Date of Report: 09/03/2013

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

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

B. Type of Action

[X] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

[ ] 2. Interim Report #____.
[ ] Updating the initial funding request based on more accurate site data or design analysis
[ ] Status of accomplishments to date

[ ] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Patch Springs Fire

B. Fire Number: UT-SLD-000612

C. State: Utah

D. County: Tooele

E. Region: Intermountain

F. Forest: Uinta-Wasatch-Cache

G. District: Salt Lake

H. Fire Incident Job Code: PDHU2S

I. Date Fire Started: 08/10/2013

J. Date Fire Contained: 08/24/2013

K. Suppression Cost: $ 2,600,000

L. Fire Suppression Damages Repaired with Suppression Funds
1. **Fireline waterbarred (miles)**: 0.8
2. **Fireline seeded (miles)**: 0.8
3. **Other (identify)**: 0

M. Watershed Number: 160203050102, 160203050104, 160203050201, 160203050202, 160203050203, 160203050501

N. Total Acres Burned: 31,010
[19,762] NFS Acres [7053] BLM [2070] Tibal [37] State [2089] Private

O. Vegetation Types: Alpine, aspen, barren, bottomland hardwood, Douglas-fir, mahogany, pinyon-juniper and juniper; sagebrush-grass, spruce-fir, tall shrub-mountain brush.

P. Dominant Soils:

Abela – Found on fan remnants. Elevation ranges from 5,000 to 6,000 feet. Slopes range from 5-15%. Soils formed from alluvium derived from limestone or quartzite. Soils have very cobbly loam textures at the surface and extremely gravelly sandy loam textures in the subsurface. Soil depth is deep (60+ inches). Drainage class is well drained. Soil loss tolerance (T-factor) is 3 (tons/acre/yr).

Berent – Found on dunes. Elevation ranges from 4,500 to 5,800 feet. Slopes range from 2-15%. Soils formed from eoalian sands from lacustrine deposits. Soils have a fine sand texture in the surface and subsurface. Soil depth is deep (60+ inches). Drainage class is somewhat excessively drained. T-factor is 5.

Hiko Peak – Found on dunes. Elevation ranges from 4,500 to 5,800 feet. Slopes range from 2-15%. Soils formed from eoalian sands from lacustrine deposits. Soils have a gravelly loam surface texture and very gravelly loam subsurface. Soil depth is deep (60+ inches). Drainage class is well drained. T-factor is 5.

Datemark – Found on mountainsides. Elevation ranges from 7,000 to 10,000 feet. Slopes range from 30-70%. Soils formed from colluvium over residuum weathered from limestone. Soils have a gravelly loam surface texture and gravelly to very cobbly loam subsurface texture. Soil depth is moderate (20-40 inches). Drainage class is well drained. T-factor is 2.

Podmor – Found on mountainsides at elevations between 6,000 and 10,000 feet. Slopes range from 30-70%. Soils formed from residuum and/or colluvium derived from quartzite. Soils have a very cobbly loam surface and subsurface texture. Soil depth is moderate (20-40 inches). Drainage class is well drained. T-factor is 2.

Flygare – Found on mountainsides at elevations between 7,200 and 10,000 feet. Slopes range from 30-60%. Soils formed in alluvium and colluvium derived from quartzite and limestone. Soils have a cobbly loam surface texture and a very cobbly sandy clay loam and loam subsurface textures. Soil depth is deep (60+ inches). Drainage class is well drained. T-factor is 5.

Lodar – Found on mountainsides at elevations between 6,000 and 8,500 feet. Slopes range from 30-60%. Soils formed in residuum and/or colluvium derived from limestone. Soils have a very cobbly loam surface and subsurface texture. Soil depth is shallow (0-20 inches). Drainage class is well drained. T-factor is 1.

Lundy – Found on mountainsides at elevations between 6,000 and 8,500 feet. Slopes range from 30-60%. Soils formed in residuum and/or colluvium derived from limestone. Soils have a very cobbly loam surface and subsurface texture. Soil depth is shallow (0-20 inches). Drainage class is well drained. T-factor is 1.

Reywat – Found on hillsides at elevations between 5,200 and 7,200 feet. Slopes range from 30-60%. Soils formed in residuum and/or colluvium derived from quartzite and igneous rocks.

Soils have a very cobbly loam surface texture and very cobbly clay loam subsurface texture. Soil depth is shallow (0-20 inches). Drainage class is well drained. T-factor is 1.

Broad – Found on hillsides at elevations between 5,200 and 7,200 feet. Slopes range from 30-60%. Soils formed in residuum and/or colluvium derived from quartzite and igneous rocks. Soils have a very cobbly loam surface texture and very cobbly clay loam subsurface texture. Soil depth is moderate (20-40 inches). Drainage class is well drained. T-factor is 2.

Medburn – Found on fan remnants and lake terraces at elevations between 4,500 and 5,750 feet. Soils formed in alluvium and/or lacustrine deposits derived from sedimentary rock. Soils have a fine sandy loam surface and subsurface texture. Soil depth is deep (60+ inches). Drainage class is well drained. T-factor is 5. This soil type is located on BLM lands within the fire perimeter.

Rock Outcrop – dominant cliff and rock outcrop structure with little soil development.

Q. Geologic Types: primarily sedimentary limestone

R. Miles of Stream Channels by Order or Class: Perennial – 8 miles, intermittent/ephemeral – 152 miles

S. Transportation System

Trails: 7.4 **miles** **Roads:** 9.1 **miles**

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 13,766 **(low)** 9,328 **(moderate)** 1,011 **(high)**

B. Water-Repellent Soil (acres): 1,011

C. Soil Erosion Hazard Rating (acres): 9,077 **(low)** 0 **(moderate)** 19,840 **(high)**

D. Erosion Potential: 0.6 **tons/acre/year**

E. Sediment Potential: 0.6 **tons/acre**

PART IV - HYDROLOGIC DESIGN FACTORS For Indian-Hickman Canyon

A. Estimated Vegetative Recovery Period, (years): 3-5 years

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

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

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 0.9

F. Design Flow, (cubic feet / second/ square mile): 4.5

G. Estimated Reduction in Infiltration, (percent): 51

H. Adjusted Design Flow, (cfs per square mile): 7.1

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats (narrative): The BAER ID team assessed several values at risk and threats on National Forest lands. These are aquatic resources, noxious weeds, heritage resources, safety due to hazard trees and the result of the assessment is shown in Table 1.

Table 1. BAER Risk Assessment for NFS Lands

Critical Value/Resource and Threats	Probability of Damage or Loss	Magnitude of Consequences	Risk Assessment
BAER Value Hydrologic Resources	Possible	Minor	Low
Non BAER Value Aquatic Resources	Likely	Moderate	High
BAER Value Soil Productivity	Unlikely	Moderate	Low
BAER Value Native or naturalized Plant communities	Very Likely	Moderate	Very High
BAER Value Cultural and Heritage Resources	Possible	Moderate	Low
BAER Value Human life and safety	Unlikely	Moderate	Low
BAER Value Property	Likely	Minor	Low

HYDROLOGIC RESOURCES - Hydrologic impacts and design storm impacts were analyzed for the Indian Hickman (3587 acres) and Dry Canyon (2030 acres) subwatersheds. These two subwatersheds were selected for analysis because BARC map imagery, reconnaissance flights, and ground based assessment indicated that they had highest concentrations of moderate and high severity wildfire effects. Both subwatersheds are located on the west side of Stansbury mountain range and drain toward the west into Skull Valley. These subwatersheds have well defined channels within the canyons but these channels become less defined and braided at the mouths of the canyons where large alluvial fans are present. Indian Hickman Canyon has perennial flow in the lower portion of the canyon. A diversion structure, located approximately 0.5 miles west of UWC NF boundary (not on NFS lands) diverts much of the baseflow into a pipeline that supports livestock watering and hydrant facilities on the Skull Valley Indian Reservation. Dry Canyon was dry at the time of the BAER assessment. In both canyons, the highest burn severity was observed within conifer stands on the north facing slopes in the upper extents of the subwatersheds.

Two methods were used to estimate changes in stream flow from the burn. The first method uses the discharge estimates from Utah StreamStats and applies a multiplier for moderate and high burn severities. The second method uses the program "Forest Service Peak Flow Calculator, Estimated peak flow for burned areas using Curve Number technology" @ http://forest.moscowfsl.wsu.edu/fswepp/ermit/peakflow/.

Method 1: This method uses the discharge estimates from Utah StreamStats and applies a multiplier for moderate and high burn severities. Soil burn severity for the total acreage of the Indian Hickman subwatershed was approximately 15% high, 49% moderate, 27% low, and 9% unburned. Pre-fire 2-year stream discharge for Indian Hickman was modeled to be 25.5 cfs. Post-fire 2-year stream discharge was modeled to be 39.7 cfs. The increase in discharge that may result from wildfire effects (loss of effective ground/canopy cover and hydrophobic soils) may result in debris flows and channel enlargement within the canyon, however the BAER team

did not identify any values at risk on NFS lands. Hillslope and channel treatments are not recommended to mitigate these flood impacts. The design storm for Indian Hickman subwatershed is a 5 year 1 hour storm. This storm is expected to produce 0.881" of precipitation.

Soil burn severity for the total acreage of the Dry Canyon subwatershed was approximately 14% high, 51% moderate, 29% low, and 6% unburned. Pre-fire 2-year stream discharge for Dry Canyon was modeled to be 21.2 cfs. Post-fire 2-year stream discharge was modeled to be 32.8 cfs. The increase in discharge that may result from wildfire effects (loss of effective ground/canopy cover and hydrophobic soils) may result in debris flows and channel enlargement within the canyon, however the BAER team did not identify any values at risk on NFS lands. Hillslope and channel treatments are not recommended to mitigate these flood impacts. The design storm for Dry Canyon subwatershed is a 5 year 1 hour storm. This storm is expected to produce 0.825" of precipitation.

Method 2: This second method uses a program that estimates the change in peak flow from burned areas using Curve Number technology. The precipitation inputs are the same as under Method 1. The estimated storm runoff discharges for Indian Hickman are pre-fire = 1.2 cfs and post-fire = 69.5 cfs and for Dry Canyon are pre-fire = 0.7 cfs and post-fire = 38.6 cfs.

SOIL PRODUCTIVITY – Prior to the fire the effective ground cover consisted of duff near juniper, sagebrush, and conifer and rock fragments and was about 80% ground cover. After the fire most of the organic matter ground cover in the burned area was lost and what remains are small rock fragments. Most of the lower elevation area consists of loams and fine sands. The soils in the upper part of the watershed are shallow to bedrock and very steep.

In the short term, due to the lack of ground cover the erosion potential is high and therefore could affect the long-term soil productivity. However, fine roots in the soil are still intact and the potential for natural revegetation is high. The vegetation on the 2009 Pole Canyon fire that burned north of this fire has recovered naturally without treatment. Similar results are expected for this fire.

Non BAER Value- AQUATIC RESOURCES - Within the Patch Springs Fire perimeter, there are two streams which support a fishery population, Indian Hickman Creek and Barlow Canyon. Indian Hickman Creek supports a population of rainbow trout and Barlow Canyon supports a population of brown trout, both of which are non-native species, but which have become naturalized over time. Neither population is stocked by Utah Division of Natural Resources. The habitat supporting the Indian Hickman rainbow trout population is almost entirely on NFS lands as a diversion structure about 0.5 miles downstream of the boundary diverts most of the water out of the stream. There are likely insufficient flows below the diversion to support fish. Barlow Creek has not been sampled by the Forest, but most of the year brown trout are likely limited to a small section of stream from the spring downstream to a stock pond located just upstream from a small private inholding. No amphibian populations have been identified on NFS Lands, but the GAP analysis indicates that there may be some potential habitat for Great Basin spadefoot toad and leopard frog, but it is likely of limited value.

The "Probability of Damage or Loss" to aquatic species is "likely" within 1 to 3 years due to the severity of burn within this drainage. It is possible that some loss occurred during the burn over depending on the increase in water temperature. Much of the large-woody debris structure in the stream is intact, but a debris flow would likely result in the loss of some or all of this structure depending on the magnitude of the flow. The Burned Area Reflectance Classification map

indicates high intensity burn within a large portion of the drainage. The topography in this drainage is also very steep. We estimate the "Magnitude of Consequences" to be moderate resulting in considerable or long term effects to fisheries resources. Because of the steepness of this drainage emergency stabilization actions would likely have limited benefit. In addition, rainbow trout are not a TES species.

NATIVE OR NATURALIZED COMMUNITIES - The risk of increased infestations of noxious weeds is high due to existing populations within the fire perimeter, it is likely that some treatment will be necessary. Below is the list of known infestations within the fire perimeter. On lands adjacent to the forest service, or along roads leading to FS lands there were infestations of Canada thistle, field bindweed, houndstongue, poison hemlock, and diffuse knapweed. All of the species listed are declared noxious and are a high priority for treatment.

Table 2. Known infestations within the Fire Perimeter

NRCS Plant Code	Scientific Name	Common Name	Infested Acres
CIVU	Cirsium vulgare	bull thistle	0.50
TARA	Tamarix ramosissima	saltcedar	1.81
CADR	Cardaria draba	whitetop	29.70

There is a great risk to the ecological integrity and future soil productivity of the burned area. It will be compromised by an invasion of cheatgrass (Bromus tectorum) into the areas where the juniper cover type burned and resulted in moderate and high soil burn severity. This aggressive species would also alter the fire regime. If these areas convert to a cheatgrass dominated understory, the fire return interval might be 10 times as frequent as the historical fire patterns.

CULTURAL AND HERITAGE RESOURCES - Culturally sensitive natural resources in addition to Prehistoric and historic era cultural resources were affected by the Patch Springs fire. The area of the Patch Springs fire has been used by Native Americans for approximately 14,000 years up to the modern day. Historic resources in the area are related to continued traditional Native American use of the area, in addition to historic mining, logging, and agricultural activities, by a number of different groups including the Skull Valley Goshute.

While the fire did not affect previously identified historic properties on the UWCNF, we know that archaeological sites were affected even if they had not been previously formally recorded and evaluated for NRHP eligibility. These sites consist of aboriginal occupations that are typically indicated by a surface scatter of prehistoric artifacts, usually consisting mainly of lithic debitage. It is possible that some of these sites will be affected by erosion and natural taphonomic process expected after the fire, such as mudslides and potential surface collection due to the fact that the artifacts are more visible after the vegetation has been removed. There are no mitigation recommendations for these resources.

Historic resources in the area are related to mining, logging, and agriculture. It is possible that these resources may be affected by taphonomic processes at work after a forest fire, such as erosion and collecting by the public. The potential effect is minor to moderate, and there are no mitigation recommendations at this time.

Areas of traditional use by members of the Skull Valley Band of Goshutes have been affected by the fire. A field trip on 8/25/13 with Jerry Bear of the Skull Valley Goshute revealed that up through the 1990s there were traditional Pinyon nut harvesting areas in Dry Creek Canyon, as well as Red Willow for basketry, and Chokecherry harvesting. Jerry indicated that collecting these resources was in decline through the late 1980s and early 1990s due to the dwindling presence of water in the canyon, and that these resources were no longer being collected prior to the Patch Springs Fire. Few Pinyon trees remain in the canyon and most of the remaining few trees were burned in the fire. Due to the fact that these three botanical resources were no longer being actively collected prior to the fire, there are no mitigation recommendations at this time.

Overall, the projected possible minor to moderate effect to cultural resources, past and present, from the after effects of wildfire, do not necessitate mitigation for those resources.

HUMAN LIFE AND SAFETY – The fire burned mostly through Juniper vegetation. Some areas of conifer burned in the upper areas of Indian Hickman and Dry Canyon drairages. The burned conifer poses a low threat to human safety due to its location in areas where few people would go because they are in very steep areas near the very headwaters of these canyons.

PROPERTY-RANGE STRUCTURES – Several segments along the boundary fence was burned. An interior pasture fence on the Barlow allotment was burned. At this time this allotment is not grazed.

B. Emergency Treatment Objectives (narrative): The average rate of growth for a weed infestation is 14% every year if the infestation is invading a somewhat healthy ecosystem. The Patch Springs Fire has created a situation where the weed infestations can capitalize on the disturbance and grow at a much faster rate. The above mentioned species are very aggressive and create monoculutres further inhibiting the ability for a natural recovery.

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

Land 90% **Channel** XXX% **Roads/Trails** XXX% **Protection/Safety** XXX%

D. Probability of Treatment Success

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

E. Cost of No-Action (Including Loss):

NRCS Plant Code	Scientific Name	Common Name	Infested Acres IA	Year 1(YR1) [(IA x .14)+IA] X $100	Year 2(YR2) [(YR1 x .14)+IA]x$100	Year 3 [(YR2 x .14)+IA]x$100
CIVU	Cirsium vulgare	bull thistle	0.50	0.57/$57	0.65/$65	0.74/$74
TARA	Tamarix ramosissima	saltcedar	1.81	2.06/$206.00	2.35/$235.00	2.68/$268
CADR	Cardaria draba	whitetop	29.70	33.86/$3386	38.60/$3860	44.00/$4400

14% growth is an average of typical growth rate of all the rangeland weeds. The weeds above are particularly aggressive and the growth rate in a disturbed area is expected to be much higher. Also note the exponentioal growth of untreated infestations.

F.Cost of Selected Alternative (Including Loss): $8250

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology [X] Soils [ ] Geology [ ] Range
[ ] Forestry [ ] Wildlife [ ] Fire Mgmt. [ ] Engineering
[ ] Contracting [ ] Ecology [X] Botany [X] Archaeology
[X] Fisheries [ ] Research [ ] Landscape Arch [X] GIS

Team Leader: Charlie Condrat

Email: ccondrat@fs.fed.us **Phone**: 801-999-2173 **FAX**: 801-999-2187

H. Treatment Narrative:
(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

No treatments are recommended to control runoff or sedimentation from the fire because the risk of damage to critical resources on National Forest lands is low. No treatments are recommended for aquatic resources because the effectiveness of emergency stabilization actions would have limited benefit and fish species are not TES. Monitoring and treatment of invasive plants through early detection and response is recommended. No treatments are recommended for heritage resources because the possible effect to these resources on National Forest lands is minor and no mitigation measures are recommended.

Land Treatments:

Noxious Weed Early Detection and Rapid Response (EDRR) Treatment

General Description: The purpose of this noxious weed detection treatment is to allow

natural recovery of native plant communities where invasive plants were not present or in minor amounts prior to the fire. The treatment is to identify the spread of noxious weeds from any currently known location of noxious weeds. Due to existing populations within the fire perimeter, it is likely that some treatment will be necessary. Three aggressive noxious weeds need immediate attention: bull thistle, saltcedar and whitetop. This recently burned area offers a disturbed site for noxious weeds to occupy. EDRR along the outside perimeter of all documented known weed sites within the fire perimeter. Treat and map any new or expanded weed populations.

Location (Suitability) of Sites: There is a strong likelihood that musk thistle occurs in other locations yet to be mapped. Scotch thistle is located on private land at the historic Dell Ranch and likewise has great potential to spread on the forest. This is critical opportunity to apply an early detection/ rapid response strategy and keep these from spreading to the Forest.

Design/Construction Specifications: This treatment provides for a weed crew to monitor the 600-ft-wide buffer around known locations of noxious weeds on the National Forest lands to detect and treat new occurrences of noxious weeds that may be spreading away from the known location out into the burned area.

a) EDRR will be conducted on 32 units and if weeds are found they would be treated. These units would be monitored three times during the first growing season following the fire. It is estimated that a crew of two individuals can monitor, and if needed, treat 5 units per day. This equates to 6.5 days per monitoring round and for three monitoring rounds the total number of days for a 2-person crew are 20 days.
b) EDRR will occur at multiple times during the growing season to catch both early and late maturing species. It is assumed that this treatment is conducted by personnel on the Wasatch-Cache National Forest.
c) EDRR will be conducted by a botanist and technicians under direction of a botanist qualified to identify target species.
d) New population locations will be mapped using a gps and/ or 1:24,000 quad map and flagged on the ground. Because BAER funds will help to locate the new populations, the UWC National Forest can cost share with normal appropriated NFRR funding to enter the information into databases. NRIS and Wasatch-Cache survey and treatment forms will be filled out and entered into national database.
e) If new populations are small, plants will be hand dug and bagged for removal at time of discovery. Larger populations will be flagged for later treatment and a request for additional funding will be submitted.
f) Equipment washing for weed prevention is mandatory on all equipment and/or vehicles that may be harboring soil and debris prior to entering burned area for rehab or any other related activity.

Purpose: The fire has created suitable habitat for the spread of existing population of noxious weeds. EDRR will reduce the potential for establishment of new noxious weed sites or populations and allow recovery of native plant ecosystems.

Channel Treatments: No Treatments

Roads and Trail Treatments: No Treatments

Protection/Safety Treatments: No Treatments

I. Monitoring Narrative:
(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Part VI – Emergency Stabilization Treatments and Source of Funds **Interim #**

			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										
Botanist	day	350	5	$1,750	$0		$0		$0	$1,750
GS-5 Seasonal	day	150	40	$6,000	$0		$0		$0	$6,000
Chem/equipmt	dollars	500	1	$500	$0		$0		$0	$500
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$8,250	$0		$0		$0	$8,250
B. Channel Treatments										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$0	$0		$0		$0	$0
D. Protection/Safety										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$0	$0		$0		$0	$0
E. BAER Evaluation										
				—			$0		$0	$0
Insert new items above this line!				—	$0		$0		$0	$0
Subtotal Evaluation				—	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
				$0						
				$0						
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$8,250	$0		**$0**		**$0**	**$8,250**
Previously approved										
Total for this request				**$8,250**						

[j1]

PART VII - APPROVALS

1. _____ 9/3/13
Forest Supervisor (signature) Date

2. _____ 9/11/2013
(FOR) Regional Forester (signature) Date