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

Date of Report: 08/16/2010

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

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

B. Type of Action

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

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

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

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Dutch Fire

B. Fire Number: CA-KNF-005561

C. State: CA

D. County: Siskiyou

E. Region: 05

F. Forest: Klamath National Forest

G. District: Oak Knoll

H. Fire Incident Job Code: P5FN9D

I. Date Fire Started: July 31, 2010

J. Date Fire Contained: August 4, 2010

K. Suppression Cost: $3,000,000

L. Fire Suppression Damages Repaired with Suppression Funds:
1. Fireline waterbarred (miles): 2.8 miles dozer line;1.6 miles handline
2. Fireline seeded (miles):
3. Other (identify):

M. Watershed Number: 18010206080205

N. Total Acres Burned: 336
NFS Acres (144) Other Federal ( ) State ( ) Private (192)

O. Vegetation Types: White oak with mountain mahogany, manzanita and deerbrush

P. Dominant Soils: Skalan family, moderately deep with similar shallow soils

Q. Geologic Types: metasedimentary rock

R. Miles of Stream Channels by Order or Class: ephemeral: 2.7; perennial: 1.4 miles

S. Transportation System

Trails: 0 miles Roads: 0.9 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 73 (low) 166 (moderate) 97 (high)

B. Water-Repellent Soil (acres): 24

C. Soil Erosion Hazard Rating (acres): 35 (low) 75 (moderate) 226 (high)

D. Erosion Potential: 1.3 tons/acre

E. Sediment Potential: 416 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

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

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

D. Design Storm Duration, (hours): 6

E. Design Storm Magnitude, (inches): 3.0

F. Design Flow, (cubic feet / second/ square mile): 33 (3cfs)

G. Estimated Reduction in Infiltration, (percent area): 77

H. Adjusted Design Flow, (cfs per square mile): 145

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Several resource values were assessed including: long-term soil productivity, water quality, beneficial uses and associated aquatic habitat for T&E fish species, roads, culverts and private property. These values at risk were assessed as to their upstream/upslope hazard and associated potential risk from post-wildfire watershed conditions. Field investigations and subsequent analyses/models were used to determine their post-wildfire hazard and associated risk from potential debris flows, flooding, soil erosion and accelerated sedimentation.

A sequential evaluation process assessed the post-fire watershed conditions starting at the hillslopes and moving downslope or down the stream channels to determine potential hazards and associated risks to the various resource values. First the hillslope and stream channel burn severities were identified and mapped. A debris flow initiation and transport map was developed that is based on inherent soil-hydrologic characteristics. Based on the findings of the burn severities, the post-fire watershed stream flows were modeled and combined with the debris flow map to assist with determining the potential hazard and associated risk to the aforementioned resource values. Further field investigations of these resource values were conducted to determine if they were at risk from the post-fire induced hazards.

Watershed - The soil erosion rates will increase with amounts varying based on burn severity and characteristics of individual landtypes. Several subwatersheds have an increased hazard of rill and gully erosion, increased runoff and debris flows. Erosion rates may reach or exceed soil loss tolerances in the 2 to 5 years following the fire. Unacceptable soil loss is dependent on several factors including soil burn severity, inherent soil characteristics, steepness of hillslopes, and climatic triggers. Long-term productivity may be negatively affected on steep hillslopes with high burn severities that experience high intensity rainfall from thunderstorms. At a minimum there will be a substantial increase in sedimentation to the drainages within the Dutch Fire. There is a direct relationship of higher sedimentation associated with adjacent areas of high burn severities on steep hillslopes. Dry soil ravel has already occurred in these burned areas. Sedimentation will increase dramatically depending on increasing rainfall intensities and initiation of debris torrents as existing inchannel sediment and new ash flushes out during the first significant rainfall events. In the short-term it is very likely that there will be negative effects to aquatic habitat within the analysis area (Dutch Creek) due to increased sediment delivery from severely burned areas. In the long-term, effects will be largely dependant on the climatic triggers and the spatial coverage of these storms that may occur over the next 1 to 3 years. Flashy runoff peaks due to the higher runoff efficiency associated with cover loss and soil crusting on the high severity sites has the potential to initiate rill erosion. This material, plus any generated by potential debris slides, would be delivered fairly efficiently to the road, the flat terrace below the road and eventually to Dutch Creek.

Fisheries - The Klamath River is the major fisheries habitat in the vicinity of the fire. Four small subwatersheds within the fire have a high potential to transport sediment to the lower 2 miles of Dutch Creek, which is a tributary to the Klamath River. This section of the river is habitat for Endangered Species Act-designated critical habitat for coho salmon, and is used for migration, adult holding, spawning, and juvenile rearing of salmonid fishes, as well as habitat for other anadromous and native fishes. All potential fire-caused soil and water impacts would be direct to Dutch Creek and subsequently to the Klamath River. If the intense, triggering storms were to occur in the winter, winter flows would probably dilute fire impacts to the river. The higher flow conditions would expand opportunities for fish to find refuge. The greater likelihood of effects on fisheries would be associated with an intense summer thunderstorm, when river flows are already relatively low. Most of the salmonids present during the summer months are juveniles, including coho salmon. As ambient water temperature increases and quality decreases during this season, salmonids are mainly found in refugial areas such as cold-water tributary confluences. Salmon and steelhead fry would be the most vulnerable, experiencing some mortality when forced to flee desired habitat due to ash, and especially suspended sediment and associated turbidity. This stress is expected to last a few days, at most, and would diminish downstream. The long term affect on river habitat from the addition of predominantly fine-grained sediment is not expected to be significant.

Roads – Road 47N20 is the only road that provides access for 4 year-round residences to Highway 96. During the field investigation, several issues pertaining to emergency road stabilization were identified. Three culverts (on ephemeral channels) were evaluated and found to be inadequate and/or inoperable to handle expected postfire runoff. These 3 culverts currently have a diminished capacity to carry water. One inlet is 90% obstructed, another is 50% obstructed and the third is 25% obstructed with no defined inlet channel beyond 5 feet from the inlet. The result of these field investigations identified threats to public safety and deterioration of water quality through possible road failures. With the landscape now burned, the runoff flows will be greater in intensity and more debris is available for transport at these crossings.

Noxious weeds - Burned areas are vulnerable to weed infestation because fire disturbs sites and eliminates competing vegetation, which creates a favorable environment for establishment of invasive species. The threat of non-native invasive weed species is a serious concern in the Dutch Fire area. Currently, the Forest Service lands within the fire contain no noxious weeds, however there are several undesirable, non-native invasive species currently existing (yellow starthistle and Dyers woad) along road 47N20 and on private land. The Forest Service lands are located in the northern portion of the fire, above the private land where these existing noxious weed are currently located. Because all access to the fire occurred through infested habitat, it is likely that these species were spread to the upper slopes of burned area by bulldozers and fire personnel. Of greater concern is the possible introduction of new noxious weed species not previously identified within the watershed. No weed washing of vehicles occurred during suppression and rehabilitation activities for this fire. Air traffic utilized Tree of Heaven campground for air support which has a number of listed weed species not currently found within the fire perimeter that may be a concern. Vehicles or aircraft could have come from weed infested areas and weeds introduced through mud, debris, or gear. Of particular concern are species that are rated by the State of California as Class A pests. Class A pests are competitors that are targeted for priority eradication in the county before their numbers are too great to successfully eliminate.

Noxious weeds are known to readily invade burned areas, especially if the fire was hot enough to suppress native perennial species. Approximately 78% of the burned area (260 acres) burned at high or moderate burn intensity. These 260 acres of the Dutch Fire area are especially susceptible. Hundreds of acres of ground disturbance and canopy removal have created prime habitat for weed encroachment.

Private property - There are 5 residences and numerous associated outbuildings directly below the fire area along road 47N20. Two below the road residences have no potential for damage from winter/thunderstorm flood damage. Three residences (one below the road and two above the road) have a low threat of flood damage and one outbuilding (above the road) has a high probability of incurring some level of damage from winter/summer thunderstorms.

B. Emergency Treatment Objectives:

1. Protect the integrity of the road providing access for 4 year-round residences.
2. Assess encroachment of noxious weeds into the fire area by monitoring for Dyers woad and yellow starthistle encroachment next growing season. If results of detection survey identify new infestations, treat by manual pulling. See Noxious Weed Monitoring Plan for methodology.
3. Control runoff and potential sediment damage to current livable structures.

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

Land **NA** % Channel **NA** % Roads/Trails **90** % Protection/Safety **80** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	90	NA
Road	80	90	NA
Protection/Safety	70	80	NA

E. Cost of No-Action (Including Loss): **$38,300**
The values at risk directly lost through No-Action includes: damage to fish and their habitat in Dutch Creek, loss of soil productivity (as impacted by noxious weed potential and erosion), impact on water quality, impacts to road 47N20 and possible damage to private property (1 residence and 2 out buildings).

F. Cost of Selected Alternative (Including Loss): **$11,277**
It was assumed the primary treatments would be successful in reducing resource values lost through No-Action by 80 percent. The remaining resource values lost (as a factor of success) were added to the cost of the primary land treatment.

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Tom Laurent

Email: tlaurent@fs.fed.us Phone: (530) 842-5401 FAX: (530) 841-4571

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

Land Treatments:

Noxious Weed Detect and Treatment

General Description:

Monitor known weed populations and all areas within the perimeter of the Dutch Fire for weeds introduced or spread during fire suppression and/ or rehabilitation. Dozer line and burn areas adjacent to roads or areas used for fire suppression and/ or rehabilitation activities are high priority sites for monitoring. Treat and map any new or expanded weed populations.

Channel Treatments:

No Treatments Prescribed

Roads and Trail Treatments:

Drain Dips (with armor) – Clean out 2 small culverts and place gravel rock at one ephemeral channel crossing. This will allow the expected increased level of sediment to be controlled at the road crossing and prevents the runoff from running down the road and causing damage to road bed and fill slope. The armor consisting of rip rap is placed over the length and width of the reconstructed crossing. Construct low water crossing per Forest Service standards

Purpose:

The purpose of this road treatment is to protect road infrastructure and control sediment movement and depositional aea. The proposed treatment will help prevent unacceptable erosion, and minimize degradation to water quality, T&E anadramous fish habitat, and spawning habitat in Dutch Creek.

Protection/Safety Treatments:

Patrols for Storm Induced Runoff

General Description:

Road 47N20, which lies below the Dutch Fire, contains drainage structures that cross ephemeral channels located in watersheds that have predominately high to moderate burn severity. These 7 subwatersheds now have the potential for increased runoff and debris flows. These increases in flows pose a threat to the reconstructed low water crossing and three culverts. If these flows plug the drainage structures the result would block the daily use of the road to the permanent residences located along the road. With the loss of vegetation normal storm frequencies and magnitudes can more easily initiate rill and gully erosion on the slopes and it is likely that this runoff will cover the roads or cause washouts. These events make for hazardous access along this road and put the safety of land owners at risk. The patrols are used to identify those road problems such as filled in rocked channel crossing, plugged and overtopped culverts and washed out roads and to clear blocked areas, thus allowing continual road access to the residences. The storm patrollers shall have access to at least a backhoe and dump truck that can be used when a drainage featue is nondriveable or soon to be plugged and to repair any road receiving severe surface erosion.

Location (Suitable) of Sites:

The patrols will be restricted to that portion of road 47N20 that is located directly beneath the fire perimeter.

Design/Construction Specifications:

1. FS personnel will identify and direct the work. Immediately upon receiving heavy rain and Spring snowmelt the FS will send out a patrol. In addition, the residents will be given a Forest Service phone number that will notify the road crew supervisor about the need for road storm maintenance. Pertaining to hazardous road conditions (sediment, washouts and plugged culverts) so the problems can be corrected before they worsen or prohibit motor vehicle use by the residents.

2. Authorized Forest Service personnel shall bring in equipment necessary to mechanically remove obstructions from the roads and culvert inlets and catch basins where necessary.
3. All excess material and debris removed from the drainage system shall be placed outside of bank-full channel where it cannot re-enter stream channels.

Purpose:

The purpose of the patrolling is to evaluate the condition of road 47N20 for motorized access and to identify and implement additional work needed to maintain and/or repair damage to road surfaces and flow conveyance structures across roads. These patrols are needed to provide safe access along a FS road and minimize deterioration of water quality due to road failures. Engineering and District personnel will survey the roads within the fire perimeter after high-intensity summer thunderstorms and high intensity winter rains in 2010, 2011 and 2012. Survey will inspect road surface condition and culverts/inlet basins for capacity to accommodate runoff flows.

I. **Monitoring Narrative:**

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

See attached noxious weed detection survey for details.

Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

			NFS Lands				Other Lands			All
		Unit	# of	WFSU	Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	SULT $	$	units	$	Units	$	$
A. Land Treatments										
Nox Weeds Detect	acres	30	100	$3,000			$0		$0	$3,000
				$0			$0			
				$0			$0		$0	
				$0			$0		$0	$0
Subtotal Land Treatments				$0			$0		$0	$3,000
B. Channel Treatments										
				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
Subtotal Channel Treat.				$0			$0		$0	$0
C. Road and Trails										
Rolling rocked dips	each	1500	1	$1,500			$0		$0	$1,500
Storm patrol/maintence	each	1200	3	$3,600			$0		$0	$3,600
				$0			$0		$0	$0
				$0			$0		$0	$0
Subtotal Road & Trails				$5,100			$0		$0	$5,100
D. Protection/Safety										
				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
Subtotal Structures				$0			$0		$0	$0
E. BAER Evaluation										
Baer Team	day	5	1400	$7,000			$0		$0	$7,000
				$0			$0		$0	$0
F. Monitoring				$0			$0		$0	$0
G. Totals				**$12,100**			**$0**		**$0**	**$15,100**

PART VII - APPROVALS

Dutch Fire BAER Report
Initial Request developed by Tom Laurent
August 16, 2010

Forest Supervisor (signature) _____ Date _____

Regional Forester (signature) _____ Date _____