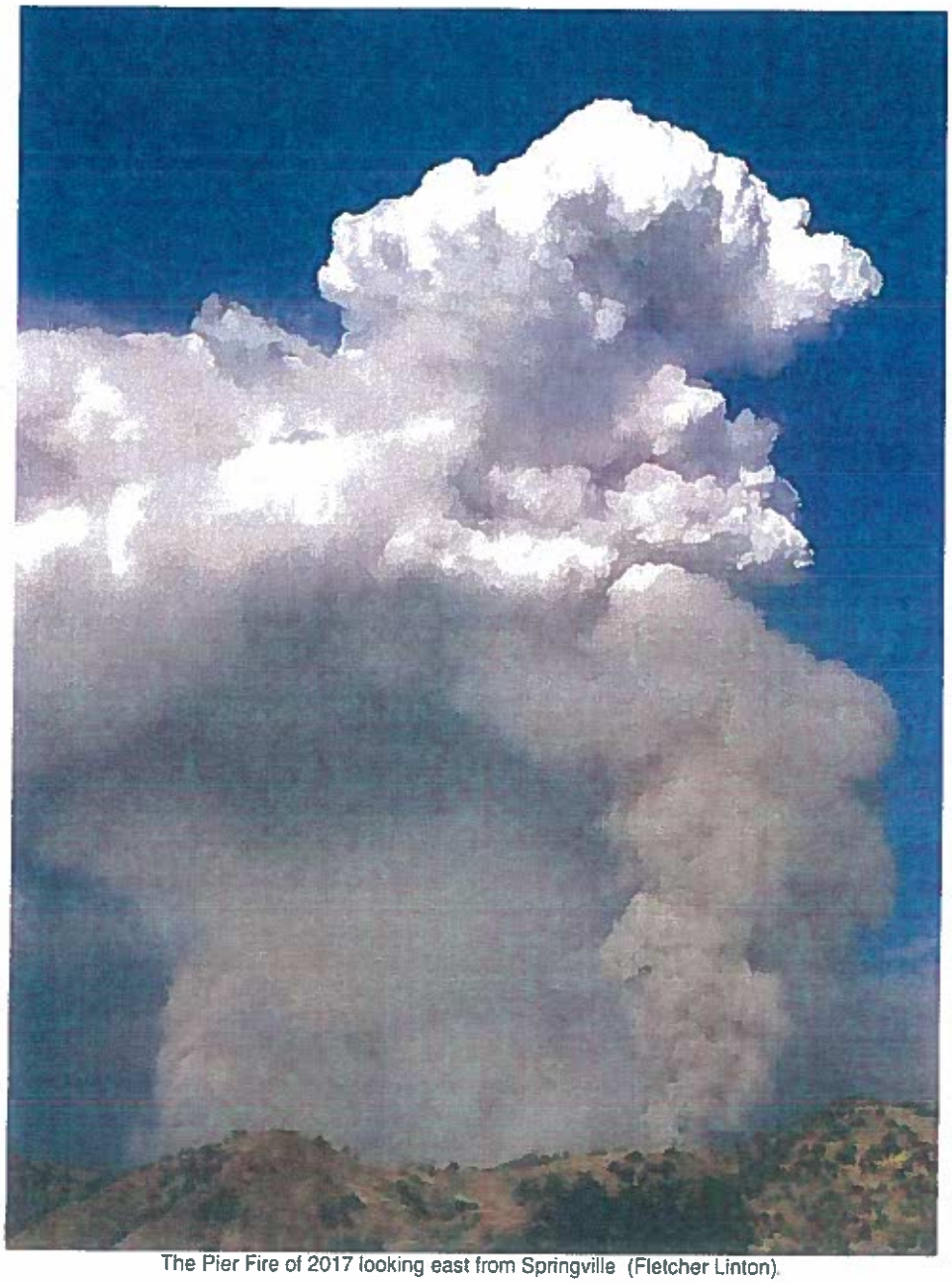
USDA-FOREST SERVICE
(7/08)

FS-2500-8
Date: 9/18/17

**DRAFT PIER FIRE BURNED AREA REPORT**
(Reference FSH 2509.13)

## PART I - TYPE OF REQUEST



The Pier Fire of 2017 looking east from Springville (Fletcher Linton).

A. Type of Report

[X ] 1. Funding request for estimated WFSU-SULT funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[X ] 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation 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: Pier Fire

B. Fire Number:CA-SQF-002385

C. State:California

D. County:Tulare

E. Region:5

F. Forest:Sequoia National Forest

G. District:Western Divide

H. Fire Incident Job code: P5LA1W 0513

I. Date Fire Started:August 29, 2017

J. Date Fire Contained: 85% as of 9/17/2017

K. Suppression Cost: approximately 32 million as of 9/15/2017

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 53 miles of dozer lines, 70 miles of reinforced road, 10.5 miles of handline
2. Fireline seeded (miles): 0
3. Other (identify):

M. Watershed Number(s):

| HUC 12 Watershed Name | HUC 12 Watershed Number | Acres |
|---|---|---|
| Campbell Creek-Tule River | 180300060701 | 25,227 |
| Lower North Fork Tule River | 180300060204 | 15,260 |
| Long Canyon-Middle Fork Tule River | 180300060103 | 15,299 |
| North Fork Middle Fork Tule River | 180300060102 | 26,685 |
| South Fork Middle Fork Tule River | 180300060101 | 28,327 |

N. Vegetation Types: Vegetation types in the Pier fire burn perimeter are predominantly mixed conifer dominated by pine (27%) and canyon live oak (18%). Plant communities varies from blue oak savanna, chaparral and live oak woodland at the lower elevations to ponderosa pine, mixed conifer forest, and giant sequoias at the upper elevations. Various riparian plant communities are found along river, streams, and within meadows.

O. Dominant soil types

| Map Unit | Acres | % of Fire |
|---|---|---|
| Auberry sandy loam, 30 to 50 percent slopes | 5352 | 19 |
| Dome-Chaix-Rock outcrop association, steep | 3017 | 11 |
| Rock outcrop-Auberry-Kanaka family association, very steep | 2777 | 10 |
| Auberry sandy loam, 50 to 75 percent slopes | 2681 | 10 |
| Kanaka-Millerton families-Rock outcrop association, steep | 2138 | 8 |

*With Auberry supporting the hardwood stands, Dome and Chaix associated strongly with the Sequoia grove and outcrop dominated map units supporting the south aspect Chamise and manzanita communities.*

P. Geologic Types: The Pier Fire occurred on the west slope of the Central Sierra Nevada mountain range within the Middle and South Forks of the Tule River drainages. The majority of the burned area occupies the HUC 10 – Middle Fork Tule River watershed. The physiography of the region is dominated by extremely rugged canyons and steep slopes mostly draining into the Middle Forks of the Tule River.

Bedrock within the boundaries of the Pier Fire consists of two primary rocks types: Mesozoic Undifferentiated Granitic rocks (Mzg) ranging from granite to gabbro; and Pre-Cretaceous Metavolcanic rocks (JTrm) consisting of undivided metasedimentary and metavolcanic rocks, covering a relatively small area on the east and northeast of the burned area (Figure 1). Surficial geologic units include alluvial deposits, gravel and sand of varying ages and surficial scars and deposits from various types of instability features.

Q. Miles of Stream Channels (with Fire perimeter) by Order or Class: 43 miles of perennial streams, 24 miles of intermittent streams, and 329 miles of ephemeral streams.

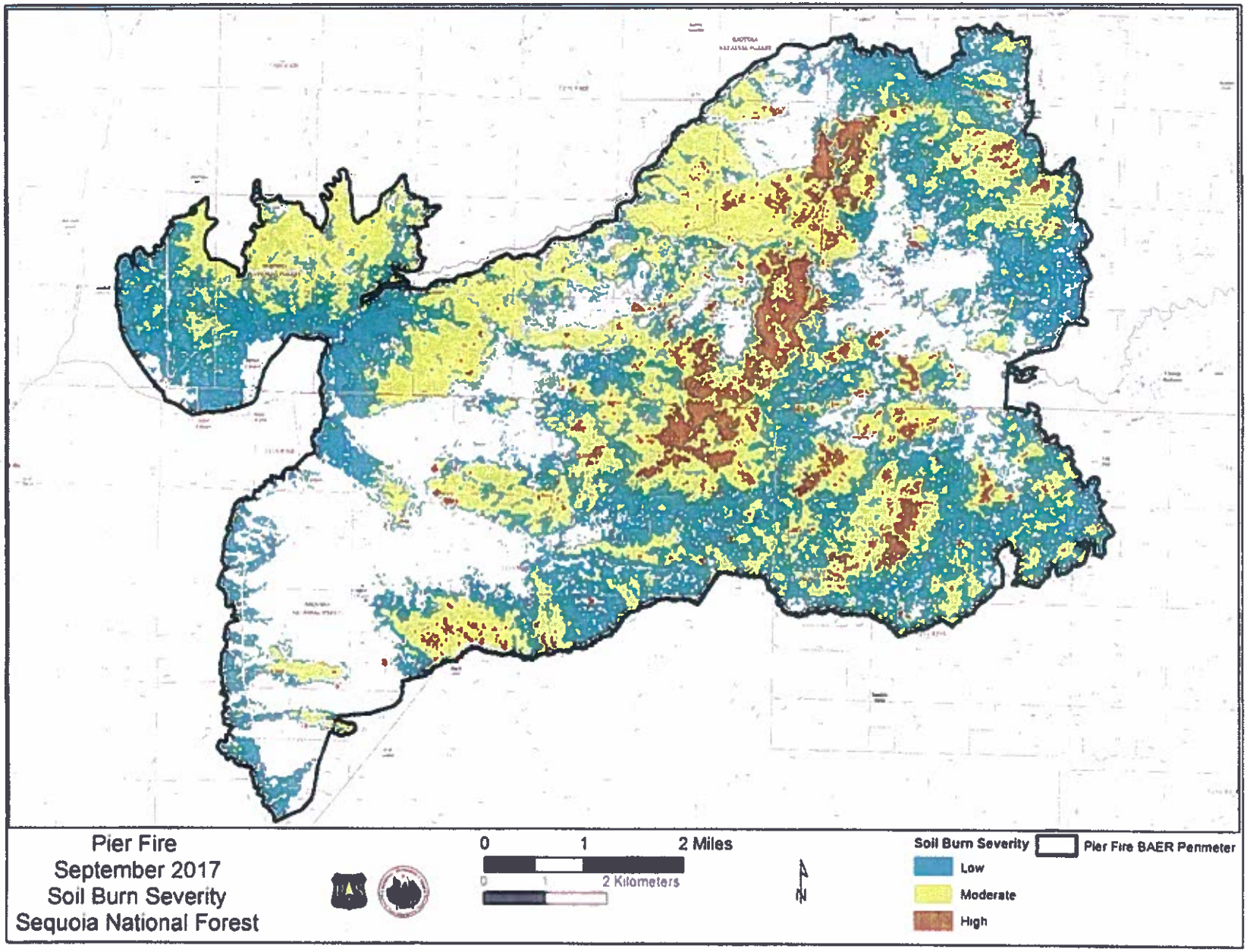
R. Transportation System

Trails: 3 miles Roads: 33 miles

## PART III - WATERSHED CONDITION

A. Burn Severity (acres):

| Soil Burn Severity Acre | | | | |
|---|---|---|---|---|
| Unburned/V. Low | Low | Moderate | High | Total |
| 7,039 | 10,606 | 8,503 | 1,255 | 27,403 |
| 25.7 % | 38.7% | 31.0% | 4.6% | 100% |


Pier Fire
September 2017
Soil Burn Severity
Sequoia National Forest
0 1 2 Miles
0 1 2 Kilometers
N
Soil Burn Severity
Pier Fire BAER Perimeter
Low
Moderate
High

B. Water-Repellent Soil (acres): 50%

C. Soil Erosion Hazard Rating (acres):
___ (low) ___ (moderate) _____ (high)

D. Erosion Potential: 2.34 tons/acre for a 5 year storm interval

E. Sediment Potential: See erosion potential

## Soils Summary

The soils are primarily weathered from granitic parent material and calcareous sedimentary rock weathering to sandy loam material. Because of topography, climate and vegetation, south aspect soils and low elevation north aspect soils tend to be shallow and rocky whereas the higher elevation north aspect slopes tend to be deep productive soils with much less rock. It is these north aspect soils that support the Sequoia groves. Dominant soil types are Auberry, Dome and Chaix soil series and a broad extent of rock outcrop.

Erosion rates prior to the fire were lower than the sensitivity of the standard erosion model. Erosion rates post fire were 0.7 tons/acre for a 2 year event and 2.34 tons/acre for a 5 year event. These are very low post fire erosion rates and represent the rates expected for a well-planned resource burn. Rates are low due to 65% of the fire burning at low SBS or no burn at all. The areas that did burn moderate and high also had relatively low erosion rates for higher SBS with rates above 10 tons/acre being very limited in extent.

Erosion rates are likely to be highest in areas with high SBS on steep ground. These areas primarily are Stevenson Gulch, a smaller no name drainage of Stevenson Gulch, and Soda Springs Canyon. The main threat from these canyons is debris flows.

With low erosion rates and well armored soils, the risk to soils was determined to be **LOW.** No treatments were warranted to protect soil productivity.

## Hydrologic Summary

Overall soil burn severity for National Forest Systems Lands is approximately: 4.6% high, 31% moderate, 38.7% low, and 25.7% very low to unburn. Most (64%) of the Pier Fire is comprised of unburned/very low to low soil burn severity. As a result, modelling showed only minor increases in post-fire runoff for most pour points. Middle Fork Tule River HUC10 (which represents almost all of the burn area) only showed a 20.6% increase in water yield for 2 year, 6 hour design storm, which is less than the Q5 flow (Table 11). Of the 16 pour points modelled, two showed marked increases in runoff potential over 100%, ranging from 185% - 191% (pour points 11 and 16); one

pour point showed a moderate increase (60%, pour point 9) in runoff response, with the remaining pour points showing <50% increase in runoff response. Stream channels measured in the vicinity of Values at Risk showed confinement to >Q50 and in many cases >Q100. As such, risks from ***flooding alone*** are considered low for a 2 year, 6 hour design storm. Debris flows, on the other hand, pose a much greater threat in areas of steep terrain and moderate to high soil burn severity (for more information on debris flow potential, see geology report).

The greatest increases in runoff occur in drainages along Highway 190 between County Road 208A and Mohogany Flat, and these drainages coincide with areas of high debris flow potential and/or excessive runoff (pour points, 11 and 16). These areas represent the greatest risk of flood damage to property. The moderate increase in runoff associated with Moorehouse Creek (pour point 9) could cause floatable woody debris to obstruct the foot bridges at the Moorehouse Springs Fish Hatchery. This could cause minor structural damage and localized flooding.

Although some runoff might be attenuated with large scale hillslope treatments for smaller storms thus slowing debris flow initiation, preventing debris flows with hillslope treatments alone is not effective. As such, no hillslope treatments are recommended, rather an early weather warning system (and signage) should be established to advise residents and motorists in these areas of possible flood and debris flow activity along Highway 190.

## Debris Flow Summary

Within the burned area of the Pier Fire, some drainages along the Middle Fork Tule River – Hwy 190 corridor, show a great deal of past mass wasting as rockfall, debris slide and debris flows that will be increased during future storms. Other watersheds have little evidence of recent past slope instability, but as conditions have changed due to the fire, erosion and mass wasting might be initiated.

In watersheds that experienced moderate to high soil burn serverity, as a result of the removal of vegetation by the fire, soils are exposed and have become weakened, and rocks on slopes have lost their supporting vegetation. Due to these post-fire new conditions, some sections of Hwy 190, in addition to some other roads are at risk from rolling rock, plugged culverts, debris slides and in some cases, debris flows. Risks to human life, roads, trails and natural resources is moderate to high in some areas of the Pier Fire.

Base on the USGS debris flow modeling some drainages along the Middle Fork Tule River have a high probability to produce large debris flows. This is confirmed by field and aerial observations which show that some drainages along the Middle Fork Tule River – Hwy 190 corridor are loaded with large deposits of rock and soil, which inceasing the threat to human life and safty.

Recommended treatments for debris flow, mass wasting and rock fall hazards include notification of the public of these hazards through an early alert system, warning signs and road closures; clearing and improvement of catch basins and ditches along the road; maintenance and up-grade of drainage structures.

The US Geological Survey (USGS) - Landslide Hazards Program, has developed empirical models for forecasting the probability and the likely volume of post-fire debris flow events. To run their models, the USGS uses geospatial data related to basin morphometry, burn severity, soil properties, and rainfall characteristics to estimate the probability and volume of debris flows that may occur in response to a design storm (Staley, 2016). Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 12 – 40 millimeters per hour (mm/h) rate. We selected a design storm of a peak 15-minute rainfall intensity of 20 millimeters per hour (0.79 inch/hr.) rate to evaluate debris flow potential and volumes since this magnitude of storm seems likely to occur in any given year.

Based on USGS debris flow modeling it appears that under conditions of a peak 15-minute rainfall intensity storm of 20 millimeters per hour (0.79 inch/hr.), the probability of debris flows occurring is 80-100% in some channel/creeks along the Hwy 190 corridor. Under these same conditions, predicted volumes of these debris flows are expected to range from 1,000-100,000 cubic meters in these same channels.

## PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 2-3

B. Design Chance of Success, (percent): 95%

C. Equivalent Design Recurrence Interval, (years): 2, 5, and 10

D. Design Storm Duration, (hours): 6

E. Design Storm Magnitude, (inches): 2.22, 2.90, and 3.48

F. Design Flow[1], (cubic feet / second/ square mile):
   - Middle Fork Tule HUC10 (11.8)

G. Estimated Reduction in Infiltration, (percent): 3% to 191%

H. Adjusted Design Flow, (cubic feet / second/ square mile):
   - Middle Fork Tule HUC10 (14.2)

[1] Assumes a 2 year, 6 hour design storm with a PPT depth of 2.22 inches

## PART V - SUMMARY OF ANALYSIS

### A. Describe Critical Values/Resources and Threats

**Background:**
The Pier Fire started August 29th, 2017 and burned a total of 32,807 acres in the Middle Fork and South Fork of the Tule River. The southern fire perimeter was not completely burned out until September 17 on the Tule Reservation. The Forest Service BAER could not evaluate the burn effects within the South Fork of the Tule watershed because soil burn severity could not be calculated at the time, and drew the analysis boundary within the Middle Fork of the Tule River only, excluding the South Fork for a subsequent analysis. The total acreage analyzed in this report is 27,403 acres. A Bureau of Indian Affairs BAER team arrived on Sept. 16 to assess the burn area on the Tule Reservation within the South Fork of the Tule River watershed. The Forest Service BAER team has met with the BIA team to share information and coordinate our efforts.

The portion of the Pier Fire that the Forest Service analyzed in this report burned almost entirely on lands administered by the Sequoia National Forest. Only 4% of the fire burned under high soil burn severity, 31 % moderate, 39% low and 26% unburned. Most of the areas were understory burns under the canopy of conifers and oaks where the unburned overstory and needle and leaf fall from lightly burned trees will contribute to soil protection. Forest Service values at risk include the road system in the Black Mountain Sequoia Grove and the roads near Sequoia Crest, and two archeological sites. Non-Forest values at risk include Highway 190, some private residences in the Mahogany Flats area, access roads over Forest lands to special uses. Threats to life and safety occur across the burned area from snags, rock fall, debris flows, and flooding.

The cause of the fire is still under investigation.

**Values at Risk Matrix:**

The values at risk (VAR) matrix displayed in Appendix A summarizes values at risk, post wildfire threats and risk ratings. Values with high or very high risk ratings are addressed, where possible, with BAER response actions (treatments). Generally, response actions are not recommended for values with low and intermediate risk ratings. The level of risk was assessed by using the matrix below which accounts for the probability of an event occurring and the magnitude of consequences if it occurred.

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:

| **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 |

**Summary of Pier Fire BAER Values at Risk:**
Based on field observations and assessment of burned watershed conditions and expected responses the BAER team identified potential for post wildfire impacts on the following BAER values at risk:

**Human Life and Safety**

- Increased risk for the general public to be impacted by rolling rocks, flooding, landslides, debris flows and hazardous trees along road and trails:

  The BAER team identified increased risk for potential impacts to life and/or safety of Forest visitors and personnel entering the burned area. Potential threats include rolling rocks, flooding, debris flows and/or landslides, sediment or debris delivery to hazardous trees, loss of road or trail tread, and loss of ingress/egress. Generally, increased risk occurs within or directly down-slope from high and moderate burn severity areas. The proposed installation of warning signs outreach efforts along the Middle Fork Tule River and Wishon Fork to share key information from the BAER report will also lower the probability that life and/or safety could be impacted by post wildfire processes. Although the probability of a recreationists being hurt by flooding or debris flows due to the fire are low, the consequences of this are major, resulting in an intermediate risk. Because the cost of signage is low, the BAER team recommends placing warning signs along access routes.

  As a result of the burned watersheds it was determined through the BAER Risk Assessment process that it is very likely that the burned steep hill sides above some road segments pose a risk to road users from rock fall, debris flows, landslides and flash flooding, particularly along Highway 190 between the Power Station and Mahogany Flats resulting in hazards to road users from the potential loss of road function, denial of access, entrapment, or direct injury from debris. Caltrans representatives were informed of the potential for debris flows along Highway 190 at cooperator meetings. The BAER team met with NOAA Weather to discuss an early warning system and the installation of a rain gauge near the area of most concern along Highway 190. Slopes in this area are far too steep to effectively treat with mulch, and these treatments would not significantly reduce the debris flow potential even in areas that could be mulched. Any road treatments to reduce the probability of damage or risks to safety will be the responsibility of Caltrans. The Tulare Office of Emergency Services was contacted by the BAER team about this situation.

**Property**

- USFS system roads
  It has been determined through the BAER Risk Assessment process that it is possible that post burn conditions will increase runoff and the movement of sediment into some road drainage features, such as culvert inlets, over side drains, roadway dips and runouts along Forest system roads near Sequoia Crest and the road system in the Black Mountain Sequoia Grove.

The magnitude of this occurrence is considered moderate and puts property (the road) at risk for blockage and uncontrolled water to divert, resulting in likely damage to the invested road improvements, and a high risk to the road prism. There are many snags in the Black Mountain Grove that could possibly hit anyone in this area with major consequences, so the risk to life is high. Road treatments on the above Forest road systems such as culvert cleanouts are proposed, and the BAER team recommends installing a gate and closing the Black Mountain Sequoia Grove roads while this risk is high.

- USFS trails
  There is low probability of damage from the Pier Fire to the Fisherman's trail along the Middle Fork of the Tule River because this trail has not been maintained for many years and is already been damaged by rain and soil movement. No treatment is recommended for the trail prism.

- USFS campgrounds
  None of the developed campgrounds in or around the fire are at risk from post-fire watershed events or snag hazards.

- Private Property
  Water diversion and conveyance access road and infrastructure:
  These aqueducts within the fire perimeter are private and the responsibility of Pacific Gas and Electric or Southern California Edison, including the preparation of the access roads for rainfall. These companies have been contacted by the BAER team to inform them of this hazard.

  The BAER team did identify private residences and structures at increased risk from post wildfire processes. However, extensive inventory of structures and other values on private land is the responsibility of the landowners with help available from NRCS. Information sharing and outreach efforts with NRCS, Tulare County OES, and potentially affected communities have been conducted to increase awareness of burned area conditions and potential impacts to private values.

  There is a possibility that Highway 190 infrastructure could be damaged by debris flows from the burned area, and this information has been shared with Caltrans.

**Natural Resources**

- Water for domestic and agricultural uses
  There is a water intake for the community of Springville on private property along the Tule River that will be affected by water quality degradation due to the burn, but this system has the ability to divert water away from a holding/settling pools during high runoff. Sedimentation increases into Lake Success from the burn are very small due to the low average burn severity of the Pier Fire. Both of these are non-Forest values at risk. No treatment to reduce erosion on Forest land is feasible for either value.

- Native or naturalized plant communities
  Introduction of invasive weeds from suppression equipment is likely along dozer lines and other areas where the soil has been disturbed with major consequences and BAER funds are requested to treat this risk.

- Soil productivity and hydrologic function
  Soil productivity and hydrologic function will not in general be impaired by this fire because of the low soil burn severity across the burn. There are small scale areas within the burn where soil and water movement can cause issues with property and safety as noted above, but the over-all impact of the fire on soil and hydrologic values is light.

- Fisheries and Aquatics
  There are no federally listed fish or aquatic species in or immediately downstream of the fire that would be affected by post-fire watershed changes.

- Wildlife
  Condors occasionally fly over the burn area or roost there, but the fire will not change the habitat suitability. Mountain yellow-legged frogs occurred historically in areas adjacent to the burn but are extant in this area and there is no potential habitat that would be degraded by post-fire watershed events.

**Cultural Resources**

- Prehistoric sites
  A significant prehistoric site on Forest property has a possibility of being damaged by erosion events with major consequences resulting in high risk. A small stabilization treatment is proposed to protect this site.

- Historic sites
  There is one historic site on a steep ridgeline within the Forest that is likely to be impacted by soil movement with moderate magnitude of consequences resulting in high risk that will require minimum stabilization efforts to protect.

B. Emergency Treatment Objectives: To inform the public of the hazards of entering a burned area, To allow safe passage of water to protect road infrastructures, watersheds, and cultural sites, from accelerated sheet and rill erosion. 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, 5, and 10-year events) emergency planning measures can be designed to mitigate and minumize 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 First Major Damage-Producing Storm:

Land _ 80_% Channel N/A_ % Roads _90_% Protection/Safety_90_%

D. Probability of Treatment Success

| | Years after Treatment | | |
|---|---|---|---|
| | 1 | 3 | 5 |
| Land | 90% | 85% | 80% |
| | | | |
| Channel | n/a | n/a | n/a |
| | | | |
| Roads/Trails | 95% | 90% | 85% |
| | | | |
| Protection/Safety | 95% | 90% | 85% |

E. Cost of No-Action (Including Loss):

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:

| | | | | |
|---|---|---|---|---|
| [x ] Hydrology | [x ] Soils | [x ] Geology | [ ] Range | [ ] |
| [x ] Forestry | [ **x**] Wildlife | [x ] Fire Mgmt. | [x ] Engineering | [ ] |
| [ ] Contracting | [ ] Ecology | [x ] Botany | [x ] Archaeology | [ ] |
| [x ] Fisheries | [ ] Research | [ ] Landscape Arch | [x ] GIS | |

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H. **Treatment Narrative:**

(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

Land Treatments:

Noxious Weed Control

The unknowing introduction of invasive noxious weeds into areas disturbed by wildfire, fire suppression and fire rehabilitation have the potential to establish persistent weed populations. These persistent populations could affect the structure and habitat function of

plant communities within the burn area. Forest Service direction is to minimize the establishment of non-native invasive species to prevent unacceptable degradation of the burned area. Consequently, delayed assessment of dozer lines, road as dozed line, safety zones, staging areas, and roads is necessary to detect the spread and introduction of weeds in the first year after fire. Assessing the establishment of weeds and treating small outlying populations before they expand, will prevent the weeds from becoming serious threats to the recovery of native plants and lowering ecosystem function. This prevention will also help protect natural recovery in rare and listed Threatened plant habitat. The treatment is noxious weed detection surveys of dozer lines, road as dozed line, safety zones, staging areas, and roads affected by the Pier fire. These targeted areas will be surveyed for evidence of introduction or spread of noxious weeds. If any new or outlying populations are found in these surveys, a supplementary request for noxious weed treatment will be submitted. Only dozer lines, road as dozer line, safety zones, staging areas, and roads on GSNM property will be surveyed during weed detection surveys. The Forest will evaluate and eliminate the potential for noxious invasive weed establishment and spread, in selected high priority areas affected by the Pier fire suppression activities. The Forest will inspect selected areas and monitor for newly established weed occurrences. 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.

Documentation of new infestations will include:

- GPS negative and positive inspection results
- Incorporate data into GIS spatial database
- 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 May/June 2008. Based upon the first year's survey, additional surveying may be requested for up to one years.

| | | |
|---|---|---|
| GS –11 Botanist | $400/day x 4 days = | $1,600 |
| Two GS – 05 Bio Techs | $225/day x 1.5 PP (15 days) x 2 = | $6,750 |
| Mileage: | 800 miles @ 0.5/mile = | $400 |
| Lodging: | $80/day x 30 days | $2,400 |
| Per Diem: | $60/day x 30 days | $1,800 |
| | **Total Cost Estimate for FY 2018 =** | **$12,950** |

Channel Treatments: None

Road Treatments:

A. FINDINGS ON THE GROUND SURVEYED - ROADS

The field survey was conducted on September 14th & 15th by the road engineer along with field coordination with the Hydrologist, Archeologist, and Soil Scientist. Dominate Forest Service roads within the fire perimeter are;

21S03 Fox Farm Road: Provides access to a developed Campground (Wishon), Sequoia Crest Community, Private Property, Hunting, Hiking Trails, and Disperse Camping along the road. Most of the road segments have inside ditch, rolling dips, run-off ditches, over-side-drains, and culverts ranging from 18" to 36" in diameter.

21S12 Solo Road: Provides access to Giant Sequoia Groves, Private Property, Hunting, Hiking Trails, and Disperse Camping along the road. Most of the road segments have inside ditch, out slope segments, over-side-drains, and culverts ranging from 12" to 36" in diameter.

Other secondary roads were also surveyed within the burned for the purpose of this report; Approximately 20 miles of Forest Service roads are proposed for treatments.

B. CONSEQUENCES OF THE FIRE ON ROAD VALUES AT RISK

- Life and Safety (21S03): as a result of the burned watershed, it has been determined through the BAER risk assessment process/matrix, that the risk to road users along the Fox Farm Road is considered minor.

- Property (21S03): As a result of the burned watersheds, it has been determined through the BAER risk assessment process/matrix, the risk to Forest Service Road is considered high with moderate consequences. Damage to the invested road improvements, loss of road functions, denial of access to road users, and private properties owners. Downslope movement of fine ash, sediments and rock would affect the drainage features and functions of the road system.

- Life and Safety (21S12): As a result of the burned watersheds, it was determined through the BAER risk assessment process, the risk to road users on Forest Service Road is considered High with Major consequence due to the burned slopes above the road, creating the potential for debris flows, rock fall, and washouts.

- Property (21S12): As a result of the burned watersheds, it has been determined through the BAER risk assessment process/matrix, that the risk to Forest Service Roads is considered High with Major consequences. Damage to the invested road improvements, loss of road functions, denial of access to road users, and private property owners. Downslope movement of fine ash, sediments and rock would affect the drainage features and function of the road system.

C. TREATMENTS TO MITIGATE THE EMERGENCY - ROADS

- Life and Safety (21S03) - Proposed BAER treatments to mitigate the emergency for the road are; Install BAER warning signs at main entry points of road, install information sign, inspect road after damaging storms for debris flows and washouts, identify problem areas and respond as needed with personnel and equipment to insure road is safe to access.

- Property (21S03) - Proposed BAER treatments to mitigate the emergency to invested road improvements, road functions, and assure access are; restore drainage functions on selected locations, enlarge inlet catch basin to increase flow capacity for culverts to prevent overtopping and creating fill failures.

- Life and Safety (21S12) - Proposed BAER road treatments to mitigate the emergency for the road are; Install BAER warning signs on the 21S94 road at main entry points of roads, install information signs, install a gate at selected location, install rock barriers adjacent to gate to discourage OHV usage, inspect road after damaging storms for rock fall, debris flows and washouts, identify problem areas and respond as needed with personnel and equipment as needed when road opens during Spring time and safe to access.

- Cultural Resources: It has been determined that the road related emergency and consequences described above, could have potential impacts on cultural resources adjacent to these roads. Thus, coordination with the district archeologist is recommended for mitigations to perform treatments. See Archeology report for further details.

- **It is recognized that BAER is NOT intended to correct past maintenance deficiencies. The changed conditions due to fire activity has created an urgency for correction and storm proofing of some of these drainage features on segments along the road.**

D. PROPOSED ROAD BAER TREATMENTS

- Install Information and BAER Warning Signs on (21S03 and 21S94).
- Install Gate with Road Closure and Information signs on (21S12).
- Restore Drainage Functions at culvert inlets by enlarging catch basin.
- Storm Patrol and Response.

The probability of these accepted and economically proposed road treatments is considered to be at the 80 to 90 percent success rate, dependent on the 2016 /17 winter storm cycles and implementation schedule.

E. ROAD TREATMENTS COST ESTIMATE

| Miles Treated | |
|---|---|
| 21S03 | 4.80 |
| 21S04A | 1.17 |
| 20S41A | 0.36 |
| 21S12 | 8.58 |
| 21S12B | 1.20 |
| 21S25 | 2.02 |
| 21S25A | 1.20 |
| 21S25C | 0.58 |
| **TOTAL** | **19.91** |

| Cost per Road | | |
|---|---|---|
| **Road #** | **BAER Cost** | |
| 21S03 | $ | 14,070 |
| 21S04A | $ | 840.00 |
| 20S41A | $ | 840 |
| 21S12 | $ | 42,420.00 |
| 21S12B | $ | 2,520.00 |
| 21S25 | $ | 1,680.00 |
| 21S25A | $ | 1,680.00 |
| 21S25C | $ | 840.00 |
| 21S94 | $ | 3,570.00 |
| **TOTAL** | **$** | **68,460** |
| Estimate Includes Mobilization & Overhead (contract prep, administration, implementation) | | |

| Miles | Cost/Mile | |
|---|---|---|
| 19.91 | $ | 3,438 |

| Cost Benefit Matrix | | | | | |
|---|---|---|---|---|---|
| Road # | Name | Miles Treated | Treatment Cost | Cost/Mile | Road Value/Mile |
| 21S03 | FOX FARM | 4.80 | $ 14,070 | $ 2,931 | $ 50,000 |
| 21S04A | HOSSACK | 1.17 | $ 840 | $ 718 | $ 50,000 |
| 20S41A | SABLE RD | 0.36 | $ 840 | $ 2,333 | $ 50,000 |
| 21S12 | SOLO | 8.58 | $ 42,420 | $ 4,944 | $ 50,000 |
| 21S12B | SOLO | 1.20 | $ 2,520 | $ 2,100 | $ 50,000 |
| 21S25 | LONG CAYON | 2.02 | $ 1,680 | $ 832 | $ 50,000 |
| 21S25A | LONG CAYON | 1.20 | $ 1,680 | $ 1,400 | $ 50,000 |
| 21S25C | LONG CAYON | 0.58 | $ 840 | $ 1,448 | $ 50,000 |

- **Potential Value @ Risk $995,500**
- **Average Road Value/Mile is estimated at $50,000**

Trail Treatments:

The one official trail impacted by the burned area is the Tule River Trail, 30E29 (sometimes called Fisherman's trail), beginning from Upper Coffee Camp and ending just west of the community of Mahogany Flat. The Tule River Trail is approximately five miles in length and, where extant, follows the Tule River south of Hwy 190.

The first two miles of the Tule River Trail from the trailhead at Upper Coffee camp day use area represent the only continuously intact section of the trail. This section is unaffected by the burned area. Starting at the confluence of the Upper Fork of the Middle Fork of the Tule River (Wishon Drainage) the trail is in a continuous burned area until the end of the trail near the community of Mahogany Flat. The use of this trail is minimal and many sections are either in disrepair or not extant. Due to the fractured condition of the Tule River Trail and that many sections are either un-maintained or not extant, the risk of user exposure to hazards is minimal and emergency treatment is not necessary. There are numerous user-generated trails from Highway 190 down to various swimming holes on the Tule River wherever parking opportunity exists.

The only emergency treatment recommendations for trails and recreation issues for the Pier Incident concern river access points along a five mile section of Highway 190 from Lower Coffee Camp day use area to the end

of the Tule River Trail near Mahogany Flat due to the increased possibility of rock falls, possible hazard tree exposure, storm-related debris flow and elevated drainage flows from adjacent and upstream slopes in the burned area.

A. Treatment Objective: Minimize risk to life and risk of damage to property along system and non-system river access points through placement and maintenance of warning signage. These treatments would be designed to inform the public in reference to the increased risks of recreating along the river due to the effects of the burn area including hazard trees, rock fall, high flows and debris flows especially during thunderstorm events nearby, upslope or upstream.

B. Treatment Description: It is recommended that signage warning of increased risk be placed at various access points along the Middle Fork of the Tule River and the North Fork of the Middle Fork (Wishon Fork). Access points have been identified along the Middle Fork (see recreation specialist report).

| ITEM | UNIT | UNIT COST | NO. OF UNITS | TOTAL COST |
|---|---|---|---|---|
| Warning Sign | Each | $300 | 20 | $6000 |

Protection and Safety:

Heritage Site Protection

The Pier incident will have post-fire effects on two cultural resources (05135200338, and 05135200147). Effects to these sites include erosion of cultural components, and the loss of covering vegetation that can lead to vandalism and looting. The likelihood of these impacts and their correlated magnitude of consequence on the BAER Risk Assessment Matrix results in a determination of high risk for both sites. For this reason, a BAER emergency exists for these heritage resources.

To mitigate the post-fire adverse effects, treatments to these sites will be applied under BAER. These treatments will include erosion control, and looting/vandalism deterrence. The total cost of these treatments is 4,602 dollars.

Site 05135200338 – Sacred Site
Recommended BAER Treatment:

- Limiting access from the public by keeping the existing gate on the road below locked.
- Discouraging looting by covering the sensitive cultural components with sand.
- Limiting erosion by installing straw wattles above the site to deflect water and soil into the adjacent drainage.
- Planning and coordination with the local tribe and the State Historic Preservation Office as needed.
- Treatment cost:
    - Straw wattles: 5 @ $50 each = $250
    - Wood stakes: 5 bundles @ $4 each = $20
    - Forest Archaeologist: GS-12 @ $320 per day for 1 day = $320
    - Archaeologist GS-9: @ $300 per day for 2 days = $600
    - Archaeological Technician GS-7: @ $200 per day for 2 days = $400
    - Monitoring: GS-9 Archaeologist @ $300 per day for 3 days = $900

  Total Cost: $2,490

Site 05135200147 – Camp 4
Recommended BAER Treatment:

- Limiting access from the public by keeping the existing gate on road 20S32 locked.
- Discouraging artifact collection (looting) by covering the scatter with erosion control cloth (jute).

- Limiting erosion of artifacts down slope by covering the scatter with jute and installing straw wattles where necessary.
- Treatment cost:
    - Straw wattles: 5 @ $50 each = $250
    - Wood stakes: 3 bundles @ $4 each = $12
    - Jute mesh: 4 @ 85 each = $340
    - Jute mesh Staple: 1 box @ $110 each = $110
    - Archaeologist GS-9: 1 @ $300 per day = $300
    - Archaeological Technician GS-7: 1 @ $200 per day = $200
    - Monitoring: GS-9 Archaeologist @ $300 per day for 3 days = $900

    Total Cost: $2,112

Implementation Team Leadership and Coordination

*Interagency Coordination:*
Interagency coordination started during the fire and continued throughout the BAER Assessment. Continuing this coordination by providing the BAER Assessment Report, specialist reports and attending meetings is anticipated. In addition, letters detailing potential physical responses and impacts from the fire that may influence safety in and downstream of the fire area will need to be composed and sent to all public and private stakeholders at risk from increased sediment and flooding. Funding is requested for agency coordination, Implementation team lead, and for the Forest BAER Coordinator to ensure continued coordination with cooperating agencies, prompt implementation, tracking of BAER treatments, and installation of burn area warning signs. The facilitation may include: phone calls, meetings, and field trips to the affected areas.

**Table 11 – BAER Interagency Coordination**

| Item | Unit | Cost | Number | Total |
|---|---|---|---|---|
| Coordination with Public & Private | ea | $370 | 10 | $3700 |

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

| | | | NFS Lands | | | | Other Lands | | | | All |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Unit | # of | WFSU | Other | # of | Fed | # of | Non Fed | Total |
| Line Items | Units | Cost | Units | SULT $ | $ | units | $ | Units | $ | $ |
| **A. Land Treatments** | | | | | | | | | | |
| Invasive Weeds | project | 1 | 12950 | $12,950 | $0 | | $0 | | $0 | $12,950 |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Land Treatments* | | | | $12,950 | $0 | | $0 | | $0 | $12,950 |
| **B. Channel Treatments** | | | | | | | | | | |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Channel Treat.* | | | | $0 | $0 | | $0 | | $0 | $0 |
| **C. Road and Trails** | | | | | | | | | | |
| Road Stormproofing | project | 1 | 68460 | $68,460 | $0 | | $0 | | $0 | $68,460 |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Road & Trails* | | | | $68,460 | $0 | | $0 | | $0 | $68,460 |
| **D. Protection/Safety** | | | | | | | | | | |
| Heritage site protectior | project | 1 | 4602 | $4,602 | $0 | | $0 | | $0 | $4,602 |
| Trail Signage | each | 20 | 300 | $6,000 | $0 | | $0 | | $0 | $6,000 |
| Coordination | Days | 370 | 10 | $3,700 | $0 | | $0 | | $0 | $3,700 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Structures* | | | | $14,302 | $0 | | $0 | | $0 | $14,302 |
| **E. BAER Assessment** | | | | | | | | | | |
| Team cost | | 1 | 59903 | | $59,903 | | $0 | | $59,903 | |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Evaluation* | | | | $0 | $59,903 | | $0 | | $59,903 | $0 |
| **F. Monitoring** | | | | | | | | | | |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Monitoring* | | | | $0 | $0 | | $0 | | $0 | $0 |
| | | | | | | | | | | |
| **G. Totals** | | | | **$95,712** | **$59,903** | | **$0** | | **$6,000** | **$95,712** |

## PART VII - APPROVALS

1. _____
Forest Supervisor (signature)

19 SEP 2017
Date

2. Barnie T. Gyant
Regional Forester (signature)

9/19/2017
Date

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.)

| Pier Five BAER Risk Matrix | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Value | Type of Risk | Probability | | | Magnitude of Consequences | | | Risk | | | Treatment to Measure Potential Post Wildfire Impacts | | | |
| | | Life | Property | Other | Life | Property | Other | Life | Property | Other | Life | Property | Other | Responsibility |
| Water Use - Quality / Capacity | Sedimentation | | | Unlikely | | | Minor | | | Very Low | | | Natural | FS |
| Soil Productivity | Erosion | | | Possible | | | Minor | | | Low | | | Natural | FS |
| Native Vegetation Recovery and Diversity | Expansion of invasive noxious species | | | Likely | | | Major | | | Very High | | | Weed detection | FS |
| T&E Plant Species - Springville clarkia | Habitat degradation | | | Possible | | | Moderate | | | Intermediate | | | Weed detection | FS |
| T&E Terrestrial Wildlife - Condor | Alteration of Overflights and Roost Availability | | | Unlikely | | | Minor | | | Very Low | | | Natural | FS |
| T&E Fisheries and Aquatics | No Risk to Species | | | N/A | | | N/A | | | N/A | | | N/A | FS |
| Cultural Resources | | | | | | | | | | | | | | |
| Prehistoric site near flume | Erosion | | | Possible | | | Major | | | High | | | Erosion control | FS |
| Historic material (Aqueduct) | Movement of Resources | | | Likely | | | Moderate | | | High | | | Cover resources | FS |
| Roads | | | | | | | | | | | | | | |
| 21503 | Erosion | | Likely | | | Moderate | | | High | | | Signs, Catch Basin, Storm Inspection & Response | | FS |
| 21504A, 21504A 21512B, 21525, 21525A, 21525C | Erosion | | Likely | | | Moderate | | | High | | | Catch Basin | | |
| 21512 | Erosion | Possible | Likely | | Major | Moderate | | High | High | | Signs, Catch Basin, Storm Inspection & Response, Gate | | | FS |
| 21504 | Erosion | | Likely | | | Moderate | | | High | | | Signs | | FS |
| Trails, Camps, Facilities | | | | | | | | | | | | | | |
| Upper & Lower Coffee Camp Facility | Rock fall, debris flow | | Unlikely | | | Minor | | | Very Low | | | None | | FS |
| Tule River and Wishon River Access | Rock fall, high flow, debris flow, hazard trees | Unlikely | Unlikely | | Major | Major | | Intermediate | Very Low | | Signs | Signs | | FS |
| Tule River Hiking Trail | Rock fall, debris flow, hazard trees | | Unlikely | | | Minor | | | Very Low | | | None | | FS |
| Wishon Campground | Rock fall, debris flow | | Unlikely | | | Minor | | | Very Low | | | None | | FS |
| Coy Flat Campground | Rock fall, debris flow | | Unlikely | | | Minor | | | Very Low | | | None | | FS |
| West Divide Work Center | High Flow | Unlikely | Unlikely | | Moderate | Moderate | | Low | Low | | None | None | | FS |

| Potential Values at Risk that are not within Forest Service Jurisdiction | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Value | Type of Risk | Probability | | | Magnitude of Consequences | | | Risk | | | Treatment to Measure Potential Post Wildfire Impacts | | | |
| | | Life | Property | Other | Life | Property | Other | Life | Property | Other | Life | Property | Other | Responsibility |
| Water Use - Quality / Capacity | | | | | | | | | | | | | | |
| Lake Success Water Capacity | Sedimentation | | | | | | | | | | | | Inform / Coordinate | BOR |
| Springville Water Treatment Facility | Sedimentation | | | Unlikely | | | Moderate | | | Low | | | Inform / Coordinate | OES |
| Springville Community Flooding | Sedimentation | Unlikely | Unlikely | | Major | Moderate | | Intermediate | Low | | | | Inform / Coordinate | OES |
| Roads | | | | | | | | | | | | | | |
| Highway 190 | Rock Fall, debris flow, high flow | Possible | Very Likely | | Major | Major | | High | Very High | | | Inform, Coordinate | | Cal Trans |
| All SUP Roads | Erosion | | Likely | | | Moderate | | | High | | | Inform, Coordinate | | SVP |
| Varied Ford by Casino | BIA will evaluate potential risks | | | | | | | | | | | Inform, Coordinate | | BIA |
| Public Safety | | | | | | | | | | | | | | |
| Mahogany Flat Homes | Flow, sediment, woody debris | | | | | | | | | | | Inform, Coordinate | | HRCS |
| Tule Residence Homes | BIA will evaluate potential risks | | | | | | | | | | | Inform, Coordinate | | BIA |
| Burned infrastructure at top of Bateman Ridge (Private) | Hazardous material entering Federal lands | | | Possible | | | Moderate | | | Intermediate | | Inform, Coordinate | | OES |