

Happy Camp Fire Protection Strategy Analysis

The Happy Camp Ranger District is located in the western portion of the Klamath National Forest and the northwestern section of Siskiyou County in Northern California. Most private land holdings and communities are located along the Klamath River/ Highway 96 corridor with additional concentrations in the Indian Creek and Elk Creek drainages of the community of Happy Camp and the Seiad Creek and Grider Creek drainages of the Seiad Valley community. Until the early 1990's, logging and timber products processing dominated the local economy. Small business and tourism have not yet filled the gap left by the diminished timber industry.

Fire History

Nineteenth century visitors to the Klamath River region wrote of scattered timber patches and chaparral on the hills with denser forest types occurring on lower northerly and eastern slopes as well as in the bottoms of drainages. It was also described as being dominated by hardwood-grass savannah. Coniferous forest was a combination of Douglas fir, Ponderosa pine and Sugar pine with mixed severity fire behavior. The homogenous forest types seen today were not typical. Fire history research done in the Thompson Creek drainage by Taylor and Skinner drew the conclusion that attributes of the areas' late-succession forests, including snags and multiple canopy layers, were less common in the past and the present condition is largely influenced by 20th century fire suppression.

Wildfire appears to have been the disturbing force that most often worked to shape the landscape. Fire history studies in the area (Taylor and Skinner, Agee) suggest that the median fire interval was 12 years in pre-settlement times and had increased to 25 years during suppression time (1905-1992). Higher intensity or stand-replacing fires with longer fire return intervals were more common on south aspects and upper slopes while north, easterly and lower to mid-slopes tended to have shorter fire return intervals and generally lower intensity fires.

Most areas adjacent to the community of Happy Camp or private property within the primary intermix drainages (Elk Creek, China Creek, and Indian Creek) have not burned significantly since suppression agencies began keeping records in the early twentieth century.

More fires occurred from mid summer to early autumn. Lightning is more frequent in early summer but the likelihood of ignition increases as fuels dry out.

The Karuk and Shasta tribes focused their lives on the Klamath River and its major drainages, fishing and trading along the river and moving up the mountains for gathering and hunting during the summer season. They often used fire to improve the quality of favored forest products. Fires were started to improve grass and browse near seasonal camps, to make it easier to gather acorns, a diet staple, and reduce insect infestation in the

acorns as well as to improve the quality of basket making materials. Bear grass has stronger straighter stalks after fall burning and many of the shrubs used in basket-making, including hazel and willow produce fresh shoots that are long and straight and less labor intensive to gather and use after a spring burn of low intensity.

When the Klamath National Forest was established shortly after the turn of the century fire suppression was one of the primary resource management activities along with logging, mining and grazing regulation. The districts on the west side of the forest were generally too rugged for intensive logging though until after the post- World War II economic boom. As access and technology improved timber harvest and fire suppression efforts escalated. Photos from the 1940's show the mountains to have less continuous forest and stands of regenerated forest gave indication of past large fires as well as more openings in the forest canopy and fewer snags and downed logs on the forest floor.

In the past 50+ years wild fires have been aggressively suppressed allowing a more continuous forest cover from canyon bottoms to high on mountain slopes. Fire history from that same period indicates that fire occurrence has transitioned from much lower intensity ground fires to less frequent stand replacing fires. Additionally as more areas were logged those areas were burned with fairly high intensity prescribed fire then replanted often in single species plantations. Those plantations provide a continuous forest type that is very homogenous, allowing crown fire to propagate very readily on the areas' rugged terrain. When young, < 35 years old, these plantations suffer high mortality during crown fires.

Late Summer of 1987 is a good example of how the changes in forest structure allowed an unusually intense lightning storm to ignite not just one but many stand replacing fires totaling over one hundred thousand acres. Again in 1994 a large, dry lightning storm ignited multiple fires in the Dillon Creek drainage. Several fires were not contained and burned together due to extreme terrain and limited firefighting resources. Total burned area was approximately 27,000 acres or approximately half of the 50,000-acre watershed. Last year, 2001, a storm caused 50 fire ignitions of which two, the Swillup and Crawford fires, were not contained during initial attack and ultimately burned several thousand acres. (*Figure 1, fire history*) In 2003 the Stanza fire escaped initial attack and burned 2800 acres in the Happy Camp municipal watershed after a lightning event that caused 4 fires on the district

Current Conditions

The Happy Camp Ranger District has very diverse forest types. Its typical forest types include Douglas fir, Klamath mixed conifer, White fir, pine types (Ponderosa, Sugar, Jeffrey and Knob cone), hardwood-conifer, hardwood and montane chaparral. With the exception of White fir all are relatively well adapted to moderate intensity fire in mature stands.

A lack of low to moderate intensity fire has allowed less fire tolerant conifer species and more shade tolerant species to fill in underneath stands. As stand density increases, the canopy closure, fuel build-up and ladder fuels, and potential for disease or pest mortality

and/or catastrophic wildfire go up dramatically. Additionally as small fires were suppressed, forest openings and meadow retention were reduced and as large stand replacing fire areas were reforested large areas of single age plantations have been created.

(Figure 2, FM map)

Fuel Models	Description	Expected fire behavior
FM 5	Montane chaparral: manzanita, deer brush Conifer plantations < 35 years	Generally surface fire in litter cast and grass or forbs. In plantations ground fire with flame lengths > 5 feet will often sustain active crown fire.
FM 8	Mature stands of conifers, hardwoods w/ open under stories	Fire burns more slowly in surface litter with low flame lengths.
FM 9	Pine dominated stands with open under stories.	Fire more likely to run through litter than in FM 8. Concentrations of dead & down fuel contribute to torching or crowning.
FM 10	Douglas fir dominated stands with dense under story and high amounts of fuel. Forest types with wind throw, disease/pest mortality and aged thinning slash.	Most intense fire behavior of timber/litter fuel types. Crowning, torching and spotting are more frequent leading to control problems.
FM 12	Typical of moderate to high intensity 1987 burns. Visually appears to be dominated by slash.	Rapid fire spread, often high-intensity fire. Once a fire starts it is generally sustained until a fuel break or a change in fuel profile is encountered.
FM 14	Riparian Areas (full time water)	Virtually nonflammable

The Happy Camp community area is primarily fuel model 5 on the east side with average fuel loadings of 15-20 tons and the west is dominated by fuel model 10, at 20-25 tons per acre, with some fuel models 8 and 9. Topography is generally steep averaging 45 to 60%.

The Chief of the Forest Service was recently quoted as saying that the US Forest Service was a victim of “Analysis Paralysis” due to restrictions placed upon federal agencies to meet high levels of analysis and documentation before projects are implemented. The Happy Camp Ranger District is most definitely struggling with that issue. In addition to analysis and documentation required by the National Environmental Policy Act (NEPA), we must meet implementation standards for protecting federally listed Threatened and

Endangered species (T&E species, Endangered Species Act) and their habitat, and are obliged to adhere to standards agreed to under the Northwest Forest Plan (NFP).

The NFP requires that before any ground disturbing activity all federal agencies that operate in the Pacific Northwest must survey for any of old-growth dependent species whose range is within the project area or where habitat is similar to known ranges. Protocols for habitat surveys range from single visits before a project to multiple visits through more than one season and /or stringent weather requirements that limit working days available to meet requirements for projects.

Weather

Happy Camp currently averages approximately 51 inches of rain per year with a historic range from 40-67 inches per year. In 2001, we experienced a record low with less than one half the historical norm.

(see FF+ 90% table Appendix A)

Happy Camp Fire Protection Strategy (HCFP Strategy)

In its original form the project was referred to as Town Hazard and its aim to protect the Happy Camp community from wildfire encroaching from the surrounding Klamath National Forest administered lands. This was to be accomplished by linking existing FS roads with constructed fuel breaks (Little Grider Fuel break project) and making use of recent under-burn and wildfire burn areas.

Then in the aftermath of the catastrophic fires in the Rockies of 2000, the National Fire Plan (NFP) was developed to coordinate the fire suppression and prevention efforts among state and federal wildland firefighting agencies and the public. One piece of the NFP was the 10-Year Comprehensive Strategy which directed stakeholders to:

- 1) Improve Prevention and Suppression
- 2) Reduce Hazardous Fuels
- 3) Restore Fire Adapted Ecosystems
- 4) Promote Community Assistance

The first issue tackled was the funding of adequate levels of suppression forces. Greater funding was budgeted by Congress and more fire suppression personnel were hired and equipment purchased.

To encourage community participation grants were made available to groups or individuals within communities who wanted to protect their properties from catastrophic wildfire. Generally those grants are available when a property owners group or community organizes into Fire Safe Councils. The property holders develop projects specifically to reduce available fuels around their property and to reduce hazards for firefighters attempting to suppress wildfire on private property. Those projects can be funded through state and federally administered programs. Federal, State and local agencies work with the Fire Safe Councils, and plan fuels hazard reduction programs on high priority public lands adjacent to private holdings.

Analysis of federal and State lands surrounding communities on the Klamath National Forest was done considering fuel conditions, ability to contain potential fires and resource values to be protected including municipal watersheds, resource investments such as plantations and cultural values. Happy Camp and Sawyers Bar were identified as the priority communities at risk based on those values. All communities on the Happy Camp

Ranger District are considered to be at risk. To focus efforts ¼ mile community defense zones and then 1 ¼ mile community threat zones were drawn concentrically around communities and private property on the ranger district. (*Figure 3, CDF Zones*)

Those concentric lines were often situated in on indefensible mid-slope or inaccessible topographic features. The lines were then redrawn to strategic ridges, roads or previous wildfire holding features. In some places this extended the threat zone considerably in others it narrowed the distance. This also drew our attention to roads that weren't being maintained or that were scheduled to be decommissioned. Those concerns could then be brought to the table in other project meetings as issues for discussion.

The Happy Camp area has approximately 90,000 acres within the community defense and threat zones while Seiad Valley is estimated to have 40,000 acres within the zones.

At this point Happy Camp Hazard began to metamorphose into the Happy Camp Fire Protection Plan with a variety of projects within the approximately 1½ - mile ring of community defense and threat zones. These projects included pre-commercial and commercial thinning, hand piling and mechanical treatments to reduce hazardous fuel concentrations to be followed up with low intensity under-burns and two shaded-fuel breaks.

The project was still focused on the Happy Camp area and it seemed obvious that all areas containing private properties and communities on the district should be considered and prioritized in the same manner. The original project was called HCFP '03 and an umbrella analysis called the HCFP Strategy was begun. The goals of the HCFP Strategy are:

- ❖ **Protection of life and property from wildland fire.**
- ❖ **Restore fire-adapted ecosystems.**
- ❖ **Protect high priority watersheds and significant values at risk.**

From there the objectives were identified as:

- **Reduce potential fire behavior to flame lengths less than 4' within ¼ mile (defense zone) of at risk communities .**
- **Reduce the potential for sustained crown fire within 1 ½ mile (threat zone) of at risk communities.**

*Those fire behavior characteristics were defined for 90th percentile weather as observed from Slater Butte Remote Automated Weather Station (RAWS) and BEHAVE. App. A

To further define the priorities and funding opportunities for hazardous fuels reduction projects within approximately 90,000 acres, the Happy Camp community area was described by issues & values threatened:

- 1) Municipal watersheds: Indian and Elk Creeks

- 2) Plantations less than 35 years old: Indian Creek, Thompson/China and Oak Flat /Ukonom
- 3) % Area contained in community threat zone: Indian Creek, Oak Flat/Ukonom and Grider Seiad.
- 4) Historic Fire: Indian Creek, Elk Creek, Seiad and Grider Creeks
- 5) Area in LSR or sensitive habitat

From those general rankings, analysis areas called HCFP Defense zones were delineated.
(Figure 4 Defense zones)

Indian Creek Zone: The area from the mouth of Doolittle Creek to West Branch Campground. This watershed provides surface domestic water to private landholders within its boundaries. Approximately 5000 acres were burned in the 1987 fires and previously the Indian Ridge burn of 1967 had burned close to 10,000 acres, consequently there are large areas of plantations. Can expect high intensity fire behavior that local forces would not be able to contain without extra resources in extreme weather conditions over much of the southern zone. Accessibility would be an issue during suppression activities.

Happy Camp Zone: The Klamath River corridor from the mouth of Doolittle Creek to Kanaka Creek. Cade Mountain on Highway 96 across the river to include China Creek and continuing up to the East Fork of Elk Creek. Outside the actual community there are clusters of homes along the main drainages. Elk Creek is the municipal watershed for Happy Camp. Elk Creek has had 3 large fires (4000+ acres) in the past five years; previously about 25,000 acres had burned during 1987. Fire intensity in untreated areas through the Elk Creek and Cade Mountain sections would be expected to be high. In the Little Grider and Benjamin areas mixed intensity is likely and all would be potentially beyond district resources to contain due to accessibility.

Down River Zone: The Klamath River corridor from Kanaka Creek to Aubrey Creek. This area has occasional private holdings and contains occasional rural homes. Three of the large wildfires on the district have occurred in this area since 1990. Expect mixed to high intensity fire with limited access.

Thompson Zone: From Cade Mountain to Seattle Creek. Occasional private holdings with domestic water supplied by adjacent drainages. Approximately 9000 acres burned in 1987 during the Thompson Fire, much of this was reforested afterwards. Mixed intensity fire is predicted in extreme weather conditions but containment would be severely hampered by accessibility for any but air resources.

Seiad Valley Zone: Seattle Creek through the Seiad Valley. This includes the community of Seiad and many clusters of private residences along the Klamath River and its main drainages. Many private homes are dependent on surface sources for domestic water supplies. Forty thousand plus acres were burned in 1987 to the north and south of the community. Suppression in this area would be extremely limited by topography and road access.

Zone Name	Total acres	Private acres	<35 year plantations	Municipal watershed acres	Fire starts/ 1000 acres/year	Total acres Historic fire
Down River	28879	1715	2439	HC water board-184	378 starts	65,595
Happy Camp	27289	3670	2993	HC 4044 other 1559	.16 574 starts	28,342
Indian Creek	25046	2006	4853	Other 4225	.25 470 starts	6,549
Thompson	8369	473	1577	Other 2735	.23 260 starts	122
Seiad Valley	40649				.39 803 starts	
total	130,330				.25 3275 starts	
					.31	

*1921-2001

The HCFP Zones were then compared in terms of fire severity and ability to contain a fire to be described by mapped fuel models, accessibility, historic weather, slope and aspect. More current road closure, maintenance and de-commissioning data is being collected on the district with the hope that contain/severity models can be updated on the forest, though currently GIS resources are stretched. We are also gathering data layers to do modeling using the FARSITE fire simulation model and FVS-FFE. The areas identified as high to mixed intensity/mortality and difficult to unlikely to contain will be prioritized for fuels treatments at different levels. Focus is on areas where private properties, municipal watersheds, and sensitive habitat.

(Figure 5, contain/severity models)

Phase one –HCFP '03 went into planning at this stage. HCFP '03 has a variety of commercial and pre-commercial thins and under-burns within the 1 ½ mile threat zone as well as 2 shaded- fuel breaks and mechanical treatment of hazard fuels immediately adjacent to the community. This totals approximately 1400 acres. Projects were selected with an eye toward ability to begin Survey and Manage and T&E surveys in the summer of

2002 so implementation could start as early as mid 2003. NEPA is in final stages. Funding was a collaborative effort from Timber/Silviculture and Fuels Management.

UNIT	PCT	Under Burn	CT/T	CT/SS	Hand Pile	Masticate	Dozer Pile
TOTAL Acres	83	893	245	42	70	71	84

Another 130 Acres was treated with pre-commercial thinning to maintain more fire resilient stands under a district- wide PCT categorical exclusion.

As Phase two went into initial stages, fuels and timber planners used managed stand layers in the corporate GIS data base and then developed a cross walk to stand types as they would relate to fire behavior (*see table following*). Fire Behavior was determined by assigning Fire Behavior Prediction System (FBPS) Fuel Models to each stand type the comparing predicted fire behaviors as listed in *Aids to Determining Fuel Models for Estimating Fire Behavior – GTR INT 122 April 1982-* by Hal E. Anderson and running BEHAVE for 90th percentile weather and fuel moistures. Those numbers were then compared with the fire behavior objectives.

Fuels treatment opportunities were described in general terms for Phase 2 using this table.

Fuel Risk	Stand Description	Threat zone does not meet objective	Defense zone does not meet objective i	Commercial thin	RX burn	Mechanical Masticate <45% slope, <12" dbh	Hand pile >45% slope <12" dbh	Mechanical Hand >45% slope <12" dbh
1	Mature stands not Previously managed	√	√	X	X	X	X	X
2	Managed mature stands w/ past treatment				X	X	X	X
3	Managed mature stands w/out treatment	√	√	X	X	X	X	X
4	New plantations ≤ 5 years							
5	5-30 year plantations, Unthinned					X	X	X

6	5-30 year plantations, w/ thinning slash	√	√			X	X	X
	Early mature, high risk to loss from fire	√	√	X	X	X	X	X
8	Early mature, low-moderate risk to loss from fire				X	X	X	X
9	Hardwood dominated, brush fields	√	√			X	X	X
10	water							
11	Urban Development							

See fuel risk figure

	Down River			
	Happy Camp Zone	Indian Creek Zone	Zone	Thompson Zone
% Threat zone doesn't meet objectives	67	71	64	79
% Defense zone doesn't meet objectives	67	58	60.4	78
acres threat zone doesn't meet objectives	14475	13206	22048	4647
Acres defense zone doesn't meet objectives	6798	3831	2519	1120

HCRD	
% Threat zone doesn't meet objectives	65.80
% Defense zone doesn't meet objectives	66.14

The defense zone should not support flame lengths of greater than four feet in extreme fire weather and indices (90th percentile) for any length of time. This would allow hand crews, engines, and homeowners to defend property safely and with reasonable expectations of success. Within the 1 ¼ mile threat zone, projects will focus on larger scale under-burns, thins and other fuel treatments that will attempt to prevent stand-lethal active crown fire spread across the landscape and reduce potential fire behavior to a level where direct attack is likely to be successful. Flame lengths eight to ten feet should not be continuously sustained. Crown fire is less likely to be supported when shade tolerant species-trees and shrubs are removed from the under story, canopy cover and continuity are reduced and crown height is increased, especially if cut materials are removed or reduced in volume. This does not have to be consistent across the landscape but can incorporate small openings and sections of higher density. Vegetation types on the district will require diligent maintenance by under-burning and other follow-up fuel treatments to maintain potential fire behavior at those levels.

HCFP Phase two is focused more specifically on the Happy Camp/Indian Creek zones around the higher concentrations of private homes. Proposed projects are being analyzed and the Happy Camp Fire Safe Council has completed several segments of fuels reduction projects within the private property boundaries of Happy Camp proper as well as along Indian Creek road. The activities on federally administered lands will include buffering concentrations of private property with fuels management activities such as thinning pruning and hand-piling hardwoods and brush to be burned within two-three hundred feet (Cohen, www.firelab.org), follow-up under-burns, other mechanical treatments (mastication, crushing and yarding) within the ¼ mile defense zone to reduce the intensity of fire encroaching on private lands from forest and vice versa. Projects in the threat zone would include fuel reduction along roads such as Indian Creek Road, China Grade Elk Creek and tactically important roads near the community as well as road brushing to facilitate initial attack, access and firefighter safety. Currently the Salmon River RD is using a prescription that calls for thinning ≤ 4” diameter trees and shrubs, pruning to 6’, 200’ below the road and 150’ above the road as well as removing hazard snags. Fuels reduction adjacent to private property both on a landscape level and at private property boundaries adjacent to Indian Creek in the Happy Camp Protection Zone is a high priority. Thinning projects funded by silviculture/timber and fuels management are also planned. All projects except commercial thinning have been analyzed using “Healthy Forest” categorical exclusions.

HCFP Phase 2 Fuels Treatment Proposed Projects		
Treatment Types	Acres	
Underburns	3241	Including some potential mosaic burning Thinning from below to reduce crown/torch potential
Thinning	1498	
Mechanical	1210	Includes under story thinning piling, chipping,
Intermix Fuel reduction –Indian Crk/ Perkins	172	Understory thinning piling, chipping adjacent to FireSafe projects, w/ BIA
Elk /China PCT & handpiling	256	PCT along roads and Private boundaries
Roadside Hazard Reduction	756	Understory & hazard snag removal for strategic/ tactical access
Cultural/ Habitat Projects	200	Underburns w/in WUI that improves habitat or veg structure for gathering

Specific project areas have been identified to allow T&E, S&M and noxious weed surveys to be funded and staffed for as well as consultation by FWS and NMFS. It is a goal of the district to have worked through one cycle of fuel hazard reduction in ten years. This would average out to about 9,000 acres affected per year for Happy Camp and 3,500 acres per year for Seiad within the 1½- mile defense zones.

Indian Creek/Perkins Intermix projects began implementation early 2004. An agreement with the Bureau of Indian Affairs is ongoing to make use of a local BIA crew.

Elk China PCT '03 is nearing completion with the units that a local area contractor is thinning and handpiling.

The district plans to treat as many acres within the defense zone as possible and to implement projects on at least 1/3(*Finney*) of the threat zone that does not meet fire behavior objectives.

Planning will spread to Seiad Valley by 2005 and to the Thompson and Downriver Defense zones in later phases of the Happy Camp Strategy.

HAPPY CAMP FIRE PROTECTION
STRATEGY OPPORTUNITIES

Under story Fuels Reduction				
Unit	Acres	Legal location	Fuels Objective	NEPA
101	84	T16N R8E Sec	Reduce potential wildfire	CE

		9 Hum.	encroachment	
102	385	T17N R7E Sec 26,35 Hum.	From public lands to private lands and from private property toward	
103	741	T17N R7E Sec 27,22 Hum.	Public lands. Predicted wildfire flame lengths should be less than 4'	
113	190	T17N R7E Sec 23	With only isolated torching. These projects are pre-commercial thins.	
114	100	T17N R7E Sec 27,22 Hum.	Where trees and brush < 6" diameter will be removed to reduce fuel	
	1500		Continuity and trees may be pruned to 20' or 50% live canopy.	
			Slash will be generally piled and burned, though some may	
			be chipped or lopped and scattered.	
			This will be adjusted to protect domestic water sources and storage. <i>Defense & Threat zones</i>	
Commercial Thinning to Meet Fuels Objectives				
Unit	Acres	legal location	Fuels Objective	NEPA
1	235	T17N R7E Sec 36 Hum.	Reduce the potential for fire starts to move from the ground to the	EA
2	62	T16N R8E Sec 6 Hum	overstory and maintain a self-sustaining crown fire. Maintain current	
3	30	T16N R8E Sec 6 Hum	condition class or move toward condition class 1. Maintain Overall	
4	282	T16N R8E Sec 5,6 Hum.	canopy cover > 40%, <70%. Within 1/4 mile of private property	
6	61	T16N R7E Sec 3,10 Hum.	predicted ground fire flame lengths should be < 4'.	
7	6	T16N R7E Sec 3 Hum.	Natural & Activity fuels will generally be underburned at low	

			intensities	
8	33	T16N R7E Sec 9 Hum.	but to buffer sensitive areas or reduce air quality impacts some activity fuels	
9	131	T16N R7E Sec 16	may be masticated, chipped or hand piled and burned.	
10	97	T16N R8E Sec 18 Hum.	fuels may be masticated, chipped or hand piled and burned.	
11	18	T16N R8E Sec 19 Hum.	Defense or Threat Zone	
12	132	T16N R8E Sec 18,19 Hum.		
14	202	T17N R8E Sec 31,6 Hum.		
16				
	1288			
Underburns				
Unit	Acres	legal location	Fuels Objective	NEPA
UB-A	680	T16N R7E Sec 23 Hum.	Natural Fuel accumulations will be burned at low to moderate intensities to	CE
UB-B	708	T16N R7E Sec 24 Hum.	Reduce the potential for fire starts to move from the ground to the	
UB-C	735	T16N R8E Sec 17 Hum.	over story and maintain a self-sustaining crown fire. Maintain current	
UB-D	539	T16N R7E Sec 11 Hum.	condition class or move toward condition class 1.	
UB-E	207	T16N R7E Sec 9 Hum.	Within 1/4 mile of private property predicted ground wildfire	
UB-F	90	T17N R7E Sec 34 Hum.	flame lengths should be < 4'.	
UB-G	287	T17N R7E Sec 27 Hum.	To buffer sensitive areas or reduce air quality impacts some activity fuels	
UB-I	255	T16N R7E Sec 16 Hum.	fuels may be masticated, chipped or hand piled and burned.	

	3501		Defense or Threat Zone	
Roadside Understory Fuels Reduction				
Unit	Acres	legal location	Fuels Objective	NEPA
104	207	T16N R7E Sec 3 Hum. rd16N30	Reduce understory fuel loading to decrease potential for self-sustained	CE
105	43	T46N R12W Sec 31Mt Diablo rd45N86Y.	crown fire by removing trees and brush <6' diameter and pruning	
106	153	T16N R8E Sec 16 Hum. rd45N87	trees to 20' or 50% of live canopy. This project will be within a 400'	
107	306	T17N R7E Sec 26 Hum. Rd 17N12	strip along the road (150' below & 250' above) This is to maintain current	
108	47	T16N R7E Sec 17 Hum. Rd 16N47	condition class or move toward condition class 1 and increase the	
	756		likelihood for safe access or fire suppression tactical or strategic activity. Hazard trees	
			will be removed when there is a direct safety concern & will be	
HCFP Phase 2			limbed and left or removed to a deck as needed. Slash will be	
TOTAL ACRES			masticated, chipped or piled and burned.	
			Defense or Threat Zone	
HCFP Strategy Ongoing Projects				
Wildland-Urban Interface Fuel Reduction ((Indian Creek PCT/ Perkins Gulch Wildland Interface Project)`04)	Acres	legal location	Fuels Objective	NEPA

Unit 109	23	T17N R7E Sec 22 Hum.	Reduce potential wildfire encroachment	CE
110	32	T17N R7E Sec 26 Hum.	from public lands to private lands and from private property toward	signed
111	60	T17N R7E Sec 35 Hum.	public lands. Predicted wildfire flame lengths should be less than 4'	
112	57	T16N R7E Sec 3 Hum.	with only isolated torching. These projects are 300' deep strips	
Total 4 Areas	172		where trees and brush < 6" diameter will be removed to reduce fuel	
			continuity and trees may be pruned to 20' or 50% live canopy.	
			Slash will be be generally piled and burned, though some may	
			be chipped or lopped and scattered.	
			This will be adjusted to protect domestic water sources and storage.	
			<i>Defense Zone</i>	

Appendix A

FireFamily Plus Percentile Weather Report for RERAP

Station: 040225: SLATER BUTTE LO Variable: ERC

Model: 7G4PE3

Data Years: 1961 - 2001

Date Range: April 30 - September 15

Wind Directions: SE, S, SW, W, NW

Percentiles, Probabilities, and Mid-Points

Variable/Component	Range	Low	Mod	High	Ext
Percentile Range	0 - 15	16 - 89	90 - 97	98 - 100	
Climatol. Probability	15	75	7	3	
Mid-Point	ERC	14 - 14	44 - 44	74 - 74	80 - 80
Num Observations		33	73	59	14
Calculated Spread Comp.		7	11	16	16
Calculated ERC		15	45	74	80

Fuel Moistures

1 Hour Fuel Moisture	14.00	5.40	3.90	3.70
10 Hour Fuel Moisture	14.70	6.60	4.80	4.60
100 Hour Fuel Moisture	17.50	11.30	6.70	5.90
Herbaceous Fuel Moisture	106.60	81.90	38.00	31.80
Woody Fuel Moisture	131.30	104.00	51.30	42.10
20' Wind Speed	5.90	4.70	4.00	3.80
1000 Hour Fuel Moisture	22.40	14.50	8.30	7.30

3808 Weather Records Used, 2022 Days With Wind (53.10%)

FireFamily Plus Event Locator Report

Listing of Selected Events

Station: 040225 - SLATER BUTTE LO

May 1 - October 30, 1961 - 2001

Event Definition:

Avg(Max Temperature) \geq 90.00 Percentile (85.00° F.)

OR Avg(Min RH) \geq 90.00 Percentile (39.00 %)

OR Avg(Wind Speed) \geq 90.00 Percentile (10.00 mph)