



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 #2 – this request builds off Backbone BAER Interim Request #1. Additions are marked with red font.

Part II - Burned-Area Description

A. Fire Name:

Backbone

B. Fire Number:

AZ-COF-000642

C. State of Fire Origin:

US-AZ

D. Multiple States:

- ☐ Yes
- ☒ No

E. Region:

3

F. Forest:

Coconino National Forest; Tonto National Forest

G. District:

Red Rock Ranger District; Payson Ranger District

H. Fire Incident Job Code:

N227

I. Date Fire Started:

06/17/2021

J. True Containment Date (if known):

07/14/2021

K. Estimated Containment Date (if uncontained):



L. Watershed Numbers (All NFS)

Table 1. Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
150602030308	Gap Creek-Verde River	39,304	14,578	37
150602030306	Hardscrabble Creek	25,250	926	3
150602030307	Lower Fossil Creek	29,829	18,979	63
150602030304	Mud Tanks Draw	8,516	1,277	15
150602030206	Pine Creek	30,726	31	0
150602030302	Sycamore Canyon	17,656	4,119	23
150602030305	Upper Fossil Creek	25,859	2,013	7

M. Total Acres Burned:

Table 2. Total Acres Burned by Ownership

Ownership	Acres
NFS (Coconino)	35,293
NFS (Tonto)	6,634
Private	4
Total	41,923

N. Vegetation Types:

The Backbone fire burned in pinyon juniper woodland, juniper grassland, grassland, semidesert grassland, chaparral, mesquite desert willow and riparian vegetation communities. Areas outside the riparian zone have high amounts of fire-adapted shrub cover that are expected to resprout rapidly and within 3 years after the wildfire. Elevations range from approximately 3000 feet in riparian and mesquite desert willow vegetation types to 5800 feet in pinyon juniper woodlands. Pinyon/juniper woodland was the dominant vegetation type within the burn perimeter. The pinyon-juniper woodlands and chaparral types had high amounts of pre-fire shrub cover dominated by turbinella oak, manzanita and other shrub species that area fire adapted and sprout rapidly following wildfire.

O. Dominant Soils:

Almost all soils are volcanically derived from basalt residuum, cinders, and welded ash (tuff). These soils occupy over 95% of the fire. Dominant soils are classified as Lithic and Typic Haplustalfs, shallow to moderately deep, clayey-skeletal or fine, textures with very or extremely gravelly clay loam or loam surfaces. These soils are clayey in nature with low infiltration and permeability rates. These soils are found on three major landforms and slope classes. They are found on elevated plains on slopes ranging from 0-15%, hills on slopes ranging from 15-40% and mountains and escarpments on slopes exceeding 40%. Riparian areas are derived from alluvium and only occupy about 1.5% of the fire. Slopes range from 0-5%. They are classified as Typic and Aquic Ustifluvents, deep, sandy-skeletal, with extremely cobbly loamy sand or sandy surface textures. They have sandy textures throughout and have rapid infiltration and permeability rates. Adjacent to riparian areas lie stream terraces or abandoned flood plains with mesquite-desert willow vegetation types. These soils occupy less than .1% of the burn and are found on slopes ranging from 0-5%. They are dominated by Typic Ustipsamments, deep loamy sands with



low amounts of rock cover. They have sandy textures throughout and have rapid infiltration and permeability rates.

P. Geologic Types:

Sedimentary strata are from the Paleozoic era ranging in age from Mississippian (359-323 million years ago) to Permian (299-252 million years ago) and are classified as: limestones, redbeds (mudstone, siltstone, shale, sandstone and conglomerate), and aeolian to coastal dune sandstones. The various sedimentary formations are bounded by regional unconformities, time gaps in the rock record created by erosion. Fossil Springs consists of several vents along a 200 m reach of Fossil Creek, at or near channel level. It is the largest concentration of spring-water discharge in the Mogollon Rim region. Fossil Creek is notable for travertine dams or terracing. This geologic formation is the dramatic geological phenomena that makes Fossil Creek both aesthetically and scientifically valuable and contributes to the finding that geology is an ORV for the WSR.

Q. Miles of Stream Channels by Order or Class

Table 3. Miles of Stream Channels by Order or Class

Stream Type	Coconino NF	Tonto NF
Perennial	7	6
Intermittent	46	1
Ephemeral	162	25
Canal/Ditch/pipeline	10	0

R. Transportation System:

NFS Trails (Coconino)

Table 4. Forest Service trail miles by type

Trail Type	Coconino NF	Tonto NF
Non-motorized	20.4	4.5
Motorized	0	0

NFS Roads

Table 5. National Forest Service road miles by maintenance level

Maintenance Level	Coconino NF	Tonto NF
1	19	0
2	24	1
3	15	5
4	0	0
5	0	0
Total	58	6

Other roads:

2 miles – State Highway



Part III – Watershed Condition

A. Burn Severity (acres):

Table 6. Burn severity acres by ownership

Soil Burn Severity	Coconino NF	Tonto NF	Other	Total	% of NFS	% within Fire Perimeter
Unburned	3,505	578		4,083	10%	10%
Low	20,028	2,734		22,762	54%	54%
Moderate	11,382	2,906	4	14,288	34%	34%
High	370	416		786	2%	2%

B. Soil Erosion Hazard Rating (All NFS)

Table 7. Acreage by soil stability and soil burn severity

Soil Erosion Hazard Class	Acres
Low	3,253
Moderate	33,069
High	5,602

C. Erosion and Sediment Potential:

Soil erosion modeling (erosion potential) results for sheet and rill erosion within the entire fire perimeter predict a total of approximately 6.6 tons/acre/year. Only Moderate and High soil burn severity classes in the 15-40% slopes are predicted to erode above the annual threshold of soil renewability. All soil burn severity classes (L, M, H) in slopes greater than 40% are predicted to erode above the soil loss threshold. Sediment potential in the entire burn scar is about 3340 cubic yards/square mile. Gully erosion is not modeled but expected to meet or exceed sheet and rill erosion based on observations and comparison to the 2010 Schultz Fire and others. Sediment Potential Delivery to stream courses (fire-wide)= 3340 cubic yards/sq mile * .25 = 835 cubic yards/square mile. (This assumes 25% is delivered to connected stream courses).

D. Debris Flow Potential:

The US Geological Survey has estimated the probability and magnitude of debris flows within and from the burned area and developed a debris flow hazard rating from the combination of these factors for various rainfall intensities for watersheds within the burned area. They have developed debris flow hazard ratings for both watersheds and stream channels. This site assesses debris flow hazard for a storm with different intensities. For this fire the peak 15-minute intensity of 24 mm/hr and peak 15-minute intensity of 40mm/hr debris flow hazards were considered. The former can be expected to occur at a sub-annual frequency, whereas the latter is roughly equivalent to the one-year return interval storm event for this area. According to their analysis, the primary areas of concern for debris flows are the areas that drain toward Fossil Creek on river left (southern side of Fossil Creek) for most of the length of the creek in the burn scar and the Child's Southeast subwatershed. Stream segments with elevated risk of debris flows are found throughout the portions of the burn scar with moderate and high soil burn



severity. Most watersheds are estimated to produce debris-flow volumes between 10,000 and 100,000 cubic meters.

E. Estimated Vegetative Recovery Period (years):

The Backbone Fire is not anticipated to create long-term change to the Fossil Creek system; vegetative recovery is anticipated to occur within 3 to 5 years post-fire.

F. Estimated Hydrologic Response (brief description):

Hydrologic response for watersheds in the 2-year storm event within the burn scar will be extreme for 3.5% of the modeled sub-basins, very significant for 5.3% of the sub-basins, significant for 24.6%, minimal for 36.8%, and unchanged for 29.8% (definitions of magnitudes are in the hydrology report). Areas of particular concern include the Fossil Springs Watershed, Boulder Watershed, Deadman Watershed, Ike's Backbone Watershed, and the Southeast Watershed above the Child's recreation site. According to the modeling, while there are watersheds in the upper portion of the burned area that drain to Fossil Creek, such as the Fossil Springs Watershed, that have significant to extreme increases in peak flows post fire for the 50% probability or 10% probability events, these watersheds are not large enough to substantially impact overall flows in Fossil Creek until the stream meets the Boulder Canyon drainage. Where Boulder Canyon enters Fossil Creek, changes in flows become significant for the 50% and 10% likelihood storm event. Because monsoonal events are generally less than five square miles in area a tropical storm may be the first damaging storm over the burned area. Modeling for the tropical storm revealed that the area of greatest concern in this scenario is the Boulder Creek drainage.

Part IV – Summary of Analysis

A. Introduction/Background:

The Backbone Fire began as a lightning strike on June 16, 2021. As of the date of this report the Backbone Fire perimeter includes 41,924 acres on the Coconino and Tonto National Forests. Fire spread was a combination of flanking, backing, and sustained up-canyon/upslope runs. Spotting distance was up to 0.5 miles with group torching and short duration crown fire runs. Burnout operations along Hwy 87 west of the town of Strawberry were conducted in early morning hours to reduce undesirable fire behavior while effectively removing surface fuels. The fire spread through a combination of slow creeping and short runs, spotting, and burnout operations resulting in a mosaic of fire severity on USFS land.

The fire has burned within the Fossil Creek and Verde River drainages. Fossil Creek, one of two Wild and Scenic rivers in Arizona, seems to appear out of nowhere, gushing 20,000 gallons per minute out of a series of springs at the bottom of a 1,600-foot-deep canyon. Over the years these calcium-laden waters have laid down large deposits of a type of limestone called travertine. That rock-like substance encases whatever happens to fall into the streambed, forming the fossils for which the area is named.

Fossil Creek has been described as the most diverse riparian area in Arizona. Over 30 species of trees and shrubs and over one hundred species of birds have been observed in this unique



habitat. Several threatened or endangered species (TES) and other regional sensitive species occur within the burned area, including four TES fish within Fossil Creek.

In addition, Fossil Creek contains sites of significant cultural importance to American Indian Tribes and has a number of Dilzhé'é (Western Apache) cultural sites. The Dilzhé'é lived along Fossil Creek for generations and several families consider this to be their homeland.

The Forest Service BAER team began their assessment on July 2nd. Soil burn severity (SBS) mapping was accomplished using a variety of methods. The initial map was produced using burned area reflectance classification (BARC) imagery processed by the Forest Service Geospatial Technology and Applications Center in Salt Lake City, Utah. Field validation of the BARC map was completed using the methods outlined in RMRS-GTR-24, resulting in a final field-validated soil burn severity map.

The Forest Boundary between the two units follows Fossil Creek and therefore cooperation will be needed to implement treatments crossing administrative units.

B. Describe Critical Values/Resources and Threats (narrative):

Human Life and Safety:

There is a threat to the public, partners, and NFS staff working in or visiting the Backbone fire burned area from post-fire flash flooding and debris flows, rock fall, and fire-damaged hazard trees. Most people come to Fossil Creek to sunbathe, wade, hike and birdwatch. People recreating in Fossil Creek and in the Verde River immediately downstream of the confluence with Fossil Creek are at particular risk from flash flooding. In addition to the direct threats to life and safety, there is an elevated risk of loss of access/egress due to post-fire runoff events making roads and trails impassable. Risk levels vary from intermediate to very high with minimal to very significant increases in post-fire flows anticipated from a high-probability (2-yr return interval) storm event. Treatments proposed include administrative closures of vulnerable routes and sites through at least the 2022 monsoon season or until sufficient watershed recovery (S12), hazard warning signs (S1a/S1b), and closure gates (S2).

There are two vault toilets located within the Fossil Creek recreation area that are at an elevated risk of flood inundation, which has the potential of introducing human waste into the waterway. The proposed treatment for this risk is to pump the vaults prior to flood events (S6).

Property:

There are two ML3 roads within the burned area, Forest Service Road (FSR) 708 and FSR 502. Road segments that passed through or downslope of areas with moderate or high SBS effects, or roads that travel along or cross channels or gullies with elevated flood risk were found to be at high or very high risk of damage due anticipated *significant* to *very significant* increases in post-fire flood flows in channels, and elevated runoff from burned hillslopes. These roads provide the only egress from the recreation sites and only ground-based access for search and rescue operations. Treatments identified for these segments include storm proofing (R1), storm inspection and response (R2), and armoring the abutments of Boulder Creek and Salome Creek Bridges (R11). To assist in accomplishing the recommended road treatments, an off-forest implementation team leader is requested to prepare road package contracts (R15).



Only one ML2 road was identified during the assessment, FSR 9D. This road was determined to be at low risk as it primarily follows the ridgeline with burned area above it.

Approximately 26 miles on the Coconino NF (Mail Trail #84, Flume Trail #154, Towel Creek #67, and Dorens Defeat #75) and 4.5 miles on the Tonto NF (Bob Bear/Fossil Springs Trail #18, Waterfall Trail, Tonto Bench Trail, and Deadman Mesa Trail). Many of these trails are within the Fossil Creek WSR corridor located in drainage bottoms. Several segments of trail were determined to be at very high risk from flash flood and debris flows from 2-year storm events. The damage or loss of these segments of high-use trails that are of significance to tribes or other partners in the recreation area was considered to have major magnitude of consequence. Trails of lesser significance were considered be a minor to moderate loss. Trail drainage stabilization (T1) has been proposed for the segments of trails determined to be at high or very high risk. Infrastructure at several trailheads and recreation sites were evaluated and none were found to be at unacceptable risk from post-fire events.

Natural Resources:

Terrestrial TES critical values within the fire footprint include Chiricahua leopard frog (*Rana chiricahuensis*), Mexican spotted owl (*Strix occidentalis lucida*), and western yellow-billed cuckoo (*Coccyzus americanus occidentalis*). Additionally, several threatened and endangered species and critical habitat occur along the Verde River downstream of the Backbone Fire perimeter including western yellow billed cuckoo and southwestern willow flycatcher (*Empidonax traillii extimus*). Only the habitat for the Chiricahua leopard frogs at occupied habitat at Hackberry Springs and western yellow-billed cuckoo habitat along Fossil Creek were determined to be at unacceptable post-fire risk. Anticipated effects include erosion of the uplands, scouring of the channel, sedimentation and ash reducing water quality, filling of shallow pools with sediment, loss of overhead cover resulting in increased water temperatures, and trash in the immediate uplands that will degrade frog habitat. Because the pools in this system are very shallow and the pool habitat limited, this spring does not have the capacity to withstand post-fire events. Installation of straw wattles has been proposed at key sites upslope of the frog ponds in order to minimize transport of eroded sediment into the ponds (G3).

The area affected by the Backbone Fire supports three federally listed fish species and Critical Habitat (CH) for three species within the burned areas on National Forest System lands. These species and CH are found within Fossil Creek and the Verde River, both of which will be affected by the fire. Fisheries habitat is currently protected by a barrier preventing non-native fish encroachment upstream that is at post-fire failure risk. An inspection and response treatment has been proposed to address possible barrier failure (C1).

The critical native plant populations within the Backbone Fire perimeter include sensitive plant habitat and vulnerable native plant communities where invasive plants are currently absent (designated botanical areas and two culturally and biologically important Emory oak groves). The Fossil Creek Botanical Area is a highly diverse riparian deciduous forest associated with a large and complex spring system and travertine geology. While not a listed species, Metcalfe's ticktrefoil (*Desmodium metcalfei*), Fossil hill creek bedstraw (*Galium collomiae*), and fringed rockdaisy (*Perityle ciliata*) are rare and narrow endemic species that occur within the Fossil Springs botanical area. Aggressive perennial Himalayan blackberry is present within the burned area adjacent to Fossil Springs. EDRR at Fossil Creek Botanical Areas is the proposed treatment (P1a).



A total of 14 miles of dozer line, one mile of handline, and one mile of mixed construction line were constructed as part of suppression efforts. One camp, 21 drop points, five helispots, and 13 repair points also resulted in ground disturbance that could encourage expansion of noxious weeds. A total of 1,769 acres were burned in burnout operations. EDRR of these areas impacted by suppression activities is proposed to mitigate the risk to intact native plant communities (P1b).

Soil and water critical values including soil productivity, hydrologic function, and WSR values were determined to not be at unacceptable risk from post-fire events (details in specialist reports).

Cultural and Heritage Resources:

The Backbone Fire burned area encompasses cultural sites ranging from the Middle Archaic period (3,550-1550 BCE) through the post-contact period (1542-1970 CE). Pre-contact sites, predating the arrival of European explorers and colonists, include agricultural fields and related features, lithic reduction areas, resource extraction and processing areas, temporary camps, rock art, and habitation sites, including cliff dwellings and pueblo architecture. Local historic sites include 20th c. hydroelectric sites, flumes, early roads and bridges, work camps, and cabin sites. In the COF-TNF Fossil Creek Management Area, many archaeological sites dating to the early 20th c. were occupied by families of Apache and Yavapai people whose relatives still live in the region today and for whom these places have special meaning. Thirty sites of the 266 sites within the burn perimeter were reviewed for fire effects, because they were in the high burn severity zone, considered very significant, and hydrology or soils modeling indicated a post-fire damage risk. Of these sites, 19 were field checked for specific information about burn severity, erosion, vegetation loss, tree mortality, and visibility. Twelve sites were found to be at unacceptable risk post-fire and are recommended for BAER treatments including seeding, erosion control measures such as straw bales or wattles, mulching, and tree felling.

C. Emergency Treatment Objectives:

Reduce the post-fire risks to life and safety through administrative and physical closures of trails and roads, signing, and monitoring. Storm-proof and stabilize roads and trails to protect the property investment and maintain access for administration and the public. Promote revegetation and soil stabilization by native plant communities through early detection/rapid response surveys to minimize the spread of non-native plants. Site-specific erosion control to minimize erosion and sedimentation to cultural sites and TES habitat. Storm inspection and response of the fish barrier to determine effectiveness of the barrier after post-fire flows.

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

Table 8. Probability of completion prior to the first major storm event. Estimated to the nearest 10 percent

Treatment Type	Probability
Land	80%
Channel	90%
RoadTrails	70%
ProtectionSafety	90%



E. Probability of Treatment Success

Table 9. Probability of treatment success estimated to the nearest 10 percent

Treatment Type	1 year after treatment	3 years after treatment	5 years after treatment
Land	80%	80%	80%
Channel	70%	70%	70%
RoadTrails	70%	70%	70%
ProtectionSafety	90%	90%	90%

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

Coconino NF- \$1,628,200

Tonto - \$897,600

G. Cost of Selected Alternative (Including Loss):

Coconino NF - \$335,883

Tonto NF - \$62,531

H. Recommended Treatment Narratives:

Recommended treatments are summarized below for all critical values with a risk value of ‘very high’ and ‘high’ or ‘intermediate’ for life and safety critical values.

Please refer to the project file for:

1 - The complete list of all critical values assessed in the Critical Values spreadsheet.

2 – Detailed project cost information is available in specialist reports.

Table 100. Explanation of recommended treatments for each critical value with a risk value of very high, high or intermediate (life and safety only).

Type	Critical Value	Treatment	Narrative
Channel	<i>Fossil Creek fisheries - CH (Spikedace, Loach minnow), present (Spikedace E, Gila topminnow E, Roundtail chub)</i>	<i>C1. Channel Treatment</i>	<i>Visit barrier after storm events (temp seasonal crew) and have temporary barrier supplies on site for rapid response in case the barrier is compromised by post-fire events.</i>
Ground Cover	<i>Chiricahua leopard frog habitat (Hackberry Springs)</i>	<i>G3. Other Ground Cover Treatments</i>	<i>Emergency slope stabilization above Hackberry Springs (about 1000’ of wattles – four layers deep, placed in a U shape on the southwest slope above the spring)</i>



<i>Type</i>	<i>Critical Value</i>	<i>Treatment</i>	<i>Narrative</i>
Plants	<i>Fossil springs botanical area</i>	<i>P1a. Invasives EDRR</i>	<i>Surveying an area where the threat of noxious or invasive plants is identified. If noxious or invasive plants occur, remove isolated populations by hand or through approved herbicide application.</i>
Plants	<i>Native plant populations impacted by fire suppression actions</i>	<i>P1b. Invasives EDRR - Suppression Repair</i>	<i>Surveying an area where the threat of noxious or invasive plants is identified. If noxious or invasive plants occur, remove isolated populations by hand or through approved herbicide application.</i>
Roads	<i>FSR 502 and 708</i>	<i>R1. Storm Proofing (storm proofing existing drainage features)</i>	<i>Re-establish road drainage through culvert cleaning, ditch clearing, channel cleaning upstream of crossings, and reshaping of road template.</i>
Roads	<i>FSR 502 and 708 - Boulder Creek and Sally May Bridges</i>	<i>R11. Stream Crossing Protection (other)</i>	<i>Install additional rip-rap at bridge abutments to further armor bridge structure.</i>
Roads	<i>FSR 502 and 708 - including Boulder Creek and Sally May Bridges</i>	<i>R2. Storm Inspection and Response</i>	<i>Inspect roads during or immediately after storms, checking sediment and debris accumulations and performing a thorough, rapid inspection of road-drainage features, culverts, and other structures include gabions. The crew is responsible for maintaining the drainage of the road, culvert/ditch function, and removing debris.</i>
Roads	<i>Implementation leader to set up and establish contracting for road work.</i>	<i>R15. Implementation Leader</i>	<i>Implementation leader to set-up and establish contracting for road work.</i>



<i>Type</i>	<i>Critical Value</i>	<i>Treatment</i>	<i>Narrative</i>
Safety	<i>HLS of travelers on NFS roads, on NFS trails, trailheads, recreation sites, and water activities</i>	<i>S12. Other Protection and Safety Treatment</i>	<i>Area closure through 2022 monsoon season; installation of rain gauges to assist in determining length closure should remain in effect.</i>
Safety	<i>HLS of travelers on NFS roads, on NFS trails, trailheads, recreation sites, and water activities</i>	<i>S1a. Road Hazard Signs</i>	<i>Install Road Hazard warning signs according to Forest Service sign installation guidelines.</i>
Safety	<i>HLS of travelers on NFS roads, on NFS trails, trailheads, recreation sites, and water activities</i>	<i>S1b. Trail/Recreation Hazard Signs</i>	<i>Installation of cautionary signage regarding the possible risks of entering burned areas at recreation sites within, downstream of the fire area and upstream at river access sites.</i>
Safety	<i>HLS for river recreation (Sheep's Bridge, and river corridor after Fossil confluence)</i>	<i>S12. Other Protection and Safety Treatment</i>	<i>Area closure through current 2021 monsoons and installation of hazard signs. Cost of signs included in S1b.</i>
Safety	<i>HLS of travelers on NFS roads, on NFS trails, trailheads, recreation sites, and water activities</i>	<i>S2. Physical Closure Devices (gate, berm, boulders, etc.)</i>	<i>FSR 9D - Install standard FS pipe gate at cattle guard NW of FSR 9H to assist in closure enforcement</i>
Safety	<i>HLS/Water quality impacted by human waste</i>	<i>S6. Recreation Site - Human Waste Containment</i>	<i>Pump vaults to prevent overflow in flooding events at Lower Homestead and Childs</i>
Trails	<i>Irving Flume Trail #154, Fossil Creek Waterfall Trail, Mail Trail #84, Towel Creek Trail #67 and Dorens Defeat Trail #75</i>	<i>T1. Trail Drainage Stabilization</i>	<i>Work includes maintenance of native surface trails and installation of protective measures to avoid damage from events. Construction of additional drainage features to avoid concentrating runoff on tread. Maintenance of existing drainage features.</i>
Heritage	<i>Cultural Resources</i>	<i>Cultural Resource Point Protection</i>	<i>Seeding, mulching, straw bales or wattles, tree felling, and monitoring</i>



Type	Critical Value	Treatment	Narrative
Heritage	Cultural Resources	Section 106 Compliance	Administration of Section 106 of the National Historic Preservation Act of 1966

Part V – Emergency Stabilization Treatments and Requested Funds

Coconino NF request (calculations do not match due to rounding errors)

Type	Treatment	Units	Unit Cost	# of Units	Total \$
Channel	C1. Channel Treatment	Cost/Site	24,000	1	\$24,000
Ground Cover	G3. Other Ground Cover Treatments	Cost/Acre	1,000	1	\$1,000
Plants	P1a. Invasives EDRR	Cost/Acre	288	24	\$6,794
Plants	P1b. Invasives EDRR - Suppression Repair	Cost/Acre	119	64	\$7,600
Roads	R1. Storm Proofing (storm proofing existing drainage features)	Cost/Mile	4,000	7.8	\$30,960
Roads	R11. Stream Crossing Protection (other)	Cost/Site	5,000	2	\$10,000
Roads	R2. Storm Inspection and Response	Cost/Mile	5,000	7.8	\$38,700
Roads	R2. Storm Inspection and Response – Supplemental Funding	Cost/Mile	21,758	7.8	\$169,713
Roads	R2. Storm Inspection and Response – Inspection Salary	Cost/Mile	550	7.8	\$4,290
Roads	R15. Implementation Lead	Cost/Day	\$500	10	\$5,000
Safety	S12. Other Protection and Safety Treatment	Cost/Unit	400	2	\$1000
Safety	S1a. Road Hazard Signs	Cost/Unit	250	6	\$1,500
Safety	S1b. Trail/Recreation Hazard Signs	Cost/Unit	200	18	\$3,600
Safety	S2. Physical Closure Devices (gate, berm, boulders, etc.)	Cost/Site	3,000	1	\$3,000
Safety	S6. Recreation Site - Human Waste Containment	Cost/Unit	550	2	\$1,100
Trails	T1. Trail Drainage Stabilization	Cost/Mile	1,247	6	\$6,734
Trails	T1. Trail Drainage Stabilization	Cost/Mile	1,247	5	\$6,609



Heritage	<i>Cultural Resource Point Protection</i>	<i>Cost/Unit</i>	10743	1	\$10,743
Heritage	<i>Section 106 Compliance</i>	<i>Cost/Day</i>	354	10	\$3,540
<i>Assessment Cost (not included in request)</i>		<i>\$65,138</i>			
Previously Approved		\$161,880			
Requested Amount		\$174,003			
Total Request		\$335,883			

Part VI - Emergency Stabilization Treatments and Requested Funds

Tonto NF Request (calculations do not match due to rounding errors)

Type	Standard Treatment	Units	Unit Cost	# of Units	Total \$
Plants	<i>P1a. Invasives EDRR</i>	<i>Cost/Acre</i>	288	9	\$2,706
Plants	<i>P1b. Invasives EDRR - Suppression Repair</i>	<i>Cost/Acre</i>	119	16	\$1,900
Roads	<i>R1. Storm Proofing (storm proofing existing drainage features)</i>	<i>Cost/Mile</i>	4,000	1.3	\$5,360
Roads	<i>R2. Storm Inspection and Response</i>	<i>Cost/Mile</i>	5,000	1.3	\$6,700
Roads	<i>R2. Storm Inspection and Response – Supplemental Funding</i>	<i>Cost/Mile</i>	21,758	1.3	\$28,286
Roads	<i>R2. Storm Inspection and Response – Inspection Salary</i>	<i>Cost/Mile</i>	550	1.3	\$715
Safety	<i>S12. Other Protection and Safety Treatment</i>	<i>Cost/Unit</i>	400	1	\$500
Safety	<i>S12. Other Protection and Safety Treatment</i>	<i>Cost/Unit</i>	0	0	\$0
Safety	<i>S1a. Road Hazard Signs</i>	<i>Cost/Unit</i>	250	4	\$1,000
Safety	<i>S1b. Trail/Recreation Hazard Signs</i>	<i>Cost/Unit</i>	200	10	\$2,000
Trails	<i>T1. Trail Drainage Stabilization</i>	<i>Cost/Mile</i>	1,247	1	\$1,247
Heritage	<i>Cultural Resource Point Protection</i>	<i>Cost/Unit</i>	12117	1	\$12,117

USDA FOREST SERVICE



FS-2500-8 (2/20)

<i>Assessment Cost (not included in request)</i>	<i>\$12,244</i>
<i>Previously Approved</i>	<i>\$33,530</i>
<i>Requested Amount</i>	<i>\$29,001</i>
<i>Total Request</i>	<i>\$62,531</i>



Part VII – Team, Status & Supporting Documents

A. Maps and Additional Supporting Documents for this report can be found at:

<https://usfs.box.com/s/9uftcmidqj7na665hqvvpefp98arhfpj>

B. Skills Represented on Burned-Area Survey Team:

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Team Leader: Mike Martinez

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Team Members:

Skill	Team Member Name
GIS	Dorothy Thomas, Theresa Nallick
Soils	Rory Steinke, Austin Jacobson
Hydrology	Kelly Mott Lacroix, Kyle Paffett
Engineering	Paul Gerber
Recreation	Michael Suggs
Wildlife/Botany	Janie Agyagos
Fisheries	Matt Oneill
Cultural/Heritage	Anne Dowd, Melissa Julien
PIO	Cathleen Thompson