

BURNED-AREA REPORT

(Reference FSH 2509.13)

during the mountain pine beetle epidemic. Engelmann spruce/ subalpine fir, some Douglas fir and aspen were also found in the area with small patches of non-forested vegetation. Tree density and understory composition and cover varied with aspect and slope. Common understory plants in forested areas include dwarf huckleberry, Ross' sedge, elk sedge, common juniper and forbs. Some areas within the fire perimeter were previously logged and were composed of more sparsely vegetated stands of young lodgepole pine. Open, non-forested areas on NFS lands were primarily wetlands, small kettle ponds, fens, and larger riparian areas composed of a combination of sedge meadows, willow carrs, and sparsely treed wetlands. Disturbed areas along Forest Service roads 511, 512, 543 and connecting NFS roads within the fire perimeter contain a combination of native vegetation and invasive weeds such as toadflax, oxyeye daisy, and Canada thistle.

- P. Dominant Soils:** Dominant soil types within the fire perimeter include the Taglake series and seasonally inundated Mollisols associated with riparian areas. Smaller components include the Ansel and Granile series. These soils are mostly well-drained and slightly to moderately erosive. They are typically characterized by coarse loam to sandy loam surface textures and many soils in the area have skeletal properties indicative of large amounts of rocks. Soil structure and fine roots were impacted by fire in high soil burn severity areas. Loss of the litter/duff layer and compromised structural integrity will exacerbate post fire erosion and will inhibit recovery in areas where these effects were most pronounced. Areas that remained unburned and those that experienced low burn severities were found to have a more natural structure (generally granular to subangular) with more organic matter and higher amounts of soil moisture. Recovery of small amount grasses and forbs was observed throughout the burned area and over the range of burn severities. Based on signs of early recovery, it is likely more extensive recovery will continue following snowmelt if normal soil moisture and climatic conditions exist. Complete consumption of heavy fuels was far less common than partial consumption of heavy fuels. Consumption of heavy surface fuels will likely detrimentally affect soil productivity over small areas but, overall, it is not believed that long term soil productivity will be an impediment to the continued recovery of plants during successive growing seasons. Debris flows and high rates of erosion are likely and expected within drainages that experienced moderate to high soil burn severity, especially in steep drainages where ground cover consumption was high.

- Q. Geologic Types:** The Medicine Bow Mountains are a mountain range in the Rocky Mountains that extend for 100-miles from northern Colorado into southern Wyoming. The northern extent of this range is the sub-range the Snowy Range. From the northern end of Colorado's Never Summer Mountains, the Medicine Bow Mountains extend north from Cameron Pass along the border between Larimer and Jackson counties in Colorado and northward into south central Wyoming. In Wyoming, the range sits west of Laramie, in Albany and Carbon counties. The area of the Keystone fire sits just east of this county divide in Albany County within the Upper North Platte River drainage.

The Medicine Bow Mountains resulted from continental compression during the Laramide Orogeny. Beginning about 70 million years ago, the Rockies began uplifting along thrust faults that broke up the Precambrian granite of the Earth's crust. By 50 million years ago, all of Wyoming's major mountain ranges were elevated and the major basins defined. Rocks exposed along the flanks and peaks of the Medicine Bow Mountains span the Precambrian to modern. The landscape today is representative of glaciation events and subsequent erosion. The most recent of these events is known as the Pinedale glaciation, preceded by the more extensive Bull-Lake glaciation.

R. Miles of Stream Channels by Order or Class: 2.2 miles perennial; 2.9 miles intermittent

S. Transportation System

Trails 0.7 miles Roads: 9.4 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 288 (11% Unburned) 848 (34% low) 876 (35% moderate) 515 (20% high)

The BAER team utilized a Burn Area Reflectance Classification (BARC) map to produce an accurate soil burn severity map in a short timeframe (see Map 1). The Burn Area Emergency Response (BAER) team acquired BARC images which covered most of the burned area. Following field review, minor systematic adjustments to the classification were made and the BARC map was adjusted to reflect field observations in the burn area.

B. Water-Repellent Soil (acres): Observations indicated strong repellency within a ¼ inch of the surface over moderate to high burn severities. Areas with coarse textured surface layers, high burn severities, and/or thick ash layers commonly had strong water repellency at depths of greater than ½ an inch. The pattern of water repellent soils is likely to be patchy and mosaic. While insufficient field data was collected to determine precise acreages of water repellent soils, the extent of water repellent soils is estimated to be approximately 20-30%% of the moderate and high burn severity areas.

Increased runoff due to hydrophobic conditions is reflected in the peak flow analysis contained in the Hydrology Report. Increased overland flow due to the hydrophobic conditions may increase hill-slope rill and sheet erosion. Hydrophobic layers will usually take six months to two years to break down. Plant root development, soil microbial activity, and freeze-thaw cycling all contribute to the degradation of hydrophobic conditions. More details are available in the soils specialist report.

C. Soil Erosion Hazard Rating (acres): 206 (none) 291 (slight) 1,992 (moderate) 0 (severe)

A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised. More details are available in the soils specialist report.

D. Erosion Potential: Erosion response is heavily influenced by soil burn severity and hill slope. Before the fire, most of the forested areas had protective ground cover in the form of litter, duff, or ground vegetation. Before the fire, minimal soil erosion occurred on forested hill-slopes within the burned area. Following the fire, the rates of erosion are expected to increase significantly because the burn affected soil aggregate stability, canopy cover, ground cover, and infiltration rates.

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 3-5 years following

the fire, particularly on steep slopes. More details are available in the soils specialist report.

- E. Sediment Potential:** Modeling results indicate that rates of erosion are very low (generally close to zero) in unburned densely forested areas. Rate of erosion will increase significantly to over 4 tons/acre on gentle (20%) forested hillslopes that were mapped at moderate or high soil burn severity. 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. 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 and second year following the fire, particularly on steep slopes. More details are available in the soils specialist report.

Post fire debris flow hazard: The United States Geological Survey (USGS)-Geologic Hazards Division provided predictive debris flow model results. The model generates predictions for channel and basin probability, volume, and combined hazard for several design storms. For this assessment, channel segment probability model results, based on 15 minutes of precipitation at an intensity of 24 millimeters per hour are displayed and described (see Map 2 & https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=102). Based upon the USGS hazard assessment and BAER team field observations and experience, we expect that, in response to 15 minutes of rainfall at 24 mm/hour:

- The probability that debris flows would occur in perennial main stem channels throughout the burned area is generally low. However, flooding and or entrainment of sediment and/or woody debris could occur.
- Throughout the burned area, the probability that debris flows could occur in first order tributaries within numerous burned watersheds is much higher, commonly 40-60%.
- There is a 40-60% probability debris flows could deliver materials to Keystone Creek

PART IV - HYDROLOGIC DESIGN FACTORS

The following contains the hydrologic factors used in the analysis and a comparison of pre to post-fire flow projections for the modeled precipitation events by watershed.

- | | |
|------------------------------------------------------------|-------------------------|
| A. Estimated Vegetative Recovery Period, (years): | 3-5 years |
| B. Design Chance of Success, (percent): | 80 |
| C. Equivalent Design Recurrence Interval, (years): | 25 |
| D. Design Storm Duration, (hours): | 1 |
| E. Design Storm Magnitude, (inches): | 1.25 |
| F. Design Flow, (cubic feet / second/ square mile): | 60 cfs/mi ² |
| G. Estimated Reduction in Infiltration, (percent): | 55% |
| H. Adjusted Design Flow, (cfs per square mile): | 106 cfs/mi ² |

Modeling of burned catchments associated with values at risk of the Keystone Fire was conducted to predict the increased flooding risk of a late summer convective storm. Modeling focused on catchments with the greatest values at risk, as well as the overall

Douglas Creek composite watershed downstream of Rob Roy Reservoir. Modeled catchments included Bear/Keystone Creek, Horse Creek, Douglas Creek and Podunk Creek, a small catchment within Douglas Creek with a CBPU water intake structure. The 10-year and 25-year 1-hour storms were modeled to represent a high intensity thunderstorm storm expected to occur in late summer and early fall.

Modeled Catchments

8 th field sub-watershed	HUC	Named streams in the fire perimeter	Total acres	Acres burned	Percent burned
Bear/Keystone Creek	1018000201040203	Keystone Creek	1,531	1,216	79%
Horse Creek	1018000201040202	Horse Creek	1,861	237	13%
Douglas Creek	1018000201040201	Douglas Creek, Flume Creek, Lewis Creek, Willow Creek, Jim Creek, White Swan Creek	6,587	735	11%
Podunk Catchment	null	Podunk Collection area	118	24	20%

Burned area by catchment modeled.

Acres by Burn Severity

Catchment name	Unburned acres/ percentage	Low acres/ percentage	Moderate acres/ percentage	High acres/ percentage	Total Watershed acres
Douglas Cr	5851/ 89%	356/ 5%	295/ 4%	83/ 1%	6,586
Bear/Keystone Cr	316/ 21%	319/ 21%	510/ 33%	387/ 25%	1,532
Horse Cr	1,624/ 87%	131/ 7%	61/ 3%	45/ 2%	1,861
Podunk Cr	97/ 82%	13/ 11%	8/ 7%	1/ 0.8%	118
Total	7,888/ 78%	819/ 8%	875/ 9%	515/ 5%	10,096

Burn severity percentages.

The results of the pre- and post-fire hydrologic modeling for the 10 and 25-year, 1-hour rain events are shown in the tables below.

Catchment Name	Area (sq. mi)	10 yr Design Flow (cfs/mi ²)	10 yr Adjusted Design Flow (cfs/mi ²)	10 yr Estimated Prefire Discharge from Design Storm (cfs)	10 yr Estimated Postfire Discharge from Design Storm (cfs)	% increase
Bear/ Keystone Creek	2.39	16	140	39	334	750
Horse Creek	2.91	26	38	76	111	45
Podunk Creek	0.18	42	61	8	11	46
Douglas Creek	10.29	25	35	262	357	36

10-year, 1-hour modeled storm event.

Catchment Name	Area (sq. mi)	25 yr Design Flow (cfs/mi ²)	25 yr Adjusted Design Flow (cfs/mi ²)	25 yr Estimated Prefire Discharge from Design Storm (cfs)	25 yr Estimated Postfire Discharge from Design Storm (cfs)	% Increase
Bear/Keystone Creek	2.39	44	232	105	555	429
Horse Creek	2.91	66	86	191	251	31
Podunk Creek	0.18	106	136	20	25	28
Douglas Creek	10.29	61	82	629	846	34

25 year, 1 hour modeled storm event.

Significant increases in flow are expected in the Bear/Keystone Creek drainage post-fire. Horse Creek, Douglas Creek and the Podunk catchment also have increased runoff post-fire, but to a lesser magnitude. These results should be interpreted with caution as numerous assumptions and simplifications of physical processes are embodied in the output. While absolute flow magnitudes may contain considerable uncertainty, relative increases in peak flow provide a more useful guide for understanding the general extent of alteration of a catchment's soil hydrologic function. More details are available in the hydrology specialist report.

PART V - SUMMARY OF ANALYSIS

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

A BAER Risk Assessment (FSM 2523.1 Ex 2) was completed for *Critical Values* in and downstream of the Keystone burn area the table below summarizes where the level or risk warrants recommended treatments:

Value At Risk	Probability of Damage or Loss	Magnitude of Consequence	Risk Level	Treatment Recommended
Human Life and Safety				
Public Safety	Likely	Major	Very High	Yes
Property				
Roads	Likely	Moderate	High	Yes
CBOPU Infrastructure	Likely	Moderate	High	Yes
Natural Resources				
Native Plant Communities/ Noxious weeds	Very Likely	Moderate	High	Yes
Water quality – municipal water supplies	Likely	Moderate	High	Yes
Cultural Resources				

Heritage Sites	Possible	Major	High	Yes
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Additional critical values were considered (see project file), but the level of risk did not warrant recommending a treatment.

Human Life and Safety:

Hazard trees: Threats to life and safety are highest on infrastructure used by the public and agency personnel such as roads located within moderate or high soil burn severity. Hazard tree safety concerns existed prior to the fire due to the beetle-kill timber, and these hazards have been further exacerbated by the fire. Burned trees, especially those previously impacted by beetle, are a high risk hazard due to the risk of injury or death from falling trees. Additionally there is increased hazard for forest users beyond this infrastructure such as hunters and others occupying the burned areas. There is a high likelihood of hazard trees falling in the vicinity of Forest users. BAER information/outreach treatments are recommended to reduce the human safety risk.

Flooding and Debris Flow: There is a higher probability of increase flood flows within and downstream of the burn area, especially in the Keystone Creek drainage and along National Forest System Road 586. There is also a higher probability of debris flows within the burn area, especially in steep, high burn severity headwater drainages. There is potential for Forest users in the area to be exposed to elevated flood flows and/or debris flows with little warning. BAER information/outreach and administrative road closure treatments are recommended to reduce the human safety risk.

Emergency Determination: Increased threats to human life and safety from hazard trees and debris flows is likely, and the magnitude Major resulting in a Very High risk rating and therefore a burned-area emergency exists.

Property:

Roads: Roads and road/stream crossings within the burned area are at risk from impacts from increased water, sediment, and/or debris. Severely burned slopes and drainages exist above several roads in many locations. Impacts include damage to the road and/or loss of access due to severe erosion of the road surface, or deposition of sediment or debris. Roads within the burned area are also likely to exacerbate the risk of flooding and erosion by collecting surface water, concentrating it and delivering it to hillslopes or stream channels. BAER road treatments are recommended to minimize the damage to the roads.

CBOPU Infrastructure: NFSR 556.01 on NFS lands, which is used to access Cheyenne Board of Public Utilities water supply infrastructure within the burned area, is at risk from impacts from increased water, sediment, and/or debris. Burned slopes and drainages exist above NFSR 556.01 in select locations. Impacts include damage to the road, loss of access and/or damage to the pipeline in the road due to severe erosion of the road surface, or deposition of sediment or debris. BAER coordination and information sharing treatments are recommended to facilitate Cheyenne Board of Public Utilities ability to minimize the damage to the road.

Emergency Determination: The probability of loss or damage to roads is Likely and the magnitude of consequence is Moderate, therefore, the BAER risk is High and a burned-area emergency exists.

Natural Resources:

Native Plant Communities/Noxious Weeds: There are no known occurrences of Threatened or Endangered plant species within the fire perimeter.

The integrity of native plant communities are at risk from non-native plant (weed) invasion following the Keystone fire. Forest Service policy mandates the Forest to minimize the establishment of non-native invasive species to prevent unacceptable degradation of the burned area. Plant communities most at risk include areas with the highest soil burn severity, those closest to roads and other seed transportation corridors, those closest to known populations of weeds (including populations on private lands), and those in recent areas of timber harvest. Native plant communities are a critical resource for maintaining the ecological integrity of Forest Service lands and providing habitat for a large variety of wildlife species.

A large number but limited distribution of non-native and noxious weed species were known to occur in the fire scar previously. Populations were relatively small and almost exclusively restricted to roadsides, timber harvest units, private lands, and other disturbed areas. However, all of these species are known to increase in patch size and distribution post-fire event. The noxious weeds known from the area include musk thistle (*Carduus nutans*), Canada thistle (*Cirsium arvense*), dalmation toadflax (*Linaria dalmatica*), yellow toadflax (*Linaria vulgaris*), oxeye daisy (*Leucanthemum vulgare*), and spotted knapweed (*Centaurea maculosa*). Additionally, cheatgrass (*Bromus tectorum*), though not previously known from the area, can typically experiences landscape-scale population explosions post-fire. The areas that experienced roadside timber harvest (to create fuel breaks) followed by forest fire are thought to be most at risk from cheatgrass and noxious weed invasion. This is because the logging equipment and other incident-related vehicles on the roadsides may introduce cheatgrass and/or other noxious weeds, while the fire created optimal conditions for germination, establishment, and spread. BAER Early Detection and Rapid Response weed treatments are recommended to minimize the damage to the native plant communities.

Water Quality – Municipal Water Supply: Large sediment increases are expected. These increases will be of short term duration, recovering to pre-fire conditions over time with the worst impacts occurring over the next three years. During this time there is high potential for degradation of water quality due to increased sediment loading at intake locations for the CBOPU with the greatest concern being the intake on Horse Creek. BAER coordination and information sharing treatments are recommended to facilitate Cheyenne Board of Public Utilities ability to minimize municipal water quality impacts.

Emergency Determination: Invasive species establishment and expansion resulting in loss or damage of native plant communities is Very Likely and the consequences are Moderate, therefore the BAER risk is High and a burned-area emergency exists.

Water quality impacts resulting in loss or damage to municipal water supplies is Likely and the consequences are Moderate, therefore the BAER risk is High and a burned-area emergency exists.

Cultural and Heritage Resources:

Cultural Resources: Threats to cultural resources has increased due to predicted increased flood flows, erosion and sediment, and potential debris flows. Flood flows exacerbated by sediment bulking and/or debris flows threaten to erode and damage cultural resources on NFSR

586. BAER road treatments are recommended to minimize the damage to the cultural resources along the road.

Emergency Determination: The probability of loss or damage to cultural resources along NFSR 586 is Likely and the magnitude of consequence is Moderate, therefore, the BAER risk is High and a burned-area emergency exists.

B. Emergency Treatment Objectives (narrative):

Human Life and Safety:

Human Life and Safety: Reduce the risk of loss of life or injury to humans from burned trees falling, debris flows and flooding.

Property:

Roads: Minimize damage to road infrastructure from expected increases in runoff from the burn area; minimize impacts to natural resources from erosion, sedimentation and road or road/stream crossing failure; minimize risk to life/safety concerns with road failure or loss of access.

CBOPU Infrastructure: Facilitate Cheyenne Board of Public Utilities ability to minimize the damage to NFSR 556.01 from expected increases in runoff from the burn area.

Natural Resources:

Native Plant Communities/Invasive Weeds: Minimize introduction and expansion of invasive species into native plant communities.

Water Quality – Municipal Water Supply: Facilitate Cheyenne Board of Public Utilities ability to minimize impacts to municipal water supplies from expected erosion and sedimentation from the burn area.

Cultural and Heritage Resources:

Cultural Resources: Minimize damage to cultural resources from expected increases in runoff from the burn area.

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

Land 80% Channel n/a Roads/Trails 80% Protection/Safety 90%

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	70	80	80
Channel	n/a	n/a	n/a
Roads/Trails	80	90	100
Protection/Safety	80	90	100

E. Cost of No-Action (Including Loss): \$374,190 (reflects monetary cost only, does not reflect non-market values)

Extensive repair or reconstruction of roads at increased risk of post-fire effects is estimated to be \$199,200 based on the existing IDIQ contract on the Forest. Loss of access for recreation/tourism, permittees, and administration is estimated at \$25,000. There is a threat to life and safety as well as natural resources that have non-monetary value. The VAR tool was used to assess the cost benefit of implementing the treatments, and indicated that treatments were justified with a ratio of 2.4. The VARTool Calculation Spreadsheet is available in the project file. As described in this report, increased risk for impacts to life/safety and non-market cultural and ecological values exists throughout the burned area. These values were not addressed in the VAR Assessment nor considered in the benefit/cost ratio.

F. Cost of Selected Alternative (Including Loss): \$62,067

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input type="checkbox"/> Range
<input type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input type="checkbox"/> Archaeology
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input type="checkbox"/> GIS

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BAER Team Members

Soils
Hydrology
Vegetation/Botany/Invasive Weeds
Engineering
Wildlife
Fisheries
Cultural Resources
Cheyenne BOPU Liason
NRCS liason
USGS Debris Hazard

Eric Schroder/Ryan Adams (trainee)
Liz Schnackenberg/Katie Buchan (trainee)
Katie Haynes
Ryan Nupen/Nate Davis (trainee)
Sean Harkins (consulation only)
Bill Baer (consultation only)
Tara Hamilton (consultation only)
Casey Whitman
Ruben Vasquez
Francis Rengers

H. Treatment Narrative:

The proposed treatments on NFS lands can help to reduce the impacts to critical values at risk, but treatments cannot fully mitigate the potential effects. Detailed information of the treatments summarized below can be found in the specialist reports prepared in support of this funding request. The treatments listed below are those that are considered to be the most effective to protect identified values at risk NFS lands.

Land Treatments:

Invasive Weeds: Early Detection Rapid Response surveys: This treatment is to reduce the potential for impaired vegetative recovery and loss of native plant communities due to the spread of invasive weeds by conducting detection surveys and rapid response eradication efforts in the areas identified as being at the highest risk. High risk areas are those burn areas that contain know weed populations, or suppression disturbances (ie dozer line etc) adjacent to known weed population, and where vectors exist such as roads. Approximatley

4 miles of roadside are mapped as having existing patches or individual noxious weed plants and believe another 5 miles of previously un-infested roadside are at risk. The estimated acreage with high risk for invasion (treat + monitor) is approximately 74 acres roadside and 90 acres patch cuts, with an additional 153 at moderate risk for invasion (monitor only).

EDRR monitoring will begin in 2018 during the detection periods of noxious weed species. Crews will simultaneously monitor for and treat noxious weeds and cheatgrass. Treatment methods may include boom spraying operations, backpack spraying, changes to grazing methods, cultivation, hand pulling or biological control. As encountered, weed populations will be documented, mapped, and spot or boom treated with appropriate methods.

Channel Treatments: None recommended.

Roads and Trail Treatments:

Road treatments were identified on NFSRs 586, 586.A, 511, 543, and 507, to include:

- Road/drainage stabilization with rolling dips, waterbars, and cleaning and replacement of damage of culvert inlets and cleaning ditches.
- Installation of a overflow/relief dip in NFSR 543, south to the Keystone Creek bridge, to prevent water/debris from running down/south on NFSR 543 in the event of flood or debris events exceeding the capacity of the bridge. Removal of brush up and downstream of bridge.
- Removal of two undersized 36" culverts and road fill across Keystone Creek on a non-system road.
- Stormproofing closed system roads (NFSR 586.A), by removal of existing culverts and creation of drainage ditches across the road.
- Treatment of hazard trees where necessary to protect workers implementing BAER treatments
- Repair/replacement of gates to facilitate BAER recommended administrative road closures for safety.
- Storm patrol.

Specific treatments and cost estimates for road treatments are based on costs from an existing IDIQ contract that the MBR NF already has in place. Specific treatments by road are detailed in the engineering report.

Protection/Safety Treatments and Interagency Coordination:

Treatments to address life and safety concerns include:

- Continuing the administrative closure to public motorized use on NFSR 586, (currently road has an emergency closure due to fire suppression and a routine seasonal closure from November 15 to April 30) until risk of post-fire flooding and debris flow are minimal, likely 3-5 years. An emergency closure order would be put in place; gates at both ends repaired or replaced; and closure signage installed near both gates. The closure would be reviewed annually until risk is reduced. Non-motorized access would not be included in the BAER closure, but hazard information would be posted for non-motorized users.

- Posting of hazard warning signs at key portal entrances notifying the public of post-fire hazards. This signing will address the threats of hazard trees as well as flood and debris flow potential.
- Provide public information on potential threats to life, safety and private property residences. Outreach could include press releases, news articles, posting information on the internet and/or creation and dissemination of brochures. The primary objective is to share information and discuss potential protective measures that could be implemented.

In addition, there is a need to continue the interagency coordination initiated during the BAER assessment. This involves communication and coordination with other federal, state and local agencies with jurisdiction over lands where life or property are at risk from post-fire conditions.

- Coordinate with the National Weather Service (NWS), Albany County Emergency Services, Sheriff's Office and the Natural Resources Conservation Services (NRCS) to discuss potential threats to life, safety and private property in the vicinity of Keystone. The primary objective is to share BAER assessment information and discuss potential protective measures that could be implemented.
- Coordinate with Wyoming Game and Fish to provide information about post fire threats to life/safety of people with permits to hunt in the burned area and also emergency administrative road closures.
- Coordinate with NRCS and Laramie Rivers Conservation District to discuss potential post fire issues regarding noxious weeds.
- Coordinate with area property owners on rationale and timing of BAER treatment implementation.

Treatments to address property and natural resource (municipal water supply & infrastructure) concerns include:

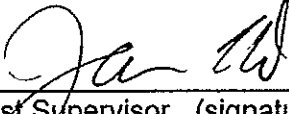
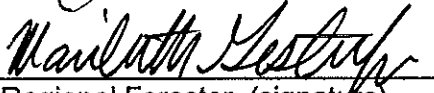
- Coordinate with the Cheyenne Board of Public Utilities to continue to discuss potential threats to municipal water supply & infrastructure. The primary objective is to share information, discuss potential protective measures that could be implemented by Cheyenne Board of Public Utilities and facilitate CBOPU implementation of protective measures they deem warranted to address post-fire threats to critical values.

I. **Monitoring Narrative:** Implementation monitoring will be accomplished during implementation of BAER treatments and is included in treatment cost estimates.

Part VI – Emergency Stabilization Treatments and Source of Funds – Initial Request

Line Items	Units	Unit Cost	NFS Lands		Other \$
			# of Units	BAER \$	
A. Land Treatments					
Noxious Weed EDRR					
Personnel				\$0	
GS-11 Range	Days	375	10	\$3,750	
GS-05 Range	Days	200	20	\$4,000	
GS-04 Range	Days	179	20	\$3,580	
Fleet	LS	1049	1	\$1,049	
Supplies (herbicide)	LS	2186	1	\$2,186	
<i>Subtotal Land Treatments</i>				\$14,565	\$0
B. Channel Treatments					
<i>Subtotal Channel Treat.</i>				\$0	\$0
C. Road and Trails					
Restore Drain Func	Miles	800	2	\$1,600	
Brush Stream Chan	Site	1000	1	\$1,000	
Driveable waterbar	Each	500	17	\$8,500	
Relief Dip	Each	1300	1	\$1,300	
Clean Culverts	Each	100	41	\$4,100	
Clean Ditch	LF	1	8572	\$8,572	
Replace 18" cul end	Each	780	1	\$780	
Remove culverts	LF	25	60	\$1,500	
Install gates	Each	1000	2	\$2,000	
Install portal signs	Each	1100	4	\$4,400	
Storm Patrol	Miles	500	5	\$2,500	
<i>Subtotal Road & Trails</i>				\$36,252	\$0
D. Protection/Safety					
Personnel					
GS-11 Agcy Coord.	Days	400	10	\$4,000	
GS-11 PAO	Days	400	10	\$4,000	
Team Lead	Days	350	5	\$1,750	
Materials/Supplies	LS	1500	1	\$1,500	\$0
<i>Subtotal Structures</i>				\$11,250	\$0
E. BAER Evaluation					
	LS		1		\$15,000
<i>Subtotal Evaluation</i>				—	\$15,000
F. Monitoring					
<i>Subtotal Monitoring</i>				\$0	\$0
G. Totals				\$62,067	\$15,000
Previously approved					
Total for this request				\$62,067	

PART VII - APPROVALS

1. 
Forest Supervisor (signature)
2. 
Regional Forester (signature)

8/4/17
Date

8/9/2017
Date