**Date of Report:** 6/24/20

# BURNED-AREA REPORT

## PART I - TYPE OF REQUEST

**A. Type of Report**

☒ 1. Funding request for estimated emergency stabilization funds

☐ 2. No Treatment Recommendation

**B. Type of Action**

☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

☐ 2. Interim Request #___

☐ Updating the initial funding request based on more accurate site data or design analysis

## PART II - BURNED-AREA DESCRIPTION

**A. Fire Name:** Tadpole Fire

**B. Fire Number:** NM-GNF-000232

**C. State:** New Mexico

**D. County:** Grant

**E. Region:** Region 3

**F. Forest:** Gila NF

**G. District:** Silver City

**H. Fire Incident Job Code:** P3M51D (0306)

**I. Date Fire Started:** 06/06/2020

**J. Date Fire Contained:** estimated July 18th

**K. Suppression Cost:** 3,139,000

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

1. **Fireline repaired (miles):** Hand line 3 miles, Dozer line 5.1 miles
2. **Other (identify):**

**M. Watershed Numbers:**

*Table 1: Acres Burned by Watershed*

| HUC # | Watershed Name | Total Acres | Acres Burned | % of Watershed Burned |
|---|---|---|---|---|
| **150400010803** | Lake Roberts-Sapillo Creek | 23,377 | 133 | 0.57% |
| **150400010805** | Sheep Corral Canyon – Sapillo Creek | 25,649 | 3,113 | 12.14% |
| **150400020101** | Upper Bear Creek | 38,368 | 6,189 | 16.13% |

**N. Total Acres Burned:**

*Table 2: Total Acres Burned by Ownership*

| OWNERSHIP | ACRES |
|---|---|
| **NFS** | 9,435 |
| **OTHER FEDERAL (LIST AGENCY AND ACRES)** | 0 |
| **STATE** | 0 |
| **PRIVATE** | 0 |
| **TOTAL** | 9,435-based on 06/21 fire perimeter |

**O. Vegetation Types:** Ponderosa Pine, Mixed Conifer, Evergreen Oak/Shrub Mix

**P. Dominant Soils:** Mollisols, Enceptisols , Alfisols

**Q. Geologic Types:** Rhyolite, Basalt, Tuff, Andesite Alluvium

**R. Miles of Stream Channels by Order or Class:**

*Table 3: Miles of Stream Channels by Order or Class*

| STREAM TYPE | MILES OF STREAM |
|---|---|
| **PERRENIAL** | 0 |
| **INTERMITTENT** | 3.6 |
| **EPHEMERAL** | 37.3 |
| **OTHER (DEFINE)** | |

S. **Transportation System:**
**Trails:** *National Forest (miles):* 9.45 *Other (miles):* 0
**Roads:** *National Forest (miles):* 15.01 *Other (miles):* 4.4 New Mexico State Highway 15

## PART III - WATERSHED CONDITION

**A. Burn Severity (acres):**

*Table 4: Burn Severity Acres by Ownership*

| Soil Burn Severity | NFS | Other Federal (List Agency) | State | Private | Total | % within the Fire Perimeter |
|---|---|---|---|---|---|---|
| **Unburned** | 528 | | | | | |
| **Low** | 4,998 | | | | | |
| **Moderate** | 3,150 | | | | | |
| **High** | 622 | | | | | |
| **No Data** | 138 | | | | | |
| **Total** | 9,435 | | | | | |

B. **Water-Repellent Soil (acres):** 1,800

**C. Soil Erosion Hazard Rating:** Slight:1,543 acres, Moderate:3,952 acres, Severe:3,940 acres

**D. Erosion Potential**: Pre-fire 10,103 tons Post-fire 28,220 tons

**E. Sediment Potential:** Pre-fire -- 202 cubic yards, Post-fire – 3,326 cubic yards

**F. Estimated Vegetative Recovery Period (years):** 3-5

**G. Estimated Hydrologic Response (brief description):**
The design storm selected to evaluate pre and post-fire peak flows for watersheds within the burned perimeter was the 25-year/1-hour storm. This storm is representative of the high-intensity monsoon season thunderstorms which are considered the principal threat to smaller (sub 6th code) watersheds. Rainfall for the 25-year/1- hour storm was determined by reference to the web-based version of NOAA Atlas 14 "Precipitation-Frequency Atlas of the United States" using data from partial duration peak rainfall records. The estimate of the 25-year/1-hour storm modeled for the Tadpole Fire was 1.92 inches.

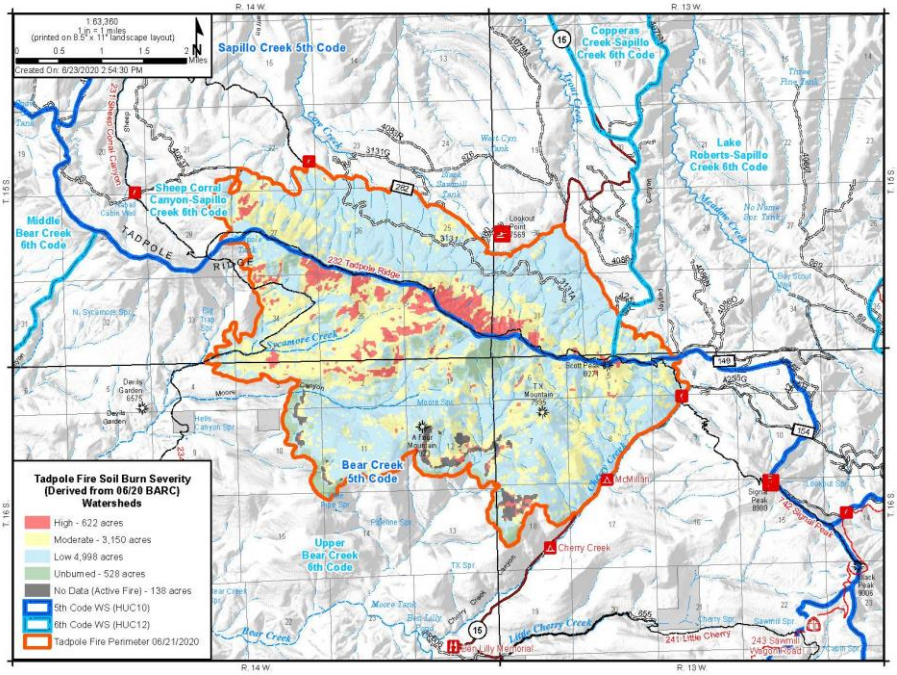
The first damaging storm for the Tadpole fire is expected to occur sometime in late June or early July, with subsequent damaging storms continuing through August. During this period, rainfall is characterized by convective, high-intensity, short-duration storms typical of the Southwestern monsoon season. Storms during this period are generally of limited areal extent, averaging an estimated 5 square miles or less. This convective rainfall period poses the most immediate threat of watershed and fisheries damage due to accelerated runoff and erosion, as well as from pulses of ash inputs to streams in the burned area.

The Wildcat5 storm runoff model was used to predict peak flow runoff generated in key watersheds under pre- and post-burn conditions. Small drainage basins with higher percentages of high burn severity showed the greatest increases in runoff potential. These increases varied from a projected 53% increase in peak flow in a watershed with mostly low burn severity to over an 850% increase on a small watershed with more than 50% high and moderate burn severity.

## PART V - SUMMARY OF ANALYSIS

**Introduction/Background**
The Tadpole fire is burning in the Pinos Altos Mountain Range on either side of Tadpole Ridge 8 miles north of Silver City, NM on the Gila National Forest. Elevations range from 6600 ft to 8600 ft. Vegetaion types include ponderosa pine, mixed conifer and thick evergreen oak shrub on the south facing slopes of Tadpole Rige. The fireline on the eastern portion of the fire is New Mexico State Highway 15. The northern portion of the fire has the majority of the values at risk associated with it and is cold and black. The southern portion of the fire south of Tadpole Ridge where the fire continues to burn, has fewer values at risk associated with it. It is estimated from the Fire Team that this fire will not be out until we get into our monsoons.

Soil Burn Severity Map of Tadpole Fire



A. **Describe Critical Values/Resources and Threats (narrative):** Critical Values identified (FSM 2523.1 Exhibit 01) during the BAER assessment are: Human life and safety, property, natural resources. The BAER team evaluated the risk to those critical values using the BAER Risk Assessment (FSM 23235.1 Exhibit 02).

*Table 5: Critical Value Matrix*

| **Probability of Damage or Loss** | **Magnitude of Consequences** | | |
|---|---|---|---|
| | Major | Moderate | Minor |
| | **RISK** | | |
| Very Likely | **Very High** | **Very High** | **Low** |
| Likely | **Very High** | **High** | **Low** |
| Possible | **High** | **Intermediate** | **Low** |
| Unlikely | **Intermediate** | **Low** | **Very Low** |

**See appendix A for full list of Values at Risk and their associated ratings.**

1. **Human Life and Safety (HLS):** There are post fire risks to life and safety as a result of the Tadpole Fire. Individuals who may find themselves on Forest road 282 (Sheep Corral Road) are at risk from post fire flows and run the risk of being stranded during and after rain events due to road failures, washouts and potential debris flows. The Sheep Corral road recieves a considerable amount of local traffic and has several popular trailheads located along it, one which leads to the Gila River and Gila Wilderness a desired destination. The road ends at the Gila Wilderness boundry and for a majority of the road there is no other way out than the way you entered.
   Two trails go through the fire with a total of 5 access points. Trails are, 232, which is a very popular trail for the local community of Silver City. The other trail is 234 Sycamore Canyon trail which is more remote but does act as an alternate route for the Contenental Divide trail.

2. **Property (P):**There is very high risk of substantial damage to Forest Service road 282, a level 3 road due to post-fire conditions. This road serves as access to popular trail heads that lead to the Gila River and Gila Wilderness, is the only acess to an active grazing allotment and recieves high use from local residents. It also serves as only access to a large section of the Silver City District and is needed for fire response and management. This road is expected to be heavily impacted by extreme flows and excessive sedimentation. Modeling results indicate that nine culverts along this road need to be pulled prior to monsoons and low water crossings installed in their place. Potential loss of portions of these roads are anticipated if they are not prepped prior to the monsoon season.

3. **Natural Resources (NR):**There is a very high risk of accelerated soil erosion and sediment production predicted within the Tadpole Fire burned area, particularily in the high burn severity on the north slope of Tadpole Ridge. Modeling predicts a 2.8 fold increase in erosion potential, with the area weighted soil loss rate increasing from 1.1 tons per acre before the fire to 3.0 tons per acre after the fire. Of the 3 tons per acre, 2.5 tons per acre is predicted to originate from high and moderate burn severities. Of the 9,435 total acres within the burned area, 3,940 acres have a soil erosion hazard rating of severe. The initiation of new surface erosion sources from the very steep slopes pose an extreme threat to long-term soil productivity.

   Hydrologic function will be greatly reduced due to loss of vegetative overstory, vegetative ground cover, and the duff layer. The loss of these layers in the ecosystem has profound negative effects to hydrologic function. In a functioning watershed these layers intercept and slow raindrop impact, absorb and slow overland flow, and provide a natural resistance to excessive erosion. Recovery of watershed condition and hydrologic function can take many years to stabilize.

4. **Cultural and Heritage Resources:** Cultural resources that may have been affected by post fire erosion and flows were evaluated and none were at risk.

**B. Emergency Treatment Objectives:**

**HLS:** Post warning/hazard signs on Forest roads 282 and 876 and at trail access points that that have trails leading into the burned area. Install gates on these two roads so they can be closed during monsoon season. Signs would inform forest users of the potential risks and hazards that could be encountered when entering the burned area. The gates are intended to keep the public out of the burned area during monsoon season, alleviating risks to life and safety.

**Property:** Prepare Forest road 282 by increasing road ditch capacity along the road in addition to fully cleaning all culverts and lead out ditches to prevent road failure due to excessive flows and sedimentation from post fire rain events. Modeling indicates six culverts along Forest road 282 will need to be pulled and low water crossings installed as modeling indicates these culverts are undersized and will not handle modeled increase peak flows and sedimentation. Implement Storm Inspection and Response.Treatments are intended to prevent road failure and minimize post fire negative affects to our road infrastructure and investment.

**C. Probability of Completing Treatment Prior to Damaging Storm or Event:**
**Land**: N/A
**Channel:** N/A
**Roads/Trails:** 90%
**Protection/Safety:** 100%

**D. Probability of Treatment Success**

*Table 6: Probability of Treatment Success*

| | *1 year after treatment* | *3 years after treatment* | *5 years after treatment* |
|---|---|---|---|
| ***Land*** | N/A | | |
| ***Channel*** | N/A | | |
| ***Roads/Trails*** | 70 | 80 | 95 |
| ***Protection/Safety*** | 85 | 85 | 955 |

**E. Cost of No-Action (Including Loss):** $589,000

**F. Cost of Selected Alternative (Including Loss):** $213,000

**G. Skills Represented on Burned-Area Survey Team:**

☒ Soils ☒ Hydrology ☒ Engineering ☒ GIS ☒ Archaeology
☒ Weeds ☐ Recreation ☐ Fisheries ☒ Wildlife
☐ Other:

**Team Leader:** Mike Natharius
**Email:** mike.natharius@usda.gov **Phone(s)** 575-313-0524

**Forest BAER Coordinator:**Mike Natharius
**Email:**mike.natharius@usda.gov **Phone(s):** 575-313-0524

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

| Skill | Team Member Name |
|---|---|
| *Team Lead(s)* | Mike Natharius |
| *Soils* | Jenny Natharius |
| *Hydrology* | Edgar Martinez |
| *Engineering* | Rex Null |
| *GIS* | Brian Park |
| *Archaeology* | Chris Euler |
| *Weeds* | Jenny Natharius |
| *Recreation* | |
| *Other* | |

## H. Treatment Narrative:

**Land Treatments:** N/A

**Channel Treatments:** N/A

**Roads and Trail Treatments:**
6.8 miles of Forest road 282 will be prepped prior to monsoons to mitigate negative post fire impacts. The Forest will utilize their road crew and equipment for this work. They have years of experience in prepping roads to handle increased postfire flows and sediment on the Forest. Costs are very reasonable compared to contracting work out and they are ready to implement immediately.
*See attached Treatment Map for locations.*

- Clean culvert inlet and outlet. This work shall include cleaning the inlet and outlet of culverts to maximize flow and resizing and rebuilding ditch blocks to insure culvert is at capacity. A backhoe would be used for this task.
- Armor leadout ditches and culvert outlets with riprap. This work shall include the placement of 6" – 24" rip rap borrow on roadway shoulder and or ditch line. A backhoe, trackhoe or dozer will be used to shape or place.
- Construct broad based rolling dips as needed. Grade dip would be constructed to insure roadway drainage operation. A dozer would be used for this task.
- Install 2 closure gates. Install closure gate at locations identified for public safety and traffic management.
- Pull or remove six culverts that are not predicted to handle increased flows as a result of post fire conditions and install low water crossings in their place. Low water clossings will be armor with rip rap.

**Protection/Safety Treatments:**
Post warning/hazard signs on Forest roads 282 and 876 and at access points that have trails leading into the burned area. Install gates on these two roads so they can be swung shut during monsoon season. *See attached treatment maps for locations.*

**Storm Inspection and Response**
This treatment will occur throughout the monsoon season prior to and after storm events and is intended to keep culverts and other drainage structures such as road line ditches, lead out ditches cleared and free of sediment and debris so that they are functioning properly
Storm Inspection and Response is recommended to prevent or minimize post-fire negative impacts to the Forest road infrastructure.

## I. Monitoring Narrative:

## PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

| Line Items | Units | Unit Cost | # of Units | BAER $ | Other $ | # of units | Fed $ | # of Units | Non Fed $ | Total $ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| **A. Land Treatments** | | | | | | | | | | |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Land Treatments* | | | | $0 | $0 | | $0 | | $0 | $0 |
| **B. Channel Treatments** | | | | | | | | | | |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Channel Treatments* | | | | $0 | $0 | | $0 | | $0 | $0 |
| **C. Road and Trails** | | | | | | | | | | |
| Road Prep | PayPeriod | 16,000 | 0.5 | $8,000 | $0 | | $0 | | $0 | $8,000 |
| Culvert Removal | PayPeriod | 16,000 | 0.5 | $8,000 | $0 | | $0 | | $0 | $8,000 |
| Rip Rap | per yard | 100 | 75 | $7,500 | | | | | | $7,500 |
| Storm Inspecton & Respons | PayPeriod | 16,000 | 3 | $48,000 | | | | | | $48,000 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Road and Trails* | | | | $71,500 | $0 | | $0 | | $0 | $71,500 |
| **D. Protection/Safety** | | | | | | | | | | |
| Warning/Hazard signs | per | 150 | 7 | $1,050 | $0 | | $0 | | $0 | $1,050 |
| Road Closure gate | per | 2,000 | 2 | $4,000 | $0 | | $0 | | $0 | $4,000 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Protection/Safety* | | | | $5,050 | $0 | | $0 | | $0 | $5,050 |
| **E. BAER Evaluation** | | | | | | | | | | |
| Initial Assessment | Report | $22,000 | | --- | $0 | | $0 | | $0 | $0 |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Insert new items above this line!* | | | | --- | $0 | | $0 | | $0 | $0 |
| *Subtotal Evaluation* | | | | $0 | $0 | | $0 | | $0 | $0 |
| **F. Monitoring** | | | | | | | | | | |
| | | | | $0 | $0 | | $0 | | $0 | $0 |
| | | | | $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** | | | | $76,550 | $0 | | **$0** | | **$0** | **$76,550** |
| Previously approved | | | | | | | | | | |

## PART VII - APPROVALS

1._____

Forest Supervisor Date