

Date of Report: 08-05-2016

BURNED-AREA REPORT

(Reference FSH 2509.13)

PART I - TYPE OF REQUEST**A. Type of Report**

- ☒ 1. Funding request for estimated emergency stabilization funds
☐ 2. Accomplishment Report
☐ 3. No Treatment Recommendation

B. Type of Action

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
☐ 2. Interim Report ____
 ☐ Updating the initial funding request based on more accurate site data or design analysis
 ☐ Status of accomplishments to date
☐ 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION**A. Fire Name: Saddle Fire****B. Fire Number: UT-DIF-000219****C. State: Utah****D. County: Washington****E. Region: 04 - Intermountain****F. Forest: 07 - Dixie****G. District: 01 - Pine Valley****H. Fire Incident Job Code: P4KA0Y (0407)****I. Date Fire Started: June 13, 2016****J. Date Fire Contained: Est. to be End of Fire Season 2016****K. Suppression Cost: \$14,000,000 (est.)****L. Fire Suppression Damages Repaired with Suppression Funds****1. Fireline/Non Motorized Trail waterbarred and returned to pre-fire width (miles): .83 miles total****M. Watershed Number(s): (6th level hydrologic units, percent of watershed acres within fire perimeter):**

HU Number	HU Name	% in Fire
150100080703	Mahogany Creek-Santa Clara River	2
150100080702	Headwaters Santa Clara River	7
150100080704	Baker Dam Reservoir-Santa Clara River	0.05
150100080807	Snow Canyon	0.07

N. Total Acres Burned: 2299**NFS Acres (2299) Private (0)**

O. Vegetation Types:

Vegetation Group	Acres
Aspen, Mixed Conifer	141
Curlleaf Mountain Mahogany	80
Rock/ Curlleaf Mountain Mahogany	267
Mixed Conifer	1404
Rock/Mixed Conifer	353
Grass-Forb	4
Ponderosa Pine/Mountain Brush	5
Gambel Oak, Mountain Brush	45

P. Dominant Soils: The soils are typically 4 to 40 inches deep to bedrock with very stony to extremely stony loam and sandy loam surface textures formed from monzonite porphyry. Much of the burned area has exposed porphyry bedrock outcrops of varying size and exposure amounts (40 to 60% of the dominate soil units are rock outcrops). The terrain is very steep (30 to 70% slopes) with high runoff but moderate erosion hazard. Upper areas (7,000 feet and above with favorable aspects) supported mixed conifer and aspen stands that when disturbed stimulate aspen generation.

Q. Geologic Types: The soils within the Saddle fire were formed quartz monzonite porphyry, a gray, coarse-grained, intrusive igneous rock similar to granite but with a slightly different mineral composition. The Pine Valley Mountains, which are capped by an igneous, mushroom-shaped intrusion called the Pine Valley laccolith was emplaced about 21 million years ago as molten rock from deep within the earth moved upward into shallow overlying sedimentary rocks. There it spread out and crystallized into what is one of the largest such intrusions in the world; uplift and erosion have since uncovered this granite-like rock.

R. Miles of Stream Channels by Order or Class: **Perennial: 0 miles** **Intermittent: 7.4 miles**

S. Transportation System (within the fire perimeter): **Trails: 1.46 miles** **Roads: 0 miles**

PART III - WATERSHED CONDITION

Burn Severity (acres): **1445** (unburned & low) **586** (moderate) **268** (high)

Burn severity for example microsheds with potential BAER concerns

Microsheds	Severity (acres and percent within Hydrologic Unit)				
	High	Moderate	Low/Unburned Within Fire Perimeter	Unburned Outside of Fire Perimeter	Total
Lloyd Canyon	114 (7%)	210 (13%)	722 (45%)	565 (35%)	1611
Forsyth Canyon	43 (2%)	148 (7%)	281 (15%)	1529 (76%)	2001
Earl Canyon	63 (7%)	144 (16%)	257 (28%)	454 (49%)	918
Lark Canyon	13 (1%)	33 (4%)	96 (12%)	701 (83%)	843

B. Water-Repellent Soil (acres): **23 (based on hydrophobicity testing on different burn severities within the fire it is estimated at 10% of the high severity burned areas)**

C. Soil Erosion Hazard Rating (acres):

54 (low) **2244** (moderate) **0** (high)

D. Erosion Potential: **1.5** ton/acre (due to mosaic nature of fire burn and low proportion of high severity a moderate severity with 2nd year after fire was used with ERMIT for this number)

E. Sediment Potential: **960** tons / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): **5 to 10**

B. Design Chance of Success, (percent): **90% (with no treatment)**

C. Equivalent Design Recurrence Interval, (years): **25 years**

D. Design Storm Duration, (hours): **30 minute and 24 hour**

E. Design Storm Magnitude, (inches):

- **30 minute 25 yr event - 1.37**
- **24 hour 25 yr event – 3.35**

F. Design Flow, (cubic feet / second/ square mile): **30 min/25 year event**
Forsyth Canyon 103.63
Lloyds Canyon 106.43
Lark Canyon 65.2
Earl Canyon 86.5

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

H. Adjusted Design Flow, (cfs per square mile): **see table**

Microsheds (30min/25year)	Design Flow (cfs per square mile)	
	Pre-fire	Post-fire
Forsyth Canyon	103.42	119.87
Lloyds Canyon	106.55	238.20
Lark Canyon	65.35	96.11
Earl Canyon	86.26	278.31

PART V - SUMMARY OF ANALYSIS

Background: On June 13, 2016 a lightning caused ignition occurred on the Dixie National Forest, approximately 2 air miles south west of the town of Pine Valley near an area of the mountains known as the “saddle”. Due to the very steep rocky terrain, lack of direct access to the fire, and no safe landing areas near the fire to fly firefighters in, the decision was made to monitor the fire for the time being. Initially the fire behavior was described as creeping and smoldering and was not increasing in size rapidly. However, increasing winds resulted in more active fire behavior and fire size increased rapidly. Fire size on the morning of June 16th was estimated at 103 acres and a Type 4 Incident Commander was assigned. On the afternoon of June 17th, fire size was estimated at 163 acres and a Type 3 Incident Management Team (IMT) was ordered. Color Country Team 2 (local Type 3 IMT) assumed command of the fire at 0600 on June 18th. Fire activity continued to be active under windy conditions and the size estimate was 318 acres on the afternoon of June 19th. The DIF made the

decision on June 19th to order a National Incident Management Organization (NIMO) IMT. The fire grew substantially overnight on the night of June 20-21 and was estimated to be at 512 acres on the afternoon of June 21st. The decision was made to evacuate 86 homes and close the FS's Pine Valley Campground at approximately 1400 hours that afternoon. The NIMO Team received their in-briefing on the evening of June 20th, shadowed the Type 3 IMT on June 21st, and assumed command of the fire at 0600 hours on June 22nd. The fire was approximately 825 acres at this time. The NIMO Incident Commander (IC) received a dual delegation of authority from the DIF and the State of Utah. Utah Governor Gary Herbert visited the fire on the afternoon of June 22nd.

Later fire spread into a more shrub dominated fuel type on the west and north sides of the fire presented an opportunity to establish direct control lines on the west and north flanks due to reduced fire behavior, gentler terrain, and sufficient safety zones provided by the burn. This strategy also involved improving existing established fuel breaks above the Pine Valley community, establishing contingency control lines to the west and east of the direct control line, and substantial structure assessment and protection efforts in the Pine Valley community. Implementing this strategy required ordering additional resources which were primarily crews, engines, aviation assets, heavy equipment, and support personnel.

Precipitation in varying amounts occurred over the fire area on June 30th and July 1st, which facilitated the establishment and improvement of direct control lines on multiple divisions, permitted the release of some aviation assets, and eliminated the need for a night shift. However this precipitation also impacted and delayed planned burn out operations of indirect control lines. The success of establishing direct control lines on the northern flanks in Forsyth and Lloyd Canyons reduced the threat to the community. This permitted the downsizing of the structure protection organization. The fire size was listed at 1,540 acres and 42% containment on July 1st. Voluntary evacuations remained in place for 54 residences and the FS Pine Valley Campground remained closed due to the uncontrolled fire perimeter being within one-quarter mile of the community.

The decision was made on July 3rd to transfer command of the fire from NIMO to Color Country Team 1. This transfer of command occurred on July 6th. The fire was listed at 1,647 acres with 42% containment and an estimated \$10,254,400 total cost to date at the time of the transfer of command. The acreage of the fire as of July 25th was 2299 acres all on the Dixie National Forest with a containment of 84%. Due to the steep rocky terrain it is anticipated that the fire will remain at 84% containment until the fire season is over.

A. Describe Critical Values/Resources and Threats:

Summary of Issues:

1. Human Life and Safety (HLS)

- a. High risk to **forest visitors and Forest Service employees** due to the increased threat of falling trees and rocks. (*Treatment: T2*)

Risk Assessment: Elevated threat to human health and safety from deteriorating trails and falling trees and rocks on forest trails within the fire perimeter.

Probability of Damage or Loss: Possible – Numerous snags along the trail will have potential risk to public safety.

Magnitude of Consequence: Major– Loss of life or injury to humans.

Risk Level: High

2. Property (P):

- a. High risk to **road and trail infrastructure** due to an increased threat of damage expected to these forest investments from increased runoff, erosion and deposition. (*Treatments: T3 and T4*)

Due to fire effects, drainages within the burn perimeter are likely to generate higher stormflows in the first few years following the fire. Larger flow events in part are a function of increased surface runoff from the areas with bare hillslopes. Furthermore, the burned and exposed soils are more susceptible to erosion, entrainment and transport to stream channels. This combination of increased runoff and greater susceptibility to erosion threatens transportation infrastructure. Transportation infrastructure

is a value at risk of damage from post-fire erosion and elevated peak flows within and below the fire, including trails. There are approximately 2.25 miles of trails (1.46 miles within the fire perimeter and .79 miles immediately adjacent to the fire perimeter) and two road-stream crossings (outside of fire perimeter) that are potentially at risk to threats from post fire runoff.

Risk Assessment: Threats to Forest Service trails and associated structure.

Probability of Damage or Loss: Likely – High potential of road and trail drainage failure due to post-fire flows.

Magnitude of Consequence:, Major - loss of FS infrastructure

Risk Level: Very High

3. Natural Resources (NR):

- a. Very High risk to native plant diversity due to the threat from the spread of noxious weeds and invasive plant species. Known noxious weed and invasive populations exist immediately adjacent to the burned area. Most populations to date occur along existing road and trail systems and fuel break corridors. (*Treatment: T1*)

Roads, trails and fire lines within and/or adjacent to the Saddle Fire are primary corridors for weed dispersal and the warm/dry habitats that are moderate to highly susceptible to new weed invasion have been burned. Most of the previously identified weed infested sites occur adjacent to burned areas. The susceptible habitats within the fire contain known infestations of Scotch thistle and Spotted Knapweed. Small spot infestations of these noxious weeds are scattered along the fuel break which run near the fire perimeter.

Risk Assessment: Threats to native plant communities due to the establishment or spread of noxious weeds.

Probability of Damage or Loss: Very Likely - Based on moderate and high burn severity and proximity to known weed infestations.

Magnitude of Consequence: Major – Loss of native plant communities and spread of noxious weeds.

Risk Level: Very High

- b. Intermediate Risk to potentially Suitable Occupied Habitat for Federally Listed T&E due to the threat of possible habitat loss of California Condor prey species

Portions of the fire occurred within potential/suitable condor foraging habitat. Condors are known to fly along the cliffs areas of the south and west end of the fire perimeter on the Pine Valley Ranger District. The Saddle fire impacted some of these cliff areas where radio collared condors have been known to occur.

Risk Assessment: Threats to native plant communities that support California Condor prey species.

- **Probability of Damage or Loss** – Possible Occurrence
- **Magnitude of Consequences** – Moderate
- **Risk** – Intermediate

B. Emergency Treatment Objectives:

The goal of the burned area emergency response is to:

- Minimize damage to key system travel (roads and trails) routes within and adjacent to the fire boundary.
- Warn users of forest roads and trails of hazards present in the burned area.
- Control expected invasion of noxious weeds within and adjacent to the area where soils/vegetation was disturbed as a result of the fire and/or suppression activities.

In accordance with the revised Forest Service manual, the risk matrix below, Exhibit 2 of Interim Directive No.: 2520-2015-1 was used to evaluate the Risk Level for each value identified during the Saddle Fire BAER

assessment. Only treatments directly addressing FS Values at Risk with a rating of High or above are being requested for BAER authorized treatments.

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Very High - Native Veg	Very High	Low
Likely	Very High Infrastructure Roads/Trails	High –	Low
Possible	High - Health and Safety	Intermediate Listed T&E Species	Low
Unlikely	Intermediate	Low	Very Low

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

Land **70** % Channel **NA** % Roads/Trails **75** % Protection/Safety **60-90** %

D. Probability of Treatment Success

Treatment	Years after Treatment		
	1	3	5
Land	75	80	80
Channel	--	--	--
Roads/Trails	90	90	90
Protection/Safety (hazard trees)	70	60	60

E. Cost of No-Action (Including Loss): **\$181,700**

Resource/Value Affected (Potential)	Estimated Cost
Increase 428 acres of noxious weeds (\$400 per acre for treatment)	\$171,200
Loss of 0.75 miles of trail that could be affected by moderate/high severity post fire runoff (\$14,000 per/mile)	\$10,500
Total	\$181,700
Loss of road passage by two stream crossings that could be affected by moderate/high severity post fire runoff	Cannot be valued
Possible loss of life/injury from additional danger of hazard trees	Cannot be valued.

F. Cost of Selected Alternative (Including Loss): \$55,300

Resource/Value Affected (Potential)	Estimated Treatment Cost Including Loss	Total
Loss of 0.75 miles of trail that could affected by moderate/high severity post fire runoff (\$14,000 per/mile)	\$2,440 for proposed treatment (\$4,000/mile x 0.61 mile) plus \$1,500 for potential loss.	\$3,940
Increase 428 acres of noxious weeds (\$20 per acre for treatment EDRR, Potential of \$400 treatment per acre if not treated)	\$8,560 for proposed treatment (\$20/acre) plus \$42,800 for potential loss.	\$51,360
Possible loss of life/injury from additional danger of hazard trees	Possibility of loss of life/injure, which cannot be valued.	Cannot be valued

Loss of road passage by two stream crossings that could be affected by moderate/high severity post fire runoff	Cannot be valued	Cannot be valued
Total		\$55,300

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range
<input type="checkbox"/> Forestry	<input checked="" 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 checked="" type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input checked="" type="checkbox"/> Recreation	<input checked="" type="checkbox"/> GIS

Team Leader: **Brooke Shakespeare, Forest Soil and Water Program Manager (Detailed)**

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Team Members:

Brooke Shakespeare, Detailed as Soil and Water Program Manager, Dixie National Forest
Chris Butler, Hydrologist, Dixie National Forest
Marian Jacklin, Cultural Resources, Dixie National Forest
Maia London, Cultural Resources, Dixie National Forest
Rand Beckstrand, Range Management Specialist, Dixie National Forest
Mark Madsen, Botanist, Dixie National Forest
Jake Dodds, Engineering, Dixie National Forest
Allison Farrow, Detailed as Special Uses, Dixie National Forest
Laurie Parry, Resource Information Manager (GIS), Dixie National Forest
Nick Walendziak, Recreation, Dixie National Forest
Nick Glidden, Trails Program Manager, Dixie National Forest
Devin Johnson, Wildlife Biologist, Dixie National Forest
Ron Rodriguez, Wildlife Program Manager, Dixie National Forest

H. **Treatment Narrative:**

Land Treatments:

T1 - Early Detection & Rapid Response

General Description of Treatment: Invasive plants and weed assessments will be conducted 2 times in FY2017 for Early Detection and Rapid Response (EDRR) on any new infestation located within the fire perimeter. Treatments will occur at proper phenology of each species to ensure maximum control.

Because noxious weeds are scattered in small patches primarily north and adjacent to the burn area (see map in botany report), there is a high risk for new infestations within the fire perimeter to become established due to the disturbance caused by the wildfire and the suppression equipment used to fight the fire.

Suitable Sites: Assess areas that have a high potential for weed/invasive species establishment. Priority acres for EDRR are 428 acres along roads, trails, fuel break, and the base camp site.

Design/Construction Specifications:

- Inventory 428 acres along road 31032, Goat Springs and Forsyth trails, Pine Valley fuel break, hose lay locations, helicopter landing sites, and base camp site for any noxious weeds (Knapweed, Scotch

thistle, and White top). Treat with chemical or mechanical methods to control spread and infestation using Integrated Pest Management (IPM) techniques. This would be done during the first year after the fire (2017 growing season).

- Monitor weed populations within and adjacent to the fire to determine if the combination of fire disturbance and susceptible habitat facilitates weed spread or increases weed densities, along with post treatment effectiveness monitoring.

Purpose of Treatment: This treatment is necessary to prevent the establishment and to control the spread of new noxious weeds and non-native invasive species in the burned area.

Infrastructure Protection/Safety Treatments:

T2 – Safety Warning Signs

General Description: This treatment is for the installation of burned area warning signs.

Burned area signs warn the public identifying of the possible dangers associated with a burned area on major entry points into the burned area and recreational areas. It shall contain language specifying items to be aware of when entering a burn area such as falling trees and limbs, rolling rocks, and flash floods

Suitable Sites:

- Forsyth trail head
- Goat springs trail heads (both ends).

Detailed Design/Construction Specifications:

Some Burned Area warning signs already owned by the District have been placed at some of the suitable locations. Two more signs are needed.

Purpose of Treatment: The purpose of the Burned Area signs is to provide safety to the motorists and forest visitors of upcoming dangers and/or objects.

T3 – Restoring Drainage Function (Trails)

General Description: This proposal will treat portions of the system trails which are at high risk to damage from the additional runoff and erosion caused by post-fire conditions. The threats are from increased surface flow and upland slope erosion that will occur within the fire area. The imminent increase in flow will cause increased sediment loads on existing drainage structures and further downcutting of portions of the trails. The risk can be reduce by installing additional drainage structures to accommodate the additional flow that is expected,. Safe travel and access for BAER rehab crews will also be addressed.

Factors taken into consideration when prescribing trail treatments include: burn intensity, burn severity, soil type and structure, trail grade, side slope, topography, vegetative cover, drainages, current trail use, and expected use.

Suitable Sites: Treatment locations shall be as designated in the field. The proposed treatment is located on the following trails:

- 0.1 miles on Forsyth Trail #31012 where it is immediately downslope of a high and moderate burn severity
- 0.51 miles Goat Springs Trail #31016 where it goes through high burn severity

Design/Construction Specifications: As needed, install a combination of water bars, grade dips, and check dams to better withstand increased water and debris flow. Crews will also remove large rocks and debris as needed.

Purpose of Treatment: The purpose of this treatment is to allow increased post fire runoff to flow over a trail without damaging the tread.

T4 – Storm Inspection and Response (Roads)

General Description: Storm inspection and response keeps culvert and drainage structures functional by cleaning sediment and debris from the inlet between or during storm events on roads where access is required. Maintenance of this road was the district's top roads priority in 2016 and with help from the county the travel surface of the road was improved before the fire occurred. At the two unimproved channel fords of Lark Canyon and Earl Canyon, the road is at risk of damage leaving it impassible if runoff increases from the portion of the fire that drains into these two canyons.

Suitable Sites: The proposed treatment is located on the following road:

- Forest Road #31032

Design/Construction Specifications: Mobilization of a grader if needed to clean sediment and debris from the 2 stream crossings after runoff events.

Purpose of Treatment: The purpose of this treatment is to allow existing road structures to function following any post fire events.

I. Monitoring Narrative:

Early Detection / Rapid Response Treatment Effectiveness Monitoring: Follow-up monitoring with program funds will occur in 2nd & 3rd years as needed if new or expanded weed populations are discovered during the 1st year BAER treatments.

Road and Trail Treatment Effectiveness Monitoring: Monitoring will be conducted by district personnel and/or members of the Forest Engineering staff. Monitoring will consist of visiting the site after high intensity thunderstorms and/or after spring run off to ensure the drainage work is functioning as designed.

Part VI – Emergency Stabilization Treatments and Source of Funds

Initial Request

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands				All Total \$
			# of Units	BAER \$		# of units	Fed \$	# of Units	Non Fed \$	
A. Land Treatments										
T1-Early Detection & Rapid Response	acres	20	428	\$8,560	\$0		\$0		\$0	\$8,560
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$8,560	\$0		\$0		\$0	\$8,560
B. Channel Treatments										
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Channel Treatments				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
T3-Restore Drainage (Trails)	mile	4,000	1	\$2,440	\$0		\$0		\$0	\$2,440
T4-Storm Inspection and Repair	Each	1,680	3	\$5,040	\$0		\$0		\$0	\$5,040
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Road and Trails				\$7,480	\$0		\$0		\$0	\$7,480
D. Protection/Safety										
T2-Hazard Warning Signs	each	75	2	\$150	\$0		\$0		\$0	\$150
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Protection/Safety				\$150	\$0		\$0		\$0	\$150
E. BAER Evaluation										
Initial Assessment	Report	\$24,498	1	---	\$0		\$0		\$0	\$24,498
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
Subtotal Evaluation				---	\$0		\$0		\$0	\$24,498
F. Monitoring										
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals				\$16,190	\$0		\$0		\$0	\$40,688
Previously approved										
Total for this request				\$16,190						

PART VII - APPROVALS

1. Angelita Bullets 08/05/2016
Forest Supervisor (signature) Date

2. /s/ George C. Iverson (for) 08/12/2016
Regional Forester (signature) Date