

**China Fire
China-Back Complex
Klamath National Forest**



**Burned Area Emergency Restoration Assessment
2500-8 Report**



Date of Report: 7/26/2007

BURNED-AREA REPORT

(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

- ☒ 1. Funding request for estimated emergency stabilization funds
☐ 2. Accomplishment Report
☐ 3. No Treatment Recommendation

B. Type of Action

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
☐ 2. Interim Report # _____
 ☐ Updating the initial funding request based on more accurate site data or design analysis
 ☐ Status of accomplishments to date
☐ 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTIONA. Fire Name: ChinaB. Fire Number: KNF-3238C. State: CAD. County: SiskiyouE. Region: 5F. Forest: KlamathG. District: Oak Knoll (51)H. Fire Incident Job Code: P5DQM0I. Date Fire Started: July 9, 2007J. Date Fire Contained: July 20, 2007K. Suppression Cost: \$2,300,000

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): 6.0 miles
2. Fireline seeded (miles):
3. Other (identify):

M. Watershed Number: 1801020803N. Total Acres Burned: 2,937

NFS Acres(2,287) Other Federal () State () Private (650)

O. Vegetation Types: White oak, whiteleaf manzanita, buckbrush, ponderosa pine and Douglas fir.P. Dominant Soils: Bluesprin, Skalan and Lithic Mollic Haploxeralfs families; Dome, Chaix and Holland seriesQ. Geologic Types: Metavolcanic with a small amount of granitic rocks

R. Miles of Stream Channels by Order or **Class**:

(Stream Class per FSM 2536.1, R5 supplement)

Class I: 8.0 miles Class II: 0 miles Class III: 4.6 miles Class IV: 4.6 miles

S. Transportation System

Trails: 0 miles Roads: 2 miles of co-op and 4 miles of County roads

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 1,280 (low) 1,263 (moderate) 394 (high)

B. Water-Repellent Soil (acres): 100

C. Soil Erosion Hazard Rating (acres):

436 (low) 1,775 (moderate) 726 (high)

D. Erosion Potential: 0.4-2.7 tons/acre (avg of 1.4 tons/acre)

E. Sediment Potential: 114 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

B. Design Chance of Success, (percent): 90

C. Equivalent Design Recurrence Interval, (years): 2

D. Design Storm Duration, (hours): 6

E. Design Storm Magnitude, (inches): 0.96

F. Design Flow, (cubic feet / second/ square mile): 230 Clear Ck. (burned portion),
596 Cayuse 5th field (burned portion)

G. Estimated Reduction in Infiltration, (percent): 15 Clear Ck. (burned portion),
2 Cayuse 5th field (burned portion)

H. Adjusted Design Flow, (cfs per square mile): 265 Clear Ck. (burned portion),
596 Cayuse 5th field (burned portion)

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The China Fire is within the China-Back Complex. It is the only fire in that complex eligible for BAER funds. On July 9, 2007 a lightning-caused fire started in Swiss Gulch, approximately 0.5 miles above the Klamath River. It spread to the north, south and southeast. The initial attack personnel were not able to contain the fire, which spread to Cayuse-Klamath River and Clear Creek 7th field watersheds. It was contained on July 20, 2007. Fifty-five percent of the fire burned in high and moderate severity classes.

Threat to watershed values: At the 7th field watershed scale, the wildfire burned portions of the Cayuse-Klamath River and Clear Creek 7th field watersheds. Clear Creek is tributary to Humbug Creek. A third of the drainage area of Clear Creek (tributary to Humbug) burned, and moderate and high severity comprises 76% of the area in the burned portion of Clear. None of the rest of Humbug was in the burned area. There are a half dozen small “face drainages” that enter the Klamath River that were entirely within the fire perimeter. The portion of the combined face drainages that burned at moderate and high severity was 17%. This burned area comprises 37% of the seventh field watershed, which includes face drainages across the river that were outside the fire perimeter.

Surface erosion/sedimentation: A cumulative watershed effects (CWE) analysis was completed for the Cayuse-Klamath River and Clear Creek 7th field watersheds to evaluate the effects of the wildfire on these watersheds. One component of this CWE land disturbance model is a surface erosion/sediment delivery (USLE) analysis. The USLE analysis was used to evaluate the difference between pre-wildfire and post-wildfire watershed conditions. This USLE analysis estimates sedimentation by considering factors such as disturbance type and land sensitivity. As disturbances to the land surfaces and stream channels in a watershed occur over space and time, the risk of initiating or contributing to existing adverse cumulative watershed effects becomes a concern. A continuum exists from lower to higher risk of adverse watershed effects. This USLE analysis has an inference point that is intended to represent the center of that risk continuum. If the wildfires’ expected effect on water quality is above the inference point, the risk ratio will be above 1. A comparison of the pre-wildfire modeled risk ratio to the post-wildfire risk ratio provides a basis for analyzing the wildfire’s risk of adversely affecting watershed conditions. The further above 1.0 that the risk ratio is, the higher the likelihood that there will be increased sediment production and delivery. The USLE model showed that the risk ratio changed from 0.20 (pre-fire) to 0.96 (post-wildfire) in the Cayuse-Klamath River 7th field watershed and from 0.22 to 0.97 in the Clear Creek 7th field watershed. The delivered sediment increases due to the wildfire are calculated to be 254 and 271 yds³ for Cayuse-Klamath River and Clear Creek 7th field watersheds, respectively.

Debris flow risk: Although the mouths of the burned area watersheds draining into the Klamath River do not show evidence of recent debris flow deposits, there is evidence of such events following watershed disturbance, including wildfire, in nearby watersheds. This includes Clear Creek, based on the geologist’s field observations, although that event was more than 50 years ago. Face drainages along the Klamath River are very steep and rocky, with lots of outcrop. The fire, especially where moderate and high severity burned, will make the slopes shed water more rapidly, and be more prone to debris flow during intense summer thundershowers. There is also a potential for winter storm debris flows, although that risk is probably less. One County Road culvert is particularly undersized. Water flow alone is expected to increase around two percent; however, sediment and debris increase described above can quickly overwhelm this 24” pipe. In another face drainage, a jeep road crosses the channel with a large oversteepened fill where all the supporting vegetation was burned off. The fill has a high risk of failing and initiating a debris flow.

Threat to Private property: There are no threats to private property, with one exception. There are two logs that could roll onto private property near a residence across the County Road. The resident was contacted, and conveyed that he will remove the logs using his own labor and equipment under a firewood permit.

Threat to Public Safety: Rock fall risk will be considerably higher under post-fire conditions on steeper slopes. This is particularly true along the County Road which follows the Klamath River. This heightened risk has been identified based on several factors: fire severity, slope steepness and rock outcrops. These areas can be identified from preliminary mapping, GIS coverage, and air photo interpretation, respectively. The debris flow risk described above poses the most likely risk to public safety, since rocks, mud and woody debris could be delivered to the County road bed during storms. These could block traffic flow, or create road hazards. The value of public safety is difficult to estimate. For the purpose of Section E and F, the loss was assumed to be \$75,000, which includes \$25,000 for vehicle damage and \$50,000 in potential human injury.

Threat to Aquatic Values: Humbug Creek, a tributary of the Klamath River is habitat for Endangered Species Act-designated critical habitat for coho salmon. It is used for migration, adult holding, spawning, and juvenile rearing of Chinook salmon, steelhead, and other salmonid fishes, as well as habitat for resident native fishes. Only a portion of the fire-caused soil and water impacts would be delivered directly to the last 0.25 miles of

Humbug Creek. The Klamath River is just outside the fire perimeter, but it's as close as 200' in places. The river provides holding and rearing habitat for several anadromous fish species, including coho salmon. It also provides habitat to several resident fish species, as well as amphibians, Western pond turtle, and numerous riparian obligate species.

Threats to fishery values are described below in three areas: (1) the Humbug Creek 6th field watershed, (2) tributaries to the Klamath River within the Cayuse-Klamath River 7th field watershed, and (3) the Klamath River.

(1) Humbug Creek 6th field watershed: Perennial streams in the Humbug Creek 6th field watershed provide about 7.4 miles of habitat for Endangered Species Act-designated coho salmon, about 11.6 miles for Forest Service Sensitive steelhead trout, about 0.5 mile of habitat for Chinook salmon, and about 22 miles for resident rainbow trout. In the Humbug Creek 6th field watershed, the China Fire burned only in the Clear Creek subwatershed. Clear Creek flows into Humbug Creek about 0.25 miles above the confluence of Humbug Creek with the Klamath River. Therefore, within the Humbug Creek watershed, the China Fire has the potential to affect fish habitat only in the lowest 0.25 mile of mainstem Humbug Creek and the lower 2.1 miles of Clear Creek. There is approximately 1.3 miles of coho salmon habitat and steelhead trout habitat, and 2.1 miles of resident rainbow trout in Clear Creek downslope of the China Fire. Therefore, within the Humbug Creek watershed, the China Fire has the potential to affect approximately 1.55 miles of coho salmon and steelhead habitat, 0.25 miles of Chinook salmon habitat, and 2.35 miles of resident rainbow trout habitat. Increased sediment delivery caused by the China Fire has the potential to adversely affect salmon and trout habitat in Clear Creek and the lower 0.25 mile of Humbug Creek by causing pools to fill in with sediment, and by decreasing the quality and stability of spawning gravels. Partial loss of riparian shading along Clear Creek coupled with channel shallowing caused by channel infilling is likely to adversely affect salmon and trout habitat by increasing stream heating and peak water temperatures, particularly in lower Humbug Creek where water temperatures were already marginally suitable for salmon and trout before the China Fire occurred. The China Fire will not adversely affect fisheries in the Humbug watershed above the Clear Creek confluence because water quality and fish habitat above the confluence will not be affected and because the ability of fish to migrate through the lower 0.25 miles of Humbug Creek will not be significantly changed (Humbug Creek is usually hydrologically-disconnected from the Klamath River in summer and early fall because of sediment deposition at the mouth – the additional sediment deposition expected to result from the China Fire is not likely to change timing or duration of annual hydrologic disconnection). Therefore, windows of opportunity for fish to migrate into and out of Humbug Creek are not likely to be changed by elevated sedimentation from the China Fire.

(2) tributaries to the Klamath River within the Cayuse-Klamath River 7th field watershed: The China Fire has no potential to affect fish habitat in tributaries to the Klamath River within the Cayuse-Klamath River 7th field watershed because none of the tributaries are fish-bearing.

(3) Klamath River: The Klamath River provides spawning, rearing, holding, and migrational habitat for salmon, steelhead trout, and other fish species. Elevated sediment delivery rate to the Klamath River caused by the China Fire will further degrade water quality and fish habitat in the Klamath River by increasing turbidity (turbidity was already considered "at-risk" in the Klamath River before the China Fire). Increased water temperatures caused by the China Fire will further degrade water quality and fish habitat in the Klamath River (water temperature was already considered "Not Properly Functioning" before the China Fire).

Estimation of losses: Assuming that fisheries resources are adversely affected by the China Fire in the Humbug Creek watershed but nowhere else, and that 1.55 miles of coho salmon and steelhead habitat, 0.25 miles of Chinook salmon habitat, and 2.35 miles of resident rainbow trout habitat are un-productive for five years, the economic value of the fishery resource that would be lost would be primarily from sportfishing for steelhead and resident rainbow trout. There would be little economic value lost from salmon production in this area because few, if any, Chinook salmon spawn in Humbug Creek and because coho salmon are an endangered species that are prohibited from being caught. The sportfishing value of steelhead that could be lost is estimated to be \$10,000 (assuming 10 steelhead adults per year X five years X \$200 per steelhead), and the sportfishing value of rainbow trout that could be lost is estimated to be \$5,000 (assuming 20 angler days per year X five years X \$50 per angling day). Total fishery resource economic loss that could result from the China Fire is estimated at \$15,000.

B. Emergency Treatment Objectives:

Channel Treatments: Clearing of woody debris in unnamed stream that drains to the Klamath River (face drainage) would increase hydraulic efficiency and reduce the risk of a County road culvert plugging during a debris flow or peak stream flow. This treatment would achieve two objectives: 1) greatly reduce the risk to public safety during use of the road, and 2) slightly decrease water quality risks due to uncontrolled drainage into the river. There are steep, erodible slopes between the road and the river. Any water quality impacts would create risks to the anadromous fishery in the river.

Road Treatments: There are two roads that would have different treatment objectives. (1) a Forest System road would have riprap placed to control drainage and dissipate energy to protect water quality of Humbug Creek and the Klamath River (the anadromous fish streams). (2) a jeep road would have an unstable fill removed and waterbars installed to protect water quality and fish habitat in the Klamath River.

Treatment for Protection of Public Safety: County Road crews would do additional storm patrol and maintenance to clear sediment and debris that could be delivered the first winter. This clearing would reduce the fire-caused hazards during storms.

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

Land % Channel 100 % Roads/Trails 100 % Protection/Safety 75 %

D. Probability of Treatment Success

| | Years after Treatment | | |
|-------------------|-----------------------|-----|-----|
| | 1 | 3 | 5 |
| Land | | | |
| | | | |
| Channel | 85 | 80 | 75 |
| | | | |
| Roads/Trails | 100 | 100 | 100 |
| | | | |
| Protection/Safety | 100 | 80 | 75 |
| | | | |

E. Cost of No-Action (Including Loss): **\$90,000**

F. Cost of Selected Alternative (Including Loss): **\$56,045**

Note: When BAER costs alone are considered, the cost is \$38165. This includes \$18750 in loss.

G. Skills Represented on Burned-Area Survey Team:

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

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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: No land treatments are planned.

Channel Treatments: An unnamed stream that drains to the Klamath River (face drainage) would have clearing of burned woody debris to reduce the risk of a 24" culvert plugging under the County road during a debris flow or peak stream flow. Such plugging would greatly increase the risk to public safety during use of the road, and increase water quality risks due to uncontrolled drainage over steep slopes directly into the river. The woody material would be chipped and the chips left in the burned area to provide erosion control as needed.

Roads and Trail Treatments: There are two roads that would have different treatment prescriptions. (1) A Forest System road would have riprap placed at drainage outlets, and to armor the fill of a newly installed culvert. The culvert installation, grading and drainage improvement will be covered by suppression funds and private landowner user fees. This is a coop road that has an existing cost share agreement with Michigan Cal Land Co. that allows for appropriate sharing of work and accounting procedures to ensure the agreement is implemented. BAER, Fire Suppression, and Michigan Cal Land Co. would share the costs equally (2) A jeep road (not a system road) would have an unstable fill removed and a channel crossing that was burned at very high severity. An erosion control blanket will be placed on the excavated surface. Twelve waterbars will be constructed along the mile length of road into the fill.

Protection/Safety Treatments: County Road crews would do additional storm patrol and maintenance to clear sediment and debris that could be delivered the first winter. The cost estimate assumed six storm events for a duration of one day each. A cost share agreement would be developed to allow the County to contribute equipment use and fuel for a loader, a dump truck, and a pickup truck. BAER funds would be used to reimburse the County of Siskiyou for the salaries of two equipment operators and a swamper. The time used in the estimate above is assumed to be at the regular time rate (not overtime).

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.) Monitoring to detect noxious weeds will be accomplished using regular Forest Service funds. However, if multiple sites are discovered, submittal of an interim BAER request will be considered.

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

| Line Items | Units | Cost | Units | BAER \$ | \$ | units | \$ | Units | \$ | \$ |
|--|---------|---------|-------|-----------------|----------|-------|-----|-------|---------|----------|
| A. Land Treatments | | | | | | | | | | |
| | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| <i>Insert new items above this line!</i> | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| <i>Subtotal Land Treatments</i> | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| B. Channel Treatments | | | | | | | | | | |
| Chipper | Day | \$200 | 1 | \$200 | \$0 | | \$0 | | \$0 | \$200 |
| Personnel | Crewday | \$800 | 1 | \$800 | \$0 | | \$0 | | \$0 | \$800 |
| | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| <i>Insert new items above this line!</i> | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| <i>Subtotal Channel Treat.</i> | | | | \$1,000 | \$0 | | \$0 | | \$0 | \$1,000 |
| C. Road and Trails | | | | | | | | | | |
| Riprap Equipment, fuel | Hour | \$210 | 24 | \$5,040 | \$5,040 | | \$0 | 24 | \$5,040 | \$15,120 |
| Fill Removal Equipment | Hour | \$210 | 10 | \$2,100 | \$0 | | \$0 | | \$0 | \$2,100 |
| Supplies (erosion blank) | Sum* | \$1,450 | 1 | \$1,450 | \$0 | | \$0 | | \$0 | \$1,450 |
| <i>Insert new items above this line!</i> | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| <i>Subtotal Road & Trails</i> | | | | \$8,590 | \$5,040 | | \$0 | | \$5,040 | \$18,670 |
| D. Protection/Safety | | | | | | | | | | |
| Personnel | Crewday | \$840 | 6 | \$5,040 | \$0 | | \$0 | | \$0 | \$5,040 |
| Equipment, fuel | Day | \$1,300 | 6 | | \$7,800 | | \$0 | | \$0 | \$7,800 |
| | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| <i>Insert new items above this line!</i> | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| <i>Subtotal Structures</i> | | | | \$5,040 | \$7,800 | | \$0 | | \$0 | \$12,840 |
| E. BAER Evaluation | | | | | | | | | | |
| Personnel | | | | \$4,610 | \$0 | | \$0 | | \$0 | \$4,610 |
| Vehicles | | | | \$175 | \$0 | | \$0 | | \$0 | \$175 |
| <i>Insert new items above this line!</i> | | | | --- | \$0 | | \$0 | | \$0 | \$0 |
| <i>Subtotal Evaluation</i> | | | | \$4,785 | \$0 | | \$0 | | \$0 | \$4,785 |
| F. Monitoring | | | | \$0 | | | | | | |
| | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| <i>Insert new items above this line!</i> | | | | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| <i>Subtotal Monitoring</i> | | | | | \$0 | | \$0 | | \$0 | \$0 |
| G. Totals | | | | \$19,415 | \$12,840 | | \$0 | | \$5,040 | \$37,295 |
| Previously approved | | | | | | | | | | |
| Total for this request | | | | \$19,415 | | | | | | |

* See attached breakdown of supply costs.

PART VII - APPROVALS

1. /s/Margaret J. Boland July 27, 2007
Forest Supervisor (signature) Date
2. /s/ James M. Peña (for) July 31, 2007
Regional Forester (signature) Date