

Date of Report: June 5, 2013

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: Soldier Basin B. Fire Number: AZ-CNF-000274
C. State: Arizona D. County: Santa Cruz
E. Region: Southwestern (3) F. Forest: Coronado
G. District: Sierra Vista H. Fire Incident Job Code: P3HG5M
I. Date Fire Started: 05/17/2013 J. Date Fire Contained: 05/28/2013
K. Suppression Cost: \$1,400,000 on 05/28/2013
L. Fire Suppression Damages Repaired with Suppression Funds
 1. Fireline waterbarred (miles): Handline - 6
 2. Fireline seeded (miles): 0
 3. Other (identify): 1 Petroglyph site
M. Watershed Numbers: 150503010203 (Harshaw Creek), 150503010206 (Middle Sonoita Creek), 150503010303 (Canada de la Paloma – Sanata Cruz River)
N. Total Acres Burned: 10,773 total acres
 NFS Acres(10,225) Other Federal () State () Private (548)

O. Vegetation Types: Vegetation in burned areas includes broadleaf evergreen woodland, desert grassland, and riparian vegetation.

P. Dominant Soils: Soil textural descriptions within the Soldier Basin Fire include very cobbly/gravelly loam; cobbly loamy sand, and gravelly sandy loam.

Dominant Soils within the Soldier Basin Fire perimeter

Soils	Burned Area (%)
Aridic Lithic Haplustolls	30%
Lithic Ustic Torriorthents	30%
Ustic Haplargids	21%
Aridic Ustorthents	14%
Lithic Ustic Haplargids	4%
Aridic Haplustalfs	1%

Q. Geologic Types: Alluvium with colluvium from primarily igneous rocks (mostly acidic), alluvium from granite and other metamorphic rock, granite rock outcrops.

R. Miles of Stream Channels by Order or Class:

Stream miles by order within Soldier Basin Fire Perimeter.

Stream Order	Length (Miles)
1	25.97
2	10.05
3	2.27
4	1.36
Grand Total	39.65

S. Transportation System

Trails: 0 miles Roads: 38 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 1,759 (unburned, very low); 6,582 (low); 2,421 (moderate); 8 (high)

USFS – 1,652 (unburned/very low); 6,223 (low); 2,340 (moderate); 8 (high)

Private – 107 (unburned/very low); 359 (low); 81 (moderate)

B. Water-Repellent Soil (acres): (all high severity plus 45% of moderate severity)

C. Soil Erosion Hazard Rating (acres): 0 (low) 1377 (moderate) 8635 (high) 759 (not rated)

D. Erosion Potential: 1.4 tons/acre (estimate)

E. Sediment Potential: 700 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):	<u>1-2</u>
B. Design Chance of Success, (percent):	<u>80</u>
C. Equivalent Design Recurrence Interval, (years):	<u>5</u>
D. Design Storm Duration, (hours):	<u>0.5 hour</u>
E. Design Storm Magnitude, (inches):	<u>1.40 inches</u>
F. Design Flow, (cubic feet / second/ square mile):	<u>297 cfs/mi²</u>
G. Estimated Reduction in Infiltration, (percent):	<u>26</u>
H. Adjusted Design Flow, (cfs per square mile):	<u>375 cfs/mi²</u>

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The Soldier Basin Fire burned 10,773 acres in the Patagonia Mountains. The Patagonia Mountains experience intense summer rain events (very high rainfall rates in relatively short durations) as part of the North American Monsoon. Vegetation in burned areas includes broadleaf evergreen woodland, desert grassland, and riparian vegetation.

Summary of Watershed Response

Hydrologic Response:

The site of the Soldier Basin Fire has a bimodal precipitation pattern. The climate is semi- arid with an average annual rainfall of 16 to 18 inches. The climate is heavily influenced by the North American monsoon, which delivers approximately fifty percent of the state's annual precipitation between the months of July and September. The second precipitation period occurs between November and April, providing about thirty percent of annual precipitation (Sheppard et al. 2002).

Based on historic precipitation patterns, high-intensity monsoon storms will likely initiate about one month following this fire. These storms are associated with flash flooding and erosion events. Runoff volume will be elevated due to impacts from the fire, potentially creating hazardous conditions within and downstream of the burned area.

Areas within and downstream from the fire were evaluated for impacts of increased runoff. Sub-watersheds were delineated from identified Values at Risk (VARs). The Wildcat V hydrology model was used to predict pre- and post-fire runoff. These runoff events were modeled using a 5-year 30 minute design storm, which has a magnitude of 1.40 inches. Pre-fire design flow was estimated at 297 cubic feet per second/square mile and post-fire design flow was estimated at 375 cubic feet per second/square mile – a 26% increase in post-fire peak flow. These values vary by sub-watershed and are described in detail along with the analysis method in the hydrology and watershed specialist report.

Erosion Response:

Soil textures range from gravelly loam to extremely very cobbly fine sandy loam. Soils are generally shallow since geomorphic erosion rates are high. Slopes range from 5 percent on toe slopes along the western edge of the burned area and low gradient ephemeral drainages to vertical where escarpments, canyon walls and large rock outcrops occur. Ground cover, which is critical for maintaining soil stability, has been consumed in the small areas where high severity wildfire has occurred. Other areas that exhibit low burn severity have retained some effective ground cover, including live vegetation, unburned litter, and partially burned litter. Soils with low

burn severity generally retain surface structure and porosity since fine roots of grasses and forbs remain intact and larger woody species typically survive. Some residual organic matter often remains, which covers soil surfaces and provides habitat for soil organisms that facilitate recovery of nutrient cycles. These soils generally respond rapidly and in a positive manner following low burn severity as revegetation occurs, soil surfaces regain protective cover, and nutrient cycles are enhanced. Soils that are subjected to moderate and high soil burn severities have evidence of excessive soil heating in isolated patches; these areas typically exhibit longer term recovery with increased erosion potential. The most severely burned areas generally occur on steep terrain at higher elevations where pre-fire vegetation density and fuels accumulations were higher. Water repellency, or soil hydrophobicity, is present in some areas that burned at moderate severity within the fire perimeter, but was most evident in higher burn severity areas. However, in general, low and moderate burn severities rarely exhibit hydrophobic conditions within the fire affected area.

While soils will be adversely affected in some areas that burned at moderate severity, there is no general emergency for soils resources as the predominant onsite wildfire effects are within normal limits for this area. The overall scale of the fire is approximately equal to historic fire occurrences, and downstream effects of erosion and slope destabilization are likely within the natural range of variability for the area where the Soldier Basin Fire occurred. Given the slope characteristics and active hillslope processes, few opportunities exist where land treatments can be implemented to mitigate potential flooding and debris flow hazards, regardless of available funding.

Wildlife Response:

The area affected by the Soldier Basin Fire supports important habitats and occurrences of the following Federally Threatened and Endangered (T&E) wildlife species: Lesser long-nosed bat (Endangered), Jaguar (Endangered), Ocelot (Endangered) and Mexican spotted owl (Threatened with designated Critical Habitat). Some of the above-mentioned species and their habitats within the affected area have been impacted by the fire and suppression activities. Overall, however, because the vast majority (99%) of the fire was unburned, low, or of moderate soil burn severity, habitat for all listed species was likely improved by reducing the catastrophic wildfire probability.

The effects on lesser long-nosed bat, jaguar, and ocelot are limited to habitat loss. Portions of the burned area includes likely travel corridors, foraging areas, and potential occupied habitat but no known occurrences of any of these species, or their roosting sites in the case of the lesser long-nosed bat, were within the affected fire area. No emergency conditions exist for lesser long-nosed bat, jaguar, and ocelot, or their habitat, as a result of anticipated post-fire effects.

One Mexican spotted owl (MSO) protected activity center (PAC) was within the fire perimeter. Approximately 7 acres (>1%) in the southern end of the PAC experienced high soil burn severity and was where the most significant loss of habitat occurred. In this area, the high burn severity resulted in crown scorch, loss of all canopy cover, understory vegetation, and the consumption of all downed woody debris. Approximately 168 acres (13%) was outside the fire perimeter and was unburned. Approximately 1084 acres (86%) of the PAC inside the fire perimeter remained unburned or suffered low to moderate soil burn severity. Generally, these areas resulted in some loss of understory vegetation and tree scorching but retained most of the canopy cover. No emergency conditions exist for MSO, or their habitat, as a result of anticipated post-fire effects. There was also habitat loss within the designated Critical Habitat area outside occupied PAC, but, as mentioned above, the vast majority of the burned area was low to moderate burn severity. Many of the mix-conifer patches remained intact and suffered only the loss of understory vegetation with minimal crown scorching and loss of canopy cover.

Heritage:

At least thirteen cultural resource sites have been documented within the area affected by the fire. Tribal consultations for unrelated Forest projects in the surrounding area have not revealed any information regarding Traditional Cultural Properties.

As indicated by the site inventory, mining features are widespread and they account for a large proportion of the sites, and many of the other historical structures are presumably associated with mining. Mining features themselves have been documented only sporadically as cultural resources. In many cases when they have been designated as sites, archaeologists have refrained from formal NRHP-eligibility recommendations.

No sites were identified for treatment by the BAER program. A petroglyph site was impacted by slurry drop, but restoration funding will be sought through the suppression account.

Range/Botany:

The prominent vegetation type within the fire perimeter consisted of broadleaf evergreen woodlands occurring from 4,400 to 6,200 feet within the fire perimeter. To a lesser extent the fire also included desert grasslands and riparian vegetation occurring in Harshaw Canyon.

There are no Threatened or Endangered plant species known or likely to occur in the affected areas. There is no designated critical habitat in the affected areas. Habitat for the endangered Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*) exists on Coronado NF Land adjacent to the fire, but it was not affected by the Soldier Basin Fire.

Seventeen invasive plant species are known to occur on the Coronado. These species are considered to be a threat due to the possibility of their spread into the newly disturbed fire area. Areas disturbed by fire and fire suppression activities are highly susceptible to noxious weed invasion because competing native vegetation is removed. Weed infestations often occur in previously disturbed areas, riparian corridors, along roadways or adjacent to private lands. The sizes of known infestations are variable, from individual plants to infestations over about 100 acres.

Values at Risk:

The risk matrix below, Exhibit 2 of Interim Directive No.: **2520-2010-1**, was used to evaluate the Risk Level for each value identified during Assessment. Values at Risk (VAR) with a risk of Intermediate or higher are discussed below. The comprehensive VAR list is located in Appendix A.

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

Life:

Road/Stream crossings: There are multiple road/stream crossings within and immediately downstream of the burn area. Post-fire flows at multiple locations along the road network could be exacerbated.

Risk Assessment – Threats to travelers on Forest Roads

Probability of Damage or Loss: Possible - Low water crossings/flash flood risk.

Magnitude of Consequence: Moderate - Possible injury of both administrative users and Forest visitors.

Risk Level: Intermediate –Treatment considered for threats to human life or safety. Mitigate by deploying warning signs

Property:

Forest Service and private roads: FS and private roads exist throughout the burn area. There is a risk to the roads and crossings from increased runoff, associated sediment and debris and debris flows.

Risk Assessment – Threats to Forest Service and Private Roads

Probability of Damage or Loss: Probable to Likely – Multiple crossings and parallel sections in the floodplain

Magnitude of Consequence: Moderate – Water could channel down road with possible wash outs and potential for crossings to be damaged or destroyed.

Risk Level: Intermediate– Debris will likely need to be periodically removed from roadbed and minor maintenance of roads will likely be necessary. Work with NRCS to notify private landowners of road-related issues.

Water Infrastructure (water trough & wells): A water trough in Canada de la Paloma-Santa Cruz River Watershed was installed within the channel and is at increased risk from flooding. Wells in Harshaw Creek Watershed and Sonoita Creek Watershed are at risk for ash and sediment deposition.

Risk Assessment – Threats to water trough and related infrastructure; threats to wells.

Probability of Damage or Loss: Possible – Water trough is located on terrace above wash. Risk from increased sedimentation/flooding at site. Wells are located in close proximity to washes and are vulnerable to flood impacts.

Magnitude of Consequence: Moderate – Fiberglass trough could be mobilized or damaged from debris carried in flood water. Wells could become contaminated with ash or tailing effluent from upstream.

Risk Level: Intermediate– Disconnect trough, move out of the path of increased flow to adjacent site with decreased vulnerability. Notify NRCS to protect wells on private lands.

Gas Line: A gas line in Sonoita Creek Watershed is buried below several wash crossings. This line could be undermined during high flow events.

Risk Assessment: Threats to integrity of gas line

Probability of Damage or Loss: Unlikely – Gas line is likely buried at a depth not susceptible to undercutting during high flow events.

Magnitude of Consequence: Major – the line crosses several washes. There are multiple points where the line could be damaged.

Risk Level: Intermediate – Work with El Paso Gas Company to further analyze risk and make necessary mitigations. Work with NRCS or inform private property owners directly about potential risk.

Natural Resources:

Native Plant community: Suppression efforts may have introduced non-native invasive species into the burn area with the potential to impact native plant communities. There were minimal non-native invasive plants in the Patagonia Mountains at elevations above 5500 feet prior to the fire. Potential for invasive plant spread is increased due to border-related traffic and post-fire conditions.

Risk Assessment – Probability of damage or loss of the native plant community

Probability of Damage or Loss: Likely - Based on miles of hand line and associated suppression activities and border-related traffic along unauthorized trails.

Magnitude of Consequence: Moderate – loss of native plants communities.

Risk Level: High – Invasive species detection surveys following monsoon and winter precipitation

Water Quality: The Patagonia Mountains have extensive mining sites. Associated features such as tailing piles are located close to drainages and may be transported in increased flows into washes and riparian areas.

Risk Assessment – Probability of transporting contaminants into the watershed

Probability of Damage or Loss: Likely - based on expected flows.

Magnitude of Consequence: Moderate – potential downstream contamination.

Risk Level: Intermediate – Need to evaluate for potential stabilization treatment. Most of disturbance is on private land.

B. Emergency Treatment Objectives:

As noted above, threats to life, property, and natural and cultural resources from loss of water control, increased sediment delivery, establishment of noxious weeds, and habitat degradation for Federally Endangered and Threatened species exist as a result of the Soldier Basin Fire. For these reasons the primary treatment objectives are:

- Mitigate effects of changed post-fire watershed response on human life and safety, primarily along roads and with administrative and public users.
- Mitigate effects of changed post-fire watershed response on Forest Service infrastructure such as water systems.
- Minimize the increased potential for the spread of invasive and noxious weeds.
- Collaborate with NRCS, El Paso Gas Company, Santa Cruz County, and private land owners to raise awareness about identified risks.

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

Land N/A % Channel N/A % Roads/Trails N/A % Protection/Safety 85 %

D. Probability of Treatment Success

Years after Treatment			
	1	3	5
Land*	80	N/A	N/A
Channel	N/A	N/A	N/A
Roads/Trails	N/A	N/A	N/A
Protection/Safety	85	95	95

*Note: Initial request is for weed detection surveys. If weeds are detected, then an interim request will be submitted for treatment. Due to the variable seasonality of weed species, there is a high likelihood that new species will occur after one year of survey and treatment. As a result, treatment success in years 3 and 5 will depend on Forest allocation to effectively monitor and continue treatment.

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

Reference the VAR Tool Spreadsheet in separate document

F. Cost of Selected Alternative (Including Loss):

Reference the VAR Tool Spreadsheet in separate document

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 type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS

Team Leader: Marc Stamer

Email: mstamer@fs.fed.us

Phone: (520)388-8374, Fax: (520)388-8305

Core Team Members:

Kit MacDonald – Soil Scientist
Tedd Huffman - Hydrologist
Adam Springer - Hydrologist
Chris Stetson – GIS

John Kraft – Wildlife/Fisheries
Walt Keyes – Roads Engineer
David Mehalic – Heritage
James Heitholt – Range/Botany

H. Treatment Narrative:

Land Treatments:

Initial Treatment Request

Invasive Plants: Forest Service policy mandates the Forest to minimize the establishment of non-native invasive weeds to prevent ecosystem degradation of burned areas. Fire fighting vehicles and equipment are common vectors that spread invasive weeds. There is a high likelihood that suppression activities on the Soldier Basin Fire have vectored weed seed into the burned area because vehicles and equipment were not washed prior to entering the fire area, some vehicles and equipment originated in areas with weed infestations, and there are known weed infestations on roads and private land near the fire. Most of the burned area does not have known invasive weed infestations. If new infestations are established, the magnitude of the consequences could be significant and long-term. An Early Detection Rapid Response strategy to monitor for weed infestations and treat small infestations, providing survey time is not compromised, is proposed.

Areas disturbed by the Soldier Basin Fire and associated suppression and rehabilitation activities are highly vulnerable to invasive weed invasion. These include roads, trails, hand line, dozer line, staging areas, safety zones, helicopter drop points and riparian areas at road crossings. If weeds are detected during the surveys, an interim request for treatment will be requested.

SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST
2013	GS-11 Invasive Spp Coordinator	\$330/Day	7	\$2,310
	GS-11 Range Staff/COR	\$330/Day	5	\$1,650
	Summer 2013 IDIQ Rate Road Survey	\$75/Mile	60	\$4,500
	Summer 2013 IDIQ Rate Trail or Handline Survey	\$250/Mile	8	\$2,000
	Summer 2013 IDIQ Rate by Acre Basis	\$150/Acre	1	\$150
2014	Spring 2014 IDIQ Rate Road Survey	\$82.50/Mile	60	\$4,950
	Spring 2014 IDIQ Rate Trail or Handline Survey	\$275/Mile	8	\$2,200
	Spring 2014 IDIQ Rate by Acre Basis	\$165/Acre	1	\$165
TOTAL				\$17,925

Channel Treatments: N/A

Road and Trail Treatments: N/A

Protection/Safety Treatments:

Flash Flood Hazard Warning Signs for Roads: Flash flood hazard warning signs will be installed at targeted locations along at-risk roads. These locations are ingress areas of roads that either cross drainages or are located in low-lying areas adjacent to drainages and are at risk of flash flooding due to fire effects. These signs are necessary to inform forest users of immediate danger posed by storm-related response to flood effects within and downstream of burned areas. This treatment is expected to provide protection of human life and safety.

SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST
2013	Hazard signs	\$200	5	\$1,000
TOTAL				\$1,000

Move livestock water trough out of floodplain: A USFS owned livestock water trough located in Canada de la Paloma-Santa Cruz River Watershed is at risk for becoming mobilized in floods or damaged by debris during a flood. Moving this trough out of the floodplain would prevent damage to the resource.

SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST
2013	Backhoe	\$1,200/day	1 day	\$1,200
TOTAL				\$1,200

Implementation Coordinator: An Implementation Coordinator is requested to facilitate implementation of several recommendations from the BAER analysis. These items include:

- Oversee installation of flood warning signs
- Coordinate with NRCS to address issues with roads, wells, and other impacts to private property
- Coordinate with El Paso Gas Company to examine gas line risk
- Coordinate invasive plant detection efforts
- Coordinate with Santa Cruz County regarding flood impacts at Harshaw Cemetery
- Coordinate relocation of water trough

SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST
2013	Days	\$320	10	\$3,200
TOTAL				\$3,200

I. Monitoring Narrative: N/A

Part VI – Emergency Stabilization Treatments and Source of Funds

			NFS Lands			Other Lands				All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER \$	\$	units	\$	Units	\$	\$
A. Land Treatments										
Weed detection				\$17,925						
Subtotal Land Treatments				\$17,925	\$0		\$0		\$0	\$17,925
B. Channel Treatments										
None recommended										
Subtotal Channel Treat.				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
None recommended										
Subtotal Road & Trails				\$0	\$0		\$0		\$0	\$0
D. Protection/Safety										
Install hazard signs for roads	each	200	5	\$1,000						
Relocate water trough	day	1200	1	\$1,200						
Implementation Coordinator	day	320	10	\$3,200						
Subtotal Structures				\$5,400	\$0		\$0		\$0	\$5,400
E. BAER Evaluation										
Assessment				\$0	\$28,069		\$3,155		\$0	\$31,224
Subtotal Evaluation				\$0	\$28,069		\$3,155		\$0	\$31,224
F. Monitoring										
None recommended				\$0						
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals				\$23,325	\$28,069		\$3,155		\$0	\$54,549
Previously approved				\$0						
Total for this request				\$23,325						

PART VII - APPROVALS

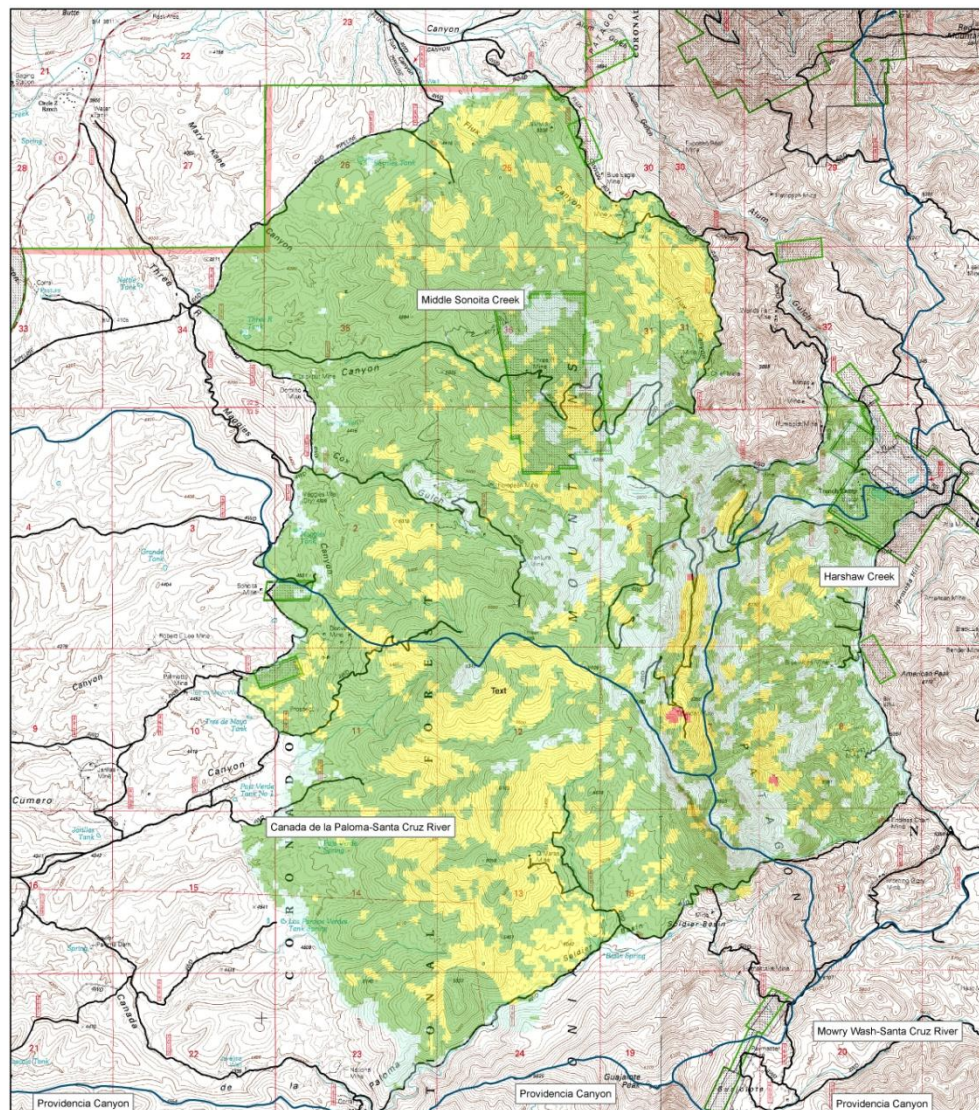
1. /s/ Heidi Schewel (for)
Forest Supervisor

6/7/2013
Date

2. /s/ Gilbert Zepeda, Acting
Regional Forester

6/14/2013
Date

APPENDIX A. Soil Burn Severity Map



Soldier Basin Fire
BAER Assessment Team
Final Soil Burn Severity
June 2, 2013



1:24,000

1 0.5 0 1 Miles

Soil Burn Severity

- High
- Moderate
- Low
- Unburned/Very Low
- HUC 6 Watersheds
- Roads

The Forest Service makes no expressed or implied warranty with respect to the character, function, or capabilities of the data or their appropriateness for any user's purposes. represented features may not be in an accurate geographic location. The Forest Service reserves the right to correct, update, modify, or replace this geospatial information without notification.
Map created June 02, 2013, by Marc Stamer

APPENDIX B. Comprehensive Values at Risk

Value at Risk	Comments	Probabi lity of Damage (VL, L, P, Un)	Magnitude of Consequence (Maj, Mod, Min)	Determi nation (VH, H, Int, L, VL)	Treatment/ Recommendation
Middle Sonoita Creek – Humboldt Sub-Watershed					
Thunder Mine	Inside High Severity, Out of channel and low watershed response	Un	Mod	L	No Treatment
Sunnyside Mine	Inside Low Severity w/ High and Moderate Severity above, Tailings in channel and additional sites upstream	P	Mod	Int	
Middle Sonoita Creek – Three R Sub-Watershed					
Ventura Mine	Visible tailings, No change in condition from the fire. Water is flowing out of the adit. This is outside the scope of BAER.	Un	Min	VL	Consider CERCLA response. Need to discuss with Salek.
European Mine	Visible tailings	P	Min	L	No Treatment
Three R Mine	Visible tailings, Most of the watershed above is unburned or burned at low severity	P	Mod	Int	Evaluate for potential stabilization treatment. Disturbance primarily on private land.
Lookout Mine	Adjacent to and above road. No tailings visible on aerial photo, On a bench on flat terrain.	Un	Min	VL	No Treatment
Barriles Stocktank	Rock outcrop at top of watershed.	Un	Mod	L	
Natural Gas Pipeline		Un	Maj	Int	Implementation Coordinator provide report to Gas Company
82 Road Xing at 3R	Peak flows are expected to increase by 20% above pre-fire levels for a 5 yr 30 min rainfall event which is equivalent to pre-fire runoff from rainfall event with a recurrence interval of between 5 & 10 yrs – this small increase in peak flow would be unlikely to damage the concrete box culverts or plug them	Un	Min	VL	No Treatment
FS4679, FS215, FS235, FS4678,	Threat to property	P	Mod	Int	
FS4679, FS215, FS235.	Minimal risk to human safety and life due to generally low burn severity.	Un	Min	VL	

FS4678,					
Private Roads	Three R	P	Mod	Int	Implementation Coordinator provide report to County/NRCS. Consider signs on NF Property
Flowing Well	Located in a small watershed area.	Un	Min	VL	No Treatment
Maggies Tank	Somewhat large watershed with less than 40% moderate burn severity.	P	Mod	Int	
Three R Tank	Dominantly low burn severity in the watershed above this tank.	Un	Min	VL	
Historic Mine					
Artifact Scatter	Low severity around and above site	Un	Min	VL	
Historic Mine	Talk to Dave				
Historic Mine					
House, Outhouse and Shower	Frequent unauthorized use by forest visitor,	Un	Mod	L	No Treatment. Recommend LE&I contact visitor and relay potential for post-fire response.
Sonoita Creek - Allum (Encompasses Humboldt) Sub-Watershed					
Chief Mine	In small patch of moderate severity surrounded by low severity	Un	Min	VL	No Treatment
Circle Z Ranch	Located at confluence of Three R and an unnamed drainage	Un	Mod	L	Parts of property are close to channel, post-fire increase only 36% (1300cfs to 1800cfs). Not expected to have loss of water control.
Flux Mine	Visible tailings, Assumption is channel is adequate to convey post-fire flood flows	P	Mod	Int	No Treatment
Invincible Prospect	Outside of burn				
Patagonia Jewel					
Red Mountain					
Exposed Reef Mine					
Blue Eagle Mine	Outside of burn, Visible tailings				
Aztec Group					

Mine					
World's Fair Mine					
January and Norton Mine	Visible tailings				Adjacent to burned area & channel. No concern.
Noname Mine	No tailings visible. Not located in channel.	Un	Min	VL	No Treatment
Trench Mine	Inside burned area, but on bench and outside of channel.	Un	Min	VL	
Humboldt Mine	Visible tailings, Adjacent to burned area and outside of channel.				
Open well casing	Low, unburned and moderate severity surrounding this site. Potential for sediment to enter well. May want to place removable well cap on well head.	P	Mod	Int	Recommend implementation coord inform property owner of potential risk.
Natural Gas Pipeline	Unsure of depth pipeline is buried at channel crossings. May want to verify with El Paso. Only 20 percent increase in flood flow possible.	Un	Maj	Int	
Residence & Ranch	Peak flows are expected to increase only by 20% above pre-fire levels for a 5 year 30 minute rainfall event which is equivalent to pre-fire runoff from rainfall event with a recurrence interval of between 5 and 10 years – this small increase in peak flow would be unlikely to damage the residence and associated buildings.	P	Min	L	Magnitude is likely to be nuisance flooding
82 Xing at Alum	Peak flows are expected to increase only by 20 % above pre-fire levels for a 5 year 30 minute rainfall event which is equivalent to pre-fire runoff from rainfall event with a recurrence interval of between 5 and 10 years – this small increase in peak flow would be unlikely to damage the concrete box culverts or result in plugging the culverts	Un	Min	VL	No Treatment - Private property
Flux Canyon Road	Infrastructure should be able to handle modeled increase in flood flow.	Un	Mod	L	No Treatment
FS4701	Road is located in the channel of Humboldt Canyon, Potential for damage to forest infrastructure	L	Mod	H	
FS4685	Road is located in close proximity to drain. Potential risk of damage to Forest infrastructure	P	Min	L	
FS4701	Road is located in the channel of Humboldt Canyon. Potential risk to human life and safety if road is used during monsoon season	L	Maj	VH	Install hazard signs.
FS4685	Road is located in close proximity to drain. Potential risk to human life and safety if road is used during monsoon season	P	Mod	Int	
FS215, FS5551, FS4702, FS4700, FS4898, FS5552, FS5550, FS4685A,		Un	Min	VL	

FS5785					
Private Roads	Outside of burn perimeter	P	Min	L	No Treatment - Private property
Trench Camp Water Tanks	In Harshaw watershed. Low burn severity. No concern.	Un	Min	VL	No Treatment
Spring near Flux Mine	Spring located in channel. Livestock water source	Un	Min	VL	
Historic ?	No risk from increased response				
Historic Humboldt Mine	No risk from increased response				
Canada de la Paloma-Santa Cruz River – Rockhouse Sub-Watershed					
O'Mara's Mine	Visible tailings. Out of channel, close to ridgeline.	Un	Min	VL	No Treatment
Historic Rock Structure - Mansion	Probably has had high flows before. Based on models, there is low likelihood of loss of water control. Peak flows are expected to more than double at the site for a 5- year recurrence interval rainfall event. Post-fire flows for a similar rainfall event are approximately equivalent to a rainfall event with a recurrence interval of between 10 and 25 years on pre-fire watershed conditions. It is expected that this structure has been subjected to at least a 25-year event in the past. Channel capability calculations show the channel could handle flows 3 to 4 times larger than modeled for post-fire flows using the design storm prior to damaging the historic structure.	P	Min	L	
Water Trough	Located adjacent to channel in potential flow path.	P	Mod	Int	If FS property, consider unplumbing trough and moving to upland location near solar panel and large storage tank.
Solar Panel, Well Head and Water Storage Tank	Located on small ridge dissected by 2 drainages, Minimal risk since these are out of drainage channels.	Un	Mod	Int	No Treatment
Water Well with dilapidated windmill & structures	Located on small terrace above drainage.	P	Mod	Int	
Stock Tanks		Un	Min	VL	
Canada de la Paloma-Santa Cruz River – Rockhouse (4897)					
FS4698, FS4897,	Property - FS4698 is also in Harshaw subwatershed, Border Patrol uses these roads and pays USFS for maintenance	P	Mod	Int	No Treatment

FS4681					
FS4698, FS4897, FS4681	Potential risk to human safety and life.	L	Mod	H	Install hazard signs
FS4659	Located further downstream than other roads described above.	P	Mod	Int	No Treatment
FS235	Located on fire perimeter, running perpendicular to fire with low water crossings common	P	Min	L	
Denver Mine	Tailing evident on aerial photo. Rock outcrops common in this area. Three sites located on side slope above drainage	Un	Min	VL	
Corral	Located adjacent to drainage	P	Mod	Int	
Historic Mine					
Historic Building					
Petroglyphs & Cupule	Low severity above, close proximity to channel. Probably persisted from larger flood events.	Un	Mod	L	
Petroglyphs		Un	Mod	L	
Historical Structure - Stone House - Bunk House	Adjacent to channel. Low Severity above. Out of channel. Has persisted after larger events.	Un	Min	VL	
Historical Building					
Historical Structure					
MSO PAC		P	Min	L	
Harshaw Creek – Cemetery Sub-Watershed					
Auguste Mine	x	Un	Min	VL	No Treatment
Blue Nose Mine	Visible tailings	Un	Min	VL	
No name Mine	x	Un	Min	VL	
Cemetery	One grave site is potentially at risk from increased flow. Peak flows are expected to increase only by 15 percent above pre-fire levels for a 5 year 30 minute rainfall event which is equivalent to pre-fire runoff from rainfall event with a recurrence interval of between 5 and 10 years – not greater that what had been experienced by this cemetery in the past.	P	Min	L	Recommend relay info county.
Dam	Fire edge, Large structure, almost full of sediment, large watershed with low severity above.	Un	Min	VL	No Treatment
Harshaw Road	Low risk to property due to low severity	P	Min	L	No Treatment
Harshaw Road	Low risk to human safety and life due to low severity	Un	Mod	L	

FS5553, FS5554, FS5566, FS4701	Property - Predominately Channel bottom	P	Mod	Int	No Treatment
FS5553, FS5554, FS5566, FS4702	Life and Safety - Predominately Channel bottom	P	Mod	Int	Recommend installing warning signs.
Residences	Property - Adjacent to channel, downstream outside of burn. Change in watershed response minimal.	Un	Mod	L	No Treatment
Residences	Life and safety - Adjacent to channel, Change in watershed response minimal.	Un	Min	VL	
Patagonia Municipal Water Supply	Water quality - No significant change to watershed conditions post-fire.	Un	Min	VL	
FS5521 & FS49 Intersection	Public safety, low risk to human safety and life, low burn severity	Un	Mod	L	
Residence along Harshaw Rd within burn	Residence is safe, well is close to channel and could experience ash deposition under high flow event.	P	Mod	Int	Coordinate with NRCS/Property owner
Other Values at Risk					
Utility Lines	Infrastructure out of channels	Un	Min	VL	No Treatment
Native Plant Communities	Along roads, drop points and handlines. Known occurrences at ICP. Also along indirect and direct handline, and unauthorized user defined trail.	L	Mod	H	Noxious weed detection surveys.
MSO Critical Habitat		P	Min	VL	

APPENDIX C. Recommendations and Follow-up Items

- Cover open wells
- Law Enforcement talk to squatter in Three R Canyon. Primary risk is if occupant attempts to leave site during high flows. Recommend that occupant move to nearby high ground.
- Sunnyside Mine – Tailings →increased amount of precipitates in channel
- Lack of water bars on roads
- 1.5 mile 1 ¼ DR9HPE pipe needs replaced
- 2.5 miles of fence repairs
- Clean out tanks