Date of Report: 10/28/19

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: Decker Fire

B. Fire Number: CO-RGF-001388

C. State: Colorado

D. County: Chaffee, Fremont, Saguache

E. Region: 02

F. Forest: Pike-San Isabel (PSICC) and Rio Grande (RGNF)

G. District: Salida, Saguache

H. Fire Incident Job Code: P2MR8R (0209)

I. Date Fire Started: September 8, 2019

J. Date Fire Contained: Expected 12/20/19

K. Suppression Cost: $22.2 million (10/26/19)

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

1. Fireline repaired (miles): 22.8 Dozer; 28.2 handline
2. Other (identify): Drop points; heli-spots, safety zones

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
110200010901	Bear Creek	10,470	3,920	37.4
130100030201	Headwaters San Luis Cr	31,085	3,496	11.2
110200010902	King Gulch-Arkansas River	10,160	265	2.6
110200010902	Maverick Gulch-Arkansas River	23,314	1,210	5.2
130100030202	Rock Creek	27,612	124	0.4

N. Total Acres Burned: Acres represent BARC perimeter, not suppression fire perimeter**.**

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	8679
OTHER FEDERAL (LIST AGENCY AND ACRES)	BLM-71
STATE	0
PRIVATE	265
TOTAL	9015

O. Vegetation Types: Vegetation types within the Decker fire area consist mostly of spruce-fir (2,564 acres), Douglas fir/warm-dry mixed conifer (1,720 acres), aspen (1,123 acres), aspen/cool-moist mixed conifer (1,012 acres), pinyon-juniper forests (1,018), and mountain grass and shrubland communities (1,209 acres). Small areas of riparian and alpine vegetation are also present within the burn perimeter. Warm-dry mixed conifer on the Rio Grande NF is classified by the presence of Douglas fir and bristlecone pine whereas drier, mixed conifer sites on the PSICC are characterized by the presence of Douglas fir, ponderosa pine and lodgepole pine.

P. Dominant Soils: The soils in the Sangre de Cristo area are typical of mountain soils throughout the Rocky Mountains. Primary soil families are Leighcan and Pergrin composed of decomposed parent materials muscovite-biotite gneiss, hornblende gneiss, residuum and colluvium, muscovite schist, and siltstone. Textures range from sandy loam to large boulders on steep mountain slopes, stream bottoms, and alluvial fans.

Q. Geologic Types: Precambrian metamorphic rocks and young Paleozoic sedimentary rocks comprise most of the surface area of this mountain range. The Precambrian crystalline rocks, which occur the length of the range, are composed of several types of gneiss and of smaller amounts of granite and meta-diorite which have been intruded into the older gneissic rocks. The Sangre de Cristo Mountains were most recently affected by the Pleistocene glaciation. Course outwash materials pouring out of melting glaciers were deposited near the base of the mountain range and extend out into the surrounding basins. Primary rock units on the Decker Fire include gneiss, gabbro, siltstone, and alluvium.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERRENIAL	14.8
INTERMITTENT	22.1
EPHEMERAL	21
OTHER (DEFINE)	

S. Transportation System:
Trails: *National Forest (miles):* PSICC: 5.9; RGNF: 7.0 *Other (miles):*
Roads: *National Forest (miles):* PSICC: 5.5; RGNF: 3.9 *Other (miles):* 0.9 BLM and private

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	1776	BLM-8	0	29	1813	20%
Low	3410	BLM-30	0	67	3507	39%
Moderate	3392	BLM-30	0	144	3566	40%
High	101	BLM-3	0	25	129	1%
Total	8679	BLM-71	0	265	9015	100%

B. Water-Repellent Soil (acres):

Soil Burn Severity	High Repellency Acres	Mod-High Repellency Acres	Moderate Repellency Acres	Low Repellency Acres
Unburned	102	447	318	947
Low	384	1036	341	1746
Moderate	385	989	461	1729
High	9	30	66	25
Total	880	2502	1186	4447

C. Soil Erosion Hazard Rating:

Soil Burn Severity	High EHR Acres	Moderate EHR Acres	Low EHR Acres
Unburned	808	988	17
Low	1043	2410	54
Moderate	936	2403	227
High	71	47	11
Total	2858	5848	309

D. Erosion Potential: 2 Tons/Acre (For High SBS)Sediment Potential:

Soil Burn Severity	Tons/Acre Forested	Tons/Acre Shrub
Low	0.33	0.1
Moderate	0.5	0.23
High	1.99	0.63

F. Estimated Vegetative Recovery Period (years): 3-5 years for effective ground cover

G. Estimated Hydrologic Response (brief description): The Wildcat 5 Rainfall-Runoff Hydrograph Model (Hawkins and Greenberg 2013) was used to predict increases in peak flows resulting from the fire. Two separate design storms were used in this analysis. The 2-year, 30-minute storm was chosen to represent a high intensity monsoonal storm that has a 50 percent chance of occurring in the next year. The 10-year, 30-minute storm was used to represent a stronger thunderstorm since this area often has storms that stalls over it and produces heavy rainfall in a short time frame. The design storm magnitudes found using the NOAA

Precipitation Frequency Data Server were 1.05 inches and 1.67 inches, respectively (Perica et al. 2013). Experience with other natural and prescribed fires indicates that while storms of 0.5 inch or greater will cause erosion and elevated floods and sediment loads, it is typically 1 inch or greater high intensity storms that produce significant damage. The drainages modeled were used to inform and provide guidance for road and trail treatments. The table below shows the estimated increase in streamflow based on the two storm events.

Modeled Drainage Names	2-year, 30-minute storm event (1.05 in/hr)		10-year, 30-minute storm event (1.67 in/hr)	
	Relative Percent Increase	Times Increase	Relative Percent Increase	Times Increase
Rainbow Trail at Bear Creek	641%	7.4	892%	9.9
Rainbow Trail at Loggie Gulch	274%	3.7	207%	3.1
King Gulch at Forest Service Boundary	192%	2.9	142%	2.4
101 Road Crossing	51%	1.5	52%	1.5
Bear Creek at 101 Road	432%	5.3	484%	5.8
Rock Creek at 101 Road	237%	3.4	208%	3.1
Columbine Trailhead	303%	4.0	264%	3.6
North Decker Creek	167%	2.7	147%	2.5
Dorsey Creek	525%	6.2	536%	6.4
Bear Creek Trailhead	65%	1.6	40%	1.4
North Rock Creek	40%	1.4	42%	1.4

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Decker Fire started September 8, 2019 by lightning approximately nine miles south of Salida, Colorado on the Rio Grande National Forest; it subsequently spread onto the San Isabel Forest to within two miles of the town of Salida. Due to concerns with potential fire effects to Salida and other local communities, a Type 1 incident management team was assigned. The fire affected largely NFS lands on the Rio Grande and Pike/San Isabel National Forests with some effects to private and BLM lands. As of this initial assessment, the fire is 84% contained with a projected containment date of December 20, 2019. The BAER assessment commenced on October 21, 2019, with the final report completed October 28, 2019. The VAR spreadsheet in the project file summarizes critical values evaluated and the risk assessment to identify where a BAER emergency exists that warrants treatment. Risk assessment focused on the most probable damaging storm events which are high intensity short duration thunderstorms during the July/August monsoon season.

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

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):

a. Human life/safety is at risk from threats associated with snags, debris flows, increased flooding, and loss of egress/access on roads. Snags at the lower Methodist trailhead area of concentrated use pose a risk to human safety.

b. Abandoned mines pose a serious threat to human health and safety for both physical injuries and possibility of suffocation due to reduced oxygen levels in open features. Abandoned mines within the burned area are more visible to members of the public now that the ground cover and vegetation has been removed.
c. Human life/safety would be threatened if power to the communication site on Methodist Mountain was lost since this is the primary repeater for the Salida Ranger District.

2. Property (P): Loss of road and trail prism and fuction could occur from increased erosion, flooding and debris flows for road and trail sections within and downstream of areas of moderate/high SBS. Roads provide critical access to communication sites and trailheads. Outdoor based recreation is a key component of the local economies, and loss of trails and road access could have substantial effects. Affected roads include NFSRs 101, 106, 108, 948, 982, and 990; trails include 1336, 1416, 1426, 757, and 758. Road and trail failures could also affect municipal and gold medal fisheries water quality within and downstream of the burned area. Historic public land survey monuments that control the public land boundaries are at risk of being obliterated from flash flooding, landslides, debris flow, and falling hazard trees which may result from the fire. Many of these are located in floodplains and on steep, unstable slopes Historic cadastral markers made of piled stone/rock are at risk of being destabilized and/or eroded. Re-calculating the positions in order to re-establish corners could result in an altered shape and location of the property boundaries as they exist on the ground today. This could lead to an adverse effect on the patented rights of the surrounding property owners which could result in future title claims against the United States of America by those affected. These threats are being addressed through the long-term rehabilitation pilot program (see Addendum 1). **Natural Resources (NR):**Native plant communities are at risk of invasion by known populations of Colorado State listed noxious weeds adjacent to areas of high and moderate SBS, and areas disturbed by suppression actions.

4. Cultural and Heritage Resources: No BAER emergencies were identified.

B. Emergency Treatment Objectives:

a. Minimize threats to life/safety to the extent possible through administrative closures and signing. Ensuring functionality of the Methodist Mountain FS repeater site would also protect life/safety.
b. Prevent threats to human life/safety in unstable areas surrounding abandoned mines, and hazards associated with the mines such as open and/or reduced oxygen.
c. Storm proof and stabilize roads and trails to protect the property investment and maintain access for administration, the public, and to communication sites; this would also protect municipal and gold medal fishery water quality.
d. Promote revegetation and soil stabilization by native plant communities through early detection/rapid response surveys to minimize the spread of Colorado State listed noxious weeds; this would also improve water quality.
e. Retain the exact location of existing public land survey monuments as part of the long-term rehabilitation program (Addendum A).

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

Land 90 **Channel** NA
Roads/Trails 80 **Protection/Safety** 90

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Land	80	80	80
Channel	NA	NA	NA
Roads/Trails	80	85	90

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Protection/Safety	80	90	90

E. Cost of No-Action (Including Loss)[1]: PSICC: $356,200; RGNF: $86,000

F. Cost of Selected Alternative (Including Loss): PSICC: $126,363; RGNF: $65,754

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Liz Schnackenberg
Email: liz.schnackenberg@usda.gov **Phone(s)** 970.870.2234; 970.819.2900

Forest BAER Coordinator: Steve Sanchez
Email: steven.a.sanchez@usda.gov **Phone(s):**719-553-1518; 719-849-1282

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

Skill	Team Member Name
Team Lead(s)	Liz Schnackenberg/ Cait Woods
Soils	Leah Shipstead/ Patrick Moran (T)
Hydrology	Jamie Krezelok
Engineering	Aaron Lamp
GIS	Gordon Bowman (BLM)
Archaeology	Amanda Sanchez/Steve Matt (NPS)
Weeds	Beth Davis
Recreation	Ben Lara/Greg Hamilton (T)
Other	Sean Hines (Cadastral); Stephanie Shively (Wildlife)

H. Treatment Narrative:Land Treatments: Early detection/rapid response (EDRR) surveys will focus on areas of high and moderate soil burn severity adjacent to known Colorado State listed noxious weeds, as well as areas disturbed by suppression activities. 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 existing county agreements. 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. Treatments would be implemented through contracts with the counties.

[1] E and F do not include cost of life/safety threats or loss of native plant communities. The VAR-lite tool was used for the cost benefit analysis and is available in the project file.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC - EDRR Contract -160 acres	Acres	$1,150	15	$ 17,250
PSICC- Contract prep/admin	Day	$455	5	$2,275
RGNF - EDRR Contract- 95 acres	Day	$1,150	10	$ 11,500
RGNF- Contract prep/admin	Day	$455	5	$2,275

Channel Treatments: None

Roads and Trail Treatments: Treatments address both the road/trail prism, as well as stream crossings where there is a high probability of failure due to increased debris, flood flows, and debris flows. Road treatment costs reflect IDIQ contract for implementation.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC – IDIQ Contract Prep and Admin	Days	$375	15	$ 5,625
RGNF – IDIQ Contract Prep and Admin	Days	$375	10	$ 3,750

RT1a- Road Stormproofing: Road stormproofing involves cleaning or armoring of existing drainage structures, as well as recently installed treatments to remove accumulated sediment and expand existing features to ensure drainage capacity prior to seasonal storms, reducing the risk to the transportation infrastructure.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC - RT1a. Road Drainage (Stormproofing)	Miles	$1,435	7.7	$ 11,049
RGNF - RT1a. Road Drainage (Stormproofing)	Miles	$1,435	2.2	$ 3,157

RT1b: New Drainage Features: Drainage dips are used to drain water effectively from the road surface and prevent concentration of water. Drainage dips also provide a relief for surface water flow on the road and serve as a relief valve in the event of culvert plugging.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC - RT1b. Road Drainage (New Drainage)	Each	$350	30	$ 10,500
RGNF - RT1b. Road Drainage (New Drainage)	Each	$350	14	$ 4,900

RT2- Storm Inspection and Response: Storm Inspection and Response will keep culverts and drainage features functional by cleaning sediment and debris from drainage features between storms with the intent to retain the effectiveness of the above treatments. This work will be accomplished with Forest Service local engineering conducting surveys, and contract for implementation.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC - RT2. Storm Inspection and Response	Miles	$1,623	7.7	$ 12,497
RGNF - RT2. Storm Inspection and Response	Miles	$1,623	2.2	$ 3,571

RT3a: Culvert Removal - Work will include removal of existing culverts and a rough expansion of the crossing to more closely reflect the pre-existing drainage channel dimensions. This will allow a greater capacity for the channel to respond to storm flows and pass debris without damaging or plugging culverts which would result in cascading road failures and increased sediment to stream courses.

Treatment	Units	Unit Cost	# of Units	Total Cost

PSICC – RT3. Culvert Removal	Each	$750	4	$ 3,000
RGNF – RT3. Culvert Removal	Each	$750	1	$ 750

RT3b: Hardened Ford Crossing - Work will include import and placement of small riprap to armor crossings created by culvert removals detailed in RT3 where continued access for either the public or FS staff is required.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC - RT4. Hardened Ford Crossing	Each	$2,650	4	$ 10,600
RGNF - RT4. Hardened Ford Crossing	Each	$2,650	1	$ 2,650

T1: Trail Stabilization: Stabilize trail tread as necessary to limit erosion potential and to ensure safe use and travel on the trail for BAER treatment crews. Clearing and improving undamaged drainage structures to ensure capacity to respond to increased runoff (water bars, check dams, rolling dips). Remove/Repair areas of slumping and sloughing. Stabilize the cut and fill slopes as needed. Work will include snagging trees as appropriate for worker safety.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC – Trail stabilization	Each	$5,000	5	$ 25,000
RGNF – Trail stabilization	Each	$5,000	2	$ 10,000

T2: Trail Storm Patrol: Will keep culverts and drainage features functional by cleaning sediment and debris from drainage features between or during storms. Provide trail and bridge inspection to keep drainage features functional by cleaning sediment and debris and re-establishing drainage as needed following storm events to retain the effectiveness of the trail stabilization treatments.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC - T2. Storm Inspection and Response	Miles	$660	10	$ 6,600
RGNF - T2. Storm Inspection and Response	Miles	$660	5	$ 3,300

Protection/Safety Treatments:

P1: Road Hazard/Closure Signs: This treatment will install burned area warning signs at key road entry points to caution forest users. This work will be accomplished with Forest Service force account or contract.

Sign Type	Location
PSICC - P1a. Entering Burned Area, Fallen Rocks and Debris.	NFSR 101 at FS Boundary
	NFSR 101 at Columbine TH
	NFSR 101 at Bear Creek TH
	NFSR 106 at Rainbow Trail TH
	NFSR 108 at FS Boundary
	NFSR 108 at Rainbow Trail TH (Lower)
	NFSR 108 at Rainbow Trail TH (Upper)
RGNF - P1a. Entering Burned Area, Fallen Rocks and Debris.	Access to NFSR 980 on State Land at US-285
	NFSR 982 at FS Boundary
	NFSR 990 at FS Boundary

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC - P1a. Road Hazard Signs	Each	$ 370	7	$ 2,590
RGNF - P1a. Road Hazard Signs	Each	$ 370	3	$ 1,110

P2 Administrative Road Closure Gate: This treatment will install temporary closure gates with required signing to prevent access to high risk areas in the years immediately following the fire. These closures will eventually be rescinded as determined by FS administration.

Closure Type	Location
PSICC - P2. Gate Closure	NFSR 101 at FS Boundary
	NFSR 108 at FS Boundary
PSICC - P2. Gate Closure	NFSR 990 at FS Boundary

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC - P2. Gate Closure	Each	$4,990	2	$ 9,980
RGNF - P2. Gate Closure	Each	$4,990	1	$ 4,990

P3: Trailhead snag removal: This treatment will remove snags that are a threat to trailhead users who are often stationary for longer time periods during preparation to use the trails.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC – Trailhead snag removal	Day	$1,000	1	$1,000

P4: Abandoned Mine Safety Fence and Hazard Fence Installation: Treatments include protective fences and barriers to limit public access to reduce the immediate threat with the intention of the home unit applying for funds for permanent closure. Safety fences with signs will be installed around the outside of abandoned mine features to warn the public of the potential threat of a nearby open mine feature. These sites were not evaluated on site due to access and time limitations. Consequently additional treatments may be warranted.

Treatment (PSICC)	Units	Unit Cost	# of Units	Total Cost
Abandoned Mine Hazard Signs	Each	$200	2	$400
Safety fence	Each	$900	1	$900
Section 106 Clearance	Days	$450	3	$1350

TOTAL COST: $2,650

Treatment (RGNF)	Units	Unit Cost	# of Units	Total Cost
Abandoned Mine Hazard Signs	Each	$200	4	$800
Safety Fence	Each	$900	2	$1800
Section 106 Clearance	Days	$450	3	$1350

TOTAL COST: $3950

P5: Communication site monitoring[2]: Under this treatment a USFS radio technician will visit Methodist Mountain communication site periodically to ensure functionality of solar panel electricity back-up for the USFS repeater.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC – Communication site/repeater monitor	Day	$400	3	$1,200

LT-C1: Protection of historic land monuments: The monuments will be located on the ground using survey grade GPS, and then a modern monument will be set in its place along with steel fence posts so that they can be easily located after damaging storms which may deposit debris and ash. This treatment is proposed for long-term rehabilitation funding and included in Addendum 1.

I. Monitoring Narrative:

The USGS plans to monitor debris flow potential on the Decker Fire. Monitoring would include installation of monitoring equipment which would require a special use permit.

Treatment	Units	Unit Cost	# of Units	Total Cost
PSICC – Special Uses Administration	Day	$400	2	$800

[2] This is included as a treatment since it is not monitoring a BAER treatment, but rather ensuring communication site functionality similar to storm patrol for roads.

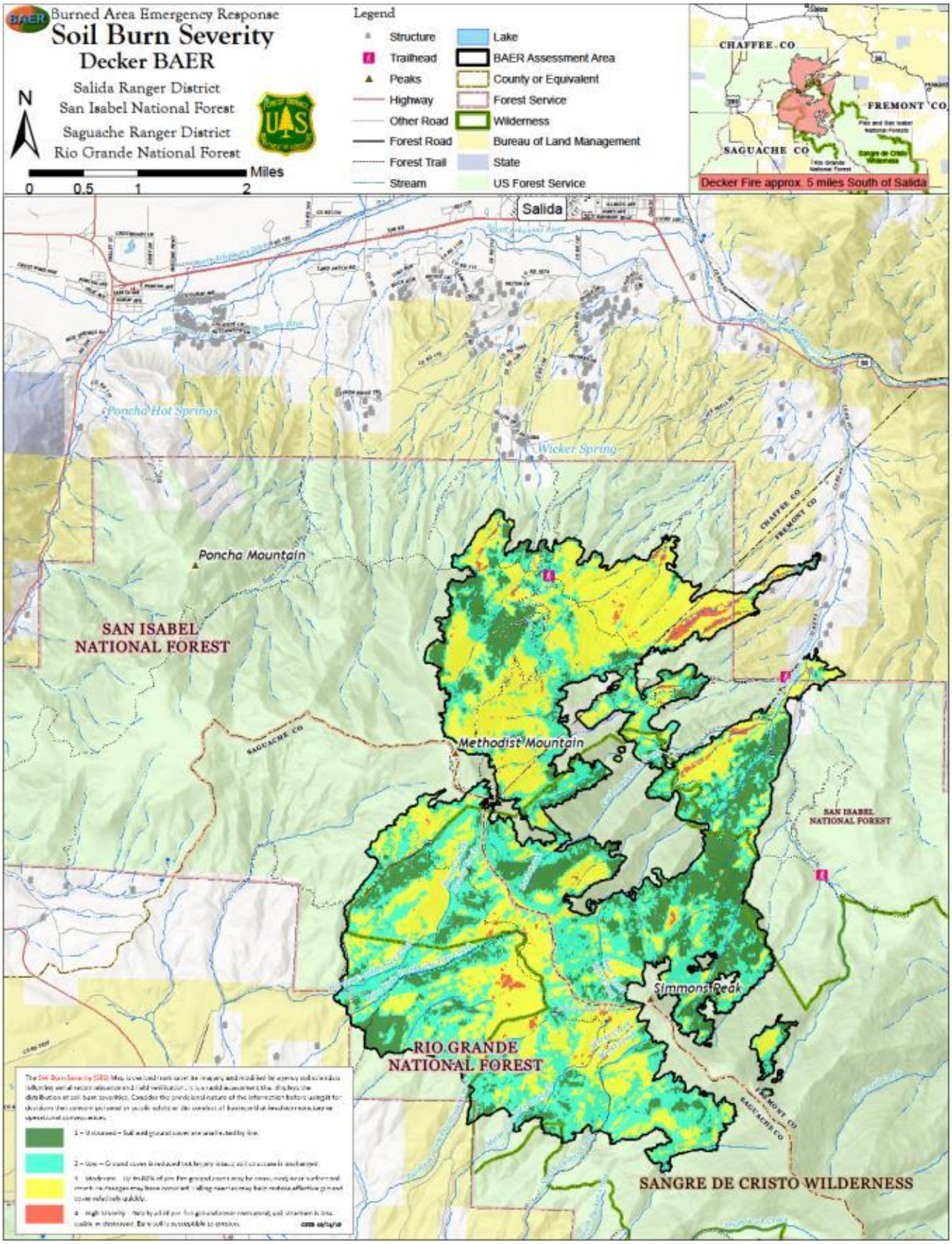
PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS- PSICC				
Line Items	**Units**	**Unit Cost**	**# of Units**	**BAER $**
A. Land Treatments				
EDRR	day	1,150	15	$17,250
GS-11 Contract prep/admin	day	455	5	$2,275
Insert new items above this line!				$0
Subtotal Land Treatments				$19,525
B. Channel Treatments				
Insert new items above this line!				$0
Subtotal Channel Treatments				$0
C. Road and Trails				
Rd stabilization IDIQ contract	mile	3,083	11.4	$35,146
Rd IDIQ contract prep/admin	day	375	15	$5,625
Rd storm patrol/response	mile	1,623	8	$12,497
Trail stabilization	mile	5,000	5	$25,000
Trail storm patrol/response	day	660	10	$6,600
Insert new items above this line!				$0
Subtotal Road and Trails				$84,868
D. Protection/Safety				
Warning Signs	each	370	7	$2,590
Admin closure gate/install	each	4,990	2	$9,980
Trailhead snag removal	day	1,000	1	$1,000
Abandon Mine safety fence	each	1,300	1	$1,300
Section 106 consutation	day	450	3	$1,350
Communication site	day	400	3	$1,200
Implementation team leader	day	375	10	$3,750
Insert new items above this line!				$0
Subtotal Protection/Safety				$21,170
E. BAER Evaluation				
Initial Assessment	report	$24,615		---
Trainee		$975		
Insert new items above this line!				---
Subtotal Evaluation				$0
F. Monitoring				
GS-11 Realty Spec- SUP	day	$400	2	$800
Insert new items above this line!				$0
Subtotal Monitoring				$800
G. Totals				$126,363
Previously approved				
Total for this request				**$126,363**

PART VII - APPROVALS

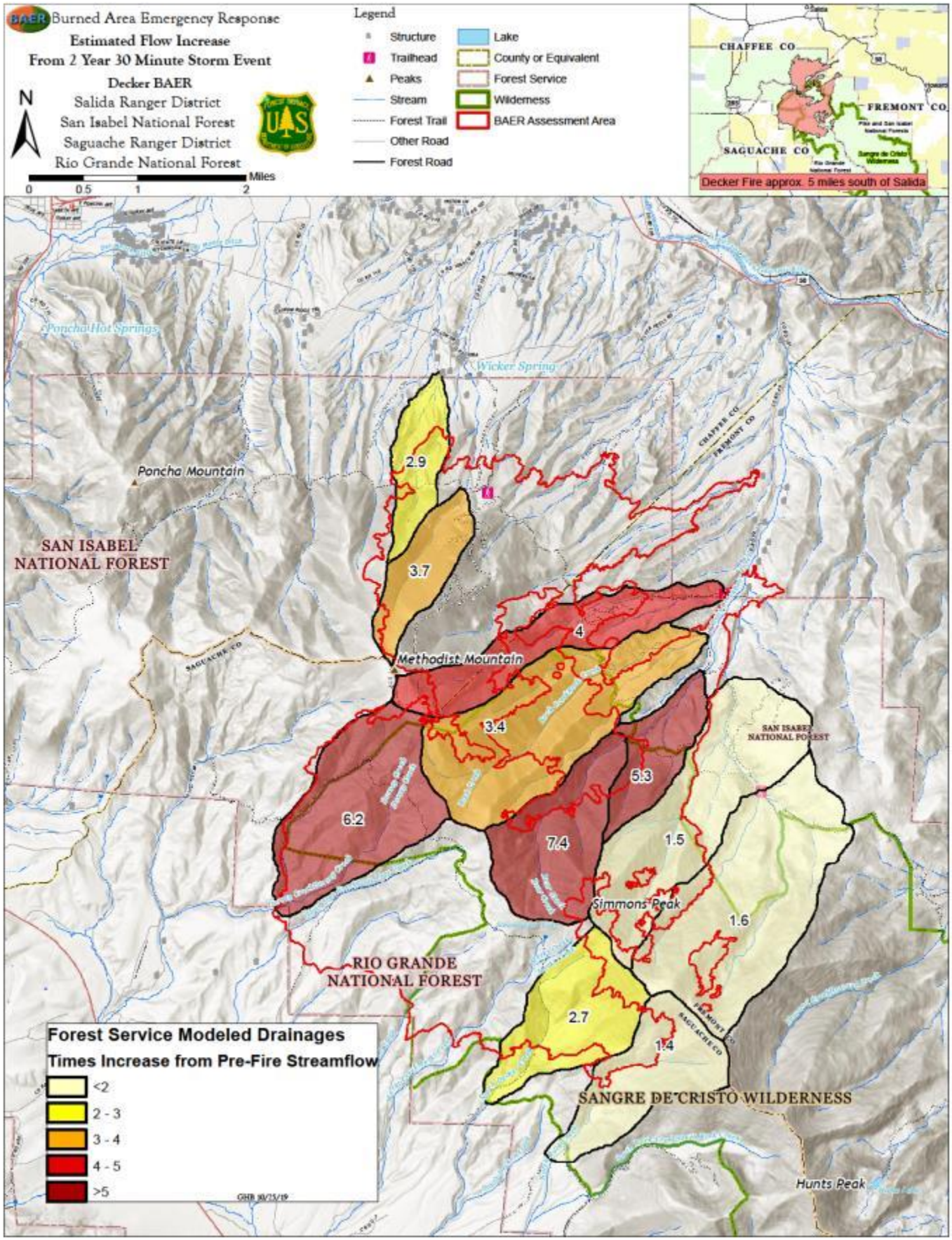
1._____
Forest Supervisor Date

2._____
Regional Forester Date

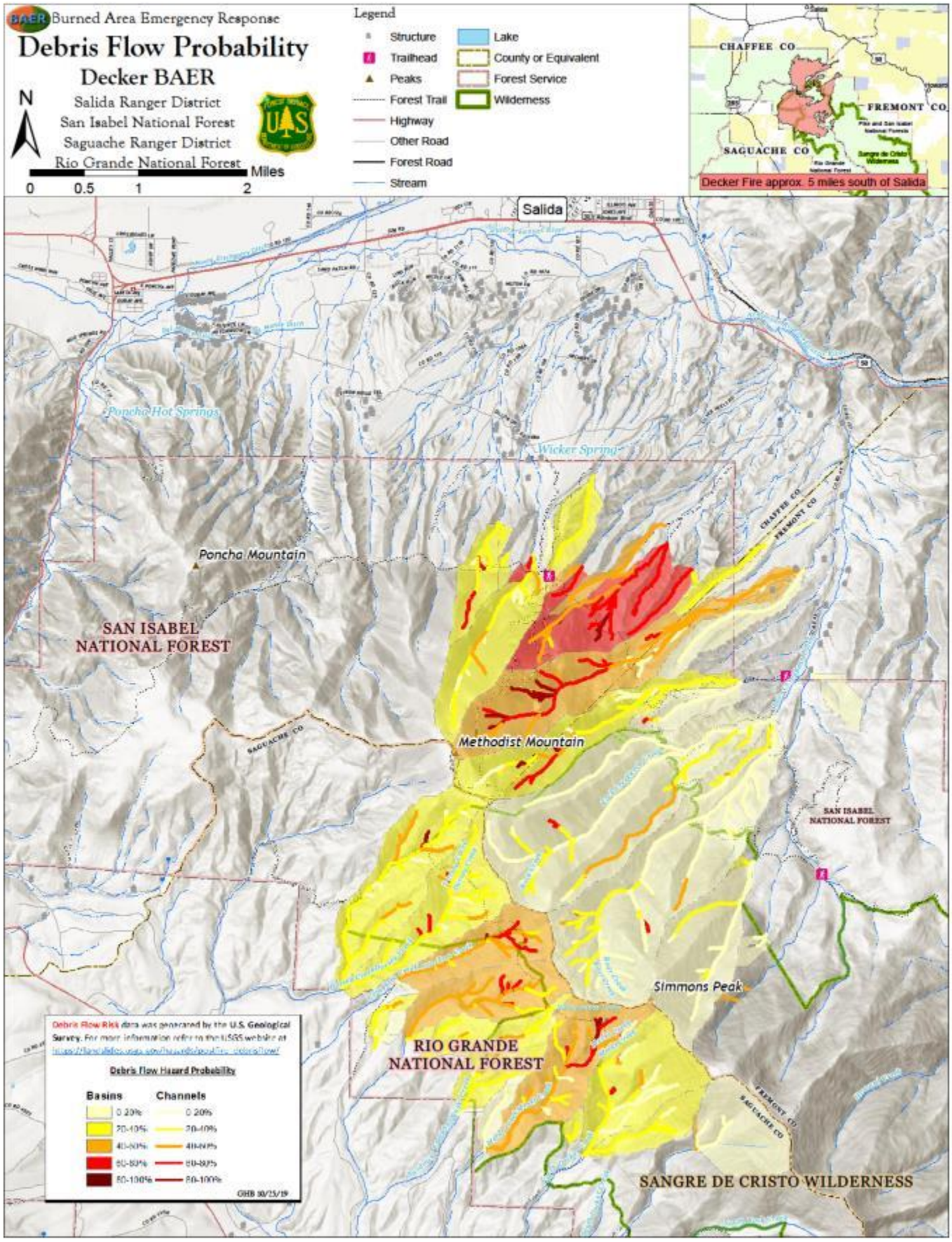
Map A: Soil Burn Severity



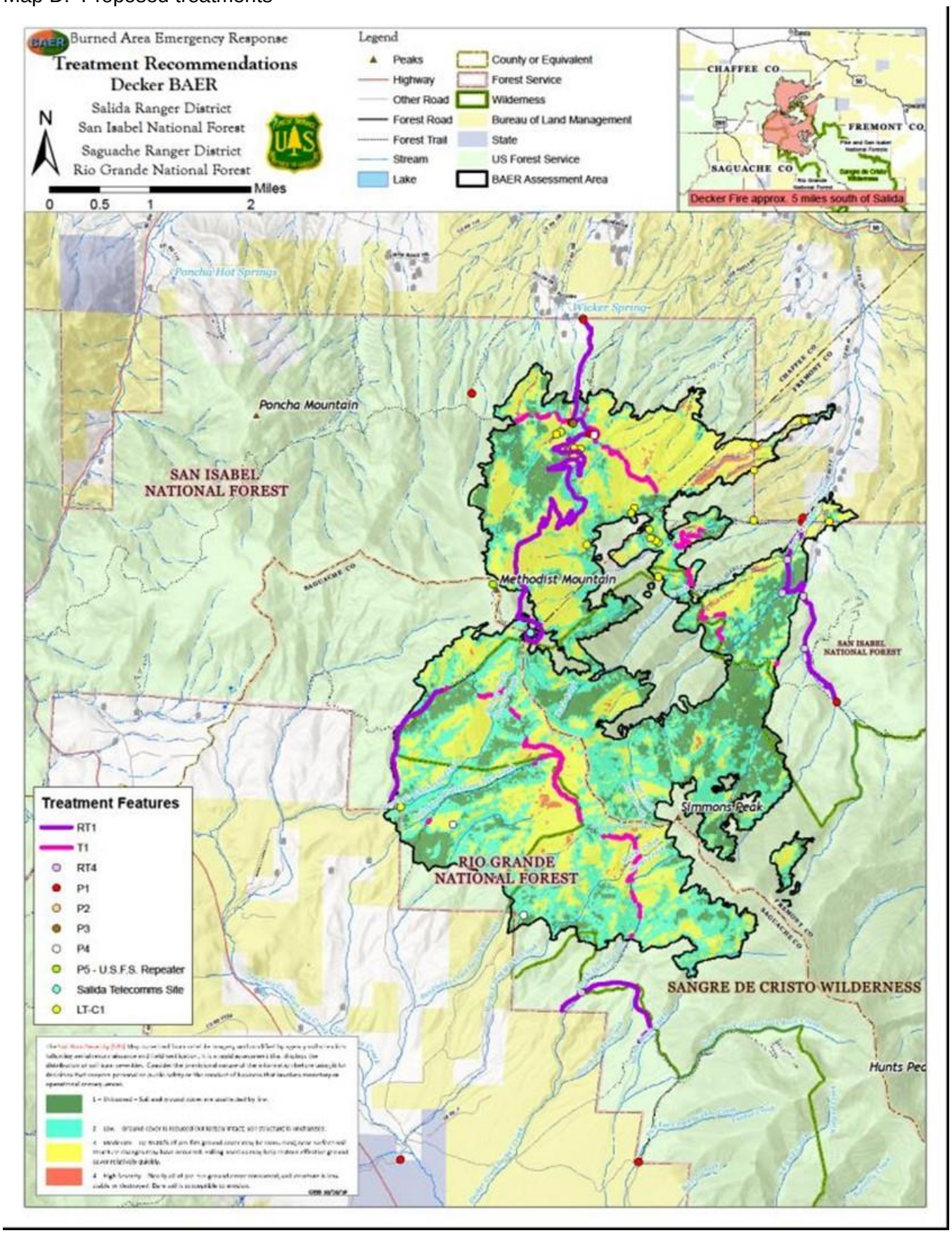
Map B: Modellied Flood Flow Increases on NFS lands



Map C: Debris Flow Probability



Map D: Proposed treatments



Map E: Proposed Weed Monitor/treatment areas