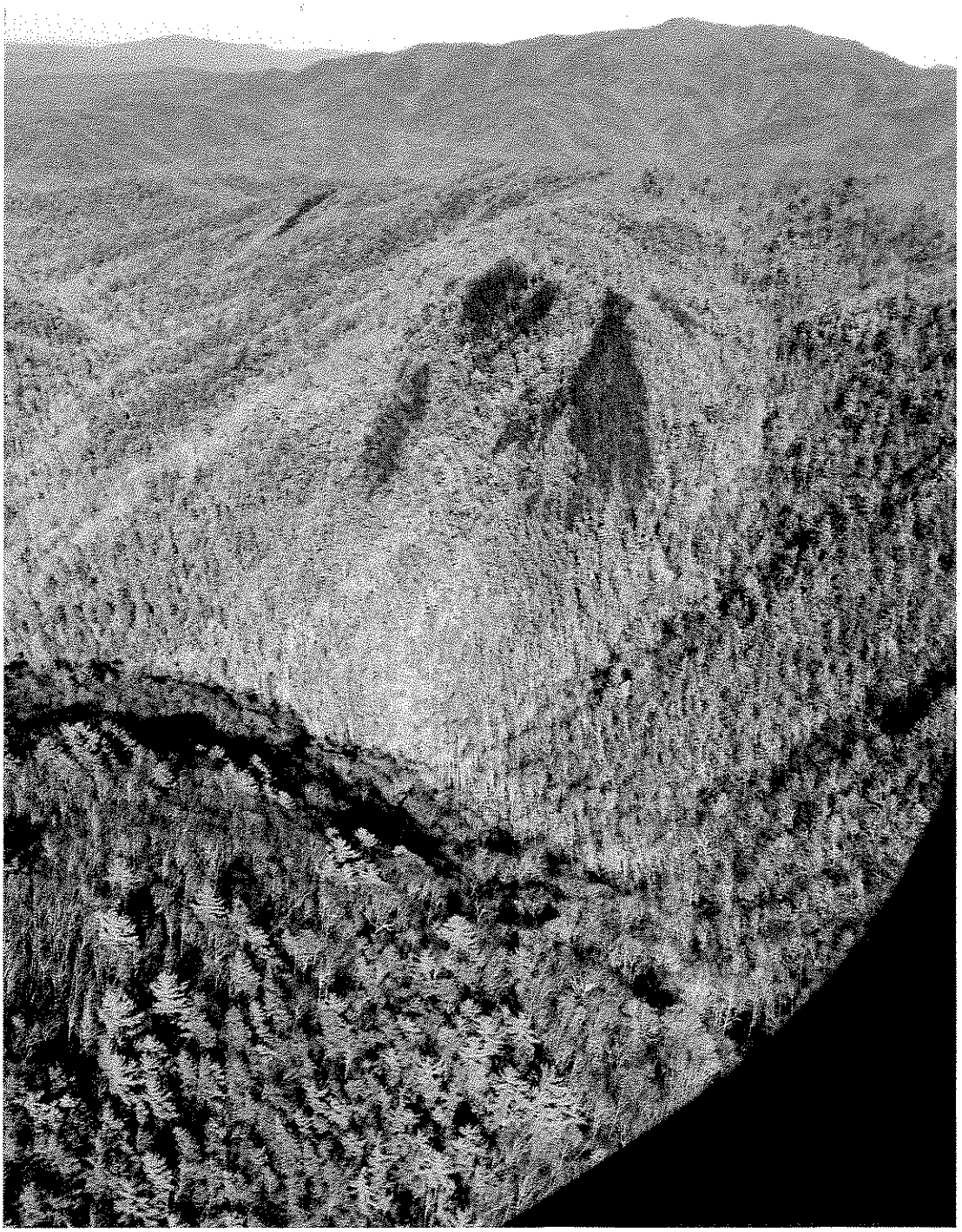
Rough Ridge Fire
December 2016



USDA-FOREST SERVICE FS-2500-8

(6/06)

Date of Report: 12/07/2016

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[x] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[x] 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: Rough Ridge

B. Fire Number: GA-CHF-160052

C. State: GA

D. County: Murray, Fannin, and Gilmer

E. Region: R8

F. Forest: Chattahoochee-Oconee

G. District: Conasauga

H. Fire Incident Job Code: P8KR89

I. Date Fire Started: 10/16/2016

J. Date Fire Contained: 12/6/2016

K. Suppression Cost: $8 million

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 9.62 miles
2. Fireline seeded (miles): 9.62 miles
3. Other (identify): N/A

M. Watershed Number: Jack's River (031501010102) and Headwaters Conasauga River (031501010101).

N. Total Acres Burned:
NFS Acres (27848) Other Federal ( ) State (192) Private ()

O. Vegetation Types: The Rough Ridge Fire lacks specific botanical survey data. In general, the Cohutta wilderness has a mosaic of habitats including: Cove Forest, Low to Mid-elevation Mixed Oak Pine Forest, Northern Hardwood and Boulderfield Forest as well as Floodplain, Bottomlands and Riparian Zones. Habitats found within the burned area are not particularly rare or unique and do not support any endangered species. Cove Forest generally occur on mesic sites with canopy composition that includes tulip-tress (*Liriodendron tulipifera*), basswood (*Tilia americana*), white ash (*Fraxinus americana*), American beech (*Fagus grandiflolia*), northern red oak (*Quercus rubra*), eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), and sourwood (*Oxydendrum arboretum*). Low to Mid-elevation Mixed Oak Pine Forest occurring below 3500 on drier sites that support rock chestnut oak (*Quercus prinus*), white oak (*Quercus alba*), southern red oak (*Quercus falcata*), northern red oak, scarlet oak (*Quercus coccinea*) with conifers such as loblolly pine (*Pinus taeda*), Virginia pine (*Pinus virginiana*), white pine and eastern hemlock. Northern Hardwood and Boulderfield Forest generally occur above 3500 feet in elevation and support canopy species with northern affinities including yellow buckeye (A*esculus flava*), striped maple (*Acer pensylvanicum*), American beech, basswood and yellow birch (*Betula alleghaniensis*). Floodplain, Bottomland and Riparian Zones occur along rivers and streams with some floodplain development with typical species assemblages including: sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), red maple (*Acer rubrum*), sugarberry (*Celtis laevigata*) and some oak species.

P. Dominant Soils
- 8.1% of burned area, Junaluska-Tsali complex, 5 to 45 percent slopes. Loamy, mixed, subactive, mesic Typic Hapludults.
- 2.8% of burned area, Ashe and Edneyville stony loams, 25-60 percent slopes. Coarse-loamy, mixed, active, mesic Typic Dystrudepts.
- 1.2% of burned area, Tsali channery loam, 45 to 70 percent slopes. Loamy, mixed, subactive, mesic, shallow Typic Hapludults.

Although the majority of the burned area is not mapped, the similarity of the soil series that have been surveyed suggests that the unmapped areas would also have loamy Typic Hapludults as the dominant soil type

Q. Geologic Types:

Geologic Map Unit	**Acres**
Pm3a - Metasedimentary rock and mica schist	2,019
Pm5 – Slate and quartzite	23,358
Q1c – Quartzite and metasedimentary rock	23
Pm6 - Conglomerate	1,236
Pp3 – Phylite and quartzite	1,404

R. Miles of Stream Channels: 115.07 miles

S. Transportation System

Trails: 46.07 miles Roads: 7.65 miles (NFS) 0 miles (County) 0 mile (Private)

PART III - WATERSHED CONDITION

A. Burn Severity (acres): ____(very low) 28004 (low) 36 (moderate) _____ (high)

B. Water-Repellent Soil and increased runoff (acres): The degree and extent of water repellent soils is largely unknown because field measurements were not collected. Water drop penetration tests were not conducted because soils were wet to at least 12-18 inches from a recent rainfall event. Infiltration of recent rainfall indicates that formation of water repellent layers is minimal. The extent of water repellent soils is not known but, if water repellency occurs at all, the pattern is likely to be patchy and mosaic. If water repellent layers did form, they would likely rapidly degrade by plant root action.

C. Soil Erosion Hazard Rating (acres):

Pre-fire erosion hazard for burned area soils was obtained from existing soil survey erosion hazard rating information. The EHR interpretation is based on soil properties such as soil texture, slope, aggregate stability, infiltration rate, subsoil permeability, depth to restrictive layers, and soil rock content. The ratings indicate the hazard of soil loss from off-road and off-trail areas after a disturbance assuming 50 to 75 percent soil exposure. No evidence of such a high percentage of soil exposure was observed during the field survey. Therefore, the erosion hazard rating indicated is likely higher than the actual erosion hazard due to the low severity burn. Actual pre and post fire erosion potential is better reflected by the ERMiT modeling runs for this project (See ERMiT model results section).

Erosion Hazard Ratings

EHR	Slight	Moderate	Severe or Very Severe
Acres	149.4	3,162.4	1,965.7

D. and E. Erosion and Sediment Potential: Erosion and sediment potential was assessed by ERMiT modelling, field observations following a post fire rainfall event and review of local applicable field based research studies.

Discussion of Erosion Potential and Summary of Representative ERMiT Model Results
ERMiT allows users to predict the probability of a given amount of sediment delivery to the base of a hillslope following variable burns on forest, rangeland, and chaparral conditions in each of five years following wildfire. The ERMiT model and background documentation can be accessed at http://forest.moscowfsl.wsu.edu/fswepp/. The following ERMiT results indicate that rates of erosion are very low **(generally close to zero)** in unburned forested areas. The model results also indicate that rates of erosion will increase on forested hillslopes that were mapped at low soil burn severity.

Representative ERMiT Model Results

30-45% slopes. Forested- Unburned

- There is a 25% chance that sediment delivery will exceed 0.00-0.01 tons/ ac in the first year.

15% slope. Forested- Low Soil Burn Severity

- There is a 25% chance that sediment delivery will exceed 4.1 ton / ac in the first year following the fire.

30% slope. Forested- Low Soil Burn Severity

- There is a 25% chance that sediment delivery will exceed 6.73 ton / ac in the first year following the fire.

30% slope. Forested- Moderate Soil Burn Severity

- There is a 25% chance that sediment delivery will exceed 8.63 ton / ac in the first year following the fire.

45% slope. Forested- Low Soil Burn Severity

- There is a 25% chance that sediment delivery will exceed 8.49 ton / ac in the first year following the fire

ERMiT Model Assumptions and Inputs:

- Slope length was 150 feet for all ERMiT runs
- Soil surface texture was loam
- Soil Rock Content was 15%/Volume

Ground observations indicate that actual post fire ground cover patterns over most of the fire area are mosaics of unburned, very low and low soil burn severities. Therefore, rates of post fire hillslope erosion are not likely to be as high as the numbers generated by the low soil burn severity ERMiT runs. Other factors which mitigate actual post fire erosion risk include high infiltration rates and minimally impacted dense roots throughout the surface soil layers. In the unburned/low soil burn severity areas, it is likely that, the hillslope scale, erosion could increase slightly above unburned conditions but it appears unlikely significant damaging sedimentation of stream channels will occur.

Multiple studies have reported little to no erosion after light to moderate intensity fires in the southeastern United States (Goebel et al., 1967; Neary and Currier, 1982; Van Lear and Waldrop, 1986; Van Lear and Danielovich, 1988; and Shahlee et al., 1991). A literature review done by Yoho 1980 indicated the range of sediment yield from a periodically burned forest was between 0.01-0.23 tons/acre/year. The small amounts of sediment transported within these studied burn areas required a storm with rainfall intensities of approximately two inches per hour lasting for at least 15 minutes (Swift et al., 1993). See appendix for full article citations.

Following the fire, a rain event of approximately two inches occurred over a two day period (November 29th-30th). Data from four weather stations in and around the burned area revealed peak rainfall intensities.

Precipitation summary from local weather stations (RAWS)

Weather Station	**Peak Intensity (inches/hour)**
Cohutta (hour interval)	0.96
Grassy (15 minute intervals)	0.70
Jack's River (15 minute intervals)	1.96
Three Forks (15 minute intervals)	0.68

Three days following the storm BAER personnel observed infiltration down to at least 18 inches within the soil profile, and no evidence of increased hillslope runoff, erosion or sedimentation. Generally mobilization of ash was not observed except for minimal amounts in select locations in the lower Conasauga River.

Soil Burn Severity and Ancillary Characteristics:

The following photograph show charred but not consumed ground cover. Dry litter and leaves were consumed by a backing fire. Forest duff and fine roots were minimally impacted by fire. The soil burn severity is low and the risk for damaging post fire erosion is also low in these areas

PART IV - HYDROLOGIC DESIGN FACTORS

Estimated Vegetative Recovery Period, (years): 0-1 years
Full vegetative recovery is anticipated to occur next spring.

B. Design Chance of Success, (percent): 80

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

D. Design Storm Duration, (hours): 1
Based on Swift et. al. 1993.

E. Design Storm Magnitude, (inches): 2 .

Based on Swift et. al. 1993.

F. Design Flow, (cubic feet / second/ square mile): See Table 2, below.

G. Estimated Reduction in Infiltration, (percent): 0

H. Adjusted Design Flow, (cfs per square mile): See Table 2, below.

PART V - SUMMARY OF ANALYSIS

Introduction:

Costly and dramatic rehabilitation efforts are typically not required even after sever fire recovery rates of souther appalchain watersheds are much faster than western forests due to rapid vegetation regrowth (Clinton Vose 2000; Elliott et. al. 1999).

Soils/Erosion Response
Please refer to the soils section of this document for a description of the soil and erosional response resutling from the fire.

Watershed Response:
The Rough Ridge Fire is located in the South Atlantic Gulf Region (03), the Alabama Basin Subregion (0315), the Coosa-Tallapoosa Accounting Unit (031501), and the Conasauga Cataloging Unit (03150101). All but 111 acres (3%) of the fire are within two sixth level HUCs – Conasauga Headwaters (031501010101) and Jacks River (031501010102) (Table 1).

Burn severity was low for 99% of the area within the fire perimeter, and moderate for the remaining 1%. See Table 2 for a breakdown of burn severity by watershed, and results of the hydrologic assessment. Potential values at risk identified for watershed response include hydrologic function and water quality.

Table 1 Rough Ridge Fire acres and soil burn severity by 6th-Field HUC.

6th-Field Watershed ID	Total Area Acres	Rough Ridge Fire Acres	High SBS Acres	Moderate SBS Acres	Low/Unburned SBS Acres
Conasauga Headwaters	23,562	17,277	0	1	17,276
Jacks River	31,428	10,651	0	35	10,616
Other	na	111	0	0	0

Table 2. Drainage areas, burn severity acres, and estimated 5-year peak flows and peak yields for the four analyzed pour points in the Rough Ridge Fire.

			Estimated Pre-Fire		Post-Fire	
Watershed Pour Points	Total Area Miles^2	Moderate SBS Acres	5-Year Flow CFS	5-Year Yield CFS/Mile^2	5-Year Flow CFS	5-Year Yield CFS/Mile^2
Consauga River[1]	24.9	1	2,320	93	No Change	No Change
Jigger Ck[2]	3.5	0	534	153	No Change	No Change
Jacks River[3]	35.4	35	3,020	85	No Change	No Change
Hurricane Branch[4]	2.06	0	359	174	No Change	No Change

1-Conasauga River at the fire perimeter
2-Jigger Creek at the fire perimeter

3-Jacks River at Rice Camp Branch
4-Hurricane Branch on private parcel

Hydrologic Function
The following four watershed pour points were established adjacent to the fire perimeter and near the upstream extent of aquatic T&E species:

- Conasauga River
- Jigger Creek
- Jacks River
- Hurricane Branch

Channel peak flows for a range of frequencies were determined using the USGS StreamStats web application tool (http://water.usgs.gov/osw/streamstats/index.html) based on Gotvald and others (2009) and Feaster and others (2014). A 5-year (or 20% annual exceedance probability) flow event was selected as the benchmark for hydrologic assessment because Swift and others (1993) determined that a rainfall event in excess of 5 mm per hour was required to mobilize surface material following prescribed fire in the southern Appalachians. Five-year peak flows and yields for the pour points are summarized in Table 2.

Table 2 Drainage areas, burn severity acres, and estimated 5-year peak flows and peak yields for the four analyzed pour points.

			Estimated Pre-Fire		Post-Fire	
	Total Area	Moderate SBS	5-Year Flow	5-Year Yield	5-Year Flow	5-Year Yield
Watershed Pour Points	Miles^2	Acres	CFS	CFS/Mile^2	CFS	CFS/Mile^2
Conasauga River[1]	24.9	1	2,320	93	No Change	No Change
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1-Conasauga River at the fire perimeter

2-Jigger Creek at the fire perimeter

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4-Hurricane Branch on private parcel

The Rough Ridge Fire is not expected to alter the 5-year peak flow (or flows of other magnitudes) for the analyzed pour points. This is due to the extensive unburned and low soil burn severity areas within the fire, and the very limited acres (~ 35) of moderate soil burn severity.

Water Quality:

Turbidity/Sedimentation

No evidence of increased hillslope runoff, erosion or sedimentation was observed during the field investigation. Mobilization of ash was not observed except for minimal amounts in select locations. As the fire burned in a complex mosaic pattern leaving many areas unburned, and moderate severity burn acres were very limited post-fire conditions are not anticipated to produce a measurable change in turbidity.

Limited areas of connectivity between trail drainage features and stream channels were observed, but these issues predated the Rough Ridge Fire and were not exacerbated by the fire with respect to sedimentation. However, these pathways do have the potential to convey small amounts of ash to the drainage network. Riparian impacts and some sedimentation associated with dispersed campsites were observed, but these issues also predated the Rough Ridge Fire and were not exacerbated by the fire.

Nutrient Loading

A literature review by Ranalli (2004) stated that existing studies "have shown that nutrients and cations released from the combustion of organic matter can follow several pathways to streams and lakes: (1) volatilization followed by diffusion and dissolution of smoke into a stream or lake or the dissolution of smoke in precipitation; (2) erosion of ash by wind and water from hillslopes to a stream or lake and subsequent leaching of the ash in a stream or lake; or (3) leaching of ash left on the soil surface by precipitation and subsequent movement over or through the upper soil horizons by storm runoff or through the entire soil profile to ground water.

Observations made during the field investigation indicate that pathways (2) and (3) as described above are not and have not been viable for delivery of substantial concentrations of nutrients to waterbodies within the perimeter of the Rough Ridge Fire. Reports of extremely heavy smoke in the Conasauga River headwaters while the fire was active suggest that pathway (1) listed above was viable for delivery of ash/nutrient loading that affected water quality and may be the cause of a known fish kill. In addition, aquatic species may already have been stressed, dilution factors were limited, and water temperature

were likely elevated due to drought conditions and lower stream flows at the time of the fish kill. GA DNR is doing an investigation on the fish kill and will produce a report. Since the fire is no longer active and the air quality within the fire perimeter has returned to normal (high quality), pathway (1) described above is no longer viable and future impacts to water quality that could affect aquatic biota are not anticipated.

Beneficial uses:
In 2016 the Conasauga River within the Cohutta Wilderness Area of the Chattahoochee National Forest (headwaters to Forest Service Road 17) was designated as Georgia's first Outstanding Natural Resource Waters (ONRW). Both the Conasauga and Jacks Rivers within the Cohutta Wilderness are classified as a State Wild and Scenic Rivers and Primary Trout Streams Each of these designations carries with it specific anti-degradation policies (Georgia Rules and Regulations for Water Quality Control 2016). Since no measurable changes to hydrologic function or water quality are anticipated as a result of post-fire watershed conditions, the Rough Ridge fire is not anticipated to affect designated beneficial uses.

Geology/Geologic Response: Risk of debris flows risk in the Rough Ridge Fire area is low and has probably not increased significantly following the fire. Historically, landslides have occurred in the area during/following periods of heavy rainfall. Based on the fact that the vast majority of the area was mapped as low or unburned soil burn severity, it is unlikely the risk for landslides has increased significantly as a result of the fire. However, if future monitoring indicates tree mortality at larger scales than expected occurs, landslide risk could be re-assessed.

Rock Fall: Increased risk for several years along steeper sections of trail such as Hickory Creek and Conasauga River Trails and along the Forest Road 51.

A. Describe Critical Values/Resources and Threats:

*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. Only values at risk that had a risk of Intermediate or above are discussed.*

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**

Threats to Life/safety and Property

National Forest Roads: There are approximately 7.65 miles of maintenance level 2, 3 and 4 roads within the fire area. Some roads in the northwest part of the fire are closed to motorized traffic. Forest Road 51 going through the fire area contains rolling dips, gravel (hardened) and overside drains providing for road drainage. This road is stable is will be to address any increases in post-fire runoff or sediment.

Uncontrolled runoff can result in off-site damage and potential negative impacts to the transportation system. A secondary consequence of post-fire runoff to the transportation system could be increased

adverse effects of storm water runoff and decreased control of storm water runoff, which could deliver high volumes of water and sediment onto adjacent hillslopes.

Although little to no impacts are expected, annual or major storm checks of the culverts are recommended for a couple of years to check for accumulation of fire debris in the channels at the road crossing and rolling dip/lead-off ditch locations.

Emergency Determination:

Probability of Damage or Loss: **Unlikely**

Magnitude of consequences: **Minor**

Risk Level: Low

Trails and Dispersed Campsites: There are approximately 46 miles of level 2 and 3 trails in the fire area, mostly in the Cohutta Wilderness. There are over 400 dispersed campsites located throughout the Wilderness in the fire area. The BAER team assessed a variety of trails to characterize the condition of the trails and potential post-fire effects affecting the trail system. In some instances, organic material burned under the trail comprising trail tread. This can also lead to localized erosion (ash and sediment) adjacent to the trail and in some cases entering riparian areas and water bodies throughout the wilderness. Post-fire runoff onto the trail system is expected to be minor. Burned trees and falling rocks can present a hazard to recreationists throughout the wilderness but especially on steeper trail sections. Although little to no impacts are expected from post-fire runoff, it is recommended that water bars and leadoff ditches are checked and cleaned out to ensure proper drainage.

Emergency Determination:

Threats from erosion, hazard trees and rockfall from the trail system. The threat from erosion and falling rocks is not as great as the threat from hazard trees. Threat of hazard trees adjacent to trails and dispersed campsites.

Probability of Damage or Loss: **Likely**

Magnitude of consequences: **Moderate**

Risk Level: High

WildernessTrailheads: There are approximately 9 wilderness trailheads affected by the fire. Burned trees surround many of the trailheads. It is unknown where the trees survived the fire until leaf out next spring.

Emergency Determination:

Threat of hazard trees adjacent to wilderness trailheads.

Probability of Damage or Loss: **Likely**

Magnitude of consequences: **Major**

Risk Level: Very High

Private Land:

Based on the burn severity pattern and the location of the private land the BAER team found the risk to homes and other structures is **very low** as the potential increase in peak flows and runoff from hillslope do not a pose a threat. .The BAER Team leader contacted the local NRCS offices and discussed the BAER team findings with them on Monday December 5.

Hurricane Branch Creek flows into private land on the eastern boundary of the fire. A road in the private land crosses the creek in several areas, based on the burn severity the BAER team found the risk to the road is **very low**.

Threats to Natural and Cultural Resources

Off Highway Vehicles (OHV's).
Suppression operations created dozer lines and pull outs, creating highly visible areas of disturbance, these areas are currently being repaired as part of suppression repair. However, the disturbance will be highly visible for several years even after repair.

Note: *The BAER team recommends that the District monitor dozer lines and check for OHV incursion and keep the "P" code open. If that occurs additional repairs and disguising will be completed under the "P" code.*

Aquatic and Terrestrial Species

The Conasauga River is occupied by the federally-endangered Conasauga River logperch, one of the rarest fishes in North America. Endemic to the Mobile Basin, its entire range is limited to only 11 miles of the upper Conasauga River (which is Designated Critical Habitat for the species). This section of river begins approximately 6.5 miles downstream of the Rough Ridge fire area. The federally-threatened blue shiner occurs in both the Jacks and Conasauga Rivers immediately downstream and downslope of the fire. There is designated Critical Habitat for three threatened mussels and eight endangered mussels in the Conasauga River immediately downstream and downslope of the fire area. Three of these are known to be present just below the fire area: fine-lined pocketbook, southern pigtoe, and triangular kidneyshell. In addition to these aquatic species, there is suitable habitat for two federally-listed bat species: Indiana bat (endangered) and northern long-eared bat (threatened). However, there has been no documented evidence of either of these bats within the Rough Ridge fire area nor are known roost caves within the fire area.

Threats to federally-listed aquatic species including flooding, feral swine, non-native/invasive aquatic plants, Off Highway Vehicle (OHV) incursion, and unauthorized equestrian use were considered by the BAER interdisciplinary assessment team, however, it was determined by the team that these threats are not likely to be/become exacerbated by the fire primarily because the level of these threats have not changed relative to pre-fire conditions. Additional post-fire risks to federally-listed aquatic species that were identified include erosion/sedimentation and increased nutrient loading. The BAER team soil scientist and hydrologists concluded that the threat of sedimentation and nutrient loading are minimal, or the same, compared to pre-fire conditions.

Identified post-fire risks to Indiana and northern long-eared bats that were evaluated by the BAER interdisciplinary team include erosion/sedimentation and flooding. The BAER team soil scientist and hydrologists concluded that these threats are minimal, or the same, compared to pre-fire conditions. OHV incursion and unauthorized equestrian use are also unlikely to cause negative effects to Indiana and northern long-eared bats. Possible impacts to habitat from non-native invasive plants will be mitigated by a BAER treatment to survey and treat non-native invasive plants within the fire area.

Overall, the risks to federally-listed fish and wildlife are expected to be the same as pre-fire conditions due to most of the fire resulting in only low/unburned soil burn severity.

The sedimentation/nutrient loading risk determination for federally-listed aquatic species is:

Emergency Determination

Probability of Damage or Loss: **Unlikely**
Magnitude of Consequences: **Major**
Risk: **Intermediate**

Identified post-fire risks to Indiana and northern long-eared bats that were evaluated by the BAER interdisciplinary team include erosion/sedimentation, non-native/invasive plants, OHV incursion, and unauthorized equestrian use. The BAER team soil scientist and hydrologists concluded that these threats are minimal or similar to pre-fire conditions.

The overall risk determination for all evaluated treat types for federally-listed bats is:

Emergency Determination

Probability of Damage or Loss: **Unlikely**
Magnitude of Consequences: **Moderate**
Risk: **Low**

Ecosystem Stability and Vegetation Recovery

Invasive weeds:
The Rough Ridge Fire lacks comprehensive botanical survey data.

Weeds with known occurrences within the Rough Ridge Fire are Japanese stiltgrass or Nepalese browntop (*Microstegium vimineum*), princesstree (*Paulownia tomentosa*), autumn olive (*Eleaegnus umbellate, E. angustifolia, E. pungens*), multiflora rose (*Rosa multiflora*), sericia lespedeza (*Lespedeza cuneate*), bicolor lespedeza (*Lespedeza bicolor*). There has been no mapping of weed occurrences. Generally these species are responsive to canopy gaps and soil disturbance and would therefore be expected to invade dozer or hand lines used for containing the fire most aggressively. While these species are capable of establishing in burned areas, without soil or canopy disturbance most would be less likely to invade the interior forest with closed canopy. However, bicolor lespedeza is known to aggressively invade burned areas and is known to occur along Hemp Top Trail, Hickory Creek Trail and Beech Bottom Trail

Unauthorized OHV (Off Highway Vehicles) incursions have the potential to create significant soil disturbance. Disturbance cuased by OHV's can destabilized soils and make sites more receptive to

invasive weed species. However, the Cohutta has a fairly contiguous ownership with few inholdings, therefore, OHV's are not known to be a regular problem in the burned areas.

Feral pigs (*Sus scrofa*) are a non-native species known to adversely impact native habitats. Feral pigs are omnivores consuming a wide variety of foods, they will eat carrion, birds, mammals, insects, fruits, nuts, green vegetation and roots of many plants. The consumption of plant roots can change the vegetation communities. Feral pigs are nomadic on the landscape, opportunistically taking advantage of food sources, they consume a wide variety of foods. Generally staying in floodplains, bottomlands and riparian zones, pigs will aggressively move into upland habitats when abundant food sources such as an acorn crop or food plot are available. Pigs create significant soil disturbance and can displace native plants, creating opportunities for exotic invasive species to invade. There are no known occurrences of native plants and no expected reason that pigs would create additional damage due to this fire.

Two campsites (Cottonwood Patch and Little Bald Mountain) and 9 designated parking areas are located around the perimeter of the fire, providing easy accesses to hikers and horse riding groups. Authorized trails cross the wilderness area. Unauthorized equestrian trails have been established throughout the wilderness area. Horses can be a significant source of invasive species. Due to frequency of use, all are possible weed vectors.

Approximately 9.62 miles of dozer or hand line was constructed and should be surveyed for weed infestations after germination next spring. No weed washing station was made available during suppression efforts, it is possible that equipment used during initial attack may not have been cleaned, or that weeds located within the fire perimeter could have been spread during fire suppression activities. The soil disturbance associated with line construction will facilitate a receptive site for establishment of NNIS.

Emergency Determination:

Probability of damage or loss: **Very Likely**

Magnitude of Consequences: **Moderate**

Risk Level: Very High

No TES plant species are found in the fire area therefore additional analysis or treatments are not needed.

Cultural Resources:

Prehistoric and historic sites in the fire perimeter could be at risk to loss of archaeological deposits or stratigraphic integrity as a result of post-fire erosion, flooding, and/or debris flows. However, it is unlikely, as the BAER team observed on trails that the burn scars were shallow and root systems were generally undamaged and it is likely that the cultural deposits of sites are intact with little post-fire effect. Increased visibility of surface artifacts due to a loss of vegetation, and increased exposure to looting by artifact collectors, is considered to be a low, short-term risk for all known and unknown archaeological sites in the Rough Ridge Fire.

B. Emergency Treatment Objectives:

<u>Threats to Life and Property</u>

Inform the public on hazards within the fire area and mitigate hazard trees.
Work with Forest volunteers to improve trail tread

Threats to Ecosystem Stability
Determine if new invasive species have been introduced in and adjacent to the fire area due to suppression activities

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

Land n/a__ % Channel **n/a** % Roads/Trails **95** % Protection/Safety **95** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	90	100	100
Channel			
Roads/Trails	95	100	100
Protection/Safety	95	100	100

E. Cost of No-Action (Including Loss): **See VAR spreadsheet costs are justified, especially since most of the treatments address threats to life**
F. Cost of Selected Alternative (Including Loss): $

G. Skills Represented on Burned-Area Survey Team:

[x] Hydrology	[x] Botany	[x] Fisheries(adjunct)	[x] Archaeology
[x] Soils	[x] Wildlife	[ ] Forestry	[ ] Research
[ ] Geology	[x] Ecology	[ ] Landscape Arch	[x] Recreation
[ ] Engineering	[ ] Range	[x] GIS	[ ] Fire Management

Team Leader: Todd Ellsworth

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H. Treatment Narrative:

Land Treatments:

Invasive weed early detection and rapid response: At minimum, survey 9.62 miles of dozer line and hand line should be surveyed for invasive species. Additionally the trails with known occurrences of bicolor lespedeza should be surveyed (Hemp Top, Hickory Creek, Beech Bottom trails).

Inside the wilderness areas small infestations will be eradicated by hand pulling and disposing of plants in garbage bags taken off site. It may not be possible to reverse the long-term trend in NNIS expansion

where it is already present in high densities unless new treatment options are discovered. Dense infestations of NNIS may be impossible to control without herbicide or other methods beyond hand pulling.

Weed Surveys and Rapid Response Costs				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
1 GS-12 botanist	Days	$443	10	$4430
1 GS-7 weed technician	Days	$317	10	$3170
Travel	Days	$150	10	$1500
Supplies	Each	$500	1	$500
Vehicle gas mileage	Miles	$0.50	440	$220
Total Cost				**$9,820**

Channel Treatments: N/A

Roads and Trail Treatments:

Trail Tread improvement/storm proofing: Improve trail tread and drainage on level 2 and 3 trails throughout the Wilderness. On several trails such as the Conasauga River trail, and the Panther creek trail on the single track portions of the trail, the tread was burned due to organics. This poses a risk to trail users and can lead to minor amounts of increased off-site erosion. Funding request is for the Wilderness tech. to work with volunteer groups such as Conasauga District Trail Volunteers (CDTV), and Southern Appalachian Wilderness Stewards (SAWS) and Southeast Conservation Corp. (SECC) The Southeast Conservation Corp will do the majority of the work. The Wilderness Tech. will work in conjunction with Heritage Resources during project layout to ensure heritage resources are protected.

Trail tread improvement/stormproofing				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
1 GS-7 Wilderness Tech	Days	$260	5	$1,300
1 GS-11 Heritage resource manager	Days	$370	2	$1,110
SECC crew 1pp	Days	$800	10	$8,000
Travel	Each	$142	2	$284
Misc. supplies/tools	Each	$100	1	$100
Vehicle gas mileage	Miles	$0.50	200	$100
Total Cost				**$10,884**

Protection/Safety Treatments:

Hazard signs at Wilderness trailheads and public (website) information:

Place appropriate hazard signage at the 9 trailheads that lead to the Wilderness in the spring when traiheads open. Costs include sign replacement due to weather and/or vandalism. Insert information on trail hazards on the Forest Public facing website. Sign language could include:

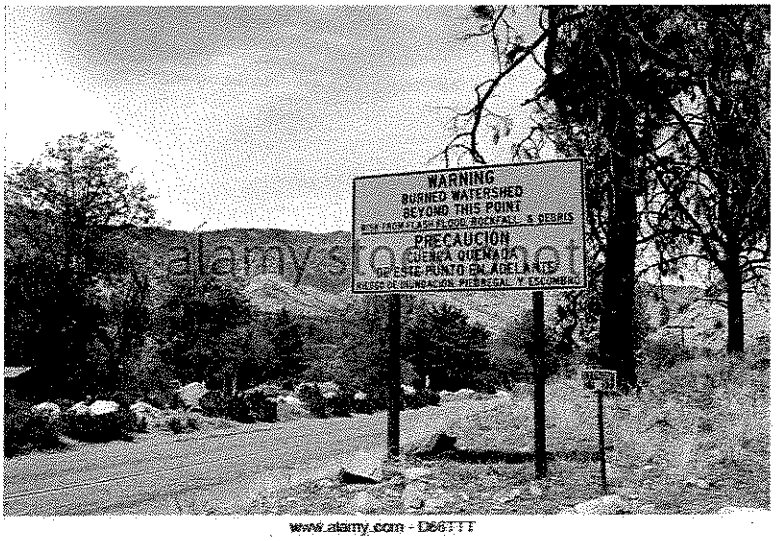
WARNING
Entering Burned Area
Potential Hazards Include:
Fall Trees
Flash flooding
Portions of trail are damaged or destroyed or blocked with debris

Hazard signs at wilderness trailheads				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
1 GS-7 Wilderness Tech	Days	$260	4	$1,040
1 GS-11 Recreation/web site manager	Days	$350	2	$700
Misc. supplies	each	100	1	$100
Vehicle gas mileage	Miles	$0.50	300	$150
Total Cost				**$1,990**

Hazard Sign (51 road)

Place and appropiate sign at the gate on Forest Road 51 when entering the fire area. See an example of road hazard sign below: Sign language could include:

WARNING
Entering Burned Area
Potential Hazards Include:
Fall Trees
Rocks
Portions of road may be blocked with debris



Hazard sign (road)				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
1 GS-07 Tech	Days	$260	3	$780
Materials	each	$500	1	$500
Vehicle gas mileage	miles	$.5	100	$50
Total Cost				**$1330**

Hazard Tree mitigation at Wilderness Trailheads:
Identify and mitigate immenent hazard trees at the 7 Wilderness trailheads affected by the fire. We anticipate up to 20 trees. There is a LOP for bats in and around the fire area.

Hazard tree at wilderness trailheads				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
1 GS-7 Wilderness Tech	Days	$260	5	$1,300
1 GS-11 Wildlife Biologist	Days	$425	1	$425
Misc. supplies	each	100	1	$100
Vehicle gas mileage	Miles	$0.50	300	$150
Total Cost				**$1,975**

I. **Monitoring Narrative:**

Part VI – Emergency Stabilization Treatments and Source of Funds

			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										
Weed detection	days	942	10	$9,420	$0		$0		$0	$9,420
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$9,420	$0		$0		$0	$9,420
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										
trail tread improv.	Mi	1,088.48	10	$10,885	$0		$0		$0	$10,885
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$10,885	$0		$0		$0	$10,885
D. Protection/Safety										
Hazard Signs (trail)	day	497.5	10	$4,975	$0		$0		$0	$4,975
Hazard Sign (road)	day	443	3	$1,330						$1,330
				$0	$0		$0		$0	$0
hazard trees	day	395	5	$1,975	$0		$0		$0	$1,975
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$8,280	$0		$0		$0	$8,280
E. BAER Evaluation										
BAER Team	ea	44,441	1	$44,441			$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation					$0		$0		$0	$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				$28,585	$0		**$0**		**$0**	**$28,585**
Previously approved										
Total for this request				**$28,585**						

PART VII - APPROVALS

1. _____ _____
Forest Supervisor (signature) Date

2. Kara L Chadwick 12/15/16
Regional Forester (signature) Date

Appendix A: Cost/Benefit spreadsheet

Fire Name	Rough Ridge
Location	Chatachoochee N.F.
Date	12/7/2016

SUMMARY

Total Treatment Cost	**$ 26,215**
Expected Benefit of Treatment	**$ 39,000**
Implied Minimum Value (IMV)	**#VALUE!**

MAP ZONE A

Value Type	Value at Risk	Implied Value and/or Benefit Cost
Life and Safety	**Yes**	
Non-Market: Cultural Values	No	
Non-Market: Ecological Values	**Yes**	
Market Values: Direct	**Yes**	$ 40,000
Market Values: Loss of Use	**Yes**	$ 25,000
Total Market Resource Value		$ 65,000
Proposed Treatment		$ 26,215
Reduction in Probability of Loss		0.60
Expected Benefit of Treatment		$ 39,000
Exp B/C Ratio of Treatment for Market Resources Only		1.5
Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		**Justified**