A STRATEGIC FUELS REDUCTION PLAN

FOR THE HAT CREEK VALLEY FIRE SAFE COUNCIL

AND THE COMMUNITIES OF

OLD STATON

HAT CREEK

CASSEL

Prepared for
Hat Creek Valley Fire Safe Council

By
Western Shasta Resource Conservation District

Funded by
California Fire Safe Council

Funding provided by
USDA Forest Service
Cooperative Forestry Assistance

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SIGNATURE BLOCK

NAME	SIGNATURE	ORGANIZATION	DATE
Linda Hartman		Chairperson, Shasta County Board of Supervisors	JUL 22 2008
Mike Chuchel		Unit Chief, CAL FIRE Shasta-Trinity Unit and County Fire Warden, Shasta County Fire Department	5/19/08
Kit Mullen		District Ranger, U.S.D.A. Forest Service, Hat Creek Ranger District	1/23/08

TABLE OF CONTENTS

MAPS

HAT CREEK VALLEY FIRE SAFE COUNCIL AREA

1. GENERAL VEGETATION
2. FIRE HISTORY
3. FUEL MODELS
4. LAND OWNERSHIP
5. PLANTS AND WILDLIFE
6. EXISTING ROADS
7. SOILS
7A. SOIL SURVEY CA 708
7B. SOIL SURVEY CA 604
7C. SOIL SURVEY CA 707
8. LOCATION OF PROPOSED FUELBREAK PROJECTS – OLD STATION
9. LOCATION OF PROPOSED FUELBREAK PROJECTS – HAT CREEK
10. LOCATION OF PROPOSED FUELBREAK PROJECTS - CASSEL

This Document shall be known as the **Hat Creek Valley Strategic Fuels Reduction Plan**

Step 1 – Convene the decision makers for this Strategic Fuels Reduction Plan:

- Local Government: Chairperson, Shasta County Board of Supervisors
- CalFire Shasta-Trinity Unit Chief and Shasta County Fire Warden: Mike Chuchel
- Shasta County Fire Department's Old Station, Hat Creek, and Cassel Volunteer Companies

These decision makers or their representatives, were notified on March 19, 2007 and invited to participate in the development of this plan.

Step 2 - Federal Agencies Involved:

Representatives of the federal agencies managing land or having operations in the vicinity of the communities are:

Agency	Representative	Date Invited to Participate
USDA Forest Service	Kit Mullen	3/19/07
USDI Bureau of Land Management	Jerry Wheeler and Tim Bradley	3/19/07
USDI National Park Service	Scott Isaacson	3/19/07
U.S. Fish and Wildlife Service	Jim Smith	3/19/07
Bureau of Indian Affairs	Director	4/20/07
Local Tribal Governments	Sharon Elmore, et al	3/19/07
Bureau of Reclamation	Brian Person	4/20/07
Natural Resources Conservation Service	Bob Bailey	3/19/07

Step 3a – Involve State and Local Agencies to Participate

The representatives of the state and local agencies that have jurisdictional responsibilities in the vicinity of the communities are:

Agency	Representative	Date Invited to Participate
State Parks and Recreation	Andrew Urlie	3/19/07
California Department of Fish and Game	Curt Babcock	4/23/07
Fall River Resource Conservation District	Bob Rynearson	3/19/07
Department of	Steve Cureton	4/27/07

Transportation		
Department of Water Resources	Fraser Sime	4/20/07
Cal Fire	Jim Ferguson	3/19/07

Step 3b – Engage Interested Parties

The parties from our community that have shown interest in forest/fire management or may be interested in the content of this Strategic Fuels Reduction Plan are:

Interested Parties	Date Invited to Participate
Fire Safe Councils	3/19/07
Landowners	4/21/07
Forest Products Interests	3/19/07
PG&E	3/19/07
U.C. Cooperative Extension	3/19/07

Step 4 – Establish a Community Base Map

See a base map of the communities and adjacent landscapes of interest on Maps #6, 8, 9, and 10. Detailed on the maps are:

- The inhabited areas at potential risk to wildland fire and include: the communities of Old Station, Hat Creek, Cassel, McArthur-Burney Falls State Park, and the developed areas around them.
- Areas containing critical human infrastructure, such as escape routes, municipal water supplies, power or communication structures, including: State Highway 89, State Highway 44, State Highway 299, PG&E Transmission Lines, State Fish Hatchery.
- Areas of Community Importance, including: McArthur Burney Falls State Park, Volcanic lava flows and tubes, Local volunteer firehouses, Hat Creek recreation fishery, and local campgrounds.

After considering the location of the inhabited areas, the critical human infrastructure, and the risk of wildfire, the community has identified on the map, a wildland – urban interface (WUI) zone around the community assets, which in general includes the area within two (2) to five (5) miles from the community or structure. Natural and man-made barriers have been used to define the boundary on the community base maps (e.g. highways, ridgelines, rivers, etc. Details can be found on Maps #8, 9, and 10.

HCV-FSC Evacuation Plan - The USFS, Hat Creek Ranger District, in collaboration with CalFire and the Shasta County Sheriff's Department, has developed a comprehensive emergency evacuation plan for the FSC area. This comprehensive plan has been distributed to agencies serving the valley (See Appendix C). An abbreviated version is

being made available to residents of the valley for their use in case of an emergency. The abbreviated version is also posted at the various campgrounds throughout the valley.

HAT CREEK VALLEY STRATEGIC FUELS REDUCTION PLAN RISK ASSESSMENT COMMITTEE RESULTS
Steps 5, 6, and 7

BASIC ASSUMPTIONS	
People	2.3 per dwelling
Property Value	$250,000 per dwelling
Dwellings	Count the dots on the map

Following are the Risk Assessment Committee's Prioritized Areas of Concern and Proposed Solutions. Details can be found on Maps 8, 9, and 10.

OLD STATION

#1 Concern - Big Springs Estates

Proposed Solution:

a. Fuelbreak along Forest Highway (F.H.) 32N01X or 32N13, starting at Hwy. 44 intersection, 0.6 miles long, 2 chains (132 feet) on both sides of the road = 19 acres treated; plus F.H. 32N01XA through Big Pine Campground, east across Hat Creek to the bluff, 0.4 miles long, 4 ch. wide = 13 ac. Total treated area for this extended fuelbreak = 32 acres.

b. Fuelbreak along Hwy. 44 from F.H. 32N88Y north for
0.75 miles long, 2 ch. (132 ft.) on both sides of the road = 24 ac. treated

Big Springs Estates Ownership – 95 % USFS
Number of dwellings = 47
Number of people = 108
Value of structures = $11,750,000

#2 Concern – Hat Creek Village and Rim Rock Subdivision, called Hat Creek Village

Proposed Solution:

a. Fuelbreak along the border of Sections 32 and 33, Twp. 33N, R5E, and the border of the NW1/4, NW1/4, Sec. 33, Twp. 33N, R5E
1.0 mi. long, 3 ch. (200 ft.) wide = 24 ac. treated

b. Fuelbreak along the USFS border in the SW 1/4 and Center 3/4, Sec. 33, Twp. 33N, R5E
1.25 mi. long, 3 ch. (200 ft.) wide = 30 ac. treated

c. Fuelbreak along the border Sections 26 and 33, Twp. 33N, R5E, between the public and private land, 0.125 mi. long, 3 ch. (200 ft.) wide = 3 ac. treated

Hat Creek Village Ownership – USFS

Number of dwellings = 103
Number of people = 237
Value of structures = $25,750,000

#3 Concern – Hat Creek Highlands
Proposed Solution:
a. Fuelbreak along the east edge of public land in the west ½ of the southeast ¼ of Section 1, Twp. 33N, R4E, 0.25 miles long, 3 ch. (200 ft.) wide = 6 ac. treated
b. Fuelbreak along Sugarloaf Lane
0.85 mi. long, 2 ch. (132 ft.) wide on both sides of the road = 27 ac. treated
c. Fuelbreak around water tank at the end of Ponderosa Way
0.1 mi. long, 3 ch. (200 ft.) wide = 3 ac. treated

Hat Creek Highlands Ownership – 75 % Private, 25 % USFS.
Number of dwellings = 74
Number of people = 170
Value of structures = $18,500,000

HAT CREEK
#1 Concern – North of the USFS Hat Creek Work Center
Proposed Solution:
a. Fuelbreak along the west side of Hwy. 89, beginning across from the intersection with F.H. 35N23, proceeding south to across from Chaffey Lane, in Section 33, TWP 35N, R4E and Sections 3 and 4, TWP 34N, R4E
1.25 mi. long, 3 ch. (200 ft.) wide = 30 ac. treated
Ownership – 60 percent Private, and 40 percent Public
b. Fuelbreak beginning on the west side of Hwy. 89, across from Chaffey Lane and proceeding south on the west side of the ditch behind the houses, and ending at the lava outcrop south of Gatewood Road in Sections 3 and 10, Twp. 34N, R 4E
1.0 mile long, 3 ch. (200 ft.) wide = 24 ac. treated
Ownership - Private

Number of dwellings = 52
Number of people = 120
Value of structures = $13,000,000

#2 Concern - Honn Creek Road
Proposed Solution:
Maintain thinned area along the west side of Hwy. 89 from the border of Sections 34 and 35, TWP 34N, R4E, south along the highway.
1.0 mi. long, 3 ch. (200 ft.) wide on the west side of the road = 24 ac. treated
Honn Creek Road vicinity Ownership – Private
Number of dwellings = 32
Number of people = 74
Value of structures = $8,000,000

#3 Concern – Red Rock Hill
Proposed Solution:
Maintain fuelbreak on CalTrans right-of-way along Hwy. 89 from USFS Hat Creek Work Center south to Honn Creek.
3.0 mi. long, 1 ch. (66 ft.) wide on both sides of the road = 48 ac. treated
Red Rock Hill Ownership – 90 percent Private, 10 percent USFS
Number of dwellings = 53
Number of people = 122
Value of structures = $13,250,000

CASSEL
#1 Concern – Cassel Road, Cassel
Proposed Solution:
Fuelbreak starting at Cassel Road, across from Boster's Nursery, and proceeding southeast across country to the rim west of Hat Creek in sections in Sections 6 and 7, Twp. 36N, R3E.
0.75 miles long, 3 ch. (200 ft.) wide = 18 ac. treated (masticated)

Cassel Road vicinity Ownership – Private
Number of dwellings = 54
Number of people = 124
Value of structures = $13,500,000

#2 Concern – Crane Road
Proposed Solution:
Fuelbreak west of Crane Road, beginning at Cassel Road, across from the intersection with Thrush Road, and proceeding southwest to the power transmission lines.
1.0 miles long, 3 ch. (200 ft.) wide = 24 ac. treated (masticated)

Crane Road Ownership – 60 percent Public, 40 percent Private
Number of dwellings = 28
Number of people = 64
Value of structures = $7,000,000

#3 Concern – Wildbird Lane
Proposed Solution:
An "L" shaped fuelbreak heading west from Sand Pit Road for 1/8 mile, then proceeds south for 0.3 miles and terminates at F.H. 36N13.
0.5 miles long, 3 ch. (200 ft.) wide = 12 ac. treated

Wildbird Lane Ownership – 90 percent Private and 10 percent Public
Number of dwellings = 14
Number of people = 32
Value of structures = $3,500,000

Details of the considerations, options, processes, and planning can be found in Appendix A- Hat Creek Valley Fire Safe Council Area Strategic Fuels Reduction Plan. The background information involving fire history, fuel models, various methods of treating fuels, threatened and endangered plants and animals, as well as soils prevalent in the area are all discussed. Community members who chose to participate in the assessment of community risks are listed as members of the Risk Assessment Committee beginning on page A 44 of Appendix A.

HAT CREEK VALLEY STRATEGIC FUELS REDUCTION PLAN

Step 5a – Develop a Community Risk Assessment

As designated on the base map by the HCV FCS Risk Committee, the following tables list the associated wildfire risk, as viewed by these community members. The Fire Hazard Severity Zone Rating column reflects the state-wide rating system.

OLD STATION

Community, structure or area at risk	Fuel Hazard	Risk of Wildfire Occurrence	Structural Ignitability	Firefighting Capability	Overall Risk	Fire Hazard Severity Zone Rating
Big Springs Estates	High	High	High	Moderate	High	Very High
Hat Creek Village	High	High	High	High	High	Very High
Hat Creek Highlands	High	High	High	High	High	Very High

Rating: High, Medium, Low
Fire Hazard Severity Zone ratings: Very High, High, Moderate

HAT CREEK

Community, structure or area at risk	Fuel Hazard	Risk of Wildfire Occurrence	Structural Ignitability	Firefighting Capability	Overall Risk	Fire Hazard Severity Zone Rating
North of Hat Creek USFS Work Center	High	High	High	Moderate	High	Very High and High
Honn Creek Road	High	High	High	Moderate	High	Very High and High
Red Rock Hill	High	High	High	High	High	Very High and Moderate

Rating: High, Medium, Low
Fire Hazard Severity Zone ratings: Very High, High, Moderate

CASSEL

Community, structure or area at risk	Fuel Hazard	Risk of Wildfire Occurrence	Structural Ignitability	Firefighting Capability	Overall Risk	Fire Hazard Severity Zone Rating
Cassel Road, Cassel	High	High	High	High	High	Very High and High
Crane Road	High	High	High	Moderate	High	Very High
Wildbird Lane	High	High	High	High	High	Very High

Rating: High, Medium, Low
Fire Hazard Severity Zone ratings: Very High, High, Moderate

Step 5b – Develop overall community priority

Community priorities were assessed by the HCV-FSC Risk Committee based on local knowledge of the area.

OLD STATION

Community, structure, or area at risk	Overall Risk	Community Value	Cultural Value	Overall Priority	Fire Hazard Severity Zone Rating
Big Springs Estates	High	High	High	High	Very High
Hat Creek Village/Rim Rock Sub.	High	High	High	Moderate	Very High
Hat Creek Highlands	High	High	High	Low	Very High

Rating: High, Medium, Low
Fire Hazard Severity Zone ratings: Very High, High, Moderate

HAT CREEK

Community, structure, or area at risk	Overall Risk	Community Value	Cultural Value	Overall Priority	Fire Hazard Severity Zone Rating
North of the Hat Creek USFS Work Center	High	High	High	High	Very High and High
Honn Creek Road	High	High	High	Moderate	Very High and High
Red Rock Hill	High	High	High	Low	Very High and Moderate

Rating: High, Medium, Low
Fire Hazard Severity Zone ratings: Very High, High, Moderate

CASSEL

Community, structure, or area at risk	Overall Risk	Community Value	Cultural Value	Overall Priority	Fire Hazard Severity Zone Rating
Cassel Road, Cassel	High	High	High	High	Very High and High
Crane Road	High	High	High	Moderate	Very High
Wildbird Lane	High	High	High	Low	Very High

Rating: High, Medium, Low
Fire Hazard Severity Zone ratings: Very High, High, Moderate

Step 6a – Community Hazard Reduction Priorities
Based on the results of the community risk assessments, priority ratings have been determined for the communities and areas of community importance. The community recommendations for the type of treatment for the surrounding vegetation are listed in the following table.

OLD STATION

Community, Structure, or Area at Risk	Type of Treatment	Method of Treatment	Overall Priority
Big Springs Estates	Hand Labor or Mechanical	Brush Removal	High
Hat Creek Village/Rim Rock Subdivision	Hand Labor or Mechanical	Brush Removal and Thin from below	Moderate
Hat Creek Highlands	Hand Labor	Brush Removal	Low

Type of Treatment: Fire, Mechanical (tractor, cable, helicopter), Hand Labor, Chemical, Other.
Method of Treatment: Prescribed Fire, Thinning From Below, Commercial Thinning, Sanitation-Salvage, Biomass, Brush Removal, Other.
Overall Priority: High, Medium, Low.

HAT CREEK

Community, Structure, or Area at Risk	Type of Treatment	Method of Treatment	Overall Priority
North of Hat Creek USFS Work Center	Hand Labor or Mechanical	Brush Removal	High
Honn Creek Road	Hand Labor or Mechanical	Brush Removal	Moderate
Red Rock Hill	Hand Labor or Mechanical	Brush Removal	Low

Type of Treatment: Fire, Mechanical (tractor, cable, helicopter), Hand Labor, Chemical, Other.
Method of Treatment: Prescribed Fire, Thinning From Below, Commercial Thinning, Sanitation-Salvage, Biomass, Brush Removal, Other.
Overall Priority: High, Medium, Low.

CASSEL

Community, Structure, or Area at Risk	Type of Treatment	Method of Treatment	Overall Priority
Cassel Road, Cassel	Hand Labor or Mechanical	Brush Removal	High
Crane Road	Hand Labor or Mechanical	Brush Removal	Moderate
Wildbird Lane	Hand Labor or Mechanical	Brush Removal and Thinning	Low

Type of Treatment: Fire, Mechanical (tractor, cable, helicopter), Hand Labor, Chemical, Other.
Method of Treatment: Prescribed Fire, Thinning From Below, Commercial Thinning, Sanitation-Salvage, Biomass, Brush Removal, Other.
Overall Priority: High, Medium, Low.

Step 6b – Recommendations to Reduce Structural Ignitability.

Individuals and community members can reduce structural ignitability throughout the Hat Creek Valley Community by taking the following measures.

1. Upgrade existing structures to fire safe building codes.
2. Replace roofs with approved fire safe roofing.
3. Maintain 100 foot defensible space around structures.
4. Clean roofs and gutters annually.
5. Develop a community phone tree in case of a fire emergency.
6. Request from the county, arrangements to use the reverse 911 system.

In an effort to generate support for the fuel reduction projects being proposed by the Risk Assessment Committee, the HCV-FSC has secured the funding to construct fuel reduction demonstration projects in each of the three communities. Details of the demonstration projects are presented in Appendix B.

Step 7 – Develop an Action Plan and Assessment Strategy

The Risk Assessment Committee along with agencies and private landowners of the vegetation surrounding the Hat Creek Valley Communities, individual structures, or identified areas of concern, have submitted projects that provide protection and reduce risk. The following table displays a list of projects submitted and the community recommendations

Community, Structure, or Area at Risk	Project Name	Agency/ Landowner	Funding Needs ($)	Time Table	Community Recommendation
Old Station					
	Big Springs Estates	95 % Public 5 % Private	140,000	7.0 months (2.0 years)	High
	Hat Creek Village/Rim Rock Sub.	Public	142,500	7.15 months (2.0 years)	Moderate
	Hat Creek Highlands	75 % Private 25 % Public	90,000	4.5 months (1 year)	Low
Hat Creek					
	North of the USFS Hat Creek Work Center	60 % Private 25% Public	Hand = 135,000 Masticate = 52,700	Hand = 7 months (2 years) Masticate = 1.4 mos.	High
	Honn Creek Road	Private	60,000	3 months	Moderate
	Red Rock Hill	90 % Private 10% Public	120,000	5 months (1.5 years)	Low
Cassel					
	Cassel Road, Cassel	Private	Hand = 45,000 Masticate = 20,600	Hand = 2.25 mos. Mast. = 0.5 mos.	High
	Crane Road	60 % Public 40 % Private	Hand. = 60,000 Masticate = 24,400	Hand = 3 mos. Mast. = 0.6 mos.	Moderate
	Wildbird Lane	90 % Private 10 % Public	Hand. = 30,000 Masticate = 16,000	Hand. = 1.5 mos. Mast. = 0.3 mos.	Low

STRATEGIC FUELS REDUCTION PLAN UPDATES

The communities of Hat Creek Valley intend to assess progress annually and invite agencies and landowners to submit additional projects that provide community protection. Additional (new) projects will be displayed in an update appendix to this plan.

A STRATEGIC FUELS REDUCTION PLAN FOR THE HAT CREEK VALLEY FIRE SAFE COUNCIL

APPENDICES & MAPS

APPENDIX A

Tables

APPENDIX B

APPENDIX C

MAPS

HAT CREEK VALLEY FIRE SAFE COUNCIL AREA

APPENDIX A
A. HAT CREEK VALLEY FIRE SAFE COUNCIL AREA FUELS REDUCTION PLAN STRATEGY

I. EXECUTIVE SUMMARY

Wildfire plays a natural part in the evolution of vegetation in the 117,338-acre Hat Creek Valley Fire Safe Council Area (HCV-FSCA), located 50 miles east of Redding, California. Vegetation in the area is characterized by seven vegetation types: Douglas-fir-Mixed Conifer Forest, Mixed Conifer, Ponderosa Pine, Canyon Live Oak Woodland, Black Oak Woodland, Gray Pine Woodland, and Chaparral. Elevation ranges for these vegetation types are between 3,182 feet at Rock Spring on the valley floor and 7,863 at Burney Mountain.

Successful fire suppression activities combined with successful historic fuel modification for the past eighty years have significantly increased the volume of vegetation across the landscape, resulting in High to Very High Fire Hazard Severity Ratings by the CAL FIRE. The USDA Forest Service (USFS) rates the HCV-FSCA as an extreme wildfire zone.

The number and size of devastating wildfires impacting the western United States over the past ten years resulted in the creation of a National Fire Plan for the U. S. Departments of Interior and Agriculture. Funding was made available through the National Fire Plan, California Fire Plan, the 2003 Healthy Forests Initiative, and other agencies to assist local communities and watershed groups in identifying/planning and implementing fuel reduction programs.

The *Hat Creek Valley Strategic Fuels Reduction Plan* has been prepared for the Hat Creek Valley Fire Safe Council by the Western Shasta Resource Conservation District under a grant through the California Fire Safe Council, with funding provided by the USDA Forest Service and its Cooperative Forestry Assistance Program. The communities of Old Station, Hat Creek, and Cassel and surrounding rural residential areas have a population of about 849 permanent residents. There are also camping areas (public and private) and resorts existing in the area, which means the population in the area could easily triple in the tourist season..

The purpose of this plan is to identify and lay out a network for the construction of shaded fuelbreaks and other community activities that dovetail with fuel reduction plans of the USFS. These combined projects will be designed to increase protection for those living in the area, protect values at risk, provide firefighter safety when containing a blaze, allow residents safe transportation routes away from a wildfire, and encourage a maintenance plan to protect and continue this fuel reduction plan.

Prior to this plan, an inventory and location of the various fuel types was completed for the area by the Hat Creek Ranger District of the USDA Forest Service. This data was used to predict fire behavior in various vegetation types, and a fuel reduction plan was developed by the USFS to be implemented on public land. The intermingling of private with the public land has made it imperative to develop a fuel reduction plan for private land to complement and increase the effectiveness of the USFS fuel reduction plan.

The reader is reminded that this plan is not a static document. Information contained within is the best currently available. Present on-going research, next fire season, or a change in the community may make updates and changes to this Strategic Fuels Reduction plan necessary.

II. BACKGROUND

A. INTRODUCTION

In 2006 the California State Fire Safe Council awarded the Western Shasta Resource Conservation District (WSRCD) and the Shasta County Fire Safe Council a grant funding through the USDA Forest Service' Cooperative Forestry Program. A purpose of the grant was to prepare a Strategic Fuels Reduction Plan for the communities of Old Station, Hat Creek, and Cassel, all of which lie within the boundaries of the Hat Creek Valley Fire Safe Council. This plan supports the goals and objectives of the USFS Hat Creek Ranger District. WSRCD has completed other strategic fuels reduction plans in Shasta County for the Lower Clear Creek Watershed, Upper Clear Creek Watershed, Cottonwood Creek Watershed, Shingletown Ridge Area, Shasta West Watershed, Lakehead Fire Safe Council. and Cow Creek Watershed.

The Hat Creek Valley communities are located in the Hat Creek Valley, approximately 50 miles east of the City of Redding, California and 235 miles north of San Francisco. The Hat Creek Valley is part of the Pit River Basin and is an important watershed of the Sacramento River and Shasta Lake.

The Hat Creek Valley Fire Safe Council covers an area about 30 miles long, which averages about 18 miles wide, and covers a total area of about 183 square miles or approximately 117,338 actual acres. Access to the area is via State Routes 44, 89, and 299. Access is also available from several Forest Service roads.

The topography of this area varies from steep to valley floor, with elevations from 3,182 feet at Rock Spring near Cassel, to 7,863 feet on Burney Mountain. The land ownership in the area is owned primarily by the public (national forest land) and large timber companies, with a small percentage owned by small private land owners. Consequently, the area has remained relatively undeveloped over time and is a high quality water supply source for Lake Britton and later the Central Valley Project, which supplies water throughout California.

The communities within the Hat Creek Valley Fire Safe Council Area are: Old Station, Hat Creek, and Cassel, with McArthur-Burney Fall State Park occupying the northern end of the valley. Land ownership is 72% public and 28% private. The USDA Forest Service (USFS) land lies within, and is managed by the Lassen National Forest.

Fuels reduction projects for the Hat Creek Valley Fire Safe Council Area attain a high priority because the area is:

- Surrounded by the Lassen National Forest on all sides;
- Located near areas where major large fires have occurred in the past; and is:
- Surrounded by vegetation on Forest Service land that has the highest fire hazard risk rating given by the USDA Forest Service and CAL FIRE.

Based on the current conditions in this area and on the compounded hazardous fuels situation, the Lassen National Forest estimates are that the next fire event in this area is likely to be more extensive and destructive than the 1987 Lost Fire wildfire event. Timber stand structure within the valley indicates that an estimated 60 percent of the existing National Forest stands in the area are likely to generate or allow crown fire behavior in a future wildfire event.

B. STATEMENT OF NEED

i. Demographics

The 2000 census grouped population in the Hat Creek Valley by zip code. The post office at Old Station recorded 250 people served by its zip code. Hat Creek has recorded 392 people, and Cassel has 207 people, for a total population in the valley of 849 in 2000.

ii. Previous Reports

The Soil Survey of Lassen National Forest Area, California (USDA Forest Service, 1984) *and The Soil Survey of Intermountain Area, California* (USDA Natural Resources Conservation Service, 2003) were consulted for soil information. Specific information was used from the General Soil Maps, and from individual soil mapping unit descriptions.

iii. Climate

The elevation of the valley floor ranges from 4,500 feet at Old Station, to 3,300 feet at Hat Creek, to 3,200 feet at Cassel. Mean annual precipitation is 20 to 40 inches, some of this coming as snow. The mean annual air temperature is estimated to be 57 to 65 degrees Fahrenheit. Climatic data quoted from *The Soil Survey of Lassen National Forest Area, California.*

iv. Wildlife and Plants

Vegetation outside the developed agriculture areas is mainly trees and brush. It includes ponderosa pine, sugar pine, California black oak, incense-cedar, Douglas-fir, and white fir, with a mixed understory of ceanothus and manzanita. Vegetative elements include wild herbaceous plants, shrubs, desertic shrubs, riparian shrubs and trees, and coniferous trees. Deep side canyons typically support significant stands of aspen, cottonwood, and other riparian vegetation.

This vegetation provides important summer habitat for deer and some winter habitat at the lower elevations. Trees and rock outcrops provide important perching, roosting, and nesting habitat for birds of prey, including northern goshawk, golden eagle, bald eagle, and numerous hawks and owls. Various mammals inhabit the area, including mountain lion and black bear.

C. GOALS AND OBJECTIVES OF THE PLAN

The purpose of this plan is to create a fuel reduction plan for the Hat Creek Valley area. This area consists of high fire risk properties clustered on the valley floor and the forested wildlands on the hills surrounding the valley. This plan was completed in

partnership with CAL FIRE, USFS, Old Station Volunteer Fire Company, Hat Creek Volunteer Fire Company, Cassel Volunteer Company, the Hat Creek Valley Fire Safe Council (HCV-FSC), and any other individuals, businesses, and agencies that have interest in or jurisdiction in the Hat Creek Valley.

The goals and objectives of this plan are to:

- Provide for personal safety and minimize property loss
- Create a fire safe corridor along Highways 89 and 44, and the secondary roads feeding into them
- Partner with USFS and private landowners on a strategic fuels reduction plan
- Develop neighborhood fuel reduction projects within the communities at risk
- Assist the local Volunteer Fire Companies to up-grade their firefighting equipment
- Invite CalTrans, Sierra Pacific Industries, Roseburg Forest Products, and Shasta County Road Department to partnership with the HCV-FSC
- Protect ecological and landscape values to soils and to the environment
- Reduce volatile fuels on ridge lines, roads and large blocks of property
- Minimize the risk of wildfire starts
- Minimize wildfire from burning into the valley
- Reduce fuels so that large trees or other valued landscape vegetation will be spared
- Encourage safe burning practices for the reduction of fuels
- Identify agency and landowner fire prevention responsibilities
- Encourage and maintain multi-agency and landowner responsibilities in the implementation and maintenance of this plan

D. METHODOLOGY

The activities necessary for the development of the Hat Creek Valley Strategic Fuels Reduction Plan include:

- Meet with community members, landowners and stakeholders about the scope of a plan
- Evaluate values at risk, such as structures and natural resources
- Present data to the HCV-FSC Risk Assessment Committee, which includes local residents, representatives from USDA Forest Service (USFS), CAL FIRE and the local volunteer fire companies, for review and assistance in prioritization
- Coordinate with agencies on their management objectives in the valley
- Identify long term maintenance options for fuelbreaks
- Identify potential mechanical treatments and possible uses of excess fuels
- Develop a priority list of recommendations and potential funding sources
- Complete a draft community wildfire protection plan for review by the risk assessment committee
- Present a draft fuel management plan to the community through the HCV-FSC
- Incorporate recommendations and issue a final Strategic Fuels Reduction Plan.

III. SUPPORTING PLANS, ORGANIZATIONS AND AGENCIES

A. NATIONAL FIRE PLAN

In 2001 the Chief of the USDA Forest Service published a *National Fire Plan* (U.S. Department of Interior and U.S. Department of Agriculture, 2001), which is a cohesive strategy for improving the resilience and sustainability of forests and grasslands at risk, for conserving priority watersheds, species and biodiversity, reducing wildland fire costs, losses and damages, and to better ensure public and firefighter safety. To achieve these goals, work began to improve firefighting readiness, prevention through education, rehabilitation of watershed functions, hazardous fuel reduction, restoration, collaborative stewardship, monitoring jobs, and applied research and technology transfer.

The objective of the National Fire Plan is to describe actions that could restore healthy, diverse, and resilient ecological systems to minimize the potential for uncharacteristically intense fires on a priority basis. Methods include removal of excessive vegetation and dead fuels through thinning, prescribed fire and other treatment methods. The focus of the strategy is on restoring ecosystems that evolved with frequently occurring, low intensity fires. These fires typically occurred at intervals of between 1-35 years and served to reduce the growth of brush and other understory vegetation while generally leaving larger, older trees intact. The report is based on the premise that sustainable resources depend on healthy, properly functioning, resilient ecosystems. The first priority for restoration is the millions of acres of already roaded and managed landscapes that are in close proximity to communities. More information about the National Fire Plan is available on the Internet at www.fireplan.gov.

B. THE CALIFORNIA FIRE PLAN

The California Fire Plan has five strategic objectives:

1. Create wildfire protection zones that reduce risks to citizens and firefighters.
2. Assess all wildlands (not just the state responsibility areas) to identify high risk, high-value areas and develop information and determine who is responsible, who is responding, and who is paying for wildland fire emergencies.
3. Identify and analyze key policy issues and develop recommendations for changes in public policy.
4. Develop a strong fiscal policy focus and monitor wildland fire protection in fiscal terms.
5. Translate the analyses into public policies.

A key product of the Fire Plan is the identification and development of wildfire safety zones to reduce citizen and firefighter risks from future large wildfires. Initial attack success is measured by the percentage of fires that are successfully controlled before unacceptable costs are incurred. Assets at risk are identified and include citizen and firefighter safety, watersheds, water, timber, wildlife, habitat, unique areas, recreation, range structures, and air quality. Air quality is a factor because based on the annual average acres burned by wildfires from 1985-1994, CAL FIRE calculates wildfires emit almost 600,000 tons of air pollutants each year.

The safety and asset assessments in the plan enable fire service managers and stakeholders to set priorities for prefire management project work. Prefire management includes a combination of fuels reduction, ignition management, fire-safe engineering

activities and improvements to forest health to protect public and private assets. CAL FIRE finds there is a direct relationship between reduced expenditures for prefire management and suppression and increased emergency fund expenditures, disaster funding, and private taxpayers' expenditures and losses.

CAL FIRE is responsible for fire suppression on privately-owned wildlands and provides emergency services under cooperative agreements with the counties.

In 2000 the State Board of Forestry and CAL FIRE completed a comprehensive update of the state fire plan for wildland fire protection in California. The overall goal of the plan is to reduce total costs and losses from wildland fire by protecting assets at risk through focused prefire management prescriptions and increasing initial attack success. CAL FIRE"s statewide Initial Attack Fire Policy is to aggressively attack all wildfires, with the goal of containing 95% of all fire starts to 10 acres or less.

In the Hat Creek Valley, USFS, Lassen NF, Hat Creek RD has the primary responsibility for wildland fire protection for the communities of Hat Creek and Old Station. The community of Cassel is under Shasta County for the protection of wildland and structural fires. The area North of Hwy 299 is under state protection for wildland and structural fires. Shasta County Fire Dept. does have responsibility for all structural and medical aid responses for the communities Hat Creek and Old Station. The Forest Service and CAL FIRE do have a cooperative agreement for dispatching and resource sharing on all wildland fires occurring in the mutual threat zone along the Hwy 89 and Hwy 299 corridors. The cooperative agreement in conjunction with the six party agreement that does outline the cooperative sharing of resources on wildland fire suppression efforts.

In summary, USFS and CAL FIRE believe that cooperative fire protection, fuels reduction, and fire prevention must be linked in order to have future success in dealing with the wildfire problems within the HCV-FSCA.

C. SHASTA COUNTY FIRE SAFE COUNCIL

The Shasta County Fire Safe Council (SCFSC) was formed in May 2002 as part of a statewide effort that began in 1993 to form area Fire Safe Councils across the state to educate and encourage Californians to prepare for wildfires before they occur. (See www.firesafecouncil.org for more information.) The mission of the Shasta County Fire Safe Council is to be a framework for coordination, communication and support to decrease catastrophic wildfire throughout Shasta County. The group meets quarterly to discuss projects, share information, schedule speaking engagements, develop educational opportunities, and update maps showing fuels reduction projects and maintenance throughout the county. SCFSC has a public outreach element in the form of an educational exhibit housed in a trailer designed specifically for the purpose. The trailer is available for use by fire safe councils throughout the county for use at schools, fairs, and other civic gatherings. For more information check out SCFSC on the web at www.westernshastarcd.org.

D. LASSEN NATIONAL FOREST

The Forest Service administers about 76,713 acres or 65% of the Hat Creek Valley Fire Safe Council Area (See Map #4). These lands are managed as part of the Hat

Creek Ranger District of the Lassen National Forest (LNF). A completed *Fuels Analysis and Strategy* provides a basis for managers to make decisions concerning placement and priorities of fuels management projects. It is a unit level analysis meant for forest level considerations. The report states it may also be used as a tool for project level planning.

The analysis characterizes the LNF in terms of hazard, risk and value. Hazard is defined as fire behavior potential, which has implications for resource damage as well as suppression capability. Risk is the probability of a fire occurring based on local fire history. Value refers to the monetary, ecological or political worth of a definable area. All three values (hazard, risk and value) are quantified by a measure of low, moderate, or high through a combined use of scientific data and technical expertise, and displayed in a GIS map. The three are then combined in an overall rating.

The final step of this analysis prioritizes the forest in terms of critical fire danger areas based on the hazard, risk and value ratings and management needs. These priorities align with the National Fire Plan and the Cohesive Strategy and will guide resource management considerations on the forest, such as natural fuels project priorities and identification of essential road access for protection purposes. The national priorities are wildland-urban interface, readily accessible municipal watersheds, threatened and endangered species habitat, and maintenance of existing low risk Condition Class I areas.

E. PRIVATE TIMBER PRODUCTION ZONES

About 38,076 acres or 32% of the HCV-FSC area are owned by private forest landowners who manage the lands as Timber Production Zones (TPZs), which are restricted to timber production and certain compatible uses (See Map #4). Fruit Growers Supply is the largest commercial forest landowner in the watershed.

Typically, all contractors and employees permitted on private forest land are required to make every effort and take all precautions necessary to prevent fires. A sufficient supply of hand tools are maintained on a job site at all times for fire fighting purposes only. Tools include shovels, axes, saws, backpack pumps, and scraping tools. Each forest worker, employee, or person permitted on private forest land is required to take immediate action to suppress and report any fire on or near the property.

On all fires, a sufficient number of people stay on a fire until it is known that adequate action has been taken by USFS taking primary responsibility for putting out the fire. All people and equipment remain until released by the agency in charge, or for a longer period, if considered necessary by the land manager.

During fire season, most companies conduct daily aerial patrols covering their forest operations and pay special attention to those areas where work is being conducted, even hours after workers have left the area.

Specific treatments are required for limbs and other woody debris (often called slash) created by harvest operations in order to minimize fire hazards in areas where the public has access. It can include piling and burning slash no later than April 1 of the year following its creation, or within a specified period of time after fire season, or as justified in the associated Timber Harvest Plan. Within 100 feet of the edge of the traveled surface of public roads, and within 50 feet of the edge of the traveled surface of permanent private roads open for public use where permission to pass is not required, slash and any trees knocked down by road construction or timber operations are typically lopped for fire hazard reduction, then piled and burned, chipped, buried or removed from the area. Lopping is defined as severing and spreading slash so that no part of it remains more than

30” above the ground. All woody debris created by harvest operations greater than one inch (1”) and less than eight inches (8”) in diameter within 100 feet of permanently located structures maintained for human habitation are removed or piled and burned. All slash created between 100-200 feet of permanently located structures maintained for human habitation are usually lopped (cut) for fire hazard reduction, removed, chipped or piled and burned. Lopping may be required between 200-500 feet from a structure if an unusual fire risk or hazard has been determined.

F. PRIVATE LAND – OTHER

Other private land in Hat Creek Valley totals about 2,549 acres or 3% of the HCV FSC Area (See Map #4). Private land use includes farms, ranches, residences, businesses, and recreation facilities in and around the communities of Old Station, Hat Creek, Cassel, and McArthur-Burney Falls State Park.

G. PARTNERS

The Hat Creek Valley Fire Safe Council was founded in 2005 by a group of volunteer firefighters and concerned homeowners who recognized the need to reduce the hazard of wildfire from around their communities and homes.

The goals and objectives of HCV-FSC follow:

Establish guidelines including:

1. Development of Fire Safety education
2. Demonstrate different fuel reduction techniques to local residents and agency members
3. Identify local fire dangers and develop a Strategic Fuels Reduction Plan
4. Develop and implement plans to reduce fire danger
5. Develop evacuation procedures
6. Continue expansion of guidelines for future HCV-FSC projects

Following is a list of organizations and agencies HCV-FSC is partnering with to implement this Strategic Fuels Reduction Plan.

- USDA Forest Service (USFS),
- USDA Natural Resources Conservation Service (NRCS),
- USDI Bureau of Land Management (BLM),
- USDI National Park Service(NPS),
- USDI Fish and Wildlife Service (USFWS),
- California Department of Fish and Game (DFG),
- California Department of State Parks (DSP),
- California Department of Forestry and Fire Protection (CAL FIRE),
- California Highway Patrol (CHP),
- CalTrans,
- UC Cooperative Extension Service (UCCE),
- Fall River Resource Conservation District (FRRCD),
- Western Shasta Resource Conservation District (WSRCD),
- Shasta County Board of Supervisors
- Shasta County Fire Safe Council (SCFSC),
- Shasta County Sheriff’s Department,

- Shasta County Road Department,
- Old Station Volunteer Fire Company,
- Hat Creek Volunteer Fire Company,
- Cassel Volunteer Fire Company,
- Shasta County Fire Department,
- Sierra Pacific Industries (SPI),
- Fruit Growers Supply,
- Pacific Gas and Electric (PG&E),
- Local Native American Tribes,
- The communities of: Old Station, Hat Creek, and Cassel.

IV. ANALYSIS OF FUEL INVENTORY AND CONDITIONS

A. RECENT HISTORY OF MAJOR FIRES

Three (3) other major fires occurred in Shasta County in the last decade, the Fountain Fire near Round Mountain (1992) burned 63,960 acres, the Canyon Fire near Happy Valley (2001) burned 2,580 acres, and the Jones Fire near Bella Vista (2001) burned 26,020 acres were wind driven events, with resulting extreme fire behavior and great property and timber losses.

In summary, with heavy fuel loading, hot temperatures, critically low humidity, and strong hot - dry winds, a major wildfire potential exists in the Hat Creek Valley and eastern Shasta County area.

B. AGENCY LARGE FIRE DATABASES

CAL FIRE and USFS maintain databases and GIS layers on large fires and fire starts within and around their Forest Protection Zones (FPZ). The CAL FIRE database also includes fires recorded within the NPS FPZ. Both databases include the year of fire start, large fires, and total fire acreage, but cause of fire is included only on CAL FIRE fire start data and USFS large fire data.

USFS records were made only of those fires that received some type of fire suppression action; fires that had no suppression activity or that went out due to natural causes were not recorded. The CAL FIRE database does not contain fire starts prior to 1985.

C. WILDLAND FIRE ENVIRONMENT

The three major components of the wildland fire environment are fuels, weather, and topography (National Wildland Coordination Group, 1994). Weather is a major factor and local weather conditions are important in predicting how a fire will behave.

The climate in Hat Creek Valley is typically Mediterranean with wet, cool winters and dry, warm summers. Three types of fire weather conditions that occur during the dry period of the year (fire season) are important factors when considering Hat Creek Valley weather. These types of weather conditions are: 1) Pacific High – Post Frontal (Post-Frontal), 2) Pacific High-Pre Frontal (Pre-Frontal, and 3) Subtropical High Aloft (Subtropical High).

The Cone fire in September 2002 that burned 2006 acres, mostly in the Blacks Mountain Experimental Forest, is an example of a major fire that burned under Post-Frontal conditions. The Lost fire in the Hat Creek Valley that burned more than 24,000 acres in September 1987 and the Fountain fire of August 1992 that burned more than 63,960 acres on Hatchet Mountain are examples of fires driven by Pre-Frontal conditions. An example of a Subtropical High type fire is the Bolam fire that burned approximately 960 acres on the north side of Mt. Shasta in August 1970.

Lightning strikes are a common source of ignition for wildfires in the mountains and hills surrounding Hat Creek Valley. Occasionally, incursions of subtropical moisture that moves north from the eastern Pacific and the Gulf of California produce widespread thunderstorms that result in numerous fires. Hundreds of lightning fires can be ignited over short periods during these events. The occurrence of widespread, simultaneous, lightning ignitions has contributed to fires that burn for weeks and cover very large areas as in 1977, 1987, 1990, and 1999. The information on climate and lightning has been gleaned from the book ***Fire in California's Ecosystems***, University of California Press, 2006.

Topography can affect the direction and the rate of fire spread. Topographic factors important to fire behavior are elevation, aspect, steepness and shape of the slope. When fire crews are considering fire suppression methods, the topography is always critical in determining the safest and most effective plan of attack. When accessible, ridge lines are very important features from which to conduct fire suppression activities and can be a strategic area from which to conduct fuels management activities.

Fuel factors that influence fire behavior are: fuel moisture, fuel loading, size, compactness, horizontal continuity, vertical continuity, and chemical content. (National Wildfire Coordinating Group 1994)

- Fuel moisture is the amount of water in a fuel, expressed as a percentage of the ovendry weight of that fuel. For example, a fuel sample can be found to have 20- 60% moisture content. Moisture content can range from as low as 5 % to a high of 260+%.
- Fuel loading is defined as the ovendry weight of fuels in a given area, usually expressed in bone dry tons. For example, an area can be calculated to have 20 bone dry tons per acre of fuel. A bone dry ton is 2000 pounds of vegetation when rated at 0% moisture content.
- Size refers to the dimension of fuels, and compactness refers to the spacing between fuel particles.
- Continuity is defined as the proximity of fuels to each other, vertically or horizontally, that governs the fire's capability to spread and sustain itself.
- Chemical content in fuels can either retard or increase the rate of combustion.

All of these factors will influence the quantity of heat delivered, the duration, flame length and the rate of spread of any given fire, and should be considered prior to considering pre-fire projects or initiating fire suppression activities.

D. FUEL INVENTORY

The Lassen National Forest has developed a GIS layer that shows the fuels in the Hat Creek Valley area. Fuels are made up of the various components of vegetation, live and dead, that occur on a given site. Fuels have been classified into four groups – grasses, brush, timber, and slash. The differences in fire behavior among these groups are

basically related to the fuel load and its distribution among the fuel diameter-size classes. In 1972, 13 mathematical fire behavior models or Fuel Models were developed by Rothermel (1972) to be utilized in fire behavior predictions and applications for every vegetation type. These Fuel Models represent the types of fuel most likely to support a wildfire.

TABLE 1 – FUEL MODEL TYPES – ROTHERMAL, 1972

Fuel Model	Fuel Complex
	Grass and Grass-Dominated
1	Short Grass (1 foot)
2	Timber (grass and understory)
3	Tall Grass (2.5 feet)
	Chaparral and shrub fields
4	Chaparral (6 feet)
5	Brush (2 feet)
6	Dormant brush, hardwood slash
7	Southern rough
	Timber litter
8	Closed timber litter
9	Hardwood litter
10	Timber (litter and understory)
	Slash
11	Light logging slash
12	Medium logging slash
13	Heavy logging slash

The fuel models were designed to estimate fire behavior during severe fire hazard conditions when wildfires pose greater control problems and severely impact natural resources. Fuel models are simply tools to help the user realistically estimate fire behavior. The criteria for choosing a fuel model includes the assumption that fire burns in the fuel stratum best conditioned to support the fire. This means that situations will occur where one fuel model will represent the rate of spread most accurately, while another best depicts fire intensity. In other situations, two different fuel conditions may exist, so the spread of fire across the area must be weighed by the fraction of the area occupied by each fuel type.

In 2005 the fuel models were revised by Joe H. Scott and Robert E. Burgan in *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model.* These fuel models were designed to reflect wildfire behavior after fuel reduction treatment, and supplement fire behavior fuel models for use in the Rothermel (1972) surface fire spread model.

Fuel models in the new set are grouped by fire-carrying fuel type. The number of fuel models within each fuel type varies. Fuel types are as follows:

- (NB) Non-burnable
- (GR) Grass

- (GS) Grass-Shrub
- (SH) Shrub
- (TU) Timber-Understory
- (TL) Timber-Litter
- (SB) Slash-Blow-down

Fuel models in the new set are grouped by fire-carrying fuel type. Fuel types are denoted as follows:

TABLE 2 – SCOTT/BURGAN FUEL MODEL NUMBERS TO STANDARD AND CUSTOM FUEL MODELS**

Fuel Type	Fuel Model Number Block	Used in Original or New Set	Reserved for Future Standard Fuel Models	Available for Custom Fuel Models
	1-13	1-13		
	14-89			14-89
NB	90-99	91-93, 98-99*	94-95	90, 96-97
GR	100-119	101-109	110-112	100, 113-119
GS	120-139	121-124	125-130	120. 131-139
SH	140-159	141-149	150-152	140, 153-159
TU	160-179	161-165	166-170	160, 171-179
TL	180-199	181-189	190-192	180, 193-199
SB	200-219	201-204	205-210	200, 211-219
	220-256			220-256

* The gap in the NB numbering sequence is to retain fuel model numbers 98 as open water and 99 as "rock" (bare ground), as has been the convention in other fuel modeling programs.

** From Scott and Burgan, 2005.

Results of the Fuel Inventory

The USFS Fuel Model GIS layer (Map #3) shows that the HCV-FSC Area is covered by the following Fuel Models determine using field observation by Forest Service personnel and classifying their findings according the fuel model that best fits the local area.

TABLE 3 – FUEL MODEL TYPE, EXTENT, AND CHARACTERISTICS

Fuel Model Type	Extent (Acres)	Characteristics
NB 3	3,400	Agriculture
NB 8	315	Water
NB 9	1,023	Rock/Barren
SH 2	39,506	Moderate Load, Dry Climate Shrub
SH 7	1,944	Very High Load, Dry Climate Shrub

TU 5	600	Very High Load, Dry Climate Timber-Shrub
TL 5	28,629	High Load, Conifer Litter
TL 8	41,921	Long Needle Litter

To understand the current fuel loading conditions, it is important to understand past fuel loading conditions. Local fire history is shown on Map #2. Due to the historical fire regime, overall plant densities were most likely lower than those of today. Frequent fires would have drastically reduced vegetation densities and accumulated fuels. Furthermore, it is also very likely that the species composition is much different today due to fire suppression. Fire-adapted species, which thrived in re-occurring fire environments, have declined due to competition from non-fire dependent species. Whatever the cause of the fuel modification, the resulting danger from wildfire is critical. Those areas in the wildland urban interface are graphically represented as the High rating areas.

E. OTHER WILDFIRE PROTECTION PLANS

McArthur-Burney Falls Memorial State Park Wildfire Management Plan, April 29, 1997, states it is the policy of the Department of Parks and Recreation (DPR) to eliminate all unwanted fires occurring on State Park System lands. DPR has a companion, in-house fire management document that addresses prevention and pre-suppression activities. As of March 1, 2007, DPR has adopted a new wildfire planning document stating revised guidelines and policy to aid agency personnel in their efforts to update existing wildfire management plans.

The USDA Forest Service, Hat Creek Ranger District, has published a Decision Memo implementing the Jawbone Wildland Urban Interface Project, which comprises approximately 430 acres in Section 33, Township 35 north, Range 4 East, and Sections 4, 9, 15, and 22, Township 34 North, Range 4 East located in the Hat Creek Valley. As written, the prescription for fuels reduction consists of 1) Manual Treatment, Piling, and Pile Burning; and 2) Mechanical Treatment and Underburning.

V. VALUES AT RISK

A. RESIDENCES AND MAJOR STRUCTURES

About 773 homes make up the communities of Old Station, Hat Creek, and Cassel, and the surrounding area. Major structures include stores, post offices, restaurants, schools, and resorts.

COMMUNITY INFRASTRUCTURE:

OLD STATION VOLUNTEER FIREHOUSE

HAT CREEK VOLUNTEER FIREHOUSE

CASSEL VOLUNTEER FIREHOUSE

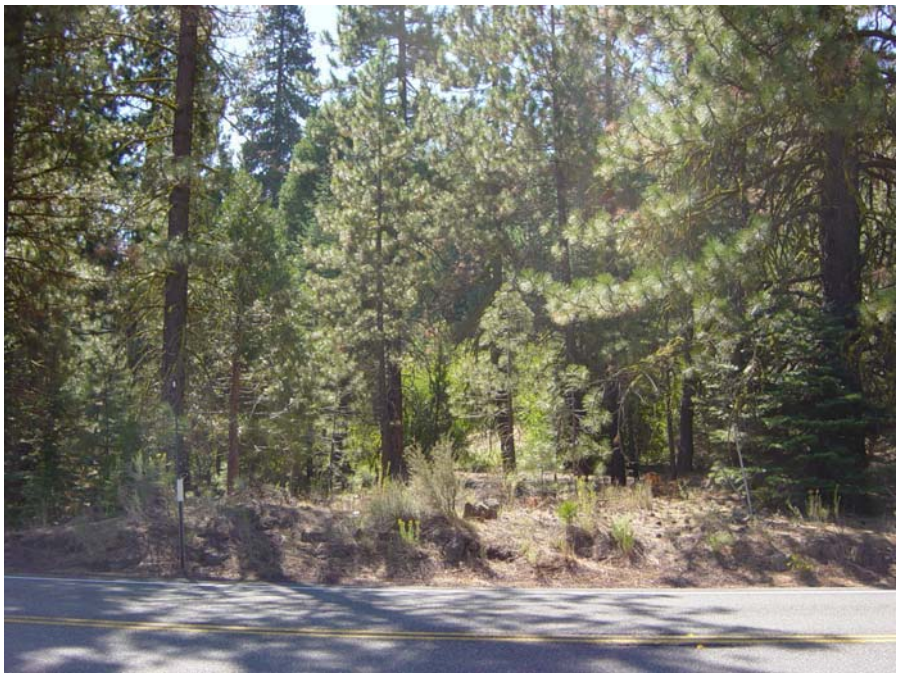
The year-round population is 849 residents. In summer, the population swells with recreationists.

HAT CREEK STORE, OLD STATION

JJ'S CAFÉ, OLD STATION

B. FOREST LAND

Private timber production zones occupy about 38,076 acres in the higher elevations surrounding the valley (See map #4). These lands are operated and managed by commercial timber companies, which are regulated by the California Forest Practice Rules. The intent of the Forest Practice Act is to "create and maintain an effective and comprehensive system of regulation and use of all timberlands so as to assure that: a) where feasible, the productivity of timberlands is restored, enhanced and maintained; and b) the goal of maximum sustained production of high-quality timber products is achieved while giving consideration to values relating to recreation, watershed, wildlife, range, forage, fisheries, regional economic vitality, employment and aesthetic enjoyment."



COMMERCIAL FOREST LAND

C. FISH AND WILDLIFE

The Hat Creek Valley has a typical distribution of wildlife species for the forests, woodlands, and brushlands of northern California. Elevation and exposure are primary influences on the distribution of these forest habitats. Douglas-fir occurs on north and east slopes, especially at elevations over 3,000 feet, but Douglas-fir is also a component of mixed conifer forests where the exposure is slightly warmer or elevations lower. The driest habitat types occur on the east side of the valley. These areas are often vegetated by brushfields and gray pine. Ponderosa pine also occurs in these areas, but is more prevalent on east and north facing slopes. California black oak also occurs as a minor species in all forest types. The California black oak is an important source of mast for wildlife. Mast is the fruit of oaks and other trees, particularly where considered food for wildlife and domestic livestock. Wildfire control over the past 100 years has encouraged the increase of western juniper, an aggressive, native species on the landscape. Those areas having less than 12 inches of precipitation are where this increase on the juniper is most notable.

Listed Species

The extensive forest present in the HCV-FSCA serves as habitat for several threatened, endangered, or sensitive species (See Map #5).

- The bald eagle (Haliaeetus leucocephalus) - federally threatened and state endangered
- The Pacific fisher (Martes pennanti pacifica) – federal species of concern and state species of special concern
- The northern goshawk (Accipiter gentiles) – federal species of concern
- California wolverine (Gulo gulo) – federal species of concern and state threatened
- Marten (Martes americana) – federal sensitive species

Fisheries

Hat Creek enjoys the reputation among sport fishermen as one of the best fishing streams in northern California.

VI. FUEL TREATMENTS

A. INTRODUCTION

Reducing fuel loads is one of the most effective elements of any fire prevention and protection program. Although fire is an integral component of the California ecosystem, managing fire by managing fuel loading is critical to maintaining communities, ranches, forest land, grazing lands, riparian areas, and the overall health and function of a watershed. The ability to implement fuel reduction projects typically comes down to the source of funds available, the cost of labor, the permitting process to implement the project, and landowner cooperation.

B. SHADED FUELBREAKS

Shaded fuelbreaks are constructed to create defensible space where firefighters can conduct relatively safe fire suppression activities. Shaded fuelbreaks may also slow a wildfire's progress enough to allow supplemental attack by firefighters. The main idea behind shaded fuelbreak construction is to break up fuel continuity to prevent a fire from reaching the treetops, thus forcing the fire to stay on the ground where it can be more easily and safely extinguished. Shaded fuelbreaks may also be utilized to replace flammable vegetation with less flammable vegetation that burns less intensely. A well-designed shaded fuelbreak also provides an aesthetic setting for people and a desirable habitat for wildlife, in addition to fuels reduction. The California Board of Forestry has addressed the needs to strengthen community fire defense systems, improve forest health and provide environmental protection. The Forest Practice Rules allow a Registered Professional Forester (RPF) to use a special silviculture prescription when constructing or maintaining a community fuelbreak, exempts community fuelbreaks from an assessment of maximum sustained production requirements, and allows defensible space prescriptions to be used around structures.

The WSRCD, through consultation with its agency partners, has developed the following Shaded Fuelbreak Standards:

- The typical minimum width of a shaded fuelbreak is 100 feet, but can be up to 300 feet wide or more. The appropriate width is highly dependent on the slope, fuel density, fuel type, fuel arrangement, and landowner cooperation.
- Fuelbreaks should be easily accessible by fire crews and equipment at several points. Rapid response and the ability to staff a fire line is very important for quick containment of a wildfire.
- The edges of a fuelbreak are varied to create a mosaic or natural look. Where possible, fuelbreaks should compliment natural or man-made barriers such as meadows, rock outcroppings, and roadways.
- A maintenance plan should be developed before construction of a fuelbreak. Although a fuelbreak can be constructed in a matter of a few weeks, maintenance must be conducted periodically to keep the fuelbreak functioning properly.

- The establishment of a shaded fuelbreak can lead to erosion if not properly constructed. Ground cover, such as grass or prostrate shrubs, should be maintained throughout the fuelbreak to protect the soil from erosion.

Demonstration Fuelbreak at Canyon School in Lakehead

A properly treated area should consist of well-spaced vegetation with little or no ground fuels and no understory brush. Tree crowns should be approximately 10-15 feet apart. The area should be characterized by an abundance of open space and have a 'park like look' after treatment.

In areas where privacy is a concern, islands of brush may be left in strategic positions. CAL FIRE recommends that brush left in place be limited to islands having a diameter two times the height of the brush, and a distance three times the height of the brush between the islands. If the islands of brush are strategically placed, a homeowner can achieve a reasonable amount of defensible space, and retain the privacy most people are seeking when they move to the wildland – urban interface (WUI).

The Pile and Burn method is most commonly utilized when constructing fuel breaks. Material is cut and piled in open areas to be burned. Burning takes place under permit on appropriate burn days. Burn rings can be raked out after cooling as a means to decrease their visual effect, and seeded with native wildflowers to regain some ground cover and discourage non-native weeds from occupying the site.

C. MECHANICAL TREATMENT

Using mechanized equipment for reducing fuels loads on suitable topography and in certain fuel types can be very effective. Depending on the use of the equipment, it may

require environmental review and documentation. Using equipment to remove excess vegetation may enable the landowner to process the debris to a level where it can be marketed as a product for use in power generation. The debris then becomes labeled as "biomass" or "biofuels" and is further explained in Section IX of this report.

Mechanical methods to remove fuels include, but are not limited to, the utilization of bulldozers with or without brush rakes, excavators, chainsaws or mechanized falling machines, masticators, chippers, and grinders. Mechanical treatments are typically conducted with some type of masticator, which grinds standing brush and reduces it to chips, which are typically left on the ground. Brush may also be mechanically removed and fed into a grinder for biomass production. Mechanical treatments are also utilized on industrial and non-industrial timberlands in which trees are thinned by mechanized tree cutting or falling machines. In most cases, stands of trees are thinned from below as a means to eliminate the fuels that can take a fire higher in the forest into the tree canopy (ladder fuels). However, stands of trees may also be thinned from above to eliminate crown continuity.

Mechanical treatments can be used successfully on stable ground up to 50% slope, but should only be conducted during dry periods when soils are not saturated to minimize erosion and compaction. The drastic visual impacts should be considered when planning projects so that all parties are aware of how the area will look when the project is completed. Initial planning should address mitigation for erosion potential, using measures such as waterbars, ditching, and mulching in critical areas. Furthermore, the impacts on wildlife and archaeological resources must be addressed.

Due to air quality concerns, the mechanical treatment method is becoming a more acceptable method of fuel reduction in WUI areas despite its greater cost. Compared to prescribed fire, mechanical treatment involves less risk, produces less air pollutants, is more aesthetically pleasing, and allows landowners to leave desirable vegetation.

Mechanical treatment will usually necessitate a cultural resource survey, CEQA/NEPA documentation and compliance, a Natural Diversity Database search, and the preparation of Water Quality documents. The cost of these safeguards must be figured into the budget for any projects using mechanical methods.

D. MAINTENANCE TREATMENT

Maintenance plans for all existing shaded fuelbreaks, as well as a maintenance strategy for all planned shaded fuelbreaks need to be formulated as soon as funding can be made available. A maintenance section needs to be added to all planned shaded fuelbreaks. Scrub oak re-sprouts and manzanita seedlings on disturbed areas are typical of the vegetation needing control. Control can take many forms including chemical control, mechanical control, or grazing by livestock (namely goats).

The time frame for maintenance is typically two years, five years and ten years after initial construction of the shaded fuelbreak. Treatment with livestock would need to be repeated more frequently (See #2 below).

Periodic maintenance of a fuelbreak sustains its effectiveness. Seeding the fuelbreak with annual grass cover immediately following its construction will help reduce brush and conifer invasion, but depending solely on grass cover will not eliminate invading plants for an extended period of time. The species of grass must be selected with care. A mature stand of tall grass presents a flashy fuel hazard that may be almost bad as the brush re-sprouts.

Shade is another method for controlling the re-growth of vegetation. The shade in shaded fuelbreaks is a two-fold benefit. Not only does it make the fuelbreak more aesthetically palatable, the shade also limits the re-growth of shade intolerant species like manzanita and toyon.

Following are several methods to maintain fuelbreaks:

1. Herbicides

The use of herbicides is a very effective and inexpensive method of eliminating unwanted vegetation, but there are many restrictions. Some herbicides are species specific, which means they can be used to eliminate brush species and will not harm grass species. Manual treatment is also a very effective means to eliminate invading vegetation, but is very labor intensive. The cost of fuelbreak maintenance must be balanced with its degree of effectiveness.

2. Herbivores

Herbivore (goat) grazing may be used as a means of maintaining fuelbreaks, since goats will eat brush and weeds. Browse makes up about 60% of a goat's diet, but only about 10-15% of a cow's diet.

Goats used for fuel load reduction are managed to remove dense understory, including brush, shrubs, forbs, and lower branches to remove ladder fuels. It may require giving goats supplements of protein or energy, depending on the class of goats used and the time of year. The choice must be balanced on the type of soil, vegetation and livestock analysis. Monitoring of the herbivore grazing is critical since over-grazing can lead to erosion.

As goats work through an area they also work on the understory, old pine needles and leaves, break lower branches, and split apart old downed branch material. Once an area has been "brushed" by goats, it can be maintained as a living green belt. Fire control or containment with goats takes coordination of the stock owner, land steward, local fire patrol, professional fire abatement teams, CAL FIRE, DFG, and others.

According to a report published by the North Carolina Cooperative Extension Service, grazing goats have been observed to select grass over clover, prefer browsing over grazing pastures, prefer foraging on rough and steep land than over flat, smooth land, graze along fence lines before grazing the center of a pasture, and graze the top of the pasture canopy fairly uniformly before grazing close to the soil level.

Herbivore grazing has been done in the Sierra Foothills by Goats Unlimited, Rickerby, CA. They report the vegetation in the Sierra Foothills grazing area consists of woody plants, shrubs, forbs and grasses. Before entering a new area, the herder develops a landscape goal, completes a vegetative survey and identifies toxic plants. They identify the growth habit and adaptation of each plant species, especially those that are toxic. The objective is to control the invasion of unwanted species and encourage perennial grasses to return. In a report published by Langston University, goats improve the cycling of plant nutrients sequestered in brush and weeds, enabling the reestablishment of grassy species. Portable electric fencing with solar energizers is used to control the goats' foraging area.

A "Rule of Thumb" for the cost of using goats for fuels reduction projects was found in a report on the Internet. A minimum effective goat herd has 500 animals, which will remove fuel from about 3 acres per day at a cost of $1.00 per day per goat. The cost

includes the goats, portable fencing, a goat herder, water and all transportation and daily supervision.

Herbivores Used In Fuel Reduction

3. Converting Brush Land to Forest Land

Brush land frequently occurs on soils that are best suited for growing brush. The exception to this are forest soils that have been burned, and have come back to brush. Brushland soils are sloping to very steep loams and are gravelly, stony, or rocky. These soils are usually shallow to bedrock, and available water capacity is low or very low. Vegetation is generally chaparral, which includes such species as chamise, Lemmon ceanothus, buckbrush, toyon, poison-oak, whiteleaf manzanita, and western mountainmahogany. There are few trees occurring on the sites, such as interior live oak and gray pine. At least 80 percent of the surface cover is woody vegetation.

Conversion from brushland to forest land will entail a thorough investigation of the site. Soil depth, type, aspect, and exposure will all determine the success or failure of an attempted conversion. With few exceptions, most of the brushy sites are naturally occurring, and represent the native vegetative community.

Natural regeneration of coniferous species after a burn is very difficult to accomplish. A conversion from brush to forest land should begin with a thorough investigation of the capability of the site to support coniferous trees. The second, or next step, should be to secure a reliable source of climatically adapted seedlings; and the third step should be to develop a planting plan. A realistic cost estimate should be the fourth step. All this should be accomplished before the existing brush cover is removed.

HCV-FSC DEMONSTRATION PROJECTS:

HCV-FSC is conducting three fuel reduction demonstrations as part of their agreement with WSRCD and the State Fire Safe Council. Three sites were chosen from a group of volunteer landowners. One site was chosen in each community. Two demonstration sites were treated mechanically, and a third was treated by hand. See Appendix B for details about the demonstration projects. HCV-FSC would like to thank

the landowners and the committee who volunteered to participate in the demonstration projects.

VII. SOILS

The soil information for the Hat Creek Valley has been obtained from multiple sources. Soils information is excerpted from the Soil reports from the Lassen National Forest, Natural Resources Conservation Service, and the Shasta-Trinity National Forest. The Soils Map for the Hat Creek Valley appear in Map #7.

Soil parent materials in the area can be characterized as either volcanic rocks, or alluvium. Soils on the valley floor are typically gently sloping, shallow to deep, well to poorly drained, sandy loam to silt loam soils, on alluvial fans and valleys. Upland soils are characterized as moderately deep to deep, well to somewhat excessively drained on volcanic flats, gently sloping hills, ridges, and mountain side slopes. Lava flows occur as flat to steep, excessively drained, miscellaneous land types. Rock outcrop and rubble land usually occur on steeper slopes.

Typical native vegetation on the valley floor is perennial and annual grasses, big sage, silver sage, lodgepole pine, aspen, willow, and black sage. The majority of this land is used as summer rangeland.

Upland soils typically have vegetation consisting of Jeffrey pine, ponderosa pine, sugar pine, incense-cedar, California black oak, white fir, mountain whitethorn, deerbrush, and Greenleaf manzanita.

Vegetation on lava flows and rock outcrops is basically western juniper, mountain mahogany, Greenleaf manzanita, big sage, and a few conifers growing in pockets of soil.

Fuels management activities located on unstable soils or on slopes greater than 40 percent can stimulate erosion processes or exacerbate existing erosion problems; therefore, prior to any fuels management activities, all soil types within any future project area should be identified and evaluated to determine the erosion hazard. Projects should be designed to prevent or minimize erosion by reducing soil disturbance, maintaining vegetation where appropriate, avoiding steep and unstable slopes if possible, and incorporating the use of grass seed or fire resistant vegetation as a means to provide soil stabilization. Detailed soil mapping information should be examined once project boundaries have been established.

High intensity wildfire can also damage soil by incinerating roots and the humus layer (organic portion of soils) that holds soils together and provides energy dissipation. In addition, the loss of large areas of vegetation can reduce evapotranspiration and increase peak flow, which can result in augmented erosion potential, adversely affecting watershed resources. Many life forms, including invertebrates of phylum Arthropoda that are essential for cycling plant material and fixing atmospheric gases, are unknowingly destroyed. These invertebrates eventually re-establish their populations, but time is lost in maintaining and building up the soils. Over time, continual burning will result in soil depletion, much the same as continual plowing and crop harvesting will deplete the soil of mineral nutrients and negatively affect the soil structure. Fortunately in this area of California, there exist relatively young volcanic soils in the mountains and recent alluvial soils in the valleys that can tolerate fire without immediately showing negative effects.

Continued burning though can have long-term negative effects (National Park Service, 2002).

Low intensity prescribed fires in light to medium fuels seldom produce enough heat to significantly damage soil or increase the erosion potential within a given watershed. The chemical and physical properties of soil change dramatically after a high intensity fire. Loss of organic matter causes the soil structure to deteriorate, and both the water-storing and transmitting properties of soils are reduced. The living tissues of microorganisms and plants can be damaged by fire if the temperatures are above 1200 degrees F (DeBano 1970).

VIII. ROADS FOR ACCESS

Roads are an essential part of any fire and fuels management plan, providing the principal access to the communities, homes and wild places in the watershed (See Map #6). Additionally, roads may offer a defensible space from which firefighters can conduct direct attack on wildfires and also provide strategic locations for roadside fuelbreaks. Roadside fuelbreaks provide not only defensible space for firefighters, but also a safe escape route for residents in the event of a wildfire.

Roads in the Hat Creek Valley typically intersect the Highway 89 corridor. North of Cassel, Highway 299 is also a factor. In the Old Station area, Highway 44 coincides with Highway 89. The valley can be reached from both the north and south along Highway 89, which is the major connection throughout the area. All roads are important for providing fire protection access. This plan will not attempt to identify and map all paved or improved roads. Roads that are vital to future projects will be included in treatment options. Following is a list of dominant fire access roads.

TABLE 4 – HAT CREEK VALLEY FIRE SAFE AREA ROADS

A. CASSEL
Cassel Road
Cassel – Fall River Road
Sand Pit Road
Clark Creek Road

B. HAT CREEK
Doty Road
Bidwell Road
Wilcox Road

C. OLD STATION
Highway 44
USFS 33N22
Remann Avenue
Hall Way
USFS 33N01Y
Wander Lane

Hat Creek Drive
Rim Rock Ranch Road
Potato Butte Road
Brook Haven Drive
Sugarloaf Lane
Willow Way
Ivie Lane
Big Springs Court
Big Springs Estates Boulevard
Blur Heron Circle
USFS 32N01X
USFS 32N01XA – Big Pine Campground

IX. BIOMASS ANALYSIS

For thousands of years, people have been taking advantage of the earth's vegetation, also called biomass, to meet their energy needs (www.epa.gov, 2002). Technologies for using biomass continue to improve and today biomass fuels can be converted into alternative fuels (biofuels), such as ethanol, methanol, biodiesel, and as boiler fuel for use in industrial heating and power generation.

When used for generating electricity, biomass is typically burned to transform water into steam, which is used to drive a turbine and attached generator (www.epa.gov, 2002). Although a majority of the biomass market is associated with energy production, biomass offers a wide verity of uses such as fiber-reinforced composites, fiber-filled thermoplastics, high performance fiberboard, cement board, mulch for landscaping and soil amenities, smoke chips for curing and flavoring meat and bio-oils which are used as asphalt additives or adhesives. Potential markets continue to be explored and developed by the private sector, and the federal government has also demonstrated interest in the biomass industry by the release of Executive Order 13134. On August 12, 1999, President Clinton released Executive Order 13134, designed to stimulate the creation and early adoption of technologies needed to make biobased products and bioenergy cost-competitive in the large national and international markets (www.bioproducts-bioenergy.gov, 1999).

The utilization and development of biomass technology offers many economic and socioeconomic benefits. However, one of the most widely acknowledged benefits is the development and utilization of biofuels as a means to reduce the world's dependency on non-renewable fossil fuels. Presently, a majority of the electricity in the U.S. is generated by burning fossil fuels such as coal, natural gas, and oil. On the local level, the development of biotechnology also offers both economic and socioeconomic benefits. The LFSCA contains thousands of acres of forestland, which produce a substantial amount of renewable biomass each year. The biomass market associated with wood products production has long been developed, and biomass harvesting for fuel reduction is a common practice within managed forestlands in northern California. Biomass production not only provides economic support at the local, state, and federal levels, but also reduces the nation's dependency of fossil fuels. The watershed also contains thousands of acres of brushland, which produce a significant amount of renewable

biomass, although only a small portion of the biomass produced from chaparral landscapes is utilized for biofuels.

The potential for biomass production within the Hat Creek Valley is good given that the valley contains a substantial amount of raw material (brushland and forest land species). The closest wood-fired power plants are approximately 30 road miles away in Burney, California. There is a 31-megawatt wood-fired power plant, and a 11.4-megawatt wood-fired power plant in close proximity to each other. There are other wood-fired power plants in Shasta County, but these facilities are the closest to the Hat Creek Valley.

The feasibility of any biomass operation depends on the market price of biomass, (also commonly called hogged fuel or hog fuel if it is processed through a hammer hog) the density or amount of fuel on the ground, and transportation costs. Processing can include harvesting and chipping or hogging and costs are directly correlated with the species, age, size and density of the vegetation being processed as well as the topography of the area. The transportation cost from the project area to the nearest wood fired power plant is directly related to the size of the vehicle, time needed for loading biomass, the road bed system and distance to the plant.

The price a power plant is willing to pay for a ton of biomass vs. the processing and transportation costs determines the economic feasibility of an operation. However, the value of fuel reduction to the landowner should be included in this calculation to determine the true feasibility of a biomass operation.

Harvesting is usually accomplished with an excavator and/or a bulldozer tractor, which is utilized to remove and pile the brush. Processing can be accomplished with a hammer hog, tub grinder, drum chipper or some other type of industrial type chipper fed by an excavator or other mechanical means.

Biomass Collection in Action. Tub grinder on right, conveyor moves biomass into the van.

Pursuant to the California Forest Practice Rules, if biomass operations involve the harvest of commercial species, the project requires a permit issued by CAL FIRE. Biomass operations not involving the harvest of commercial species are not subject to the California Forest Practice Rules, but are subject to Water Quality jurisdiction, and may require county permits or other agency review depending on the physical characteristics of the project area. A Registered Professional Forester should be involved prior to commencement of any biomass operation in order to determine what permits might be required and to estimate the cost and timing of obtaining the permits.

Although the biofuels industry is the most developed biomass market in northern California, other markets are currently in the developmental stage and may become a commercially viable option for biomass products in the future. These markets are far

from becoming a significant force in the market place, but may provide alternative utilization methods and future marketing opportunities.

X. POTENTIAL COST SHARE FUNDING SOURCES

The following table is a list of cost share programs provided by the University of California, Cooperative Extension Service (UCCE).

TABLE 5 – FUNDING SOURCES AND COST SHARE PROGRAMS

Program	Goals	Services	Will Fund	Agency	Who	Limitations
Emergency Watershed Protection	Helps safeguard people and property following natural disasters.	Technical and financial assistance	Up to 75%	NRCS	Public agencies, non-profits, community groups	25% cost share. Must obtain necessary permits
Environmental Quality Incentives Program	To address significant natural resource needs and objectives	Cost sharing, technical and educational assistance	Up to 75% set by local working group	NRCS, FSA	Agricultural producers having significant natural resource needs	Approved practices up to $10,000 per producer per year. Must have Conservation Plan approved by RCD.
Hazard Mitigation Grant Program	Hazard mitigation to reduce risk from future disasters	Cost share	Up to 75%	FEMA	Agencies, governments, non-profits, tribes	Federal Disaster Areas
Vegetation Management Program	To provide incentives for using fire as a tool to control unwanted brush, and other vegetation, which creates wildfire hazards?	Covers liability, conducts prescribed burn	Up to 90% cost share	CAL FIRE	Landowners, individual or group	Agreement to sign, plan required
California Forest Improvement Program	Forestry, watershed and riparian protection and enhancement	Reforestation, site prep, land conservation, and fish & wildlife habitat improvements	75% up to $30,000 per contract, rehab after natural disaster up to 90%	CAL FIRE	Landowners	Plan (can be cost shared) required, 20-50,000 acres of forestland

Additional funding sources include:

- **California Department of Conservation**, RCD Grant Assistance Program
- **U. S. Forest Service,** Forest Service Community and Private Land Fire Assistance Grant Program
- **Shasta County Resource Advisory Committee**, Title II Funds, Secure Rural Schools and Community Self-Determination Act of 2000
- **Sacramento Regional Foundation** (for the Bureau of Land Management), Community-Based Wildfire Prevention Program
- **California State Fire Safe Council,** Clearing house for sources of funding for fuel reduction projects

XI. FUNDING FUELBREAK MAINTENANCE

Since grant funds are often obtained just to construct the fuelbreak, maintenance efforts are often left to the landowner. Unfortunately, some landowners do not have the physical or financial means to do maintenance. If a fuelbreak is not properly maintained in its entirety, it will not provide adequate fire protection in the long run. Therefore, in some situations it is often best for fire safe councils, watershed groups, and other conservation organizations to seek funding for maintenance as a means to better ensure fire protection for a given area. The Strategic Fuels Reduction Plan was developed as a result of the USFS National Fire Plan. This plan provides grant funding for fuel reduction projects on private lands. In addition, many of the programs listed in Table 5 above also provide funding opportunities for fuels reduction and maintenance. Future legislation may also provide funding for fuels reduction projects.

In addition, many private sector programs are available. Information on private sector funding can be found at the following Internet sites:

www.fdncenter.org
www.ice.ucdavis.edu/
www.tpl.org/tpl/about/
www.ceres.ca.gov/foreststeward/funding.html
www.teleport.com/~rivernet/general.htm
www.ufei.calpoly.edu/data/news/grants.html

Funding programs can assist in the development of shaded fuelbreaks, defensible space around structures, roadside fuel reduction, and community fire safe projects.

XII. STRATEGIC FUEL MANAGEMENT PLAN ACTION ITEMS

A. INTRODUCTION:

Action items described in this plan have been proposed by the Hat Creek Valley Fire Safe Council Risk Assessment Committee and are presented as a result of their deliberation. All action items are considered to be an integral part of any plan to manage the fuels in the HCV-FSCA. Funding for accomplishing these action items, as well as others that may arise in the future, is discussed in a separate section of this plan. A priority list of fuel reduction and maintenance projects was developed by the Risk Assessment Committee. Factors considered in developing this project list include:

- Fire history for the area, both lightning caused and human caused fires.
- Heavy fuel loading conditions with closed canopies.
- Assets at risk.
- Common wind directions and speed.
- Roadsides overgrown with vegetation.
- Major topographical features important to fire control and weather patterns which influence fire behavior.
- Road access for fire fighters.

B. POTENTIAL PROJECTS:

After several meetings to review the assets at risk, fire safe practices, Lassen National Forest project plans and funding opportunities, the Risk Assessment Committee recommended the following action items.

Seek funding and/or agency support for the following:

- Maintain and refine Emergency Evacuation Plans for the area.
- Develop comprehensive road maps of the area to assist emergency response agencies.
- Locate emergency Landing Zones for helicopters in the local communities.
- Designate collection points throughout the valley for evacuees threatened by a wildfire
- Develop a citizen's alert system for residents and businesses to provide notification in the event of an emergency.
- Reduce hazardous fuels along local roads to provide safe and efficient ingress and egress for citizens and fire fighters in the event of a wildland fire.
- Assist residents unable to meet the challenge of reducing the fuel load on their property themselves.

In a demonstration of commendable community concern, staff at the Hat Creek Ranger Station took the initiative and developed a community evacuation plan for the Hat Creek Valley Fire Safe Council Area (See Appendix C) . This plan has been printed and made available to emergency response agencies in the area. An abbreviated version has been made available to the citizens of the area, and posted in area campgrounds.

C. CONSTRUCT SHADED FUELBREAKS:

Sites for shaded fuelbreaks have been identified by citizens of the HCV-FSC Area through the Risk Assessment Committee. Locations of the proposed fuelbreaks are a combination of neighborhood protection and efforts to compartmentalize the fuels in the HCV-FSC Area (See Maps # 8 A, B, and C). New fuelbreaks should be constructed as funding becomes available, and/or as partnerships can be formed to benefit a larger part of the community. The following list is arranged by community, and prioritized by the Risk Assessment Committee.

BASIC ASSUMPTIONS	
People	2.3 per dwelling
Property Value	$250,000 per dwelling
Dwellings	Count the dots on the map

OLD STATION

#1 Concern - Big Springs Estates

Proposed Solution:

a. Fuelbreak along Forest Highway (F.H.) 32N01X or 32N13, starting at Hwy. 44 intersection, 0.6 miles long, 2 chains (132 feet) on both sides of the road = 19 acres treated; plus F.H. 32N01XA through Big Pine Campground, east across Hat Creek to the bluff, 0.4 miles long, 4 ch. wide = 13 ac. Total treated area for this extended fuelbreak = 32 acres.

OLD STATION CONCERN #1-A BIG PINE CAMPGROUND

b. Fuelbreak along Hwy. 44 from F.H. 32N88Y north for
0.75 miles long, 2 ch. (132 ft.) on both sides of the road = 24 ac. treated

Big Springs Estates Ownership – 95 % USFS
Number of dwellings = 47
Number of people = 108
Value of structures = $11,750,000

OLD STATION CONCERN #1-B HIGHWAY 44

#2 Concern – Hat Creek Village and Rim Rock Subdivision, called Hat Creek Village
Proposed Solution:
a. Fuelbreak along the border of Sections 32 and 33, Twp. 33N, R5E, and the border of the NW1/4, NW1/4, Sec. 33, Twp. 33N, R5E
1.0 mi. long, 3 ch. (200 ft.) wide = 24 ac. Treated
b. Fuelbreak along the USFS border in the SW 1/4 and Center 3/4, Sec. 33, Twp. 33N, R5E
1.25 mi. long, 3 ch. (200 ft.) wide = 30 ac. treated
c. Fuelbreak along the border Sections 26 and 33, Twp. 33N, R5E, between the public and private land, 0.125 mi. long, 3 ch. (200 ft.) wide = 3 ac. treated

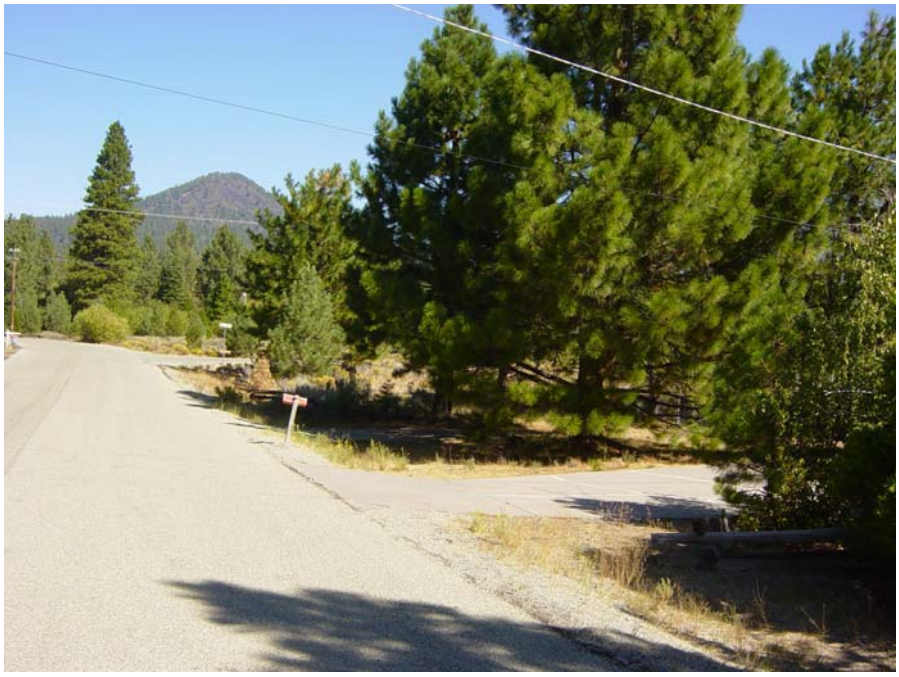
Hat Creek Village Ownership – USFS
Number of dwellings = 103
Number of people = 237
Value of structures = $25,750,000

OLD STATION CONCERN #2 HAT CREEK VILLAGE

#3 Concern – Hat Creek Highlands
Proposed Solution:
a. Fuelbreak along the east edge of public land in the west ½ of the southeast ¼ of Section 1, Twp. 33N, R4E, 0.25 miles long, 3 ch. (200 ft.) wide = 6 ac. treated
b. Fuelbreak along Sugarloaf Lane
0.85 mi. long, 2 ch. (132 ft.) wide on both sides of the road = 27 ac. treated
c. Fuelbreak around water tank at the end of Ponderosa Way
0.1 mi. long, 3 ch. (200 ft.) wide = 3 ac. treated

Hat Creek Highlands Ownership – 75 % Private, 25 % USFS.

Number of dwellings = 74
Number of people = 170
Value of structures = $18,500,000



OLD STATION CONCERN #3 SUGARLOAF LANE

HAT CREEK
#1 Concern – North of the USFS Hat Creek Work Center
Proposed Solution:
a. Fuelbreak along the west side of Hwy. 89, beginning across from the intersection with F.H. 35N23, proceeding south to across from Chaffey Lane, in Section 33, TWP 35N, R4E and Sections 3 and 4, TWP 34N, R4E
1.25 mi. long, 3 ch. (200 ft.) wide = 30 ac. treated
Ownership – 60 percent Private, and 40 percent Public
b. Fuelbreak beginning on the west side of Hwy. 89, across from Chaffey Lane and proceeding south on the west side of the ditch behind the houses, and ending at the lava outcrop south of Gatewood Road in Sections 3 and 10, Twp. 34N, R 4E
1.0 mile long, 3 ch. (200 ft.) wide = 24 ac. treated
Ownership - Private

North of the USFS Work Center
Number of dwellings = 52
Number of people = 120
Value of structures = $13,000,000

HAT CREEK CONCERN #1 BEHIND HOMES WEST SIDE OF HWY. 89, NORTH OF USFS WORK CENTER

#2 Concern - Honn Creek Road

Proposed Solution:

Maintain thinned area along the west side of Hwy. 89 from the border of Sections 34 and 35, TWP 34N, R4E, south along the highway.

1.0 mi. long, 3 ch. (200 ft.) wide on the west side of the road = 24 ac. treated

Honn Creek Road Ownership – Private

Number of dwellings = 32

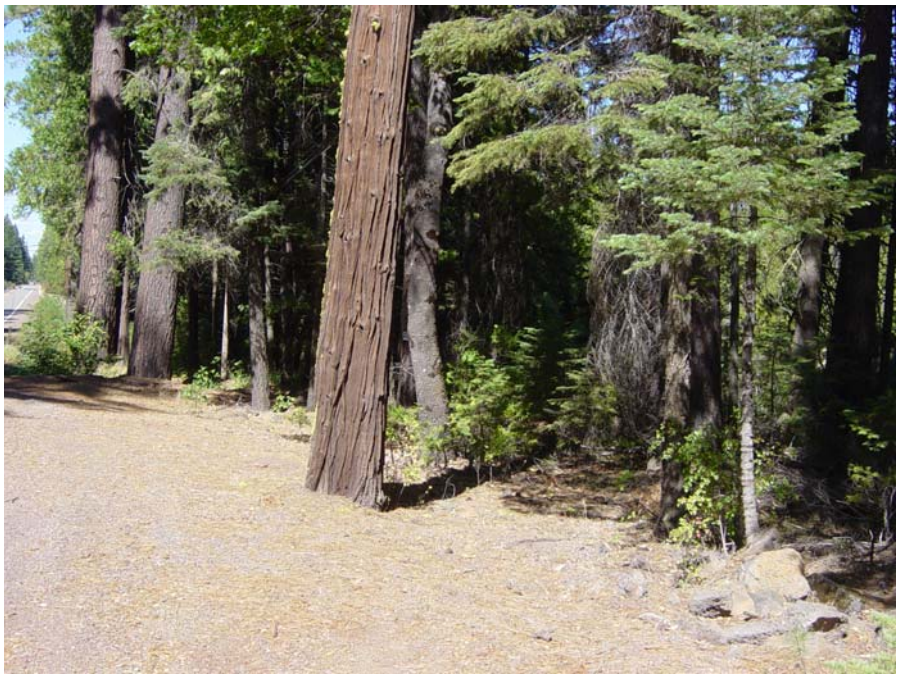
Number of people = 74

Value of structures = $8,000,000

HAT CREEK CONCERN #2 HWY. 89 WEST SIDE NEAR HONN CREEK ROAD

#3 Concern – Red Rock Hill
Proposed Solution:
Maintain fuelbreak on CalTrans right-of-way along Hwy. 89 from USFS Hat Creek Work Center south to Honn Creek.
3.0 mi. long, 1 ch. (66 ft.) wide on both sides of the road = 48 ac. treated

Red Rock Hill Ownership – 90 percent Private, 10 percent USFS
Number of dwellings = 53
Number of people = 122
Value of structures = $13,250,000



HAT CREEK CONCERN #3 HWY. 89, NORTH OF HONN CREEK

CASSEL
#1 Concern – Cassel Road, Cassel
Proposed Solution:
Fuelbreak starting at Cassel Road, across from Boster's Nursery, and proceeding southeast across country to the rim west of Hat Creek in sections in Sections 6 and 7, Twp. 36N, R3E.
0.75 miles long, 3 ch. (200 ft.) wide = 18 ac. treated (masticated)

Cassel Road, Cassel Ownership – Private
Number of dwellings = 54
Number of people = 124
Value of structures = $13,500,000

CASSEL CONCERN #1 CASSEL ROAD

#2 Concern – Crane Road
Proposed Solution:
Fuelbreak west of Crane Road, beginning at Cassel Road, across from the intersection with Thrush Road, and proceeding southwest to the power transmission lines.
1.0 miles long, 3 ch. (200 ft.) wide = 24 ac. treated (masticated)

Crane Road Ownership – 60 percent Public, 40 percent Private
Number of dwellings = 28
Number of people = 64
Value of structures = $7,000,000

CASSEL CONCERN #2 CRANE ROAD

#3 Concern – Wildbird Lane
Proposed Solution:
An "L" shaped fuelbreak heading west from Sand Pit Road for 1/8 mile, then proceeds south for 0.3 miles and terminates at F.H. 36N13.
0.5 miles long, 3 ch. (200 ft.) wide = 12 ac. treated

Wildbird Lane Ownership – 90 percent Private and 10 percent Public
Number of dwellings = 14
Number of people = 32
Value of structures = $3,500,000

CASSEL CONCERN #3 WILDBIRD LANE

D. UNDEVELOPED LOTS

There are many undeveloped lots scattered throughout the local sub-divisions in the area. Many of these landowners live outside Shasta County. Fuel build-up on these vacant parcels is dangerous for the rest of the homes in the area. The HCV-FSC will seek funding to identify landowners of these properties, and work with them to get the fuel build-up on the undeveloped parcels reduced to a safe level.

TYPICAL UNDEVELOPED LOT

E. GRANT FUNDING OPPORTUNITIES

Funding sources are as varied as the projects listed above. There are several sources of funding available through the agencies in the area. Historically, funding sources have been CalFed, BLM, CAL FIRE, National Park Service (NPS), USFS, U. S. Fish and Wildlife Service (USFWS), and California Department of Conservation (DOC).

Programs that have funded fuelbreak construction in the past include:

* USDA Forest Service – Community Protection Grants Program
* USDA Forest Service – National Fire Plan Community and Private Land Fire Assistance Program
* California Department of Conservation – RCD Grant Assistance Program.
* USDI Bureau of Land Management – Community Based Wildfire Prevention Grants Program
* USDI Bureau of Land Management – Jobs In The Woods Program Grants
* USDI Fish and Wildlife Service – Jobs In The Woods Program Grants
* California Department of Forestry and Fire Protection
* National Park Service – Community Assistance Grants
* Shasta County – Secure Rural Schools & Community Self-Determination Act of 2000.

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B. GLOSSARY

BehavePlus – A computer program used for predicting fire behavior.

Chain – A unit of measurement equal to 66 feet.

Fuel Characteristics – Factors that make up fuels such as compactness, loading, horizontal continuity, vertical arrangement, chemical content, size and shape, and moisture content.

Fuel Ladder – Fuels which provide vertical continuity between strata. Fire is able to carry from ground, to surface, to crown.

Fuel Moisture Content – The amount of water in a fuel, expressed as a percentage of the ovendry weight of that fuel.

Fuels – Any organic material, living or dead, in the ground, on the ground, or in the air, that will ignite and burn. General fuel groups are grass, brush, timber and slash.

Mast – Fruit of oaks and other trees, particularly where considered food for wildlife and domestic livestock.

Mechanical Treatment – Using mechanized equipment including but not limited to bulldozers with or without brush rakes, excavators, rubber tired skidders, mechanized falling machines, chippers and grinders.

Pile and Burn – Material is cut and piled in open areas to be burned. Burning takes place under permitting environmental conditions.

Prescribed Burning – The burning of forest or range fuels on a specific area under predetermined conditions so that the fire is confined to that area to fulfill silvicultural, wildlife management, sanitary or hazard reduction requirements, or otherwise achieve forestry or range objectives.

Rate of Speed – It is expressed as rate of forward spread of the fire front, usually is expressed as chains per hour.

Seral Vegetation – A series of plant communities that follow another over time on a specific site.

Shaded Fuelbreak – A wide strip or block of land on which the vegetation has been modified by reducing the amount of fuel available, rearranging fuels so that they do not carry fire easily, and replacing particularly flammable fuels with others that ignite less easily and burn less intensely.

Surface Fire – A fire that burns surface litter, debris and small vegetation.

Topography – The configuration of the earth's surface, including its relief and the position of its natural and manmade features.

Wildland Urban Interface (WUI) – Areas where urban fuels directly meet forest fuels, primarily within 66 to 200 feet of houses, but may extend as far as one quarter mile.

C. RISK ASSESSMENT COMMITTEE

Don Curtis
Chairman, Hat Creek Valley Fire Safe Council
Old Station, CA

Ray Manley
Resident
Old Station, CA

Daryl Conover
Fruit Growers Supply
Burney, CA

John Becker
Resident
Old Station, CA

Pete Johnson
Fall River RCD/Beaty & Associates
Hat Creek, CA

Jim Piccinini
Resident
Old Station, CA

Don Chaix
Chief, Cassel Volunteer Fire Company
Cassel, CA

Skip Willmore
Fuel Reduction Contractor
Burney, CA

John Parrish
Chief, Old Station Volunteer Fire Company
Old Station

Larry Turman
USDA Forest Service, Hat Creek Ranger District, LNF

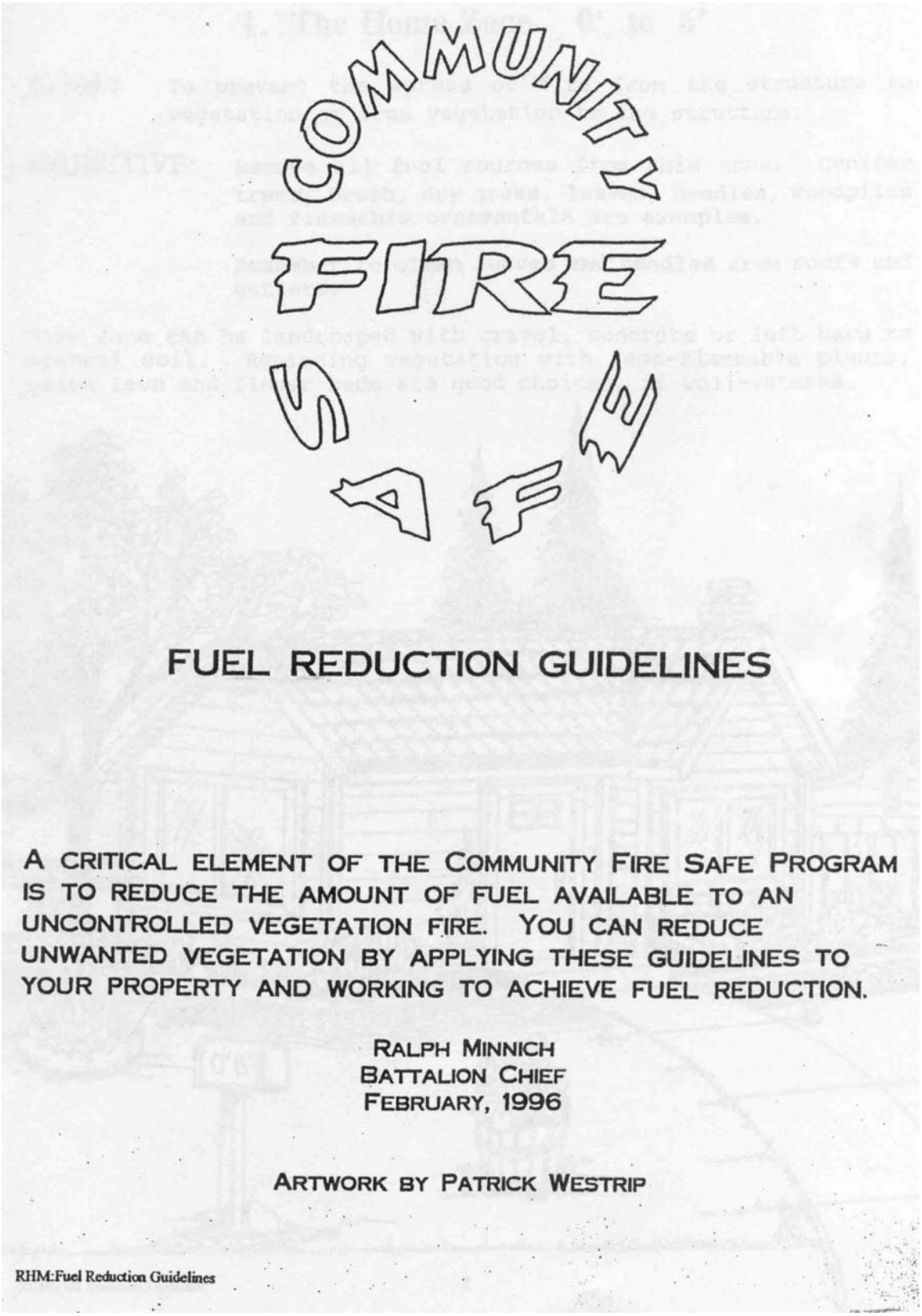
Fall River Mills, CA

Randy Garner
Chief, Hat Creek Volunteer Fire Company
Hat Creek, CA

Tim Weaver
Fire Safe Council Coordinator
Redding, CA

Jack Bramhall
WSRCD, Assistant Project Manager
Anderson, CA 96007

D. COMMUNITY FIRE SAFE FUEL REDUCTION GUIDELINES



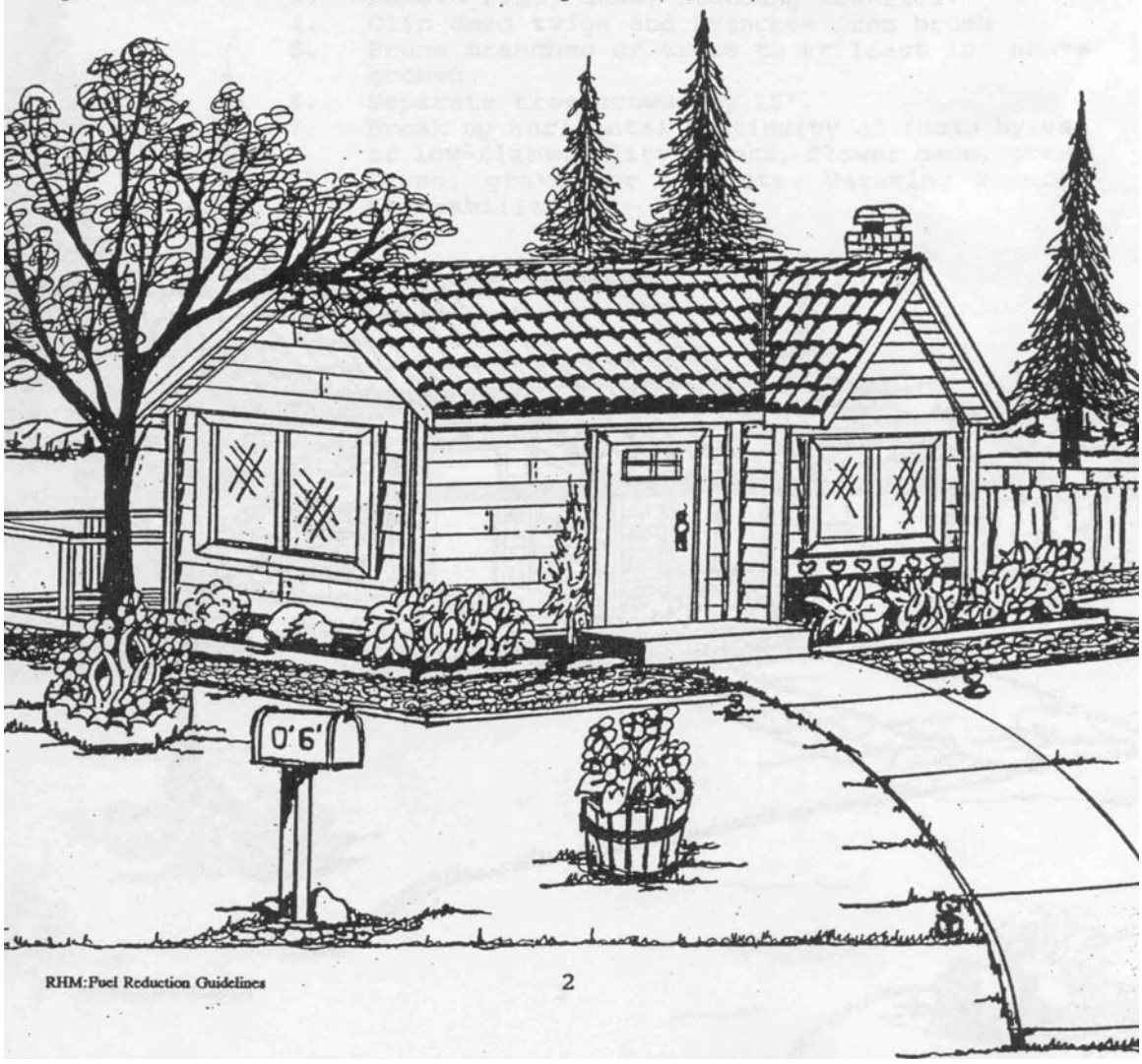
1. The Home Zone 0' to 6'

GOAL: To prevent the spread of fire from the structure to vegetation or from vegetation to the structure.

OBJECTIVE: Remove all fuel sources from this zone. Conifer trees, brush, dry grass, leaves, needles, woodpiles and flammable ornamentals are examples.

Remember to clean leaves and needles from roofs and gutters.

This zone can be landscaped with gravel, concrete or left bare to mineral soil. Replacing vegetation with less-flammable plants, green lawn and flower beds are good choices, if well-watered.



2. The Yard Zone 6' to 30'

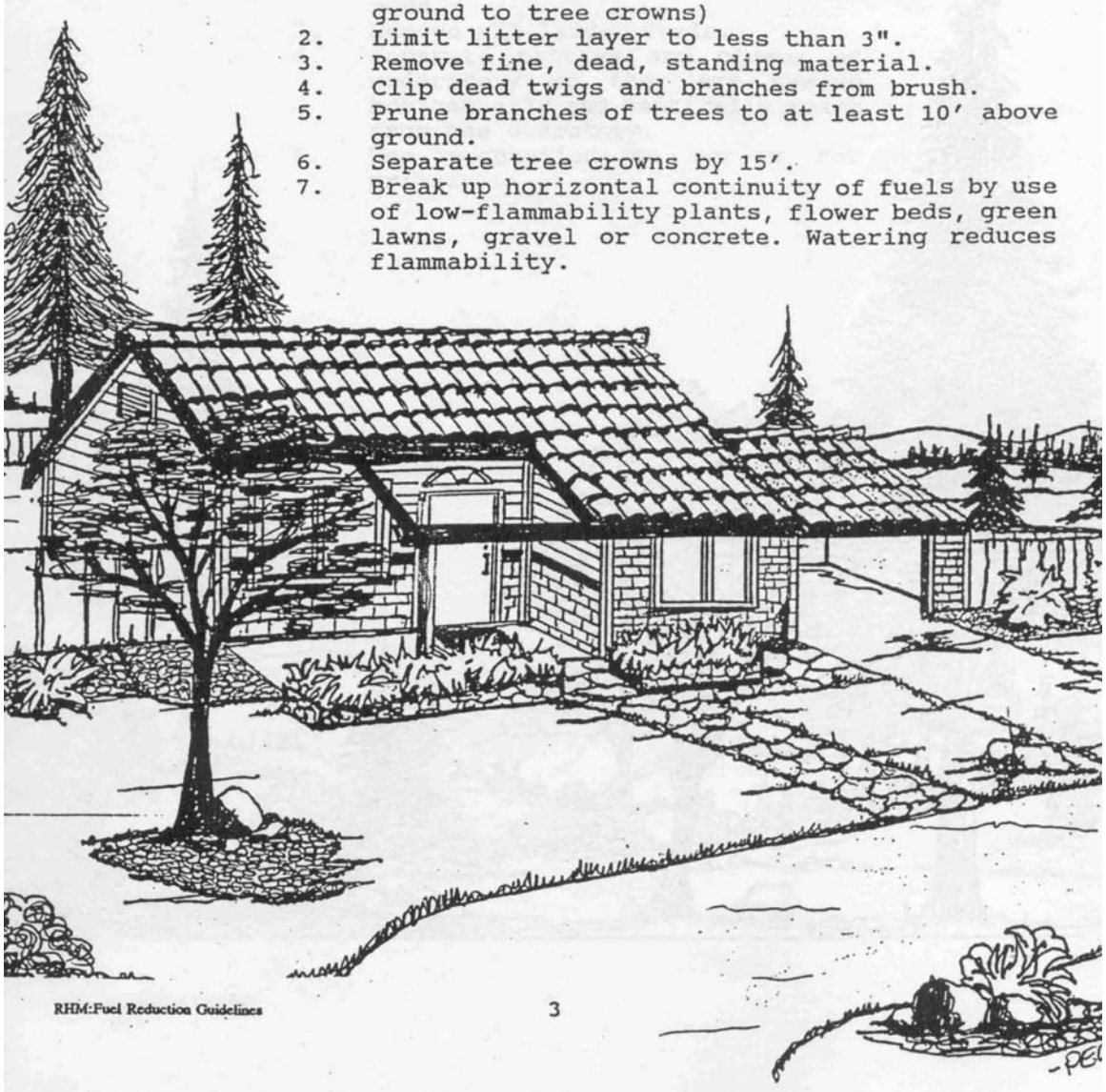
GOAL: To prevent a fire from moving from ground fuels to brush or tree crowns and to slow the rate of fire spread.

> reduced fuels means reduced fire intensity
> reduces potential exposure problems
> preserves overstory vegetation

[This zone should be sufficient for grasslands and is integrated into fuel reduction for brush and timberlands.]

OBJECTIVE:

1. Eliminate fuel ladders (continuous fuel from ground to tree crowns)
2. Limit litter layer to less than 3".
3. Remove fine, dead, standing material.
4. Clip dead twigs and branches from brush.
5. Prune branches of trees to at least 10' above ground.
6. Separate tree crowns by 15'.
7. Break up horizontal continuity of fuels by use of low-flammability plants, flower beds, green lawns, gravel or concrete. Watering reduces flammability.



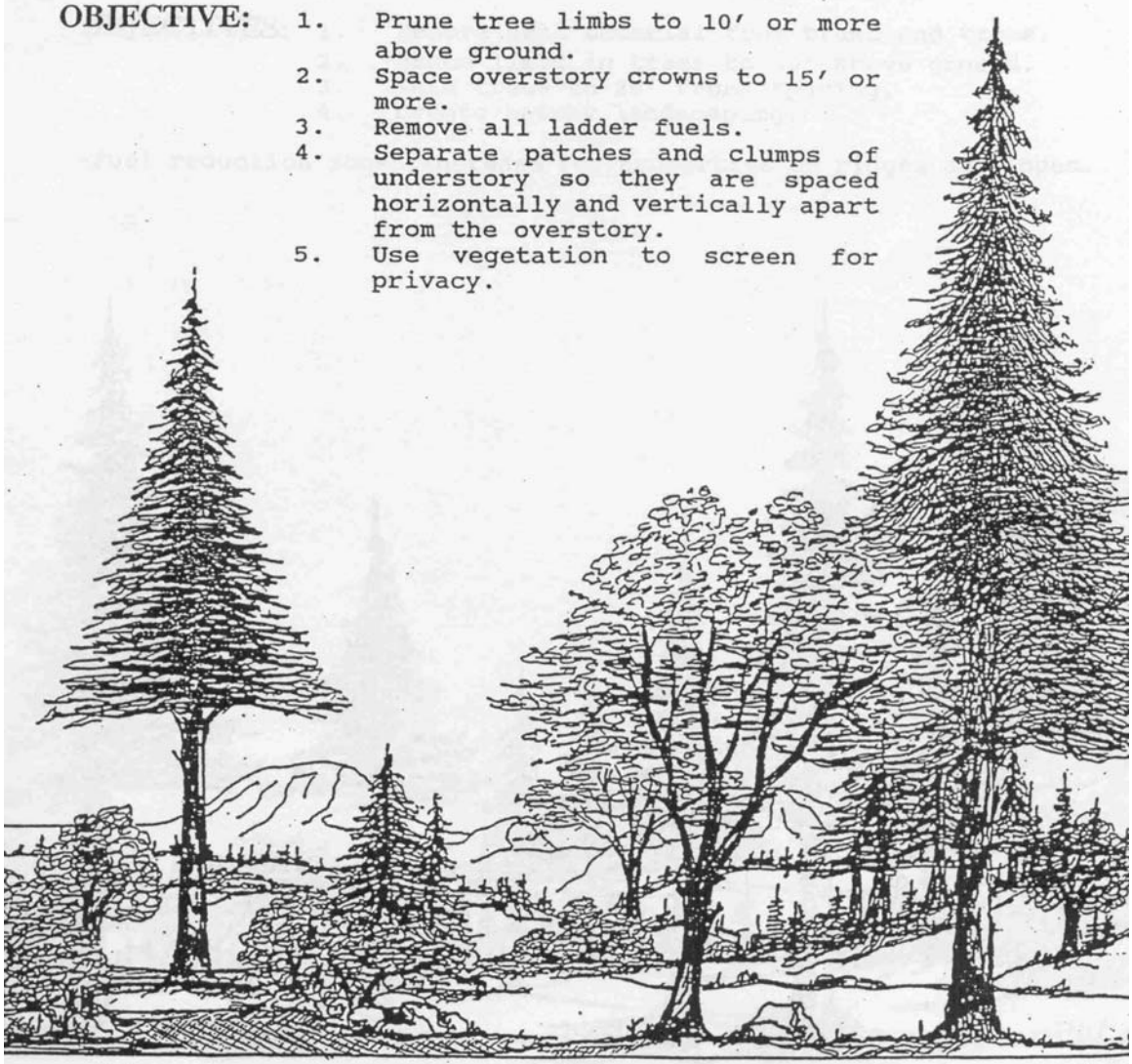
3. The Brush / Screen Zone 30' to 75'

GOAL: To keep a wildland fire on the ground thereby minimizing intense burning and damage to overstory vegetation.

[This is the primary zone for fire suppression. Although 75′ of fuel reduction appears adequate for brushcovered lands, further effort is necessary in timberlands.]

OBJECTIVE:

1. Prune tree limbs to 10′ or more above ground.
2. Space overstory crowns to 15′ or more.
3. Remove all ladder fuels.
4. Separate patches and clumps of understory so they are spaced horizontally and vertically apart from the overstory.
5. Use vegetation to screen for privacy.



RHM:Fuel Reduction Guidelines 4

4. Woodland / Forest Zone 75' to 150'*

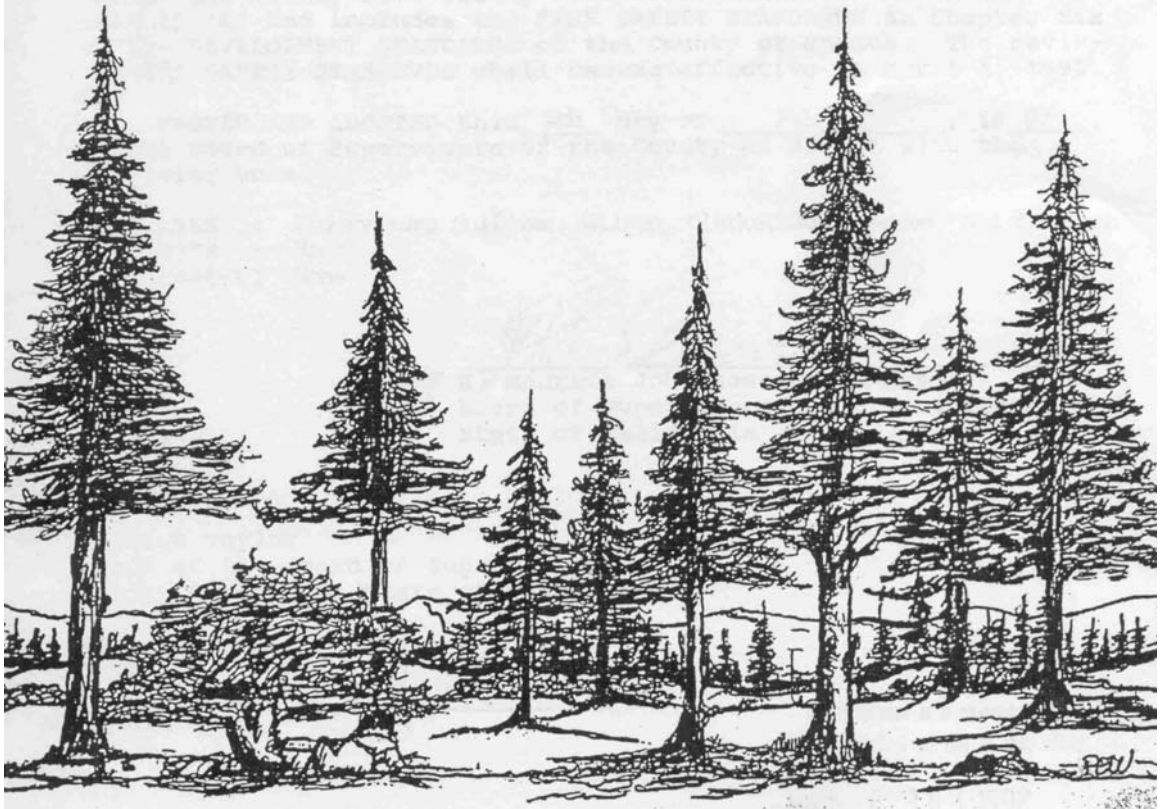
GOAL: To provide a space in which a fire will "cool down, slow down and stay on the ground" thereby maintaining fire safety in forest communities.

[This zone can provide cover for wildlife. Views within this zone can be enhanced to be more aesthetically pleasing.]

OBJECTIVES:

1. Remove dead material from brush and trees.
2. Prune limbs in trees to 10' above ground.
3. Thin trees to 20' trunk spacing.
4. Create patchy landscaping.

*Fuel reduction zones increase for properties on ridges or slopes.



APPENDIX B
Demonstration Projects of the Hat Creek Valley Fire Safe Council (HCVFSC)

Background
Cassel, Hat Creek, and Old Station are all designated as communities at risk and are adjacent to U.S. Forest Service lands in Shasta County, northeastern California. Historical fire history maps show the likelihood of continued wildland fires impacting nearby residential communities. Principal problems include lack of federal/private coordination, inadequate education and outreach, and lack of a larger protection plan. Three fuel reduction demonstration sites will showcase strategies prior to large-scale removal in a later implementation phase. The project will increase public awareness and gather local, state, and federal support for wildland fire protection.

Areas of Concern
Preliminary discussion has prioritized areas in all three communities.
Cassel –– Cassel Estates
Hat Creek –– Hat Creek Highlands
Old Station –– Big Springs Estates, adjacent to U.S. Forest Service
These areas are directly adjacent to the planning areas of "Backbone" and "North 49", as developed under the Quincy Library Group federal funding in the Lassen National Forest.

The Process
A volunteer risk assessment group consisting of Hat Creek Volunteer Fire Department personnel, a private timber resource company, and local community members received six applications for demonstration work. All six landowners signed an access agreement to allow the risk assessment committee a chance to visit the site. Each site was reviewed and ranked according to the fire risk to adjacent houses, fuel type, slope, and landowner involvement. Three 2-acre sites were chosen; one in each community.

Environmental Planning
The demonstration project, although small in scope, still requires environmental permits under the scope of the California Environmental Quality Act (CEQA). Specifically, compliance with the Endangered Species Act (ESA/Migratory Bird Treaty Act (MBTA) and the National Historic Preservation Act (NHPA) were required. HCVFSC contracted this element out to a professional archeologist and biologist that performed field surveys and delivered a final report. There were no significant findings in Cassel or Hat Creek, although there were historical references identified in Old Station. The Final Report is available through the Hat Creek Valley Fire Safe Council.

An encroachment permit from the California Department of Transportation was also secured for the site in Hat Creek. The permit requires a six inch road base, approximately 20’ X 30’, in the entryway off State Highway 89.

Fuel Reduction
Mechanical removal is planned at both the Cassel and Hat Creek demonstration sites. Specifically, small equipment mastication is targeted because of the relatively flat slopes at each site. The Old Station site will require hand removal where the slash will be piled and burned. Pending approval of all permits, fuel reduction activity is planned for fall 2007, winter 2008, following the closure of the fire season.

Cassel Demonstration Site

Hat Creek Demonstration Site

Old Station Demonstration Site

APPENDIX C

Hat Creek Valley Fire Evacuation Plan

HAT CREEK VALLEY
FIRE EVACUATION PLAN
INDEX

Instructions on which collection point to use in case of evacuation

MAPS

HAT CREEK VALLEY
EVACUATION COLLECTION POINTS

IF SHLETERING IN PLACE CAN BE USED FOR THE PUBLIC IMPELMENT THIS TACTIC FIRST.

CASSEL COLLECTION POINTS

- If the public has to evacuate to the north report to collection point # 4.
- If the public has to evacuate to the south report to collection point # 7.
- If the public can stay in Cassel report to collection point # 5.

HAT CREEK COLLECTION POINTS

- If the public has to evacuate to the north report to collection point # 5.
- If the public has to evacuate to the south report to collection point # 8.
- If the public can stay in Hat Creek report to collection point # 7 or 6.

OLD STATION COLLECTION POINTS

- If the public has to evacuate to the north report to collection point # 7.
- If the public has to evacuate to the south report to collection point # 9.
- If the public can stay in Old Station report to collection point # 8.

NORTH OF HWY 299

- If the public has to evacuate north of the Hwy 299 report to either collection point # 2 or 3. If collection point 2 or 3 can not be used for a collection point use # 1.
- If the public has to evacuate to the south report to collection point # 4.

SOUTH OF HWY 299

- If the public has to evacuate south of Hwy 299 use collection points # 4 / 5/ 7 depending on location of incident.

FOREST SERVICE CAMPGROUNDS

- If the campgrounds have to evacuate to a collection point. The location of the incident will determine the location of the collection point. The Incident Commander will make that decision as to where to evacuate the public to.

ALTERNATE SITES

- If the public has to evacuate to the east on Hwy 44 the collection point will be at the Bogard Rest Stop.

INCIDENT COMMANDER RESPOSIBILITY

Incident Commanders will need to coordinate the evacuation plan with the Shasta County Sheriff.

Contact SIFC to advise them that an evacuation is needed and what collection point is going to be used. Refer to Evacuation Map for location points.

Shasta County Sheriff will have the responsibility for implementing the evacuation plan. If Shasta County Sheriff is not on scene use Forest Service LE or CHP to start evacuations.

Hat Creek Valley
Evacuation Collection Points

The Fire Safe Council

Old County Road
Forest Route 38N02
Harlow Flat
Telephone
Forest Route 38N01
Red Mountain
Forest Route 37N07
89
Bird Flat
Forest Route 37N06
Rim of Lake
Clark Creek
Lorenz
Dusty Campground
Warner Grade
Ted Elder
Spring Creek
Thousand Springs
Brewster
Ritter
County Fire Station 13
Soldier Mtn
Osprey
Horr
Island
Old Crook
Old School
Linfield
Brown
Alfalfa
Lewis
Mc Arthur
A
Walnut
McArthur
Gomez
Glenburn
Reynolds
Dee Knoch
Main
Fall River Mills
Pit No 1 Powerhouse
299
Cassel Fall River
Shoshoni
State Hwy 89
State Hwy 299
Crane
Hat Creek Powerhouse No 1
Apple Orchard
Wildgoon
Black Ranch
Cottonwood
Johnson Park
Oak
Kern
Cassel
Burney
Enterprise
Hudson
Tamarack
Park
Mountain View

Legend

- Railroad
- County Fire Station 13
- Campground

Evacuation Collection Points

1. McArthur Fairgrounds
2. Burney Falls State Park
3. Hat Creek Construction
4. Mountain Christian Academy
5. County Fire Station 10

1:100,000

0 1 2 4 Miles

N

Hat Creek Valley
Evacuation Collection Points

The Fire Safe Council

Hat Creek

Old Station

Eskimo Hill

To Susanville

Forest Route 35N14
Forest Route 36N18
Pole Line
Forest Route 33N32
Bidwell
State Hwy 89
Doty
Forest Route 34N75
Honn Campground
Forest Route 34N19
Forest Route 34N22
Wilcox
Bridge Campground
Rocky Campground
Mc Elroy
Cave Campground
Circle
Wander
Hat Campground
Sugar Loaf
Birch
Old Station
Big Pine Campground
State Hwy 44
Sheep Camp
Twin Bridges Campground
Forest Route 32N18
Forest Route 32N16
Forest Route 32N13
Bridge Creek
Forest Route 32N17
Lassen Peak

89 44 6 7 8 9 FS N

Legend
- FS Forest Service Fire Stations
- Campground
- Evacuation Collection Points
- 6 Baptist Church
- 7 County Fire Station 11
- 8 County Fire Station 12
- 9 Eskimo Hill

1:100,000
0 1 2 4 Miles

Hat Creek North Structure Map

1:32,000

0 0.25 0.5 1 Miles

N W E S

Legend

- Heliports
- Structures
- USFS Land
- USFS Roads
- Roads
- Streams

Volunteer Fire Hall Station 11

USFS Hat Creek Workcenter Station 31

T35N R4E

T34N R4E

SH 7R01 · 35N15 · 35N15H · 35N23 · 35N35A · 35N73 · 35N73A · 34N76 · 34N76A · 34N76C · 34N76D · 34N76E · 34N76F · 34N76G · 34N76H · 34N77 · 34N77A · 34N77B · 34N77C · 34N77D · 34N77E · 34N19 · 34N19D · 34N19E · CA 89 · SH 6R200 · SH 6R201

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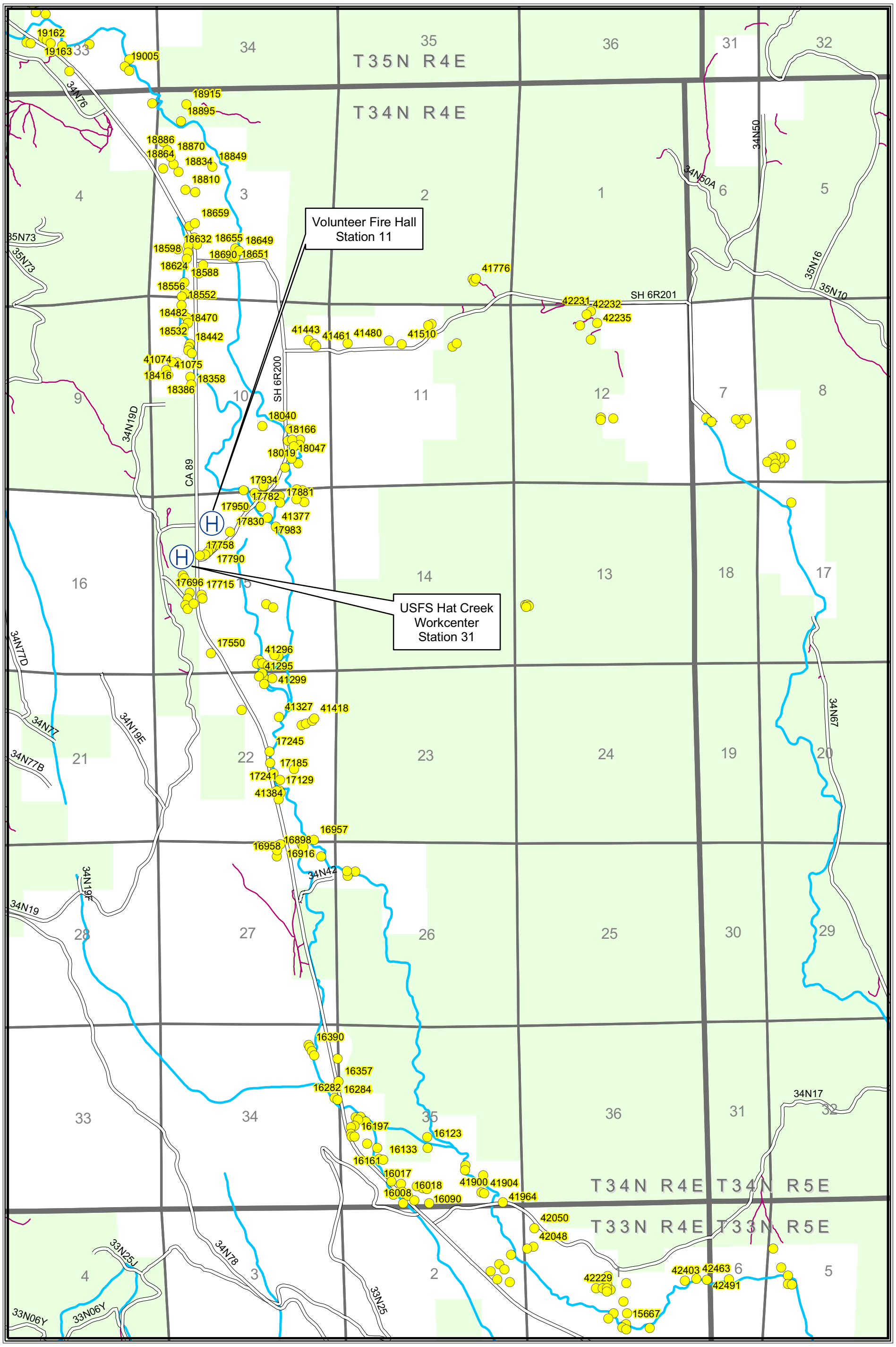
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T34N R4E
T34N R5E
T33N R4E
T33N R5E
Volunteer Fire Hall
Station 11
USFS Hat Creek
Workcenter
Station 31
SH 6R201
SH 6R200
CA 89
34N76
34N50
34N50A
34N16
35N10
35N73
34N19D
34N77D
34N77
34N77B
34N19E
34N19F
34N19
34N42
34N67
34N17
33N25J
34N78
33N25
33N06Y
19162
19163
19005
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18166
18047
18019
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16916
16390
16357
16282
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16197
16123
16133
16161
16017
16018
16008
16090
41900
41904
41964
42050
42048
42403
42463
42491
42229
15667
41776
42231
42232
42235
41443
41461
41480
41510
Heliports
Structures
USFS Land
USFS Roads
Roads
Streams
Hat Creek South
Structure Map
1:32,000
0 0.25 0.5 1 Miles
Allison Mead, Friday, April 29, 2005 3:58:13 PM
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Hat Creek Village
Rim Rock Subdivision
Structure Map

1:6,000

Miles
0 0.05 0.1 0.2

N W E S

Legend

- Water Source
- Heliports
- Structures
- USFS Land
- USFS Roads
- Roads
- Streams

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

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T32N R4E T32N R5E

6

5

1

7

8

12

12755
12739
12792
12690
12678
12656
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42464
12650
42480
42506
12644
12640
12627
12630
42491
12620
42482
12632
12637
12601
12625
12612
12589
12609
42520
42444
42468
12600
12601
12593
42471
12579
12589
12557
12543
12543
12524
42530
12505
42526
12477
12483
12597

Sugarloaf Ln
Clearbrook Dr
Willow Way
Ponderosa Way
Ivie Ln
Sugarloaf Lane
Brook Haven Dr
Potato Butte Rd
Birch Ln
CA 44
CA 89
32N79Y
32N79Y A
32N91
32N89
32N20
32N20E
32N89A
32N89B

50,000 gal
Water Tank

Hat Creek Highlands

Hat Creek Store
Post Office
RV Campground

Hat Creek Highlands Structure Map

1:6,000

0 0.05 0.1 0.2 Miles

Legend

- Water Source
- Heliports
- Structures
- USFS Land
- USFS Roads
- Roads
- Streams

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

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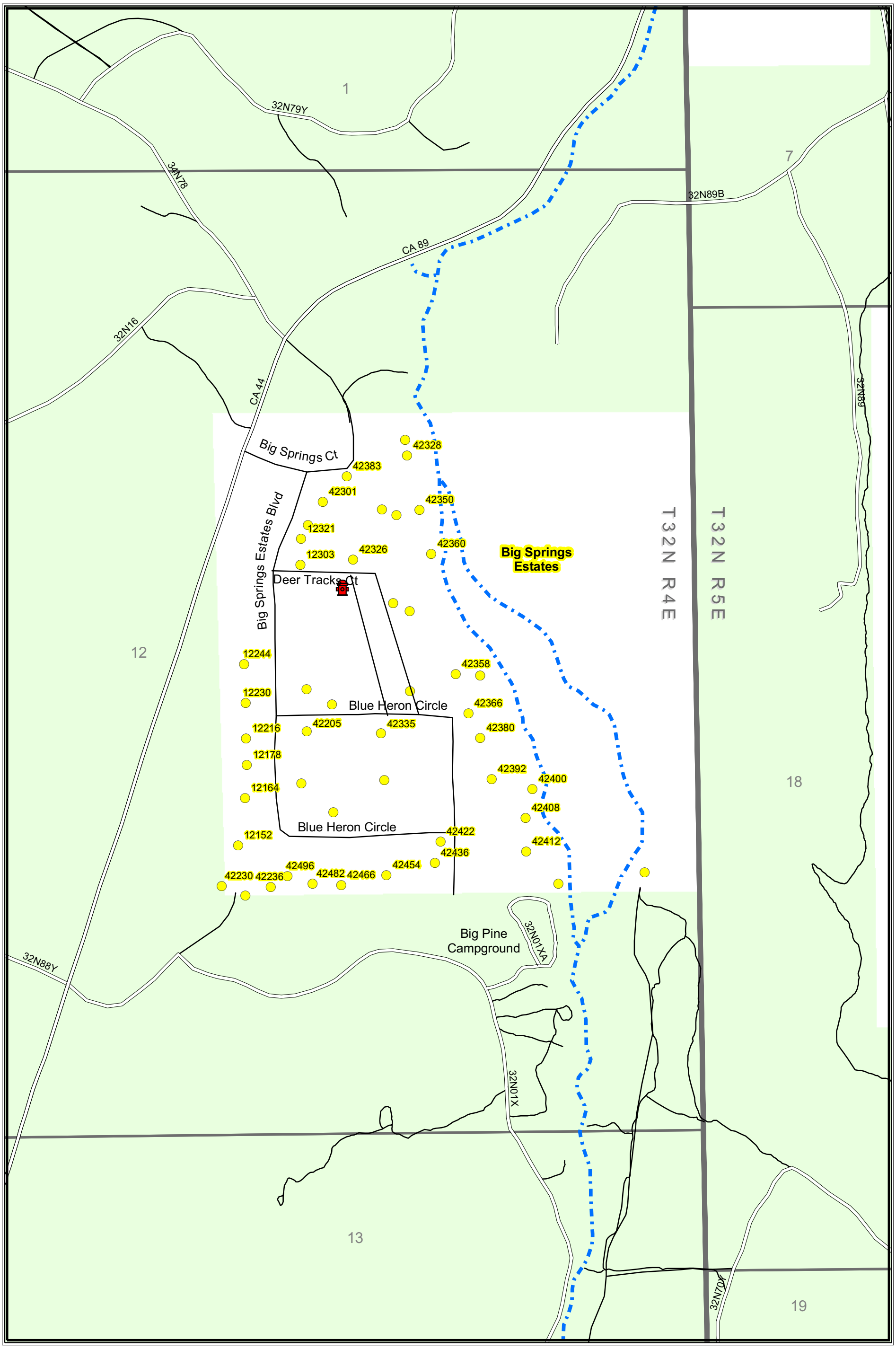

Big Springs Estates Structure Map

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Legend

- Water Source
- Heliports
- Structures
- USFS Land
- USFS Roads
- Roads
- Streams

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Cassel North Structure Map

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0 0.2 0.4 0.8 Miles

N W E S

Legend

- Structures
- USFS Land
- USFS Roads
- Roads
- Streams

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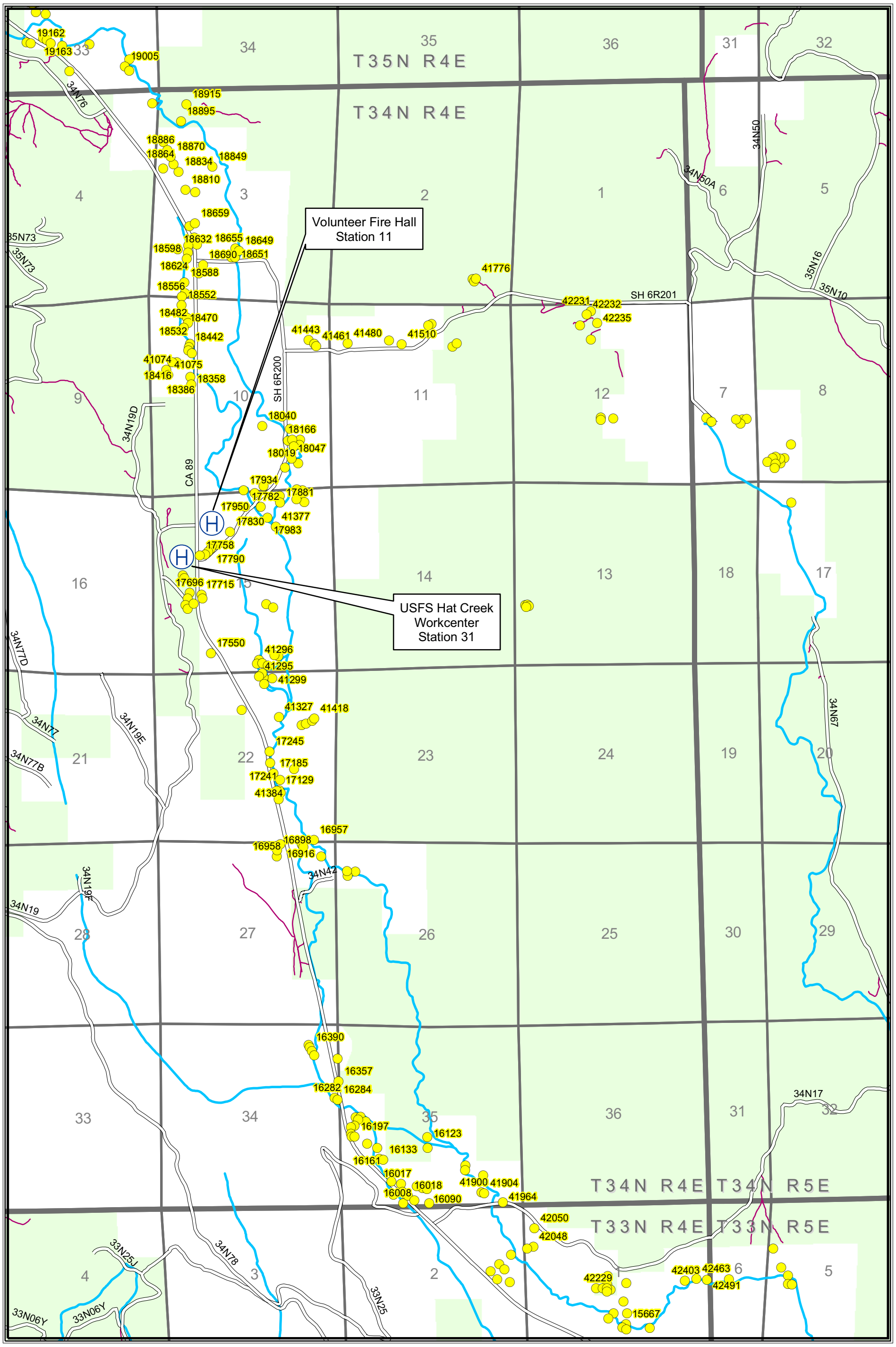
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T34N R5E
T33N R4E
T33N R5E
Volunteer Fire Hall
Station 11
USFS Hat Creek
Workcenter
Station 31
SH 6R201
SH 6R200
CA 89
34N76
34N50
34N50A
34N16
35N10
35N73
34N19D
34N77D
34N77
34N77B
34N19E
34N19F
34N19
34N42
34N67
34N17
33N25J
34N78
33N25
33N06Y
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Heliports
Structures
USFS Land
USFS Roads
Roads
Streams
Hat Creek South
Structure Map
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Map # 1
Hat Creek Valley Fire Safe Council
General Vegetation

0 1 2 4 6 8

Miles

Map Revised
09.15.07

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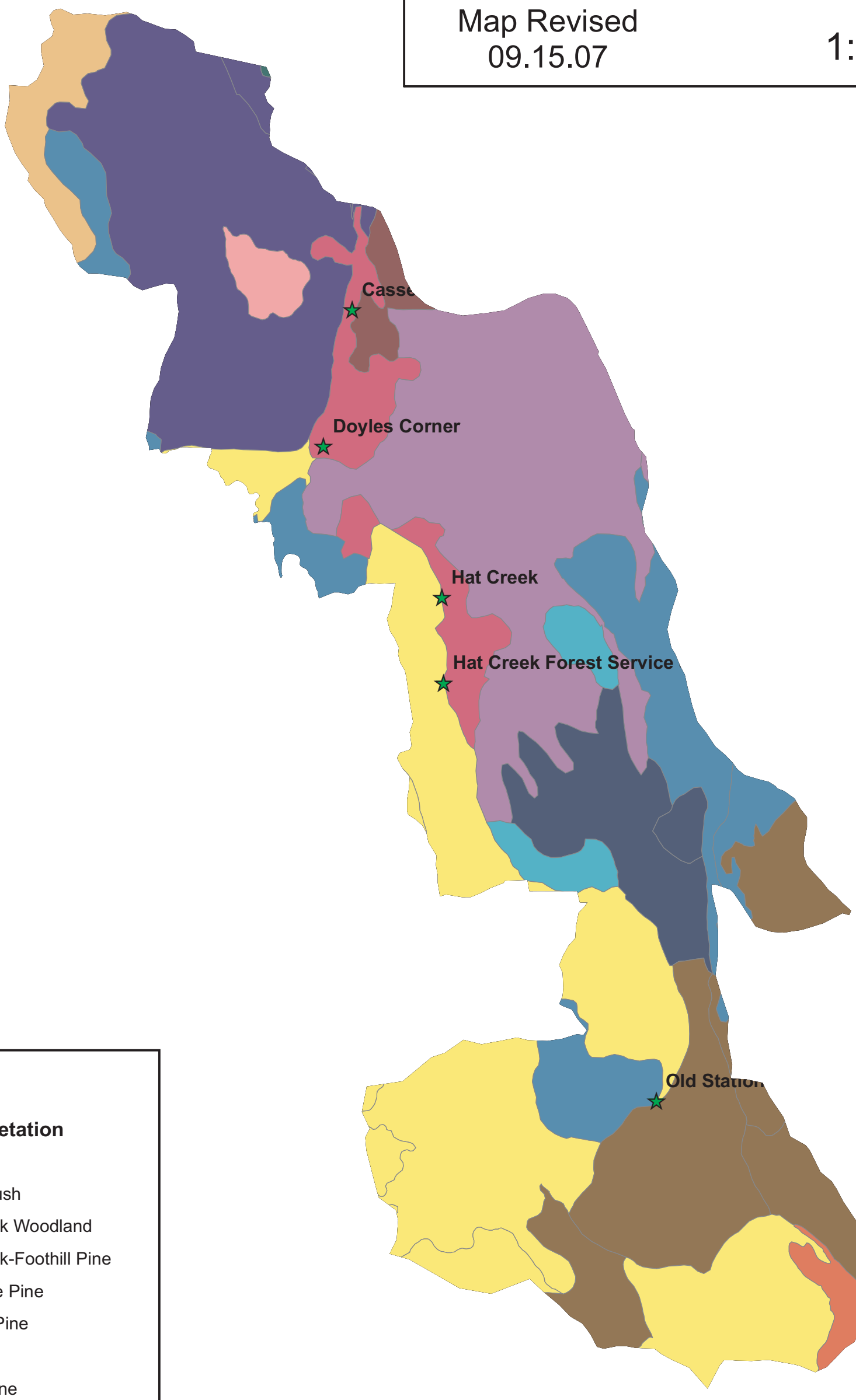


Places

GENVEG

General Vegetation

- Barren
- Bitterbrush
- Blue Oak Woodland
- Blue Oak-Foothill Pine
- Eastside Pine
- Jeffrey Pine
- Juniper
- Lacustrine
- Montane Hardwood
- Montane Hardwood-Conifer
- Pasture
- Perennial Grassland
- Sierran Mixed Conifer
- Wet Meadow

Map # 2
Hat Creek Valley Fire Safe Council
Fire History

0 1 2 4 6 8

Miles

Map Revised
09.15.07

1:150,000

N

Cassel

Doyles Corner

Hat Creek

Hat Creek Forest Service Station

Old Station

Project Area
Places
Shasta_CO_Fire_History_(2000_-_2005)_
Shasta_CO_Fire_History_(1950_-_1999)_
Shasta_CO_Fire_History_(1900_-_1949)_

Map # 3
Hat Creek Valley Fire Safe Council
Fuels Model

0 0.5 1 2 3 4

Miles

Map Revised
10.05.07

1:150,000

Data Source:
Fuels Model --
Fuels Staff, USFS,
Hat Creek Ranger Station,
Fall River Mills.

Fuel Type

- Bare Ground
- Agriculture
- Long Needle Litter
- Moderate Load, Dry Climate Shrub
- High Load, Conifer Litter
- Very High Load, Dry Climate Shrub
- Very High Load, Dry Climate Timber - Shrub

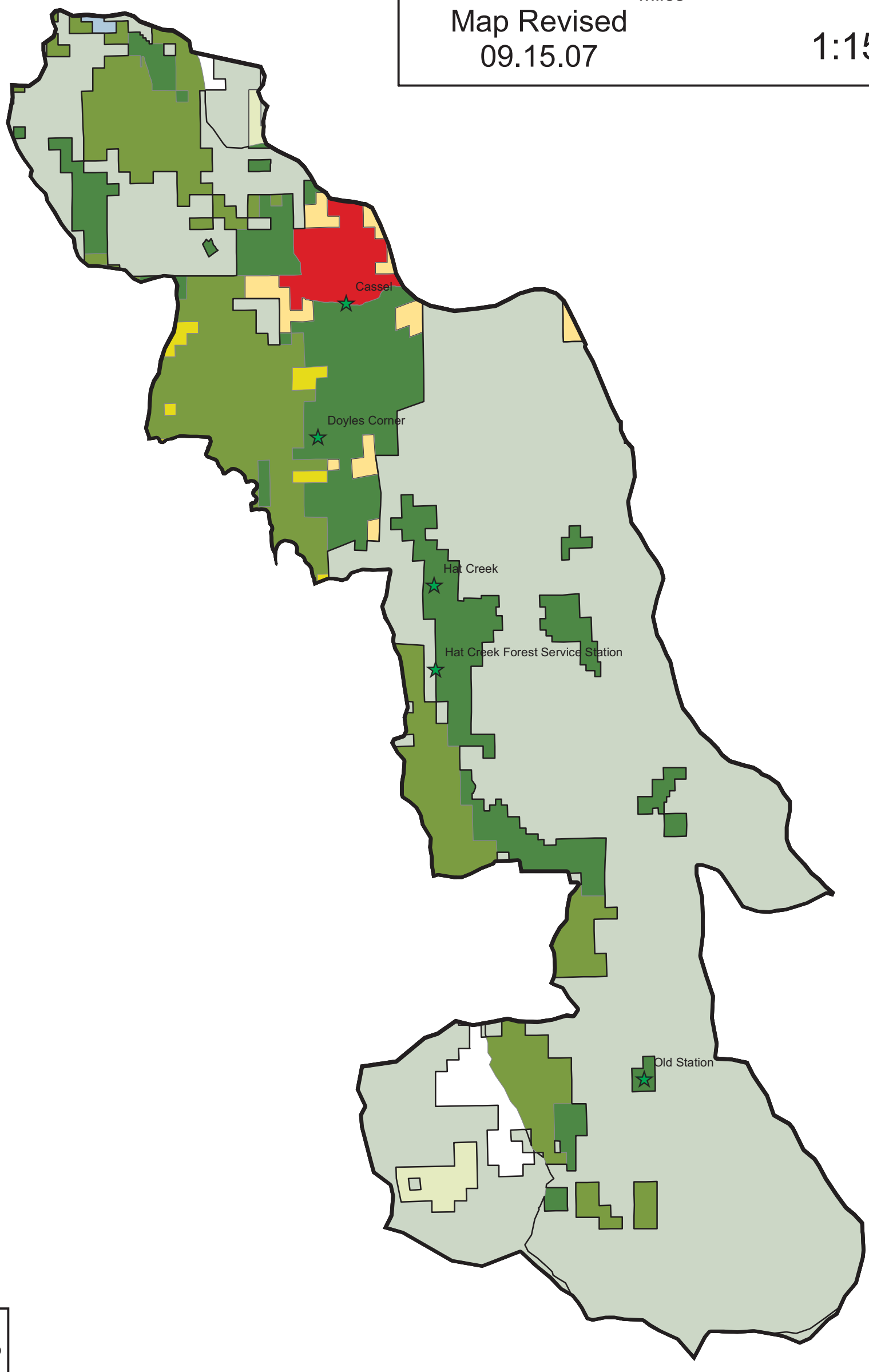
Map # 4
Hat Creek Valley Fire Safe Council
Land Ownership

0 1 2 4 6 8

Miles

Map Revised
09.15.07

1:150,000



Places

Land Ownership

- Unclassified
- BLM
- Fruitgrowers
- LVNP
- Other Private
- PG&E
- Sierra Pacific
- State
- Lassen NF

Map # 5
Hat Creek Valley Fire Safe Council
Plants & Wildlife (CNDDB)

0 1 2 4 6 8

Miles

Map Revised
09.15.07

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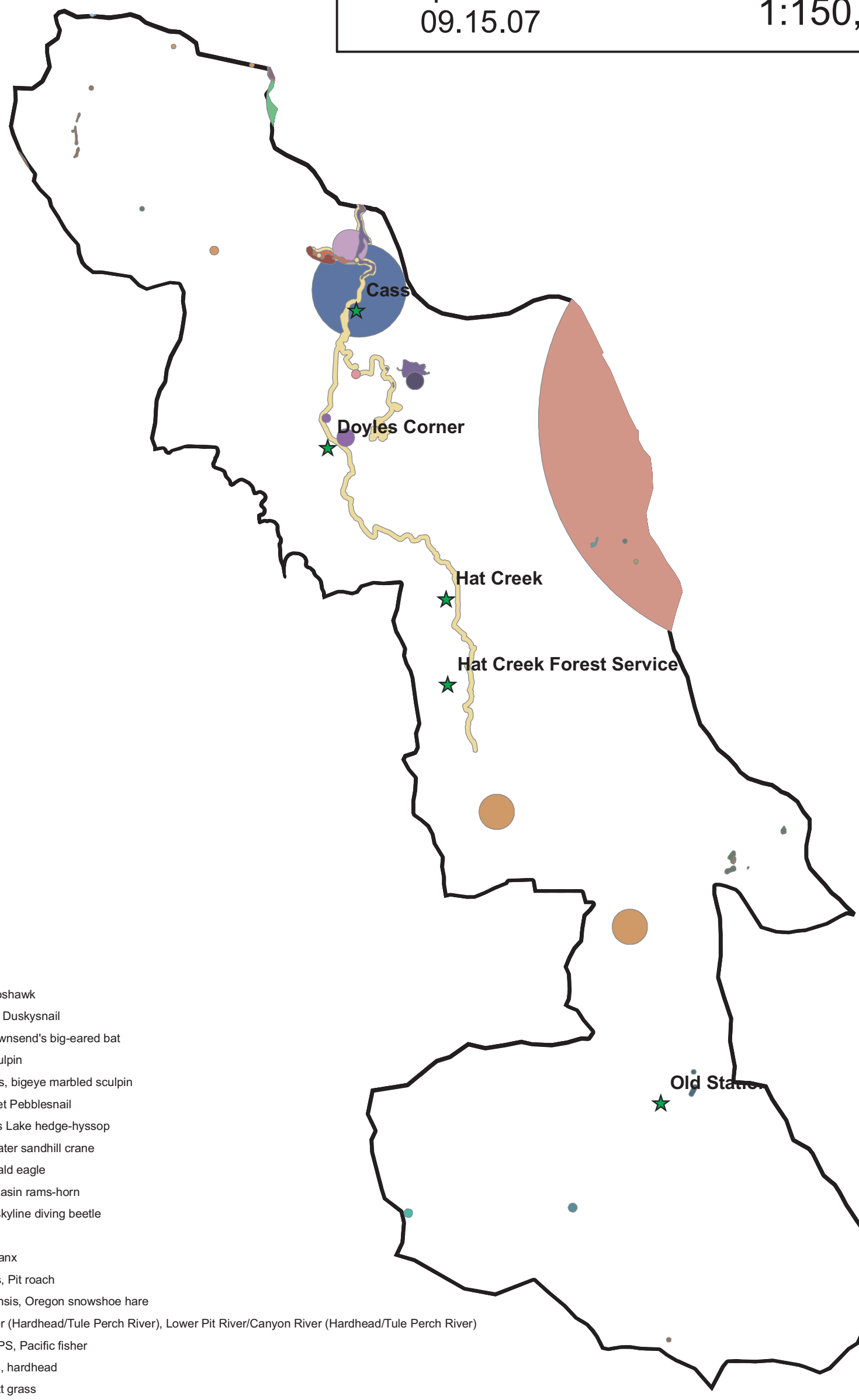


Places

cnddb

SNAME, CNAME

- Accipiter gentilis, northern goshawk
- Colligyrus convexus, Canary Duskysnail
- Corynorhinus townsendii, Townsend's big-eared bat
- Cottus asperrimus, rough sculpin
- Cottus klamathensis macrops, bigeye marbled sculpin
- Fluminicola seminalis, Nugget Pebblesnail
- Gratiola heterosepala, Boggs Lake hedge-hyssop
- Grus canadensis tabida, greater sandhill crane
- Haliaeetus leucocephalus, bald eagle
- Helisoma newberryi, Great Basin rams-horn
- Hydroporus leechi, Leech's skyline diving beetle
- Juga acutifilosa, topaz juga
- Lanx patelloides, Kneecap Lanx
- Lavinia symmetricus mitrulus, Pit roach
- Lepus americanus klamathensis, Oregon snowshoe hare
- Lower Pit River/Canyon River (Hardhead/Tule Perch River), Lower Pit River/Canyon River (Hardhead/Tule Perch River)
- Martes pennanti (pacifica) DPS, Pacific fisher
- Mylopharodon conocephalus, hardhead
- Orcuttia tenuis, slender orcutt grass
- Pacifastacus fortis, Shasta crayfish
- Pandion haliaetus, osprey
- Pit R. Drainage Rough Sculpin/Shasta Crayfish Spring Stream, Pit R. Drainage Rough Sculpin/Shasta Crayfish Spring Stream
- Pogogyne floribunda, profuse-flowered pogogyne
- Potamogeton zosteriformis, eel-grass pondweed
- Pyrgulopsis archimedis, Archimedes Pyrg
- Riparia riparia, bank swallow
- Tuctoria greenei, Greene's tuctoria

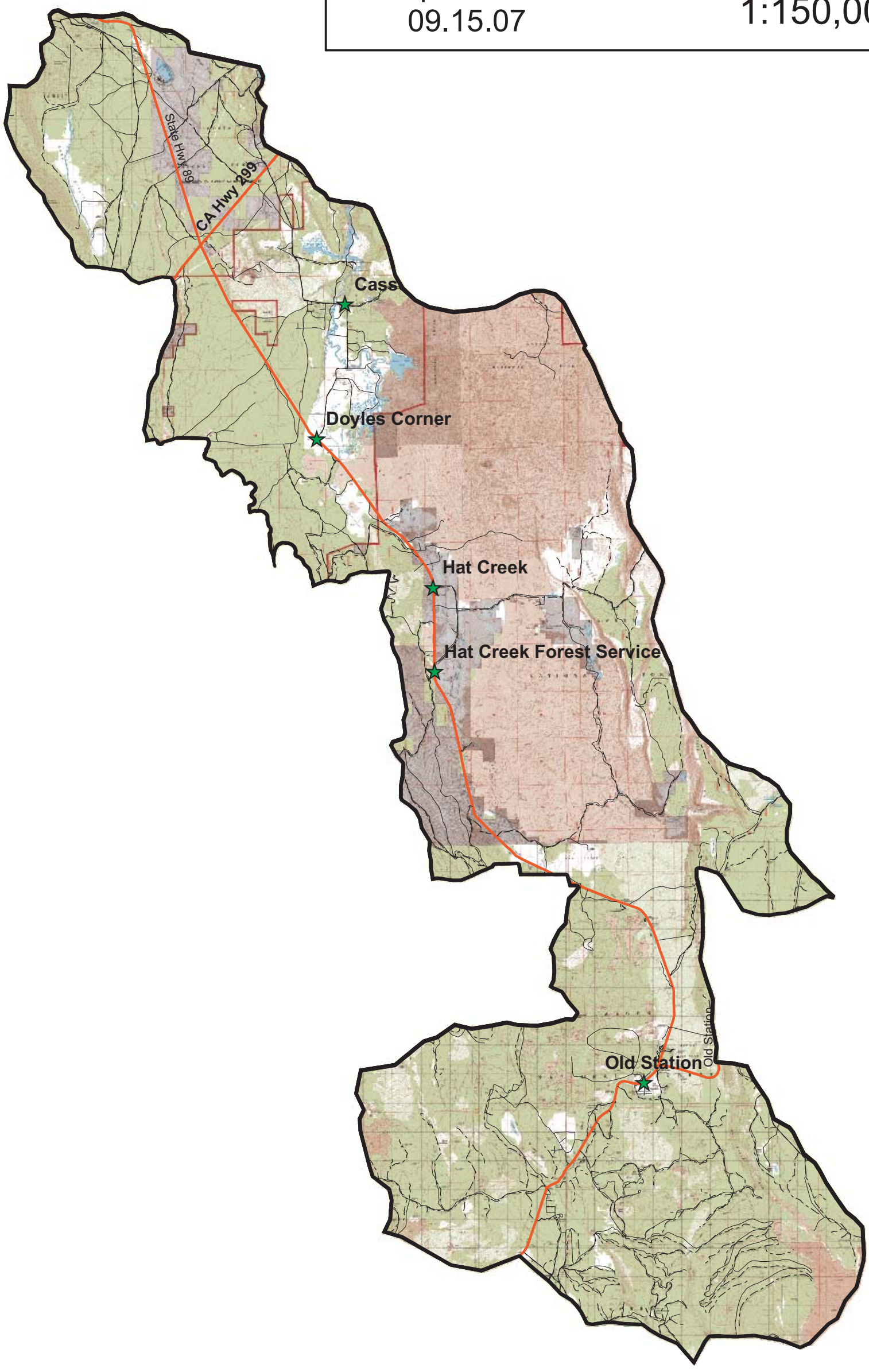
Map # 6
Hat Creek Valley Fire Safe Council
Roads

0 1 2 4 6 8

Miles

Map Revised
09.15.07

1:150,000



Places

Project Area

Map # 7
Hat Creek Valley Fire Safe Council
Soil

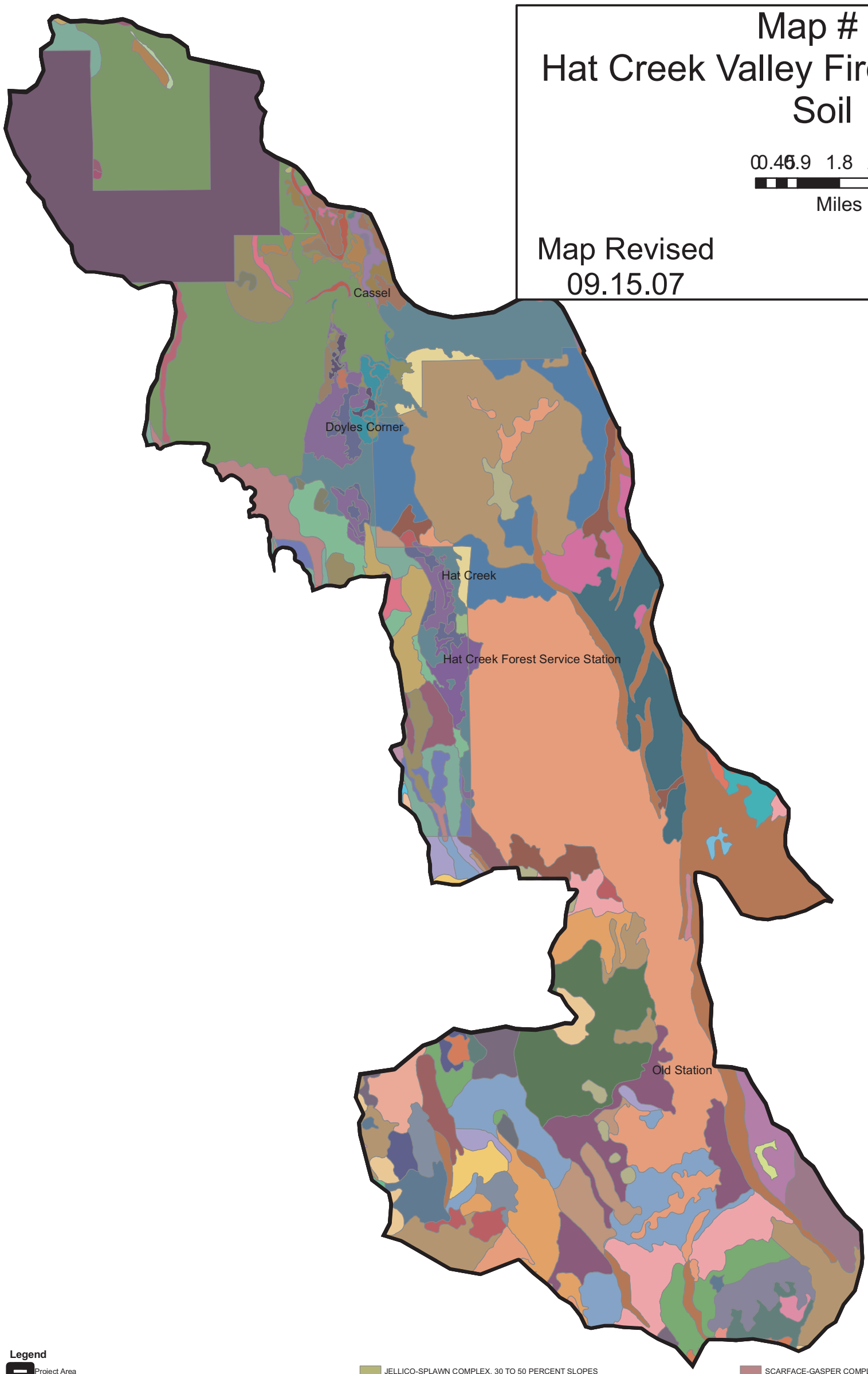
0 0.45 0.9 1.8 2.7 3.6

Miles

N

Map Revised
09.15.07

1:150,000



Legend

Project Area

soil

Soil Type

- Aquolls, 0 to 15 percent slopes.
- BOARDBURN-HAMBONE COMPLEX, 5 TO 15 PERCENT SLOPES
- BOLLIBOKKA LOAM, 2 TO 15 PERCENT SLOPES
- BOLLIBOKKA LOAM, 30 TO 50 PERCENT SLOPES
- BOLLIBOKKA LOAM, 50 TO 75 PERCENT SLOPES
- BRITTON SILTY CLAY LOAM, 15 TO 30 PERCENT SLOPES
- BRITTON SILTY CLAY LOAM, 30 TO 50 PERCENT SLOPES
- BUNSELMEIER VERY GRAVELLY SANDY LOAM, 15 TO 30 PERCENT SLOPES
- BURNEY-ARKRIGHT COMPLEX, 2 TO 9 PERCENT SLOPES
- Bobbitt family, moderately deep-Gwin family association,0 to 35 percent slopes.
- Bobbitt-Holland families-Lithic Haploxeralfs association, 0 to 15 percent slopes.
- Bobbitt-Holland-Skalan families association, 0 to 15 percent slopes.
- Brownlee-Skalan families association, 0 to 35 percent slopes.
- Durixerolls, 0 to 15 percent slopes.
- Durixerolls-Bobbitt family, moderately deep association, 0 to 35 percent slopes.
- GASPER-SCARFACE COMPLEX, 15 TO 30 PERCENT SLOPES
- GASPER-SCARFACE COMPLEX, 30 TO 50 PERCENT SLOPES
- GASPER-SCARFACE COMPLEX, MOIST, 2 TO 15 PERCENT SLOPES
- GRAVEL PITS
- HAMBONE-BOARDBURN COMPLEX, 15 TO 30 PERCENT SLOPES
- HAMBONE-BOARDBURN COMPLEX, 30 TO 50 PERCENT SLOPES
- HENHILL SILT LOAM, PARTIALLY DRAINED, 0 TO 2 PERCENT SLOPES
- Inville family-Sheld family, moderately deep-Rubble Land association, 15 to 50 percent slopes.
- Inville-Yallani families complex, 0 to 35 percent slopes.
- Inville-Yallani families complex, 35 to 50 percent slopes.
- Inville-Yallani families, cobbly complex, 15 to 50 percent slopes
- JELLICO-SPLAWN COMPLEX, 30 TO 50 PERCENT SLOPES
- JELLYCAMP-LASSEN-LONGCREEK COMPLEX, 2 TO 15 PERCENT SLOPES
- JELLYCAMP-OLLIERIVAS COMPLEX, 2 TO 9 PERCENT SLOPES
- KEDDIE LOAM, 0 TO 2 PERCENT SLOPES
- KEDDIE MUCK, 0 TO 1 PERCENT SLOPES
- LASVAR-PITVAR COMPLEX, 0 TO 2 PERCENT SLOPES
- LAVA FLOWS
- LAVA FLOWS-GASSAWAY COMPLEX, 2 TO 15 PERCENT SLOPES
- LAVA FLOWS-NEER COMPLEX, 2 TO 15 PERCENT SLOPES
- Lava Flow-Lithic Haploxerolls association, 0 to 35 percent slopes.
- Lava Flow-Lithic Xerochrepts complex, 0 to 35 percent slopes.
- Lava Flow.
- Lithic Haploxeralfs-Skalan family complex, 0 to 15 percent slopes.
- Lithic Xerumbrepts-Rock Outcrop-Rubble Land association, 15 to 50 percent slopes.
- Lithic Xerumbrepts-Rubble Land-Sheld family, moderately deep association, 35 to 70 percent slopes.
- MATQUAW GRAVELLY SANDY LOAM, 0 TO 5 PERCENT SLOPES
- MATQUAW VERY GRAVELLY SANDY LOAM, 0 TO 2 PERCENT SLOPES
- MODOC SANDY LOAM, 2 TO 5 PERCENT SLOPES
- Neer-Sadie families complex, 0 to 35 percent slopes.
- Neer-Sadie families-Washougal family, moderately deep complex, 0 to 35 percent slopes.
- Neer-Skalan families complex, 0 to 35 percent slopes.
- Neer-Skalan families complex, 35 to 50 percent slopes.
- Neer-Skalan families-Rubble Land complex, 15 to 70 percent slopes.
- RICKETTS-ORHOOD COMPLEX, 30 TO 50 PERCENT SLOPES
- RUBBLE LAND-ARGIXEROLLS-ROCK OUTCROP COMPLEX, 30 TO 75 PERCENT SLOPES
- RUBBLE LAND-ROCK OUTCROP COMPLEX, 30 TO 75 PERCENT SLOPES
- RUBBLE LAND-XERORTHENTS COMPLEX, 50 TO 70 PRECENT SLOPES
- Rubble Land-Deadwood family association, 35 to 70 percent slopes.
- Rubble Land-Pass Canyon family-Bobbitt family, moderately deep association, 35 to 70 percent slopes.
- SCARFACE-GASPER COMPLEX, 2 TO 15 PERCENT SLOPES
- SPLAWN-JELLICO COMPLEX, 5 TO 15 PERCENT SLOPES
- SWANBERGER CLAY, 0 TO 1 PERCENT SLOPES
- Sadie-Washougal families, alluvial association,0 to 15 percent slopes.
- Sheld family, moderately deep-Lithic Xerumbrepts association, 0 to 35 percent slopes.
- Sheld family, moderately deep-Sheld family-Rock Outcrop complex, 0 to 35 percent slopes.
- Sheld family-Sheld family, moderately deep complex, 0 to 35 percent slopes.
- Sheld family-Shels family, moderately deep complex, 35 to 50 percent slopes.
- Skalan family-Washougal family, moderately deep-Rock Outcrop association, 0 to 35 percent slopes.
- Skalan-Bobbitt families association, 0 to 35 percent slopes.
- Skalan-Holland families association, 0 to 35 percent slopes.
- Skalan-Holland families association, 35 to 50 percent slopes.
- Soils data not complete
- Supan family, 0 to 15 percent slopes.
- TWINBUTTES VERY GRAVELLY COARSE SANDY LOAM, 30 TO 50 PERCENT SLOPES
- TWINBUTTES-LAVA FLOWS COMPLEX, 2 TO 15 PERCENT SLOPES
- Trojan-Inville-Patio families association, 0 to 35 percent slopes.
- Typic Xerorthents, 15 to 50 percent slopes.
- Typic Xerorthents-Yallani family association, 0 to 35 percent slopes.
- Typic Xerorthents-Yallani family association, 35 to 50 percent slopes.
- WATER
- WENGLER VERY GRAVELLY COARSE SANDY LOAM, 30 TO 50 PERCENT SLOPES
- WENGLER VERY GRAVELLY COARSE SANDY LOAM, 5 TO 15 PERCENT SLOPES
- WINNIBULLI LOAM, 0 TO 2 PERCENT SLOPES
- Yallani family-Lava Flow-Sheld family, moderately deep association, 0 to 35 percent slopes.
- Yallani family-Sheld family, moderately deep association, 15 to 35 percent slopes.
- Yallani-Portola families association, 0 to 35 percent slopes.
- Yallani-Sheld families, moderately deep, cobbly complex, 0 to 35 percent slopes.
- ZEUGIRDOR-GOULDER COMPLEX, 30 TO 50 PERCENT SLOPES

Places

Map # 8
Hat Creek Valley Fire Safe Council
Old Station Area. WUI and Projects

0 0.125 0.25 0.5 0.75 1

Miles

Map Revised
10.05.07

1:25,000

Proposed Fuelbreaks

WUI

Data Source:
WUI --
Risk Assesment Committee,
Hat Creek Valley Fire Safe Council

Map # 9
Hat Creek Valley Fire Safe Council
Hat Creek Area. WUI and Projects

0 0.2 0.4 0.8 1.2 1.6

Miles

N

Map Revised
10.05.07

1:34,000

Proposed Fuelbreaks

WUI

Data Source:
WUI --
Risk Assesment Committee,
Hat Creek Valley Fire Safe Council

Map # 10
Hat Creek Valley Fire Safe Council
Cassel Area. WUI and Projects

0 0.1 0.2 0.4 0.6 0.8

Miles

Map Revised
10.05.07

1:20,000

Proposed Fuelbreaks

WUI

Data Source:
WUI --
Risk Assesment Committee,
Hat Creek Valley Fire Safe Council