

**BURNED-AREA REPORT**

(Reference FSH 2509.13)

Date of Report: 6/28/2013

Date of Interim #1: 7/10/2013

**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 # 1  
☒ 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: Silver FireB. Fire Number: NM-GNF-000230C. State: NMD. Counties: Sierra, GrantE. Region: 03F. Forest: Gila NFG. Districts: Wilderness, Silver City, Black RangeH. Fire Incident Job Code : P3HJ20I. Date Fire Started: 06/07/2013  
containmentJ. Date Fire Contained: as of 6/27/13 20%J. Date Fire Contained: as of 7/10/13 80% containmentK. Suppression Cost: \$11,500,000.00K. Suppression Cost: \$14,000,000.00

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred and brush brought back on line (miles): Work is ongoing. No mile estimate at this time.
2. Fireline seeded (miles): Work is ongoing. No mile estimate at this time.
3. Other (identify): Work is ongoing. No mile estimate at this time.

M. Watersheds – Affected 6<sup>th</sup> Codes South Percha Creek, North Percha Creek, Holden Prong, Headwaters of Tierra Blanca Creek, Headwaters of Berrenda Creek, Gallinas Canyon, Gaviñon Arroyo Mimbres, Mud Spring Canyon, South Fork Palomos Creek, North Seco Canyon, Seco Creek, Cave Creek, Headwaters of Los Animas Creek, Trujillo Canyon Creek, Powderhorn Canyon-Mimbres River, Allie Canyon-Mimbres River, Shepard Canyon-Mimbres River, Noonday Canyon, Noonday Canyon-Mimbres River, Headwater Black Canyon, Outlet Black Canyon, Rocky Canyon.

N. Total Acres Burned: Based on IR Perimeter of 6/26/2012  
NFS Acres: (56080) Other Federal: (0) State: (0) Private: (670)

N. Total Acres Burned: Based on IR Perimeter of 7/08/2012  
NFS Acres: (137,901) Other Federal: (0) State: (9) Private: (788)

O. Vegetation Types: Pinyon/Juniper, Ponderosa Pine, Mixed Conifer

P. Dominant Soils: Mollisols, Alfisols, Inceptisols

Q. Geologic Types: Andesite, Limestone, Rhyolite/Tuff

R. Miles of Stream Channels by Order or Class:  
Perennial: 19      47  
Intermittent: 25      20  
Ephemeral: 236      271

S. Transportation System  
Trails: 80 miles      124 miles  
Roads: 24 total FS miles      19 miles

### **PART III - WATERSHED CONDITION**

A. Burn Severity (acres): 12,959 (no data) 13,229(low/unburned) 17,173(moderate) 13,389(high) Acres reflected in the burn severity map from 6/21/2012 do not cover the entire final burn area. No data acres of burn severity are due to satellite imagery and infrared burn perimeter taken at different times on 6/21/13.

A. Burn Severity (acres): 683(no data) 80,292(low/unburned) 36,931(moderate) 20,793(high)

B. Water-Repellent Soil: Phase1 (acres): 30,562  
Water-Repellent Soil: Phase2 (acres): 57,724

C. Soil Erosion Hazard Rating (acres):  
Phase 1      318 (low)      802 (moderate)      55,630 (high)  
Phase2      1,914 (low)      2,340 (moderate)      134,376 (high)

D. Erosion Potential: 9.8 tons/acre (average across fire, low mod, and high severity)

E. Sediment Potential: 873 cubic yards / square mile (average total)

#### **PART IV - HYDROLOGIC DESIGN FACTORS**

A. Estimated Vegetative Recovery Period, (years):	<u>5</u>
B. Design Chance of Success, (percent):	<u>80%</u>
C. Equivalent Design Recurrence Interval, (years):	<u>25</u>
D. Design Storm Duration, (hours):	<u>6</u>
E. Design Storm Magnitude, (inches):	<u>2.5"</u>
F. Design Flow, (cubic feet / second/ square mile):	<u>371</u>
G. Estimated Reduction in Infiltration, (percent):	<u>50+</u>
H. Adjusted Design Flow, (cfs per square mile):	<u>724</u>

#### **PART V - SUMMARY OF ANALYSIS**

##### **A. Describe Critical Values/Resources and Threats:**

The Silver Fire started on June 7<sup>th</sup> as a result of a lightning strike in the vicinity of Sawyers Peak located south of State Highway 152 on the Silver City Ranger District of the Gila National Forest. The majority of the fire is on National Forest System lands managed by the Silver City, Wilderness and Black Range Ranger Districts located west of the community of Kingston, NM. Approximately 670 acres of the burn is on privately owned lands.

The burn area is comprised of very steep and rugged terrain ranging from pinyon-juniper scrub at 6,000ft to mixed conifer at 10,000ft elevation. Numerous very steep slopes and high gradient drainages located within the burned area will transport significant water and debris flows during subsequent rain events. Many of the channels have not experienced high flows in many years and consequently have large amounts of stored sediments that could easily be transported under peak flows.

The Silver Fire continued to actively burn during the BAER assessment. This initial request will be phase 1 of a 2 phase assessment. Phase 1 of this assessment with its associated Values at Risk used the 6/21/2013 soil burn severity which was based on BARC imagery dated 6/13/2013 and 6/21/2013. This imagery was adjusted by team soil scientists after field assessments to reflect observed field conditions and degree of soil hydrophobicity throughout the burned area. At this point the fire is over 92,000 acres and 20% contained. The fire continues to spread north westerly, north easterly and westerly. An interim 2500-8 for phase 2 will be submitted at a later date.

This interim 2500-8 addresses phase 2 of the Silver Fire BAER assessment. The Silver Fire is now 80% contained as of July 10th and has burned approximately 138,500 acres. Phase 2 of

this assessment with its associated Values at Risk used the 7/9/2013 soil burn severity which was based on SPOT imagery taken on 7/5/2013, BARC imagery taken on 7/7/2013 and aerial and ground hand mapping conducted from 7/2/13 to 7/7/2013. This imagery was adjusted by team soil scientists after field assessments to reflect observed field conditions and degree of soil hydrophobicity throughout the burned area. The growth of the fire is minimal and has not grown in any significant amount in the last few days due to recent precipitation over the burn area. An additional 118 acres of private lands and 9 acres of State lands were affected by the fire.

The Silver Fire has severely burned large contiguous tracts of Forest system lands across the Crest of the Black Range, including the headwaters of South Percha, Middle Percha, North Percha Creek, Mineral Creek, and Carbonate Creek that drain directly into the communities of Kingston and Hillsboro. The headwaters of Gallinas Canyon also experienced a significant amount of high severity burn. This area drains onto public lands where homes and infrastructure will be affected by high post fire flows. The majority of these communities are situated in the floodplain and have experienced high flows and flooding in the past without any burn in the upper watershed. New Mexico State Highway 152, a popular route that attracts many visitors each year, is expected to be severely impacted by post fire conditions. The vegetation and duff layer that once served to intercept, absorb and hold water were eliminated in the moderate and high severity burn areas within the fire area. Extremely steep long slopes will further add to the loss of control of water, excessive downstream sedimentation and loss of site productivity.

Additional watersheds have been severely affected including the headwaters of Allie Canyon Mimbres River and Powderhorn Canyon Mimbres River sixth code watersheds. These areas drain into the Mimbres River and the Mimbres River Valley and onto public lands where homes and infrastructure will be affected by post fire flows. The Mimbres River is a 303d listed stream and a large agricultural community including fields and orchards exist in this valley.

Post-fire flows from a 25 year 1 hour precipitation event are expected to increase 2-3 times in most of the affected drainages. Additionally, pre-fire erosion rates commonly less than one ton per acre have been modeled post-fire to over 36 tons per acre. This greatly exceeds the dominant pre-fire soil loss tolerance of 1 to 3 tons per acres. Changes in runoff response compounded by sediment bulking are issues of serious concern for downstream values of public safety human life and property.

Post fire flows from phase 2 are expected to increase up to 2 times pre fire flows. Post fire erosion rates have been modeled at 9.8 tons/acre for Phase 2.

Severe damage to Forest Service infrastructure including numerous Forest system roads totaling 25 miles, six developed Forest Service campgrounds and 80 miles of trails will also be severely impacted by post fire erosion, sedimentation and flooding.

An additional 19 miles of forest system roads and 125 miles of trails will be impacted by post fire erosion, sedimentation and flooding.

Loss or damage to critical natural resources, including soil productivity, water quality, watershed health, cultural resources, threatened and endangered species and critical habitat has resulted from this fire and irreversible damage is expected if management action is not taken in the watersheds mentioned above. In addition a significant amount of high and moderate burn severity has occurred in the headwaters of Animas Creek, a 303d listed stream, located in the

Aldo Leopold Wilderness affecting numerous Outstanding Natural Resource Waters (ONRW) totaling 11 miles.

A significant amount of high and moderate burn has impacted the headwaters of the Mimbres River, a 303d listed stream and ONRW. There is also an additional 24 miles of ORNW streams and 55 acres of ONRW wetlands affected by the Silver Fire, phase 2.

### Critical Values Identified

Critical Values identified (FSM 2523.1 Exhibit 01) during the BAER assessment are: Human life and safety, property, natural resources and cultural/heritage resources. The BAER team evaluated the risk to those critical values using the BAER Risk Assessment (FSM 23235.1 Exhibit 02).

The following risk matrix shown below, Exhibit 2 of Interim Directive No.: **2500-2010-1**, was used to evaluate the Risk Level for each value at risk identified during Assessment:

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	Loss of life or injury to humans; substantial property damage; irreversible damage to critical natural or cultural resources.	Injury or illness to humans; moderate property damage; damage to critical natural or cultural resources resulting in considerable or long term effects.	Property damage is limited in economic value and/or to few investments; damage to natural or cultural resources resulting in minimal, recoverable or localized effects.
	RISK		
Very Likely (>90%)	Very High	Very High	Low
Likely (>50% to <90%)	Very High	High	Low
Possible (>10% to <50%)	High	Intermediate	Low
Unlikely (<10%)	Intermediate	Low	Very Low

The Very High and High Risk are unacceptable risk levels due to threats to human life, property, infrastructure and resources, therefore treatments should be applied. An Intermediate Risk could be unacceptable if human life or safety is the critical value at risk.

A full list of values at risk that were analyzed during the assessment can be found in Appendix A [Attached as Appendix D is a full risk of values analyzed for phase 2.](#)

## **Human Life and Safety**

There is a high risk of loss of life on Forest Service and private land within and downstream of the burned area. Individuals who may find themselves in any of the campgrounds, trails, drainages, or on roads affected by the fire are at risk during and after storm events. Campgrounds, trails and drainages off highway 152 and the highway itself are examples of these life threatening risks. The watersheds and associated drainages affected by high burn severity will be subject to higher than usual run-off and debris flows which could cause injury or death. Southern portions of the fire are located in the historic Hillsboro Mining District. There is a considerable amount of known and unknown old mine shafts, exploratory test holes and associated tailing piles in the burned area, particularly in the vicinity of the community of Kingston. There is concern of contamination from runoff and sedimentation to surface and ground water including many private wells directly downstream from the burned area in the communities of Kingston and Hillsboro. In these communities post fire flows have been modeled at 2 times pre fire flows which increases the likelihood of damage to homes and infrastructure as well as potential of injury or death to people in these communities.

[In the Mimbres community, located along the Mimbres River where the majority of the western portion of the burn drains, post fire flows have been modeled at up to 2 times pre fire flows which increases the likelihood of damage to homes and infrastructure as well as potential of injury or death to people in this community. There are many homes located on the Mimbres River that have driveways with low water crossings associated with their access.](#)

## **Property**

There is a high risk of public and private property damage due to storm runoff and debris flows. Peak flows of 2-3 times pre-fire can be expected in drainages associated with high burn severity across the burn area. The increase in peak flows resulting from areas of high burn severity, and the loss of channel structure pose a significant threat of flood waters and debris flows that will impact Forest Service infrastructure and private property (e.g. FS campground, roads, trails, homes, businesses, culverts, bridges and low water crossings). Forest service roads within the burned area are very important access points to the forest as well as private homes and inholdings within forest boundaries. The limited amount of roads and access to forest lands in the southern part of the forest where the Silver Fire has burned makes these roads critical infrastructure to the management of this portion of the forest. The communities of Kingston and Hillsboro will be severely impacted. Several bridges along U.S. Highway 152 between Kingston and Hillsboro NM have a very high potential to be damaged. US 152 within the burned

area is expected to be heavily impacted by high flows and excessive sedimentation. Potential loss of portions of this road are anticipated.

There are many values located along the Mimbres River that have potential to be impacted by post fire flows or floods. These include residences and associated outbuildings, businesses, orchards and agricultural fields and associated irrigation ditches. 12 miles of Forest system trails will be affected due to the fire. Approximately 4 miles of the Continental Divide trail will be severely affected by the fire. This is a National System trail. Approximately 2.5 miles of Forest system road will be affected by post fire conditions; this road is a critical access point for management of National Forest Service lands.

## **Natural Resources**

### **Site Productivity and Hydrologic Function**

#### Soils

There is a high risk of increased levels of surface soil erosion and sediment delivery predicted to result as an effect of the burn severity within the Silver Fire burned area. Modeling shows that erosion will increase from pre-fire levels just over 0 tons per acre to post fire levels of over 36 tons per acre. The initiation of new surface erosion sources from moderately steep and steep slopes pose an extreme threat to long-term soil productivity, increased risk of water quality impacts, and threats to downstream resources, property and life from bulking of flood flows.

#### Hydrologic Function

Hydrologic function will be greatly reduced due to loss of vegetative overstory, vegetative ground cover, and the duff layer. The loss of these layers in the ecosystem has profound negative effects to hydrologic function. In a functioning watershed these layers intercept and slow raindrop impact, absorb and slow overland flow, and provide a natural resistance to excessive erosion. Recovery of watershed condition and hydrologic function can take up to 25 years to stabilize.

#### Water Quality

Water quality will be greatly degraded due to post fire ash and sediment deposition in all HUC 6 drainages affected by the burn. In the Hillsboro Mining District of the burned area there is concern of surface and groundwater contamination from runoff and sedimentation out of the burned area due to mines and tailing piles. These mines and associated tailing piles are also of great concern due to the number of unknown locations throughout the burn area. During field and aerial visits made by the BAER team more mines have been observed than what was previously inventoried and documented.

Private ground water wells located along the Mimbres River have potential to be affected by post fire ash flows and sedimentation.

#### Outstanding National Resource Waters

ONRW's are water bodies designated to receive special protection by the Water Quality Control Commission under New Mexico State water quality standards and the federal Clean Water Act. Degradation must be minimized in terms of degree and duration. 1/2 acre of



designated ONRW meadows and 11 miles of ONRW streams have been burned in the fire and will be impacted by ash, sediment, and debris flows in subsequent rain events.

An additional 24 miles of ONRW streams and 55 acres of ONRW wetlands will be affected by the fire.

### Riparian

Riparian areas are at high risk on NFS lands due to changes in peak flows, which will result in channel erosion and damage or loss to the riparian vegetation. Riparian habitat within the stream drainages are expected to be subject to increased channel erosion and scour as well as deposition of ash, sediment and debris from upstream areas of high burn severity. This will result in warming of surface waters due to the loss of streamside shade, which will negatively impact or cause a complete loss of aquatic habitat for fish and macro-invertebrates.

## **Cultural Resources**

The Gila National Forest contains high densities of cultural resources, however, much of the Silver Fire burn area is in higher elevations (7500 feet and above) which are considered low density. Sites in higher elevation tend to be historic properties. Increased flows of runoff and sediments as well as hazard trees pose a threat to archaeological sites and historic properties. There are approximately 22 archaeological sites located within the burn perimeter that were located inside the June 21, 2013 BARC map for the Phase 1 BAER assessment. Only 11 of these sites received field assessments. Of the 22 archaeological sites located in the June 21 burn perimeter, three archaeological sites or historic properties are eligible for the National Register of Historic Places, 18 sites are unevaluated, and one site, the Hillsboro Lookout Site, is listed on the National Register of Historic Places. The types of sites associated with the high risk category for the Phase 1 BAER assessment are historic sites that include two Civilian Conservation Corp (CCC) sites and a historic mining occupation. Treatments are warranted for these sites. The types of sites associated with the high risk category for the Phase 2 BAER assessment could include historic cemeteries, historic cabins, prehistoric roomblocks, and cliff dwellings.

For the Cultural Resources Phase 2 BAER assessment, treatments recommended for heritage resources that were categorized in the high to very high risk level include: contour felling above features to prevent increased levels of sheet-wash and removal of intact archaeological features within site boundaries. Other treatments as part of larger scale watershed treatments including aerial seeding and mulching will also help to stabilize landforms above where archaeological sites are located

## **Wildlife Species**

### Mexican Spotted Owl

The spotted owl is considered a permanent resident of the Gila NF. (USDA Forest Service 1996; USDA Forest Service 1997). Surveys for Mexican spotted owls on the Gila National Forest began in 1989. Surveys of PACs (protected activity centers) and the number of visits to determine occupancy and reproductive status have varied from year to year. Within the Aldo Leopold Wilderness little is known about most of the PACs within this section of the Burned Area. A total of 6 Mexican spotted owl PACs occur within the burn perimeter.



Critical habitat for Mexican spotted owls is also designated throughout approximately 70% of the area burned by the Silver Fire and includes all 6 PACs, protected and restricted habitat within the burn perimeter.

An additional 12 Mexican spotted owl PACs are affected by the phase 2 assessment of the Silver Fire.

#### Gila Trout

The Gila trout (*Oncorhynchus gilae*) currently occupies two streams within the Silver fire perimeter. Populations of Gila trout have been established in three streams in Grant County: Black Canyon, Sheep Corral Canyon, and McKnight Creek. All of these populations were established from the Main Diamond Creek lineage. Initial stocking of Gila trout occurred in 1970 in McKnight Creek, 1972 in Sheep Corral Canyon, and 1998 in Black Canyon (Propst et al., 1992; Gila Trout and Chihuahua Chub Recovery Team, 1999). The population in McKnight Creek inhabits approximately 8.5 km (5.3 mi) of stream and about 1.3 km (0.8 mi) of stream are occupied in Sheep Corral Canyon (Propst and Stefferud, 1997). The population of Gila trout in Black Canyon occupies approximately 18.2 km (11.3 mi) of stream (Brooks and Propst, 1999). McKnight Creek is a tributary to the Mimbres River and is not within the historical range of Gila trout.

#### Chiricahua Leopard frog

The Chiricahua Leopard Frog (*Lithobates [=Rana] chiricahuensis*) (CLF) currently occupies only one stream within the Silver fire perimeter. The Gila NF occurs in two Recovery Units (RU) identified in the Recovery Plan for the Chiricahua Leopard Frog (FWS 2007) and includes RU 6 (White Mountain-Upper Gila, Arizona and New Mexico) and RU 8 (Black-Mimbres-Rio Grande). Only Recovery Unit 8 is within the Silver fire perimeter where Seco Creek is located

### **B. Emergency Treatment Objectives:**

1. Place closure gates and post warning signs at key access points of the burn area to protect the public from entering the burned area and preventing exposure to the hazards of the burned area. Signs will be posted by roads, trailheads, and campgrounds.
2. Place closure gates at entrances of campgrounds to prevent exposing people to floods that are expected in these campgrounds.
3. Seed approximately 11,500 acres of large contiguous areas of high severity burn to provide for relatively quick establishment of vegetative ground cover to assist the burned area in maintaining soil productivity. This treatment will assist in reducing the amount of erosion and loss of control of water that the burned area will experience. Seeding of the high and moderate burn severity is also proposed for the Historic Hillsboro Mining District. This is intended to assist in stabilizing slopes and reducing negative effects to water quality.
4. Mulch approximately 2,900 acres of high severity burn in the historic Hillsboro Mining District in order to minimize the negative effects to water quality from runoff and sedimentation from this area. Mulching will also assist in seed germination and overall seeding success, while potentially minimizing negative downstream effects from mines and associated tailing piles.

5. Ensuring access to the fire lookout on Hillsboro Peak. This lookout is critical in detecting and reporting new starts on the southern end of the Forest. There will also be early warning systems installed and maintained by the USGS at the lookout site. This site will need to be visited by the USGS for installation and maintenance. Trail maintenance will be done on 8 miles along the Crest Trail to support the warning system installation and maintenance and to allow access for fire lookout personnel.
6. Mitigate damage and reduce excessive erosion to Forest system trails by installing additional drainage to areas of trails that are susceptible to erosion due to post fire conditions.
7. Stabilize Heritage sites that consist of archaeological sites, historic buildings, and traditional cultural properties (TCPs) from post fire conditions relating to storm runoff and hazard tree impacts.
8. Remove floatable debris from channels along Highway 152 where Forest Service campgrounds are located and FR 40E that runs parallel to Middle Percha creek directly above the town of Kingston. This is intended to prevent culverts from becoming blocked and causing additional damage to campground facilities.

1. Post warning signs at key access points of the burn area to protect the public from entering the burned area and preventing exposure to the hazards of the burned area. Signs will be posted by roads and trailheads.
2. Seed approximately 1,450 acres of high severity burn located in the headwaters of the Mimbres River. This will provide a relatively quick establishment of vegetative ground cover to assist the burned area in maintaining soil productivity. This treatment will assist in reducing the amount of erosion and loss of control of water that this area of the burn will experience. It will also reduce downstream effects from excessive sedimentation to the high amount of values located in the Mimbres River valley.
3. Mitigate damage and reduce excessive erosion to Forest system trails by installing additional drainage to areas of trails that are susceptible to erosion and degradation due to post fire conditions. This will also reduce sedimentation into 303d listed streams and ONRW's.

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

Land 80 % Channel 90 % Roads/Trails 90 % Protection/Safety 95 %

**D. Probability of Treatment Success**

	Years after Treatment		
	1	3	5
Land	80	90	95
Phase2	70	80	85
Channel	60	80	90
Roads/Trails	75	90	95
Protection/Safety	90	95	95

**E. Cost of No-Action (Including Loss):** to be determined

**F. Cost of Selected Alternative (Including Loss):** \$3,998,580

**F. Cost of Selected Alternative (Including Loss):** \$ 533,581

**G. Skills Represented on Burned-Area Survey Team:**

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

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BAER team roster, Appendix B.

**H. Treatment Narrative:**

**Land Treatments:**

#### Mulch

Areas of high burn severity that drain into the communities of Kingston and Hillsboro as well as private inholdings with structures on NFS lands would be mulched. Mulch is the most effective treatment for controlling erosion and reducing runoff as it provides immediate ground cover (Robichaud, et al, 2010, Napper, 2006, Larsen, et al, 2009). Areas proposed for mulching would be treated at a rate of one ton per acre. Mulch would be applied by helicopters at locations identified on the attached treatment maps. Mulch would be applied to reduce erosion and peak flows. It would be effective for reducing soil loss of soil productivity and hydrologic function and would also provide some reduction in peak flows that threaten downstream life and safety, downstream property and infrastructure, and critical aquatic resources. Mulch would also be effective at reducing negative effects and potential contamination from mines and tailing piles to downstream surface water, ground water and private wells. Mulch would also assist in stabilizing soil in and around these areas.

#### Seeding

Areas of high burn severity would be seeded with a quick germinating nonpersistent annual cereal barley that would provide rapid ground cover and a small percentage of native perennial species that would give the burned area a jump start in natural recovery and provide for long term ground cover. Seeding would reduce negative impacts to soil productivity, hydrologic function, reduce soil erosion and reduce threats to downstream life and safety, and to downstream property and infrastructure by reducing erosion and runoff. Seeding would also provide benefits for critical natural resources by accelerating vegetative recovery that would reduce erosion and sedimentation into streams and by accelerating habitat recovery for spotted owl prey species. Treatment areas are identified on the attached seeding map. The proposed seed mix is identified in the table below.

Seeding is necessary to provide vegetative ground cover where the soil seedbank has been eliminated. Most of the high burn severity that occurred as a result of the Silver Fire burned in

mature mixed conifer and pine type. Dense, closed canopy accumulated a thick layer of duff over approximately a 150-250 year period, essentially excluding forb or graminoid cover. The tree seeds are often destroyed in the organic duff layer, as are grass and forb seeds. Seeds are consumed in the fire or heat sterilized. Therefore, these soils do not have a viable seed bank of their own and will not stabilize naturally without sacrificing site potential.

#### For Seed and Mulch Treatment Areas

Species	Planting Rate (pls #s/acre)	Seeds/ft2 Contribution from Planting Rate
Barley ( <i>Hordeum vulgare</i> )	<del>69.60</del> 52.30	<del>20.00</del> 15
Prairie junegrass ( <i>Koeleria macrantha</i> )	.06	3.19
Sideouts grama ( <i>Bouteloua curtipendula</i> )	.45	2.00
Muttongrass ( <i>Poa fedleriana</i> )	.05	1.02
Blue grama ( <i>Boutelous gracilis</i> )	.05	.95
Little bluestem ( <i>Schizachyrium scoparium</i> )	.15	.90
Total	<del>70.36</del> 53.06	<del>28.00</del> 23.06

An additional 1,450 acres of high burn severity in the headwaters of the Mimbres River is recommended for seeding from the phase 2 assessment.

#### Seed Mix for Phase 2

Species	Planting Rate (pls #s/acre)	Seeds/ft2 Contribution from Planting Rate
Barley ( <i>Hordeum vulgare</i> )	52.30	15
Prairie junegrass ( <i>Koeleria macrantha</i> )	.04	2
Muttongrass ( <i>Poa fedleriana</i> )	.10	2
Arizona fescue ( <i>Festuca arizonica</i> )	.16	2
Mountain Brome ( <i>Bromus marginatus</i> )	1.36	2
Fringed Brome ( <i>Bromus ciliatus</i> )	.35	2
Total	54.31	25

#### Wilderness Treatments

Due to the nature of the burn in the headwaters of watersheds in the Aldo Leopold Wilderness and the risks to life, property, cultural and natural resources the BAER team is recommending that the seeding and mulching treatments listed above be utilized within the wilderness as well. A Minimum Requirement Decision Guide (MRDG) has been prepared and submitted for Regional Forester approval. Attached as Appendix C.

The additional proposed seeding would occur in the Aldo Leopold Wilderness. A MRDG has been prepared and will be submitted for Regional Forester approval. Attached as Appendix E

#### Protection/Safety Treatments:

Install hazard warning signs at key entry points around the burn area. These will be posted on roads and at trailheads. Closure gates on access routes to the burn area. Closure gates at developed campgrounds along Highway 152. Jersey barriers will be used as point protection around vault toilets in these campgrounds. Ensure access along the trail to a Forest Service fire lookout and early alert systems located along this trail. This work would include hazard tree felling along the trail to protect FS personnel using the trail while doing tread work to prevent

trail washout from storm events which are likely to impact access to this important fire lookout. Removal of hazard trees in developed campgrounds and parking areas would also occur.

Install hazard warning signs at key entry points around the phase 2 assessment burn area. These will be posted on roads and at trailheads. Hazard tree felling along the Continental Divide Trail, which is a national system trail, Black Range Crest Trail, Mimbres River Trail and Middle Fork Mimbres River trail to protect FS personnel using the trail while doing tread work.

#### Channel Treatments:

Remove coarse woody floatable material in Gallinas and Iron Creeks. These creeks run parallel to Highway 152 and 4 developed campgrounds along the highway. Also remove coarse woody floatable material along FR 40E that runs parallel to Middle Percha Creek and is just above the community of Kingston. It is being proposed so that culverts are not plugged during rain events and Forest infrastructure and campgrounds are not further damaged by high flow events.

#### Road Treatments

32 miles of road will be primarily treated with additional drainage structures. There are three main roads that are critical access points to the southern portion of the forest. Without these roads administration and long term management could not occur in this part of the forest. Below is a breakdown of the various treatments that would be implemented to these 3 key access points.

- Clean culvert inlet and outlet. This work shall include cleaning the inlet and outlet of culverts to maximize flow and rebuilding ditch blocks to insure culvert is at capacity. A backhoe would be used for this task and operated on the shoulder of the existing roadway.
- Armor roadway and or ditch with riprap on roads. This work shall include the placement of 6" – 24" rip rap borrow on roadway shoulder and or ditch line. A backhoe, trackhoe or dozer will be used to shape or place.
- Install low standard rolling grade dips. The existing roadway would be excavated and lead out ditch or sediment trap constructed. A dozer would be used for this task and disturbance may extend 10' below each dip to insure proper operation.
- Construct broad based rolling dip. Grade dip would be constructed to insure roadway drainage operation. A dozer would be used for this task.
- Channel cleaning per mile. This treatment is intended to remove floatable debris and reestablish channel opening to maximize drainage capacity during high flows.
- Install gate. Install metal closure gate at locations identified for traffic management.
- Install hazard sign for public safety.

For phase 2 an additional 2.5 miles of road would be primarily treated with additional drainage structures. This is the one main road that is a critical access point to this portion of the forest. Without this road, administration and long term management could not occur in this part of the

forest. Below is a breakdown of the various treatments that would be implemented to this key access point.

- Clean culvert inlet and outlet. This work shall include cleaning the inlet and outlet of culverts to maximize flow and rebuilding ditch blocks to insure culvert is at capacity. A backhoe would be used for this task and operated on the shoulder of the existing roadway.
- Construct broad based rolling dip. Grade dip would be constructed to insure roadway drainage operation. A dozer would be used for this task.
- Install hazard sign for public safety.

#### Trail Treatments:

Trail tread work will be done on 8 miles along the Crest Trail to support the warning system installation and maintenance to allow access for fire lookout personnel. Drainage will also be added to this trail accessing the Hillsboro Peak fire lookout. This is necessary in order to ensure access to this critical fire lookout. This trail system will also be used by the USGS to access and maintain an early alert systems intended to warn the communities of Kingston and Hillsboro in the event of high precipitation events. Removal of all hazard trees from fire impacted recreation sites to protect life and property.

Trail tread drainage work would be done on an additional 12 miles along the Continental Divide trail, Crest trail, Middle Fork Mimbres trail and Mimbres trail. These trails all drain into a 303d listed stream and ONRW. A portion of these trails drain into T&E Gila Trout habitat.

#### Storm Inspection and Response

Roads affected by the Silver Fire contain drainage structures that cross streams located in watersheds that have a high to moderate burn severity. These streams now have the potential for increased runoff and debris flows. The patrols are used to identify road problems such as plugged culverts and washed out roads and to clear, clean, and/or block those roads that are damaged.

#### Wildlife Treatments:

Seeding is being proposed to accelerate habitat recovery for spotted owl prey species within the burned area.

Heritage Treatments For the Cultural Resources Phase 1 BAER assessment, treatments recommended for heritage resources that were categorized in the high to very high risk level include: hand seeding sites over and above what remains of the features in order to help stabilize some of the sediment surrounding the feature, constructing berms along road segments above standing features in order to divert water downslope away from the structures, and finally contour felling above features to also prevent increased levels of sheet-wash over archaeological features. Other treatments as part of larger scale watershed treatments including aerial seeding and mulching will also help to stabilize landforms above where archaeological sites are located.

#### Noxious Weed Detection

Field site visits for the detection of invasive noxious weed species will take place post monsoon season and again in the spring. Disturbance areas from fire suppression activities on the Silver Fire.

## **I. Monitoring Narrative:**

### Seed and Mulch Implementation Monitoring

Field monitoring visits to evaluate the implementation effectiveness of mulch and seed treatments. This will be accomplished by treatment inspectors.

### Seed and Mulch Effectiveness Monitoring

Level 2 monitoring to evaluate the effectiveness of mulch and seed treatments. This will be accomplished through pace transects, ocular ground cover estimates, and photo points.



			NFS Lands				Other Lands			All
		Unit	# of		Other		# of	Fed	# of	Ion Fe
Line Items	Units	Cost	Units	BAER \$	\$		units	\$	Units	\$
<b>A. Land Treatments</b>										
Aerial Seeding	acres	90	11,477	\$1,032,930	\$0			\$0		\$0
<del>Aerial seeding adjusted</del>	<del>acres</del>	<del>23</del>	<del>11,477</del>	<del>\$0</del>						
Aerial Seeding	acres	130	1,447	\$188,110						
Aerial Mulch 1 ton/ac	acres	825	2,880	\$2,376,000						#####
Stabilize Arch Sites	per	1,000	3	\$3,000						
Stabilize Arch Sites	per	850	4	\$3,500						
Noxious Weed Detection & F	days	600	10	\$6,000						
<i>Subtotal Land Treatments</i>				\$3,609,540	\$0			\$0		\$0
<b>B. Channel Treatments</b>										
Channel Clearing	miles	12,000	5	\$60,000	\$0			\$0		\$0
<i>Subtotal Channel Treat.</i>				\$60,000	\$0			\$0		\$0
<b>C. Road and Trails</b>										
Armor Road	miles	47,000	2	\$94,000	\$0			\$0		\$0
Trail work to early alert sys	miles	11,300	8	\$90,400	\$0			\$0		\$0
Trail Drainage	miles	4,000	12	\$48,000						
Culvert Prep/cleaning	per	150	32	\$4,800						
Drainage features	miles	5,700	26	\$148,200						
Drainage features	miles	12,000	2.5	\$30,000						
Storm Inspection & Respo	days	2,000	20	\$40,000						
<i>Subtotal Road &amp; Trails</i>				\$455,400	\$0			\$0		\$0
<b>D. Protection/Safety</b>										
Hazard/Closure Signs	per	200	55	\$11,000	\$0			\$0		\$0
Closure gates	per	4,000	16	\$64,000	\$0			\$0		\$0
Hazard Tree Felling at cam	sites	750	7	\$5,250						
Jersey Barriers Rec toilets	per	2,000	9	\$18,000						
Vault Toilet Pumping	per	1,000	8	\$8,000	\$0			\$0		\$0
<i>Subtotal Structures</i>				\$106,250	\$0			\$0		\$0
<b>E. BAER Evaluation</b>										
assessment	per	86,500	1	---	\$86,500			\$0		\$0
<i>Subtotal Evaluation</i>				---				\$0		\$0
<b>F. Monitoring</b>										
Seeding & Mulch Effectiver	per	2000	20	\$40,000						
<i>Subtotal Monitoring</i>				\$40,000	\$0			\$0		\$0
<b>G. Totals</b>										
Total for initial				\$4,001,580				\$0		\$0
Total for interim #1				\$533,581						
Total				\$4,271,190						

**PART VII - APPROVALS**

1. /s/ Kelly Russell  
Kelly Russell  
Forest Supervisor

7/12/2013  
Date

2. /s/ Gilbert Zepeda (for)  
Regional Forester

7/26/2013  
Date