UNITED STATES
DEPARTMENT OF
AGRICULTURE

FOREST
SERVICE

RO

REPLY TO: 2520/6520

DATE: OCT 30 1992

SUBJECT: Authorization for Expending Burned-Area Emergency Rehabilitation Funds (EFFS-FW22) - Cleveland Fire

TO: Forest Supervisor, Eldorado National Forest

Attached is the approved interim Burned-Area Emergency Rehabilitation Report for the Cleveland fire. You are authorized to expend up to an additional $79,620 of EFFS-FW22 funds for the emergency rehabilitation treatments described in your October 29 letter and as shown in Part VI of the enclosed FS-2500-8 report.

Your accomplishments of installing a complex mix of emergency watershed treatments in a very short period of time are commendable. Please personally pass on my appreciation for a job extremely well done to those that have contributed to this effort.

for RONALD E. STEWART
Regional Forester

Enclosure

United States Department of Agriculture | Forest Service | Eldorado N.F.

Reply To: 2520 Date: October 29, 1992

Subject: Burned Area Emergency Rehabilitation -- Cleveland Fire
Interim Reports

To: Regional Forester, R-5

Attached you will find an interim Burned Area Report for the Cleveland Fire (ENF 3666). This updating of the initial funding request is based on more accurate data on actual on-the-ground cost of implementing the prescribed rehabilitation measures. Increases in funding to cover actual cost are in the following areas:

Seeding: The actual cost of application was $34/acre vs the estimated cost of $30/acre. Our unit cost increase is mainly associated with the higher amount of overhead (monitoring crews and contact administration) associated with appling seed with both a fixed wing and helicopter contractor at the same time. Through this effort our seeding operation was completed within one week of control of the fire. Because of the late season nature of this fire, it was critical that the seed be applied as quickly as possible. The actual acreage of seeding of Forest Service lands also increased by 400 acres due to adjustments in the seeding boundaries with private landowners.

Roads: The actual cost/mile of implementing the planned road protection and drainage measures has proven to be $3090/mile vs the planned cost of $2460/mile. Again the short time period to complete these road treatment measures has increased our unit cost.

Based on these actual costs the Forest would like to request an additional $79,620 of emergency funds for Eldorado National Forest Lands.

/s/ John Phipps
JOHN PHIPPS
Forest Supervisor

Enclosures

cc:
Charles Goudey, Regional Office
Gary Bilyeu
Chuck Mitchell

USDA-FOREST SERVICE Date of Report: 10/11/92

BURNED-AREA REPORT
(Reference FSH 2509.13, Report FS-2500-8)

PART I - TYPE OF REQUEST

A. Type of Report
- [X] 1. Funding request for estimated FFFS-FW22 funds
- [ ] 2. Accomplishment Report
- [ ] 3. No Treatment Recommendation

B. Type of Action
- [ ] 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation measures)
- [X] 2. Interim Report
  - [X] Updating the initial funding request based on more accurate site data and design analysis
  - [ ] Status of accomplishments to-date
- [ ] 3. Final report - following completion of work

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Cleveland B. Fire Number: ENF 3666

C. State: California D. County: El Dorado
E. Region: Pacific Southwest (R-5) F. Forest: Eldorado
G. District: Pacific, Placerville, Georgetown

H. Date Fire Started: 9/29/92 I. Date Fire Controlled: 10/14/92est.
J. Suppression Cost: $ 18,000,000 (estimate as of 10/6/92)

K. Fire Suppression Damages Repaired with FFFS-PF12 Funds:
1. Fireline waterbarred (miles) 44
2. Fireline seeded (miles) 5
3. Other (identify) Riparian Repair 3, Log Clearing from American River

L. Watershed Number: 1802012901 South Fork American River

M. NFS Acres Burned: 11,200 Total Acres Burned: 24,580
Ownership type:
(0)State (0)BLM (13,380)PVT ( )

N. Vegetation Types: 100% Mixed Conifer Forest

O. Dominant Soils: Chaix, Jocal, McCarthy

P. Geologic Types: Granite, Diorite, Gabbro, Metasedimentary, Metavolcanic, Andesitic Mudflow (Volcanic)

Q. Miles of Stream Channels by Order or Class:
6.3 miles Class 1 13.7 miles Class 2 48.7 miles Class 3 245 mi Class4

R. Transportation System:
Trails: 17 (miles) Roads: NFS = 83
State Highway = 6
County Roads = 14
Private = 49

PART III - WATERSHED CONDITION

A. Fire Intensity (Acres): 2,200 (low) 7,800 (moderate) 14,580 (high)

B. Water Repellant Soil (Acres): 17,206 Ac. (6048 Ac NFS lands)

C. Soil Erosion Hazard Rating (Acres):
2,200 (low) 6,600 (moderate) 15,780 (high)

D. Erosion Potential: 33 tons/acre
E. Sediment Potential: 21,120 cu. yds/sq. mile

PART IV - HYDROLOGIC DESIGN FACTORS

		American River		Main Tribs. in Burn	
A.	Estimated Vegetative Recovery Period:	5	years.	5	years
B.	Design Chance of Success:	80	percent.	80	years
C.	Equivalent Design Recurrence Interval:	20	years.	20	years
D.	Design Storm Duration:	6	hours.	6	years
E.	Design Storm Magnitude:	3	inches.	3	years
F.	Design Flow:	105	cfsm.	190	cfsm
G.	Estimated Reduction in Infiltration:	60%	percent.	90%	percent
H.	Adjusted Design Flow:	110	cfsm.	427	cfsm

PART V - SUMMARY OF ANALYSIS

A. Describe Emergency:

Based on the B.A.E.R. Team field survey and analysis the following emergencies exist as per FSH 2509.13:

1. Threat to Human Life: Flash flooding and sediment bulked flows along the Highway 50 corridor from tributaries to the American River, along county roads, at St. Pauli creek (building at risk from from bulked flows and/or debris flows overtopping the road), Whitehall building between Highway 50 and the river, and at 29 Mile Creek Station and the buildings across from it. At the Randall and Bull Creek Tracts, houses lay in the path of potential debris slides. Near Mill Creek there is the corner of a house in the path of potential debris slides. In Union Valley Resivour, floatable debris generated from the fire area poses a threat to waterskiers and boaters. Rockfall onto Highway 50 created by fire loosened (previously lodged behind now burned vegetation and logs) large boulders being mobilized by rainfall and gravity. Hazard trees falling onto roads, the Cleveland Corral Information Center, and throughout the burned area. Debris and rockfall potential into the Alder Creek Tract.

2. Threat to Property: (In addition to those items listed under threat to life) The Pacific Gas and Electric Canal is at risk from falling trees, rocks, and slope wash sediment deposits. Private Bridges over the American River and its tributaries are at risk from large floating logs (some of these bridges may also be fire weakened) causing log jams and bridge failure. Road fills and drainage facilities along Highway 50, County Roads, NFS roads, and Private roads. Domestic water diversions and impoundments are at risk of filling or washing out. Reservior capacity, especially in Slab Creek Reservior and Junction Reservior and the effect this has on the operating pool and life of those projects is at significant risk (Slab Creek Res. has already reached a critical level of concern relative to the dead storage capacity being exceeded and the operating pool beinging impacted by previous slope failure events in the American River Canyon). Two major powerhouses in the American River are at risk from large floatable material and debris flow bulking of the river (El Dorado

and Camino powerhouses). Cultural resource sites, including some on the National Historic Register, are at risk from washouts, surface erosion, and debris flows. Power poles on sideslopes are at risk of being undercut near new gullies and of being damaged by debris flows and slope wash sediment. A road protecting sediment catchment basin in Alder Creek is currently full and at risk of breaching, as well as the road already being at Risk.

3. Loss of control of water: While the the American River itself thru the burn are will only experience a minor increase in peak flow and flood frequency as the result of the fire due to the large upper watershed acreage not affected by this fire, the tributaries to the River within the burn are expected to experience a major loss of control of water, as are the tributaries to Silver Creek in the North end of the burn. In the American River area, most of the Tracts of houses are at the mouth of these tributaries. The inside ditch of the Michigan-California Mainline road is likely to experience cross drain culvert blockage, and concentrate hillside runoff into a single point. Many culverts within the burn are expected to block with the resultant road overtopping. The Pacific Gas and ELectric burned out flume sections will now concentrate slope wash from above the remaining canal sections to new breach points on very steep slopes, and in some cases with historic rock walls below them. Slump failures in St. Pauli's creek may change the stream course of the creek. Failure of reminant drainage structures in historic road and trail routes will cause rerouting of water to new channels.

4. Threats to Water Quality: All watersheds in the burn area have a high potential for increased sedimentation and its adverse effects on water quality. Potential for short and long term sediment related damage exist as the result of the fire. The American River itself is eventually becomes the domestic water supply for the Sacramento, California. Temperatures in the south fork of Silver Creek will be affected by the removal of shade by the fire, directly effecting the fish in the creek, as well as possibly resulting in temperature and nutrient caused eutrophication in Junction Reservior (also a part of Sacramanto's water supply). Hydroelectric plant turbine wear is also of concern. Other major beneficial uses of water in this watershed include: Local domestic water use; recreational use at campgrounds, picnic areas, fishing, sightseeing, swimming, boating, watersking, and enjoying the visual clarity of the American River; stockwater; fire protection use; and irrigation.

5. Threat to Long Term Soil Productivity: Based on the field survey, the average soil loss over the burn area was calculated to be about 33 tons per acre, from a 2 year, 30 minute storm. This figure greatly exceeds the approximated rate of soil formation for forest soils in California, which is 1 ton per acre per year. Hydrophobic soils occur in a majority of the burned area, as do soils devoid of effective ground cover.

B. Emergency Treatment Objectives:

To address the above emergencies identified by the B.A.E.R. team, the following objectives were identified:

To reduce the potential for loss of life and property at the source areas, as well as at the potential effect area, with a variety of land, channel, road, and slope stability treatments which have been demonstrated effectiveness in similar burn areas (see narrative of treatments), as well as by providing information to the general and specific publics about the potenial threats.

To retain soil on site for both maintaining the long term productivity of the ecosystem, and minimizing degradation of water quality as related to the

beneficial uses of water and maintaining control of water; by a variety of land, channel, and road treatments which have been demonstrated effectiveness in similar burn areas (see narrative of treatments).

To mitigate the emergency.

C. Probability of Completing Treatment Prior to First Major Damage Producing Storm:

Land 80 % Channel 70! % Roads 70!!% Slope Stability 90 %

! 80% chance of completion for 90% of channel treatments, including a 90% chance for completing those specific channel treatments that also treat slope stability.

!! 80% chance of completion for 90% of road treatments.

D. Probability of Treatment Success

	<----Years after treatment-----> 1	3	5
Land	80%	100%	100%
Channel	80%	95%	100%
Roads	90%	95%	100%
Other	90%	90%	90%

E. Cost of No-Action (Including Loss): $ 13,800,000+

F. Cost of Selected Alternative (Including Loss): $ 3,959,220 (Cost+Risk)

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology	[X] Soils	[X] Geology	[ ] Range
[X] Timber	[X] Wildlife	[ ] Fire Mgmt.	[X] Engineering
[ ] Contracting	[X] Ecology	[ ] Research	[X] Archaeology
[X] S.C.S_____	[X] Dist. Mgt.	[X] Silvicult.	[X] Fisheries

Team Leader: Rob Griffith
Phone: (916) 622-5061 (Eldorado) DG Address: B.GRIFFITH:R05F03A
(209) 962-7825 (Home Unit) R.GRIFFITH:R05F16D54A

Implementation Leader (Including Final 2500-8): Chuck Mitchell
Phone: (916) 622-5061 DG Address: C.MITCHELL:R05F03A

H. Treatment Narrative:

The following are the proposed emergency treatments for the Cleveland Fire. These treatments were developed based on the B.A.E.R. objectives, team recommendations of proven effective treatments, and line officer input, as well as from detailed cooperative discussion with Georgia Pacific Timber Co., Michigan - California Timber Co., USDA Soil Conservation Service, California Department of Forestry and Fire Protection, and the Sacramento Municipal Utilities District. Broad based cooperative discussion included Pacific Gas and ELectric Company, California Transportation Dept (CALTRANS), the El Dorado County Department of Transportation, the El Dorado County Department of

Transportation, California Department of Fish and Game, California Conservation Corp, and several small private landowners.

Due to the high values at risk, multiple treatment types may occur in the same area, to address the same emergency situation, thereby improving the overall effectiveness of mitigating the emergency.

Land Treatments

Seeding

This treatment would use fixed-winged aircraft and helicopters to apply Cereal Barley at a rate of 30 pure live seeds per square foot to just over 12,800 acres of soils with very high and high erosion hazard, to create ground cover, reduce runoff efficiency from the slopes, breakdown water repellant layers, retain soil on site for long term productivity of the site and reducing the stream sedimentation. In parts of the burn where life and property are threatened by flash flooding and bulked flows, and other sediment and loss of control of water induced damage to property and water quality, this treatment will help reduce the potential for losses. Cereal Barley was selected because of its effectiveness as demonstrated in other burn areas, its non-persistence over the long term in these high value commercial timber producing lands, plus that this grass meets the long term ecosystem management objectives of a variety of large land owners within the burn with affected lands.

Wetting Agent

This treatment will be used to lessen water repellancy on 100 acres or more in high intensity burn areas with high erosion hazard induced specifically by fire created hydrophobic soils. The specific wetting agent to be used is "Naiad" (manufactured by the Naiad Company), a soil penetrant used in California primarily on turf applications to act as a helping agent that makes water penetrate difficult-to-wet areas. It is an agricultural soap product. Preliminary checks of the formulation indicate no ingredients of concern (Does not carry a US EPA or California EPA registration number, is not in a US DOT hazard class, has NFPA 704 Hazard Rating of "0" in all categories, is biodegradable, requires no special personal protective equipment. Does contain "Monoethanolamine Dodecylebenzene Sulfonate", CAS # 27176870, less than 7.55%). Since this treatment has not been used on a large operational basis in burned areas previously, it will not be funded with emergency funds, and in areas where it is used, it will be a secondary treatment.

Log Erosion Barriers/Slashing

This treatment involves falling submerchantable trees available on site and creating a checkerboard pattern of log terracettes to shorten the acceleration run of water on hillslopes, thereby reducing the energy available in the water to cause erosion. Where enough woody material is available, the material will be lopped and scattered on the slope to provide cover. This treatment will be used in on 276 acres of the burn to reduce erosion and sedimentation in areas with especially high values down slope, such as on slopes above tracts of houses. This will be an additional treatment to the use of seeding in some of these areas. In addition, this treatment will be used in areas with potential for debris slides above tracts of houses, and other areas with high values at risk. Production rates for this treatment will be

boosted by use of California Conservation Corp labor available from 2 camps located within one hour driving time of the Forest.

Mulching in Stream Side Management Zones

This treatment will be used below large fill slopes on roads, where the vegetation that was previously preventing fill material from eroding directly into the American River has been burned, as well as along Silver Creek. This treatment will be used along approximately 2 miles of fill slopes or critical stream reaches where seeding effectiveness will be improved by this treatment. Straw, rather than wood fiber hydromulch will be used to prevent concentrated water from cutting through the mulch layer and reducing the effectiveness of the treatment. These areas are also within seeding prescription areas, and will further address the threats to water quality and property.

Channel Treatments

Checkdams

Five types of checkdams are proposed to help hold sediment than is already preloaded in ephemeral drainages, is expected to wash into these drainages, and to reduce the downcutting of these channels. this treatment will specifically help to lessen the threats to life, property, control of water, and water quality. Less sediment will be transported to the American River and Silver Creek, which have critical sediment related downstream values at risk. Three low head check dam designs will be used based on specific channel configuration, and material available on site: straw bale check dams (4-6 bale), single log sill check dams, and soil cement checkdams. 2655 of these structures will be build using the large California Conservation Corp labor pool that is available. 8 medium size log checkdams will also be built in specific channel reaches. 2 large, reinforced checkdams will be constructed at critical points. Most of these checkdams will be within areas that will also receive seeding, thereby further improving the effectiveness of the overall treatment of the downstream emergency. All checkdam designs to be used have been effective in previous burns.

Channel Clearing

To reduce the potential for loss of life due to floatable debris in Union Valley Reservior, channel clearing by hand is recommended for 1 mile of stream. Since the fire camp is located near this location, and the fire has not been yet controlled, fire crews could be used to do this work prior to full demobilization (or California Conservation Crews could do this work). A substantial number of large logs that were fallen as hazard trees into the American River were removed by the fire supression forces, so minimal additional channel clearing is anticipated in the American River at this time to reduce the threat to private bridges there. However, if this situation changes by more logs washing of falling into the river, channel clearing by heavy lift helicopter will be utilized in the American River (would be an addition to the current funding requested)

Roads and Trails

Road Protection - Drainage and Crossings

The property represented by the road itself, as well as the potential increase sediment load created by fill failures, stream rerouting down

inside ditches and eventual blow-outs into new channels, potential threat to life created by loss of road crossings, as well as the loss of service of roads make treatments to ensure road drainage and protection of crossings a critical treatment. Due to the high mileage of roads within the burn, the high number of specific structures and locations of concern, the need to keep the roads servicable, and the large number of types of specific treatment types needed, just a general cost per mile of road is shown on the 2500-8 form. However the "BURNED AREA EMERGENCY REHABILITATION TRANSPORTATION SYSTEM REPORT" for the fire contains detailed description of the treatment locations and types. These treatments include: Intercepting Relief dips, catch basin clearing and cleaning, ditch cleaning snorkel pipe inlets, spot rocking for water energy dissipation, rocked crossings, and trash/debris racks. All of the treatments have been previously proven effective in burned areas, and can be accomplished with available road crews.

Flood Patrol

Flood patrol will ensure that culverts do not become plugged and create major blowouts. Given the high degree of risk in this burn area, and the large potential for plugged culverts, this flood patrol would include backhoes on scene during the patrol, plus helicopter survey in critical drainages where snow plowing would otherwise be needed to open access roads in this rain on snow zone.

Slope Stability

Rock Scaling

This treatment would be used to lower boulders down slopes in a controlled manner to prevent later uncontrolled rockfall triggered by rain and gravity, and its potential effect on life and property. In the Highway 50 corridor, CALTRANS will work cooperatively with the Forest Service to accomplish this work. Other areas above tracts of houses will also receive this treatment on an individual boulder evaluation basis.

Threats to be Addressed in other ways

Tree fall on NFS lands

The threat to life by treefall is being addressed by the Forest and the fire supression organization by falling of Hazard Trees along travel routes and other locations. Closure of the burned area off of hazard cleared roadways and other facilities will be considered by either formal Forest Closure Order and/or informational methods.

PART VI - EMERGENCY REHABILITATION TREATMENTS AND SOURCE OF FUNDS BY LAND OWNERSHIP

Line Items	Units	Unit Cost $	NFS Lands Number of Units	NFS Lands EFFS-FW22 $	NFS Lands Other $ Forest NF	Other Lands Number of Units	Other Lands Fed $ EWP and SMUD	Other Lands Non-Fed $ CDF and SMUD	All Total $
A. LAND TREATMENTS									
Seeding	ac	34.	7000	238,000		2600*	78,000		316,000
Wetting Agent	ac	50.	100		5000				5,000
Log Erosion Barriers	ac	196.	276	54,096					54,096
Mulch in SMZ	ac	1000.	20	20,000					20,000
B. CHANNEL TREATMENTS									
Checkdams - low (log and straw)	ea	125.	1600	200,000		1055&	131,875		331,875
Checkdams - medium (log)	ea	300.	8	2,400					2,400
Checkdams - large	ea	1500.	2	3,000					3,000
Channel Clearing	mi	5000.	0.5	2,500		0.5@	2,500		5,000
C. ROADS AND TRAILS									
Road Protection -Drainage and Crossings	mi	3090.	81	250,000					250,000
Flood Patrol	days	2160	20	43,200					43,200
D. SLOPE STABILITY									
Rock Scaling - Hwy. 50 areas	pk	16000	1	16,000					16,000#
E. BAER EVALUATION/ ADMINISTRATIVE SUPPORT									
BAER CORE TEAM	days	2800.	9	25,200					25,200
BAER FULL TEAM	days	1600.	9	14,400					14,400
ADDITIONAL GEOLOGISTS	days	600.	4	2,400					2,400
F. TOTALS				871,196			212,375		1,088,571

* Georgia Pacific = 805 acres; Michigan-California = 1378 ac; other small pvt. = 417 ac
& Georgia Pacific = 55; Michigan-California = 1000.
@ Michigan-California lands
^ Georgia Pacific = 4 miles; Michigan-California = 45 miles (14 miles of County Roads and 6 miles of State Highway 50 are not included here, but are being evaluated by the respective transportation agencies for specific treatment implementation within their authorities).
\# CALTRANS has agreed to cooperate on this project

PART VII - APPROVALS

1. /s/ John Phipps — 10/29/92
Forest Supervisor (Signature) — Date

2. /s/ Andrew D. Lower — 10-30-92
for Regional Forester (Signature) — Date