IRON - ALPS COMPLEX BURNED AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

Granite Fire in Trinity Alps part of the Iron-Alps Complex

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: Iron-Alps Complex

B. Fire Number: CA-SHF-001057

C. State: CA

D. County: Trinity

E. Region: 5

F. Forest: Shasta-Trinity

G. District: Trinity River Management Unit

H. Fire Incident Job Code: P5D8HV

I. Date Fire Started: 6/20/2008

J. Date Fire Contained: 9/05/08

K. Suppression Cost: 72 million

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline (miles): 352
2. Fireline waterbarred and seeded (miles):
3. Other (identify):

M. Watershed Number: 26539846 - Trinity River

N. Total Acres Burned: 105,367
NFS Acres(101,000) Other Federal (1,386) State (10) Private (3,180)

Acres Sum	Ownership			
Fire	**USFS**	**BLM**	**Private**	**Total**
Buckhorn	28350		167	28518
Carey	3693		1	3694
Cedar	24465		907	25373
Eagle	28591	1386	2076	32059
Granite	552		-	551
Ironside	12797		27	12824
Zeigler	2346		2	2348
Total	**101,000**	**1,386**	**3,180**	**105367**

O. Vegetation Types: Mixed Conifer and chappral

P. Dominant Soils: Neuns, Deadwood, Goulding, Hugo, Holland, and Marpa

Q. Geologic Types: Hayfork Formation, metavolcanics, Ironside diorites

R. Miles of Stream Channels by Order or Class: Perennial – 153; Intermittent – 347; Ephemeral – 153.

S. Transportation System

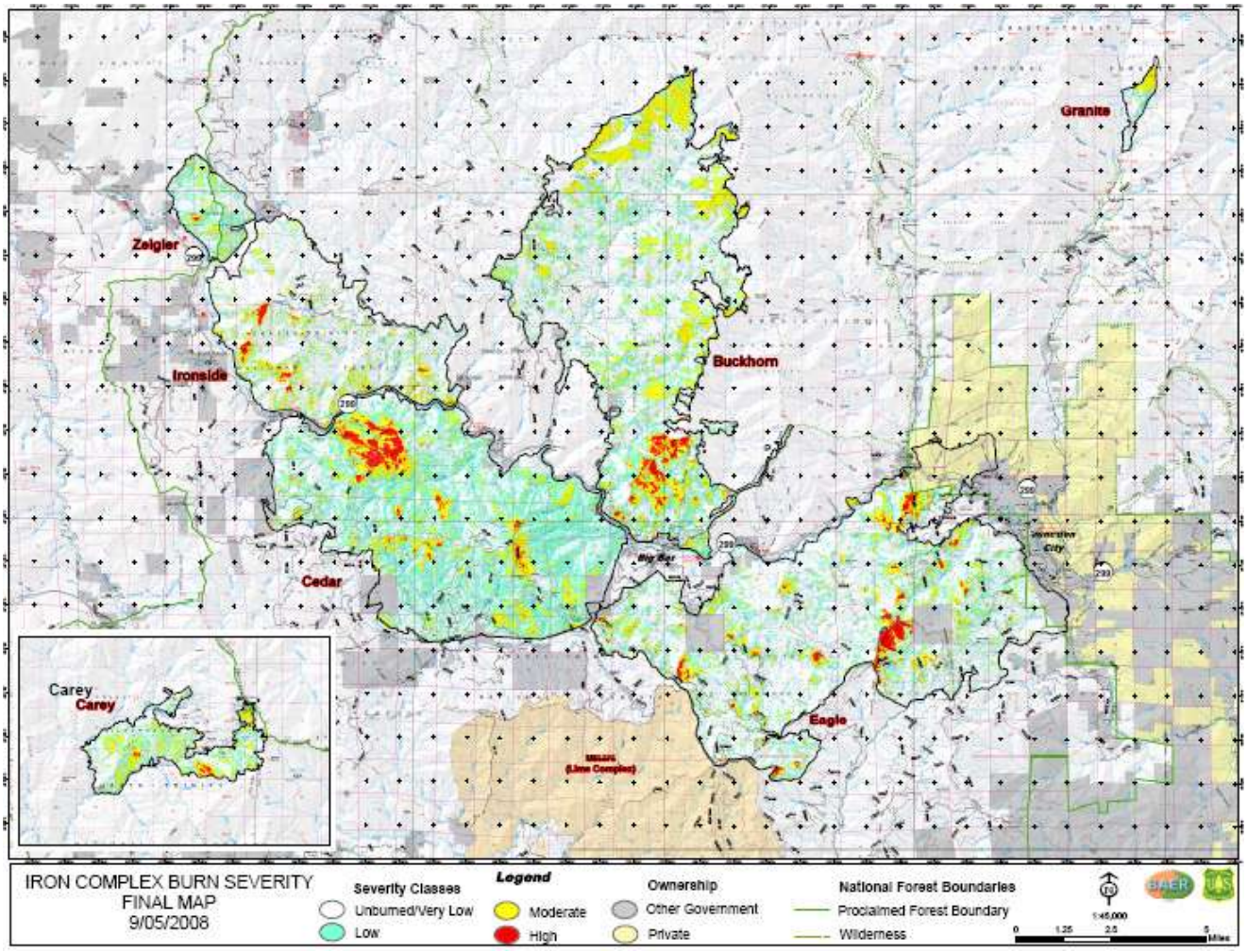
Trails: 30 miles Roads: 205 miles

PART III - WATERSHED CONDITION

A. Burn Severity by total and FS (acres): 88,503 (v. low & low) 15,805 (moderate) 2,107 (high)

		SOIL BURN SEVERITY				
FIRE	OWNER	UNB/VL	LOW	MOD	HIGH	Total
Eagle	USFS	18,435	6,239	3,207	709	28,590
	Other	1,601	1,072	742	54	3,469
Cedar	USFS	8,557	11,625	3,553	730	24,465
	Other	343	428	135	1.9	908
Buckhorn	USFS	16,197	6,641	5,069	441	28,349
	Other	107	49	11		167
Ironside	USFS	9,205	1,841	1,572	179	12,798
	Other	14	3.4	8.6	1.0	27
Zeigler	USFS	1,148	887	302	11	2,348
Granite	USFS	298	126	127		551
Carey	USFS	1,704	1,162	783	48	3,696
	Other	0	0.5	0.3		1.2
Total	USFS	55,545	28,521	14,612	2,119	100,797
Total	Other	2,066	1,553	897	57	4,572
Grand Total		**57,610**	**30,074**	**15,509**	**2,176**	**105,369**

IRON-ALPS SOIL BURN SEVERITY



B. Water-Repellent Soil by total and FS (acres): Water repellency is present in the high soil burn severity class, approx. 2,200 acres. Repellent layer is from 4 to 8 inches thick, moderate to severe, and continous.

C. Soil Erosion Hazard Rating by total and FS (acres):

378 (low) 58,999 (moderate) 43,838 (high) 2,153 (Very high)

		EROSION HAZARD RATING				
FIRE	OWNER	L	M	H	VH	TOTAL
Eagle	USFS	28	19,627	8,521	414	28,590
	Other	110	1,963	1,371	25	3,469
Cedar	USFS	6	12,065	11,613	781	24,465
	Other	22	333	550	2	908
Buckhorn	USFS	179	14,257	13,167	747	28,349
	Other		128	39	0	167
Ironside	USFS	29	9,146	3,442	181	12,798
	Other	3	11	12	1	27
Zeigler	USFS	1	1,298	1,046	2	2,348
Granite	USFS		36	515		551
Carey	USFS		134	3,561	1	3,696
	Other			1		1
Total	USFS	243	56,528	41,350	2,125	100,246
Total	Other	136	2,435	1,973	28	4,572
Grand Total		**378**	**58,999**	**43,838**	**2,153**	**105,369**

D. Erosion Potential: 15 to 55 tons/acre

E. Average Sediment Potential: 1755 cubic yards / square mile

An average winter has the potential to produce **1755** cubic yards per square mile of sediment, ranging from 720 to 2013 across the fires as a whole. Hillslope erosion was determined to have a 24% chance of sediment delivery potential.

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 15

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

C. Equivalent Design Recurrence Interval, (years): 10

D. Design Storm Duration, (hours): 6

E. Design Storm Magnitude, (inches): 2.8

F. Design Flow, (cubic feet / second/ square mile): 107 (Wannanen & Crippen)

G. Estimated Reduction in Infiltration, (percent): 2

H. Adjusted Design Flow, (cfs per square mile): 128

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Background: The Iron-Alps complex fires burned 105,330 acres due to 5,000 lighting strikes that ignited 150 fires on June 21th in Tehama, Trinity, and Shasta Counties. The fires started on ridgelines and slowly backed down the ridges over time causing a mosaic burn. The Iron-Alps Complex assessment area consisted of 100,792 acres of U.S. forestland and 3,189 acres of private lands. The Iron-Alps Complex BAER assessment area includes the Granite, Carey, Buckhorn, Ziegler, Ironside, Cedar, and Eagle fires that occurred in Trinity County.

Approximately 17% burned at high and moderate soil burn severity (see soil burn severity map below). The rest of the fires were either low or very low soil burn severity. General trends are forested areas that were north or east-facing slopes were nice mosaic under-burns. Forested areas that were south or west-facing slopes burned hotter and had tree mortality of 30-60% with ridges burning hotter (see pics below).

Ironside Fire under-burn

Eagle Fire ridgeline above Big Creek into Hayfork

Chaparral areas that were north or east-facing slopes had moderate soil burn severity were patchy. Chaparral areas that were south and west-facing, burned moderately high to high soil burn severity removing almost all vegetation (see pics below).

Cedar and Buckhorn Fire mixed timber/brush

Ironside Fire brush fields

The BAER Watershed group stratified the fire into analysis watersheds, analyzed the amount of soil burn severity, and the predicted erosion response to determine threats to identified values. The following sub-watersheds were identified as having the greatest risk to identified values: Rowdey-Stetson Creek, Trelor Creek, Middle Price Creek, Deer Creek, Pattison Creek, Prairie Creek, and upper Big Creek.

Critical values at risk:

Threats to Life, Property and Safety:

1) ***Facility structures and homes****:* The Iron-Alps Complex Fires burned on mostly USFS administered lands that had a few structures that are now at risk from erosion and flooding.

   a) Eagle Fire:
      i) Big Creek water supply facility used for the community of Hayfork.
      ii) Price Creek has several homes located next to the creek are at risk of flooding.
      iii) Conner Creek burned headwalls pose an erosion potential and are a possibly threat to domestic water sources due to flooding.

   b) Cedar Fire:
      i) Deer Creek and unnamed drainage above the community of Pattison Ranch burned fairly hot, could pose a threat to homes and domestic water intakes below.
      ii) Pattison Creek burned fairy hot and could pose a threat to domestic water intake below.
      iii) Dozer-lines above Pattison Creek, is right above domestic water intake needs waterbars and mulch to prevent sedimentation into water sources.

   c) Buckhorn Fire:
      i) Big Bar at Treloar Creek has a metal foot bridge that is off its pilings and could move with additional flows.
      ii) Possible flood potential of Big Bar Creek and Treloar Creek into the Trinity River.
      iii) The headwaters of Treloar Creek experienced high severity burns and domestic water supplies may be at risk to flooding.
      iv) Prairie, White Bar, and Treloar Creek headwaters burned hot but have good (unburned) buffer zone before domestic water sources and the main Trinity River. With burned headwalls in wilderness, Prairie Creek has a hydro. power generation facility that is at risk from flooding.

2) ***Roads and Trails****:* Many roads are now at risk due to increased flows from moderate to high soil burn severity with undersized culverts and numerous stream crossings.

   a) Eagle Fire:
      i) 33N41C road has one undersized pipe and others that are misaligned in the Red Hill area.
      ii) 33N41G has partially filled culverts that could plug due to burned slopes above in Red Hill area.
      iii) 33N51 is bermed and has burn-outs in fill in Red Hill.
      iv) 33N32 Big Creek Divide jeep trail needs outsloping.
      v) 4N16 paved road has burn-out holes and needs to be fixed along with 41N47 Packers Creek road.
      vi) 33N59 road in Price Creek could experience massive dry ravel and should be closed.
      vii) 33N05Y jeep trail diversion road has extreme berms and needs rehabilitation.
      viii) Dams and culverts used for fire suppression water sources needs to be removed in suppression rehabilitation (4N16 road) of headwaters of Price Creek.

   b) Cedar Fire:
      i) 5N25 road is at risk due to dry ravel, debris flows, and mass erosion. Maybe close it or outslope with rolling dips.
      ii) 4N11 road has undersized culverts that could plug.
      iii) Dams and culverts used for fire suppression water sources needs to be removed in suppression rehabilitation (5N25 road) of headwaters of Price Creek.

c) Carey Fire (trails):
   i) Trail crossings on 12W03 could fail due to moderate to high soil burn severity slopes above.
   ii) Hazard trees that could fall on hikers along the 12W03 trail.

d) Buckhorn Fire (trails):
   i) Trail crossings on 12W09 could fail due to moderate to high soil burn severity slopes above.
   ii) Hazard trees that could fall on hikers along the 12W09 trail.

3) ***Threats to Water Quality and Fisheries****:* With Moderate to high soil burn severity water quality could be compromised due to steep burned soils on many soils that are sandy loam.

a) Eagle Fire:
   i) Big Creek (tributary to Hayfork Creek) headwaters burned hot with high soil burn severity, water repellency to 8 inches in a gravelly loam that is m-deep to shallow. This area has gravelly loams that could erode significantly. Big Creek is critical Coho habitat and the main water source for the community of Hayfork.
   ii) Red Hill area is burned significantly near the ridgetops of Conner Creek and unnamed tributary to the east.

b) Cedar Fire:
   i) Rowdy Bar and Stetson Creek areas burned hot with loams, sandy loams, and silty clay loams with water repellency from the surface down to 4 inches on very steep slopes that are mixed conifer/tanoak. These areas will erode significantly. There is potential for debris flow activity in both drainages.

c) Buckhorn Fire:
   i) Praire creek is critical Coho habitat and rest are domestic water only. Due to its close proximity to the Trinity River, Treloar Creek posses high erosion and sedimentation potential to the Trinity River.

4) ***Threats to Soil Productivity/Ecosystem Stability****:* Areas that have moderate to high soil burn severity are at risk from accelerated erosion and loss of soil stability and soil fertility.

a) Eagle Fire:
   i) Big Creek headwaters burned very hot with deep char and water repellency down to 8 inches in gravelly loam soils with white ash and very steep slopes.

   ii) Price Creek has debris slide potential with high soil burn severity above of gravelly loam, very steep slopes, and dry ravel potential.

b) Cedar Fire:
   i) Rowdy Bar and Stetson Creek are highly burned watersheds that are prone to extreme erosion due to water repellency to 4 inches in sandy loam to loam textures of shallow soils on south and west facing brush to moderately deep soils on north and east facing slopes timber/tanoak.

c) Buckhorn Fire:
   i) Hottest burns occurred in headwall brush fields located in Treloar and upper Big French Creek.

5) ***Threats to Cultural Resources***: With loss of cover and possible erosion due to the fires, cultural resources are now exposed and are vulnerable to vandalism.

a) Eagle Fire:
   i) Squaw Creek saddle road runs through prehistoric site that is now burned and exposed. Needs cover to protect the site and water to be diverted to protect from erosion.

b) Cedar Fire:
   i) Three sites in drainage below the hot burn areas above, both are historic sites along the Trinity River and one could be affected by erosion from Stetson Creek.

   ii) Two sites in drainage with moderate burn above Corral Bottom in Bidden Creek area are open and exposed.

6) ***Threats to Wildlife Resources***: Burned areas are a loss of habitat and soil productivity and could threaten wildlife viability. Late sucessional reserves (LSR) are located along the main Trinity River and are key for maintaining old growth wildlife species. Soil productivity is key for maintaining LSR's and with high soil burn severity many areas are now at risk to losing site productivity.

a) Cedar Fire:
   i) Rowdy Bar and Stetson Creek are highly burned watersheds that are prone to extreme erosion due to water repellency to 4 inches in sandy loam to loam textures of shallow soils on south and west facing brush to moderately deep soils on north and east facing slopes timber/tanoak.
   ii) Loss of soil productivity due to erosion making it more difficult to restore habitat in the Late Success ional Reserve.

7) ***Botany (T&E, noxious weeds)*****:** Noxious weed issue due to multi-dozer lines throughout fires.

a) Eagle Fire:
   i) Dozer lines that intersect main travel roads are at risk of spreading noxious weeds.

b) Cedar Fire:
   i) Dozer line along power line in southern part above Corral Bottom was already weed infested and could spread. These areas need seed and mulch treatment.
   ii) Dozer lines that intersect main travel roads are at risk of spreading noxious weeds.

c) Buckhorn Fire:
   i) Dozer lines that intersect main travel roads are at risk of spreading noxious weeds.

8) **The rest of the fires have no values at risk (Ziegler, Ironside, and Granite).**

B. Emergency Treatment Objectives:

The purpose of emergency treatments is to mitigate erosion, sedimentation, and flooding that threatens life and property.

- Stabilize hillslopes that are likely to experience unacceptable accelerated erosion
- Stabilize roads to prevent loss of road prism due to increased watershed response
- Reduce the risk of degradation to ecosystem function and for T&E species

Risk determination is depenent on the design storm selected and downstream values at risk. By using an above average storm (10-year event) emergency planning measures can be designed to mitigate and minumize anticipated risks (see hydrologist report). Using a 10-year design storm the values at risk can be evaluated to determine if an emergency exists. Emergency determination matirx displayed below shows if an emergency exists, why, probability of failure if untreated or treated and treatment proposed to mitigate the emergency.

Iron-Alps Complex Fires Values at Risk Emergency Determination Matrix

Value at Risk	Emergency U%(yes/no)T%	Reason	Treatment
Eagle Fire:			
Big Creek Water Facility	60%/**Y**/30%	Burned headwaters	Helimulching to restore cover
Price Creek homes	50%/N/30%	Burned headwaters	Area is too steep to treat
Conner Creek dom. water	40%/N/20%	Burned headwaters	Not enough acres high severity
33N41culvert	90%/**Y**/20%	Undersized culvert	Upsize culvert and armor
33N41C&G culverts	90%/**Y**/10%	Undersized culvert	Upsize culvert and armor
33N51 burn outs	80%/**Y**/40%	Roadfill burn-out holes	Fill holes with rock and soil
33N32 jeep trail	N	Berms	Fire suppression repair
4N16 burn-outs	75%/**Y**/35%	Roadfill burn-out holes	Fill holes with rock and soil
33N59 Price Ck dry ravel	60%/N/35%	Burned headwaters	Area is too steep to treat - close
Dammed culverts t/o	N	Checkdams	Suppression repair remove
Big Ck headwall erosion	95%/**Y**/20%	Burned headwaters	Helimulching to restore cover
Red Hill erosion	50%/N/30%	Burned headwaters	Not enough acres high severity
Price Ck headwall erosion	60%/N/45%	Burned headwaters	Area is too steep to treat
Squaw Ck. Prehist. site	90%/**Y**/15%	Burned and exposed	Handmulch to restore cover
33N05Y rehab.	N	Berms	Fire suppression repair
Fireline – road cx treat.	90%/**Y**/35%	Weed invasion potent.	Seed & mulch last 50 ft fireline
Noxious weed det. survey	85%/**Y**/20%	Weed invasion detect.	Survey, detect, handpull weeds
Cedar Fire:			
Deer Ck above Pattison R.	70%/**M**/35%	Burned headwaters	Not enough acres high severity
Pattison Ck – domest. H20	75%/**Y**/30%	Burned headwaters	Not enough acres high severity
Pattison Ck – dozer line	N	Exposed loose soil	Fire suppression repair
5N25 dry ravel, debris flow	95%/**Y**/25%	Burned headwaters	Area is too steep to treat - close
4N11 undersized culverts	55%/**M**/35%	Undersized culvert	Upsize culvert and armor
Dammed culverts t/o	N	Checkdams	Suppression repair remove
RowdyBar/Stetson erosion	95%/**Y**/45%	High soil burn severity	Helimulching to restore cover
3 cultural sites Stetson Ck	55%/**M**/35%	Exposed sites	Inventory and monitor
2 cultural sites Bidden Ck	95%/**Y**/20%	Exposed sites	Handmulch to restore cover
C Bottom dozer line-weeds	90%/**Y**/30%	Weed infest. spreading	Seed and mulch
Fireline – road cx treat.	90%/**Y**/35%	Weed invasion potent.	Seed & mulch last 50 ft fireline
Noxious weed det. survey	85%/**Y**/20%	Weed invasion detect.	Survey, detect, handpull weeds
Buckhorn Fire:			
B. Bar-Treloar foot bridge	50%/N/30%	Rusted pilings	Pvt recommendation only
Treloar flooding	60%/**M**/40%	Burned headwaters	Flood warning area
Prairie Ck flooding	50%/**M**/40%	Burned headwaters	Flood warning area
Prairie Ck erosion - Coho	60%/Y/30%	High soil burn severity	Area is too steep to treat
Treloar Ck. erosion - Coho	75%/Y/30%	High soil burn severity	Area is too steep to treat
Denny Ck. erosion - Coho	75%/Y/30%	High soil burn severity	Area is too steep to treat
Fireline – road cx treat.	90%/**Y**/35%	Weed invasion potent.	Seed & mulch last 50 ft fireline
Noxious weed det. survey	85%/**Y**/20%	Weed invasion detect.	Survey, detect, handpull weeds
Trail crossings on 12W09	75%/**M**/40%	High soil burn severity	Armor trail crossings
Hazard trees on 12W09	80%/**M**/30%	Burned timber	Hazard tree removal
Carey Fire:			
Trail crossings on 12W03	75%/**M**/40%	High soil burn severity	Armor trail crossings
Hazard trees on 12W03	80%/**M**/30%	Burned timber	Hazard tree removal

Emergencies on blue will be treated or warnings in place.

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

Land **90** % Channel __ % Roads/Trails **95** % Protection/Safety **95** %

D. Probability of Treatment Success

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

E. Cost of No-Action (Including Loss):$ 3,500,000

F. Cost of Selected Alternative (Including Loss):$1,000,000

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader:Brad Rust

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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.)

1) Land Treatments: Most moderate to severely burned slopes occurred on upper slopes and ridges and burnout areas. Treatments are intended to reduce off-site sediment-laden runoff, and for on-site soil productivity for LSR retainment. Treatments will also address noxious weed introduction and infestations.

a) Eagle Fire:

i) Approximately 200 acres of severely burned hillslopes (Big Creek headwaters) need cover to reduce erosion and sediments from entering critical Coho and Spring Chinook spawning habitat in Big Creek that enters Hayfork Creek and the main water intake system for the community of Hayfork. Areas selected have direct approximity and conectivity to main salmon spawning areas. Treatments will consist of heli-mulching weed-free rice straw on slopes less than 60 percent. Areas with shallow water repellant coarse textured soils near spawning grounds will be give highest priority. Soils that are not shallow, have high rock fragment content, are not coarse textured will not have as high of priority for treatment. The rest of the burned areas natural recovery will be the preferred treatment due to adequate needle cover and seed source (see Soils specialist report for details).

ii) Throughout the Eagle Fire are numerous firelines that have been cut through noxious weed infestation areas that have the potential to spread into open exposed firelines, safety zones, and staging areas. Treatment proposed is to seed native grass and mulch the last 50 feet of firelines before they enter main roads. Noxious weed detection surveys will be conducted and if any noxious weeds are found they will be pulled and bagged. If larger outbreaks are detected then subsequent funding will be sought to treat the infestation.

b) Cedar Fire:

i) Approximately 400 acres of severely burned hillslopes (Rowdey Bar and Stetson Creek headwaters) need cover to reduce erosion and sediments from entering critical Coho and Spring Chinook spawning habitat on the main stem of the Trinity River. Areas selected have direct approximity and conectivity to main salmon spawning areas. Treatments will consist of heli-mulching weed-free rice straw on slopes less than 60 percent. Areas with shallow water repellant coarse textured soils near spawning grounds will be give highest priority. Soils that are not shallow, have high rock fragment content, are not coarse textured will not have as high of priority for treatment. The rest of the burned areas natural recovery will be the preferred treatment due to adequate needle cover and seed source (see Soils specialist report for details).

ii) Throughout the Cedar Fire are numerous firelines that have been cut through noxious weed infestation areas that have the potential to spread into open exposed firelines, safety zones, and staging areas. Treatment proposed is to seed native grass and mulch the last 50 feet of firelines before they enter main roads. Noxious weed detection surveys will be conducted and if any noxious weeds are found they will be pulled and bagged. If larger outbreaks are detected then subsequent funding will be sought to treat the infestation.

c) Buckhorn Fire:

i) Throughout the Buckhorn fire are numerous firelines that have been cut through and are potential areas for noxious weeds that have the potential to spread into open exposed firelines, safety zones, and stagging areas. Treatment proposed is to seed native grass and mulch the last 50 feet of firelines before they enter main roads. Noxious weed detection surveys will be conducted and if any noxious weeds are found they will be pulled and bagged.

2) Channel Treatments: No channel treaments are proposed.

3) Roads and Trail Treatments: Roads and trails are at risk at crossings due to expected increased flows. Several roads need bigger culverts to pass expected flows due to burned out hillslopes above. Several trail crossings are at risk from failure due to indequate crossings for expected flows. Roads 33N59 and 5N25 have severely burned slopes above and are not treatable and should be closed (see engineering specialist report for details).

a. Eagle Fire

i) 33N41

1) Construct rocked critical dip to accommodate overtopping and protect the road fills-3 ($2,700 each=$8,100)
2) Place 2" aggregate for ~ 100' at intersection of 33N41C to prevent loss of road surface. ($760)
3) Clean inboard ditch~0.5 miles ($600)
4) In sloped dip above intersection of 33N41C to drain road into ditch ($1,200)
5) Reestablish catch basin on outlet of shot gunned pipe dumping onto shoulder of 33N41C. ($252)
6) Riprap outlet catch basin of shot gunned pipe. ($756)
7) Rock dissipater for outlets of shot gunned culverts- 2 ($1,512)

8) Replace 24" cmp. Bottom completely rusted out, good possibility of under mining and failure of pipe due to increased flows. ($9,420)
9) Riprap headwall on replacement pipe ($756)

ii) 33N41C

1) Reestablish ditch from catch basin, for shot gunned pipe on 33N41, to the pipe for the 33N41c road. ~50' ($200)
2) Construct rocked critical dip-2 ($5,400)
3) Reconstruct rolling dip-2 ($2,400)
4) Construct rock disipator-2 ($1,600)

iii) 33N41G

1) Cleanout culvert inlets-2 ($380)
2) Reconstruct rolling dip-2 ($2,400)
3) Repair stump holes-2 ($600)

iv) 33N51

1) Repair stump holes-4 ($1,200)

v) 33N05Y

1) Repair Stump holes-4 ($1,200)

vi) 4N16

1) Riprap inlet channel and headwall of 2 culvert stream crossings-2 (~20 ton riprap each) ($1,600)
2) Repair stump holes ~6 ($1,800)
3) Install a curve sign with recommended 15 mph speed limit on each approach to denuded curve at Cadillac point (recommend MUTCD sign W1-2a or similar) ($1,000)

vii) 33N32

1) Out slope road ~3 miles ($5,800)

b) <u>Roads in the Eagle Ranch area</u> (33N45, 45A, 45C, 45D, 45E, 33N50…)

1) Did not assess because of active burn in the area. Needs assessment when it is safe to go in.

c) <u>Cedar Fire</u>

i) 5N25

1) Construct rocked critical dips-6 ($16,200)
2) Clean culvert inlets-6 ($1,140)
3) Clean/reestablish ditch and leadoff in through cut~0.25 miles ($300)

ii) 4N28

1) Storm patrol for first 3-4 major storm events**.** ($6,700)

iii) 4N11

1) This road did not get assessed
2) Possible storm patrol ($6,700)

d) <u>Carey Fire</u> (trails):

1) Trail crossings on 12W03 could fail due to moderate to high soil burn severity slopes above.
2) Hazard trees that could fall on trail workers along the 12W03 trail.

e) Buckhorn Fire (trails):

1) Trail crossings on 12W09 could fail due to moderate to high soil burn severity slopes above.
2) Hazard trees that could fall on trail workers along the 12W09 trail.

4) Protection/Safety Treatments: Many areas are at risk to public safety, OHV incrusion and erosion, and vadalism of protected cultural sites. Close roads 33N59 and 5N25 that have severely burned slopes above and pose severe hazard for driving.

a) Recommend a 1-year forest closure till damaging storms have passed for roads, trails, and public camping areas, to allow adequate time for treatment and safety of visitation. OHV incrusion, erosion and vadalism of cultural sites will need to be controlled with barriers and signing.

b) One prehistoric and two historical sites are open and exposed from fire damage and need restored cover (one site on Eagle Fire and others are on the Cedar fire). Three other historical sites on the Cedar Fire are open and exposed but are not treatable due to expected erosion and deposition on the site from steep draw above and will need additional assessment of cultural artifacts (see specialist report for details).

a) Eagle Fire:

(1) Spread weed-free mulch over a prehistoric site on Squaw Camp Saddle (0.5 acre with 1 day of work at $2,500/day).

b) Cedar Fire:

(1) Spread weed-free mulch over a portion (0.5 acre) of a historic site in Bidden Creek area near Corral Bottoms (1 day of work at $2,000/day).

(2) Further condition assessment and patrolling at three historic sites along Trinity River with a 2-person crew (District Archaeologist@ $300/day, GS-7 archaeologist @$140/day) = $440/day with 3 days necessary for a total of $1,730.

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 Appendix B below for road, hillslope monitoring, and cultural site monitoring.

Part VI – Emergency Stabilization Treatments and Source of Funds **Interim # 1**

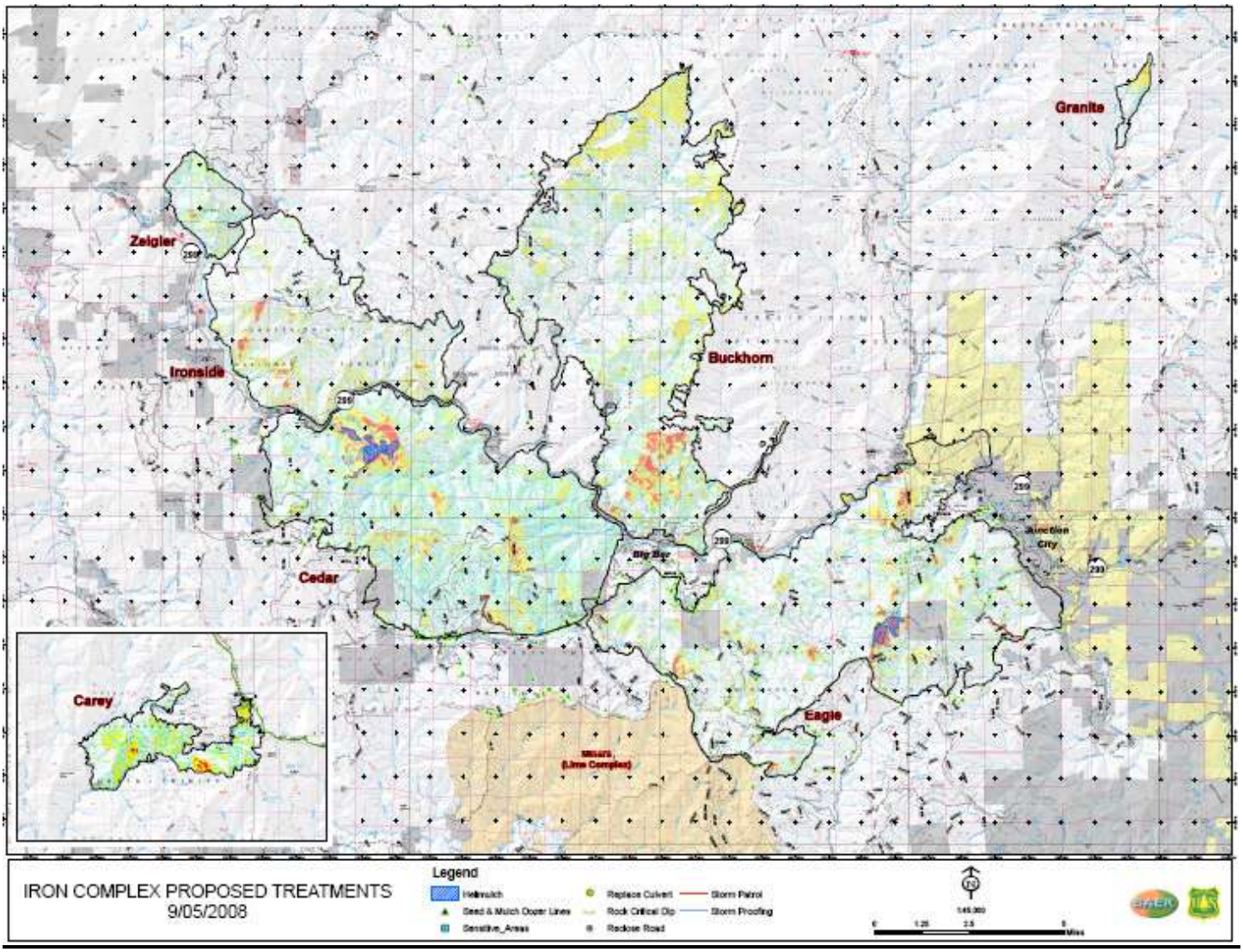
Click red icons for notes.	NFS Lands					Other Lands				All
Line Items	Units	Unit Cost	# of Units	BAER $	Other $	# of Uni	Fed $	# of Unit	Non Fed	Total $
A. Land Treatments										
Helimulching	ac	$1,000	600	$600,000						$600,000
Handmulching	ac	$725	20	$14,500						$14,500
Grass seeding	ac	$1,200	19	$22,800			$0		$0	$22,800
Nx weed detection	mi	$210	54	$11,340			$0		$0	$11,340
Hazard tree removal	mi	$700	2	$1,400			$0		$0	$1,400
Subtotal Land Treatments				$648,640	$0		$0		$0	$648,640
B. Channel Treatments										
none				$0			$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
Road stormproofing	project	$21,694	1	$21,694			$0		$0	$21,694
Storm Patrol	road	$6,720	2	$13,440						$13,440
Pipe replacement	ea	$157	60	$9,420			$0		$0	$9,420
Critical dips	ea	$2,700	11	$29,700			$0		$0	$29,700
Rolling dips	ea	$1,200	5	$6,000			$0		$0	$6,000
Safety road signs	ea	$500	2	$1,000			0		0	$1,000
Trail crossing armor	ea	$300	8	$2,400			0		0	$2,400
Subtotal Road & Trails				$81,254	$0		$0		$0	$81,254
D. Protection/Safety										
Barriers	ea	$700	5	$3,500			$0		$0	$3,500
Warning signs	ea	$150	10	$1,500			$0		$0	$3,500
Heritage site assess	ea	$2,320	1	$2,320			$0		$0	$2,320
Heritage site protect	ea	$2,250	2	$4,500			$0		$0	$4,500
Closure signs	ea	$175	25	$4,375			$0		$0	$4,375
Subtotal Protection				$16,195	$0		$0		$0	$18,195
E. BAER Evaluation										
Assessment team	---	---	---	---	$52,000	---		---		$52,000
Subtotal Evaluation				---	$52,000	---	$0	---	$0	$52,000
F. Monitoring										
Hillslope treat. Monito	ea	$2,000	1	$2,000			$0		$0	$2,000
Road Treat. Monitorin	ea	$2,000	1	$2,000						$2,000
Cultral site mulch mo	ea	$1,000	1	$1,000			$0		$0	$1,000
Subtotal Monitoring				$5,000	$0		$0		$0	$5,000
G. Totals				**$751,089**	**$52,000**		**$0**		**$0**	**$805,089**
Previously approved										
Total for this request				**$751,089**						

PART VII - APPROVALS

1. _/s/ J. Sharon Heywood_ _11 Sept 08_
   Forest Supervisor (signature) Date

2. _/S/ KATHERINE CLEMENT (FOR)_ 30 Sept 08
   Regional Forester (signature) Date

IRON-ALPS BAER Treatment Map



APPENDICES: Supporting Information:

Appendix A: Iron-Alps Complex BAER Team

Appendix B: Monitoring for Roads, OHV, and Hillslope Mulching

Appendix C: Vicinity and Ownership Map

Appendix D: Summary of Hydrology Findings

Appendix E: Summary of Geology Findings

Appendix F: Summary of Soils Findings

Appendix G: Summary of Fisheries Findings

Appendix H: Summary of Cultural Resource Findings

Appendix I: Summary of Engineering Findings

Appendix J: Summary of Botany Findings

Appendix K: Summary of Cost-Risk Analysis

Appendix L: Reccommendations For Futher Detailed Investigation

Appendix A: BAER Team and Agencies Consulted:

Iron-Alps Complex BAER Team:

NAME	UNIT	FUNCTION	CELL PHONE	OFFICE PHONE
Brad Rust	Shasta-Trinity N.F.	Team Leader	530-917-0434	530-226-2427
Annetta Mankins	Shasta-Trinity N.F.	Team Advisor	530-604-4272	530-628-1260
Steve Bachmann	Shasta-Trinity N.F.	Hydrologist	916-708-0272	530-226-2428
Angela Coleman	Tongass National Forest	Hydrologist	608-991-8737	907-228-4147
Dave Young	North Province N.F.	Area Soil Scientist	530-227-9050	530-226-2545
Eric Nicita	El Dorado N.F.	Soil Scientist	-	530-621-5390
Abel Jasso	Shasta-Trinity N.F.	Geologist	-	530-226-2423
John Lang	Tongass National Forest	Fisheries Biologist	-	907-225-2148
Julie Nelson	Shasta-Trinity N.F.	Botanist	-	530-623-1753
Lori Jackson	Shasta-Trinity N.F.	Engineering Technician	530-598-0421	530-638-1226
Justin Nettleton	Shasta-Trinity N.F.	Civil Engineer	530-945-6150	530-226-2332
Mike Dugass	Inyo National Forest	Archeologist	760-920-1464	760-647-3021
Jim Schmidt	Stan. N. F.	GIS	209-770-1900	209-532-3671
Lynn Goolsby	Stan. N. F.	GIS	-	209-532-3672

Agencies Consulted:

Tim Veil	Natural Resource Cons. Service	Conservationist	530-242-3441
Tiffany Reese	Natural Resource Cons. Service	District Conservationist	530-623-3991

Appendix B: Monitoring Protocol:

Iron-Alps Complex
Road Effectiveness Monitoring

The 2500-8 report requests funds to monitor the effectiveness of road treatments on Iron-Alps Complex roads.

1. Monitoring Questions
   - Is the road-tread stable?
   - Is the road leading to concentrating runoff leading to unacceptable off-site consequences?

2. Measurable Indicators
   - Rills and/or gullies forming of the road
   - Loss of road bed.

3. Data Collection Techniques
   - Photo documentation of site
   - Inspection Checklist (attached)

4. Analysis, evaluation, and reporting techniques

   - Monitoring will be conducted after storm events. If the monitoring shows the treatment to be ineffective at stabilizing road and there is extensive loss of road bed or infrastructure an interim report will be submitted. A several page report would be completed after the site visit. The report would include photographs and a recommendation on whether additional treatments are necessary.

Road Inspection Checklist

Date:_____ Inspector_____
Time:_____ Forest Road_____

Describe locations reviewed during inspection:_____

Was there road damage?

Was Culvert plugged?_____.

GPS)_____

Describe damage and cost to repair? (GPS)_____

Photo taken of road damage_____

Recommended actions to repair:_____

Iron-Alps Complex

Hillslope Treatment Effectiveness Monitoring

1. Monitoring Questions
    - Is there sufficient ground cover to retard accelerated erosion?
    - Is natural vegetation recovery?
    - 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 in early summer.
    - 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 in early summer after vegetation has green-up for the season. An evaluation will be made as to whether of the proposed hillslope treatments should be implemented. If the monitoring shows that vegetative recovery is ineffective at preventing unacceptable accelerated erosion the 2nd 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

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:_____

Iron-Alps Complex

Cultural Site Mulching Effectiveness Monitoring

The 2500-8 report requests funds to monitor the effectiveness of straw handmulch treatments on Iron-Alps Complex heritage sites.

1. Monitoring Questions
   - Is the straw mulch with good cover stable?
   - Is the straw mulch being undercut by concentrated runoff leading to unacceptable on-site erosion?

2. Measurable Indicators
   - Rills and/or gullies forming around the artifacts
   - Loss of artifacts

3. Data Collection Techniques
   - Photo documentation of site
   - Inspection Checklist (attached)

4. Analysis, evaluation, and reporting techniques

   - Monitoring will be conducted after storm events. If the monitoring shows the treatment to be ineffective at stabilizing and there is extensive rilling an interim report will be submitted. A several page report would be completed after the site visit. The report would include photographs and a recommendation on whether additional treatments are necessary.

Heritage Handmulch Inspection Checklist

Date:_____ Inspector_____
Time:_____ Forest Road Nearby_____

Describe locations reviewed during inspection:_____

Was there artifact damage?

Was artifacts covered or eroded?_____.

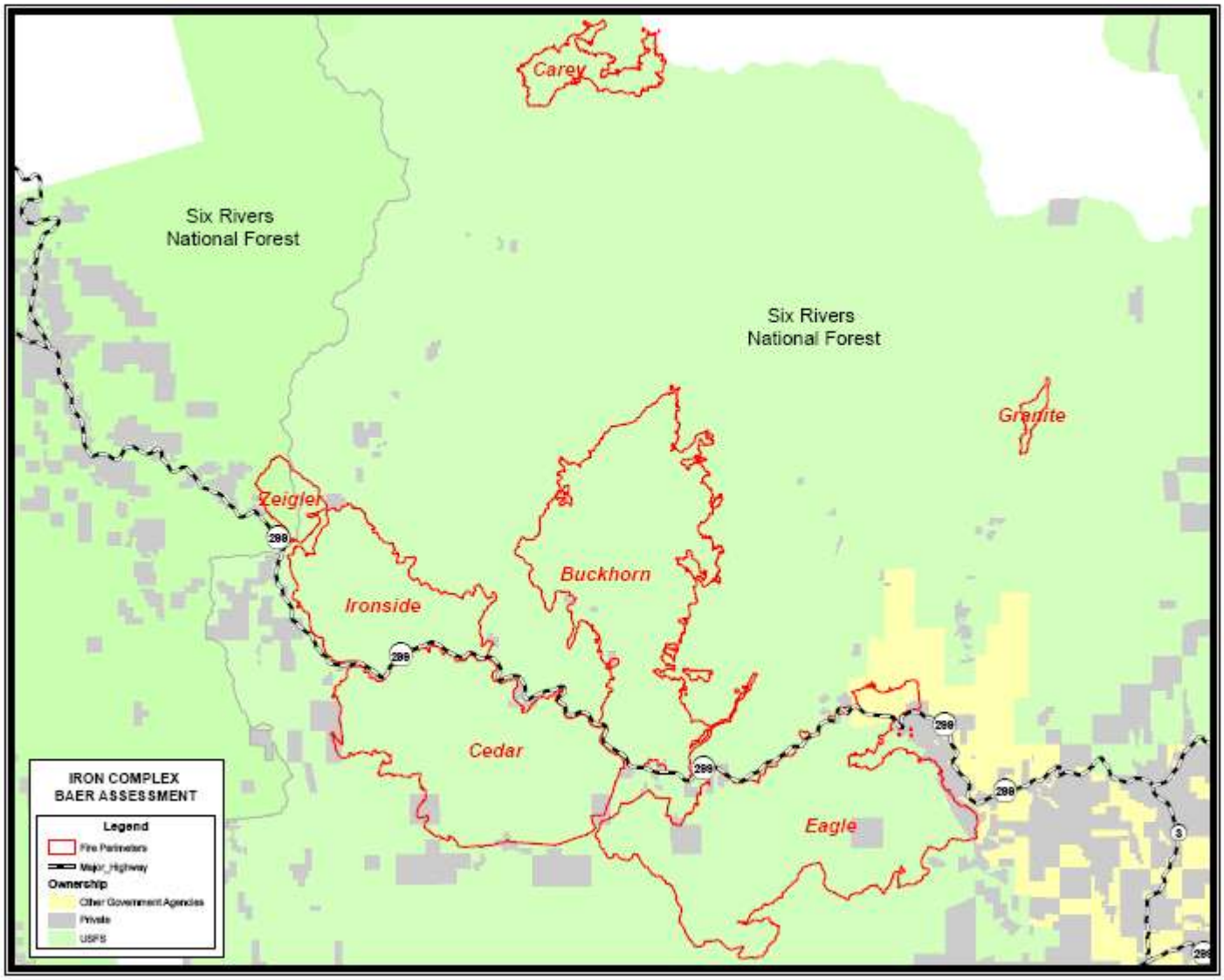
GPS)_____

Describe damage and cost to repair? (GPS)_____

Photo taken of artifact damage_____

Recommended actions to repair:_____

Appendix C: Vicinity and Ownership Map:



Appendix D: Summary of Hydrology Findings:

Hydrology Summary for Iron Fire Complex

The Iron-Alps Complex Fire was evaluated by Forest Service hydrologists to determine potential fire effects on watershed hydrologic processes and function. The assessment focused on fire-induced changes in hydrologic processes and functions that posed a significant threat to human life and property, and critical natural and cultural resources. Values as risk were identified and a determination was made as to whether or not an emergency condition existed for each value. Treatments recommendations were developed for resources where emergency conditions existed.

The Iron-Alps Complex burned a total of 105,371 acres within portions of 36 HUC 7 drainages. Hydrologic features found within the Iron-Alps Complex included the Trinity River and it tributary streams (153 miles of ephemeral streams, 347 miles of intermittent streams, 152 miles of perennial streams).

Values at risk included anadromous fish habitat in the Trinity River and its tributaries, potential sedimentation and water quality problems for domestic water supplies located downstream of burned areas, loss of soil productivity in Late-Successional Reserves, sedimentation and possible looting of archaeology sites and damage to the Forest transporation system.

Treatments that were prescribed included hillslope mulching of headwater areas of Big, Stetson and Rowdy Bar Creeks, mulching of archaeology sites, and road maintenance and drainage improvements.

Appendix E: Summary of Geology Findings:

Iron Fire Complex
BAER Geologic Assessment
9/5/2008

Abel Jasso
Geologist, Shasta-Trinity National Forest

Purpose

The geologic assessment focused on identification of immediate risks posed by landslides and rock debris flows. This was based on landslide activity being a common feature of the landscape evolution within the burned areas. **Determining if and how the fire modified the existing geologic hazards and whether the post-fire effects will threaten life, safety, property, or cause unacceptable degradation to natural or cultural resources during the first subsequent winter was the guide in the investigation**. The observations made during on-the-ground surveys were analyzed with information provided by previous geologic and geomorphic mapping, the BARC burn severity maps, GIS and aerial photography.

Areas of Investigation

The fires of the Ironside Complex include the fires (from east to west) Eagle, Buckhorn, Cedar, Ironside, Ziegler, and (to the far north) the Granite and Carey. These comprise an area of distinctly diverse geologic terrain which *acts to produce individual geomorphic processes and stability hazards*. Due to the nature of the rocks within this area, mass wasting has played a dominant role in shaping the geomorphology. A short review of the geologic composition and morphology is thusly warranted.

Geologic Hazards

Fortunately most of this fire complex did not burn with high severity (map on CD)[1]. All such areas were reviewed either on the ground or by aerial survey or both. Various factors were used in the evaluation. The following are some but not all of the factors evaluated.

- Amount and distribution of high-and moderate-burn severity within a watershed
- Presence, extent and type of pre-existing mass wasting feature and potential downstream effects
- Presence and extent of water-repellent soils
- Presence and extent of effective soil cover
- Channel stability and riparian vegetation conditions
- Potential for increased erosion or sedimentation
- Capacity and condition of structures at stream crossings
- Downstream values outside the fire perimeter that may be at risk
- Potential impacts on road and trail prisms from increased erosion and runoff

[1] A high burn severity refers to an area where trees, understory vegetation, most large ground fuels, and the forest floor have been consumed (Curran et al., 2006. *Large-scale erosion and flooding after wildfires: understanding the soil conditions*. BC Ministry of Forests, Technical Report 30.

Areas that burned with high severity and which were early on judged to pose potential geologic risk included Stetson, and Rowdy Bar Creek areas of the Cedar fire. Values at risk at this location are fisheries and road 5N25; also the headwaters of Big Creek and Price Creek in the Eagle fire; the headwaters of Treloar Creek and tributaries to the Slide and Eagle Creeks in the Carey fire area.

Other areas were also evaluated for potential geologic hazards. These include residential areas in the Conner Creek area of Junction City and the Big Bar area.

Appendix F: Summary of Soils Findings:

SHF Iron-Alps Complex – Burned Area Emergency Response

Soil Resource Assessment

David Young, Soil Scientist, Iron-Alps Complex BAER Team
USDA Forest Service, Region 5, Redding CA
530-226-2545; daveyoung@fs.fed.us

September 12, 2008

Eagle Fire, Big Bar Vicinity

Executive Summary – Soil Resource Condition Assessment:

The SHF Iron-Alps Complex burned just over 105,000 acres, mostly upon slopes above the Trinity River corridor stretching from Junction City past Burnt Ranch in Trinity County. The Complex included 4 large (>5000 ac), 2 medium (1000-5000 ac), and 1 small (300-1000 ac) fires. Overall soil burn severity was found to be 54% unburned & very low, 29% low, 15% moderate, and 2% high. The high severity class has evidence of severe soil heating, evidenced by deep char, considerable destruction of structure and organic matter, and severe water repellency; these areas have long-term soil damage and high to very high erosion hazards. The moderate areas have extensive to complete vegetative mortality, but with less soil heating and having potential soil cover in most places; these areas are still sources of increased flows and sediment production in the near term (2-4 years). The remaining 83% of soils still have good surface structure, contain intact fine roots and organic matter, and are not significantly impacted from the fires. Vegetation is a mix of chaparral and forested, with some alpine ecotypes in the Wilderness. Topography and vegetation type dominated the observed burn intensity patterns. Most severely burned slopes occurred on upper slopes and ridges. Suppression related resource damage was not an issue here as observed on other Complexes on the Forest. Land treatments are proposed in specific areas, to maintain soil productivity and promote recovery of Late Successional Reserve areas, as well as to reduce off-site sedimentation into critical fisheries habitats.

Appendix G: Summary of Fisheries Findings:

BURNED AREA EMERGENCY RESPONSE
IRON-ALPS COMPLEX FIRES
FISHERIES ASSESSMENT

Prepared by: John Lang[2]
05 September 2008

SUMMARY

The values at risk considered were coho salmon critical habitat and effects of increased sediment (water quality) on depressed fish stocks in the Trinity River Basin. The Zeigler, Ironside and Granite fires produced no specific fisheries issues requiring emergency BAER efforts. There are a few isolated areas of high severity burn in the Cedar, Buckhorn and Eagle fires, which will result in erosion and sedimentation to fish bearing streams, including the Trinity River. BAER treatment opportunities across the landscape are limited due to slope steepness (>60 percent) and inner gorge areas. Treatable acres for fisheries were limited to the Big Creek drainage (tributary to Hayfork Creek) due to its importance as a domestic water source and coho critical habitat. In all other affected burn areas, too few treatable acres were identified to make a significant or cost effective difference in post-fire projected sediment yields. Emergency BAER treatments were identified for roads in the Cedar and Eagle fires. No in channel treatments were prescribed for affected Iron-Alps Complex streams due to the steepness of side slopes (>60 percent) and instability of inner gorge areas.

2 Fishery Biologist. 2005 to present Tongass National Forest, Ketchikan-Misty Fiords RD.

Appendix H: Summary of Cultural Resource Findings:

Heritage Summary for 2500-8: BAER Assessment
Iron-Alps Complex, Shasta-Trinity National Forest

Prepared by
Michael Dugas
North Zone Archaeologist
Inyo National Forest
September 03, 2008

Objectives

* Identify recorded heritage resource sites located within the area of potential effect (APE) of the Iron-Alps Complex.

* Analyze direct/indirect effects and potential future effects to heritage resources.

* Propose specific BAER treatments and estimate monetary costs to prohibit future damage to Class I Heritage Resource properties (historic and prehistoric resources determined as eligible to the National Register of Historic Places (NRHP), per criteria in 36 Code of Federal Regulations (CFR) 60.4). Per Forest Service Manual (FSM) 2361 direction, Class II sites (defined as heritage resources with either unknown or not yet evaluated for NRHP significance) are afforded the same consideration and protection as Class I sites.

Definition of Heritage Resources

Heritage resources include prehistoric resources, historic resources and Native American resources such as traditional gathering and ceremonial areas. Prehistoric sites are the remains from human activities that predate written records and include village sites, temporary camps, lithic (stone tool) scatters, milling features related to subsistence procurement, rock features and burials. Historic sites are typically physical properties or built items that remain from human activities that occurred after written records. In North America this time period is generally considered to be when Europeans made contact with the North American continent in AD 1492. In the west, the time of historic contact was in the early 19th century with the influx of French and Russian fur trappers, and other Europen colonists in search of gold. Historic archaeological sites and structures may include town sites, homesteads, agricultural or ranching features, mining-related features, refuse concentrations, cabins, houses, churches, etc. Many areas have been used throughout time in prehistory and historic times and therefore contain both prehistoric and historic remains. These are referred to as multi-component sites.

Area of Potential Effect

In accordance with standards established for heritage resource investigations related to BAER projects in Region 5, California National Forest lands, the APE for the Iron-Alps Complex Fire is identified as encompassing: (1) all areas within the perimeter of the burned area; (2) all areas of ground disturbance created by fire suppression; (3) locations with potential for fire-related soil erosion, flooding, debris flows, etc; (4) locations where looting and vandalism will be increased due to increased visibility of sites because of the fire and (5) locations of proposed ground-disturbing watershed rehabilitation-related treatments.

Thirty-one (31) previously recorded cultural resources were identified within the Iron-Alps Complex perimeter (see Table 1). All of these resources were assessed for whether their historic and research value would be at risk from post-fire processes such as erosion or vandalism and potential need for treatment in order to protect that value. Due to limited time frames for assessment, various fire intensity conditions

(based on BARC maps), and limited research potential for some of the sites, a limited number of these sites were visited.

Table 1. Values Potentially at Risk

Fire Name	Within Burn
Buckhorn	3
Carey	0
Cedar	10
Eagle	16
Granite	0
Ironside	2
Zeigler	0

Buckhorn: All three sites within the Buckhorn Fire are sparse prehistoric lithic scatters with relatively low research value. Two of the three burned at a low intensity and one did not burn at all. Due to the low research potential, minimal threat from fire and remote location, these sites were not field inspected.

Cedar: One prehistoric and nine historic sites lie within the Cedar Fire perimeter. The prehistoric site is a sparse lithic scatter bisected by a road on a ridge top. Due to accessibility issues and the low burn intensity, it was not visited. Seven of the nine historic sites were visited and assessed for BAER treatments. The other two include the Eagle Peak Lookout which was burned down in 1973, and a small historic refuse scatter located in a low burn intensity area on a tributary to Haysend Creek.

A series of historic sites relating to mining activities along the Trinity River were inspected. Four of the five sites inspected along the river could be adversely affected by increased water/sediment flow as a result of the fire which burned with moderate to high intensity. One site, a sparse scatter of historic materials in Rowdy Bar Creek canyon will continue to wash downstream. It has limited research potential and is already out of context and needs no BAER Treatments. The three remaining sites are at risk from down slope erosion from the steep (30º-45º) slopes directly southeast. The threat to these sites is from down slope sliding which might cover the sites with sediment, thus obscuring archaeological features. The other more immediate threat is from looting. Bottle collectors were encountered while monitoring sites for this fire.

Eagle: Twelve prehistoric and four historic sites are located within the fire perimeter. Nine did not burn, six burned at very low intensity and one burned moderate to hot. This was the only site monitored for BAER treatments.

Ironside: Two prehistoric sites lie within the fire perimeter. One has been determined not eligible for the National Register of Historic Places (NRHP) and requires no protection measures. The other, Ironside Mountain, is a sacred natural feature utilized by the Chimariko Indians for a few days each summer. It burned hot near the rock but here are no archaeological remains to be protected. The only potential problem might be if a BAER treatment was proposed to occur during a period when the mountain was being used.

Appendix I: Summary of Engineering Findings:

Burned Area Emergency Response
Engineering Report

Justin Nettleton - USDA Forest Service.
Civil Engineer, Shasta-Trinity National Forests

Objectives: Evaluate the effect of the Iron-Alps Complex fires on the Forest's infrastructure and the possible damage to the infrastructure, forest resources, and surrounding watershed due to increased runoff from burned slopes.

Issues: The issues of concern include current damage and the potential of damage caused by increased runoff. Engineering concerns include culvert blockage and failure, erosion of road surface and road bed, and road damage that poses a safety threat.

Observations:
A). Background information: The fire boundary encloses approximately 186 miles of forest roads with the majority of those roads being maintenance level 2 and 3 roads. There area approximately 11 miles of state and county roads within the fire boundary. Overall the roads are in decent shape but do not have adequate drainage structures to handle the increased runoff expected from the fire damage.

B). Reconnaissance Method: All reconnaissance was completed by vehicle and foot access. Areas of high/moderate burn severity and specific values were the priority for field survey.

C). Findings/Description of Emergency: All road areas surveyed generally have the same issues.

- Undersized/plugged and misaligned culvert pipes.
- Degradation of road surface drainage profile causing runoff to flow down the road.
- Erosion at pipe and dip outlets with no energy dissipaters.
- Berms and/or through cuts that channel water on road surface with inadequate drainage relief and erosion protection.
- Damaged or failed over side drains.
- Large fills with heavy woody debris and sediment above culvert pipes.
- Assumed average ~ 1 stump hole per 2 miles road in high/moderate burn areas. (Assumption for all roads based on roads observed)
- Open cat lines that could suffer erosion and pose a safety concern if not closed.
- Sharp corner, steep slope, and denuded slope/road shoulder pose a safety concern on corner of 4N16.

Appendix J: Summary of Botany Findings:

Burned Area Emergency Response Plan
Vegetation Resource Assessment
Sept. 9, 2008

Iron-Alps Complex
Buckhorn, Carey, Cedar, Eagle, Granite, Ironside, & Zeigler Fires

Julie Kierstead Nelson, Shasta-Trinity National Forest Botanist

I. OBJECTIVES

- Identify known locations and extent of/impacts to rare plant populations and special habitats in relation to individual fires
- Identify noxious weed populations and pre- and post-fire suitable habitat for weeds
- Provide management recommendations for reducing impacts from noxious weed introductions as a result of the fires
- Provide management recommendations, where warranted, for repair of impacts to rare plants or special habitats

II. GENERAL ISSUES

- Impacts of damage to special habitats and rare plants from wildfire and fire suppression activities on ecosystem stability
- Impacts of noxious weeds on ecosystem stability and soil productivity

III. VEGETATION ISSUES PARTICULAR TO EACH FIRE IN THE IRON-ALPS COMPLEX

Fire Name	Rare Plants or serpentine present	High Weed Risk factors	Land Allocation
Buckhorn	No	Dozer lines along RNA boundary & Wilderness boundary	Wilderness, Research Natural Area
Carey	No	--	Wilderness
Cedar	No	Corral Bottom powerline used as dozer line	Late Successional Reserve
Eagle	*Buxbaumia viridis Sedum paradisum;* serpentine along east edge	--	Late Successional Reserve, Matrix
Granite	No	--	Wilderness
Ironside	No	Hwy. 299	Matrix
Zeigler	No	Hwy. 299	Matrix

A. Background Information

Rare Plants

No federally listed Threatened or Endangered plant species or their habitats are known to occur in any of the fires of the Iron-Alps Complex. Two Forest Service Sensitive plant species are documented within the Eagle fire. There are no sensitive plants known from the other fires in the Iron-Alps Complex.

Fire Name	Regional Forester's Sensitive Plant Populations Known to Occur
Eagle	Bug-on-a-stick moss (*Buxbaumia viridis*) Canyon Creek stonecrop (*Sedum paradisum*)

Bug-on-a-stick moss, a former Survey & Manage species associated with old growth, is documented from a couple locations in the Sailor Bar watershed, on large decayed logs in the riparian zone. These populations were not monitored for fire impacts, because BARC maps showed low intensity burn levels in the Sailor Bar riparian areas, and because the tiny moss is unlikely to be found during late summer. No dozer lines were mapped in the vicinity of the moss populations.

Canyon Creek stonecrop is a rock-dwelling succulent that rarely experiences wildfire impacts because it occupies large rock outcrops that usually don't burn in wildfire. Canyon Creek stonecrop populations were monitored at Hayfork Bally because of the high concentration of dozer lines shown on fire suppression maps on Hayfork Bally and adjoining ridges. No damage was seen to the stonecrop from suppression. However, some of the stonecrop plants that had been growing under shrub cover on rock outcrops were killed when the shrubs burned.

Serpentine Soils

Serpentine soils of the Rattlesnake Creek Terrane, lie just to the west of the Iron-Alps Complex; and serpentine soils of the Hayfork Terrane occur sparsely at the eastern edge of the Eagle Fire. No known populations of serpentine-related sensitive plants occur in the Iron-Alps Complex. An unsuccessful attempt was made to reconnoiter a dozer line through an Order 3 soil polygon mapped as serpentinic, located between Rattlesnake Gap and Carter Ranch in Section 23; the field crew ran out of time and was unable to verify whether the dozer line rehab would require special treatment because of serpentine soil.

Noxious Weeds

Weeds in the Iron-Alps Complex fires are mostly restricted to roadsides, but some are found within openings that have been disturbed. Prominent invasive plants known to occur within the Iron-Alps Complex include mullein (*Verbascum thapsus*), brooms (*Spartium junceum, Cytisus scoparius, Genista monspessulana*), yellow starthistle (*Centaurea solstitialis*), tree-of-heaven (*Ailanthus altissima*), and Dalmatian toadflax (*Linaria dalmatica*).

B. Reconnaissance Methods

Information on noxious weeds, rare plant habitat and populations, serpentine soils, and effects on the Manzanita Research Natural Area was derived from Shasta-Trinity National Forest file records, from discussions with Shasta-Trinity West Side planning botanist Susan Erwin, and from visits to the fire areas between August 29 and Sept. 3, 2008.

C. Findings/Description of Emergency

Value at Risk: Ecosystem Stability of Native Plant Communities, Wilderness, Late Successional Reserves, and Research Natural Area function.
Priority Threats: Dozer line construction and noxious weed introduction

Many roadsides in the Iron-Alps Complex fires are occupied to varying degrees by noxious weeds, in particular yellow starthistle, broom species, tree-of-heaven, and Klamath weed. With 100+ miles of dozer line construction for suppression of these fires, it is likely that weeds were spread to internal portions of the fires, and are poised to move into parts of the fires that burned hot enough to kill existing vegetation and damage the

seed bank. Weed infestations will displace valuable native plant species (reducing wildlife habitat) and can result in increased soil erosion because these species are less capable of stabilizing soil than their native counterparts. Some portion of the dozer lines will likely be used for OHV recreation, at least temporarily increasing chances of weed importation.

Appendix K: Summary of Cost-Risk Analysis: (pending)

Appendix L: Reccommendations For Futher Detailed Investigations:

Other Issues That Need Futher Investigations:

- Road fill burn-outs throughout and who fixes them
- Burn out issue and resource/property damage from this practice
- Eagle Ranch road conditions since the assessment team was denied access