Date of Report: 09-29-2021

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: Sylvan Fire

B. Fire Number: CO-WRF-210187

C. State: CO

D. County: Eagle County

E. Region: Rocky Mt. Region - 02

F. Forest: White River National Forest - 0215

G. District: Eagle-Holy Cross District

H. Fire Incident Job Code: P2N3D6 (0215)

I. Date Fire Started: June 20, 2021

J. Date Fire Contained: 90% contained

K. Suppression Cost: $7.2 Million

L. Fire Suppression Damages Repaired with Suppression Funds (estimates): $200,000 (estimated)
Suppression repair damages are in process. The above is the estimated cost to cover completion of the road work and handline closures.

1. **Fireline repaired (miles):** Road used as line:14.2 miles (approximately 10 left to complete). Handlines: 8.37 miles.
2. **Other (identify):**

M. Watershed Numbers: The Sylvan fire affected two separate 6th-level watersheds within the larger 4th-level Eagle River Watershed.

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
140100030401	West Brush Creek	20,844	3,553	17.0%
140100030501	Upper Gypsum Creek	28,403	177	0.6%

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	3,806
OTHER FEDERAL (LIST AGENCY AND ACRES)	
STATE	27
PRIVATE	
TOTAL	3833

O. Vegetation Types:

Native Plant Communities in the Sylvan Fire include Subalpine Spruce/Fir Forests, Mixed-Conifer Forests, and Aspen Forest.

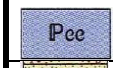
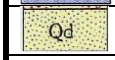
P. Dominant Soils:

Dominant soils types within the fire perimeter include the Scout and Leadville soil series. These soils are deep, well drained soils formed in colluvium and alluvium, on mountain slopes, alluvial fans and terraces.

Soils within the burn area generally have loamy-skeletal characteristics; loamy textures with twenty percent or more rock fragments. Pre-fire conditions likely exhibited well developed O horizons, 1-to-2-inch layer of litter/duff, in the soil profiles. Ground cover, critical for soil stabilization, is lacking throughout most areas mapped as moderate and high soil burn severity. These soils are sensitive to fire effects, and soil productivity is likely impacted where heavy surface fuels were consumed. Much of the High and Moderate severity burn areas have complete loss of ground cover. Higher rates of erosion are expected in moderate and high burn soil severity where ground cover was burned.

Q. Geologic Types:

Geologic Layers expressed in the area of the burn are included in the table below. Debris Flow Risk according to the USGS Geological Survey Landslide Hazards Program model estimated risk of debris flows as moderate across most of the burn area for an average 2-year 15 minute storm event.

Geologic Units of the Sylvan Fire	
Map Unit	**Map Unit Name**
	EAGLE VALLEY EVAPORITE (Pennsylvanian)-Gray and reddish-gray siltstone, shale, sandstone, carbonate rocks, and local lenses of gypsum. Unit is transitional between the coarse clastic rocks of the Minturn and Maroon Formations and purely evaporitic rocks. Thickness variable, depending on intertonguing relations.
	Young glacial drift (Lull Lake and younger))-Stream, terrace, and outwash gravels
	MAROON FORMATION (Permian and Pennsylvanian)-Maroon and grayish-red sandstone, conglomerate, and mudstone; lower part intertongues with Eagle Valley Formation or Evaporite which underlies the Maroon in places.
	MINTURN FORMATION (Pennsylvanian)-Gray, pale-yellow, and red sandstone, grit, conglomerate, and shale, and scattered beds and reefs of carbonate rocks. Includes rocks of Gothic Formation of Langenheim (1952).
	CHINLE AND STATE BRIDGE FORMATIONS

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	4
INTERMITTENT	7
EPHEMERAL	19
TOTAL	**30**

S. **Transportation System:**
Trails: *National Forest (miles):* 5.4 miles *Other (miles):*
Roads: *National Forest (miles):* 3.3 miles *Other (miles):*

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	886		10			23.40
Low	1,085		15			28.67
Moderate	1,224		2			31.99
High	611					15.94
Total	3,806		27			100

B. Water-Repellent Soil (acres): 1,837 (48% of the fire)

The degree and extent of water repellent soils, hydrophobic layers, varied but mostly limited to the moderate and high burn severity areas. However, observations indicated strong repellency at the soil surface over several vegetation types and some natural water repellency was observed in unburned sites. The strong water repellency in moderate and high severity burns were predominantly observed at the boundary between the ash layer and mineral soil surface, at an average depth of 2 inches.

C. Soil Erosion Hazard Rating:

Soil Stability by Soil Burn Severity for the Sylvan Fire					
	Soil Burn Severity Acres				
Soil Stability	**High**	**Moderate**	**Low**	**Unburned**	**Total**
Severe	48.55	50.52	16.62	5.11	120.80
High	12.3	56.87	66.27	79.66	215.10
Moderately High	12.64	4.96	0	0	17.60
Moderately Low	41.96	54.47	65.18	91.51	253.12
Low	195.27	225.81	313.52	300.2	1,034.80
Slight	299.98	833.44	637.7	420.22	2,191.34
Total	**610.70**	**1,226.07**	**1,099.29**	**896.70**	**3,832.76**

D. Erosion Potential:

Rates of erosion will increase between 0.08 tons per acre to 0.87 tons per acre in the first year depending on forested hillslopes that were mapped at moderate or high soil burn severity and vary with slope. In high and moderate soil burn severity areas, it is highly likely that increased rates of soil erosion and sediment delivery to stream channels will occur in the first year following the fire particularly on steep slopes. Extensive removal of forest floor ground cover occurred in these areas. The results also show that recovery of these areas is likely to occur within 3-5 years following the burn.

Average erosion between moderate soil burn severity soils and high soil burn severity soils (0.16+0.38) is 0.27 tons per acre.

E. Estimated Vegetative Recovery Period (years):

Post-fire vegetation recovery varies by plant community types. Native forb and shrub communities start to emerge immediate after the fire and dominate the covertype of the next couple years. Native grasses start to populate the burn area during year 2- 3 in moderate soil burn severity and some high soil burn severity areas. Aspen covertypes recover year 1 and produce a high percent of suckers that begin to thin out after 2 years. Aspen trees will dominate in that covertype between 5-10 years. It takes 10-20 years for Conifer trees to recover depending on elevation and soil moisture.

G. Estimated Hydrologic Response (brief description):

Five sub-watersheds were modeled using the Wildcat5 rainfall-runoff model to estimate the hydrologic response to a 15-minute rainstorm with a 2-year recurrence interval. Model runs evaluated both pre-burn and post-burn conditions. A bulking factor was used to estimate the increase in stream discharge associated with the entrainment of sediment from areas with moderate and high soil burn severity. The results indicate that peak flows in individual modeled sub-watersheds are likely to increase post-fire between 72% and 1900%. The large percentage increase (1900%) in one particular sub-watershed was indicative of very low pre-burn discharge values for the modeled storm, rather than very high discharge values post-burn. Predicted absolute increases in peak flow range from an increase of 0.3 cfs to 82 cfs. The model results indicate that increases in peak flows in sub-watersheds are to be expected as a result of the fire. This effect, however, is expected to be muted within the larger downstream receiving waters of West Brush Creek and Upper Gypsum Creek.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The SylvanFire, located 15miles south-southeastof Eagle, CO, started on 20 June, 2021. The cause was lightning.At the time of the BAER assessment, the fire was 90% contained. The BAER assessment used an initial BARC map fromSeptember 04, 2021. This was revised after field verification to more closely match actual conditions on the ground.

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

A BAER team began assessing the area for post-fire emergencies on September 9, 2021. The full list of critical values analyzed and risk determinations for these values is included in Appendix A. Critical Values described in the sections below were identified by the assessment team as those with risk ratings appropriate for further evaluation and treatment recommendation.

The risk matrix below (Table 7), Exhibit 2 of Directive No.: 2500-2020-1 was used to evaluate the Risk Level for each value identified during Assessment.

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**

1. Human Life and Safety (HLS):

General Burned Area Safety

Based on the potential for debris flows, flooding, rock falls, etc., the BAER team identified a serious risk to the public, employees, range permittees, and cooperators in the Sylvan Fire area. FS critical values are located within burn below burned slopes or downstream of headwaters at risk of post-fire

debris flows, rock fall, increased runoff, and hazard trees. Risk of flooding, sediment laden flows, debris flows, and rock fall occurring will be exacerbated by the fire. These post-fire watershed responses may not threaten infrastructure downstream of the burn area; however, roads will **very likely** be impacted. These impacts to access could leave FS employees, permittees, and forest users, and employees stranded, possibly exposed to harsh weather conditions and/or areas subject to rockfall, flooding, and debris flows, especially if they try to evacuate or pass through during storms. Impacts from the post-fire environment on human life and safety is considered **possible** with **major** consequences (*i.e*. death or serious injury). This results in a **high** risk to human life and safety from post-fire threats.

Seasonal closure of the burn area is recommended to prevent long-term exposure to risk and protect life and safety. Installation of burned area informational signs is recommended to educate users passing through the area on main roads of the potential hazard. Because of the **high** risk of these post-fire threats, it is recommended that burned areas adjacent to roads in the sylvan burn be closed to dispersed camping through summer 2022 to reduce length of exposure of the public within areas of elevated risk due to the Sylvan Fire. Risks associated with the burned area should be re-evaluated prior to lifting the closures.

Roads

NFSR 414.1
The probability of injury or death from falling trees, rolling rocks and other debris, washouts, debris flows, and loss of emergency egress on routes is **Possible** due to USGS debris flow modeling which shows moderate risk of debris flows along NFSR 414.1 in places along with the immediate risk to anyone traveling within the fire perimeter due to increased sedimentation and debris, poor road conditions and hazard trees. The magnitude of risk will be **Major** due to Visitors/Recreating Public, Agency Personnel and Cooperating Agencies who could be injured or killed if they encounter dangerous post-fire conditions. Motorists could also become trapped in a damaged stream crossing or loss of life or injury could occur if a vehicle were to be immobilized by degraded conditions when attempting to cross during a flood/debris flow event. For these reasons, the risk to Life and Safety at NFSR 414.1 in the burned area is **High** and emergency BAER treatments are recommended.

NFSR 431.1
The probability of injury or death from falling trees, rolling rocks and other debris, washouts, debris flows, and loss of emergency egress on routes is **Possible** due to USGS debris flow modeling which shows moderate risk of debris flows along NFSR 431.1 in places along with the immediate risk to anyone traveling within the fire perimeter due to increased sedimentation and debris, poor road conditions and hazard trees. The magnitude of the risk will be **Major** due to Visitors/Recreating Public, Agency Personnel and Cooperating Agencies who could be injured or killed if they encounter dangerous post-fire conditions. Motorists could also become trapped in a damaged stream crossing or loss of life or injury could occur if a vehicle were to be immobilized by degraded conditions when attempting to cross during a flood/debris flow event. For these reasons, the risk to Life and Safety at NFSR 431.1 in the burned area is **High** and emergency BAER treatments are recommended.

NFSR 417.1
The probability of injury or death from falling trees, rolling rocks and other debris, washouts, debris flows, and loss of emergency egress on routes is **Possible** due to USGS debris flow modeling which shows moderate risk of debris flows along NFSR 417.1 in places along with the immediate risk to anyone traveling within the fire perimeter due to increased sedimentation and debris, poor road conditions and hazard trees. The magnitude of the risk will be **Major** due to Visitors/Recreating Public, Agency Personnel and Cooperating Agencies who could be injured or killed if they encounter dangerous post-fire conditions. For these reasons, the risk to Life and Safety at NFSR 417.1 in the burned area is **High** and emergency BAER treatments are recommended.

Trails

Antones Trail #1870–The risk to public health and safety from fire weakened trees and stump holes in the burned area is **possible** since this trail sees a lower rate of use and it is unlikely a person would be in the right place and time to be injured from such risks. If someone did happen to get hit by a fire weakened tree it would result in **major** consequences due to relative difference in size and weight between a person and a tree. It is for these reasons that risk to the public health and safety on Antones Trail #1870 is **high** and BAER emergency treatments are recommended.

Mt. Thomas Trail #1871-The risk to public health and safety from fire weakened trees and stump holes in the burned area is **possible** since this trail sees a lower rate of use and it is unlikely a person would be in the right place and time to be injured from such risks. If someone did happen to get hit by a fire weakened tree it would result in **major** consequences due to relative difference in size and weight between a person and a tree. It is for these reasons that risk to the public health and safety on Mt. Thomas Trail #1871 is **high** and BAER emergency treatments are recommended.

NFSR 414.1 The probability of injury or death from falling trees, rolling rocks and other debris, washouts, debris flows, and loss of emergency egress on routes is **Possible** due to USGS debris flow modeling which shows moderate risk of debris flows along NFSR 414.1 in places along with the immediate risk to anyone traveling within the fire perimeter due to increased sedimentation and debris, poor road conditions and hazard trees. The magnitude of risk will be **Major** due to Visitors/Recreating Public, Agency Personnel and Cooperating Agencies who could be injured or killed if they encounter dangerous post-fire conditions. Motorists could also become trapped in a damaged stream crossing or loss of life or injury could occur if a vehicle were to be immobilized by degraded conditions when attempting to cross during a flood/debris flow event. For these reasons, the risk to Life and Safety at NFSR 414.1 in the burned area is **High** and emergency BAER treatments are recommended.

NFSR 431.1 The probability of injury or death from falling trees, rolling rocks and other debris, washouts, debris flows, and loss of emergency egress on routes is **Possible** due to USGS debris flow modeling which shows moderate risk of debris flows along NFSR 431.1 in places along with the immediate risk to anyone traveling within the fire perimeter due to increased sedimentation and debris, poor road conditions and hazard trees. The magnitude of the risk will be **Major** due to Visitors/Recreating Public, Agency Personnel and Cooperating Agencies who could be injured or killed if they encounter dangerous post-fire conditions. Motorists could also become trapped in a damaged stream crossing or loss of life or injury could occur if a vehicle were to be immobilized by degraded conditions when attempting to cross during a flood/debris flow event. For these reasons, the risk to Life and Safety at NFSR 431.1 in the burned area is High and emergency BAER treatments are recommended.

NFSR 417.1 The probability of injury or death from falling trees, rolling rocks and other debris, washouts, debris flows, and loss of emergency egress on routes is **Possible** due to USGS debris flow modeling which shows moderate risk of debris flows along NFSR 417.1 in places along with the immediate risk to anyone traveling within the fire perimeter due to increased sedimentation and debris, poor road conditions and hazard trees. The magnitude of the risk will be **Major** due to Visitors/Recreating Public, Agency Personnel and Cooperating Agencies who could be injured or killed if they encounter dangerous post-fire conditions. For these reasons, the risk to Life and Safety at NFSR 417.1 in the burned area is **High** and emergency BAER treatments are recommended.

2. Property (P):

Roads

NFSR 414.1 (Culverts)

The probability of damage or loss from elevated postfire runoff and debris flows at undersized culverts including West Brush Creek and Antone's Cabin Creek stream crossings is **Very Likely** due to undersized culverts which may plug and overtop during elevated runoff and post fire debris flow events resulting in significant road damage in addition to the total loss of the culvert. The magnitude of the damage will be **Major** due to property damage that will result from the damage to the culverts and associated road prism. For these reasons, the risk to NFSR 414.1 in the burned area is **Very High** and emergency BAER treatments are recommended.

NFSR 431.1 (Low Water Crossings)

The probability of damage or loss from elevated postfire runoff and debris flows at low water crossings including the Leeman Creek ford and a timber low water crossing (Puncheon Bridge) at an unnamed tributary to West Brush Creek is **Very Likely** due to elevated stormwater runoff and post fire debris flow which will aggravate damages recently incurred from a July/August convective storm event requiring future replacement/ reconstruction of low water crossing. The magnitude of the damage will be **Major** due to substantial property damage that will result from the loss of the low water crossings requiring future reconstruction to restore the service road to a passable condition. For these reasons, the risk to NFSR 431.1 in the burned area is **Very High** and emergency BAER treatments are recommended.

3. Natural Resources (NR):

Invasive Weeds

Post-fire threats from noxious weeds can be caused from both suppression activities and the fire severity. Fire is known to enhance the establishment of all weed species present, especially throughout established road and trails systems. The noxious weed populations have a high probably of spreading in all soil burn severities, but especially in moderate to high burn intensity areas. Soils that burn at low and moderate intensities likely have some loss of native seed reserves. This is due to the change in soil composition and lack of organic matter surviving the fire and/or high soil temperature. In the areas that burn at lower intensities there is a likely probability that those noxious weeds will continue to spread, but at lower rates because of the native seed reserves found in the living soil.

Noxious invasive weeds are present and have the potential to spread throughout all roads, trails, hand line and drop points or staging areas within representative native plants communities within the Sylvan Fire. Areas of moderate to high burn severity could have more aggressive noxious weed invasions and are considered highest priority for treatment. Areas with lower burn severity where noxious weeds are present will also be treated and monitored. In conclusion, the probability of damage is **very likely**, the magnitude of consequences is **major** and risk is considered **very high** to native plant communities from noxious weed infestations.

Rangeland Resource

For range resources damages the White River NF will be working with partners to repair any range related damages.

4. Cultural and Heritage Resources: Prior to the Sylvan Fire, a total of six surveys (totaling 463 acres) have been conducted within the fire perimeter; 8 sites (including 2 isolated finds) were located within the perimeter during these surveys. Once these eight previously recorded sites were identified, we looked at properties within our jurisdiction and revisited most of the sites to determine the condition of the sites and to confirm the eligibility status. Photographs and a brief description were completed for each revisited site, and this information will be submitted to SHPO and the Tribes for their records.

Because we do not have any known eligible sites within the fire perimeter at this time there are no emergency treatment or stabilization options recommended for any of these eight sites.

Any proposed engineering treatments may require cultural resource survey and/or monitoring during implementation and further consultation with the Colorado SHPO and Tribes. As additional fire-affected roads and areas of soil erosion are identified by Forest Engineers and Hydrologists, the WRNF Heritage Program Manager (HPM) or Archaeologist will be notified of proposed mitigation treatments. If, during rehabilitation and stabilization implementation, additional cultural resources are encountered, the project leader will stop all activities in the immediate area and notify the Forest HPM or Archaeologist. If avoidance of a cultural resource is not possible, mitigation will be developed in consultation with the Colorado State Historic Preservation Office and Tribal Historic Preservation Officer.

B. Emergency Treatment Objectives:

- Provide for public safety and awareness

- Limit loss of soil productivity and provide for natural vegetative recovery
- Early detection and rapid response of non-native invasive plants
- Road and trail treatments to protect investment in infrastructure and limit impact by post-fire watershed response
- Protect and stabilize Forest Service infrastructure at risk of damage as a result of increased sedimentation, stream diversion, and erosion as a result from the fire
- Reduce risk to water quality and other natural resources by reducing risk of infrastructure failure/loss and resulting in impact to downstream resources

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: N/A to storm event, but 95% probability of surveying all priorty treatmetn areas if fully funded.
Channel: N/A
Roads/Trails: 80%
Protection/Safety: 95%

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	***3 years after treatment***	***5 years after treatment***
Land	85	95	100
Channel	N/A	N/A	N/A
Roads/Trails	85	95	100
Protection/Safety	90	100	100

E. **Cost of No-Action (Including Loss):** No action could result in a greater impact to natural resources including further degraded water quality and stream health, erosion along channels, and increased propagation of invasive species throughout the burn. Sudden failure of infrastructure (roads) would increase the scouring of channels below the failure and degrade water quality in the waters downstream. There would be a loss of opportunity for the public and economic loss to the local communities due to extended closures to repair infrastructure losses. Cost of replacement of structures through contracting and using normal policy's would increase the cost of replacements and extend timelines.

Cost of engineering road treatments could be $1,050,000 if replacement were contracted, AOP passable barriers completed through traditional NEPA timeline.

Potential loss of native plant species as they are outcompeted for natural resources by invasive species, particularly by year 3.

This does not include a monetary value on loss or harm to human life.

F. **Cost of Selected Alternative (Including Loss):** Expected reduced impact on water quality and stream health, some potential competition from invasive species in areas not recommended for treatment. Cost of treatment.

Cost of road engineering treatments would be around $30,000

Cost of other treatments approximately $51,000

This does not include a monetary value on loss or harm to human life.

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Kelsha Anderson
Email: kelsha.anderson@usda.gov **Phone(s)**: C-970-230-2663

Forest BAER Coordinator: Liz Roberts
Email: elizabeth.roberts@usda.gov **Phone(s):** W-(970) 945-3239

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

Skill	Team Member Name
Team Lead(s)	Kelsha Anderson
Soils	Ryan Sparhawk, Eric Schroder
Hydrology	Justin Anderson, Steve Hunter
Engineering	Dan Woolley, Steve Hunter
GIS	Jane Frambach
Archaeology	Rebekah Sease
Weeds	Liz Roberts, Donna Shorrock
Recreation	Katherine Bazan
Range	Jessica Pettee
Fisheries	Melvin Woody, Liz Roberts
Wildlife	Liz Roberts

H. **Treatment Narrative:**

This funding request is based on potentially needing to use off-forest resources and/or overtime for forest resources.

Land Treatments:

1. L1a/L1b: Early Detection and Rapid Response – Invasive and Noxious Weeds

Early detection/rapid response (EDRR) surveys will focus on areas of unimpaired native plant communities that burned at high or moderate soil burn severity and are adjacent to known Colorado State listed noxious weeds that have a dispersal ranch which can serve as a seed source within the burn perimeter, as well as areas disturbed by suppression activities. The goal is to treat early, before the seeds develop to prevent the spread of weeds within the burn perimeter. Noxious weed populations have a high

probably of spreading in all soil burn severities, but especially in moderate to high burn intensity areas. Soils that burn at low and moderate intensities likely have some loss of native seed reserves. EDRR will be used in High and Moderate burn severities to minimize the potential for new noxious weed infestations and ensure the natural recovery of native perennial grasses and forbs.

There is a very high probability that invasive plant species and noxious weeds will emerge and populate the sylvan fire area. Due to the amount of ground/soil disturbance during fire suppression it is very likely that the areas used for fire line activities will also have hot spots of noxious weed activity. As dozers, vehicles and crew are considered vectors and can transfer noxious weed seeds to areas within the fire. Heavy equipment used for suppression activities travelled through areas of known weed populations to unaffected areas, which substantially increased the risk of noxious weed spread in these disturbed areas.

Treatment would occur through contracting due to lack of weed staff availability on the unit. If new weed populations are found they would be promptly treated to minimize the potential to spread and lead to the modification of native plant communities. Chemical treatment of new and existing noxious weed infestations will reduce the likelihood of spread to disturbed areas and help re-establish high quality wildlife habitat within the burn.

There is a total of 106.08 acres identified for EDRR (2.8% of the total fire area). It is very likely that there will be additional infestation outside the 106 areas and will be documented during the detection surveys. Past fire history on the White River NF has indicated that noxious weed infestations are aggressive along the suppression routes and within the fire perimeter. The cost to treat noxious weeds on the White River NF is increasing each year. The estimated cost in the Invasive report is $250/acre. This will address the backcountry remote access costs, front country costs, equipment cost, herbicide cost, contract prep, and detection survey costs.

Stream channels may act as vectors to spread and areas with high and moderate burn were considered at risk for expansion of invasive weed infestation due to loss of litter and seed bank within the soil. Only the highest risk areas, which are likely to be have increased risk due to an available vector for transmission (cars, people) were included in the requested treatment acres. If weed populations are noticed along stream channels an interim report will be submitted at that time.

Species of concern due to populations noted within dispersal area of the fire include Canada Thistle, bull thistle, and houndstounge. Species not currently in the dispersal area of the fire may gain opportunity to establish due to vehicle traffic along roads and trails.

Roads and Trail Treatments: Suppression Activities EDRR focuses on all the fire suppression activities that intersect known invasive weed infections. There is a total of **39.71 acres** of disturbance in the suppression activities footprint.

Treatment L1b: EDRR Suppression Activities	**Miles**	**Feet**	**Width in Feet**	**squared feet**	**acres**
Completed Hand Line	8.37	44193.6	4	176774	4.06
Road Used as Completed Line	14.2	74976	12	899712	20.65
Suppression Points (50m buffer)					15
				Total	**39.71**
				Cost per acre	250
					$9,927.50

EDRR Burn Area Roads and Trails shows 66.37 acres of disturbance in the high and moderate severity burn areas. The trails and roads have a 50 meter buffer to account for the potential spread during fire

operations. Given the high cost of treating weeds in the area of the burn, only the highest prone areas were selected for treatment.

Treatment **L1a: EDRR - moderate- High SBS - Trails & Roads (20m buffer)**	**Moderate**	**High**	**Total**
Trails - Mod & High	14.41	5.12	19.53
Roads - Mod & High	6.81	1.18	7.99
			27.52
		Cost per acre	250
			$6,880

Implement Early Detection and Rapid Response (EDRR) - see attached worksheet
EDRR – total = $18,657.50

Channel Treatments: No channel treatments were recommended.

Roads and Trail Treatments:

Roads:

1. **R5:** Installation of Critical Dip

Culverts along NFSR 414.1 present a risk to watershed sedimentation, human life and safety and property. West Brush Creek culvert is at risk of overtopping during elevated post-fire runoff and debris flow events.

Recommendation: It is recommended to lower the road prism around the structure along with the installation of an armored critical dip to capture and route overflow back to the stream channel downstream of the road crossing, if the culvert plugs with debris or is over-topped during a flood event.

2. **R5/R6:** Installation of Critical Dip/Culvert Modification

Situation: Antone's Cabin Creek culvert on NFSR 414.1 has been identified as being undersized due to significant damage to the existing 48" pipe and is at risk of being overtopped and potential failure during elevated streamflow or debris flow events.

Recommendation: Replace the existing undersized culvert to protect the road prism in the event of elevated stream flow. Lower the road prism around the structure along with the installation of an armored critical dip to capture and route overflow back to the stream channel downstream of the road crossing, if the culvert plugs with debris or is over-topped during a flood event.

If culvert cannot be replaced then instillation of a trash rack to prevent debris from entering and becoming lodged in the culvert.

3. **R8:** Boulder Low Water Crossing

The existing boulder low water crossing has been damaged during a recent post-fire flood/debris flow event on Leeman Creek as it crosses NFSR 431.1. The channel has incised and has become laterally unstable. Significant alluvial and woody debris was observed in the channel both upstream and downstream of the low water crossing.

Stabilize the boulder armoring in the low water crossing, regrade and armor the approach to either side of the crossing, remove debris from the channel upstream of the crossing and install boulder grade control to stabilize ongoing channel incision downstream of the crossing.

4. **R1/R8:** Timber Low Water Crossing

The existing timber low water crossing (Puncheon Bridge) has been damaged during a recent post-fire flood/debris flow event on an unnamed tributary of Leeman Creek as it crosses NFSR 431.1. The channel has incised and has become laterally unstable. Significant alluvial and woody debris was observed in the channel both upstream and downstream of the low water crossing.

Recommendation: Stabilize the log deck of the timber low water crossing, regrade and armor the approach to either side of the crossing and remove debris from the channel upstream of the crossing.

R2/5/6/8/10 Mobilization	QTY	Rate	Method	Unit	Total
Mobilization (Total for all treatments)	1	$2,135	LSQ	Lump Sum	$2,135

Mobilization Total	**$2,135.00**

R3: Storm Inspection and Response	QTY	Rate	Method	Unit	Total
Forestry Technician (GS-9)	3	$290	NA	Day	$870
Force Account Response	1	$5,000	LSQ	Lump Sum	$5,000
Storm Inspection and Response Total					**$5,870.00**
Cost/mile					$1,779

R5/6/8/10: Storm Proofing	QTY	Rate	Method	UOM	Total
R5: Install Armored Critical Dip	2	$4,650	DQ	Site	$9,300
R6: Culvert Modification (36” trash rack, 48” trash rack) and initial sediment removal	2	$1793	DQ	Site	$3586
R10: Debris Removal (Backhoe w/ Operators)	1	$1,420	DQ	Site	$1,420
R8: Reshape Road Prism at Stream Crossings	2	$110	DQ	Site	$220
R8: Stabilize Damaged Boulder Low Water Crossing	1	$3,660	DQ	Site	$3,660
R8: Stabilize Damaged Timber Low Water Crossing	1	$3,860	DQ	Site	$3,860
Storm Proofing Treatment Total					**$21746**

Treatment Total	**$29,751**

Protection/Safety Treatments:

1. **S1a/S2:** Temporary Road Closures and Informational signs

Access within burned areas historically bring curiosity to public and partners alike. Burned areas present an immediate risk to anyone traveling within the fire perimeter. Increased sediment flows, poor road conditions and hazard trees present constant safety concerns within the first year of a burn. Temporary closure orders with physical enforcement are important to protecting human life and safety for public, partners and FS personnel.

Roads within the Sylvan Fire are expected to see increased flows due to post-fire effects. Some existing culverts and drainage structures are undersized and will not withstand the expected increase in stream flows sediment and debris. Road prisms may be damaged and need to be rebuilt once closures are lifted. Culverts are at risk of failure creating increased sedimentation within watersheds above Sylvan Lake Reservoir and hazard trees are prevalent along traveled ways.

Recommendation: Installing informational signs for educating the public about risk of flash flooding and potential debris flows will allow public to make educated choices about recreating or traveling through the burn area. Signs alert the travelers of the dangers within the fire perimeter. Posting closure orders and informational signs at key locations in visible areas along system roads near the fire perimeter will help educate users about areas that are closed to dispersed camping and planed seasonal road closures. Closure structures such as gates or barrier at strategic locations within the fire perimeter will help enforce closure.

Post informational signs along any main arterial road that could access the fire. Temporary closure devices should be installed at the fire perimeter along the Gypsum-Brush Road (414.1), Powerline-Crooked Creek Road (431.1).

Storm inspection/response will keep culvert and drainage features functional by cleaning sediment and debris from in and around features between or during storms.

S1a: Installation of Informational Signs (3)	**QTY**	**Rate**	**Method**	**UOM**	**Total**
S1a: Burned Area Hazard Sign, posts, and hardware	3	$289	NA	Site	$867
S1a: WG 6	1	$310	NA	Day	$310
S1aForestry Technician (GS-5)	1	$150	NA	Day	$150
S1a: Forestry Technician (GS-5)	1	$150	NA	Day	$150
S1: GS-11 Archeologist	1	$300	NA	Unit	$300
S1a: Mileage - 4x4 pickup truck (1/2 ton)	100	$0.55	NA	Mile	$55
Informational Signs and Temp Closure Gates Total					**$1,832**
				Cost/Unit	$610

S2: Installation of Temp Closure Gates (3)	**QTY**	**Rate**	**Method**	**UOM**	**Total**
S2: Temp Closure gates, hardware and reflective signs	3	$1,800	NA	Site	$5,400
S2: WG 6	3	$310	NA	Day	$930
S2 Forestry Technician (GS-5)	3	$150	NA	Day	$450
S2: Forestry Technician (GS-5)	3	$150	NA	Day	$450
S2: GS-11 Archeologist	3	$300	NA	Day	$900
S2: Mileage - 4x4 pickup truck (1/2 ton)	200	$0.55	NA	Mile	$110
Informational Signs and Temp Closure Gates Total					**$8,240**
				Cost/Unit	$2,747

2. S1a/S2: Temporary Closure (If no other road treatments)

If a no treatment alternative is selected temporary closures and informational signs within the fire perimeter will be paramount to keep public and FS employees safe while the watershed responds. When the road is ready to reopen road reconditioning may be needed through any moderate or high burn severity sections that transect NFSR 414.1, 431.1 or 417.1. One to two years is recommended for closure. If this option is selected the cost to mitigate post fire damages will fall on the Forest to cover.

Recommendation: Provide temporary closures with associated hazard signs to effectively inform people of hazards and keep them out of areas at risk. Once it is determined to reopen the road a crew can assess the needs for the road. Road work will be minimal to reestablish a road prism through high burn severity. If damage occurs to culverts, work will be required to repair/replace damaged crossings or to clean inlets/outlets to provide adequate passage of water across the road.

**See cost estimate in Roads section*

3. S1b/S12: Trail Signs and Dispersed Camping Closure

The following is recommended as treatments to offset the risk to public health and safety:

- Trail/Recreation Informational Signs at burn entry points for the Mt. Thomas #1870 trail.
- Trail/Recreation Informational Signs at the east and west trail entry points for the Antone's Trail # 1871

S1b: Installation of trail/recreation informational signs (6)				
Item	**Unit**	**Number of units**	**Cost/Unit**	**Total Cost**
Recreation/Trail Informational Signs	#	6	$50	$300
Installation materials and supplies – 4x4 posts, hardware	lump	1	$150	$150
GS-5 Technician	Days	1	$160	$160
GS-5 Technician	Days	1	$160	$160
4 x4 pickup truck	miles	150	.58/mile	$87
GS-11 Archeologist	Days	1	$300	300
Total Cost				**$1157**
			Cost/Unit	$193

- Install Road Informational signs at fire entry points on FSR 414.1 and 431.1 , costs addressed in engineering report.
- Install temporary closure devices on FSR 431.1 and 414.1, costs addressed in engineering report.
- Close the burned area along FSR 414.1, 431.1, and 417.1 to dispersed camping via special order through the summer of 2022, then reassess risk

S12: Dispersed Camping Closure/Temp Closure Preparation & Information Posting				
Item	**Unit**	**Number of Units**	**Cost/Unit**	**Total Cost**
GS-11 Recreation Staff	Days	1	$410	$410
GS-5 Technician	Days	1	$160	$160
GS-5 Technician	Days	1	$160	$160
Materials/Supplies for posting special order	Lump	1	$100	$100
4x4 pickup truck	Miles	100	.58/mile	$58
			Total Cost	**$728**
			Cost/Unit	$728

4. **S3: Hazard Tree Mitigation around Road Infrastructure replacement at 2 sites**

This treatment includes the felling of hazard trees that pose a risk to personnel performing BAER treatments on road infrastructure hardening and replacement projects and sign instillation.

S3: Hazard Tree Mitigation (2 sites)				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
Fire Crew Overtime (Hazard Tree Felling)	Days	$3,500	1	$3,500
Vehicle gas mileage	Miles	$0.55	200	$110
			Total Cost	**$3,610**
			Cost/Site	$1,805

5. **S10 Interagency/Partner/Permittee Coordination**

Coordination with Sylvan Lake State Park (CPW), Pitkin and Eagle Counties, Eagle and Gypsum Cities and other partners with interests in facilities downstream of FS land, range permittees, Timber Contractor and Excel who have infrastructure in the fire area are actively repairing damaged infrastructure and/or implementing mitigations to reduce post-fire damage and may need access through closures. The BAER team's findings will be shared with those entities so that they can plan measures to protect/prepare infrastructure from post-fire watershed response events. This cost is to get the Forest started with coordination and facilitation of emergency treatments from partners and permittees.

S10: Interagency/Partner/Permittee Coordination Treatment				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
GS-12 BAER Coordinator/Forest Ecologist	Days	$500	2	$1000
GS-11 Special Uses Coordinator	Days	$400	1	$400
GS-11 Forester	Days	$400	1	$400
GS-11 Range Manager	Days	$400	1	$400
Total Cost				**$2,200**
			Average Cost/Day	$440

Monitoring Narrative:

M1: Forest Serve staff will monitor the effectiveness of the proposed closures. For safety two staff will spend ½ day every other week during the periods of Highest visitor use.

M1: Dispersed Camping Closure/Temp Closure effectiveness monitoring				
Item	**Unit**	**Number of Units**	**Cost/Unit**	**Total Cost**
GS-6 FPO Patrol Time in summer 2022 – 2 crew members, once every other week week/ ½ day each patrol during busy season, apprx. 20 wks	Days	10	$175	$1,750
4x4 pickup truck	Miles	825	.58/mile	$479
			Total Cost	**$2,229**
			Cost/Day	$223

** Note: Assumes ½ day for 2 people every other week during the busy season with high visitor, concentrating on visitor peak usage and storm event times.*

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											
L1b: EDRR - Suppression				$10,853	$0			$0		$0	$10,853
L1a: EDRR - Fire				$7,805	$0			$0		$0	$7,805
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Land Treatments				$18,658	$0			$0		$0	$18,658
B. Channel Treatments											
N/A				$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											
Mobilization				$2,135	$0			$0		$0	$2,135
R3:Storm Inspection/Response				$5,870	$0			$0		$0	$5,870
R5/6/8/10:Storm Proofing				$21,746	$0			$0		$0	$21,746
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Road and Trails				$29,751	$0			$0		$0	$29,751
D. Protection/Safety											
S1a/S2: Rd Information Signs/Gates				$10,072	$0			$0		$0	$10,072
S1b:Tr Informational Signs				$857	$0			$0		$0	$857
S12: Dispursed Camp/Temp Closure Prep & Info Posting				$728	$0			$0		$0	$728
S3: Hazard Tree Mitigation				$3,610	$0			$0		$0	$3,610
S10: Interagency Coordination				$2,200	$0			$0		$0	$2,200
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Protection/Safety				$17,467	$0			$0		$0	$17,467
E. BAER Evaluation											
Initial Assessment	Report	$36,500		---	$0			$0		$0	$0
Insert new items above this line!				---	$0			$0		$0	$0
Subtotal Evaluation				$0	$0			$0		$0	$0
F. Monitoring											
M1: Closure Effectivness Monitoring				$2,229							
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Monitoring				$0	$0			$0		$0	$0
G. Totals				$65,876	$0			**$0**		**$0**	**$65,876**
Previously approved											
Total for this request				**$65,876**							

PART VII - APPROVALS

1. SCOTT FITZWILLIAMS Digitally signed by SCOTT FITZWILLIAMS Date: 2021.09.29 16:01:32 -06'00'

SCOTT G. FITZWILLIAMS Date: 09/29/2021
Forest Supervisor

Attachment A-EDRR Cost Analysis Worksheet
PART F - INDIVIDUAL SPECIFICATION
EDRR Cost Analysis Worksheet
BAER - Sylvan Fire
R-2 White River National Forest

TREATMENT/ACTIVITY NAME	T1 - Early Detection & Rapid Response (EDRR)	**PART E SPECIFICATION #**	Noxious Weed Species Survey & Monitoring
NFPORS TREATMENT CATEGORY*	Invasive Species	**FISCAL YEAR(S) (list each year):**	2022
NFPORS TREATMENT TYPE *	Invasive Species	**WUI? Y / N**	no
IMPACTED COMMUNITIES AT RISK	All representative Native Plant Communities (refer to BAER Noxious weed specialist reports – Sylvan Fire 2021)	**IMPACTED T&E SPECIES**	none

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A.) General Description
Monitor known weed populations in areas of all soil burn severity and areas near weed populations used during suppression efforts. If weed spread occurs, treat as necessary. Treat and monitor noxious weed infestations on NFS lands associated with suppression activities and BAER treatments. ***For lands outside USFS White River NF there will be an interagency agreement (Colorado Parks and Wildlife) to address and treat noxious weeds on surrounding lands.***

B.) Location/(Suitable) Sites
Roads and Trails (system and constructed) within and leading into the Sylvan Fire used for travel with existing weed populations (See map below). Portions of hand line, helispots, drop points, and staging areas that intersected roads and trails with known weed infestations.

C. Design Specifications

1. Monitoring of disturbed areas will occur the first growing season following the fire, after flowering, to allow for verification and detection of invasive species. Surveys of the area within the first year following the fire will be conducted by two to three individuals (motorized, hiking, horseback).
2. If the accelerated spread of noxious weeds is verified, then the populations will be treated.
3. Select integrated weed management treatment dependent upon weed species and location. With chemical treatments, determine appropriate herbicide, application rate, and application timing based on species being treated and access to the population.
4. Consider sensitive habitat needs when selecting appropriate herbicide.

D. Purpose of Treatment Specifications
Reduce the potential for establishment of new noxious weed infestations in highly susceptible burned areas, prevent spread of existing infestations, and prevent increase in weed density in existing infestations. Reduce the potential for establishment of new noxious weed infestations in native or naturalized communities

E. Treatment Effectiveness Monitoring Proposed
Follow-up monitoring and treatments would be needed in subsequent years if new or expanded weed populations are discovered during the first year of survey; this follow-up would be funded out of program dollars per BAER direction.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): **Do not include contract personnel costs here (see contractor services below).**	**COST / ITEM**

R-2 White River NATIONAL FOREST GS-11 Rangeland Management Specialist @ $400/day x 4 days FY22 (Supervision, coordination, quality control, survey, monitoring, data entry) **TOTAL WRNF PERSONNEL COST**	1600
TOTAL FEDERAL-AGENCY PERSONNEL COST	

EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): **Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.**	**COST / ITEM**
N/A (See Travel Costs Below)	

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	**COST / ITEM**
R-2 White River NATIONAL FOREST HERBICIDE (may include surfactant and dye) necessary — Various Herbicides as determined **TOTAL WRNF HERIBICIDE COSTS**	**Included in price per acre**
TOTAL FOREST SERVICE MATERIALS & SUPPLIES COST	

TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	**COST / ITEM**
R-2 WHITE RIVER NATIONAL FOREST Fleet – 4x4, ¾ ton pickup truck (trailer towing capacity) @ $0.70/mile x 4 days	**250.00**
TOTALWRNF EQUIPMENT COSTS	
TOTAL FEDERAL-AGENCY EQUIPMENT COSTS	

Contract COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**COST / ITEM**
Contract Cost $250 per acre	
1. EDRR Suppression –39.71 acres	**67.23 (x250)= 16807.50**
2. EDRR – burn area roads and trails 27.52 acres	
3. Early eradication within burn perimeter EDRR- XX	
TOTAL COSTS	**18657.50**

SOURCE OF COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	P,E,M,T, C
3.	Estimate supported by cost guides from independent sources or other federal agencies	
4.	Estimates based upon government wage rates and material cost.	P,E,M,T, C
5.	No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

List Relevant Documentation and Cross-References within ESR Plan
Sylvan Fire BAER Integrated Noxious Weed Management Survey, Treatment and Monitoring Estimates

Survey/Potential Treatment Area	Acreage to be Monitored/Treated	Location	Estimated Days
R-2 WHITE RIVER Sylvan Fire	106.08	*All Primary and Secondary routes and adjoining suppression activities of the Sylvan Fire (miles + 50m buffer)	5 days
Total NFS Acres Noxious Weed Immediate Threat	**106.08 acres on FS (chemical/mechanical treatment & monitoring those treatments will be concurrent for small acreages)**		

See Attached Map – Final Sylvan Fire Soil Burn Severity & Noxious Weed Treatment Areas

Attachment B-Engineering Cost Broken Down

VI. Attachments

Table 4 Cost Breakdown NFSR 414.1

Treatment Description	Unit	Quantity	Unit Cost	Total	Remarks
Install Armored Critical Dip	Each	2	$4,350.00	$8,700.00	Obtain surfacing rock from Antone's Cabin Cr for W Brush Cr stream crossing
Debris Removal (Backhoe w/ Operators)	Hour	4	$280.00	$1,120.00	To be performed at Antone's Cabin Cr stream crossing
Stream Diversion/Dewatering	Each	1	$280.00	$280.00	To be performed at Antone's Cabin Cr stream crossing
Remove and Dispose of 48" Culvert (1' - 10' Fill Depth)	Each	1	$410.00	$410.00	To be performed at Antone's Cabin Cr stream crossing
Purchase and Install #10 Gauge 48" CMP	LF	32	$105.00	$3,360.00	To be performed at Antone's Cabin Cr stream crossing
Purchase and Install Structural Fill	CY	4	$85.00	$340.00	To be performed at Antone's Cabin Cr stream crossing
Reshape Road Prism at Stream Crossings	Mile	0.1	$1,100.00	$110.00	Approximately 125 ft to either side of the stream crossing
			Total	**$14,320.00**	

Table 5 Cost Breakdown NFSR 431.1

Treatment Description	Unit	Quantity	Unit Cost	Total	Remarks
Repair Armored Low Water Crossing	Hours	8	$280.00	$2,240.00	Reconfigure existing onsite materials
Debris Removal (Backhoe w/ Operators)	Hours	4	$280.00	$1,120.00	Use to reconstruct low water crossing
Repair Timber Crib Low Water Crossing	Hours	8	$280.00	$2,240.00	Salvage/obtain existing onsite materials
Materials Collection (Backhoe w/ Operators and Hand Crew)	Hours	4	$330.00	$1,320.00	Use to reconstruct low water crossing
Reshape Road Prism at stream crossings	Mile	0.1	$1,100.00	$110.00	Approximately 125 ft to either side of the stream crossing
			Total	**$7,030.00**	

Attachment C-Value At Risk Table

Sylvan BAER - FS Critical Value Table			**Click "Enable Content" in the upper left where it says, "SECURITY WARNING Macros have been disabled"** or this spreadsheet will not work c **Instructions:** Make sure to include enough information to be able to track logic and rationale for determinations of probability and magnitude in the risk assessment process. If needed, see the risk assessment matrix tab. Additional columns can be added at the end but do not delete columns.							
Value	**Life/ Property/ Resources**	**Critical Value**	**Threat to Value**	**Probability of Damage or Loss**	**Rationale for Probability**	**Magnitude of Consequence**	**Rationale for Magnitude**	**Risk**	**Treatment Options Considered**	**Recommended Treatment**
BAER critical value	Natural Resources - Soil and Water	Hydrologic function, soil productivity, vegetative recovery	Human traffic by foot, recreational vehicle or animal, motorized/non-motorized travel of-trail	Possible	Loss of plants, clearly defined trail location and change in view from trails due to the fire, make it easy and attractive to go off trail.	Minor	Changes in soil productivity, and hydrologic function expected to repair naturally over time	Low	Closure, informational signage, restrict site access to trail only, physical barriers along trail	Natural Recovery
BAER critical value	Natural Resources - Soil and Water	Leeman Gulch water quality and stream health	Potential for increased sedimentation from hill slopes in burned areas and/ or channel erosion from increased discharge	Possible	Sediment is more easily mobilized from burned areas and overland flow is more common from burned soils, however.	Minor	Damage to stream habitat, riparian areas and water quality likely to be localized and to recover naturally over time.	Low	Natural Recovery	Natural Recovery
BAER critical value	Natural Resources - Soil and Water	Antone's Cabin Creek water quality and stream health	Potential for increased sedimentation from hill slopes in burned areas and/ or channel erosion from increased discharge	Possible	Sediment is more easily mobilized from burned areas and overland flow is more common from burned soils	Minor	Damage to stream habitat, riparian areas and water quality likely to be localized and to recover naturally over time.	Low	Natural Recovery	Natural Recovery
BAER critical value	Natural Resources - Soil and Water	Borah Gulch water quality and stream health	Potential for increased sedimentation from hill slopes in burned areas and/ or channel erosion from increased discharge	Possible	Sediment is more easily mobilized from burned areas and overland flow is more common from burned soils	Minor	Damage to stream habitat, riparian areas and water quality likely to be localized and to recover naturally over time.	Low	Natural Recovery	Natural Recovery
BAER critical value	Natural Resources - Soil and Water	West Brush Creek water quality and stream health	Potential for increased sedimentation from hill slopes in burned areas and/ or channel erosion from increased discharge	Possible	Sediment is more easily mobilized from burned areas and overland flow is more common from burned soils, however.	Minor	Damage to stream habitat, riparian areas and water quality likely to be localized and to recover naturally over time.	Low	Natural Recovery	Natural Recovery
BAER critical value	Natural Resources - Soil and Water	Antone Spring range Water Development	Moderate chance of high volume debris flows could damage or completely wash out the water source causing incision in the channel where	Likely	About 1/2 of the watershed above the spring source was severly burned	Minor	Sedimentation could be removed from expession site of spring allowing it to flow.	Low	Shield the current source from debris flow hazards with some kind of physical barrier. Wait for burned area to revegetate and stabilize soil prior to reparing the spring development.	Natural Recovery
BAER critical value	Natural Resources - Soil and Water	Soil Productivity	Soil loss, erosion, reduced nutrient availability	Likely	Loss of formerly stable organic layer, loss of soil structure, hydrophobicity, mortality of soil organisms occuring in moderate/high sps	Minor	Will revover naturally over time	Low	Mulch, placing logs horizontally across hillslopes, soil amendments to breakdown hydrophobic layer and re-establish soil microbes	Natural Recovery
BAER critical value	Natural Resoures - Native Plants	livestock and wildlife forage	loss of native species forage in high and moderate burn severity areas due to invasive encroachment, use by livestock	Likely	Vegetation loss and soil damage have occurred in high and moderate burn severity areas	Minor	soil condition may not recover fully without treatment of invasive species and some reduction of use by livestock, however less than 1% of the allotment burned	Low	Rest allotment for the following season, reduce season of use on allotment, transport cattle through the area to break up soil.	Natural Recovery

Sylvan BAER - FS Critical Value Table

Click "Enable Content" in the upper left where it says, "SECURITY WARNING Macros have been disabled" or this spreadsheet will not work

Instructions: Make sure to include enough information to be able to track logic and rationale for determinations of probability and magnitude in the risk assessment process. If needed, see the risk assessment matrix tab.
Additional columns can be added at the end but do not delete columns.

Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Natural Resoures - Native Plants	Native species plants	Loss of Native species due to reduced native seed reserves in burned soils	Likely	Invasive species known populations are within dispersal range of the fire area.	Major	state listed noxious weeds exist within the dispersal area of the fire and have been disturned by supression and fire activity.	Very High	Chemical treatment and soil amendments, monitoring and removal of invasive species to prevent spread	EDRR
BAER critical value	Natural Resources - T&E habitat	Canada Lynx Habitat	Loss of habitat function due to loss of horizontal cover and loss of prey	Unlikely	Habitat will recovery from Moderate/High SBS over time and will function as horizontal Cover	Minor	temporal change	Very Low	Natural Recovery	Natural Recovery
Non-FS value	Natural Resources - Soil and Water	LEDE Reservoir, potable water system for Gypsum, CO	Potential for increased sedimentation from hill slopes or tributaries originating in burned areas					-	Coordinate with the Town of Gypsum	Coordinate with the Town of Gypsum
Non-FS value	Natural Resources - Soil and Water	Sylvan Lake Water Quality	Potential for increased sedimentation from hill slopes or tributaries originating in burned areas					-	Coordinate with Sylvan Lake State Park/CPW	Coordinate with Sylvan Lake State Park/CPW
BAER critical value	Property - Trails	Antone's Creek Trail (Forest Trail 1871)	Loss of trail stabilty due to increased runoff/sediment from upslope. Lack of definition makes the trail location difficult to see.	Likely	Trail is currently difficult to follow due to location of the high seveverity burn and loss of vegetation across a meadow making the trail on the other side difficult to see.	Minor	Loss of trail over time due to user created trails and failure to follow trail path.	Low	Trail needs maintenance to help define trail location and manage run off, informational Signs	Trail needs maintenance to help define trail location and manage run off, informational Signs
BAER critical value	Life and Safety	Antone's Creek Trail (Forest Trail 1871)	risk from snags along the trail, risk of injury due to fallen fire weakened trees, stump holes, burned area	Possible	Lower rate of use on trail, unlikely a person would be at the right place and time.	Major	Possible injury to human from falling tree could have Major consequences due to relatively difference in size and weight of a person to a tree	High	Remove Snags along the trail. Provide informational sinage explaining hazard.	Provide Infromational Signage at both entry points to burned area
BAER critical value	Property - Trails	Mt Thomas Trail (Forest Trail 1870)	risk to some trail segements below burned area due to loss of stability from increased runoff/sediment	Possible	relatively minor slope on burned area above trail, trail itself is around 20%. Steep trail traversing ridgeline.	Minor	Below low burn severity	Low	Drainage structures below low severity burn.	No Treatment Recommended
BAER critical value	Life and Safety	Mt Thomas Trail (Forest Trail 1870)	risk from snags along the trail, risk of injury due to fallen fire weakened trees, stump holes, burned area	Possible	Lower rate of use on trail, unlikely a person would be at the right place and time.	Major	Possible injury to human from falling tree could have Major consequences due to relatively difference in size and weight of a person to a tree	High	Remove Snags along the trail. Provide informational sinage explaining hazard.	Provide Infromational Signage at entry points to burned area

Sylvan BAER - FS Critical Value Table

Click "Enable Content" in the upper left where it says, "SECURITY WARNING Macros have been disabled" or this spreadsheet will not work

Instructions: Make sure to include enough information to be able to track logic and rationale for determinations of probability and magnitude in the risk assessment process. If needed, see the risk assessment matrix tab.
Additional columns can be added at the end but do not delete columns.

Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Property - Roads	Forest Road 431.1	Elevated postfire runoff and debris flows at low water crossings including the Leeman Creek ford and a timber low water crossing (Puncheon Bridge) at an unnamed tributary to West Brush Creek, both of which were partially destroyed during a recent July/August storm event.	Very Likely	Recently damaged low water crossings will be exposed to elevated stormwater runoff and post fire debris flow events resulting in further road/structure damage requiring future replacement/ reconstruction	Major	Substantial property damage will result from the loss of the low water crossings requiring future reconstruction to restore the service road to a passable condition.	Very High	Closure of road, repair/restore recently damaged fords to prefire conditions	repair/restore recently damaged fords to prefire conditions to accommodate increased post-fire flows
BAER critical value	Life and Safety	Forest Road 431.1	Falling trees, rolling rocks and other debris, washouts, debris flows, and loss of emergency egress on routes.	Possible	USGS debris flow modeling shows moderate risk of debris flows along FSR 414.1 in places. Immediate risk to anyone traveling within the fire perimeter due to increased sedimentation and debris, poor road conditions and hazard trees.	Major	Visitors/Recreating Public, Agency Personnel and Cooperating Agencies could be injured or killed if they encounter dangerous post-fire conditions. Motorists could be trapped in a damaged stream crossing or loss of life or injury could occur if a vehicle were to be immobilized by degraded conditions when attempting to cross during a flood/debris flow event.	High	Close road through summer 2022 until risk is reduced, seasonal closure during thundershower season, install gates to manage closure as needed. Install informational signs at entrance to burn. Close road to dispersed camping to reduce risk of stranded public. Install signs at all dispersed campsites, stating that camping is not recommended during high precipitation events. Educational Signage at entrance to burned area	Install gates for seasonal closure. Close area along the road to dispersed camping through summer 2022 then reasses risk. Educational signage at entrance to burned area.
BAER critical value	Property - Roads	Forest Road 414.1	Elevated postfire runoff and debris flows at undersized culverts including West Brush Cr and Antone's Cabin Creek stream crossings.	Very Likely	Undersized culverts may plug and overtop during elevated runoff and post fire debris flow events resulting in significant road damage in addition to the total loss of the culvert requiring future replacement in addition to road reconstruction/repair	Major	Substantial property damage will result from the loss of the culvert and associated road surface.	Very High	Close road, Replace existing undersized culverts, Install armored critical dips. Informational signage at entrance to burned area.	Replace existing undersized culverts, Install armored critical dips

Sylvan BAER - FS Critical Value Table

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Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Life and Safety	Forest Road 414.1	Falling trees, rolling rocks and other debris, washouts, debris flows, and loss of emergency egress on routes.	Possible	USGS debris flow modeling shows moderate risk of debris flows along FSR 414.1 in places. Immediate risk to anyone traveling within the fire perimeter due to increased sedimentation and debris, poor road conditions and hazard trees.	Major	Visitors/Recreating Public, Agency Personnel and Cooperating Agencies could be injured or killed if they encounter dangerous post-fire conditions. Motorists could be trapped in a damaged stream crossing or loss of life or injury could occur if a vehicle were to be immobilized by degraded conditions when attempting to cross during a flood/debris flow event.	High	Close road through summer 2022 until risk is reduced, seasonal closure during thundershower season, install gates to manage closure as needed. Install informational signs at entrance to burn. Close road to dispersed camping to reduce risk of stranded public. Install signs at all dispersed campsites, stating that camping is not recommended during high precipitation events. Educational Signage at entrance to burned area	Install gates for seasonal closure. Close area along the road to dispersed camping through summer 2022 then reassess risk. Educational signage at entrance to burned area.
BAER critical value	Cultural Resoures	Known Cultural Resources	Tree fall, site exposure, looting, erosion	Likely	Site Expose increases visibility (looting), however erosion of puncheon bridges is likely given the location	Minor	Most sites are historic in nature and have been visible to the public for years (transmission line, bridges/road crossings, ditches, trails) so most "threat to values" will be minor. Additionally the prehistoric sites are located in either unburned or low severity areas so probability of damage or loss to these sites is minor.	Low	No Recommended BAER Treatment	No Treatment Recommended
BAER critical value	Cultural Resources	Unknown Cultural Resources	Tree fall, site exposure, looting, erosion	Possible	There is approximately 3,337 unsurveyed acres within the fire perimeter so there is a high likelihood for additional cultural resource sites within the burned/treatment, and some possibility of damage given we don't know the locations.	Moderate	Previous cultural resource surveys surrounding the fire have a moderate/high density for prehistoric and historic sites - many Eligible to the National Register. Therefore, it is very possible to have potentially unknown eligible sites within the burn/treatment areas.	ntermediat	Cultural Resource surveys in BAER approved treatment areas prior to implementation.	Request 10 days of in-house labor for cultural surveys/reporting/consultation in BAER approved treaments areas.

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Value	**Life/ Property/ Resources**	**Critical Value**	**Threat to Value**	**Probability of Damage or Loss**	**Rationale for Probability**	**Magnitude of Consequence**	**Rationale for Magnitude**	**Risk**	**Treatment Options Considered**	**Recommended Treatment**
BAER critical value	Life and Safety	Forest Road 417.1a	Falling trees, rolling rocks and other debris, washouts, and loss of emergency egress on routes.	Possible	USGS debris flow modeling shows low risk of debris flows along FSR 417.1a in places. Immediate risk to anyone traveling within the fire perimeter due to increased sedimentation and debris, poor road conditions and hazard trees.	Major	Visitors/Recreating Public, Agency Personnel and Cooperating Agencies could be injured or killed if they encounter dangerous post-fire conditions. Motorists could be trapped in a damaged stream crossing or loss of life or injury could occur if a vehicle were to be immobilized by degraded conditions when attempting to cross during a flood/debris flow event.	High	Close road through summer 2022 until risk is reduced, seasonal closure during thundershower season. Install informational signs at entrance to burn. Close road to dispersed camping to reduce risk of stranded public. Install signs at all dispersed campsites, stating that camping is not recommended during high precipitation events. Educational Signage at entrance to burned area	Close area along the road to dispersed camping through summer 2022 then reassess risk. Educational signage at entrance to burned area.