USDA-FOREST SERVICE FS-2500-8 (6/06)

Date of Report: 6/08/2012

BURNED-AREA REPORT
(Reference FSH 2509.13)

Note: The information in this report is cumulative and each submission is indicated in the following text colors: Original Request, Interim #1, Interim #2, Interim #3, Interim #4. Interim #5

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

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

[X] 2. Interim Report # 5
[X] Updating the initial funding request based on more accurate site data or design analysis
[X] Status of accomplishments to date

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

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Wallow

B. Fire Number: AZ-ASF-110152-1

C. State: AZ/NM

D. County: Graham, Greenlee, Apache – Arizona
Catron New Mexico

E. Region: 03

F. Forest: Apache Sitgreaves, Gila

G. District: Alpine, Clifton, Quemado, Springerville

H. Fire Incident Job Code: P3F4CX

I. Date Fire Started: 5/29/2011

J. Date Fire Contained: 7/12/2011

K. Suppression Cost: $109,000,000

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles):71
2. Fireline seeded (miles): 71
3. Other (identify)
Hazard tree removal (miles): 27
Road Graded (miles): 10
Chipped (miles): 45

M. Watershed Number:

15020000101 – Nutrioso Creek
15040000405 – Upper Black River
15020000102 – South Fork Little Colorado River
15040000502 – Upper Eagle Creek
1506010101 – Upper Black River
1506010103 – Middle Black River
1504000403 – Center Fire Creek – San Francisco River
1504000405 – Upper Blue River
1504000407 – Lower Blue River

N. Total Acres Burned: 534,639

NFS Acres(501,652) Other Federal ( ) State (4,531) Private (6,284)

Ft Apache Indian Reservation (12,972) San Carlos Indian Reservation (9,200)

O. Vegetation Types:

Mixed Conifer – 177,971
Ponderosa Pine – 193,314
Upper Grassland – 36,412
Pinon Juniper/Oak woodland – 50,032
Chaparral – 9,979
Spruce-fir- 48,741
Riparian – 15,164

P. Dominant Soils:

Typic Hapludalfs
Typic Haplocryalfs
Pachic Argiustolls
Lithic Argiustolls
Typic Haplustalfs

Q. Geologic Types:

Basalt
Datil Formation – Volcanic Sediments
Rhyolite

R. Miles of Stream Channels by Order or Class:

Perennial – 514 miles,
Intermittent and ephemeral - 1410 miles

S. Transportation System

Trails: 304 miles Roads: 2,120 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 257,349 (48.1%) (low) 73,634 (13.7%) (moderate) 86,115 (16%) (high) 129,643 (23.7%) (unburned), 939 (.17%) (water/lakes)

B. Water-Repellent Soil (acres): 32,000

C. Soil Erosion Hazard Rating (acres):
151,181 (low) 148,541 (moderate) 139,627 (high)

D. Erosion Potential: 7.3 tons/acre

E. Sediment Potential: 19,831 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

B. Design Chance of Success, (percent): 75

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

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 2

F. Design Flow, (cubic feet / second/ square mile): 320

G. Estimated Reduction in Infiltration, (percent): 25

H. Adjusted Design Flow, (cfs per square mile): 1145

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Soil Productivity and Hydrologic Function

Areas of high and moderate burn severity have impacted soil productivity by removing vegetative ground cover, the organic matter within the topsoil and on the forest floor, and to a lesser extent by creating water repellent conditions within the soils themselves. Consumption of the organic layer on the forest floor and severe heating of the upper layer of soil has degraded the seed bank stored in the soil. The most important soil physical characteristic that affects soil hydrologic function and soil stability is soil structure. The organic matter component, which provides for loose, granular structure, can be lost at relatively low temperatures. The loss of soil structure increases the bulk density of the soil and reduces its porosity, thereby reducing infiltration and soil productivity and making the soil more vulnerable to post-fire runoff and erosion. Removal of the protective vegetative and organic layers combined with loss of soil structure and increased water repellency also increases erosion. Soil loss occurs through surface, rill, and gully erosion processes. Loss of the soil seed bank, loss of soil structure, and soil loss through erosion processes retards vegetative recovery which, in turn, further impairs soil productivity and watershed conditions.

Hydrologic function within moderately and severely burned areas has also been impacted by loss of the vegetative canopy that intercepts some rainfall, by loss of the organic layer on the forest floor that absorbs some rainfall, by loss of soil structure which reduces infiltration and to a lesser extent by development of water repellent soils which also reduces infiltration. Reduced interception and absorption, and reduced infiltration increase runoff from a given rainfall event. Increased runoff increases erosion and the magnitude of peak flows expected from a watershed. The Increased magnitude of peak flows represents an increased flood threat to downstream life and property.

Increases in erosion can occur on both uplands and in channels. Rills and gullies can form in uplands and channels can scour and downcut. Sediment delivered to channels from rill and gully erosion and eroded from channel banks during scouring and incision processes can deposit in areas of lower energy. Sediment, bedload, and debris deposits can plug culverts and bridges, deposit on floodplains, terraces and other low lying areas such as agricultural fields, can clog ditches and water supply intakes and generally adversely affect infrastructure in downstream areas.

Downcutting of stream channels can lower water tables in adjacent floodplain aquifers and result in drying of meadows and mortality of riparian vegetation. Downcutting of stream channels also separates the stream from its floodplain, alters the sediment transport characteristics of the channel, and causes erosion of the channel banks until the channel has widened sufficiently to permit development of a new floodplain at the lowered base level of the channel. The downcutting, widening and depositing processes can destabilize affected channels for many years.

Increases in runoff and erosion, changes in sediment transport characteristics, impacts to channels and floodplains, and impacts to water quality from ash, sediment, and temperature effects, combine to impair hydrologic function.

Impaired soil productivity and hydrologic function affect:

- Human life and safety on or in close proximity to burned NFS lands through increased flood threats,
- Property and infrastructure on or in close proximity to burned NFS lands through increased flooding, erosion, and debris threats,
- Critical and occupied habitat for federally listed threatened or endangered terrestrial and aquatic animal species within and in close proximity to burned NFS lands through increased flooding and water quality impacts and through delayed vegetative recovery affects.

Damage to soil productivity and hydrologic function in areas of moderate burn severity with highly erosive soils and areas of high burn severity is very likely to occur, may be irreversible, and is at least of long term duration.

Greer: Slopes adjacent to the East and West Forks of the Little Colorado River immediately upstream of Greer have burned with moderate to high severity. Twenty four percent of the area in these watersheds has burned with moderate to high severity. Additional moderate to high severity burned areas occur in the Hall Creek-Little Colorado River watershed immediately adjacent to the east side of Greer. Seven homes exist within the current mapped 100 year floodplain of Greer. The residents of these homes and potentially other homes in Greer are at risk of flooding and debris from increased runoff and erosion from burned areas. The Montlure church camp along the East Fork of the Little Colorado River above Greer is at risk of flooding from increased flood flows in the East Fork as well as flood and debris flows from a severely burned unnamed tributary to the East Fork that flows through the middle of the camp. Occupants of other homes on private lands and recreation residences at the base of burned slopes and watersheds tributary to the Little Colorado River in the Hall Creek – Little Colorado River watershed are also at risk from flooding, erosion and debris from burned areas.

River Reservoir located on the Little Colorado River below Greer is a water supply reservoir for downstream irrigation districts. Sediment and debris from upstream burned areas will deposit in this reservoir affecting water quality and potentially reducing storage capacity. Ditches that divert water from the Little Colorado River to Bunch Reservoir and Tunnel Reservoir (irrigation supply reservoirs) are at risk of damage from flooding, sediment and debris.

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Burn Severity and Erosive Soils in Proposed Mulch Treatment Watersheds											
Watershed	Area	Burn Severity				Erosive Soil by Burn Severity Class				Communities at Risk	
		High		Moderate		High		Moderate			
	acres	acres	percent	acres	percent	acres	percent	acres	percent		
Auger Creek	9413	1869	20	1973	21	1281	14	1112	12	Nutrioso	
Colter Creek	10,250	1707	17	3110	30	159	2	500	5	Nutrioso area	
Paddy Ck Nutrioso Ck	14,658	2883	20	4232	29	1386	9.5	2344	16	Nutrioso	
Riggs Ck Nutrioso Ck	21,900	2387	11	3271	15	496	2	1444	7	Nutrioso area	
Rudd Creek	17,740	3054	17	5080	29	989	6	716	4	Nutrioso area	Springerville
San Francisco River-Luna Lake	22,987	2537	11	2940	13	1273	5	1314	6	Alpine	Tal-Wi-Wi
East Fork Little Colorado River	8,966	966	11	1904	21	375	4	243	3	Greer	
West Fork Little Colorado River	8,132	240	3	921	11	117	1.4	260	3	Greer	
Hall Creek-Little Colorado River	20,555	642	3	1170	6	279	1.4	281	1.4	Greer	
South Fork Little Colorado River	16,212	1549	10	7505	46	729	4.5	1121	7	South Fork	Eagar/Springerville
Grapevine Ck Little Colorado River	13,037	1134	9	2904	21	75	0.6	103	0.8	Eagar	Springerville
Water Canyon Creek	12,364	367	3	2482	20	98	0.8	368	3	Eagar	Springerville

South Fork: The community of South Fork is located near the mouth of the South Fork Little Colorado River at the outlet of a narrow canyon through which the river flows. Fifty six percent of the watershed has burned with moderate to high severity and the community is at high risk of flooding. Fourteen residences lie within the mapped prefire 100 year floodplain. Occupants of these residences are at high risk from flood flows in the South Fork. Access to some of these residences is via personal bridges and culverted crossings that are at risk of damage from floodflows, sediment, and debris conveyed by the river. Damage to these structures will isolate the residents from road access out of the community. The bridge on County Highway 4124 as well as the Forest Service campground at South Fork are also at risk of flood flows and debris in South Fork Little Colorado River

Eagar/Springerville: Watersheds above the communities of Eagar and Springerville include Grapevine Creek–Little Colorado River and Water Canyon Creek. Thirty percent of the Grapevine Creek-Little Colorado River watershed and 23 percent of the Water Canyon Creek watershed have burned with moderate to high severity. 136 residences within these communities lie within the mapped prefire 100 year floodplains of the Little Colorado River, Water Canyon Creek, and Dry Canyon. Occupants of these residences as well as other residences in unmapped areas are at risk from flooding and debris from streams in these watersheds. Water Canyon Creek flows into the community of Eagar and the entire flow of the creek is diverted by ditches used for irrigation and water supply. Homes have been built in the area where Water Canyon Creek used to flow to its confluence with the Little Colorado River. A portion of the water supply for Eagar is diverted from a series of springs within the burned area of the Grapevine Creek-Little Colorado River watershed. This facility is threatened by flooding, debris, and erosion from within the burned area. Ditches, roads, and other structures within these watersheds are also threatened by burned area derived flood flows, sediment, and debris.

Nutrioso area: The community of Nutrioso and private lands in the vicinity of Nutrioso are threatened by flooding, sediment and debris from the Riggs Creek-Nutrioso Creek, Paddy Creek-Nutrioso Creek, Auger Creek, Colter Creek, and Rudd Creek watersheds. The Paddy Creek-Nutrioso Creek watershed flows through the community of Nutrioso. Forty nine percent of this watershed has burned with moderate to high severity. Three residences lie within the mapped 100 year prefire floodplain within Nutrioso. Residents of these homes as well as homes in unmapped parts of the Nutrioso area are at risk of flooding and debris from burned areas..

Areas of moderate to high burn severity occupy 40% of the five watersheds in and around the greater Nutrioso area. Residents in unmapped floodplain areas along streams draining these watersheds are at risk of flooding, erosion and debris from these streams.. Areas of high erosion hazard, and areas with landslide and debris flow potential exist from burned slopes adjacent to private lands. Homes and other structures exist on these private lands and are threatened by these hazards. US highway 180/191 as well as County and Forest roads in these watersheds are threatened by flooding, sediment, landslides and debris flows from burned areas. Nelson Reservoir is located downstream of Nutrioso on Nutrioso Creek. Sediment and debris eroded from the burned area is expected to deposit in the reservoir and affect water quality. Ditches, ponds and other water supply reservoirs in the Nutrioso area are also threatened by flooding, sediment, and debris from burned watersheds.

Rudd Creek is a tributary to Nutrioso Creek below Nelson Reservoir. 46% of this watershed burned with moderate to high burn severity. Private lands and the Sipe White Mountain Wildlife Area are threatened by floodflows in channels draining the burned area and by sediment and potentially landslides and debris flows from erodible slopes adjacent to private lands. Flood flows from Rudd Creek may contribute to flooding hazards in the portion of Springerville that is located adjacent to Nutrioso Creek. Sewage Treatment ponds for Springerville are located immediately adjacent to Nutrioso Creek and are threatened by flood flows in the creek.

Alpine and Tal-Wi-Wi: The communities of Alpine and Tal-Wi-Wi are located in an area surrounded by high mountains and steep slopes with substantial areas of moderate to high burn severity. These

communities lie within the San Francisco River-Luna Lake watershed. Twenty four percent of this watershed burned with moderate to high burn severity. 7 residences within the community of Alpine lie with mapped 100 year prefire floodplains. Floodplains have not been mapped in the community of Tal-Wi-Wi but are likely threatened by floodflows in channels draining the burned area. Residents of homes in mapped and unmapped floodplains in these areas are at risk from flooding, sediment, and debris. Residents located at the base of burned slopes are potentially at risk from landslides and debris flows. The water supply system for Alpine lies below burned slopes and is at risk from flooding, sediment and debris from burned slopes above the water supply facilities. Luna Lake is located downstream of Alpine on the San Francisco River. Sediment and debris eroded from burned areas is expected to deposit in the lake and impact water quality. Ponds, small irrigation supply reservoirs, and ditches in the Tal-Wi-Wi area are likely to be affected by runoff, sediment, and debris from the burned area.

Interim #2

Highway 191 and scattered communities within the Campbell Blue watershed: U.S. Highway 191 and scattered residences are downstream of the high and moderate burn severity areas. These values at risk lie within the Campbell Blue Watershed. Fourty five percent of this watershed burned at high severity with twenty five percent at moderate severity above U.S.Highway 191. In addition, scattered parcels of private land with structures are located along Campbell Blue Creek. Scattered residences lie within mapped 100 year prefire floodplains. Residents of homes in mapped and unmapped floodplains in these areas are at risk from flooding, sediment, and debris. In addition, there are several Forest Service campgrounds located downstream that are at moderate risk from flooding, sediment and debris.

Forest Road 26 and scattered communities along Horton and Beaver Creeks. Forest Road 26 along with ranches and the community of Sprucedale are downstream of substantial areas of moderate and high burn severity. These areas lie within Horton Creek and Beaver Creek Watersheds. Eight three percent of the watershed above the crossing on Forest Road 26 burned with high severity substaintally altering the post-fire hydrologic function of this watershed. Ranches and residences lie within the mapped 100 year prefire floodplains. Residents of homes in mapped and unmapped floodplains in these areas are at risk from flooding, sediment, and debris.

Roads

Roads throughout the watersheds threatening affected communities are likely to be impacted by runoff, sediment, and debris derived from burned areas. US and state highways, county roads, and Forest roads exist in these watersheds. Culverts, bridges, low water crossings, roadside ditches, and other road drainage features are at risk from these watersheds. Culverts associated with these roads are at risk of plugging from debris carried down channels from burned watersheds. Some culverts are undersized for the expected increases in peak flows and are at risk of failure from overtopping. Culvert failures may increase the magnitude of flood, sediment and erosion hazards in downstream communities and private lands and increase scouring of stream channels on NFS lands.

Hazard Trees

Hazard trees exist along private lands that threaten safety of land owners and structures on these lands. Hazard trees also exist in areas where treatments are proposed that threaten the safety of crews implementing treatments along roads.

Summary

Overall, the likelihood that life and safety is at risk from the burned area is very high and the consequences of impacts from the burned area to life and safety would be major. The potential for loss of life or injury to humans exists. The likelihood that property (homes, roads, other infrastructure) would be substantially damaged by runoff, sediment, and debris from the burned area is also very likely.

Values at Risk:

Interim #2

*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. Only treatments that had a risk of Intermediate or above are discussed below, but all values at risk are by watershed that drive treatments can be found in the specialist's report.*

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**

Human Life and Safety:

Greer, South Fork, Eagar, Springerville, Nutrioso, Alpine, Tal-WI-WI, and Luna and other parcels of private land below high and moderate burn severity slopes in the Campbell Blue Watershed, Horton and Beaver Creek Watersheds. See above for a detailed description of at-risk communities.

There are houses within the flood plain in the above mentioned communities
Probability of damage or Loss: *Likely – Very Likely – Risk of flooding is greatly increased due to post-fire hydrologic conditions.*

Magnitude of Consequences: *Moderate – Major – Possible injury to major injuries or loss of life*

Risk level: *High to Very High Treatments to reduce risk include seeding, mulching, channel clearing, interagency communication with other local, state and federal agencies, community education (the BAER team already attended meetings in Greer, Springville, Nutrioso, and Alpine).*

Interim #4

High risk to Human Life and Safety exists in conjunction with the fire caused structural damage to the Escudilla Lookout tower within the Escudilla Wilderness Area as access to the wilderness is to be reinstated. Warning signs alone to keep people from climbing the tower are deemed inadequate.

Road/Stream crossings:

There are multiple road/stream crossings within and immediately downstream of the burn area. Post-fire peak flows are predicted to be up to 375% greater than pre-fire flows for a 25 year, 1 hour rainfall event.

Risk Assessment – Threats to travelers on Forest Roads, county roads and state and federal highways

Probability of Damage or Loss: Possible – Very likely. Low water crossings/flash flood risk, culverts plugging and overtopping roads.

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

Risk Level: Intermediate – very high: treatment considered for threats to human life or safety. Seasonal closure, gates to control access and warning signs, culvert cleaning, rolling dip construction, armored rolling dips, channel clearing, interagency coordination (through BAER incident Management Team (IMT)

*and public meetings (*members of the BAER team have already attended meetings in Greer, Springerville, Nutrioso, and Alpine)).

Campgrounds near stream channels:

There are many campgrounds (South Fork Campground East Fork Recreation Area, West Fork Campground, Government Springs Trailhead, Head of the Ditch Campground (Apache N.F. administered by Gila N.F., Quemado Ranger District) within the burn area that are at increased risk of flooding and debris flows.

Risk Assessment – Threats to Forest users

Probablity of Damage or Loss: Likely – risk from flooding/loss of water control

Magnitude of Consequence: Moderate – possible injury

Risk Level: High – consider treaments – seasonal closure and warning signs

Property:

Forest Service roads:
FS roads exist throughout the burn area and there is a risk to the roads and crossings from increased runoff, associated sediment and debris and debris flows on roads in and below the high and moderate burn severity areas.

Risk Assessment – Threats to Forest Roads

Probablity of Damage or Loss: Likely – multiple crossings and parallel sections in the floodplain

Magnitude of Consequence: Moderate – water could channel down road with possible wash outs and there is a potential for crossings to be damaged or destroyed

Risk Level: High to Very High– Install rolling dips, grade dips, drainage structures, cleaning culverts, riprap ditches and outflow areas

Forest Service Trails:
FS trails exist throughout the burn area and there is risk to the trails and associated structures from increased runoff, sediment and debris, debris flows on trails in and below the high and moderate soil burn severity area.

Risk Assessment – Threats to FS Trails

Probability of Damage or Loss: Likely – trail treads easily become conduits for accumulating runoff, causing trails to become gullies and channelizing sediment into streams.

Magnatude of Consequence: Moderate - Post fire trail erosion control structures (waterbars and hardening) are too small and are to widely spaced to accommodate expected runoff.

Risk Level: High - Installation of grade dips and other drainage structures to divert flows from trails at more frequent intervals are needed to retain trails and to mitigate additional sediment into streams.

Residences:

Greer, South Fork, Eagar, Springerville, Nutrioso, Alpine, Tal-WI-WI, and Luna and other parcels of private land below high and moderate burn severity slopes in the Campbell Blue Watershed, Horton and

Beaver Creek Watersheds. Many of the residences in the mouth of canyons and adjacent to the Forest boundary have a significant amount of associated infrastructure.

Risk Assessment – Threats to private property (homes and infrastructure)

Probablity of Damage or Loss: Possible to Likely – risk from flooding greatly increased and history of past flooding

Magnitude of Consequence: Moderate – possible innundation of structures and damage to outbuildings,fences and corrals

Risk Level: Intermediate to Very High –seeding, heli-mulching, debris removal, – coordinate with NRCS and county and local emergency management services representative so that they can address specific landowner needs. BAER team members have already attended meetings in Greer, Springville, Nutrioso, and Alpine to discuss potential flooding risk.

Forest Campground and Picnic area facilities:

Some of the infrastructure associated with several of the FS campgrounds (South Fork Campground, East Fork Recreation Area, West Fork Campground, Government Springs Trailhead, Head of the Ditch Campground (Apache N. F. administered by Gila N.F., Quemado Ranger District) *are at risk from increased post-fire flooding and debris flows.*

Risk Assessment – Threats to Forest facilities

Probablity of Damage or Loss: Likely - severity of burn in watershed above campground and proximity to drainage

Magnitude of Consequence: Moderate – loss of property

Risk Level: High – remove vault tiolets; move picnic tables, bear boxes and other floatable structures up hill away from the drainages during closures; divert runoff around immovable structures

Forest non-motorized and motorized trails:

Approximately 289 miles of FS trails exist throughout the burn area in high and moderate severity areas. The Saffel canyon OHV area (25 miles) was affected by moderate severity fire. There is a risk to users from increased runoff and hazard trees. There is also a risk of damage to the trail tread and increased watershed efficiency due to lack of proper drainage on the trails.

Risk Assessment – Threats to Forest users

Probablity of Damage or Loss: Likely - severity of burn

Magnitude of Consequence: Moderate - wash out of trail and burned open well

Risk Level: High – Trail stabilization where there is the potential to damage the trail tread or washout at ephemeral and intermittent stream crossings

Natural Resources:

Soil Productivity/Watershed Functioning/Water Quality
Areas burned at high severity, and some burned at moderate severity without the potential for needle cast are at elevated risk of soil erosion and degradation of watershed function.

Risk Assessment – Threats to soil productivity and watershed functioning

Probablity of Damage or Loss: Likely – based on burn severity and lack of potential ground cover

Magnitude of Consequence: Moderate – erosion hazard is elevated from burn severity and increased post-fire erosion

Risk Level: High – aerial seed and mulch large contiguous areas of high burn severity

Native Plant community
Suppression efforts may have introduced and spread non-native invasive species into the burn area with the potential to impact native plant communities. There are known non-native invasive plants in the fire area prior to the fire. Species include: mullein, musk thistle, dalmatian toadflax, leafy spurge, Siberian elm, bull thistle, Canada thistle,and oxeye daisy among others.

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

Probablity of Damage or Loss: Likely - Based on burn severity, miles of dozer line, and other suppression activities

Magnitude of Consequence: Major – loss of native plants communities

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

Water Quality
The location of the picnic area and campground pit toilets (South Fork Campground, East Fork Recreation Area, West Fork Campground, Government Springs Trailhead, Head of the Ditch Campground (Apache N.F. administered by Gila N.F., Quemado Ranger District) *make them susceptible to post-fire flooding. There is the potential to introduce contaminents (fecal matter) into the streams.*

Risk Assessment – Probability of introducing fecal matter into the watershed

Probablity of Damage or Loss: Likely - based on expected flows

Magnitude of Consequence: Moderate – potential downstream contamination

Risk Level: High – Pump pit toilets, remove high risk pit toilet, and close to avoid potential contamination

Endangered aquatic species (Apache trout, spinedace, Gila trout, Gila Chub, loach minnow, roundtail chub)

Risk Assessment – Probability of effects on habitat

Probability of Damage or Loss : Likely - Impact from high flows and increased sediment / loss of habitat/ change of stream morphology, loss of protection from invasive aquatic species.

Magnitude of Consequence: Major - Loss of habitat/species

Risk Level: Very High – hillslope treatments of seeding, heli-mulching, road treatments, fish barrier treatments

Summary of Risks: The full list of values at risk is included in the companion documents (specialists' reports) and the VARs are listed by watershed.

B. Emergency Treatment Objectives:

Reduce impacts to soil productivity and hydrologic function
Reduce the threat of downstream flooding, erosion, and debris
Reduce the threat of hazard trees to safety of property owners, roads, and treatment crews
Protect Forest Service investment in its road infrastructure and minimize impacts to the road and highway infrastructure of other jurisdictions

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

Land **50** % Channel **50** % Roads/Trails **50** % Protection/Safety **90** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	75	80	90
Channel	75	65	50
Roads/Trails	75	75	90
Protection/Safety	90	90	90

E. Cost of No-Action (Including Loss): We estimated 160 homes within the floodplain in the affected communities (Springerville, Eager, Nutrioso, South Fork, Luna and scattered ranches and homes. See attached VAR worksheets for economic analysis.

F. Cost of Selected Alternative (Including Loss): See VAR worksheets for economic analysis (specialist's report).

G. Skills Represented on Burned-Area Survey Team:

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

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H. **Treatment Narrative:**

Land Treatments:

Mulch
Areas of high burn severity, and areas of moderate burn severity with highly erosive soils, that lie within watersheds that drain to communities at risk of flooding would be mulched. Mulch is an effective treatment for controlling erosion and reducing runoff (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 aircraft at locations identified on the attached treatment maps. Mulch would be applied to reduce erosion and peak flows. It would be effective for reducing loss of soil productivity and hydrologic

function and would also provide some reduction in peak flows that threaten downstream life and safey and downstream property and infrastructure.

Treatment Status: Interim #1 mulching 100% completed
Interim #2 mulching 100% completed

Interim #2

Hand Mulching

Areas of high and moderate burn severity directly around communities and/or concentrated residences and infrastructure at risk of sedimentation and flooding would be hand mulched with straw. The request is for the mulch only, as community volunteers would apply the mulch. Areas proposed for mulch would be treated at a rate of 1-2 tons/acre. Mulch would be applied to reduce erosion and peak flows. It would be effective for reducing loss of soil productivity and hydrologic function and would also provide some reduction in peak flows that threaten downstream life and safey and, downstream property and infrastructure.

Treatment Status: Volunteer mulch spreading has begun, approximately 4 acres completed

Seeding

Areas of high burn severity would be seeded to provide vegetative ground cover where the soil seedbank has been degraded. A quick germinating non-persistent annual species would provide rapid ground cover and perennial species would provide longer term ground cover. Seeding would reduce impacts to soil productivity and hydrologic function 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 with valuable TES fish species, spring snails, and by accelerating habitat recovery for spotted owl prey species. Treatment areas are identified on the attached seeding map. The proposed seed mixes are identified in the tables below.

Wallow Fire – High Elevation Mix (approximately 79,110 acres). This mix is proposed for elevations 8000 feet and above that were mixed conifer vegetation type. The majority of this mix is comprised of fast growing non-persistent cereal grain intended to provide fairly quick herbaceous ground cover. There is a small amount of natives seed in this mix intended to give the burned area a jump start in native grass recovery

Species	Planting Rate (pls #'s/acre)	Seed/ft2 Contribution from Planting Rate	Total PLS #'s Needed
Barley (H. vulgare	20.00	5.75	1,800,000
Arizona fescue (F. arizonicus)	0.08	1.00	7,200
Muttongrass (P. fendleriana)	0.07	1.45	6,300
Slender wheatgrass (E. Trachycaulus)	0.70	2.60	63,000
Mountain brome (B. carinatus marginatus)	0.10	0.15	9,000
Idaho fescue (F. idahoensis)	0.18	1.80	15,750
Triticale	24.50	7.25	2,205,000
Total	45.63	20.00	4,106,250

Wallow Fire – Low Elevation Mix (approximately 2,569 acres). Low elevation mix is intended for burned areas below 8000 feet in the Ponderosa pine type. The majority of this mix is comprised of fast growing non persistent cereal grain intended to provide fairly quick herbaceous ground cover. There is a small amount of natives seeds in this mix intended to give the burned area a jump start in native grass recovery.

Species	Planting Rate (pls #'s/acre)	Seed/ft2 Contribution from Planting Rate	Total PLS #'s Needed
Barley	20.00	5.75	380,000
Blue grama (B. gracilis)	0.25	4.73	4,750
Western wheatgrass (P. smithii)	0.50	1.25	23,750
Triticale	22.00	6.59	418,000
Total	43.00	20.00	826,500

Treatment Status: Completed 100 percent of total seeding both interim 2 and 3

Interim # 1:

Contract savings for aerial straw mulch application = $245,900

Additional request for aerial seed applications = $3,081,105. Seed costs have doubled since the referenced White Fire, and trucking costs have increased four fold, resulting in more than double the cost of implementation. Acreage was reduced from 81,680 acres to 78,848 acres as some treatment areas were eliminated

Interim # 2

Heritage Resource Protection

Six sites were identified within the fire area that are at risk from post-fire conditions. One site is a petroglyph that was damaged during the fire. The other five sites are non-structural prehistoric sites.

Post-fire soil and watershed conditions have the potential to directly or indirectly impact heritage resources within the Wallow Burn area. Threats include: fire-killed trees which can fall on existing features, Possible destruction of archaeological features/deposits, potential exposure of human remains. Loss of data and site integrity or expose buried artifacts and other materials.

Noxious Weed Detection

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 Walow 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 Wallow 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.

Stock Tank Cleaning

The fire area contains approximately 130 stock tanks that are likely to fill with sediment during runoff producing events. These stock tanks will store hillslope sediments and likely reduce the amount of ash and sediment reaching stream channels. Forest range permittees have offered to clean these tanks when full of sediment. This request to support the permittees.

Interim #3

An additional 1055 acres of high soil burn severity was identified on the Gila National Forest and Apache-Sitgreaves NFs above the communities of Luna, NM and Blue, AZ. Request for additonal aerial seeding = $70,000.

Interim #4

Up to 2,500 acres of aerial straw mulch application (based on funding) within the Rudd Creek Watershed on high soil burn severity/high erosion hazard areas above Arizona Game and Fish Department facilities will be accomplished using outside funding. This watershed has had little mulch treatment, has no flood attenuating structures and is less than 6 miles from the Town of Springerville. This watershed was the next in line to be treated if further funding could be obtained with 38 percent of the watershed in high or moderate soil burn severity conditon.

Interim #5
An area of about 400 acres of high severity burn within the watershed above Hulsey Lake was not previously treated. A group has volunteered to spread BAER seed on these areas, and additionally spread straw mulch previously purchased in interim #1 on 20 of those acres. The estimated seed cost is about 50 dollars per acre for $20,000. This will reduce potential sediment entering the lake and provide for reduced erosion and protect long term soil productivity. Treatments are scheduled for early June.

Weed Detection and Treatments
Additional funding necessary for weed detection to complete work prior to July 8. The original request was to use local resources, however, none are available. Therefore, travel and overtime are needed to complete the work. The original request did not include treatment at an estimated detection rate of 1.2 percent of surveyed areas. Total request is $44,000 for detection, and 35,000 for potential treatment for $79,000 total. Previous request 32,900, additional request $45,400.

Channel Treatments:
Floatable debris will be removed from channels above at-risk communities

Treatment Status: 18.4 miles of debris removal was accomplished. Cost adjustment is reflected in cost spreadsheet.

Interim #4

Repair and strengthening of existing Apache trout barriers. Barriers are at high risk of loss due to predicted increased flows within the Black River Watersheds. Funding is provided by Arizona Game and Fish Department.

Roads and Trail Treatments:

Remove temporary bridge FR 8067 above the community of Tal –Wi-Wi.

Remove, improve, and clean culverts above at risk communities and on roads that provide critical access points into the burned area.

Grade dips in roads above at-risk communities and critical access points to improve drainage and to prevent postfire runoff from eroding the road and directing runoff into communities.

Riprap ditches above key drainages above at-risk communities and critical access points to prevent road failure and capture by post fire runoff that could direct additional runoff into these communities.

Temporary concrete barriers to divert runoff around facilities and capture debris in drainages and along roads above at-risk communities and critical access points.

Install trash racks to catch debris and prevent culvert failure from loss of critical access roads.

Interim #1

Additional Road and Trail Treatments

- Clean culvert inlet and outlet in priority area within high burn severity areas and areas of moderate severity with highly erosive soils.
    - Level 4 roads – 3 miles
    - Level 3 roads – 41.5 miles

- Enhance ditch block at culvert. This work shall include placing the material excavated at culvert inlet at culvert entrance to insure ditch flow is directed into culvert.
    - Level 4 roads – 3 miles
    - Level 3 roads – 41.5 miles

- Install low standard rolling dip. The existing roadway would be excavated and lead out ditch or sediment trap constructed.
    - Level 2 roads – 223 miles

- Construct a high standard burrow grade dip. Grade dip would be constructed with borrow to insure roadway drainage operation.
    - Level 3 roads – 41.5 miles

- Ditch cleaning. Roadway ditches, including lead out ditches, shall be cleaned of debris to insure proper operation to prevent loss of control.
    - Level 3 roads – 41.5 miles

- Dozer maintenance, Maintain low standard roads to ensure proper drainage and hydrologic function.
    - Level 1 roads – 755 miles

- Overflow structures (159 structures) – Construct ripraped overflow ditches at at-risk crossings.

- Warmsprings overflow structure – Construct a spillway at this crossing.

- Bridge scour – 4 bridges on forest roads at risk of failure from high flows. Riprap around the bridge to protect from high peak flows.

- Bridge protection debris removal (11 bridges) – remove debris above the bridges that can cause a debris jam damaging the bridges. This would be completed after every runoff producing storm event.

- Gates(55): Gates are to close roads that are at risk of tread damage and public safety.

Interim #2

Trail Stabilization: Areas of high and moderate burn severity are at risk for accelerated runoff onto existing Forest Service System trails. Accelerated runoff can detrimentally affect the trail tread and lead to increased watershed efficiency. A small crew would visit trails in high and moderate burn severity area and storm proof the trail by implementing the following actions:

- Clear debris and accumulated sediment from existing trail earthen and rock waterbars to maximize efficiency. Add to water bar structure integrity by adding reinforcement materials to structures as needed.

- Clear stream channel crossings of debris and increase channel capacity at crossing to allow stream flow to bypass trail and not divert onto trail. Reinforce downstream side of crossing with water bar or berm to minimize diversion onto the trail.
- Install additional waterbars and grade stabilizers on sections of trail where there is a lack of adequate water controls, using local rock or earthen berms.

National Forest System Road 24 (Level 3): The crossing at Beaver Creek is at risk of overtopping damaging the road and mobilizing the fill. An armored spillway would be constructed to allow water to pass over the road without damaging the surface.

National Forest System Road 25 (Level 3) The crossing at Conklin Creek is at risk of overtopping damaging the road surface and mobilizing the fill. An armored spillway would be constructed to allow water to pass over the road without damaging the surface.

Engineering Cost Adjustment: The Forest has begun implementation on many of the previously approved road treatments. The following treatments were identified as costing more or additional work was identified requiring a cost adjustment:

- *Roadway drainage clearing*: Fifty additional treatment sites were identified.
- *Clean/enhance Culverts*: Additional hazard trees removal is required for this treatment.
- *Rolling dips*: Additional hazard tree removal and forty additional rolling dips were identified and are required for this treatment.
- *Grade Dips*: Additional hazard tree removal is required for this treatment.
- *Debris Removal*: Additional hazard tree removal is required for this treatment.

Total hazard tree removal:

- 756 miles for level 1 roads
- 266 miles for level 2-4 roads

Interim #3

Road hazard tree removal is costing more than planned. An additional $150,000 is needed to complete hazard tree removal on FS roads for the protection of forest workers and contractors working on those roads and drainage structures.

Interim #5

Additional Trail Stabilization

We request funding for portions of contract trail crews to complete specific fire risk stabilization consisting of water bars, catchment dams to prevent loss and damage to trail from impending 2012 monsoon season. Other work to be completed on trails including maintenance, repair of flood water damaged trail segments, hazard tree removal is funded with regular program funding and grants.
A spreadsheet showing trails and BAER work to be completed is sent seperately. Request for funds are $27,500 for a total of 550 structures, and includes overhead to manage crews and document accomplishments. This funding request is in addition to trail work that has been accomplished.

Protection/Safety Treatments:

Barricades are needed to close access to the burned area at sites near the communities and warning signs are required to inform users of roads into the burned area of hazardous conditions

Hazard trees will be removed along boundaries with private land where safety or structures would be at risk. Hazard trees would also be removed at sites where there is interest by the public in mulching burned areas adjacent to at risk communities. Hazard trees would also be removed along critical access roads.

Interim #4.

Chainlink fence panels will be flown in by helicopter and assembled to restrict access to the fire damaged Escudilla Lookout Tower within the Escudilla Primitive Area. The fence will remain in place until the tower can be removed and/or replaced.

Treatment Status: All BAER approved hazard trees along FS roads have been treated.

Additional Protection/safety treatments

- Barricades (200): Wooden barricades to discourage unauthorized incursion and enforce road closures.

- Vault toilet cleanout: Pump vault toilets in campgrounds that are in the floodplain and are at risk of flooding. This could create a public health hazard.

Treatment Status:

- 4 toilets pumped.

- Vault toilet removal: Remove a vault toilet at imminent risk of failure due to increased peak flows and flooding. This could create a public health hazard.

Interim #2

Additional Protection/safety treatments

- **Forest Service Structure Protection (K-rails – 164):** The purpose of this treatment is to divert water around Forest Service Recreational Facilities such as campgrounds and picnic areas in or adjacent to the floodplain below high and moderate severity burn areas. Placement of structures include the following campgrounds**:** South Fork Campground, East Fork Recreation Area,West Fork Campground,Government Springs Trailhead, and Head of the Ditch Campground (Apache N.F. Administered by Gila N.F., Quemado Ranger District).

- **Fence Replacement (Big Lake Sewage Lagoon):** The fence (approximately 200 feet) around the Big Lake Sewage Lagoon burned and the Forest is now in violation of Arizona Department of Environmental Quality. Big Lake recreational area is one of the few areas within the Forest that is open to the public. The current situation is a hazard to people visiting the lake and an attractant for wildlife who can now access the lagoon.

- **Flood Hazard/closure signs (525):** During this phase of the assessment the BAER Team determined that additional signs were required for public safety. The Forest has many access points into the fire area signs would be placed in these areas to inform user of the risks in the post-fire environment. In addition, signs would be placed at critical stream/road crossings throughout and below the burn area. The hydrologic modelling would help inform critical areas where signs are needed.

- **Power line clearing (42 miles)**: The fire created a situation to where burned trees are at risk of falling on power lines that supply power to the Big Lake Recreational area, and Alpine Ranger District. Interruption of electricity would create a hardship to both Forest Service facilities and limit the Forests ability to provide recreational opportunities and/or respond to critical needs. This treatment would address only the trees in immenent threat of falling on the power lines.

Interim #5

Additional Protection/safety treatments

- Purchase and installation of additional trail closure and warning signs 100 signs for $6450. Savings from interim #2 Flood Hazard/closure signs above offset costs.

Treatment Status: 87% of powerline hazard tree removal completed
100 % of FS road hazard trees removal completed
65% of road infrastructure protection completed (140 miles)

References

Larsen, Isaac J, Lee H. Macdonald, Ethan Brown, Denialla Rough, Matthew J. Welsh, Joseph H. Pietraszek, Zamir Libhova, Juan de Dios Benavides-Solorio, Keelin Schaffrath, 2009. Causes of Post-Fire runoff and Erosion: Water Repellency, Cover, or Soil Sealing?. Soil Science Society of America Journal, 73:1993-1407.

Napper, Carolyn, 2006. Burned Area Emergency Response Treatments Catalog, USDA Forest Service National Technology and Development Program, Watershed, Soil, Air Management 0625 1801-SDTDC, 254 p

Robichaud, Peter R., Louise E. Ashmun, and Bruce D. Sims., 2010, Post-Fire treatment Effectiveness for Hillslope Stabilization, USDA Forest Service Rocky Mountain Research Station General Technical Report RMRS-GTR-240, 62p.

BAER overhead implementation Team

- The initial BAER overhead implementation team consists of an ICS organization to facilitate timely and safe implementation of BAER treatments outlined in this document. The organization consists of the following personnel:
  - IC
  - OPS
  - Safety
  - Plans
  - Logistics
  - Finance
  - Liason (interagency)
  - Contracting Officer
  - Ordering
  - Communications
  - GIS
- Costs also reflects per diem and camp rental
  - For month 1, $277,810

- The Implementation team overhead for months 2 and 3 is scaled down to implement contracts only.
  - I C
  - 2 OPS
  - Safety
  - Finance
  - Contracting Officer
  - Contracting Officer Representative
  - GIS
- Included costs are per diem, land use agreement (office) and miscellaneus
- For month 2, $165,000 shift to contract administration.
- For month 3, $120,000 as contracts will begin to be completed.
- Total Implementation Team Overhead Costs $562,810

Interim #4:

Emergency Endangered Species Consultation, Biological Evaluation preparation and consultation costs for implementation of BAER treatments: 2 Biologists for 4 weeks. Salary $16,000 from implementation team savings.

I. **Monitoring Narrative:**

Level III: Postfire Treatment Effectiveness Monitoring for FY2011 Wallow Fire

The objectives of this monitoring are to: 1) determine the effectiveness of aerial seeding on hillslope erosion on high soil burn severity areas, 2) use the existing historic watershed to evaluate changes in peak flows, runoff and sediment yields at a watershed scale (about 400 ac) for various burn severity conditions, 3) determine the sediment contribution from the hillslope as compared to the sediment contribution from the channel and its effect on the overall sediment budget for these watersheds. These results will allow for better treatment selection as detailed sediment contribution for hillslopes and channels will be known.

Interim #3

Additional Needs due to intense precipitation events:
Two high intensity storms required unexpected sediment loading to all 4 of the study weirs. On July 11th, a 1.3 inch precipitation event generated debris flow that closed the road into the Thomas weirs, and filled both of the weirs with sediment. Removal of the debris cost $5,800 for an excavator and backhoe/loader to clear the road and clean the weir ponds. On July 30, the site was inspected and another storm or storms had partially filled the weir ponds on all 4 of the research weirs. An estimated $4,200 is needed to remove the sediment again to ensure the weirs function properly. The total for sediment/debris removal for both storm events is $10,000. A large portion of the watersheds suffered high soil burn severity and these runoff events will probably occur again, therefore, it is important to clean the weirs periodically throughout the life of the research project.

Interim #4

Additional needs due to intense precipitation events in excess of interim #3:
See above, removal of sediment from Thomas and Willow Watershed weir ponds additional $10,000 from aerial seed savings.

Interim #5

2nd Year Post-fire Treatment Monitoring

Monitoring Costs 2nd Year:

Supplies			
Replacement rain gauges	$230/each	2	$460
Replacement ultrasonic	$350/each	1	$350
Data Logger/communication	$800/each	1	$800

Monitoring		
Personnel Routine maintenance and data processing		
RMRS Flagstaff		
Hydrologist GS-9	14 days @ $210/day	$2,940

Field tech GS-4	20 days@$128/day		$2,560
RMRS Moscow (monitoring, data entry, lab work, and analysis)			
Hydrologist GS-11	24 days @ $287/day		$6,888
Field Tech GS-5	24 days @ $144/day		$3,456
Field Tech GS-5	24 days @ $144/day		$3,456
Travel (air, vehicles)	8 person-trips @ $960		$7,680
Per diem/housing	2 trips x 4 days x 4 people x $128/day	$4,096	
Clean out			
Post storm Cleanout Summer 2012			
Backhoe (via Forest contract)	$1800/event	6 events	$10,800
Repairs	$1000	$1,000	
Personnel			
Hydrologist GS-11	14 days @ $287/day		$4,018
Field Tech GS-5	15 days @ $144/day		$2,160
Field Tech GS-5	15 days @ $144/day		$2,160
Travel	14 person trips @ $960/trip		$13,440
Per diem/housing	6 trips x 4 days x 4 people $128/day		$12,288
Channel surveys	$600	2 surveys	$1,200

Total 2nd Year Monitoring and Maintenance Cost	$78,142

Wallow Fire Hillslope Treatment Effectiveness Monitoring

1. Monitoring Questions
    - Is there sufficient ground cover to retard accelerated erosion?
    - Is natural vegetation recovering?
    - Did the mulch/slash stay on site?
    - Was the treatment tested by a design storm?

2. Measurable Indicators
    - The amount of ground cover in treated and areas of high burn severity in completed treatment units.
    - Rills, gullies or evidence of sheet wash erosion on the hillslopes

3. Data Collection Techniques
    - Photo documentation of sites
    - Inspection checklist (see attached)

4. Analysis, evaluation, and reporting techniques
    - Monitoring will be conducted during and after treatment. If the monitoring shows that ground cover from mulch and/or grass seeding (vegetative cover) is ineffective at preventing unacceptable accelerated erosion the going into winter an interim report will be prepared and submitted. A several page report should be completed after the site visit. The report would include photographs and a recommendation on whether additional treatments are necessary.

Hillslope Inspection Checklist (draft)

Date:_____ Inspector:_____

Time: _____ Watershed:_____

Describe Location of inspected site:
_____
_____
_____
_____

Ground Cover: _____(Complete at least 2 transects in inspection area of 10 points each)

Is there evidence of rill, gullies or sheet wash (describe extent and severity)?_____

Photo Taken of site?_____

Recommended Actions:_____

Part VI – Emergency Stabilization Treatments and Source of Funds **Interim #5**

			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											
Aerial mulch 1 t/acre	acre	600	22,812	$13,687,200	$0			$0		$0	$13,687,200
Seeding	acre	40	81,680	$3,267,200	$0			$0		$0	$3,267,200
Seeding Cost Adj.			78,848	$3,081,105							
Aerial Mulch Savings				-$245,900							
Aerial Mulch Riggs	acre	550									
Heritage Protection	ea	700	5	$3,500							
Hand mulching	acre	375	80	$30,000							
Aerial mulch 1 t/acre	acre	600	10,888	$6,532,800							
Add Nx Wd det/trt	acre			$45,400							
Nx weed detection	acre	0.8	41,150	$32,920							
Stock Tank Cleaning	ea	100	130	$13,000							
Aerial Mulch AZGFD	acre	0	2,500	$0	$1,500,000						
Aerial Seeding	acre	66.3	1,055	$69,947							
Aerial seeding Cost Adjustment from Int 2				-$20,000							
Aerial seeding Cost Adjustment from Int 2				-$219,946							
Aerial Mulch Cost Adjustment from Int 2				-$171,900							
Ground Seeding	acre	50	400	$20,000							
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Land Treatments				$26,125,326	$1,500,000			$0		$0	$16,954,400
B. Channel Treatments											
Debris Removal	miles	4100	10	$41,000	$0			$0		$0	$41,000
Trash racks	ea	10,000	2	$20,000	$0			$0		$0	$20,000
Trash racks	ea	3000	10	$30,000	$0			$0		$0	$30,000
Fish Barrier stab.	ea		19		$100,000						
debris removal cost adjusment	miles	13,231	18.4	$243,450							
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Channel Treat.				$334,450	$100,000			$0		$0	$91,000
C. Road and Trails											
Remove Temp brdg	ea	30000	1	$30,000	$0			$0		$0	$30,000
culvert improvements	ea	200	206	$41,200	$0			$0		$0	$41,200
rip rap ditches	ea	1250	40	$50,000	$0			$0		$0	$50,000
diversion barriers	ea	660	140	$92,400	$0			$0		$0	$92,400
roadway drainage	ea	230	500	$115,000	$0			$0		$0	$115,000
clean/enhance culverts	miles	2790	44.5	$124,155				$0		$0	
Ditch cleaning	miles	675	41.5	$28,013				$0		$0	
rolling dips	miles	1890	223	$421,470	$0			$0		$0	$421,470
grade dips	miles	10,800	42	$448,200	$0			$0		$0	$750,070
dozer mntce.	miles	270	757	$204,390							
overflow structures	ea	2500	159	$397,500							
warmsprings	ea	11000	1	$11,000							
bridge scour	ea	20000	4	$80,000							
gates	ea	3000	55	$165,000							
Debris Removal	ea	25000	11	$275,000							
Trail stabilization	miles	135	150	$20,250	$250,000						
engineering contract admin.	ea	215000	1	$215,000							
NFSR 24 Crossing	ea	9,600	1	$9,600							

PART VII - APPROVALS

1. /s/- James Zornes — 6/8/2012
Forest Supervisor (signature) — Date

2. /s/ C. L. Newman, Jr. — 6-13-12
Regional Forester (signature) — Date