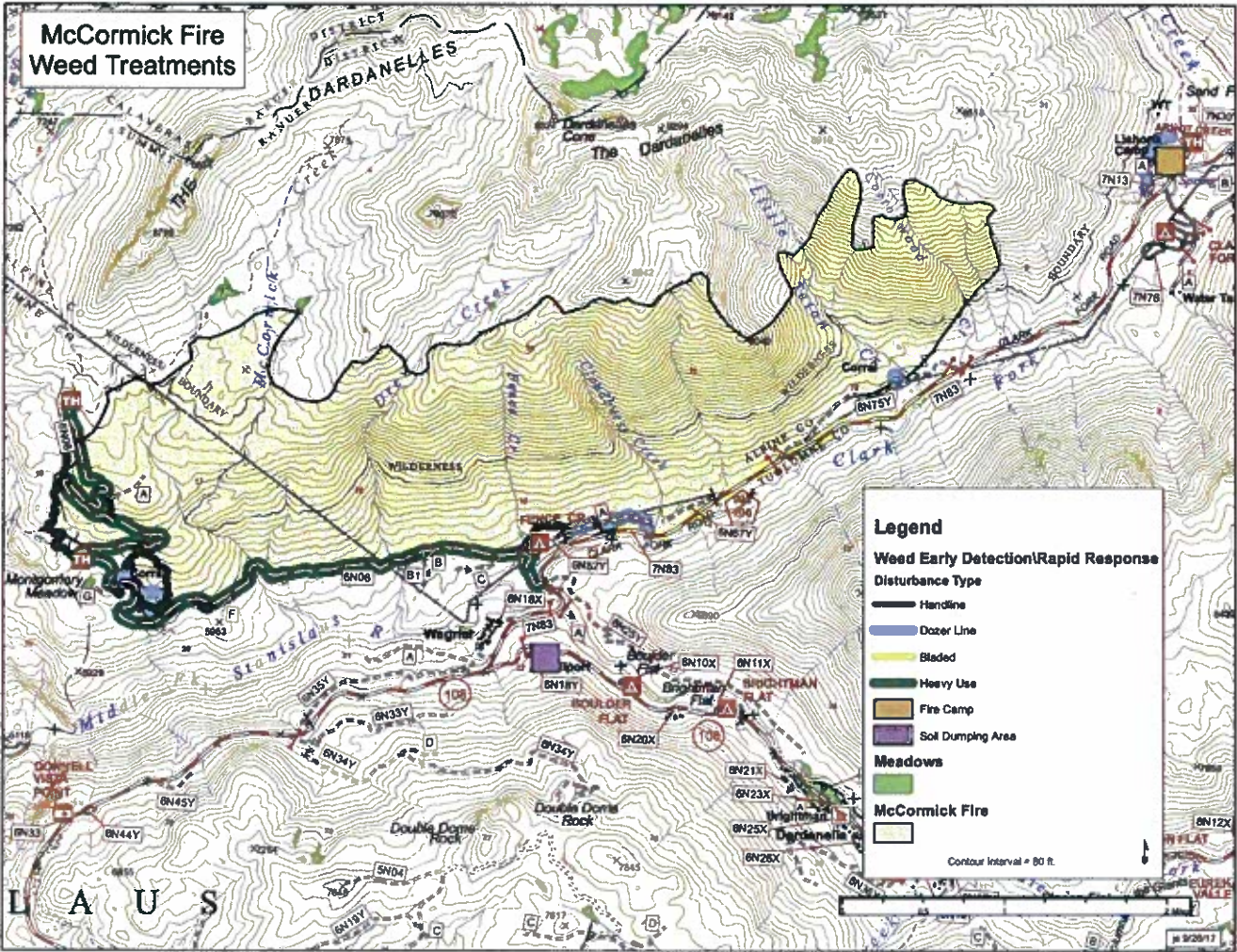


Appendix E: Treatment Maps (proposed)

Map 1- Road treatments



Map 2- Proposed Weed treatments



Appendix F: Economic Analysis (based on VAR Calculation Tool)

Fire Name	Summit Complex (McCormick Fire)		
Location	Summit Ranger District, Stanislaus National Forest, CA		
Date	9/28/17		

SUMMARY	Total Treatment Cost	\$	69,933
	Expected Benefit of Treatment	\$	131,000
	Implied Minimum Value (IMV)	\$	30,766

MAP ZONE A	Value Type	Value at Risk	Implied Value and/or Benefit Cost
	Life and Safety	Yes	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	
	Market Values: Direct	Yes	\$ 125,000
	Market Values: Loss of Use	Yes	\$ 127,000
	<i>Total Market Resource Value</i>		\$ 252,000
	<i>Proposed Treatment</i>		\$ 30,700
	Reduction in Probability of Loss		0.50
	Expected Benefit of Treatment		\$ 126,000
	Exp B/C Ratio of Treatment for Market Resources Only		4.1
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		\$ -

MAP ZONE B	Value Type	Value at Risk	Implied Value and/or Benefit Cost
	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	
	Market Values: Direct	No	\$ -
	Market Values: Loss of Use	Yes	\$ 10,000
	<i>Total Market Resource Value</i>		\$ 10,000
	<i>Proposed Treatment</i>		\$ 9,733
	Reduction in Probability of Loss		0.50
	Expected Benefit of Treatment		\$ 5,000
	Exp B/C Ratio of Treatment for Market Resources Only		0.5
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		\$ -

MAP ZONE C	Value Type	Value at Risk	Implied Value and/or Benefit Cost
	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	Yes	
	Market Values: Direct	No	\$ -
	Market Values: Loss of Use	No	\$ -
	<i>Total Market Resource Value</i>		\$ -
	<i>Proposed Treatment</i>		\$ 16,100
	Reduction in Probability of Loss		0.60
	Expected Benefit of Treatment		\$ -
	Exp B/C Ratio of Treatment for Market Resources Only		
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		\$ 26,833

MAP ZONE D	Value Type	Value at Risk	Implied Value and/or Benefit Cost
	Life and Safety	No	
	Non-Market: Cultural Values	Yes	
	Non-Market: Ecological Values	No	
	Market Values: Direct	No	\$ -
	Market Values: Loss of Use	No	\$ -
	<i>Total Market Resource Value</i>		\$ -
	<i>Proposed Treatment</i>		\$ 3,500
	Reduction in Probability of Loss		0.89
	Expected Benefit of Treatment		\$ -
	Exp B/C Ratio of Treatment for Market Resources Only		
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		\$ 3,933
MAP ZONE E	Value Type	Value at Risk	Implied Value and/or Benefit Cost
	Life and Safety	Yes	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	
	Market Values: Direct	No	\$ -
	Market Values: Loss of Use	No	\$ -
	<i>Total Market Resource Value</i>		\$ -
	<i>Proposed Treatment</i>		\$ 9,900
	Reduction in Probability of Loss		0.65
	Expected Benefit of Treatment		\$ -
	Exp B/C Ratio of Treatment for Market Resources Only		
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		\$ -