

Date of Report: 08/07/2018

BURNED-AREA REPORT
(Reference FSH 2509.13)

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: Venado

B. Fire Number: NM-SNF-000562

C. State: NM

D. County: Sandoval

E. Region: Southwestern (03)

F. Forest: Santa Fe (10)

G. District: Jemez (04)

H. Fire Incident Job Code: P3LO28

I. Date Fire Started: 07/20/2018

J. Date Fire Contained: unknown

K. Suppression Cost: \$3,000,000 (estimated as of August 2, 2018)

L. Fire Suppression Damages Repaired with Suppression Funds

- 1. Fireline waterbarred (miles):
- 2. Fireline seeded (miles):
- 3. Other (identify):

M. Watershed Number: 130202020107 (Rio Guadalupe)

N. Total Acres Burned: 3,482 acres

NFS Acres(3,482) Other Federal () State () Private ()
Per ICS-209 dated July 28, 2018

O. Vegetation Types: Pinyon/Juniper, Ponderosa pine, Dry Mixed conifer

P. Dominant Soils: Eutric Glossoboralfs, loamy-skeletal, fine, or fine loamy, mixed (540 acres), Lithic Dystrochrepts / Lithic Glossoboralfs, loamy-skeletal, mixed (41 acres), Mollis Eutroboralfs, fine or loamy-skeletal, mixed (1,332 acres), Pachic Argiborolls, fine, mixed (5 acres), Typic Dystrochrepts, loamy-skeletal, mixed (462 acres), Typic Eutroboralfs, mixed (603 acres), Typic Ustorthents, nonacid, frigid (96 acres), Udic Argiborolls, fine, mixed (221 acres), and Udic Ustochrepts, loamy-skeletal, mixed (191 acres)

Q. Geologic Types:

Approximately 50% of the burned area occurs on intrusive/plutonic geology. These plutonic formations underlay most of the Joaquin Canyon drainage. Approximately 30% of the burned area occurs on limestone formations, with the bulk of these areas concentrated along the northern third of the fire and some formations at the southern end with exposures along the 376 road at the southeast perimeter of the burned area. The remaining geology are evaporties and volcanic rocks intrusion that emerge near the center of the burned area along FSR #488 and extend toward the southern perimeter of the fire.

R. Miles of Stream Channels by Order or Class:

| | |
|-----------------------------------|-------------------|
| 1 st Order: 15.8 miles | Ephemeral: 15.8 |
| 2 nd Order: 1.1 miles | Intermittent: 1.1 |
| 3 rd Order: 0.9 miles | Perennial: 0.9 |

S. Transportation System

Trails: 0 miles Roads: 8 miles (mtc. Level 2 and 3) 11 miles (mtc. Level 1)

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 382 (un-burned) 1,093 (low) 1,166 (moderate) 737 (high)
(Note: 113 acres – no data due to cloud cover)

B. Water-Repellent Soil (acres): 1,903

C. Soil Erosion Hazard Rating (acres):
0 (low) 1,709 (moderate) 1,784 (high)

D. Erosion Potential: 6.35 tons/acre

E. Sediment Potential: 27.57 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

| | |
|---|-------------|
| A. Estimated Vegetative Recovery Period, (years): | <u>5-7</u> |
| B. Design Chance of Success, (percent): | <u>50</u> |
| C. Equivalent Design Recurrence Interval, (years): | <u>24</u> |
| D. Design Storm Duration, (hours): | <u>1</u> |
| E. Design Storm Magnitude, (inches): | <u>1.75</u> |
| F. Design Flow, (cubic feet / second/ square mile): | <u>77</u> |
| G. Estimated Reduction in Infiltration, (percent): | <u>60</u> |
| H. Adjusted Design Flow, (cfs per square mile): | <u>281</u> |

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The primary values at risk resulting from the Venado Fire include life and safety, transportation infrastructure, cultural resources, water quality, and native vegetation communities. The primary threat to values at risk is from increased runoff which is expected to intensify in the first few years following the fire. Erosion will increase in the fire area as a result of amplified runoff and decreased infiltration rates. High intensity, short duration rainfall may result in debris flows through Joaquin Canyon (USGS Debris Flow Model, Venado Fire 2018). Table 1 summarizes the Values at Risk with a characterization of threat and probability. The narrative following will characterize the assessment of these values at risk. At the time of the BAER Assessment the Venado Fire was not fully contained with some active fire still occurring and ongoing suppression activities. The final acres of the Venado Incident will increase from the BAER Assessment; however, barring some major event for lighting or wind, the Values at Risk and the probability of damage to these Values are unlikely to change.

Table 1. Values at Risk and the Probability of Damage and Recommended Treatments

| VAR | Description | Probability of Damage or Loss | Magnitude of Consequence | BAER Risk | Recommended Treatment |
|-----|--|-------------------------------|--------------------------|--------------|--|
| HLS | Forest Visitors | Likely | Major | Very high | Warning Signs, road closure gates, Administrative Closure, NWS warning system (burn scar matrix) |
| | Administrative Use | Likely | Major | Very High | |
| P | FR 376 (Jemez National Rec. Area) | Very likely | Moderate | High | Upgrade existing drainage features along road, storm patrol and maintenance |
| | FR 488 and Spurs | Very Likely | Moderate | High | Improve drainage features, storm patrol and maintenance |
| | Jemez Pueblo irrigation diversion | Possible | Minor | Low | |
| | USGS gaging station | Possible | Minor | Low | |
| | Gilman and Canones community | Unlikely | Major | Intermediate | |
| | Gilman Tunnel | Unlikely | Moderate | Low | |
| NR | Soil Productivity | Possible | Moderate | Intermediate | |
| | Hydrologic Function | Very Likely | Moderate | Very High | Mulch 141 acres to protect soil/hydrologic function |
| | Water Quality | Likley | Moderate | Low | |
| | Wildlife and Fish (ESA, Sensitive Species) | Unlikely | Moderate | Low | |
| | Rio Grande Sucker/Rio Grande Chub - | Likely | Moderate | High | |
| | Native Plant Communities | Likely | Moderate | High | |
| CHR | cluster of arch sites/historic sites in Joaquin Canyon | Very Likely | Moderate | Very High | Seed 5 high priority sites |

1. Human Life and Safety (HLS)

- a. **High risk to forest visitors and workers** along roads, at parking areas, and downslope/downstream of the burn scars due to an increased threat of flooding, debris flows, falling trees, and falling debris. Probability of damage or loss is likely, magnitude of consequences is major. (*Treatments: PS 1-4*)

2. Property (P):

- a. **Very high risk to road infrastructure** on NFSR 376 due to the increased watershed response to precipitation events on areas of moderate and high soil burn severity and the resultant increased runoff. This increased runoff is expected to result in the loss of control of water, overwhelming of road drainage structures, and damage to the road prism. Probability of damage or loss is likely, magnitude of consequences is major. (*Treatments: T02, T03*)
There are 8 miles of Level 2 and 3 roads that occur within or adjacent the burned area of moderate and high soil burn severity. On these roads approximately **20 culverts** could be potentially damaged. All of the culverts are undersized to support expected runoff flows related to post-fire impacts. The crossing of Joaquin Canyon and NFSR 376 is greatly undersized for the post fire flows, most of the fire drains through this crossing and is under approximately 20 feet of fill. Multiple culverts on level 2 roads may direct flows onto and down the travel way. Current drainage features including catch basins, ditches, culverts, and surface dips are at risk of being overwhelmed by increased movement of sediment and debris. Culvert upgrades are limited to road 376 because the road is a critical part of the current transportation plan and located in drainages that experienced high severity fire, and the failure of this road will directly impact water quality in the Rio Guadalupe ultimately impacting habitat for the Forest Sensitive Species Rio Grande Sucker and Rio Grande Chub. In addition, the Rio Guadalupe provides water important for the Pueblo of Jemez Pueblo agricultural water supply. Forest Road #488 and spurs are planned for storm proofing and/or pulling culverts but were not proposed for upgrade of culverts, because though these roads provide important Administrative access, they are not critical for public access. (*Treatments RT01-10*). Figures 2 and 3 show examples of locations where road work is proposed.

3. Natural Resources (NR):

- a. **Very High risk to native plant communities** because of the threat from the spread of noxious weeds and invasive plant species. The wildfire created conditions conducive to noxious weeds spread and establishment by reducing competition, exposing bare mineral soil, and creating an environment where fall nutrient availability (water and soil nutrients) goes to the fall growth period for noxious weeds and not native plants which are mostly dormant at this time. The recent fire activity dramatically changed the forest condition in some areas where moderate to high intensity fire occurred. Crown canopy was highly reduced if not eliminated (moderate to high intensity burned areas); as was shrub and forb cover in the understory. These disturbed areas are now highly vulnerable to noxious weed invasion or noxious weed spread from existing infestations or adjacent sources.

Areas burned at low intensities are also susceptible to noxious weed invasions because native vegetation was reduced. In noxious weed ecology, any reduction in competition for available nutrients, space, or light is considered an advantage to noxious weeds growth and establishment. Damage to soils and native plant communities is irreversible in most cases and the loss of native plant communities is irretrievable as the native plant communities will not return on their own. In addition to burned areas, areas not burned but disturbed during suppression activities (roads, drop points, heli-spots, etc.) are also now susceptible to the spread of noxious weed and invasive plants. The probability of damage or loss is very likely, magnitude is moderate. (*Treatments: L01*)

- b. **Intermediate Risk to Soil Productivity and Very High Risk to Hydrologic Function** as a result of the threat of increased erosion and watershed response to precipitation events on areas that experienced moderate and high soil burn severity. The loss of ground cover and presence of hydrophobic soils has increased the threat of soil erosion. Moderate severity that burned on the hotter end of the spectrum and the high severity conditions observed on this fire accounts for almost half of the total burned area. Generally speaking, burn conditions like the ones observed have the potential to impact long-term soil productivity. The landscape of this

burned area includes an appreciable extent of slopes which are greater than 40 percent with relatively long slope lengths. Typically, the longer the slope length and steeper the slope gradient, the greater the potential for high soil erosion / sedimentation. Additionally, more than half of the burned area includes soil types which have a severe erosion hazard rating. Overall, with the above considered, the probability of damage or loss to long-term soil productivity is possible and the magnitude of consequence is moderate which rates risk as **Intermediate** across the fire as a whole. It was discussed and determined by the BAER team that, based on professional experience, much of the higher elevation forest which burned moderate / high in the Joaquin Canyon area will recover well naturally from a soil productivity standpoint.

The magnitude of consequence is higher for impacts to hydrologic function and water quality with flows expected to increase by over 250% at the selected Design Storm. Storm runoff will create localized flooding along the intermittent tributaries to the Rio Guadalupe, which drain the burned area. However, those effects will decrease with distance downstream and will likely contribute a smaller overall percentage of peak flow discharge at or near the watershed outlet where the private property VAR's are located, than the rest of the watershed as a whole. In other words, the relatively small amount of acreage burned is not expected to have much impact to the overall flooding potential at critical VAR's on private property. There is however a high to very high risk to health and safety within the Joaquin drainage and below the confluence with Rio Guadalupe from flooding and debris flows.

BAER land treatments are recommended above Forest Road #376 to mitigate erosion onto road. (*Treatments: L02*)

- c. **High risk to Rio Grande Chub and Sucker Species** in Rio Guadalupe. Unlike the listed Rio Grande Cutthroat, these two species, which are classified as Forest Sensitive species do occupy habitat that is adjacent and downstream of the burn in the Rio Guadalupe. The sediment with increased runoff and potential debris delivery from hillslopes in the burned area will directly impact habitat. The sediment inputs are expected to flush and no long-term diminishment in habitat quality is anticipated. The probability of damage or loss is possible, magnitude is minor. BAER treatments are not recommended.
- d. **Low risk to agricultural supply water** downstream of the confluence of Rio Guadalupe and Jemez River as a result of increased sedimentation following storm events and potential loss of diversion and conveyance systems. The probability of damage or loss is unlikely, magnitude is minor. BAER treatments are not recommended.

Other natural resources areas, specifically, wildlife and the ESA listed aquatic species were considered by the BAER Team. The Wildlife Biologist evaluated the risk and potential for treatments to mitigate impacts for the following species. No treatments were recommended. The Mexican Spotted Owl (Threatened – ESA) and their Critical habitat (entire fire area) are within and adjacent to the fire perimeter. There are direct impacts from the fire, but the owl will not be further impacted as a result of the post-fire watershed response. New Mexico Jumping Mouse (Endangered) suitable habitat occurs adjacent to the fire along the Rio Guadalupe; however, the identified Critical Habitat (CHU) is upstream and not threatened by the fire or potential erosion effects. Both the Peregrine Falcon Management Zone, a Forest Sensitive Species, and the Northern Goshawk PFAs (Post Fledgling Areas), Forest Sensitive Species, are adjacent to or within the fire perimeter. However, as with the MSO while there are direct impacts to the Peregrine and Northern Goshawk resulting from fire effects on vegetation, the increased erosion and watershed response resulting from burned conditions will not create further habitat concerns.

4. Cultural and Heritage Resources (CHR): **Very High risk to known cultural sites that within the high burn severity areas** considered to be significant on a National level meaning they are listed on or eligible for the National Register of Historic Places, Traditional Cultural Properties (TCPs as defined in National Register Bulletin 38) or Indian Sacred Sites (as defined by Executive Order 13007) as a result of increased post-fire erosion, the threat of falling trees, and rolling debris. Probability of damage or loss is very likely, magnitude is moderate. BAER Treatments are recommended (*Treatments: L03*).

B. Emergency Treatment Objectives:

As noted above, threats to forest users, transportation infrastructure (roads and culverts), heritage sites, water quality, soil productivity, and native vegetation communities exist as a result of the Venado fire. These threats include: failure of road drainage structures, increased sediment delivery, reduction of soil productivity, loss of sensitive aquatic species and habitat, damage to cultural resources, and spread of noxious weeds. For these reasons the primary treatment objectives are:

- Protect forest users through early notification (NOAA Weather System), signage, and temporary administrative closures of roads and dispersed camping areas.
- Mitigate effects under changed post-fire watershed response, particularly where forest roads cross drainages or drainage features unlikely to support post-fire flows.
- Minimize the increased potential for the spread of invasive and noxious weeds.
- Mitigate potential damage to cultural resources and assess cultural sites that were inaccessible prior to fire containment in order to prevent irretrievable loss of archaeological information.
- Provide safe access to fire area for personnel implementing road, land, and weed mitigations.
- Monitor implemented BAER treatments and existing infrastructure to determine effectiveness in post-fire flow conditions. Monitor weeds to determine effectiveness of BAER treatments and determine need for future treatments.

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

Land 50 % Channel NA % Roads/Trails 60 % Protection/Safety 70 %

D. Probability of Treatment Success

| | | Years after Treatment | | |
|-------------------|----|-----------------------|-----|----|
| | | 1 | 3 | 5 |
| Land | | 50 | 50 | 50 |
| Channel | | | | |
| Roads/Trails | 75 | 80 | 85 | |
| Protection/Safety | 80 | 50 | n/a | |

E. Cost of No-Action (Including Loss): Cost of no-action represents the sum of the approximate cost to repair the two miles Forest Road #376 following failure, reopening the 6 miles of Level 2 roads after failure, and the estimated cost of loss of soil productivity on the 141 acres proposed for treatment. Engineering investment along the high value Forest Road #376, which as the primary access into the National Recreation area must be maintained to a high standard. The average value of the roads and the cost of repairing the road segments without BAER treatment if damage, and loss of function occurs is approximately \$100,000 per mile (total cost \$200,000). The cost to implement all proposed BAER road treatments along FS #376 is approximately \$62,000 per mile. The cost of repairing lower value roads without BAER treatment if failures to drainage structures occur is approximately \$8,000 per mile (total cost \$64,000). Cost to implement proposed trail treatments along 8 miles of Level 2 and Level 1 roads is approximately \$4,500 per mile.

The cost of loss to soil productivity along the 141 acres of mulching is estimated at \$221,700. This cost would be added to the additional losses to Forest Road #376.

Total Cost of No Action (for monetized costs only): \$485,700 (approximately)

The value of protecting the ecological integrity and soil productivity of the burned area from noxious weed infestation likely exceeds the cost of weed treatment and monitoring, although this was not quantified. Similarly the loss of cultural resources was not quantified as it is impossible to set a monetary value on resources of such cultural significance. Mitigation of potential loss of life or injury was also a consideration for many treatments including closures and road treatments. This was an important driver in determining treatment needs, and while it is acknowledged that treatments will reduce hazards to life in the project area, it is impossible to factor this potential loss into the cost of no-action.

F. Cost of Selected Alternative (Including Loss): \$371,821

G. Skills Represented on Burned-Area Survey Team:

| | | | |
|---|--|---|---|
| <input checked="" type="checkbox"/> Hydrology | <input checked="" type="checkbox"/> Soils | <input type="checkbox"/> Geology | <input type="checkbox"/> Range |
| <input type="checkbox"/> Forestry | <input checked="" type="checkbox"/> Wildlife | <input type="checkbox"/> Fire Mgmt. | <input checked="" type="checkbox"/> Engineering |
| <input type="checkbox"/> Contracting | <input type="checkbox"/> Ecology | <input type="checkbox"/> Botany | <input checked="" type="checkbox"/> Archaeology |
| <input type="checkbox"/> Fisheries | <input type="checkbox"/> Research | <input type="checkbox"/> Landscape Arch | <input checked="" type="checkbox"/> Tribal Liasion (Jemez) [] 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:

L-01 EDRR (Early Detection Rapid Response): Reduce the potential for establishment of new noxious weed infestations in native or naturalized communities, particularly in highly susceptible burned areas, and prevent or decrease the rate of spread of existing infestations. Noxious weed control with herbicides is recommended for current and new invader infestations within the Venado fire. Herbicide applications will follow the requirements and mitigation outlined under the latest NEPA and Biological Assessment for listed species. Inventory of roads, dozer lines, drop points, camps, for both current and new invader weed populations, and monitoring of weed control methods should be initiated to determine potential for weed spread and effectiveness of treatments.

- Treat areas where encroachment of spotted knapweed, Canada thistle, Nodding plumless thistle, and Bull thistle along Forest Roads 376, & 488 and spurs within the burned area or adjacent to high and moderate severity fire.
- Monitor weed populations within and adjacent to the fire to determine if the combination of fire disturbance and susceptible habitat (susceptible habitat include burned areas, disturbed areas by fire suppression activities especially dozer lines and drop points) facilitates weed spread or increases weed densities, along with post treatment effectiveness monitoring.

Total treatment area is likely about 10% of total susceptible areas or about 30 acres and total monitored areas is about 300 acres.

| L-01 – Early Detection Rapid Response | |
|---|-----------------|
| Average Treatment Cost per acre: \$250.00 (includes prep and pre-treatment flagging of sites) | |
| Average Chemical/Personal Protection Equipment Cost per acre: \$50.00 | |
| Implementation Monitoring of Treatment: \$400 per day (two person crew). | |
| Estimated treatment cost: \$300.00/acre @ 30 acres | \$9,000 |
| Weed Monitoring: 10 days @ \$400/day | \$4,000 |
| Total Estimated Cost | \$13,000 |

L-02 Mulch: Aerial application of agricultural straw along 141 acres immediately above Forest Road 376 on steep slopes where the potential for erosion and soil loss is greatest resulting in road damage and loss of soil productivity. The application of mulch should reduce the runoff and erosion from these slopes.

| L -02 –Aerial Mulch | Unit | Quantity | Unit Price | Total Price |
|------------------------|----------|----------|-------------|----------------------|
| Aerial mulch | acres | 141 | \$ 1200.00 | \$169,200.00 |
| COR Inspect | Lump Sum | 1 | \$ 3,500.00 | \$3,500.00 |
| Treatment Total | | | | \$ 172,700.00 |

L-03 Hand Seeding: To provide more targeted treatment of archaeological sites to reduce erosion, particularly along the 5 sites within the high burn severity areas crews will hand seed exposed cultural sites.

| L -03 –Seeding | Unit | Quantity | Unit Price | Total Price |
|--|--------|----------|-------------|--------------------|
| Seed | 1 site | 5 | \$ 500.00 | \$2,500.00 |
| Implementation Crew (2 person @ \$400/day) | days | 5 | \$ 2,000.00 | \$2,500.00 |
| Treatment Total | | | | \$ 5,000.00 |

Channel Treatments: none recommended

Roads and Trail Treatments:

Roads and culverts in and below the fire area will now be prone to debris flows, sediment and flooding. Increased maintenance will be required until burned area has stabilized. Roads will be subject to increased hazard and blow down trees due to the adverse effects of fire and bug infestations. NFSR 376 has received extensive road upgrades and maintenance over the past few years and is in excellent condition and will be prone to washouts over a 2 mile stretch adjacent to the burn. NFSR 376 serves as vital Forest Access to administrative work, is a principal ingress and egress for the Jemez Pueblo to access cultural sites, and is one of the highest value recreational use roads on the Santa Fe National Forest. Treatments include improved drainage capacity along Forest Road #376 to prevent road failure and the consequences of failure to human life and safety, water quality, and downstream uses of the Rio Guadalupe. The other Forest System roads within the burn treatment area have less value for access, but the BAER team recommends implementing short-term drainage improvements to reduce the impact of increased sedimentation and flow on Forest Road #376 and lessen the erosion reaching Rio Guadalupe. Treatments can be categorized as Storm Proofing treatments and generally occur at culverts such as cleaning or work at ditch entry points, or treatments occur along the along the roads and grouped as linear treatments like the placing of water bars or drainage dips. In addition, the group recommends pulling two culverts along an administratively closed road, placing trash racks at two culverts, and upsizing the culvert at Joaquin Canyon which will accumulate the bulk of the post-fire watershed response at Road #376.

RT-01 Storm Proofing Treatments-Culvert Work

Culvert Overflows and Enhancement: This work will include placing material to impove flow from the ditch into the culvert and installing overflow drains at the culvert sites. Work requires placing excavated material to provide clear path to culvert and using a backhoe and/or excavator to create overflow drain. Riprap may be placed at outlet of overflow drain.

Ditch Block Removal and Cleaning: Roadway ditches along FS Road #376, including lead out ditches, shall be cleaned of debris to insure proper operation to prevent loss of control.

Culvert Inlet/Outlet Cleaning: This work shall include cleaning the inlet and outlet of culverts to maximize flow. A backhoe would be used for this task and operated on the shoulder of existing roadway. This work is proposed at all 20 culverts impacted by the moderate and high severity fire.

RT-02 Storm Proofing Treatments-Linear Work on Roads

Grade Dips High Standard: Grade dips would be constructed with borrow to insure roadway drainage operation. Dozer and or grader would be used for this task. The higher dip standard ensures that vehicles with lower clearance can still drive the road.

Grade Dips Low Standard: The existing roadway would be excavated and lead out ditch or sediment trap constructed. Dozer would be used for this task and disturbance may extend 50' below each dip to insure proper operation.

Level 1 Water Bar: Water bars will be installed along FS Road #488 to allow drainage. Installation requires a backhoe or dozer. The water bars will be constructed at appropriate spacings, but built to a low standard allowing only a high clearance vehicle or OHV.

Armor Roadway or Ditch with Riprap: This work shall include the placement of 3" – 6" rip rap borrow on roadway shoulder and or ditch line. A backhoe or dozer will be used to shape or place.

RT-03 Storm Proofing Treatments-Trash Racks at Culvert Inlet

Install 2 trash racks at existing culverts along NFSR#376 to prevent debris from clogging pipe. Backhoe would be used for this installation.

RT-04 Storm Proofing Treatments-Culvert Removal

Remove culvert on low use roads already administratively closed to the public until runoff stabilizes (up to 3 years).

RT-05 Install New Culvert: The undersized culvert at the Joaquin Canyon crossing at FSR#376 will be replaced to eliminate the substantial risk of culvert plugging, overtopping, breaching, and channel scour with resulting road failure. The work consists of removing and replacing the existing culvert with a larger culvert that will accommodate Q100 flows and also meet bankfull width of the existing channel. The proper soil erosion control measures will be taken during construction including diverting the stream around the construction site. The resulting BAER treatment will allow for Q100 flow conditions to handle post fire runoff events. Large riprap shall be placed at the Joaquin Canyon drainage structure to prevent scour and damage during expected flood flows.

Storm Patrol and Response: Monitoring of culverts and roadways for any failure will need to be performed following runoff events until debris and sediment flows have stabilized, estimated 8-10 years. Cleaning of debris from trash racks, and culverts will be required as needed to prevent potential catastrophic failure of the structures.

Treatment Groupings and Cost Breakdowns: Total Cost for Treatments \$146,875

| Road Treatment | Description of Treatment | | | | Cost | Grouped Cost |
|--|---|------|--------|-------|--------|--------------|
| | | | \$ | Units | \$ | |
| RT01-Storm Proofing Culverts | Culvert Emergency Over Flows/Culvert Enhancements | Each | 250 | 6 | 1500 | \$6500 |
| | Ditch Block and Cleaning at Culvert Inlet | Each | 150 | 20 | 3000 | |
| | Clean culvert inlet and outlet (large fill) | Each | 1000 | 2 | 2000 | |
| RT02-Storm Proofing Road Linear Treatments | Grade Dips High Standard | Each | 1000 | 20 | 20000 | \$31,875 |
| | Grade Dips Low Standard | Each | 200 | 40 | 8000 | |
| | Level 1 Water Bar | Each | 50 | 40 | 2000 | |
| | Armor roadway or ditch with riprap | mile | 2500 | 0.75 | 1875 | |
| RT03-Trash Rack | Trash Rack | Each | 1000 | 2 | 2000 | \$2,000 |
| RT04-Culvert Removal | Remove Culvert until runoff stabilizes. | Each | 250 | 2 | 500 | \$500 |
| RT05-Culvert Replacement | Culvert Replacement-deep fills (size?) | Each | 100000 | 1 | 100000 | \$100,000 |
| Storm Patrol | Storm patrols will complete limited maintenance by removing debris from treatment structures to ensure they continue to function during future flood. Employees (a crew of 2) | Day | 800 | 10 | 8000 | \$20,000 |
| | Equipment | Day | 1200 | 10 | 12000 | |

Protection/Safety Treatments:

The safety and well-being of forest visitors utilizing Forest Roads necessitate they are informed or notified of hazards when entering the burned area. Proper signage at along roads entering or leading to the burned area is needed to provide ample warning to recreationists. Administrative closures of the burned area and the section of Forest Road #376 below the burned area will be required to ensure public safety until the threat of post-fire response mitigates over time. Potential threats to the public and agency personnel include flooding and debris flows, hazard trees, and rockfall along roads, and dispersed recreation sites that are downstream or downslope of areas with moderate to high burn severity

- Signs/Barricades/Gates shall be installed as necessary to warn, protect and/or prevent public access.
- Hazard Trees shall be removed to eliminate potential hazards to ensure safe implementation of the proposed BAER treatments. Hazard trees will only be removed as needed for crew safety.

| PS-01-02 – Hazard Signs | QTY | Rate | UOM | Total |
|--|------------|-------------|------------|---------------|
| Forestry Technician (GS-7) | 2 | \$260 | day | \$1040.00 |
| Burned Area Hazard Sign, posts, and hardware | 14 | \$120 | each | \$1680.00 |
| Treatment Total | | | | \$2720 |

| PS-03 – Gates | QTY | Rate | UOM | Total |
|------------------------|------------|-------------|------------|----------------|
| Time and Equipment | 2 | \$4500 | each | \$9,000 |
| Treatment Total | | | | \$9,000 |

| PS-04 – Hazard Tree Removal-L1 Road | QTY | Rate | UOM | Total |
|--|------------|-------------|------------|----------------|
| Time and Equipment | 10 | \$100 | mile | \$1,000 |
| Treatment Total | | | | \$1,000 |

| PS-04 – Hazard Tree Removal-L3 Road | QTY | Rate | UOM | Total |
|---|------------|-------------|------------|-----------------|
| Time and Equipment (requires heavy equipment) | 5 | \$2000 | mile | \$10,000 |
| Treatment Total | | | | \$10,000 |

BAER Evaluation:

Coordination with the Pueblo of Jemez and collaborating agencies to ensure potential post-fire impacts within and downstream of the burned area are understood and information is shared.

| Coordination | Rate | Days | Cost |
|-------------------------|-------------|-------------|----------------|
| Forest BAER Coordinator | \$420 | 5 | \$2,100 |
| Total Cost | | | \$2,100 |

In addition, associated emergency consultation for permitting work needs to be considered in the BAER funding request when emergency response actions are authorized. These are accumulated tasks above the normal program of work and are not captured in out-year program planning. **Implementation of approved BAER response actions trigger these required tasks and the unit's allocated budget does not account for these obligations.** BAER funding is the appropriate authorization to ensure this coordination and consultation is completed.

| Emergency Consultation on Implementation of Authorized Emergency Response Actions Rate | Days | Cost |
|---|-------------|----------------|
| Forest Biologist @ \$420/day | 3 | \$1,260 |
| Forest Engineer @ \$420/day | 3 | \$1,260 |
| Total Cost | | \$2,520 |

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.)

Part VI – Emergency Stabilization Treatments and Source of Funds **Interim #**

| NFS Lands | | | | Other Lands | | | | All | |
|--|-------|--------|-------|------------------|------------|------------------|------------|---------|------------------|
| Unit | | # of | | Other | # of | Fed | # of | Non Fed | Total |
| Line Items | Units | Cost | Units | BAER \$ | \$ | units | \$ | Units | \$ |
| A. Land Treatments | | | | | | | | | |
| L-01 treatment | acres | 300 | 30 | \$9,000 | \$0 | | \$0 | | \$0 |
| L-01 monitoring | days | 400 | 10 | \$4,000 | \$0 | | \$0 | | \$0 |
| L-02 Aerial Mulch | acres | 1200 | 141 | \$169,200 | | | | | \$169,200 |
| L-02 Mulch Contract A | Lump | 3500 | 1 | \$3,500 | | | | | \$3,500 |
| L-03 Hand Seed | Each | 1000 | 5 | \$5,000 | \$0 | | \$0 | | \$0 |
| <i>Insert new items above this line!</i> | | | | \$0 | \$0 | | \$0 | | \$0 |
| Subtotal Land Treatments | | | | \$190,700 | \$0 | | \$0 | | \$190,700 |
| B. Channel Treatments | | | | | | | | | |
| <i>Insert new items above this line!</i> | | | | \$0 | \$0 | | \$0 | | \$0 |
| Subtotal Channel Treat. | | | | \$0 | \$0 | | \$0 | | \$0 |
| C. Road and Trails | | | | | | | | | |
| RT-01 Culverts | Each | 20 | 325 | \$6,500 | \$0 | | \$0 | | \$0 |
| RT-02 Linear Tmts | Lump | 31,875 | 1 | \$31,875 | \$0 | | | | \$31,875 |
| RT-03 Trash Rack | Each | 1000 | 2 | \$2,000 | \$0 | | | | \$2,000 |
| RT-04 Culvert Remove | Each | 250 | 2 | \$500 | \$0 | | | | \$500 |
| RT-05 Culvert Replace | Each | 100000 | 1 | \$100,000 | \$0 | | \$0 | | \$100,000 |
| Storm Patrol and Response | Each | 4000 | 1 | \$4,000 | \$0 | | \$0 | | \$4,000 |
| <i>Insert new items above this line!</i> | | | | \$1000 | \$2,000 | \$0 | \$0 | | \$2,000 |
| Subtotal Road & Trails | | | | 500 | 10 | \$146,875 | \$0 | | \$146,875 |
| D. Protection/Safety | | | | | | | | | |
| PS-01-signs Entrance | each | 194 | 4 | \$776 | \$0 | | \$0 | | \$776 |
| PS-02-signs-Hazard W | each | 194 | 10 | \$1,940 | \$0 | | \$0 | | \$1,940 |
| PS-03-Gates | each | 4500 | 2 | \$9,000 | \$0 | | | | \$9,000 |
| PS-04 Hazard Tree Cl | Mile | 100 | 10 | \$1,000 | \$0 | | | | \$1,000 |
| PS-05 Hazard Tree Cl | Mile | 2000 | 5 | \$10,000 | \$0 | | \$0 | | \$10,000 |
| <i>Insert new items above this line!</i> | | | | \$0 | \$0 | | \$0 | | \$0 |
| Subtotal Structures | | | | \$22,716 | \$0 | | \$0 | | \$22,716 |
| E. BAER Evaluation | | | | | | | | | |
| Assessment | lump | 28000 | 1 | \$28,000 | | | | | \$28,000 |
| Implementation | days | 420 | 11 | \$4,620 | \$0 | | \$0 | | \$4,620 |
| <i>Insert new items above this line!</i> | | | | — | \$0 | | \$0 | | \$0 |
| Subtotal Evaluation | | | | — | \$0 | | \$0 | | \$4,620 |
| F. Monitoring | | | | | | | | | |
| <i>Insert new items above this line!</i> | | | | \$0 | \$0 | | \$0 | | \$0 |
| Subtotal Monitoring | | | | \$0 | \$0 | | \$0 | | \$0 |
| G. Totals | | | | \$364,911 | \$0 | | \$0 | | \$364,911 |

PART VII - APPROVALS

1. /s/ James E. Melonas
Forest Supervisor (signature)

8/7/2018
Date

2. Elaine Kohman
for Regional Forester (signature)

8/10/2018
Date

Figures

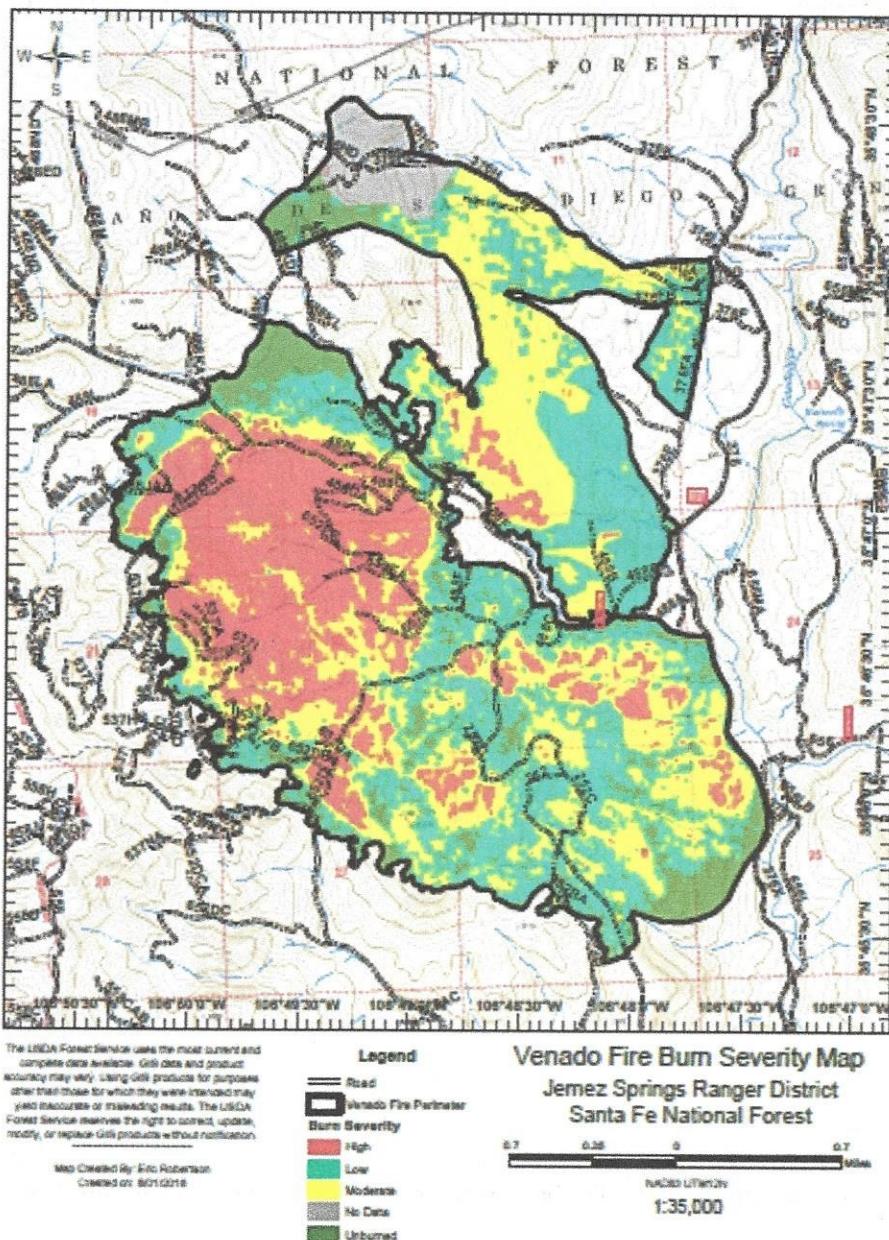


Figure 1. Final Soil Burn Severity Map



Figure 2. Sediment headed toward Rd #376 following 0.5 inch of rain. Slopes above this site are proposed for mulching treatment.



Figure 3. Culvert located along Rd #488. Road drainage improvements like water bars and critical dips are proposed.



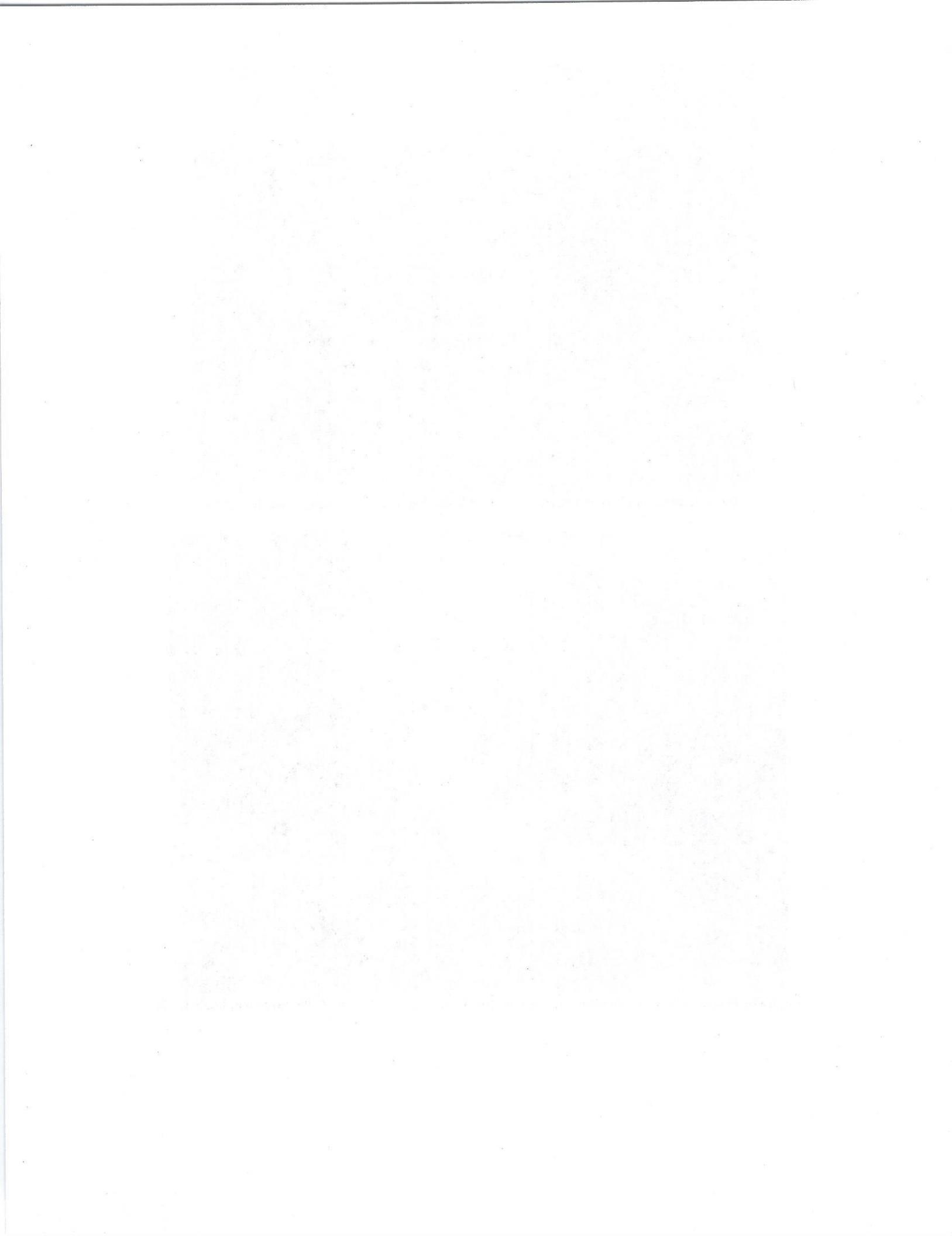
Figure 4. Location of burned area above Rd #376 where mulch treatments are proposed.

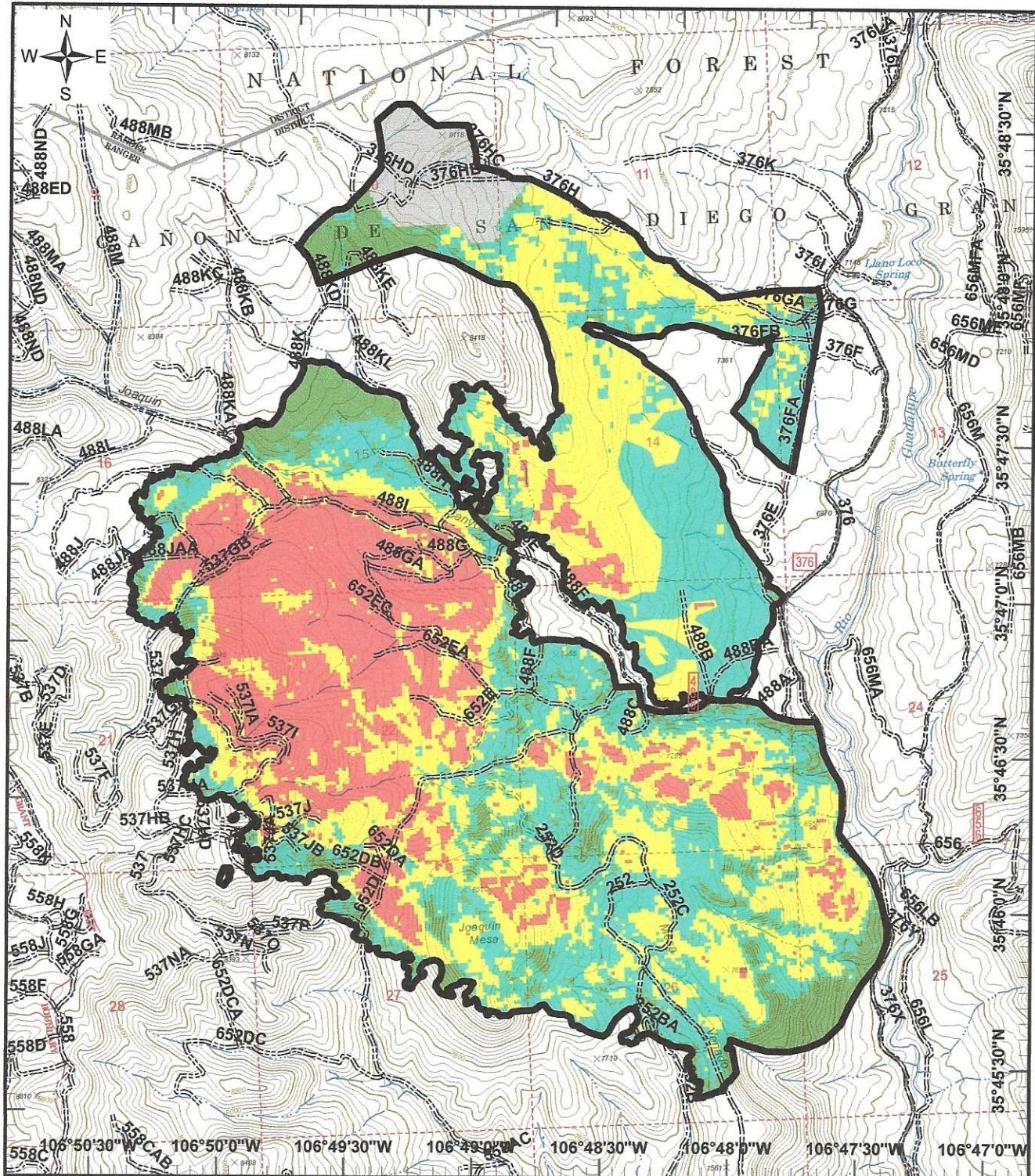


Figure 5. Joaquin Canyon Culvert at FSR#376 during assessment before precipitation



Figure 6. Joaquin Canyon Crossing after minor storm (exact precipitation at site unknown, likely 0.5")





The USDA Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than those for which they were intended may yield inaccurate or misleading results. The USDA Forest Service reserves the right to correct, update, modify, or replace GIS products without notification.

Map Created By: Eric Robertson
Created on: 8/01/2018

Legend

==== Road

Venado Fire Perimeter

Burn Severity

High

Low

Moderate

No Data

Unburned

Venado Fire Burn Severity Map

Jemez Springs Ranger District
Santa Fe National Forest

0.7 0.35 0 0.7
Miles

NAD83 UTM12N

1:35,000

