

Downriver Fire & Fuel Management Plan



Photo by Andrew Harp

Prepared for
Trinity County Resource Conservation District

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Acronyms

BLM	Bureau of Land Management
CDF	California Department of Forestry & Fire Protection
CFIP	California Forest Improvement Program
Downriver FFMP	Downriver Fire & Fuel Management Plan
EQIP	Environmental Quality Incentive Program
FRAP	Fire & Resource Assessment Program
GIS	Geographic Information System
GPS	Global Positioning System
LRMP	Land & Resource Management Plan
LSR	Late Successional Reserve
NEPA	National Environmental Policy Act
NSO	Northern Spotted Owl
NRCS	Natural Resources Conservation Service
ONCC	Northern California Service Center
PG&E	Pacific Gas & Electric
RAWS	Remote Access Weather Stations
RNA	Research Natural Area
SOD	Sudden Oak Death Disease
SPI	Sierra Pacific Industries
SRNF	Six Rivers National Forest
SRNF LRMP	Six Rivers National Forest Land & Resource Management Plan
S-T NF	Shasta-Trinity National Forest
TCRCD (RCD)	Trinity County Resource Conservation District
THP	Timber Harvest Plan
TPZ	Timber Production Zone
TRC&DC	Trinity Resource Conservation & Development Council
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFS MTWA	Six Rivers N.F. 2003 “Mainstem Trinity Watershed Analysis”
VERIZON	VERIZON Telephone Company
VFD	Volunteer Fire Department
WA	Watershed Analysis
WRTC	Watershed Research & Training Center
WUI	Wildland-Urban Interface

Downriver Fire & Fuel Management Plan

CHAPTER 1. INTRODUCTION & OVERVIEW

Purpose

The purpose of the Downriver Fire & Fuel Management Plan is to portray current fire, fuel, and access conditions and fire infrastructure and to identify management practices and projects that will promote forest succession and health while protecting the primary resources of soil and water and associated resources of wildlife and fisheries from the deleterious effects of high severity, stand replacing fires. This plan addresses residential property protection, fire control access and safety, water development for firefighting, and fuel management. It includes the communities of Hawkins Bar and Salyer and the residential areas of Gray Flat, Suzy Q Ranch, Oden Flat, Hudson Creek (southeast Willow Creek), and South Fork Road. This plan is part of the “Downriver Communities Fire Safe Plan and Demonstration Project” (03-DG-11051456-045) funded by the USDA-USFS through the National Fire Plan Economic Action Program.

Large fires have occurred in the project area in the past and despite all efforts, will probably occur again. The mix of residential development, timberlands, hot summer weather with strong afternoon winds, and high ignition risk make fire and fuel management an important concern of area residents and land managers.

The Downriver Fire & Fuel Management Plan (Downriver FFMP) is coordinated with “Recommendations on Trinity County Values at Risk from Fire and Pre-Fire Fuels Treatment Opportunities drawn from Community Meetings 1999/2000”, a report to the Trinity County Fire Safe Council from the Trinity County Resource Conservation District (TCRCD) and Watershed Research and Training Center (WRTC). The Trinity County Fire Safe Council is a coalition of organizations that collaborate to promote fire safe communities in Trinity County. The Fire Safe Council is composed of representatives from the Shasta-Trinity and Six Rivers National Forests (S-T NF & SRNF), Bureau of Land Management (BLM), Natural Resources Conservation Service (NRCS), California Department of Forestry and Fire Protection (CDF), Trinity County Board of Supervisors, TCRCD, Trinity Resource Conservation and Development Council (TRC&DC), WRTC, South Fork Trinity River Coordinated Resource Management Plan Group (South Fork CRMP), Trinity County Fire Chiefs Association, and Trinity County Association of Realtors.

In 1999 the TCRCD received a grant from the State of California, funded under Proposition 204, to develop a countywide fire plan and to implement community fuel reduction projects. It worked closely with the Fire Safe Council and with Yvonne Everett, Ph.D., Professor of Natural Resources Planning at Humboldt State University in developing the fire plan. The Downriver FFMP will become a part of that plan by reference.

The Downriver FFMP contains recommendations that agencies and individual landowners can follow to reduce the danger of wildfires degrading resource lands or burning homes or other structures. Recommendations to establish shaded fuelbreaks, thin overstocked forests, reduce ladder and surface fuels, apply prescribed fire, and execute other management practices and projects that reduce fire spread and intensity should reduce the likelihood of high severity fires and facilitate control of low and moderate severity fires to prevent them from increasing in intensity or becoming crown fires. Also included are recommendations to improve fire infrastructure, water supplies, and community safety. In support of these goals, the plan should be used to extend existing and proposed fuel treatments on the Six Rivers National Forest into private lands (see ‘Fire Access & Infrastructure Map’).

This plan is a compilation of knowledge and recommendations from a wide variety of sources, including area residents, fire and resource management experts from the Six Rivers NF, CDF, Salyer Volunteer Fire Department, and the private sector, and technicians and support personnel from the TCRCD (especially Kelly

Sheen, GIS Specialist). This plan relies heavily on GIS data and other information provided by Six Rivers National Forest personnel, including Lucy Salazar, Rob McClelland, Regina Moon, and others. Much of the information that is included in this plan was found in the 2001 “Six Rivers NF Fire Management Plan”, the 2003 “Mainstem Trinity Watershed Analysis” (USFS MTWA), and the “Lower South Fork Trinity Watershed Analysis”, which should all be referenced for more detailed information on the history, communities, natural resources, disturbance events, and USFS management goals for the Downriver FFMP area. Neither of the watershed analyses cover the entire area of the Downriver FFMP, so area specific data must be interpolated. These plans are available from the Six Rivers National Forest office in Eureka, California.

Location

The Downriver FFMP area is in western Trinity County in the northernmost portion of the South Fork of the Trinity River watershed and in that portion of the Trinity River watershed above and below its confluence with the South Fork of the Trinity River. The western border of the Downriver FFMP area is the South Fork of the Trinity and Trinity Rivers, from the boundary between Trinity and Humboldt counties (in southern Willow Creek) to Coon Creek, which is at the end of South Fork Road. The southern border is Coon Creek, from its confluence with the South Fork of the Trinity River, to Hennessey Ridge. The eastern border is the border between the Six Rivers and Trinity National Forests, from Coon Creek to the confluence of the Trinity and New Rivers, then north up the divide between Cow Creek and Dyer Creek to Waterman Ridge. The northern border is Waterman Ridge, from the divide between Hawkins Creek and Bell Creek, northwest to the boundary between Trinity and Humboldt counties, then southwest along the boundary to the Trinity River. The Downriver FFMP area is bisected by Hennessey Ridge and State Highway 299. The Downriver FFMP area encompasses approximately 30,300 acres in the Trinity and South Fork of the Trinity River watersheds in Sections 25, 33-36, T7N, R5E, HB&M; Sections 31 & 32, T7N, R6E, HB&M; Sections 1-4, 10-15, 22-26, 35 & 36, T6N, R5E, HB&M; Sections 4-10, 15-22, 27-34, T6N, R6E, HB&M; Sections 1, 12, 13, & 24, T5N, R5E, HB&M; Sections 16-21, 27-34, T6N, R6E, HB&M; Sections 3-8, 17-21, 28-30, T5N, R6E, HB&M; [All legal descriptions hereafter are within the Humboldt Base & Meridian (HB&M), so that portion of the legal description will be omitted.]

Communities

Most of the people in the Downriver FFMP area live in the Trinity River corridor, in the unincorporated towns of Salyer and Hawkins Bar, and in the residential areas of Hudson Creek (southeast Willow Creek), Oden Flat, and Suzy Q Ranch. Homes are also found scattered and clustered between these population centers and in the Gray Flat (Ranch) area. Approximately 800 people live in this area. Most of the people who live along the South Fork of the Trinity River live in the residential area of Ammon Ranch, with homes scattered as far south as Surprise Creek.

The main economic activities in these communities are services and retail trade, with much of it related to tourist activities, such as fishing, hunting, hiking, rafting, kayaking, and wildlife viewing. Agriculture, logging, and mining are also important economic activities.

Willow Creek, Salyer, Hawkins Bar, Oden Flat, Suzy Q Ranch, and Gray Flat are listed in the Federal Register as communities at high risk from the threat of wildfires. A CDF FRAP (Fire & Resource Assessment Program) map also shows Ammon Ranch as a community at high risk.

Land Ownership

The U.S. Forest Service, Six Rivers National Forest administers the majority (80%) of the land in the Downriver FFMP area (see ‘Fire Access & Infrastructure Map’). Most of the watershed from the mid-lower slopes to the tops of the ridges is National Forest.

There are 727 private parcels in the Downriver FFMP area (18% of the area), 499 (69% - 8% of the Downriver FFMP area) of which are occupied by residences and 228 (31% - 10% of the Downriver FFMP

area) of which are vacant parcels. The occupied parcels are all within one mile of the Trinity and South Fork of the Trinity Rivers on flat to gently sloping ground.

Sierra Pacific Industries (SPI) owns one 570 acre parcel (2% of the area) east of the South Fork of the Trinity River. Its property, which crosses South Fork Road (Sec. 36, T35N, R5E), is zoned Timberland Production Zone (TPZ), which requires long-term forest management for timber production. Four other parcels, totaling 230 acres (<1% of the area), are zoned TPZ. Three of these are owned by Eel River Sawmills and one by another private owner.

The remainder of the watershed consists of 26 non-private (unclear what that designates) parcels (75 acres) and one Bureau of Land Management parcel (6 acres), totaling <1% of the area.

Downriver FFMP Area Ownerships	
<u>Ownership Type</u>	<u>Acres</u>
Six Rivers National Forest	23,863
Private (vacant)	3,075
Private (occupied)	2,481
Sierra Pacific Industries	570
Private (TPZ)	230
Non-private	75
Bureau of Land Management	6
Total	30,300

Topography

The Downriver FFMP area is within two relatively narrow river canyons, the Trinity River canyon, which is oriented northwest to southeast, and the South Fork of the Trinity canyon, which is oriented north to south. Elevations within the Downriver FFMP area range from 450 feet on the Trinity River at the northwest corner of the plan area to about 4400 feet on Waterman Ridge at the highest point of the Hawkins Creek watershed. Most of the Downriver FFMP area is between 1000 and 3000 feet in elevation.

The topography of the watershed is highly dependent upon geology, soil type, and past geological events (USFS MTWA). The residential areas of Gray Flat, Hawkins Bar, Suzy Q Ranch, Oden Flat, Salyer, and Hudson Creek (southeast Willow Creek) are mostly located on gentle slopes (0-10%) created by alluvial action. Some of the residential areas south of the Trinity River and along South Fork Road are on benches or moderately gentle slopes (0-30%). The lower slopes of Hennessey Ridge are quite variable, ranging from flat to 80%. Mid to upper slopes typically range from 60 to 80%, with gentle slopes on the relatively narrow ridgetop. The lower slopes of Waterman Ridge are also quite variable, with flats and gentle slopes where residential areas are located and slopes from 50-100% elsewhere. Mid to upper slopes typically range from 60 to 80%, with gentle slopes on the relatively narrow ridgetop. The inner gorges of the rivers and tributaries tend to be the steepest, with slopes sometimes in excess of 100%.

Climate and Fire Weather

Northern California has a Mediterranean climate characterized by long, dry, hot summers and wet winters. The Downriver FFMP area averages 45-55 inches of rain per year in the lower elevations (30-year average for Willow Creek is 55 inches) and 60-80 inches in the higher elevations, with 90% of the rain occurring between October and April. About 3 inches of rain falls during June through September, with occasional intense summer thunderstorms capable of producing heavy precipitation of short duration. Accompanying lightning strikes can cause multiple fire starts.

In winter, freezing temperatures occur throughout the Downriver FFMP area. Snow may fall over the entire area, with several inches accumulating at lower elevations and several feet accumulating above 4000 feet. Snow generally lasts only a few hours to a few days at lower elevations, but may persist on north facing slopes above 4000 feet until the middle of May or June. High intensity "rain on snow" events, which cause high levels of erosion and increased flow volumes, often occur at elevations of 3000-4000 feet. Extreme events of this type occurred in 1955, 1964, 1972, 1978, 1983, 1986, 1995, and 1997. Should a catastrophic fire occur in the Downriver FFMP area, the frequency of these events could adversely impact soils and water quality, which could adversely impact some of the water drafting sites for fire engines.

Extreme fire weather can occur from early June through October, and is common in August and September. Temperatures at lower elevations in late June thru October can range from 90-100+⁰F for several days or even weeks at a time, with very low relative humidities (5-15%) and fuel moisture. Relative humidity generally reaches its lowest point in August through early October.

During the summer, from mid-day to late afternoon and early evening, on a daily basis, winds generally blow up canyon from the northwest, west, and southwest. But they can also blow down the South Fork of the Trinity and can be quite changeable and erratic in the area between Brush Mountain and the confluence of the South Fork of the Trinity and the Trinity Rivers. These winds are caused by heating in the Central Valley, which creates a low pressure area that draws marine air inland. They are especially strong (12-20 mph) near the bottom of the major canyons during mid- to late-summer, at the height of the fire season. They increase the speed of the up-slope diurnal winds (caused by solar heating) during the day and change their direction to down-slope on the lee side of north-south trending ridges, such as Hennessey Ridge. Mild, diurnal, down-slope winds blow at night as cooler, heavier air flows towards the Trinity and South Fork of the Trinity Rivers from the higher elevations.

During the spring (May and June) and fall (mid-September to late October), strong “foehn” winds sometimes blow from a northerly to easterly direction. These are dry winds that can rapidly dry small fuels, even when they have been wetted by light rainfall that often occurs during the late fire season. They can gust up to 45 mph, which can drive a fire rapidly, as occurred twice during the Megram Fire when it burned out of the Trinity Alps Wilderness, once when it traveled almost three miles into Mill Creek and once when it traveled five miles to Waterman Ridge.

Thunderstorms can occur at any time of year and generally produce strong, erratic winds, lightning, and intense downpours of rain. “Dry” lightning thunderstorms, which produce little or no rainfall, typically occur in August during the worst of the fire season. These storms generally travel into the area from the southeast, south, or southwest, traveling toward the northwest, north, northeast, and sometimes west. They normally occur over a 3-6 day period and are associated with steep terrain, high temperatures, and unstable air masses, which are common over the Trinity Alps and South Fork Mountain. Larger than normal dry lightning storms occur 2-4 times per decade and large storms occur about once every 10 years (1967, 1977, 1987, 1999).

The Redding Fire Weather Center (<http://gacc.nifc.gov/oncc/predictive/weather/index.htm>), a service of the Northern California Service Center (ONCC), provides fire weather support to fire management agencies in northern California. The district comprises seven National Forests, seven CDF ranger units, four National Park Service sites, the Hoopa Indian Reservation, and portions of two BLM districts. The weather unit also acts as the local meteorological consultant for ONCC and provides daily fire season weather briefings, regional fire weather and aviation training, and other forecasts and services.

Five Remote Access Weather Stations (RAWS) are in the Downriver FFMP area. To the southwest is Maple Creek (MPCC1) at 1680 feet, to the south is Underwood at 2600 feet, to the east is Big Bar (BGBC1) at 1500 feet, to the northwest is Hoopa (HOAC1) at 375 feet, and also to the northwest is Big Hill (BIIC1) at 3570 feet. These sites can be accessed online at <http://www.fs.fed.us/raws/> or at http://www.wrh.noaa.gov/sto/obsmap_eka.php to view current and past weather information, displayed on an hourly basis. The date, time, wind speed, temperature, relative humidity, accumulated precipitation, fuel temperature, and fuel moisture are displayed.

Past Fires and Present Threats

Past Fires

The Downriver FFMP area has a history of “extensive, stand-replacing fires following droughts and periods of infrequent, less severe fires during wetter climates. The analysis of fire history data and vegetation patterns indicates that fire has been the defining disturbance agent. Between about 1860 and 1910, high severity, stand-replacing fires burned significant areas of the [Six Rivers National] Forest. These fires followed prolonged droughts, which led to dense accumulations of fuels and contributed to the mainly stand

replacing fire severity. Current landscape distribution of vegetation seral stages indicates that most of the stand replacing fire took place in upslope (upper 1/3) positions. These locations are most susceptible to lightning strikes, strong, drying winds, and stand replacing fire.” (USFS MTWA)

But, “The majority of recent fires in the watershed have not been stand-replacing events. Fire history studies in the region indicate that the watershed falls within a mixed severity, short interval fire regime where fires would burn through stands frequently. Return intervals were approximately 15 to 20 years for the tanoak and Douglas-fir vegetation series that occupy the majority of the watershed. Fire intensities were mostly low to moderate with patches of high intensity, stand-replacing fire. The effect of this type of fire regime on forest vegetation would generally be to promote the development and maintenance of a complex forest characterized by a mosaic of stand densities and discontinuous fuel profile from the forest floor into and across the canopy. Successful fire suppression efforts have generally excluded fire from the majority of the watershed for the past 50 years. Fire exclusion has promoted an increase in stand densities with heavy fuel loading from the forest floor into the forest canopy.” (USFS MTWA)

Fire start records date back to 1910 and indicate that a total of 347 fires started in the Downriver FFMP area, with another 200 fires started within one mile of the boundary, mostly along the SR 299 corridor and in Willow Creek. Most of the human fire starts within the plan area were in the residential areas, along the SR 299 corridor, or along South Fork Road (see ‘Fire Starts & Burn Areas Map’). At least one hundred and seventy-four fires started in the thirty-three years from 1970 through 2003, as follow:

Fire Starts in the Downriver FFMP area					
Cause	'70-'79	'80-'89	'90-'99	'00-'03	Total
Human	51	31	47	28	157
Lightning	3	3	11		17

This is an average of over five fires per year, with 90% of the fires caused by humans. Almost all the human-caused fires were associated with roads and residential developments, but starts from abandoned campfires are increasing as more people recreate in the area, especially at popular spots for swimming and boating on the Trinity and South Fork of the Trinity Rivers.

Only six recorded fires have been larger than 100 acres in the USFS MTWA area, which includes the Willow Creek drainage and part of the Hoopa Valley Indian Reservation. The largest recorded burn in the Downriver FFMP area, and in the USFS MTWA area, was the 2000 acres burned by the Megram fire in the Hawkins Creek drainage. The next ten largest fires were between 50 to 780 acres. Since records have been kept (1911), about 7% of the USFS MTWA area occupied by forests and associated vegetation types has burned.

Large, fast moving fires have occurred in the vicinity of the Downriver FFMP area within the past decade and can be expected to occur within the watershed at any time. The Sims Fire started on July 28, 2004 from a PG&E power line. The point of ignition for this fire was at the Grouse Creek Bridge on Route 6, south of Sims Mountain, 17 air miles south of Willow Creek. This fire eventually burned 4030 acres over a 5-day period. The fire threatened homes and caused extensive damage, on both public and private lands, to the forest and shrub cover that protects the watershed.

The Loma Fire, 9 air miles upriver from the eastern boundary of the Downriver FFMP area, started on Highway 299 at 3:30 PM on September 14th, 2003 and burned about 4000 acres (285 acres in the first 3½ hours) over 5 days, threatening homes in Del Loma during the first day and killing trees on public and private lands. Damage to the SR 299 roadway, including guard rails, signs, and erosion control and rock slope protection, required \$604,000 to repair. (The total repair cost to Caltrans did not include the time and cost to have Caltrans staff on site during the fire to provide traffic control and removal of burning materials, or for roadway clean up following the fire.)

The Friday Fire, which started when a vehicle caught on fire in the southern area of Willow Creek in late June of 2003, burned about 400 acres of private and public lands in 3 days. This fire burned during hot, windy weather in an area where no fires had burned for over 100 years. It threatened the homes and ranches of more than twenty-five residents as well as a number of businesses. Within the first five minutes it burned electricity and phone lines next to Friday Ridge Road, which left all residents without power, phone access (except for cell phones), or water that was dependent on electric pumps. The fire also closed off possible exit routes, which resulted in long travel distances to safety zones for residents and people recreating at the popular Sandy Bar beach area along the South Fork of the Trinity River.

The Megram Fire, which burned (~2000 acres) into the northeast corner of the Downriver FFMP area and threatened all the communities in the area, started as three lightning fires in the Trinity Alps Wilderness north of Denny on August 23, 1999. Due to the unavailability of sufficient suppression resources, many of which were on fires in southern California, these fires burned together. They eventually spread to about 138,000 acres in and outside of the Wilderness and burned for over two months. In one 24-hour period the Megram Fire advanced 5 miles toward the residential areas, pushed by high (foehn) winds from the northeast.

Present Threats

Most of the recent fires had at least one thing in common; they moved rapidly, fanned by the strong winds that blow from the coast most hot summer afternoons or by the foehn winds that blow from a northerly to easterly direction in mid-September to late October. These winds are relatively predictable and completely uncontrollable. Fire suppression at the front of fires pushed by these winds is largely futile, until the winds die down in the evening.

Fire access into and within the Downriver FFMP area is limited. Many of the roads to residences are narrow and dead end and many roads and driveways are gated. Management policies on national forest lands have constrained road construction and access to existing roads. Reduced road maintenance budgets have caused some roads to fall into disrepair. Slopes on public lands are generally steep, which hampers access by suppression crews that are on foot.

Steep slopes also increase the difficulty of suppressing fires. Research has shown that the rate of spread of a fire on nearly level ground doubles on a 25% slope and doubles again on a 40% slope [Biswell (1989), USFS MTWA]. A large part of the public lands in the Downriver FFMP area are on slopes much greater than 40%, so it is likely that the effectiveness of ground forces would be limited. Aerial attack forces would probably be required for the majority of wildfires. But aerial attacks could be halted or severely limited during some weather conditions, such as the air inversions that occurred on numerous days during the Megram Fire.

According to the USFS MTWA, the Trinity River corridor from Gray Flat to Willow Creek has the highest population density and the most complicated wildland-urban interface within the Six Rivers NF. As stated in the USFS MTWA, "Fires that start in the less densely populated portions of the area may have a lower priority for response when compared to more populated wildland interfaces and intermixes found in the USFS MTWA area and throughout the state. This could be a significant factor when forces are drawn down past effective levels, possibly resulting in significantly larger and more destructive wildfires. For example, the extremely busy fire seasons of 1987, 1996, 1999, 2000, and 2002 resulted in standard resource orders being delayed for two to three days." This exact condition allowed three fires in the Trinity Alps Wilderness to burn together and become the devastating Megram Fire.

The communities of Willow Creek, Salyer, and Hawkins Bar and the residential areas of Oden Flat, Suzy Q Ranch, and Gray Ranch (Flat) are listed in the Federal Register as communities at high risk from the threat of wildfires. The residential area of Ammon Ranch on South Fork Road is also shown as a community at risk, on a CDF FRAP map. Supporting this designation is the widespread occurrence of "fire regime condition class" 2 and 3 fuels around the listed communities. Twenty-five percent of the Downriver FFMP area is classified as condition class 1, 25% as condition class 2, and 50% as condition class 3.

The fire regime condition class concept was developed by the USFS to characterize the condition of vegetation in relation to the historical range of conditions and to assess the risk of losing key ecosystem components as a result of wildfire. It is a concept similar to CDF's "fuel fire severity hazard zones". Three condition classes (1-3) are used, corresponding to CDF's four severity hazard zones [low (class 1), moderate (class 2), high (class 3), very high (class 3)]. In a nutshell, in condition class 1, fire regimes and vegetation attributes are within the natural historical range and the risk of losing key ecosystem components is low. In condition class 2, fire regimes and vegetation attributes are moderately altered from the natural range and the risk of losing key ecosystem components is moderate. In condition class 3, fire regimes and vegetation attributes are substantially altered from the natural range and the risk of losing key ecosystem components is high.

A mosaic of vegetation types, sizes and densities covers the Downriver FFMP area. The main vegetation type on the Six Rivers National Forest is dominated by tanoak, with Douglas-fir dominated forests found primarily on lower slopes, especially north of SR 299. These forests are dense (60+% canopy closure) and are mostly in an early mature to mid mature seral stage and a condition class 3 in the vicinity of residential areas to the north and east of the Trinity River and along South Fork Road. To the south of SR 299, upriver from the bridge over the South Fork, forests are in a mosaic of pole to old growth seral stages and condition classes 1-3.

The residential areas are primarily dominated by three vegetation types, white oak dominated forest (also black oak, madrone, & Douglas-fir), Douglas-fir dominated forest (also tanoak, white and black oak, & madrone), and grasslands/fields. The forests tend to be moderately dense (40-59% canopy closure) in the more densely populated areas, with patches of dense forest in some areas and sparse forest (<40% cc) in others. These forests are mostly in an early mature to mid mature seral stage and vary from condition class 1-3.

Trees in the forests in the Downriver FFMP area range in size from seedlings/saplings to large sawtimber. There are patches of young to mature shrubs, particularly in residential areas, ranging from two to twelve feet tall. There are annual/perennial grasslands, some of which are irrigated for pasture. Dense but narrow zones of riparian vegetation are found along perennial creeks and rivers. And patches of bare ground and rocky areas are found throughout the Downriver FFMP area, but mostly in the inner gorges of the two rivers.

The conditions noted above lend themselves to a full range of fire behaviors, severities, and sizes. Anything from creeping to swiftly moving surface fires, spotting fires, individual and group tree torching, to crown fires can be expected. Low severity fires can be expected where vegetation is sparse (often on south- to west-facing slopes), in stands of large trees with little understory or ground fuel, in annual grassland, or in riparian areas. Moderate to high severity fires can be expected on steep slopes (especially on upper slopes), where vegetation is denser (often on north- and east-facing slopes), in dense brushfields, and in stands with a high component of ladder and ground fuels. Fires can be expected to attain any size in this watershed and can result in accelerated erosion and major damage to vegetation and wildlife habitat.

The following five paragraphs are taken directly from the Six Rivers NF "Mainstem Trinity Watershed Analysis" (USFS MTWA). "The overall high fire risk rating for the MTWA area indicates that a wildfire has a very good chance of occurring throughout the MTWA area. A subwatershed level analysis of fire risk indicates that the watersheds associated with the Trinity River corridor are generally at greater risk of a fire start than the surrounding watersheds. When a fire does occur, the predominant vegetation and topographic conditions present within the watersheds increase risk of a fast moving, high intensity fire. In the absence of an aggressive fuel treatment program, fuels will continue to accumulate with an associated high to extreme fire behavior potential."

"High intensity fires generally result in a large portion of the areas burned at a stand replacing severity. These fast moving, high-intensity fires are very hard to contain due to extensive crowning and increased

spotting distances. With the increase in extreme fire behavior, fire suppression effectiveness is severely hampered. With increased densities of brush and understory, access for fire fighting forces becomes limited, and line construction rates are reduced. Fire crews may not be able to use direct attack suppression methods. Strategies can change to indirect attack with fire line locations further away from a fire, so there is time to construct and secure fire lines before the fire gets there. Burning from these lines is still difficult because the fuels build-up creates a higher risk that the wildfire can cross the control lines if the fire behavior becomes severe and the control areas are not large enough. This type of indirect attack can greatly increase the size of fires and is not always successful as the fire has more time to increase its momentum.”

“Large stand-replacing wildfires with high to extreme fire behavior could drastically affect the communities of Willow Creek, Salyer, Hawkins Bar, Hoopa, the HVIR and numerous groups of rural homes. Fast moving, high intensity fires often make it more difficult to get to isolated homes to do structure protection. Even smaller fires, if they are located close to private property or are wind driven, could have severe impacts on populated areas.”

“High-intensity fires can burn large areas with a mosaic of stand replacing impacts. Widespread stand replacing fires may either destroy or degrade critical [wildlife] habitat to a point where it is no longer suitable to meet desired functions. Uncharacteristically large and intense wildfires followed by severe winter storms can be detrimental to watershed function and water quality. Severe fires can accelerate runoff from the watershed through the combined effects of large-scale vegetation mortality, burning of organic matter in litter and soil, and creation of hydrophobic, impervious soil layers. This is especially true when these wildfires are associated with heavy winter storms, when more water is discharged over a shorter period of time and peak flows may be greater, which contribute to increased flood hazards. Bare soils and increased runoff can result in higher levels of sedimentation, and landslides could become more prevalent, again negatively affecting the local communities.”

“It must be noted that during periods of extended or extreme drought, fuel treatments may not always be effective. *Extreme wind-driven crown fires may still occur in areas that have had some fuel reduction treatments.*” (emphasis added)

There are many possible fire scenarios in and around the Downriver FFMP area. Four that are likely to occur at some point in time are described below. In the first scenario, humans start a fire along South Fork Road or the South Fork of the Trinity River (especially at such popular swimming areas as Sandy Bar and “Low Bridge”) during late morning to early evening on a hot summer day when the up-canyon winds (sometimes down-canyon) are increasing in speed. These winds would drive the fire rapidly toward the south (or north) and/or up-slope or up-canyon to the east. A fire started at Sandy Bar could easily jump the South Fork of the Trinity and burn into Salyer and the communities further up-river, as could a fire started in the Ammon Ranch area. A fire started at “Low Bridge” could easily burn east over Hennessey Ridge and down into the Burnt Ranch and Gray Flat area. Whether these fires became crown fires would depend upon the extent of ground and ladder fuels they encountered and the spacing between the crowns of overstory trees and shrubs to the east of the points of ignition. The steep mountainsides east of South Fork Road are generally covered with a dense, continuous forest with well developed ladder fuels in some areas and shrubs intermixed throughout, so a high severity crown fire could develop there.

The second scenario is a fire started by human causes along SR 299 or the Trinity River. This fire, pushed by westerly winds, would tend to move up canyon along the lower slopes in an easterly direction, threatening residents, homes, and businesses along the SR 299 corridor and burning into the upper watershed and adjacent watersheds. Whether this fire became a crown fire would depend upon the extent of ground and ladder fuels it encountered and the spacing between the crowns of overstory trees and shrubs to the east and southeast of the point of ignition. The SR 299 corridor has areas of relatively dense, continuous forest and shrub cover, so a localized high severity crown fire, or torching of small groups of trees, could develop there. The upper watershed has denser forests, so fire in that area would likely be a mosaic of low, moderate and high severity fire. A crown fire could develop in dense brushfields and

forests. In less dense vegetation, spotting and torching of individual trees and groups of trees would be likely.

The third scenario is a fire started by human causes in one of the residential areas along the Trinity River. This fire, pushed by westerly winds, would tend to move up canyon, threatening residents, homes, and businesses and public and private property. It would also move up-slope, threatening private and public lands. The fire would generally remain as a surface fire within residential areas due to more open forest canopies, sparser understory vegetation, non-forested areas, and gentler slopes. But it is likely that this fire would develop into a crown fire, or at least experience runouts in the canopy, as it moved upslope, as the conifer and hardwood forests are generally denser, with more ladder fuels, and the slopes are steeper.

The fourth scenario is a fire started by “dry” lightning on the mid to upper slopes of Hennessey Ridge, Waterman Ridge, or the ridges to the west of the South Fork of the Trinity. This fire, pushed by southwesterly to southeasterly winds, would tend to burn upslope in a northeasterly to northwesterly direction. If the fire started on Hennessey Ridge, it would likely burn down into the SR 299 corridor or toward South Fork Road. If on Waterman Ridge, it would likely burn up and over the ridge into the Cedar Creek drainage and east into the New River drainage, while backing downhill toward the SR 299 corridor. If on the ridges to the west of the South Fork, it might burn toward South Fork Road and/or Willow Creek. If this were a typical August “dry” lightning storm moving in from the southeast to southwest to west, it would likely have started multiple fires before reaching the Downriver FFMP area, requiring a commitment of significant initial attack resources on the Shasta-Trinity NF. This could lessen the resources available in the Downriver FFMP area.

Fire Hazard Severity: Hazard, Risk and Values at Risk

Fire hazard severity is the combination of three inter-related factors: hazard, risk, and values at risk. The combination of fire risk and hazard provide the fire planner with the ability to predict fire starts, rates of spread, intensity, and other fire behavior. This helps in designing pre-suppression projects and developing control strategies to protect the values at risk that are of primary concern to the residents and others with an interest in the downriver communities.

Fire Hazard

Fire hazard is the interaction of fuels (vegetation, buildings, and other flammables), topography, and weather (temperature, humidity, wind speed and direction, time since last rain). The interaction of these factors affects fire behavior (the rate of spread and intensity of fire), which affects the effectiveness of suppression efforts and the fire-fighting resources required. Higher hazard ratings indicate the potential for extreme fire behavior, difficulties in suppression, and increased resource damage.

Aggressive fire prevention and suppression since the late '40s and a wetter climate have contributed to a significant increase in the amount of fuels, the density of vegetation, and the understory ladder fuel component in the forests found in most of the Downriver FFMP area. These conditions have been moderated to a degree on private resource lands by timber harvesting. They have been moderated to a greater degree on residential lands, by removing trees and shrubs for development of homes and yards, construction of roads and driveways, and creation of defensible space.

Fires tend to burn more intensely on southerly to westerly aspects, steep slopes, up slopes, on upper slopes, and in narrow draws. Due to the northwest-southeast orientation of the Trinity River and the north-south orientation of the South Fork of the Trinity River, the majority of the watershed faces southeast to west, the orientation that experiences more severe fires. The terrain is generally steep (over 60%), especially in the mid to upper watershed, and there are many steep, narrow draws. Weather during the fire season is generally hot and dry, often with periods of strong winds and long intervals between significant rains. These conditions lend themselves to a high fire hazard and greater fire severity in and around the Downriver FFMP area.

The USFS modeled and mapped fire hazards for Six Rivers NF lands in the USFS MTWA area, which showed that the public lands to the north and east of SR 299, and adjacent to most of the residential property on the flats above the rivers, had high to extreme fire hazards (see table below for hazard rating attributes). The hazard rating was based upon predicted fire behavior and associated suppression effectiveness. Predicted fire behavior was modeled in terms of fire rate of spread (ROS) and intensity (flame length - FL), which were calculated based upon Anderson fuel models, National Fire Danger Rating System slope classes, and typical August fire weather. The USFS MTWA developed and mapped flame lengths that would be expected from the existing fuels in the watershed analysis area during typical fire weather. Fuels in 65% of the area in this fire plan would generate flame lengths of 0-4 feet, 15% would generate flames of 4-8 feet, and 20% would generate flames >8 feet. For a detailed description of the factors that went into the fire hazard rating, see the USFS MTWA.

Hazard	ROS (ft/min)	FL (ft)	Suppression Effectiveness
Low	0 - 5	0 - 2	3-person hand crew or engine
Moderate	5.1 - 11	2.1 - 4	5-person hand crew or engine
High	11.1 - 22	4.1 - 6	engines/hand crews/water tender plus aerial attack
Very High	22.1 - 33	6.1 - 8	all above plus tractor/aerial support
Extreme	33.1+	8.1+	beyond initial attack, into extended attack

Fire Risk

Fire risk is the chance that a fire will start in a particular area. Although lightning is an important cause of forest fires, human starts are the most common source of ignition. The greatest number of activities with fire starting potential are found close to home. Common causes of fire include children experimenting with fire, smoking, operating chain saws and grass mowers, burning yard debris, and improperly disposing of barbecue coals and wood stove ashes. House fires sometimes spread to the forest. Arson is an increasing cause of fire. Roads, hiking trails, campgrounds and picnic areas are also high risk areas for fires ignited by smoking, vehicles (parking in tall grass or faulty exhaust systems), warming fires, or camp stoves and lanterns. A number of severe fires have started on logging operations by chain saws, logging equipment, warming fires, or smoking. Power lines periodically start fires when winds or trees dislodge wires.

In the USFS MTWA area, about 69% of the fires from 1980-1996 were from incendiary and miscellaneous causes and 37% were from those causes from 1997-2001. Between 1997 and 2001, there was 1 lightning-caused fire and 76 human caused fires in the MTWA area. The categories of human-caused fires were incendiary (8), campfire (24), children (1), debris burning (16), equipment use (6), smoking (1), and unspecified miscellaneous (20). The majority of the human-caused fires occurred from July through October, which tend to be the months with the highest recreational use of the National Forest by visitors and locals.

Fires in the Downriver FFMP area have started from most of the causes listed above. Conditions in the plan area lend themselves to localized and variable degrees of risk of fire starts, with well-traveled roads and trails, high-use recreational areas, residential areas, logging operations, and areas of heavy fuels on exposed ridges posing the greatest risk. More remote areas, especially if unroaded, have a lower risk of fire starts. The fire plan area is expected to continue to experience a high risk rating in the future, (i.e., at least one fire per 10 years per thousand acres), with the highest risk in areas that are most accessible to the public, especially along South Fork Road and the Trinity River corridor. This risk-potential, in combination with the condition of the fuels within and adjacent to these watersheds, could present a substantial threat to local communities.

Trinity River

There are several popular river access points on the South Fork of the Trinity River that experience high use during the fire season. The river is accessible to the public by foot on the Hlel-Din Trail (5E32) just east of the SR 299 bridge over the South Fork of the Trinity River, the Lower Campbell Ridge Trail (5E31 & 5E40) from the Salyer VFD station, a trail from the north end of the Salyer bridge over the

Trinity River, the Tunnel Flat Trail (6E75) just north of the Salyer Roadside Rest Area, and the Gray Flat Trail (6E30) at the Gray Flat Picnic Area. The south side of the river is accessible to the public by vehicle at Hawkins Bar. There is one river access point on the west side of the Trinity River down canyon from the SR 299 bridge over the South Fork of the Trinity River, at Camp Kimtu in Willow Creek. Camp Kimtu in particular is heavily used during the summer. At all of these points there is evidence along the shore of the river of campfires, and the inner gorge and trails are generally bordered by dense, hazardous fuels. The fire start record shows numerous human-caused fires in these areas.

There is one developed campground and one picnic area that are points of increased fire risk. Camp Kimtu, in Willow Creek, a private campground with public access to the Trinity River, draws many people during the summer months. Gray Flat Campground is closed, but the nearby USFS picnic area is used by a significant number of people.

Along the Trinity River corridor there are two communities (Salyer & Hawkins Bar) with concentrations of homes and businesses, as well as numerous residences scattered or clustered on the flats along both sides of the river. The fire start record shows that most of the human-caused fire starts have been in these areas of human habitation, or along roads in the vicinity. In some of these areas there are moderate to heavy fuel loads adjacent to or in close proximity to structures and roads.

Access roads are gated to some private properties along the Trinity River corridor, which reduces the risk of human fire starts along those roads. USFS roads with gates are generally open during the fire season after the middle of May, when the risk of fire starts is greater.

There is a high voltage PG&E electrical transmission line that parallels the Trinity River through the Downriver FFMP area. There are also low voltage PG&E lines that provide electricity to virtually all of the residences and businesses along the Trinity River corridor. Electrical transmission lines have caused fires in the past and are a source of increased risk.

Logging and other activities requiring chainsaw and heavy equipment work are causes of fire starts. Logging and firewood cutting occur in the Downriver FFMP area on both public and private lands. Heavy equipment is also used for building roads and house pads and for clearing land.

Thunderstorms with lightning are not uncommon during the summer in the upper elevations of the Downriver FFMP area in the Trinity River watershed. Multiple lightning fires generally start from July to October, and are generally clustered along ridges. Fire start records show about 25 lightning fires in these areas since 1911, mostly along Waterman Ridge.

South Fork of the Trinity River

There are several popular river access points on the South Fork of the Trinity River that experience high use during the fire season. Sandy Bar, accessed from the Friday Ridge Road, is at the end of a narrow dirt road with a poor surface that is bordered by dense, hazardous fuels. The fire start record shows numerous human-caused fires in this area. Some people access the river through SPI property in Section 36, about 5.5 miles up South Fork Road. Low Bridge, about 7 miles up South Fork Road, attracts many swimmers, which increases traffic and the risk of fire starts along the road and at the river. Sometimes 50-100 cars travel South Fork Road during the summer to access the river. But there is no record of any human-caused fire starts in the vicinity of "Low Bridge". Another river access point, about 3 miles further up the river at Todd Ranch, is popular with kayakers, who put in there for a run down the river. This access point is primarily used in the spring before the onset of fire season, and there is no record of any human-caused fire starts in the vicinity. Swimmers also access a pool in the river at Surprise Creek, upriver from the cable crossing to Patrick Culvar's place.

At the end of South Fork Road is a trailhead parking area large enough for unloading stock. There is evidence that campfires have been built in and adjacent to the parking area. The vegetation in this area is dense, low to the ground, and flammable and the risk of fire starts is high.

The Ammon Ranch residential area along South Fork Road and the Jurin Ranch are areas where there have been a number of human-caused fires in the past. The risk of fire starts increases where there is human habitation and regular activity. Most of the human-caused fire starts along South Fork Road are from just south of Ammon Ranch back to the highway (but the past does not equal the future).

Access roads are gated to SPI lands and to most private properties along South Fork Road, which reduces the risk of human fire starts along those roads. But USFS roads with gates are generally open during the fire season after the middle of May, when the risk of fire starts is greater.

There is a low voltage PG&E electrical transmission line that parallels South Fork Road from SR 299 to the Todd Ranch (~10 miles up the road from SR 299). This line provides electricity to virtually all of the residences along the road. Electrical transmission lines have caused fires in the past and are a source of increased risk.

Logging and other activities requiring chainsaw and heavy equipment work are causes of fire starts. Logging and firewood cutting occur in the Downriver FFMP area on both public and private lands. Heavy equipment is also used for building roads and house pads and for clearing land, although these activities have been minimal in recent years.

Thunderstorms with lightning are not uncommon during the summer in the upper elevations of the Downriver FFMP area. Fire start records show about 16 lightning caused fires along Hennessey Ridge.

Friday Ridge/Madden Creek

About 4-6 miles west of the Downriver FFMP area are the Willow Creek, Madden Creek, Friday Ridge, and Hogback Ridge areas, which receive a high level of recreational use. In this area of the Six Rivers NF are a Late Successional Reserve (LSR 306), the Horse Mountain Botanical Area, OHV trails, and hunting opportunities. This area is easily accessible from the coastal cities and experiences a lot of traffic. There are abundant fuels in this area, including many tree plantations. Although the majority of fire starts in this area are from lightning, the largest acreage burned is from human-caused fires. Fires originating in this area would be likely to burn toward the east into the Downriver FFMP area.

Values at Risk

Values at risk are the life, property and natural resources that either cannot be replaced or require substantial costs to replace. Residents in the Downriver FFMP area value human life, homes, businesses, private property, aesthetics, clean air and water, and the natural resources that surround them. Approximately 800 people live in the Downriver FFMP area and others are absentee landowners who are part time occupants. There are also many annual visitors to the area.

The communities of Willow Creek, Salyer, Hawkins Bar, Oden Flat, Suzy Q Ranch, and Gray Ranch were listed in the Federal Register (August 17, 2001, v 66: n 160) as communities at high risk from the threat of wildfires. The CA FRAP map, "Communities at Risk From Wildfire", includes Ammon Ranch, on South Fork Road, as one of the "Communities at Risk From Wildfire on Federal Lands".

There are a number of ponds shown on the 'Fire Access & Infrastructure Map' as 'water - pond' or 'water - engine fill'. Although these ponds would survive a fire, damage to the watershed could accelerate erosion, causing the ponds to fill more rapidly than planned. These ponds were constructed to provide water for stock and/or domestic use and are of value for those purposes and for a variety of wildlife.

Most of the watercourses in the Downriver FFMP area supply water for domestic purposes. Among these are the Trinity and South Fork of the Trinity Rivers, Hudson Creek, Sharber Creek, Peckham Creek, Quinby Creek, Hawkins Creek, Cow Creek, Gray Creek, Pony Creek, Icebox Creek, and various unnamed creeks along South Fork Road. Some of the supply intakes are on USFS lands and are either officially

permitted or non-permitted. The Salyer Heights water system services about 40 people and is supplied from Sharber Creek. The Trinity Village supply intake on Hawkins Creek services 150 or more users.

As stated in the USFS MTWA, “Many of the domestic water sources are within or downstream of areas with high to extreme predicted fire behavior. If fires do occur in these areas, post-fire ash, sediment, and nutrient discharges could have short-term water quality impacts that could make the water unusable for domestic purposes without treatment. In addition, several of these water sources are downstream from active landslide areas that are chronically producing sediment. Sediment concentrations for water sources that are downstream of landslide source areas are most likely elevated and possibly make the water unusable without treatment after significant precipitation events that activate landslide erosion.”

The Salyer Roadside Rest Area is a Caltrans public rest area facility. There is quite an investment in this facility, which was designed to service travelers.

PG&E owns a high-voltage electrical transmission line that parallels SR 299 through the Downriver FFMP area as well as a number of low-voltage electrical transmission lines that serve the residences and businesses along both sides of the Trinity River and along South Fork Road. VERIZON owns telephone lines that are found in the same general area as the power lines. These transmission lines are valuable to PG&E and VERIZON and to the customers they serve.

Forested land zoned Timber Production Zone (TPZ) is managed for commercial values by SPI, Eel River Sawmills, and a non-industrial landowner. The forest on much of the TPZ land has been recently harvested, but there are significant stands of small to mid-sized conifers and hardwoods protecting watercourses. Clear cut forests have been planted with conifers and selectively cut forests still have a minimum level of larger trees. Conifers are commercially valuable for timber production and both conifers and hardwoods are valuable for wildlife habitat and watershed protection, two resources required to be protected in California during harvesting operations.

Most of the land in the Downriver FFMP area is administered by the USFS, Six Rivers National Forest. Its primary objectives for the area are to provide commercial forest management opportunities while maintaining watershed values, including soils, forest and non-forest vegetation, wildlife and fish habitat, and recreational opportunities. While in pursuit of these objectives, USFS managers place a high value on human life, private homes and property in the vicinity of its lands, aesthetics, and clean air and water.

There are significant stands of small to mid-sized conifers and hardwoods on National Forest lands. Conifers are commercially valuable for timber production and both conifers and hardwoods are valuable for wildlife habitat, watershed protection, enhancement of air and water quality, moderation of climate, and aesthetics. The loss of late mature and old-growth habitat due to catastrophic wildfire is a significant concern for SRNF wildlife managers, as approximately 75 percent of this habitat has a high to extreme fire hazard rating.

Downriver Fire Hazard Severity

The Downriver FFMP area Fire Hazard Severity rating is ‘Very High’ (CDF) because:

- Flammable structures are interspersed along the 299 and Trinity River corridor, with concentrations in Gray Flat, Hawkins Bar, Suzy-Q Road, Oden Flat, Salyer, Ammon Ranch, and the Hudson Creek area
- Most of the residential areas are adjacent to steep slopes with flammable vegetation
- Roads into many home sites are not adequate to accommodate 2-way fire engine traffic
- State Highway 299 and five county roads are well traveled during fire season, increasing the risk of human fire starts
- There is limited access for fire suppression forces in most of the communities
- Summer conditions include hot, dry and windy weather, especially in the afternoons
- Thunderstorms, with lightning strikes, are common during the summer months
- Wildland vegetation is dense in many places, with areas of continuous fuels, including dead fuel on the ground
- Fire ladders exist in many areas

Many Special Habitat Management Areas have been designated on national forest in the Downriver FFMP area. These include a number of northern spotted owl (NSO) nesting pair management areas, as well as significant nesting and roosting habitat. Some of this habitat has been designated “Late Successional Reserve” (LSR), both inside and outside the NSO management areas. Some has been designated old-growth forest. A large area of designated peregrine falcon habitat is found upriver from Salyer and designated bald eagle habitat is found along the Trinity River from the Salyer Roadside Rest Area to below the confluence with the South Fork, and along both sides of the South Fork of the Trinity River.

Riparian Reserves are interspersed throughout the fire plan area. “Riparian Reserves are managed to provide benefits to riparian associated species, enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal for many terrestrial animals and plants, and provide for habitat connectivity within the watershed. The Riparian Reserves also serve as corridors to connect Late Successional Reserves.” “Riparian Reserves are intended to maintain and restore riparian structures and functions to five categories of water bodies: 1) fish-bearing streams, 2) permanently flowing non-fish-bearing streams, 3) constructed ponds and reservoirs, and wetlands greater than 1 acre, 4) lakes and natural ponds, and 5) seasonally flowing or intermittent streams, wetlands less than 1 acre, and unstable and potentially unstable areas.” (USFS MTWA)

A Research Natural Area (RNA), the 1150-acre Hennessey Ridge RNA, has been proposed for an area south of Highway 299 at Hawkins Bar, primarily within the Icebox, Pony, and Gray Creek drainages. This RNA would represent SAF type 229, Pacific Douglas-fir, in the North Coast Province. It would be “part of a national network of field ecological areas designated for non-manipulative research, observation, and to study and maintain biological diversity on National Forest System lands. The goals of the RNA are to maintain unmodified conditions and natural ecological processes as well as provide for the Forest's physical and biological diversity by acting as a gene pool for plant and animal species.” “The objectives of establishing RNAs are (1) to preserve a wide spectrum of pristine, representative areas that typify target vegetation types and/or types considered of scientific interest; (2) to serve as control areas for comparing landscapes manipulated by humans; (3) to serve as baseline areas for measuring long-term ecological change; and (4) to preserve and maintain genetic diversity and to provide a laboratory for the study of ecological succession.” (USFS MTWAA) Part of a spotted owl management area lies within the northern portion of this proposed RNA.

The Trinity River in the Downriver FFMP area is designated as a Recreation River under the Wild and Scenic Rivers Act of 1968. The South Fork of the Trinity River, as far south as the Jurin Ranch, is designated as a Scenic River. From there south it is designated as a Wild River.

A number of undeveloped public recreation sites and one developed site, plus a few trails, are used and valued by the public.

The world’s largest recorded tanoak (*Lithocarpus densiflorus*) is located near the north end of Hennessey Ridge, northeast of USFS Road 6N31.

No dollar values have been computed for the multiple benefits from the Six Rivers National Forest, but their value is obviously quite high.

Fire Suppression Resources

To suppress fires while they are still small requires a mix of initial attack resources that are mobile and quickly available. The current USFS and CDF fire organization emphasizes ground attack as the primary initial attack resource, with support from aerial forces for extended attack. An example of this approach is the 2003 Friday Fire, which burned 400 acres in about 3 days. “Due to the volatile burning conditions and the close proximity to residences, suppression forces were ordered quickly and staffing levels were high. Equipment and staffing for the wildfire included 33 engines, 4 helicopters, 2 dozers, 2 water tenders, 59

overhead, 21 20-person hand crews, and 3 camp crews, for a total of 639 personnel. The U.S. Forest Service, Bureau of Land Management, California Department of Forestry and Fire Protection, the Hoopa Valley Tribe, California Highway Patrol, Humboldt County Sheriff, Hawkins Bar Volunteer Fire Department (VFD), Willow Creek VFD, Salyer VFD, and local government Offices of Emergency Services from Loleta, Eureka, Arcata, Ferndale and Rio Dell” all responded to this incident. (USFS Press Release)

The Trinity River corridor from Gray Flat to Willow Creek has the highest population density and the most complicated wildland-urban interface within the Six Rivers NF. As stated in the USFS “Mainstem Trinity Watershed Analysis”, “Fires that start in the less densely populated portions of the area may have a lower priority for response when compared to more populated wildland interfaces and intermixes found in the USFS MTWA [area] and throughout the state. This could be a significant factor when forces are drawn down past effective levels, possibly resulting in significantly larger and more destructive wildfires. For example, the extremely busy fire seasons of 1987, 1996, 1999, 2000, and 2002 resulted in standard resource orders being delayed for two to three days.”

The Downriver FFMP area could be served by a variety of fire suppression resources from a number of agencies. The private lands in the Downriver FFMP area are within the State Responsibility Area and the Direct Protection Area for CDF. Normally CDF would respond to wildland fires on these lands, but under an agreement with the Six Rivers NF, the USFS is the initial responder to wildland fires. Structure fires are the responsibility of the local volunteer fire departments.

Fire detection is provided primarily by two USFS lookouts and aerial reconnaissance flights. The Forest Service lookouts on Brush Mountain and Ironside Mountain provide early fire detection and are generally staffed from late May or early June (depending upon snow conditions) to late September or early October (depending on budget constraints). Brush Mountain lookout is located about 2½ miles southwest of Willow Creek and looks directly into the north end of the Downriver FFMP area. Ironside Mountain lookout is located about 2 miles northeast of Burnt Ranch and looks directly down the Trinity River canyon from Gray Flat to Salyer. On a clear day the lookouts can spot a fire in the area while it is still relatively small. The Forest Service has replaced some of its lookouts with reconnaissance flights, which occur during periods of critical fire potential, such as after a lightning storm has passed through the area or when active fires are burning.

Fire Resource Dispatch (Fire Season)

During high fire danger dispatch periods (i.e. average summer days), any wildland fire report in the Trinity River watershed could trigger the following series of fire equipment dispatches:

- Closest USFS wildland fire engines
- USFS engines (2)(Salyer)
- USFS water tender (1)(Salyer)
- USFS engine (1)(Willow Creek)
- USFS engine (1)(Burnt Ranch)
- USFS engine 32 (Junction City)
- USFS engine 41 (Mule Creek)
- USFS engine 42 (Coffee Creek)
- Closest CDF wildland fire engines (when requested)
- CDF engine (Fortuna)
- CDF engine (Trinidad)
- CDF engine 2475 (Weaverville)
- CDF engine 2466 & 2481 (Fawn Lodge)
- CDF engine 2468 (Hayfork)
- CDF engine 2478 or 2464 (Shasta)
- CDF bulldozer (Fortuna)
- CDF bulldozers 2441 & 2440 (Redding)
- CDF High Rock Fire Crews
- CDF Trinity River Fire Crews
- CDF Fire Crews from Thorn & Mendocino Ranger Unit
- Hoopa Valley Tribe engines (3)(Hoopa)
- Hawkins Bar VFD engines (1) & water tender
- Burnt Ranch VFD engines (2)
- Salyer VFD engines (2), water tender, & rescue unit
- Willow Creek VFD engines (4)
- USFS helitack 506 (Pettijohn Mtn.)
- CDF helicopters (Kneeland & Scotts Valley)
- Air attack and retardant air tankers (Rohnerville, Redding & Medford)

If the fire cannot be contained with these resources, additional resources are sent, if available. If a fire can be contained with fewer resources, resources are to return to their stations.

The Downriver FFMP area is within the Lower Trinity Ranger District of the Six Rivers National Forest. The USFS has three fire engines available for fires, two engines, a 3000-gallon water tender, and a 20 person crew at the Salyer Work Station and a fire prevention technician and one engine in Willow Creek. The USFS also has a fire engine stationed at Burnt Ranch, a division chief, battalion chief, and chief fire prevention technician stationed in Weaverville, a Model 62 engine with a 500-gallon tank stationed about 18 miles north at Mule Creek Guard Station and a Model 61 engine with a 500-gallon tank stationed about 39 miles north at Coffee Creek Work Station. The stations with engines have a 7-person crew on duty 7 days a week from June 1st to mid October, with a minimum of 5 people required for each engine. A Model 42 engine with a 500-gallon tank is stationed about 11 miles west at Junction City and has a 5 person crew on duty 7 days a week, with a minimum of 3 people required for the engine. There is a 20 person, Type I fire crew stationed at Hayfork. The USFS water tender at Big Bar can respond if needed and a tender is stationed at Mule Creek. A contract, Type II helicopter with a Helitack crew of 14 people is stationed at the Trinity River Conservation Camp during fire season.

The California Department of Forestry and Fire Protection, Humboldt Unit, when requested, will assist the USFS with wildland fires using crews from the High Rock Conservation Camp, engines (one each) from the Alderpoint, Trinidad, and Thorn Forest Fire Stations, and engines and a dozer from the Fortuna Forest Fire Station. The Shasta-Trinity Unit maintains a battalion chief, two fire captains, and two foresters at their Weaverville Station on Washington Street. During fire season, a 500-gallon engine with a 3-4-person crew is stationed there, with 2 engines 14 miles southwest at Fawn Lodge, 1 in Hayfork, and 2 in Shasta. CDF engines are funded for use on wildland fires on private lands, but if staffed they respond to any fire or other emergency year-around. The CDF Trinity River Conservation Camp at Trinity Mountain has five 15-17 person crews that can cut fire line and mop-up fire. They are also available year round to do project work.

Aerial resources available for fire suppression include USFS 'Helitack 506', USFS and CDF retardant air tankers, a USFS lead plane and CDF air attack, CDF helicopters based in Humboldt County (Kneeland Helitack Base) and Tehama County, and the USFS Redding smoke jumper corps. The Forest Service helicopter, located at Pettijohn Mountain (Trinity River Conservation Camp) in Trinity County, can be on a fire in the Downriver FFMP area within 15-20 minutes of detection. This helicopter can deploy 2-5 fire fighters (14 total) on scene and begin water bucket drops (400-gallon capacity) almost immediately. A helicopter is also stationed in Scott Valley. Retardant bombers, a lead plane, and air attack and smoke jumper planes are stationed at Redding Airport and Rohnerville Air Attack Base in Humboldt County and can be on scene within 20-25 minutes of dispatch. Retardant planes are also located at the Chico and Medford airfields. Planes from these airfields can respond within 40-55 minutes to the Downriver FFMP area. The R5 Smokejumper Unit stationed in Redding is not normally used on a fire where road access is readily available, but it could be used in areas of limited access.

There are a number of sites in the Downriver FFMP area that are suitable for landing helicopters during fire or Medivac emergencies. These sites have been assessed and approved for use by a CDF helicopter pilot (Jim Eastman) during a survey on February 17, 2006 and are mapped as "H" on the small and large versions of the 'Fire Access & Infrastructure Map' and on the 'Aerial Fire Access & Infrastructure Map'. A list of helicopter landing sites, with physical and legal descriptions, coordinates, access routes, site descriptions, and landowner contact information is in Appendix D and should be made available to all air attack and fire stations. Mr. Eastman suggested that these sites be signed and if they are manned during a fire emergency, fluorescent pink flagging, or equivalent, be tied to vegetation to act as a wind direction indicator.

The Northern California Service Center (ONCC), located in Redding, is the cooperative supply cache (for aircraft, crews, overhead, and equipment) and coordination center (it processes dispatch records, contacts unit dispatchers for resources to fill orders, and handles all incoming telephone and fax communications) for the northern California National Forests in Region 5. It includes agency representation from the US Forest Service, the Bureau of Land Management, the National Park Service, and the California Department of Forestry and Fire Protection.

The ONCC provides a number of predictive services to fire managers. The Intelligence Section at Northern Operations gathers and analyzes intelligence data from large fires and disasters. The section collects resource information for incident allocation prioritizing and distributes daily situation reports and incident information.

The Redding Fire Weather Center provides fire weather support to fire management agencies in northern California. The district comprises seven national forests, seven CDF ranger units, four National Park Service sites, the Hoopa Indian Reservation, and portions of two BLM districts. The weather unit also acts as the local meteorological consultant for ONCC and provides daily fire season weather briefings, regional fire weather and aviation training, and other forecasts and services.

There are four volunteer fire departments in or near the Downriver FFMP area that are the initial responders to structural fires. They will also assist the USFS with wildland fires that are threatening residential areas or structures. These VFDs are as follow:

The Hawkins Bar Volunteer Fire Department (HBVFD) is located on Trinity Court in Trinity Village. Helen Pellegrini (629-2264) is the Fire Chief. The non-emergency phone number of the station is 629-3920 and the emergency number is 911. The HBVFD has one fire engine #4121, Type II, 750 gallons and one water tender #4144, Type II, 1500 gallons.

The Burnt Ranch Volunteer Fire Department (BRVFD), located on School House Road in Burnt Ranch, will assist the Hawkins Bar VFD with structural fires. The BRVFD is not listed in the phone book, so the name of the fire chief and the number of the firehouse were not ascertained. The emergency phone number is 911. The BRVFD has two fire engines, #4131, Type III, 500 gallons and #4132, Type IV, 300 gallons.

The Salyer Volunteer Fire Department (SVFD) is located just off Salyer Loop Road, about 100 yards west of its intersection with Fountain Ranch Road. David Murphy (629-2073, 629-3242) is the Fire Chief. The phone number at the fire station is 629-2778. The SVFD has two fire engines equipped for structural and wildland fires, Type III, 1000 gallons, one 3000-gallon water tender, and one rescue unit with a 300-gallon tank.

The Willow Creek Fire Protection District (530-629-2968) boundary is the line between Humboldt and Trinity counties. The Willow Creek Volunteer Fire Department (WCVFD), located on Willow Road in Willow Creek, has an automatic aid agreement to assist the Salyer VFD with structural fires, a mutual aid agreement to assist the Hawkins Bar VFD, and an agreement with the Burnt Ranch VFD to help on an individual call basis. It also has mutual aid agreements with the Hoopa Valley Tribe, the USFS, and CDF. Dusty Rossman (emergency 707-845-2046) is the Fire Chief and Mike Madsen is the Assistant Fire Chief. The emergency number at the fire station is 530-629-2822, the business phone number is 530-629-2229, and the FAX number is 530-629-1979. The WCVFD has three active fire engines, one reserve engine, and one rescue vehicle. Two of the active engines are Type II, 750 gallons and one is a 4-wheel drive WUI engine, 600 gallons, equipped with a CAFF.

Volunteer fire departments in rural counties are increasingly experiencing a number of significant problems. State laws now require Workman's Compensation for all volunteers, increased levels of training, and fire chief liability for injuries to volunteers. Volunteers are aging and because of the lack of jobs in Trinity County, many young people have left the area, so recruitment of new volunteers is minimal. Funding for equipment and operations has also decreased due to general reductions in state and county budgets. All of these factors are hampering the ability of departments to respond to fires as effectively as they otherwise could.

Water Resources for Fire Suppression

The fire responders in the downriver area are concerned about obtaining adequate water supplies in a timely manner during fire emergencies. Brian Mulhollen from the Salyer VFD made a test run to the South Fork Road area and found that the best case scenario was 20-25 minutes to South Fork Road, with 3000 gallons of

water. He, and others agree, that it is vitally important to develop additional water supply sources in outlying areas.

There are a number of existing or potential water drafting locations for fire engines and water tenders in the planning area, as shown on the large and small maps titled 'Fire Access and Infrastructure Map' and the 'Aerial Fire Access and Infrastructure Map'. These locations may not be inclusive of all drafting sites and are subject to change, depending upon monthly and yearly fluctuations in flow and changes in stream channels. Some of these locations are at stream crossings and may require temporary barriers to pond water for drafting. Other locations may require minor or major development to be useful. It is advisable for fire responders to revisit all of these locations in late summer to verify their suitability and improvement needs, to obtain permission for their use, and to agree with landowners on the conditions of use. Locations of some identified water sources are as described under Project 8, page 70 and in Appendix B. Whitson Plumbing & Electric in Willow Creek (530-629-2324) does Class A plumbing and has installed a lot of the local water systems, so could be consulted on where those systems are and what their capacity is.

There is a hydrant at the USFS Salyer Work Station that is gravity fed from two 20,000-gallon tanks, which are supplied with water through a two-inch line from a pump in the Trinity River. This system is extremely important as it supplies both the USFS and the Salyer VFD. It needs to be upgraded to more effectively serve these fire departments.

An Indian Health System water system is located at the Ammon Ranch (contact Bill Oakes, 629-2901). It is evidently a good water system, but its capacity and location were not ascertained during preparation of this plan. If this system has fire hydrants, those should be located on the 'Fire Access and Infrastructure Map' and described in Appendix B.

There is a water system on the Wallen Ranch in the Hawkins Bar area that is supplied by an 8 inch pipe via a water ditch from Hawkins Creek. There is a 2 inch pipe that runs to the ranch house. This system could be upgraded by installing a larger pipe to the ranch house to fill temporary pools for filling helicopter buckets or to directly fill fire engines and water tenders. The access road should be graveled or surfaced if fire vehicle use is anticipated.

Mary Arey GPS'd all the water storage sites and road junctions in the Downriver FFMP area for the Trinity County Planning Department. These sites and junctions were plotted on maps. These maps should be obtained by fire responders and added to the maps in this fire plan.

In addition to the water drafting sites listed in Appendix B there are a number of sites that are located in the Burnt Ranch area. The suitability of these sites, and the willingness of the landowners to have them used during a fire emergency, should be determined. The following may be suitable water sources:

- Burnt Ranch Store area: culvert on Hennessey Creek with a shut off to allow water to pond
- Underwood Mountain Road area: ponds on various properties [Eleanor Jones, Anna Rose, Galen (last name unknown), and others]
- Hennessey Road area: ponds on various properties (Don Decker and others)

A CDF helicopter pilot (Jim Eastman) toured the Downriver FFMP area with the author in February of 2006 to assess safety hazards to helicopters at some of the identified water sources and at helicopter landing sites. But the suitability of ponds and river pools should be assessed during late summer and their locations recorded on the 'Aerial Fire Access and Infrastructure Map' developed for the fire plan area.

The 'Aerial Fire Access and Infrastructure Map' should be provided, at a minimum, to the air attack bases in Rohnerville and Redding, the USFS fire station at Willow Creek, the CDF fire station in Fortuna, and the Hawkins Bar, Salyer, and Willow Creek VFDs. This map shows suitable helicopter landing sites (numbered), ponds (numbered) that may be suitable for filling buckets, water sources (numbered) that may be suitable for filling fire engines and water tenders, safety zones, fire stations, public telephones, roads and gates, and power

and telephone lines. A list of each helicopter landing site and potential water source, including latitude and longitude coordinates and descriptions, has been developed and should be included with the map (see Appendices B, C, and D).

There are a number of ponds that may be suitable for filling helicopter water buckets, fire engines, or water tenders. These ponds, and potential hazards, are described briefly below and more fully in Appendix C. Jim Eastman, the CDF helicopter pilot, indicated that it is CDF policy to refill ponds from the river following fire emergencies.

Trinity River Corridor

- 1) pond (P1) on Gray Flat: This pond is on property owned by Dan (Charles) & Rebecca Aalfs (530-629-3941). It is evidently more than 3 feet deep and there are no obstructions or tall trees near it.
- 2) pond (P2) in Hawkins Bar east of Trinity Village and Denny Road: This pond is on property owned by Red and Frances Hunt (916-489-4882), Harold & Joyce Wells (Larkspur – unlisted phone), and others. It is 10-11 feet deep but water weeds grow densely during the summer, which may hamper the ability to fill buckets. There are trees to the south and west of it.
- 3) pond (P3) east of SR 299, Oden Flat, and the Trinity River: This pond is on property owned by Alex & Gloria Fulton (707-826-2926 & 530-629-4696). This is a small pond that dries up in the summer, so may be of little use for filling helicopter buckets.
- 4) pond (P4) north of Salyer, the Trinity River, and Fountain Ranch Road in open fields between Salyer Loop Road and Knoll Road: This pond is on property owned by Colleen McCullough (530-629-3341). It is a small pond whose depth is unknown, which may be suitable for only a few bucket fills. It is surrounded on three sides (north, west, and south) by open fields and on the east (to north) by trees. There is a low fence in the vicinity and a high voltage power line about 500 feet to the south.

South Fork of the Trinity River Corridor

- 1) pond (P5) on property owned by Ken & Darlene McCoy (530-629-3156) in the NW ¼, SW ¼, Sec 23, T 6 N, R 5 E just north of South Fork Road: This is a small pond at the west end of a long, narrow meadow between tall trees. This is a shallow pond that has been in place for only a few years. It has not yet adequately sealed, so goes dry in July. Adequate sealing could eventually increase the length of time this pond would be serviceable.
- 2) pond (P6) on the old Carpenter Ranch on property owned by Audrey Beeson (Hoopa – unlisted phone): This pond is more than 3 feet deep and is fed by a perennial creek. There are hardwood trees in the vicinity, but clearance is adequate for filling buckets.

The Trinity River and South Fork of the Trinity River have sections of slow, deep water suitable for filling helicopter buckets, but there are hazards associated with these sites. Both rivers run in deep canyons that are narrow and lined with tall trees. During the summer, especially in late summer, winds along these rivers can be quite strong (up to 20 mph), gusty, and changeable in direction. During windy weather, filling buckets from the rivers or ponds should be at the discretion of helicopter pilots.

Probably the greatest hazards to helicopters are high- and low-voltage power lines, telephone lines, and cables that cross the two rivers. Some of these lines have yellow or orange balls attached and others have no such warning devices. The obstructions listed below, which do not include bridges, are mapped and highlighted on the 'Aerial Fire Access and Infrastructure Map'. It should be understood that this list may not include all of the obstructions, especially on the South Fork of the Trinity River, as it was not possible to view all sections of the rivers. Pilots should always take great care when flying above the rivers.

Trinity River (listed from east to west)

- 1) low voltage power line crossing in a northeast direction from north of Pony Creek Road on Gray Flat to the private property north of the river
- 2) high voltage power line and telephone line crossing in a northwest direction from the southwest edge of Gray Flat to Fisher Road

- 3) cable and water line crossing in a northeast direction from just north of the SR 299 bridge over Gray Creek to Fisher Road
- 4) low voltage power line and telephone line crossing in a northeast direction west of the Denny Road bridge, from Hawkins Bar to Trinity Village
- 5) high voltage power line and telephone line crossing in a southwest direction from the west end of Trinity Village to the south end of the SuzyQ Road area
- 6) low voltage power line crossing in an east direction from the end of SuzyQ Road to just west of the end of Hawkins Bar Road (northwest Trinity Village)
- 7) high voltage power line crossing northwest from just west of the Salyer Roadside Rest Area to north of SR 299
- 8) telephone line paralleling the river and the abandoned portion of SR 299 from southwest of the Salyer Roadside Rest Area to south of the second bridge over SR 299
- 9) high voltage power line crossing west from private property to the east side of Oden Flat
- 10) low voltage power line crossing northeast from the northwest end of Oden Flat to Riverview Estates
- 11) high voltage power line crossing northwest from the northwest end of Oden Flat to south of the end of Fountain Ranch Road
- 12) telephone line crossing northwest from the west end of Oden Flat to south of the end of Fountain Ranch Road
- 13) low voltage power line crossing south from Fountain Ranch Road to a house between SR 299 and the river
- 14) low voltage power line and telephone line crossing north along the west side of the bridge from Salyer to Salyer Loop Road
- 15) high voltage power line crossing west from the ridge to the west of Salyer to the area between SR 299 and the river
- 16) high voltage power line and telephone line crossing west at the bridge over the South Fork of the Trinity River
- 17) low voltage power line and telephone line crossing in an east direction from south of the Campora Propane Company flat to the end of Woods Road on the east side of the river
- 18) low voltage power line and telephone line crossing in a northeast direction from the Campora Propane Company flat to Campbell Ridge Road on the east side of the river
- 19) low voltage power line and telephone line crossing in a southeast direction from the Camp Kimtu area to Seely-McIntosh Road on the east side of the river

South Fork of the Trinity River (listed from north to south)

- 1) high voltage power line and telephone line crossing west at the bridge over the South Fork of the Trinity River
- 2) low voltage power line crossing southwest from the “Carpenter Ranch” (where pond P6 is located) to “Cedar Grove Ranch”
- 3) cable crossing west ~ 600 feet north of the confluence of Surprise Creek and the South Fork of the Trinity River

Road System (Fire Access)

The road system in the Downriver FFMP area consists of a California State highway (SR 299), numerous USFS jurisdictional roads, twenty-two Trinity County roads, and numerous private roads and driveways, some of which are gated.

State Route 299

State Route 299 (SR 299) is a National Scenic Byway and the main highway that links Redding and Interstate 5, in the Central Valley, with Arcata & Eureka on the coast. SR 299 follows the Trinity River from Junction City to Willow Creek, connecting the communities along the way. In the Downriver FFMP area it is a two-

lane highway, with one section of four lanes and one of three lanes for passing. It is a heavily traveled road during the summer tourist season, especially on weekends when people from Redding travel to the coast to cool off and people from the coast travel inland to get warm and to swim in and boat on the Trinity and South Fork of the Trinity Rivers. Travel is also heavy during the hunting, fishing, firewood gathering, and mushroom gathering seasons. SR 299 is maintained and snow-plowed by the California Department of Transportation (Caltrans), which has a variable width, dedicated right-of-way.

U.S. Forest Service Roads

U.S. Forest Service jurisdictional roads access National Forest lands. These roads were built primarily to access areas for timber harvesting, and occasionally for other management activities. They are commonly used now for USFS administrative access, fire and fuels management, commercial timber harvesting, recreation, hunting, woodcutting, special forest products gathering, and sightseeing. Due to the steep terrain these roads generally follow main ridges to the dividing ridges between major watersheds, with short, dead-end spur roads to specific sites. The steep terrain, abundance of forests dominated by low value tanoak, and past management direction have limited road building in the Downriver FFMP area, so road densities are lower here than in other areas.

Timber harvesting on the Six Rivers NF has declined dramatically in the past 15 years, and as a result road construction and maintenance have also declined. The arterial and collector roads generally have surfaces that will accommodate cars while spur roads are typically of lower standard and are maintained only for higher clearance vehicles. Road conditions are highly dependent on maintenance priorities placed on individual roads, levels of traffic, and funding levels. Road maintenance needs are primarily based upon road design, purpose, and usage and physical factors. As road maintenance continues to decline, roads will potentially become less safe and more road-related resource damage may occur.

In the late '90s the USFS, Lower Trinity Ranger District, conducted a road inventory to help determine and guide road management. This resulted in the 1998 Access and Travel Management Plan, which included implementation plans for road maintenance, restoration, upgrading, and decommissioning. Apparently the plan did not provide a priority rating for the road network based upon such relevant factors as erodibility, stream crossing density, recreational use, cultural use, maintenance costs, botanical concerns, fire suppression and fuel treatment access, and anadromous fish issues to help identify and drive future projects. Maintenance and accessibility of the ridge roads is important for fire suppression and pre-suppression activities.

Trinity County Roads

The Trinity County road system was constructed primarily to access private property for residential development. There are 22 county roads in the Downriver FFMP area that are mostly located near the Trinity and South Fork of the Trinity Rivers. The exception is Denny Road, which climbs to the top of the watershed and then drops into the New River drainage to access Denny, and Hennessey Road, which climbs to the top of Hennessey Ridge and drops down into Burnt Ranch. The county roads are generally paved or chip-sealed (except for Hennessey Road) and generally have good surfaces. Some sections of Campbell Ridge Road, South Fork Road, and Hennessey Road are on steep side slopes and are too narrow for two vehicles to pass. Turnouts are infrequent in these sections of road. The Trinity County Department of Transportation maintains county roads.

Private Roads & Driveways

There are numerous private roads and driveways accessing houses and other structures on private property. These roads vary from wide (2-lane) to narrow (1-lane). A few are paved, most are graveled, and some are native material. Many have rough surfaces, but are passable by passenger cars. The landowners maintain these roads.

Road Descriptions

Primarily Trinity County and private roads are described below, although a few USFS roads are also included. USFS roads are adequately covered in the 2003 “Mainstem Trinity Watershed Analysis” (USFS MTWA), the “Lower South Fork Trinity Watershed Analysis”, and the 1998 “Access and Travel Management Plan” for the Lower Trinity Ranger District.

Unless otherwise noted, all roads described below are currently drivable by either 2-wheel or 4-wheel drive vehicles. Roads behind locked gates were not assessed for this fire plan. Road conditions can change rapidly due to landslides, culvert failures, surface rutting, rock falls, and/or tree breakage or uprooting. This is especially true where soils are highly erosive. A case in point is the closing of Campbell Ridge Road in December 2005 after a section slid into the Trinity River. It is therefore recommended that the road system be driven periodically to assess road conditions and to identify sections that need repair. The ‘Fire Control Access and Infrastructure Map’ and the road descriptions below should be updated before each fire season and copies should be made available to fire stations with suppression responsibilities in and around the Downriver FFMP area.

Most of the roads listed below are officially named and signed on the ground. Other names are those commonly used by residents and/or resource managers. These common names are so noted in the individual road write-ups. A Trinity County ordinance (#1124-2) requires 911 addresses to be placed at all residences so that they are legible and easily visible from the road upon which the premises front. Numbers are required to be at least three inches in height and preferably made from reflective material for ease of night viewing. To lower fire response times and limit confusion, it would behoove all landowners to erect road signs at road junctions and 911 addresses at driveways.

Included in the road descriptions are comments on turnarounds for fire engines and fuel conditions that should be treated to increase the safety of fire personnel and residents. These descriptions should be supplemented and modified as needed with information on specific roads and driveways that was generated by the “Big Red Truck” survey done by local volunteer fire departments in 2005.

Recreation trails on public lands are included with the road descriptions. All such trails are maintained by Six Rivers NF personnel.

All of the roads listed below originate from State Route 299 or spur off of one of those roads. They are listed under the legal land division (Section, Township, & Range) where they originate.

A. Gray Flat Area

(Section 33, T6N, R6E) Note that roads 1-3 show on the Downriver FFMP area maps as originating in Section 34, T6N, R6E. Due to a discrepancy in the GIS coverage, the east boundaries of sections 4, 9, 16, 21, 28, and 33 are incorrectly located approximately ½ mile to the west of their actual location.

1. There is an unnamed road just west of an unnamed creek that crosses SR 299 at milepost 8.2 that accesses the power line. This is a 1-lane dirt road with an uneven surface closest to the eastern boundary of the Downriver FFMP area. The fuels along this road are excessive, but the road doesn’t appear to be used on a regular basis. It is unknown who maintains this road.
2. Gray Creek Road (USFS Road 6N12) (signed) is a 1½-lane graveled road with turnouts. This road climbs west to Hennessey Ridge through Six Rivers N.F., follows the ridge northwest, and descends to the west to connect with South Fork Road just south of Ammon Ranch. It is maintained by the USFS.
3. The road (signed) to Gray Flat Campground (closed permanently) is located north of SR 299 on Six Rivers N.F. lands. It forks shortly after leaving SR 299, with the left fork to the campground being a 2-lane paved road and the right fork (USFS Road 6N56) (unsigned) to the picnic area and Gray Flat Trail trailhead (USFS Trail 6E30). The road to the trailhead and picnic area is a loop road with moderate to heavy fuels

bordering it. The road that continues to the southeast of the picnic area is a 1-lane dirt, dead end road that is rough in spots and is bordered by moderate to heavy fuels. These roads are maintained by the USFS.

(Section 28, T6N, R6E) Note that roads 4 and 5 show on the Downriver FFMP area maps as originating in Section 27, T6N, R6E. Due to a discrepancy in the GIS coverage, the east boundaries of sections 4, 9, 16, 21, 28, and 33 are incorrectly located approximately ½ mile to the west of their actual location.

4. Ammon Road (signed), located northeast of SR 299, is a 1-lane graveled road on private land that descends to a flat and dead ends. There is space to turn a fire engine around before the road ends. The first part of this road has moderately dense fuels that could be treated to reduce the fire hazard. This road is maintained by the residents.

5. An unnamed, gated, 1-lane dirt road runs south from SR 299 west of Ammon Road to connect with the power line. It follows the power line in both directions. The fuels along this road are excessive, but the road doesn't appear to be used on a regular basis. It is unknown who maintains this road.

6. Grey's Flat Road (signed), located northeast of SR 299, is a 1-lane paved road on private land that forks about 0.1 mile from the highway. The first part of this road has moderately dense fuels that could be treated to reduce the fire hazard. The left fork is a 1-lane graveled road, (unsigned) that runs for a short distance and dead ends at a dwelling. There is a turnaround on this road. The right fork (unsigned) is a 1-lane paved road that descends steeply to a gate (no turnaround before the gate) and continues on to dead end at a dwelling. It is unknown whether there is adequate space to turn a fire engine around at this dwelling. These roads are maintained by the residents.

7. Pony Creek Road (signed), located north of SR 299, is a 1-lane graveled road with a rough surface, on private land. There are two driveways (gated) and one spur road (unsigned) forking off about 0.1 mile from the highway. The main road (unsigned) goes downhill for another 0.1 mile to a number of dwellings, where it dead ends at multiple, gated spur roads. There is space to turn a fire engine around before the road ends. The first 0.2 miles of the main road have excessive fuels close to the road that should be treated to reduce the fire hazard. The last part of the road is open. One of the driveways and the spur road down 0.1 mile have excessive fuels along them. The spur road doesn't appear to be used on a regular basis. These roads are maintained by the residents.

B. Hawkins Bar Area - Denny Road and Connecting Roads (listed from south to north)

(Section 29, T6N, R6E)

Denny Road (Trinity County Road 402) is located north of SR 299 at Hawkins Bar. It is a signed, 2-lane paved road that crosses private lands and Six Rivers N.F. to access Denny and points beyond. The Trinity County Department of Transportation maintains this road and has a variable width right-of-way. This road ties in with USFS roads that eventually dead end at the Trinity Alps Wilderness boundary.

(Section 28, T6N, R6E)

1. Fisher Road (signed) (Trinity County Road 441) connects with the Denny Road about 0.2 mile north of SR 299. For the first 0.33 miles it is a 1-lane paved road on private lands and Six Rivers NF that accesses dwellings along a bench above the river. There are some understory fuels that could be treated along the north side of this road, but on the whole it is relatively open. For the next 0.7 mile it is a 1-lane graveled road that crosses Six Rivers NF along a steep, rocky slope north of the Trinity River, accessing private property and a dwelling on Cow Creek, where it dead ends. It is gated where it enters private property and there is a small turnaround there that is unsuitable for fire engines. The side slopes along this section of road are generally too steep to do fuels reduction project work and the fuels are generally light. The Trinity County Department of Transportation maintains the first 0.9 mile of this road.

(Section 29, T6N, R6E)

2. Hawkins Bar Road and Lone Pine Road access Trinity Village to the west of the Denny Road. They are approximately 1 mile north of SR 299. There are a total of seven roads within Trinity Village (all signed) that connect with at least one of these two access roads. All of these roads are maintained by the Trinity County Department of Transportation.

- a. Hawkins Bar Road (Trinity County Road 456) is a 2-lane paved road, except for a stretch between China Flat Road (east) and Chinquapin Road (west) that is divided into two single-lane, one-way roads. This road is the longest road in Trinity Village and accesses the mid-north corner of the village. It continues on past a locked gate, as a 1-lane graveled road that accesses Six Rivers N.F. lands on the Trinity River, where it dead ends. As Hawkins Bar Road is one of the main access roads into the Trinity Village subdivision, the fuels bordering it along some sections should be treated to reduce flammability. These sections are shown on the 'Hawkins Bar Project Locations Map'.
- b. Lone Pine Road (Trinity County Road 460) is a 2-lane paved road that parallels Hawkins Bar Road on the north and ends at China Flat Road. As this road is one of the main access roads into the Trinity Village subdivision, the fuels bordering it along some sections should be treated to reduce flammability (see the 'Hawkins Bar Project Locations Map').
- c. China Flat Road (Trinity County Road 459) is a 2-lane paved loop road that runs north from Hawkins Bar Road, crosses Lone Pine Road, loops to the west and then to the south, and reconnects with Hawkins Bar Road. There are some sections along it where fuels could be treated to reduce flammability (see the 'Hawkins Bar Project Locations Map').

(Section 20, T6N, R6E)

- d. China Court (Trinity County Road 481) is a short, dead end, 2-lane paved road that runs northwest from the northwest corner of China Flat Road. There is a section along the north side where fuels could be treated to reduce flammability (see the 'Hawkins Bar Project Locations Map').
- e. Big Oak Road (Trinity County Road 458) is a 2-lane paved road that runs north from Hawkins Bar Road and then reconnects with it. There is a section along the north end where fuels could be treated to reduce flammability (see the 'Hawkins Bar Project Locations Map').
- f. Chinquapin Road (Trinity County Road 457) is a 2-lane paved road that runs north from Hawkins Bar Road and then reconnects with it. There are numerous sections along this road where fuels could be treated to reduce flammability (see the 'Hawkins Bar Project Locations Map').
- g. River Road runs south from Hawkins Bar Road to access the Trinity River on Six Rivers N.F. lands and dwellings on a bench north of the river. It is a 1½-lane paved road to a locked gate and then continues on down to the river as a 1-lane paved road to a dead end. A dirt spur road at the bottom of the hill runs up river along a bench above the river and eventually dead ends. Fire engines can turn around at the bottom of the road.
- h. Trinity Court (Trinity County Road 480) is a 2-lane paved road that runs northwest from the westernmost loop of Hawkins Bar Road. It accesses dwellings and the Hawkins Bar Volunteer Fire Department firehouse. It continues on in a northerly direction onto Six Rivers N.F. lands to the west of the village, where it becomes a gated, 1-lane dirt road that dead ends. The fuels were adequately treated on USFS lands in 2005.
- i. Madrone Lane (Trinity County Road 464) is a short, 2-lane paved road that runs southeast from Hawkins Bar Road. There is a section along the north end where fuels could be treated to reduce flammability (see the 'Hawkins Bar Project Locations Map').

j. Madrone Lane turns into Madrone Trail (unsigned), a 1-lane dirt road located north of Hawkins Creek that connects with Flame Tree Road to the east. There are heavy concentrations of fuels along some sections of this road. It is unknown who maintains Madrone Trail.

(Section 21, T6N, R6E)

3. There is an unnamed, gated road just north of Lone Pine Road that runs east from Denny Road to access a large pond up the hill. This is a dead end, 1-lane dirt road with moderate to heavy fuels along it. It is unknown who maintains this road.

4. The next road north up the Denny Road (signed 1090) is an unnamed, 1-lane, chip-sealed access road that dead ends at a dwelling southeast of the Denny Road. This road is maintained by the owner.

5. The next road north is Flame Tree Road (Trinity County Road 461), a 1½-lane paved road with a turnaround at the end. This road turns into Madrone Trail, a 1-lane dirt road located north of Hawkins Creek that connects with Madrone Lane to the west.

a. Coon Creek Road (Trinity County Road 462) forks to the northwest off of Flame Tree Road. For the first 0.1 mile, to the first turnaround, this is a 1½ to 2-lane paved road. From that point to the end, a dead end turnaround, it is a rough, 1-lane, dirt and gravel road.

6. The next road up the Denny Road is an unnamed, dead end, 1-lane dirt road that crosses Hawkins Creek to the west and accesses dwellings.

7. Shortly before the first hairpin switchback on Denny Road, Wallen Ranch Road (Trinity County Road 442) turns off to the left (north) and parallels Hawkins Creek. This is a 1 to 1½-lane paved road that is maintained by the Trinity County Department of Transportation for about 0.3 mile, to the end of the county road. The unofficially named Zeigler Point Road (unsigned) (USFS Road 4) continues on from that point to Waterman Ridge. It is maintained by the USFS.

a. An unnamed road (signed Wallen Ranch) runs to the west from Wallen Ranch Road about 0.25 miles north of its intersection with the Denny Road and crosses Hawkins Creek over a bridge. It is a 1-lane, dirt, dead end road for the first 200 feet (to a sign that says “End County Road”), then turns into a gated private road that accesses a ranch and dwelling.

1) An unnamed, dead end, 1-lane dirt spur road to the south of the above road accesses some dwellings west of Hawkins Creek.

C. SuzyQ Area

(Section 19, T6N, R6E)

1. The easternmost road in this area is east of SuzyQ Road and is signed “Keyes Rentals”. It is a 1-lane, dirt, dead end driveway that runs west from SR 299 to access dwellings. It is maintained by the owners.

2. SuzyQ Road (signed) is a dead end, 1 to 1½-lane dirt road that runs north from SR 299 and accesses dwellings and a vineyard on a bench south of the Trinity River. It is maintained by the residents.

a. What is informally known as West SuzyQ Road (unsigned) runs northwest from SuzyQ Road, beginning approximately 0.2 mile from SR 299. This dead end, 1-lane dirt road accesses a dwelling. It is maintained by the owner.

(Section 20, T6N, R6E)

b. What is informally known as North SuzyQ Road (unsigned) runs west from SuzyQ Road, beginning approximately 0.4 mile from SR 299. This begins as a 2-lane dirt road and then turns into a 1-lane dirt road that forks and dead ends at dwellings. It is maintained by the residents.

- c. What is informally known as South SuzyQ Road (unsigned) runs northeast from SuzyQ Road, beginning approximately 0.5 mile from SR 299. This dead end, 1½-lane dirt road accesses dwellings. It is maintained by the residents.
 - d. An unnamed road runs east from SuzyQ Road, beginning approximately 0.5 mile from SR 299. This dead end, 1½-lane dirt road accesses dwellings. It is maintained by the residents.
3. The unnamed road just west of SuzyQ Road runs southwest through an orchard to a dwelling. It is a dead end, 1-lane dirt driveway. It is maintained by the owner.
 4. The westernmost road in this area is west of SuzyQ Road and is signed “Keyes”. It is a dead end, 1-lane dirt driveway that runs southwest from SR 299 to accesses a dwelling. It is maintained by the owner.

D. Salyer Roadside Rest Area

(Section 19, T6N, R6E)

1. USFS Road 6N51 (signed “Tunnel Flat”) is a 1-lane dirt road that runs through Six Rivers NF lands down a ridge north of SR 299 and the rest area. It is drivable for about 0.2 mile before it becomes impassable to all but 4-wheel drive vehicles. There are 3-4 turnouts where small fire engines could turn around. This road accesses Tunnel Flat Trail (USFS Trail 6E75), which accesses the Trinity River. The road is rarely maintained by the USFS.
2. An unnamed road (old SR 299) runs through Six Rivers NF lands south of the rest area. It is a gated, 1-lane, partially paved road that runs from the access road to the rest area to a berm that blocks it shortly before it connects with SR 299 just east of the rest area. The road does not appear to be maintained. Fuels could be treated by underburning between the rest area and the road to create a defensible buffer.

E. Oden Flat

(Section 13, T6N, R5E)

1. The southernmost road (unnamed) in this area is signed “Sellman’s”. It is a dead end, 1-lane dirt road that runs northeast from SR 299 to access a dwelling. It is maintained by the owners.
2. The next road north (unnamed) is a dead end, 1-lane dirt road that runs north from SR 299 to access dwellings and Riverside Mobile Home Park. There is a turnaround at the end of the road. There are two dead end spur roads that run northeast from this road. All of these roads are maintained by the owners.
3. The next road north (unnamed) is a dead end, 1-lane dirt road with a rough surface that runs southwest from SR 299, forks three times, and accesses dwellings. All of these roads are maintained by the owners.
4. The road directly across from road 3 above (unnamed) is a dead end, 1-lane dirt road that runs southeast along the power line for a short distance, then runs northeast and northwest to access a dwelling above the Trinity River. It is maintained by the owners.
5. The northernmost road in this area is an unnamed driveway. It is a dead end, 1-lane dirt road that runs northeast from SR 299 to accesses dwellings. It is maintained by the owners.
6. Between Oden Flat and Salyer is a dead end road labeled “White House Gulch” that runs northeast from SR 299. This is a short, dead end, 1-lane dirt driveway to a dwelling. It is maintained by the owner.

F. Salyer Area

(Section 14, T6N, R5E)

1. The easternmost road (unsigned), before reaching the Salyer Store, accesses the Lazy Double B Campground and RV Park to the south of SR 299. It is a dead end, private, 1-lane dirt road that continues through the campground to a dwelling on the hill. It is maintained by the owner.
2. The next driveway to the west is signed "Go Away". It is a dead end, 1-lane dirt road that access a dwelling. It is maintained by the owner.
3. **Salyer Loop Road** (signed) (Trinity County Road 444) runs northwest from SR 299, crossing the Trinity River and accessing what is known as Salyer Heights. This is a paved and striped, 2-lane road for 1.5 miles to Salyer Heights, where it forks at the south end of the residential area and becomes two 1½-lane paved roads, which reconnect at the north end. The Trinity County Department of Transportation maintains the Salyer Loop Road.

(Section 14, T6N, R5E)

- a. Just north of the bridge over the Trinity River, an unnamed and unmarked trail runs east of the road to access the Trinity River. The fuel hazard is generally low along this trail and above the swimming area due to the high, rocky cliffs. But there is grass growing near the top of the trail that is a fire hazard when it is dry. To the west of the road is a parking area that appears to be used by people who use the trail. There is a large blackberry patch to the west of this parking area that is a fuel hazard.
- b. Fountain Ranch Road (Trinity County Road 445) connects just north of the bridge over the Trinity River and runs to the east. It is described below, following the description for Campbell Ridge Road.
- c. Salyer Trail (USFS Trail 5E31) (not signed) connects with Salyer Loop Road about 0.05 mile from SR 299. It is a 1-lane graveled road that runs south through National Forest as far as the Salyer Volunteer Fire Department station. It continues south as a trail for about 0.3 mile, where it dead ends at the Trinity River. It is maintained by the USFS.
 - 1) Lower Campbell Ridge Trail (USFS Trail 5E37) forks off to the west about 0.1 mile south of the Salyer VFD station. It is a trail for the first 100-200 feet and then becomes a 1-lane jeep road that runs northwest up Campbell Ridge through National Forest lands to Campbell Ridge Road. The trail continues up the ridge as a jeep trail to Waterman Ridge. It is maintained by the USFS.

(Section 11, T6N, R5E)

- d. An unnamed driveway connects with Salyer Loop Road about 0.5 mile from SR 299. It is a 1-lane dirt road that runs northeast through private property to access dwellings. It is maintained by the property owners.
- e. Rails Road (signed) (Trinity County Road 451) connects with Salyer Loop Road about 0.7 mile from SR 299. It is a 1-lane chip sealed road that runs southwest through private property to a dwelling. It is maintained by the Trinity County Department of Transportation.
- f. An unnamed road (not signed) connects with Salyer Loop Road about 0.7 mile from SR 299. It is a 1-lane chip sealed road that runs northeast through private property to dwellings. It is maintained by the property owner.
- g. An unnamed driveway (not signed) connects with Salyer Loop Road about 1.0 mile from SR 299. It is a 1-lane graveled road that runs southwest through private property to a dwelling. It is maintained by the property owner.

h. An unnamed driveway (not signed) connects with Salyer Loop Road about 1.2 miles from SR 299. It is a 1-lane dirt road that runs west through private property to a dwelling. It is maintained by the property owner.

i. An unnamed road (signed 1491) connects with Salyer Loop Road about 1.4 miles from SR 299. It is a gated (cable), 1½-lane dirt road that runs north from Salyer Loop Road through private property and connects with Campbell Ridge Road. It is maintained by the property owners.

j. Peach Tree Road (signed) connects with Salyer Loop Road about 1.6 miles from SR 299. It is a 1½-lane, dead end, dirt road that runs southeast through private property to access dwellings and an orchard. There are five spur roads off of the main road that are maintained by the property owners. The fuels to the west (downhill) side of the road, between Salyer Loop Road and the first spur roads on the ridge, are heavy and should be treated to reduce the fire hazard.

k. Campbell Ridge Road (Trinity County Road 454) connects with the Salyer Loop Road in Salyer Heights, 1.6 miles from SR 299. It accesses the Hudson Creek area (see below) and eventually Willow Creek.

l. Salyer Court (Trinity County Road 444A) is the continuation of the left (west) fork of Salyer Loop Road. It is a 1½-lane paved road that continues north through a residential area to the National Forest boundary.

1) At the National Forest boundary a 1-lane dirt road runs east and continues through private property to a gate and a dwelling. It is maintained by the property owner.

m. Road B (signed) runs east from the eastern loop of Salyer Loop Road. It is a short, dead end, 1-lane dirt road maintained by the residents.

4. **Fountain Ranch Road** (signed) (Trinity County Road 445) originates at the Salyer Loop Road just north of the bridge over the Trinity River (0.1 mile from SR 299) and runs east, north of and parallel to the river. It is a striped, 2-lane paved road for 1.15 miles, before it turns into an unstriped, 1½-lane paved road to where the pavement and county road end 1.35 miles from the Salyer Loop Road. It is maintained to that point by the Trinity County Department of Transportation. From there on it is maintained by the residents. It becomes a 1-lane dirt road that descends through private property to cross Sharber Creek. It is gated shortly after crossing Sharber Creek and continues on parallel to the Trinity River to access dwellings at Riverview Estates. Beyond Riverview Estates it is gated twice and accesses private property and a dwelling.

Fountain Ranch Road is bordered on the north side by flammable understory fuels for about 0.5 mile, from Ferguson Road east to Councilman Road. But for the first 0.2 mile the road is bordered by a cliff that would effectively act as a fuel break, with minor clearing of vegetation near the road.

a. Knoll Road (signed) connects with Fountain Ranch Road about 0.25 mile from Salyer Loop Road. It is a gated, 1-lane graveled road that runs north to a dwelling. The field to the northwest of the dwelling is suitable for an emergency helicopter pad. The field to the east is a suitable safety zone. The road is maintained by the residents.

b. Ferguson Road (signed) (Trinity County Road 446) connects with Fountain Ranch Road about 0.6 mile from Salyer Loop Road. It is a dead end, 1-lane paved road that runs southeast for 0.1 mile to some dwellings. It is maintained by the Trinity County Department of Transportation.

(Section 13, T6N, R5E)

- c. Mary 2 Road (signed) connects with Fountain Ranch Road about 1.1 miles from Salyer Loop Road. It is a dead end, 1-lane dirt driveway that runs south to a dwelling. It is maintained by the residents.
- d. Stanley Z Road (signed) connects with Fountain Ranch Road about 1.1 miles from Salyer Loop Road. It is a dead end, 1-lane dirt driveway that runs south to a dwelling. It is maintained by the residents.
- e. Councilman Road (signed) (Trinity County Road 455) connects with Fountain Ranch Road about 1.15 miles from Salyer Loop Road. It begins as a 1 ½-lane paved road and ends as a 1-lane paved road that runs northwest to dwellings, where it dead ends. It is maintained by the Trinity County Department of Transportation.

Fuels are moderately heavy along portions of Councilman Road, particularly in the vicinity of Arnesen Lane Pvt to the end of the road.

- 1) Gravel Road Pvt (signed) connects with Councilman Road about 0.1 mile from Fountain Ranch Road. It is a dead end, 1-lane graveled road that runs north to dwellings. It is maintained by the residents.
- 2) Arnesen Lane Pvt (signed) connects with Councilman Road about 0.2 mile from Fountain Ranch Road. It is a dead end, 1-lane graveled road that runs north to a dwelling. It is maintained by the residents.
- 3) An unnamed road (signed McCoy) connects with Councilman Road about 0.3 mile from Fountain Ranch Road. It is a dead end, 1-lane graveled road that runs northwest to a dwelling. It is maintained by the residents.
- 4) An unnamed road connects with Councilman Road a little more than 0.3 mile from Fountain Ranch Road. It is a dead end, 1-lane paved road that runs northwest to a dwelling. It is maintained by the residents.
- f. Sugar Magnolia PVT road (signed) connects with Fountain Ranch Road about 1.2 miles from Salyer Loop Road. It is a dead end, 1-lane graveled road that runs southeast to a dwelling. It is maintained by the residents.
- g. An unnamed road connects with Fountain Ranch Road about 1.25 miles from Salyer Loop Road. It is a dead end, 1-lane dirt road that runs northwest to a dwelling. It is maintained by the residents.
- h. An unnamed logging road connects with Fountain Ranch Road just east of Sharber Creek, about 1.5 miles from Salyer Loop Road. It is a gated, dead end, 1-lane dirt road that runs northwest. It is maintained by the landowner.
- i. The roads beyond the locked gates were not ascertained.

G. Hudson Creek Area

(Section 33, T7N, R5E & Sections 3, 4, 9-11, 15, T6N, R5E)

1. **Campbell Ridge Road** (Trinity County Road 454) connects with the Salyer Loop Road in Salyer Heights, 1.6 miles from SR 299. It is a 1 to 1½-lane paved road with turnouts that runs northwest through private and National Forest lands. It crosses Campbell Ridge and eventually becomes Seely-McIntosh Road (Humboldt County Road 537), which connects with Country Club Road in Willow Creek. This road is quite narrow in sections and would be hazardous for drivers during emergency fire situations when traffic increases. In December of 2005 the road slid out south of Hudson Creek, 3.7 miles from its origin at Salyer Loop Road. As it is now impassable between the properties south of the slide and Willow Creek,

emergency and fire vehicles must travel from Salyer across the extremely hazardous Campbell Ridge Road. The Trinity County Department of Transportation hopes to have the road repaired sometime in late 2006. In the interim, it is negotiating with the Forest Service to construct more turnouts and widen portions of the Campbell Ridge Road.

(Section 15, T6N, R5E)

- a. An unnamed, gated (cable), 1-lane dirt road runs to the south from Campbell Ridge Road, about 0.5 miles from Salyer Loop Road, and eventually ties in at the south end with Salyer Loop Road. It is maintained by the landowner.
- b. Lower Campbell Ridge Trail (USFS Trail 5E37) runs to the southeast at the saddle on Campbell Ridge, about 1.3 miles from Salyer Loop Road. It is a 1-lane, dirt jeep road that runs down Campbell Ridge through National Forest to connect with Salyer Trail (USFS Trail 5E31) south of the Salyer VFD station. Upper Campbell Ridge Trail, a jeep road, runs northwest to connect with Waterman Ridge. It is maintained by the USFS.

(Section 10, T6N, R5E)

- c. An unnamed, gated (cable), 1-lane dirt road runs to the south from Campbell Ridge Road about 2.2 miles from Salyer Loop Road (first road toward Willow Creek from the saddle on Campbell Ridge). It is 100 feet long and accesses private property for resource management. It is maintained by the landowner.
- d. Approximately 2.7 miles from Salyer Loop Road is Woods Road signed "Jenkins". It is a 1½-lane graveled road with turnouts that runs south through private and National Forest lands to dwellings, where it dead ends. It is possible to turn fire engines around at the end of the road. Ladder fuels (Douglas-fir, tanoak, Pacific madrone, canyon live oak, white oak saplings) are dense enough along the road that treatment is advisable (see 'Hudson Creek Project Locations Map'). It is unknown who maintains the road.
- e. Approximately 3.1 miles from Salyer Loop Road is an unnamed road signed "3319". It is a gated, 1-lane graveled road with turnouts that runs south through private and National Forest lands to a dwelling, where it dead ends. It is unknown who maintains the road.
- f. Between 3.1 to 3.8 miles from Salyer Loop Road are numerous driveways to dwellings that are close to the Campbell Ridge Road. These driveways are generally gated and are maintained by the property owners. There are numerous ladder fuels (Pacific madrone and canyon live oak saplings, whiteleaf manzanita, wild grape, and blackberries 2-5 feet tall) along this section of the road (especially the east, uphill side) that should be treated to increase fire safety (see 'Hudson Creek Project Locations Map').
- g. Hudson Creek Road (signed) is approximately 3.8 miles from Salyer Loop Road. It is a 1-lane paved road that runs north through private lands to a dwelling, where it dead ends. It is maintained by the property owner.

(Section 4, T6N, R5E)

- h. Approximately 5.2 miles from Salyer Loop Road is an unnamed road. It is a gated, 1-lane graveled road with turnouts that runs southwest through private lands to dwellings, where it dead ends. There is coyote brush and blackberries 3-6 feet tall that should be treated to reduce the fuel hazard (see 'Hudson Creek Project Locations Map'). The road is maintained by the property owners.

(Section 33, T7N, R5E)

- i. Deer Lane PVT is approximately 5.3 miles from Salyer Loop Road. It is a 1-lane graveled road that runs south through private lands to dwellings, where it dead ends. It is maintained by the property owners. There are numerous ladder fuels (tanoak and canyon live oak saplings) that should be removed and moderately dense to dense pole-size trees (Douglas-fir, tanoak, canyon live oak, white oak, black oak,

and Pacific madrone) that should be thinned to increase fire safety and health (see ‘Hudson Creek Project Locations Map’).

j. Sign Tree Road PVT is approximately 5.5 miles from Salyer Loop Road. It is a 1½-lane graveled road that runs west for 0.2 miles through National Forest and private lands to dwellings, where it dead ends. Baldwin Creek L.P. PVT forks off to the south and then Sign Tree Road PVT forks near its end. Near the end of Sign Tree Road is a patch of blackberries between the road and the creek that should be cut and burned (or just burned) periodically to reduce the flammability of the fuels (see ‘Hudson Creek Project Locations Map’). The road is maintained by the property owners.

1) Baldwin Creek L.P. PVT intersects Sign Tree Road PVT about 0.1 mile from Campbell Ridge Road. It runs south through private lands and has three forks off of it. It is a 1-lane dirt road that dead ends at a gated loop and a dwelling. The fuels are dense and highly flammable along the last 0.2 miles of this road. They are primarily Scotch broom 4-8 feet tall, greenleaf manzanita 6-12 feet tall, coyote brush 3-6 feet tall, and blackberries 2-5 feet tall intermixed with madrone, oaks, and conifers. These fuels should be treated, as they will create very hazardous conditions for fire fighters and residents in the event of a fire (see ‘Hudson Creek Project Locations Map’). The road is maintained by the property owners.

a) An unnamed drive runs south from Baldwin Creek L.P. PVT. It is a 1-lane dirt road that dead ends at a dwelling. It is maintained by the property owner.

b) Erin Lane PVT runs southwest from Baldwin Creek L.P. PVT about 0.3 mile down from Sign Tree Road PVT. It is a 1-lane dirt road that dead ends at a dwelling. The fuel conditions are similar to those on Baldwin Creek L.P. PVT road, and should be treated (see ‘Hudson Creek Project Locations Map’). It is maintained by the property owner.

c) An unnamed drive runs east from Baldwin Creek L.P. PVT. It is a 1-lane dirt road that dead ends at a dwelling. The fuel conditions are similar to those on Baldwin Creek L.P. PVT road, and should be treated (see ‘Hudson Creek Project Locations Map’). It is maintained by the property owner.

k. The boundary line between Trinity and Humboldt Counties is shown crossing Campbell Ridge Road south of Deer Lane PVT in Section 33, T7N, R5E on the 7.5 minute USGS Salyer Quadrangle (1979), but the boundary is labeled “indefinite. The Trinity County boundary sign on the road is located north of Sign Tree Road PVT, 5.65 miles from Salyer Loop Road. The quad map shows that Campbell Ridge Road (Trinity County Road 454) turns into Trinity County Road 451 in the vicinity of the sign, but there is no such designation on the road itself or by the Trinity County Department of Transportation. The road becomes a 1½-lane paved road, with turnouts, which runs north through National Forest and private lands at this point. It eventually turns into Seely-McIntosh Road (Humboldt County Road 537), a 2-lane paved road that connects with Country Club Road in Willow Creek, 7.3 miles from Salyer Loop Road.

H. South Fork Road and Connecting Roads

(Section 15, T6N, R5E)

1. The Hlel-Din Trail (USFS 5E32) accesses the Trinity River north of SR 299 near its junction with South Fork Road. This trail is popular with the public during the summer. The fuels along the trail are relatively light, but could be treated to reduce the fuel hazard.

2. South Fork Road (Trinity County Road 447) runs in a southerly direction above and east of the South Fork of the Trinity River. It eventually turns into USFS Road 5N03 about 1 mile south of Dry Gulch and continues on to its end at Coon Creek. It loops back on itself at the trailhead to the South Fork Trail, where there is an open area for parking and maneuvering stock trailers.

South Fork Road is a paved, 2-lane divided road for the first 2.1 miles, from SR 299 to the old Ammon Ranch. For the next 1.45 miles, to USFS Road 6N68 (road to McCoy's and Martin's), it is a 1½-2 lane paved road. For the next 5.55 miles, to the end of the county road, it is a 1-1½ lane paved road with turnouts. For the next 2.7 miles, to the end of the road, it is a 1-1½ lane graveled road with turnouts.

- a. Approximately 100 feet south of SR 299 is a driveway signed "Wade Judy Ammon". It is a 1-lane graveled road that runs west through private property to a dwelling, where it dead ends. It is maintained by the property owner.
- b. Approximately 100 feet south of SR 299 is a driveway signed "R&A Repair Shop and Rodney & Alice Ammon". It is a 1-lane graveled road that runs south through private property to a dwelling, where it dead ends. It is maintained by the property owner.

(Section 23, T6N, R5E)

- c. Approximately 0.9 mile south of SR 299 is an unnamed, unsigned, 1-lane graveled road that runs northeast through private property to a dwelling, where it dead ends. It is maintained by the property owner.
- d. Approximately 1.2 miles south of SR 299 is an unnamed, gated, 1-lane dirt road that runs north through private property to a pond. It is maintained by the property owner.
- e. Approximately 1.45 miles south of SR 299 is an unnamed, gated, 1-lane dirt road that runs southeasterly through private property onto national forest lands, where it switches back to the northwest and dead ends on a bench above the river. There is a 400-foot section of the roadbed that has gullied from water runoff from South Fork Road. This section is above and below the switchback and is passable by high clearance, 4-wheel drive vehicles. There are hazardous fuels on both sides of the road. The road is thought to be maintained by the property owner and the USFS.

(Section 26, T6N, R5E)

- f. Approximately 2.1 miles south of SR 299 is an unnamed road signed "Molly & Dal Senter" and "Bussel's Ranch". It is a gated, 1-lane paved road that runs south through private property to dwellings, where it dead ends. It is maintained by the property owners.
- g. Approximately 2.4 miles south of SR 299 is an unnamed, gated, 1-lane dirt road that runs southwest through private property to a dwelling, where it dead ends. It is maintained by the property owner.

(Section 25, T6N, R5E)

- h. There are seven driveways in the next 0.75 mile. Only a few of these driveways are signed with the residents names. They are maintained by the property owners.
- i. Approximately 3.1 miles south of SR 299 is a driveway signed "Weber". It is a 1-lane graveled road that runs west through private property to a dwelling, where it dead ends. It is maintained by the property owner. There is an all year pond at this location, which the owner has indicated he would make available for filling fire engines and water tenders.
- j. Approximately 3.35 miles south of SR 299 is USFS Road 6N12, signed "Highway 299 – Burnt Ranch, Hennessey Peak". It is a 1½-lane, chip-sealed, graveled, & dirt road with turnouts that runs south and east as it climbs through Six Rivers N.F. to Hennessey Ridge, follows Hennessey Ridge to the southeast, and descends to the east to connect with SR 299 just south of Gray Flat Campground (where it is named Gray Creek Road). It is maintained by the USFS.
- k. Approximately 3.55 miles south of SR 299 is USFS Road 6N68, signed "Martin's & McCoy's". It is a dead end, 1½-lane dirt road with turnouts that runs west through National Forest into private land, where

it accesses dwellings and a ranch. It is gated and signed “Ken & Darlene McCoy” about 0.25 mile west of South Fork Road. Just before this gate, a 1-lane dirt spur road runs to the north, where it dead ends on private land at a dwelling. It is signed “The Martin’s, Nick, Anne, & Alicia”. Surface fuels have been removed and trees pruned up 6 feet in a 50-foot buffer along the north side of USFS Road 6N68, from South Fork Road to the Martin’s road.

There is a pond on National Forest lands just north of the road to the McCoy Ranch (past the McCoy gate).

l. Approximately 4.0 miles (milepost 4.0) south of SR 299 is Hennessey Road (Trinity County Road 435), signed “Primitive Road – Not Winter Maintained”. It is a 1-lane graveled road with turnouts. It climbs southeast to Hennessey Ridge, crosses the ridge, and descends to the east to connect with SR 299 at the Burnt Ranch Post Office. It is maintained by the USFS.

(Section 36, T6N, R5E)

m. Approximately 5.25 miles south of SR 299 is a road signed “The Shocker’s”. It is a 1-lane dirt road that runs southwest and then north through private property to a dwelling, where it dead ends. It is maintained by the property owner.

n. Approximately 5.85 miles south of SR 299 is an unnamed driveway signed “5954”. It is a 1-lane dirt road that runs southeast through private property to a dwelling, where it dead ends. It is maintained by the property owner.

(Section 1, T5N, R5E)

o. Approximately 6.3 miles south of SR 299, just east of a vineyard, is an unsigned driveway that runs east through private property to a dwelling, where it dead ends. It is maintained by the property owner.

p. Approximately 6.8 miles south of SR 299 is an unnamed road signed “Escot, Peaches, Trinity Retreat Center”. It is a 1-1½-lane chip sealed road that runs southwest through private property to access dwellings. It continues on through private property and National Forest to a dead end at a washed out bridge on the South Fork of the Trinity River. The first 0.2 mile of this road has a poor surface with many potholes and is bordered by light to moderate fuels. The last 0.15 mile of this road has a good surface and is bordered by moderate to heavy fuels. Who maintains this road, if anyone, was not determined.

This road provides access to a popular spot for swimming and boating, to a potential spot for filling water tenders and fire engines and for landing helicopters, and to an identified safety zone. It is advisable to treat the fuels along this road to reduce the chance of a fire starting in this high risk area.

(Section 12, T5N, R5E)

q. Approximately 7.4 miles south of SR 299, just past a cattle guard on a narrow section of road, is Carpenter Road (signed) (Trinity County 448), also signed “Streamfellow” & “Jurin Ranch”, that is maintained by the Trinity County Department of Transportation. It is a 1-lane graveled road that runs steeply downhill to the southwest through private property to the Jurin Ranch and dwellings, where it dead ends. There is a turnaround at the bottom of the hill, which might be inadequate for a fire engine, and a gate just beyond. The first driveway (gated) to the right (north) accesses the Streamfellow place.

r. Approximately 8.25 miles south of SR 299 is a driveway (not signed). It is a 1-lane dirt road that runs south through private property to a dwelling, where it dead ends. It is maintained by the property owner.

s. Approximately 8.3 miles south of SR 299 is a driveway (not signed). It is a 1-lane dirt road that runs east through private property to a dwelling, where it dead ends. It is maintained by the property owner.

t. Approximately 8.4 miles south of SR 299 is a driveway signed “Carpenter Ranch”. It is a 1-lane dirt road that runs southeast through private property to a dwelling, where it dead ends. It is maintained by the property owner. Approximately 0.1 mile past this drive, South Fork Road changes to a graveled road to its end.

(Section 18, T5N, R6E)

u. Approximately 9.1 miles south of SR 299 is an unnamed road signed “River Access – Todd Ranch”. It is a 1-lane road with turnouts that runs steeply downhill to the south, where it accesses a dwelling. It is possible to turn a fire engine around at this point. The road continues to a dead end at a trail used for kayak access to the South Fork of the Trinity River, where it is also possible to turn an engine around. But the last section of road along the edge of a meadow is narrow, has a rough surface, and is adjacent to dense forest. The meadow would provide a measure of safety for firefighters and other people in an emergency.

The county road ends south of the junction with the unnamed road (#29 above). USFS Road 5N03 (signed) begins here and is a 1-1/2-lane graveled road with turnouts. This road runs south to its end at Coon Creek. It is maintained by the USFS.

1). An unnamed, 1-lane dirt spur road overgrown with vegetation runs south, where it reconnects with USFS Road 5N03. This road is impassable due to the dense vegetation and a washed out section of road at a stream crossing near the south end of the road. This road is on National Forest but has not been maintained for some time.

(Section 19, T5N, R6E)

v. Approximately 10.6 miles south of SR 299 is an unnamed, 1-lane dirt spur road (end of road #29a above) that runs north for about 0.1 mile before encountering a washed out section of road at a stream crossing. This road is on National Forest but has not been maintained for some time.

w. Approximately 11.3 miles south of SR 299 is an unnamed, 1-lane dirt spur road that runs south and west to a cable crossing over the South Fork of the Trinity River that accesses Patrick Culvar’s place. This road is on National Forest and is maintained by the USFS. It accesses the Surprise Creek swimming hole, which is popular with the public. It is a possible water drafting site for filling water tenders and fire engines.

(Section 30, T5N, R6E)

x. Approximately 11.8 miles south of SR 299 is the South Fork Trail (USFS 5E23) trailhead at Coon Creek. This trailhead on National Forest has adequate parking (150’ x 50’) for horse trailers, lowboys, and other equipment. It is at the end of South Fork Road and is a loop road that allows a turnaround for equipment. It could be used as a helicopter landing spot, with removal of small trees surrounding the trailhead. Brush, ladder fuels, and dense trees surrounding the parking area should be treated to decrease the fuel hazard. The trailhead, access road, and parking area are maintained by the USFS.

It may be worthwhile to reconstruct the road to Coon Creek so that water tenders and fire engines could fill from the creek. An alternative location for pumping water is at the road crossing of Surprise Creek.

I. Friday Ridge Road Area

(Section 15, T6N, R5E)

Although this area is outside of the Downriver FFMP area, it has sites that may be important for suppression activities or pre-suppression project work.

Just south of the junction of SR 299 and Friday Ridge Road is a large flat accessed by a gated, paved road to the Hoopa Valley Tribe Roads Department Ready-mix Enterprise plant. This flat could be used as a

staging area for helicopters. It has been reported that there is a road that accesses the South Fork of the Trinity River and a 2-inch sump in the river where water could be drafted for fire engines and water tenders. The condition of this road and suitability of the site for water drafting need to be verified.

Friday Ridge Road (Humboldt County Road 8L - 100) is one of the access roads leading to Sandy Bar, a popular swimming area with high use in the summer. There have been many human-caused fires in this area, and there is a high risk that fires could jump the South Fork and burn into the Downriver FFMP area. For this reason it is included in this fire plan.

Friday Ridge Road runs in a westerly direction from just west of the bridge over the South Fork of the Trinity River. It is a 2-lane paved road maintained by the Humboldt County Road Department. It is bordered by dense grass and forbs on the shoulders and in the drainage ditches and dead white oak, Douglas-fir, and Pacific madrone saplings and manzanita where the Friday Fire burned in 2003. This will always be a zone of high risk of fire starts, so it would be prudent to treat the fuels immediately and on a periodic basis along this road, at least as far as USFS Road 6.

(Section 16, T6N, R5E)

1. Approximately 0.85 mile west of SR 299 is the junction with USFS Road 6 (signed "6 – Sandy Bar"), a 1½-lane paved road which runs south through public lands. It is bordered by dense white oak, Douglas-fir, and Pacific madrone saplings where the Friday Fire burned in 2003. This will always be a zone of high risk of fire starts, so it would be prudent to treat the fuels on a periodic basis along this section of road. The road is maintained by the USFS.

(Section 21, T6N, R5E)

a. Approximately 0.25 mile south of Friday Ridge Road is the junction with USFS Road 6N52 (signed "Sandy Bar"), a 1-½-lane dirt road with a rough surface. This road is bordered by highly flammable surface and ladder fuels, which should be treated to reduce the fuel hazard. Along some sections of the road there are Douglas-fir and canyon live oak ladder fuels. On another section there is dense greenleaf manzanita up to 12 feet tall. The parking area at Sandy Bar has dense vegetation adjacent to it, including grass, clover, forbs, blackberries, coyote brush, and poison oak under buckeye, Pacific madrone, white oak, alder, and Douglas-fir. Given the high use of this area, it would be prudent to remove the ladder fuels and prune the lower limbs from the surrounding trees out for 200 feet from the parking area to lower the fuel hazard. This will always be a zone of high risk of fire starts, so it would be prudent to treat the fuels on a periodic basis around the parking area and along the entire access road.

(Section 10, T6N, R5E)

1. Shortly after SR 299 becomes four lanes, northwest of the bridge over the South Fork of the Trinity River, Kimco Road, a dead end, 1-lane dirt road runs to the east to access dwellings. This road is maintained by the owners. It also runs along the south side of a field that is suitable for landing helicopters.

CHAPTER 2. CULTURAL & NATURAL RESOURCES

In order to understand the effects of past human-caused and natural disturbances in the Downriver FFMP area and to assess the likely effects of future planned and unplanned disturbances, it is necessary to understand as fully as possible the condition of the existing natural resources. The following overview of cultural resources, geology, soils, vegetation types, plants, noxious weeds, and wildlife and fish was compiled from aerial photographs, maps, published literature, personal interviews with resource managers from the Six Rivers National Forest who are familiar with the planning area, review of the 2001 “Six Rivers NF Fire Management Plan”, the 2003 “Mainstem Trinity Watershed Analysis” (USFS MTWA), and the “Lower South Fork Trinity Watershed Analysis”, and field work by the writer of this document.

Cultural Resources

The Downriver FFMP area is within the territory of the Hupa, Tsnungwe and Chimariko people, who are thought to have lived, foraged, hunted, and/or fished in it for at least 8000 years. In the mid 1800s Chimariko people occupied six principal villages, four of which were at Salyer, Hawkins Bar, Burnt Ranch, and Cedar Flat. Tsnungwe territory, which overlapped that of the Chimariko in the Burnt Ranch and New River area, extended from Cedar Flat to west of Willow Creek to Grouse Creek on the South Fork of the Trinity River. Hupa territory extended from just upriver of Willow Creek on the Trinity River to just upriver on the Klamath at the confluence of it and the Trinity River.

To quote the USFS MTWA, “Only limited systematic survey coverage has been accomplished for most of the highly sensitive valley and canyon floor along the mainstem Trinity River [and the South Fork of the Trinity River]. No palynological or other paleoenvironmental data for the Holocene have been obtained, nor have archaeological studies designed to identify, locate, and investigate Early, Middle, or Late Prehistoric Period sites been conducted for the study area to date.”

“The MTWA identifies a number of heritage resource data gaps for the MTWA area. It is clear that many historic period resources identified through archival research have yet to be located and documented for the MTWA area (Appendix B), such as mining camps, ditches, flumes, structures, old farms complexes, fences, boundary markers, roads and trails, mill sites, and other tangible remains of past land uses associated with mining, homesteading, transportation, logging, and other relevant themes. Likewise, research discloses that a number of ethnographically described Native American sites have yet to be located, formally recorded, and their present conditions assessed.”

“In particular, geo-archaeological studies for the MTWA area would be productive for identifying geological units where older sites may be preserved in buried contexts. Natural catchments may be present that could be used for pollen core studies.”

“In addition, cultural landscape surveys might look for collections of associated resources and investigate their links to better understand how people responded to the natural and cultural environment in which they lived for the ca. 8,000-year record of human habitation preserved in the MTWA area.”

“Systematic survey of less than 1 percent of the MTWA area has resulted in formal recordation of 67 heritage resource sites and two isolated prehistoric stone tools. As would be expected given the record of land uses documented for the MTWA area, the recorded historic period sites include mining sites, trail and road segments, homesteads, government administrative sites, recreation sites, and a sawmill. The recorded prehistoric Native American sites consist of principal settlements, scatters of flaked and/or groundstone tools, ceremonial places, and a quarry for extracting toolstone. Many additional heritage resources have been identified but remain undocumented for the MTWA area on both public and private lands. Most of the heritage resource surveys were conducted in response to the passage of environmental and historic preservation laws in the 1970's, with the majority being accomplished by Six Rivers National Forest for prior

timber sales in high country areas removed from the river. Due to the relatively small survey coverage, there is a large data gap in heritage resources existing in areas of the Forest that are not addressed by timber harvesting activities, such as terraces along river bars.”

“Heritage resources of importance to contemporary Native Americans include sacred places used for on-going ceremonial practices and localities for plant collecting, hunting and fishing (important for subsistence foods), traditional medicine, ceremonial uses, and craft making. Access to certain natural resources, sacred places, and other heritage resources on forest land is important to maintaining and perpetuating tribal identities.”

Confidential archaeological reports have been prepared for timber harvest plans (THPs) on private lands in or near the planning area. These reports may be available through the CDF office in Fortuna, CA. It is probable that other historic and prehistoric resources occur in the area. Records of recorded sites are maintained at the Northeast Information Center, Department of Anthropology, Langdon 303, California State University at Chico, Chico, CA 95929-0400. A records check should be made by this center prior to any project work using state or federal funds and a field reconnaissance must be made to determine if important cultural resources exist. If resources are found, protection measures must be devised to prevent their degradation.

The depositional context of archaeological resources can be affected by such ground disturbing activities as “road construction and improvement; timber harvesting activities; fire suppression; certain restoration activities addressing habitat, soils, or roads; mining; recreation (particularly 4WD off-road driving); and public access to heritage resource areas resulting in unauthorized excavation and artifact collecting.” (USFS MTWA)

“Fire suppression activities can result in significant direct and indirect impacts on culturally important plants and cultural settings. Dozer and hand-cutting of firelines, establishing base camps, or causing other ground disturbances can affect the stratigraphic integrity of archaeological deposits. Fuel reduction activities could potentially affect important characteristics associated with sacred sites. For example, manzanita is needed to ignite ceremonial fires (Ed Chase, pers. comm. 2003), so a fuel reduction activity that resulted in the removal of manzanita from the vicinity of a sacred site could affect an important characteristic of the site.” Burning of slash piles created by fuel reduction projects could cause heat damage to artifacts, such as arrowheads and grinding stones, on the surface of the ground. “One of the effects of fire suppression has been to increase the density of understory vegetation and increase fuel loads, which may affect production of culturally important understory plants such as beargrass and hazel.” (USFS MTWA)

Geology

The Downriver FFMP area lies along the western edge of the Klamath Mountains Geomorphic Province, a “complex geologic region formed by the accretion of crustal material along the western edge of the North American continent during ancient subduction. The region is characterized by elongate, fault-bounded belts of rock (i.e., “terrane”) representing individual accretion events. The belts are aligned in a concentric, crudely arcuate northwest-trending fashion, and they increase in age from southwest to northeast. Rocks in the province include greywacke sandstones, mudstones, greenstones, radiolarian cherts, and relatively minor limestone, as well as metamorphic equivalents of these rock types and abundant granitic and ultramafic intrusives (Irwin 1966).” (USFS MTWA)

There are seven primary rock units underlying the plan area (see “Geology Map”). These units were “established based on similarities in lithology, age, and/or degree of metamorphism” in order to allow the USFS to evaluate the susceptibility of each unit to mass wasting. Almost all of the private lands are underlain by two rock units, the Galice Formation and the Rattlesnake Creek terrane, so only those units will be described below. Descriptions of other rock units can be found in the USFS MTWA. The following unit descriptions are slightly modified from those in the USFS MTWA.

The Jurassic age Galice Formation (J1), composed of metasedimentary rocks, underlies by far the largest portion of the Downriver FFMP area and all of the properties with residences. “This unit is part of the

Western Klamath terrane (Irwin 1994). The Galice Formation consists of mildly slaty to phyllitic argillite, greywacke, and stretched pebble conglomerate. These slopes contain many large, ancient, deep-seated landslide deposits and are moderately susceptible to debris slides, debris flows, and accelerated gully erosion.” (USFS MTWA) But most of the residential private property is on gentle slopes where these erosional processes should be minimal.

The Rattlesnake Creek mélange (R1), associated with the Rattlesnake Creek terrane, underlies the next largest portion of the fire plan area. “This mélange consists of sheared and dislocated bodies of serpentized peridotite, pillow basalt, and other mafic volcanic flows and tuffs, thin-bedded chert, argillite, intermediate-composition to silicic volcanic rocks, and fine to medium-grained greywacke. Published geologic maps (Young 1978, Irwin 1994) typically identify discrete ultramafic lenses and limestone outcrops within the mélange, although those are not distinguished herein. Ancient landslide deposits are common, and slopes exhibit a wide range of mass wasting characteristics due to the varying lithologies.” (USFS MTWA)

The geomorphic evolution of the Trinity River and South Fork of the Trinity River watersheds, within the plan area, has been “influenced by the complex geology, regional tectonic uplift, high levels of precipitation, and frequent seismic activity”. These processes have created a landscape typical of the Klamath Mountain Province, steep mountains, with “deep, steep-sided canyons, relatively high-gradient, high-energy streams that are burdened with a high sediment load, widespread mass wasting”, and gently sloping to flat canyon bottoms. (USFS MTWA)

“Ancient and historic landslides are common on the steep valley walls, particularly within streamside inner gorges, which are prevalent in the [plan] area. The abundance of mass wasting in the area is a result of the steep topography, high rainfall amounts, and weak earth materials. This has resulted in the delivery of large amounts of sediment to stream channels. This landscape has historically been sensitive to human disturbance such that many slope failures are attributable to management practices (timber harvest, road/highway building) and resource extraction (hydraulic mining, etc.).” Nearly half of the landslides are attributable to human causes. (USFS MTWA)

The USFS evaluated landslide occurrence on a sub-watershed basis to identify high and low susceptibility portions of the overall analysis area. “Between 1944 and 1960, the Hawkins-Sharber and Willow Creek sub-watersheds contributed more sediment than the Upper Tributaries subwatershed, despite being smaller. The sediment peak between 1960 and 1975 was fairly evenly distributed among the three subwatersheds. Landslide activity was again highest in the Hawkins-Sharber subwatershed in the 1975-1990 interval, although mass wasting in the WAA was much reduced. Mass wasting was low throughout all subwatersheds between 1990 and 1998.” “On an individual subwatershed basis, several creeks in the WAA have developed a high concentration of landslides, usually along the streamside inner gorge slopes. These include the mainstem Trinity itself, [Sharber Creek, Quinby Creek, and Gray Creek].” (USFS MTWA)

Soils

Soil is the medium in which vegetation is rooted and provides the nutrients and retains the water upon which it depends. Fire, whether prescribed or uncontrolled, timber harvesting or other vegetation manipulations, roading, off road vehicle use, or other natural or human caused disturbances can have slight to profound effects on the stability and fertility of soil. The effects of disturbances depends upon complex interactions of multiple factors, including the type, degree, duration, location, and extent of disturbance, the time elapsed between disturbances, the resiliency of vegetation to recovery, the climate, the elevation and topography, and the structural and chemical nature, bedding plane, organic content, and water content of the soil.

Soil conditions in the Downriver FFMP area are quite variable, ranging from highly erodible soils to soils with chemical imbalances derived from serpentine rocks to a variety of soils derived from sedimentary, metasedimentary, and metaigneous rocks, diorite, or alluvium. These soils were delineated and their characteristics determined through a soil survey completed in 1993 by the Six Rivers National Forest (“Six Rivers National Forest Order 3 Soils Survey”). This survey only described general characteristics of the soils,

making it most useful for watershed planning purposes, but not for site specific projects. Where appropriate for individual projects, soils should be sampled and verified in the field to guide implementation or mitigation. Information on specific soil types (pgs. 39-41 below) came from the USFS “Mainstem Trinity Watershed Analysis” (see ‘Soils Map”). Three soil characteristics of greatest environmental concern were characterized: susceptibility to damage following burning, average erosion hazard rating (EHR), and average risk of soil compactability.

The following is from the USFS MTWA: “Wildfires can negatively impact soils, particularly if the fires are intense and [of] long duration. With intense wildfires, soils may become hydrophobic (water-repellent), thereby reducing infiltration rates and increasing surface runoff and surface erosion through rilling and gullyng. In addition, organic matter in the duff layer and possibly the A-horizon can be consumed during severe wildfires. The loss of organic soil cover may increase surface erosion and reduce long-term soil productivity. Wildfire suppression activities may cause an indirect impact on soils. Heavy equipment use may result in soil compaction and fire line construction results in the removal of organic matter and soil surface cover. Sensitivity to burn damage relates to the potential for substantial reduction in soil organic matter that would lower soil productivity. Some soils have textures and sufficient organic matter that will accommodate partial loss of organic matter without reduced productivity better than other soils. These characteristics are used to rate different soils for their sensitivity to damage from burning.”

“The soil Erosion Hazard Rating (EHR) indicates how susceptible the soil surface is to sheet and rill erosion after the soil has been disturbed. Management activities that remove surface cover, expose subsoil, result in soil compaction, or concentrate surface runoff have the potential to increase soil erosion above natural erosion rates. Potential consequences of accelerated erosion include reduced productive capacity of the site and adverse effects on water quality. Maximum EHR ratings are based on little or no vegetation cover present during the average long-term occurrence of two-year, six-hour storm events. When such a rainstorm occurs, accelerated erosion could result in most years on some of these soils and generate unacceptable resource impacts.”

“Soil compaction susceptibility characterizes the potential for heavy equipment use to result in soil compaction. Soil compaction typically occurs when moist or wet soils are compressed and the pore space between soil particles is reduced. Soil compaction and reduced soil porosity are directly linked. Compaction changes soil structure, reduces the size and continuity of pores, and increases soil bulk density. Soils can become compacted from vehicular use (timber harvest operations and roads) and repeated passes from large animals (cattle and horses) or people. Compaction becomes a problem when porosity is reduced to the point that water infiltration, percolation, and moisture storage within the soil column are insufficient to support natural levels of plant growth and nutrient cycling. The potential of soils to become compacted is primarily a function of soil texture (i.e., proportions of gravel, sand, silt, clay and organics in a given soil type) and soil moisture levels. The SRNF Soil Survey contains soil texture descriptions that were used to estimate potential risk of soil compaction.”

The “Six Rivers National Forest Order 3 Soils Survey” has a good review of the soils found in the Downriver FFMP area. Only the main soils found on the private residential parcels in the Downriver FFMP plan area are described here. A few soils (232, 242, and 265) are not described as they are found only on small portions of the private lands.

Typic Xerofluvents (map number 100) underlie most of the residential areas along the Trinity River corridor as well as a portion of the McCoy and Todd Ranches on the South Fork of the Trinity River. These young soils were formed from alluvium, found on alluvial terraces and fans, and riverwash, found on river flood plains. They are typically found on slopes up to 10%. Alluvium soils are moderately to rapidly permeable and well to excessively drained while the permeability of riverwash is very rapid and subject to frequent flooding. The rooting depth is from 40-60+ inches. The susceptibility to damage following burning is low, the average EHR is low, and the average risk of soil compactability is moderate.

Skalan-Goldridge Families Complex, Deep soils (230) are found in the southeastern portion of Gray Flat, in the area just north of Trinity Village and northeast of Fisher Road, and in the Salyer Heights, Peach Orchard Lane, and Councilman Road areas. Skalan Family, Deep soils were formed from metasedimentary rocks and are found on mountain sideslopes of from 20-60%. They have a site quality of III-IV. These soils have moderately slow permeability and are well drained. Regeneration potential and available water content is low and rooting depth is 40-60 inches. The susceptibility to damage following burning is moderate, the average EHR is moderate to high, and the average risk of soil compactability is moderate to high.

Goldridge Family, Deep soils were formed from metasedimentary rocks and are found on mountain sideslopes, typically on slopes of from 20-45%. They have a site quality of II-III. These soils have moderate to moderately slow permeability and are well drained. Regeneration potential and available water content is high and rooting depth is 40-80 inches. The susceptibility to damage following burning is low, the average EHR is high, and the average risk of soil compactability is moderate.

Goldridge Family, Deep soils (231) are similar to Goldridge (230) soils, but are found on gentler slopes. They were formed from metasedimentary rocks and are found on mountain sideslopes of from 15-30%. These soils are found in the area surrounding Wallen Ranch Road. They have a site quality of II-III. These soils have a moderately slow permeability and are well drained. Regeneration potential and available water content is high and rooting depth is 40-80 inches. The susceptibility to damage following burning is low, the average EHR is moderate, and the average risk of soil compactability is moderate.

Maymen Family, Rock Outcrop, Metasedimentary Complex soils (243) are found in a narrow band, mostly along the south side of the Trinity River, from just west of Hawkins Bar to the SR 299 bridge over the South Fork of the Trinity River. These soils were formed from metasedimentary rocks and are found on upper mountain sideslopes of from 60-80%, although the soils shown on the map are on relatively level benches above the Trinity River. They have a site quality of V. These soils are moderately permeable and somewhat excessively drained. Their regeneration potential is low, available water content is very low, and their rooting depth is 10-20 inches. The susceptibility to damage following burning is moderate to high, the average EHR is moderate, and the average risk of soil compactability is moderate.

Hugo Family, Deep and Clallam Family, Moderately Deep soils (240) are found primarily on USFS lands north of the private lands north of the Trinity River. But these soils are also found on a portion of the private lands along Salyer Loop Road and Salyer Heights and north of the extension of Fountain Ranch Road, Trinity Village, and Gray Flat. Hugo Family, Deep soils were formed from metasedimentary rocks and are found on upper mountain sideslopes of from 25-45%. They have a site quality of III. These soils are moderately permeable and are well drained. Their regeneration potential is moderate to high, available water content is moderate, and rooting depth is 40-60 inches. The susceptibility to damage following burning is moderate, the average EHR is moderate, and the average risk of soil compactability is moderate.

Clallam Family, Moderately Deep soils were formed from metasedimentary rocks and are found on mountain sideslopes of from 50-70%. They have a site quality of IV. These soils have moderately rapid permeability and are well drained. Their regeneration potential and available water content are low to moderate and rooting depth is 20-40 inches. The susceptibility to damage following burning is moderate, the average EHR is moderate, and the average risk of soil compactability is moderate.

Skalan-Kistirn-Holland Families, Deep soils (260) are found along Hennessey Ridge and in fingers reaching down to SR 299 and the South Fork of the Trinity River. Some of the residential areas and home sites on Oden Flat, at Salyer, and along South Fork Road are underlain by these soils. Skalan Family, Deep soils in this area were formed from metasedimentary rocks and are found on mountain sideslopes of from 35-70%, although they are also on relatively level benches above the Trinity and South Fork of the Trinity Rivers. They have a site quality of III-IV. These soils have moderately slow permeability and are well drained. Regeneration potential and available water content is moderate and rooting depth is 40-60 inches. The susceptibility to damage following burning is moderate, the average EHR is high, and the average risk of soil compactability is moderate.

Kistirn Family, Deep soils were formed from metasedimentary rocks and are found on upper mountain sideslopes of from 35-70%, although they are also on relatively level benches above the Trinity and South Fork of the Trinity Rivers. They have a site quality of III-IV. These soils have a moderate to moderately slow permeability and are well drained. Their regeneration potential and available water content is moderate and their rooting depth is 40-60+ inches. The susceptibility to damage following burning is moderate, the average EHR is high, and the average risk of soil compactability is moderate.

Holland Family, Deep soils were formed from metasedimentary rocks and are found on upper mountain sideslopes of from 35-70%, although they are also on relatively level benches above the Trinity and South Fork of the Trinity Rivers. They have a site quality of III. These soils have a moderately slow permeability and are well drained. Their regeneration potential is moderate to high, available water content is high, and their rooting depth is 40-60+ inches. The susceptibility to damage following burning is low, the average EHR is high, and the average risk of soil compactability is high.

Holland-Goldridge Families, Deep soils (261) underlie Ammon Ranch. Holland Family, Deep soils were formed from metasedimentary rocks and are found on benches and broad ridges of from 5-35%. They have a site quality of III. These soils have a moderately slow permeability and are well drained. Their regeneration potential and available water content are high and their rooting depth is 40-60+ inches. The susceptibility to damage following burning is low, the average EHR is high, and the average risk of soil compactability is high.

Goldridge Family, Deep soils were formed from metasedimentary rocks and are found on benches and broad ridges of from 5-35%. They have a site quality of II-III. These soils have moderate to moderately slow permeability and are well drained. Their regeneration potential and available water content are high and their rooting depth is 40-60+ inches. The susceptibility to damage following burning is low, the average EHR is high, and the average risk of soil compactability is moderate.

Madden Family, Moderately Deep soils (412) are found in the southern portion of South Fork Road, in a band from Hennessey Ridge down through the Carpenter Ranch to the South Fork of the Trinity River. These soils were formed from serpentine rocks and are found on ridges and mountain sideslopes of from 20-50%. They have a site quality of V. These soils have moderate permeability and are well drained. Regeneration potential and available water content is moderate and rooting depth is 20-40 inches. The susceptibility to damage following burning is high, the average EHR is moderate, and the average risk of soil compactability is high.

Areas occupied by soils with high burn damage susceptibility and/or high erosion hazard ratings are areas at high risk for impacts to long-term soil productivity. There are 8200 acres in this classification in the Hawkins-Sharber Creek subwatershed, on Chaix (high burn & high EHR), Clallam (high burn), Maymen (high burn), Goldridge (high EHR), and Skalan (high EHR) soils.

Areas occupied by soils with high sensitivity to burn damage that are also classified as areas of high to extreme predicted fire behavior are at high risk for soil damage from uncontrolled wildfire. There are 811 acres in this classification in the Hawkins-Sharber subwatershed, on Chaix, Clallam, and Maymen soils.

Protection of soil resources in the Downriver FFMP area during pre-fire, hazardous fuel reduction treatments should be addressed on a project basis. Projects that are funded through federal dollars currently require a National Environmental Policy Act (NEPA) analysis. Potential impacts to soils, including soil loss, are generally considered "significant" during NEPA analysis.

The following guidelines, intended to protect soil porosity and soil organic matter, were developed by the Six Rivers National Forest for protection of the soil resource (SRNF LRMP Standards & Guidelines) and should be applicable to projects on private property.

“Standards & Guidelines contained within the SRNF LRMP require that soil porosity be maintained to at least 90 percent of its natural condition over at least 85 percent of a timber harvest unit. This is important because significant reduction in soil porosity can increase the potential for soil loss through surface erosion. Most soil compaction in a forested setting such as the MTWA AREA occurs through the use of heavy equipment and as such is focused on unsurfaced roads and skid trails. Per the Standards & Guidelines in the LRMP, tractor skid trails must be limited to 15 percent of the harvest area, and the potential for soil compaction must be mitigated. Restricting use of heavy equipment to the dry season may also significantly reduce soil compaction.”

“Soil organic matter is a critical component of soil productivity. To protect soil productivity, the LRMP contains guidelines that soil organic matter in the upper 12 inches of soil should be at least 85 percent of the total soil organic matter found under undisturbed conditions for the same or similar soils. The R5 Soils Handbook states that soil quality standards will be used to guide the type of management practices and to define necessary modifications to meet threshold values for the affected soil properties.”

“The soil organic matter standard is implemented during the development of project alternatives and by specifying design criteria and mitigation measures. The R5 Soils Handbook described several options for meeting soil quality standards, including emphasis on pile burning rather than broadcast burning and a lop-and-scatter prescription for especially sensitive soils to augment natural soil cover and gradually replace organic material. Risks and tradeoffs between prescribed surface organic matter standards, the potential for future wildfire, and the need to protect and rehabilitate existing damaged soils should be important factors in any project design.”

“Regardless of soil type, the potential to damage soil organic matter during fuels reduction treatments can be minimized by modifying the timing of burning as long as the burn prescription and management objectives of the burn are still met. Burning post-treatment or natural fuels during wet weather conditions (when soils are wet or moist to a depth of 4 inches) to prevent excessive soil heating can significantly reduce the loss of organic material. Experience in the SRNF with fall and spring burning under these conditions has shown that the surface duff layer is protected. Therefore, organic matter in the upper 12 inches underlying the duff layer will also be protected, and the standard will be met or exceeded.”

“Soils damaged during high temperature wildfires may require special treatment. These soils may lose significant organics from the surface O horizon (duff and litter layer) and sometimes from the underlying A horizon. These soils may need to be avoided altogether, or at a minimum treated with extreme caution, to protect them during future management activities. Proactive treatments (e.g., slash placement, etc.) may also be useful to minimize erosion and loss of damaged soils in wildfire areas.”

“The type of information that will be needed to protect soil productivity will depend on the type of project being implemented. Typical information will include the texture of the soil and its potential to be compacted, an estimate of both existing and post-project soil cover, risk of damage to long-term productivity from heating damage from wildfires or prescribed fires, and loss of soil due to site characteristics including inherent levels of soil organic material, current and projected fuel loads, and slope. Field observations and analysis of soil properties and estimates of pre and post-management effective ground cover will reduce the uncertainties of how to prevent damage to long-term soil productivity. Modeling of surface erosion using the Revised Universal Soil Loss Equation (RUSLE) or WEPP, using both existing soil conditions and cover conditions and estimated post-project or wildfire soil conditions, would provide an estimate of the magnitude of soil erosion that will result from management activities or wildfires. Modeling results will indicate where management activity prescriptions need to be modified to prevent detrimental changes in soil productivity.”

“The uncertainty regarding the use of prescribed fire focuses on the likelihood that soil productivity objectives (effective ground cover, organic matter, large woody debris) will be achieved by the prescription. However, this uncertainty is a non-issue if compared to the soil productivity conditions that would result from a hot wildfire that occurs during severe weather conditions. Wildfire impacts on soil productivity would in all cases be higher than experienced under prescribed fire conditions.”

Vegetation Types

Vegetation in the Downriver FFMP area is influenced by aspect, elevation, soil type and depth, proximity to water, past timber harvesting method and intensity, and past fire history. Wildfire, wildfire suppression activities, logging, mining, and floods have had the greatest influence on existing vegetation patterns and species mixes.

The vegetation classification system used in the discussion below was developed by the Ecology Program of the Six Rivers National Forest. “This classification is based on a hierarchical system that provides environmental variables as indicators of ecosystem process and function at each level. This hierarchy includes series, subseries and plant association. The vegetation series represent the dominant overstory and regenerating species in a stand.” (USFS MTWA) Only the series will be used here. Vegetation maps can be found in the USFS MTWA and “Lower South Fork Trinity Watershed Analysis”.

Close to 90% of the plan area is dominated by mixed hardwood/conifer forests and conifer forests. The tanoak series is most abundant, covering about 60-70% of the area, followed by the Douglas-fir series, covering about 20-30% of the area. The remainder of the area is covered by intermixed white oak, black oak and canyon live oak stands, meadows/prairies, shrubs/forbs, and non-vegetated areas. Most of the private property is covered with Douglas-fir series forests, with lesser amounts of white oak and tanoak series forests and some small to large grassland openings and shrub/forb types.

Seral stage is related to the age and stage of development of vegetation. The early mature seral stage is most abundant in the plan area, followed by the mid-mature stage. Approximately 40% of the tanoak series and 90% of the Douglas-fir series are in these two seral stages. The early and mid-mature seral stages appear to have resulted from stand-replacing fires that occurred throughout the area in the late 1860s and early 1910s, so overstory trees range from about 95 years old to 140 years old. “Fire has been largely excluded from these stands since their origin, promoting the development of a dense, uniform, even-aged forest with heavy fuel loading from the forest floor into the forest canopy.” (USFS MTWA)

There is a significant portion of the area in late mature and old growth forest as well as shrub/forb and pole stands. The majority of the shrub/forb and pole stands are the result of timber harvesting. Plantations range from 10-70 years in age, with the majority in the 20-40 year range, and are primarily stocked with Douglas-fir and ponderosa pine.

Most of the private property in the Downriver FFMP area is covered with early mature to mid mature forests and meadows/prairies. There are also small areas of pole and late mature forests and shrub/forb seral stages. Only minor harvesting has been done on National Forest lands around the residential areas.

Vegetation is also classified by size class and canopy closure. Size class is based on the average tree diameter at breast height (DBH), as follows: size class 0 (non-timber), size class 1 (0-5.9”), size class 2 (6-10.9”), size class 3 (11-20.9”), size class 4 (21-35.9”), and size class 5 (>36”). The majority of the trees, including both hardwoods and conifers, on the SRNF portion of the plan area are in size classes 2-4 (6-35.9” DBH). The majority on private property are in size classes 3 and 4 (11-35.9” DBH).

Canopy closure is the area covered by tree crowns, as viewed from above. The classes are S (10-20%), P (21-39%), M (40-59%), and D (60-100%). Approximately 90% of the plan area has a canopy closure of between 60-100% (D). In heavily settled areas on private property, canopy closure tends to be 40-59% (M) and in meadows, prairies, and fields, it is 0-9% (S).

One further way that the vegetation can be characterized is by condition class (see ‘Past Fires and Present Threats’, page 6). “Condition classes (Schmidt et al. 2002) also can provide information related to changes in historical fire regimes. Condition Classes were derived for SRNF based on vegetation series and seral stage (USFS 2001). Condition Classes are a function of the degree of departure from historical fire regimes

resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, and canopy closure. These alterations within Condition Class 2 and 3 can result in moderate to dramatic changes to fire size, frequency, intensity, severity, or landscape patterns. In turn, the effects of insects, disease, or the eventual fire may cause an increased threat (Condition Class 2) or a significant or complete loss (Condition Class 3) of one or more defining ecosystem components.” (USFS MTWA)

Condition Classes 2 and 3 are widespread in and around the Hudson Creek, Salyer, Hawkins Bar, and South Fork Road areas. This indicates the potential wildfire threat to these communities. As time passes and brush and small to medium size trees grow, Condition Classes are transitioning into higher classes, which are more hazardous.

Plants

Although no habitat suitable for federally listed threatened and endangered plant species is found within the Downriver FFMP area, there are habitats where species of concern are found, including “SRNF Forest Sensitive Species (FSS), SRNF Special Interest Species (SIS), Northwest Forest Plan Survey and Manage (SM) species, California State Listed (CR) species, and species considered rare by the California Native Plant Society (CNPS)”. These habitats include “late seral stage conifer forests, meadows, grasslands, wetlands, serpentine habitats, and rock outcrops”. (USFS MTWA)

The following is from the USFS MTWA. “Forest Sensitive Species known to occur (historic and current) on the Forest are clustered lady's slipper (*Cypripedium fasciculatum*), mountain lady's slipper (*Cypripedium montanum*), Canyon Creek stonecrop (*Sedum paradisum*), and Howell's miner's lettuce (*Montia howellii*). The two lady's slippers (also listed as SM species) and the Sonoma manzanita (a proposed FSS plant species) also occur in the analysis area. The only Special Interest Species (proposed) in the area is Heckner's lewisia (*Lewisia cotyledon* ssp. *heckneri*). In addition to the known occurrences of these sensitive species and special interest species, potential habitat exists for other plant species of concern [see table below] within the MTWA area.”

“In addition to the lady's slippers, there are a few SM species associated with late-seral-stage forest that are present in the habitat area, but are not known to occur within the MTWA AREA. These are Benson's saxifrage (*Bensoniella oregana*, BEOR); the bryophyte, Pacific fuzzwort (*Ptilidium californicum*, PTCA); and the lichens, *Bryoria tortuosa* (BRTO2) and *Leptogium cyanescens* (LECY60). *Bryoria tortuosa* grows in association with Ponderosa pine (*Pinus ponderosa*, PIPO), Jeffrey pine (*Pinus jeffreyi*, PIJE), and Douglas-fir (*Pseudotsuga menziesii*, PSME). *Leptogium cyanescens* grows in association with Douglas-fir (*Pseudotsuga menziesii*, PSME) and canyon live oak (*Quercus chrysolepis*, QUCH2) or with California black oak (*Quercus kelloggii*, QUKE).”

Table: “SRNF Forest Sensitive Species (FSS), Proposed Forest Sensitive Species (PFSS), Special Interest Species (SIS), Proposed Special Interest Species (PSIS), California State Listed - Rare (CR), and California Native Plant Society (CNPS) Listed plant species of suspected/known occurrence within the Mainstem Trinity Watershed Analysis Area. The bolded species are known to occur within the MTWA area.”

Common Name	Scientific Name	Status
VASCULAR PLANTS		
Sonoma manzanita	<i>Arctostaphylos canescens</i> ssp. <i>sonomensis</i>, ARCAS3	PFSS, 1B¹
Bald Mountain milkvetch	<i>Astragalus umbraticus</i> , ASUM3	PSIS, 2 ¹
Benson's saxifrage	<i>Bensoniella oregana</i> , BEOR	FSS, CR, 1B ¹
Vancouver groundcone	<i>Boschniakia hookeri</i> , BOHO	PSIS, 2 ¹
Siskiyou sedge	<i>Carex gigas</i> , CAGI5	SIS, 4 ¹
bristly stalked sedge	<i>Carex leptalea</i> , CALE10	SIS, 2 ¹

Common Name	Scientific Name	Status
meadow sedge	<i>Carex praticola</i> , CAPR7	SIS, 2 ¹
clustered lady's slipper	<i>Cypripedium fasciculatum</i>, CYFA	FSS, 4¹
mountain lady's slipper	<i>Cypripedium montanum</i>, CYMO2	FSS, 4¹
Oregon bleeding heart	<i>Dicentra formosa</i> ssp. <i>oregana</i> , DIFOO	SIS, 4 ¹
Siskiyou willowherb	<i>Epilobium siskiyouensis</i> , EPSI2	SIS, 1B ¹
rockloving erigeron	<i>Erigeron petrophilus</i> var. <i>viscidulus</i> , ERPEV	PSIS, 4 ¹
Howell's fawnlily	<i>Erythronium howellii</i> , ERHO10	PSIS, 1B ¹
mahogany fawnlily	<i>Erythronium revolutum</i> , ERRE5	PSIS, 2 ¹
bristly gentian	<i>Gentiana plurisetosa</i> , GEPL6	PSIS, 4 ¹
California wild hollyhock	<i>Iliamna latibracteata</i> , ILLA2	PFSS, 4 ¹
Heckner's lewisia	<i>Lewisia cotyledon</i> var. <i>heckneri</i>, LECO2	SIS, 3¹
South Fork Mtn. lupine	<i>Lupinus elmeri</i> , LUEL2	FSS, 1B ¹
slightstemmed mitrewort	<i>Mitella caulescens</i> , MICA5	PSIS, 2 ¹
Howell's miner's lettuce	<i>Montia howellii</i>, MOHO	FSS, 2¹
water bulrush	<i>Scirpus subterminalis</i> , SCSU	SIS, 2 ¹
Cascade stonecrop	<i>Sedum divergens</i> , SEDI	SIS, 2 ¹
coast checkerbloom	<i>Sidalcea oregana</i> ssp. <i>eximia</i> , SIORE	FSS, 1B ¹
Canyon Creek stonecrop	<i>Sedum paradisum</i> SEPA15	FSS, 1B ¹
Marble Mountain campion	<i>Silene marmorensis</i> , SIMA5	SIS, 1B ¹
English Peak greenbriar	<i>Smilax jamesii</i> , SMJA	FSS, 1B ¹
BRYOPHYTES		
Pacific fuzzwort	<i>Ptilidium californicum</i> , PTCA	SM(A)
LICHENS		
	<i>Bryoria tortuosa</i> , BRTO2	SM
	<i>Leptogium cyanescens</i> , LECY60	SM

¹ CNPS Lists: 1B = Rare, threatened, or endangered in California and elsewhere; 2 = Rare, threatened, and endangered in California, but more common elsewhere; 3 = More information is needed (Review List); and 4 = Limited distribution (Watch List).

Noxious Weeds

The following is from the USFS MTWA: “Weeds are undesirable and generally exotic or non-native plant species to an area. Invasive weeds generally first become well-established in disturbed areas and along roadsides, then spread to the adjacent forest area. Potential vectors for introduction and dispersal of weeds may include road maintenance (i.e., movement of infested fill material and rock), escape from home gardens and agricultural fields and orchards onto adjacent forest lands, movement of livestock from infested lands onto overgrazed or disturbed sites, and vehicular movement of infested mud and soil. When a species is aggressively invasive, poisonous, or presents other serious management problems, it is often designated as a noxious weed by the Secretary of Agriculture or by State Agencies. The noxious plants found [in the Downriver FFMP area] are mostly native to the Mediterranean or to Asia. Once introduced and established, many noxious weeds have the potential to displace native plant species and entire plant communities. Target species are drawn from State and County noxious weed lists.”

“Noxious weeds are present in the [Downriver FFMP] area, some as localized populations. The dominance and persistence of noxious weeds displaces native species (flora and fauna) and alters various ecosystem processes. Noxious weeds also reduce property values, the quality of pastureland, and quality of riverside recreation. Potential exists for these species to spread into currently uninfested areas by such vectors as roads and equipment relocation. Opportunities exist to manage localized and leading edge populations.”

“Initial [roadside] surveys [in FY2001] of the MTWA area have documented eight areas having yellow star thistle (*Centaurea solstitialis*) infestations, and five locations where Scotch broom (*Cytisus scoparius*) has become invasive, mostly in association with roads within the MTWA AREA. Additional noxious weeds that occur in significant numbers in the MTWA AREA are bull thistle (*Cirsium vulgare*), French broom (*Genista monspessulana*), Klamathweed (*Hypericum perforatum*), and Himalayan blackberry (*Rubus discolor*).”

“The worst roadside weed populations that have been documented by the initial FS Survey are along Highway 299 and certain county-maintained roads (Table 3-47 and Figure 3-25). The yellow star thistle population along Highway 299 north of Hawkins Bar to south of China Flat has medium-level stand density, with moderate potential to spread. This population has spread from Hwy. 299 south along South Fork Road over one mile. It has also spread from Hwy. 299 east along Friday Ridge Road more than one and a half miles. The cumulatively affected acreage of this continuous yellow star thistle population along roadsides totals more than 29 acres and is by far the most extensive roadside noxious weed infestation known on the WAA.”

“Smaller, potentially serious roadside noxious weed populations have been identified on the MTWA area. A yellow star thistle population is dispersed at low density along more than two miles of the road from Hawkins Bar northeast to Happy Camp Campground. It is considered to have low potential to spread and currently covers a total of just over half of an acre.”

“There is a large dense population of Scotch broom on Waterman Ridge, just northeast of, and extending into, the MTWA area (1.27 acre total). Within less than a mile to the north along Waterman Ridge Road is a second dense Scotch broom population which covers just over one acre. Both populations are classified as having medium level spread potential. There are two additional known roadside sites of Scotch broom in the MTWA area that are smaller than a quarter acre and are classified as having medium-level spread potential, and one other has low spread potential. These documented sites are all located in the eastern portion of the MTWA area [southeast of Ziegler Point] and correspond to coverage by the initial roadside survey.” There is also scotch broom at the Salyer Roadside Rest Area and on Baldwin Creek Road PVT in the Hudson Creek area. And there is tree of heaven at the Salyer Roadside Rest Area. “This preliminary information indicates that a number of noxious weed populations require immediate management.”

“The yellow star thistle and Scotch broom weed populations are nearly all associated with roads, and the most extensive populations are along Highway 299 and county-maintained roads within the National Forest. This suggests that either travel and transport or road building and maintenance activities may be involved with weed introduction and establishment. In addition, the open canopy and disturbed nature of roadsides provide a preferred habitat for many weed species, including the most widespread noxious invasives found within the MTWA area. Weed management policy and practices by Caltrans and County road crews are likely having an effect upon weed populations along Highway 299 and the county roads.”

Other significant populations of noxious weeds include the following species, for which survey work has not yet been completed:

- bull thistle, *Cirsium vulgare*
- French broom, *Genista monspessulana*
- Klamathweed, *Hypericum perforatum*
- Himalayan blackberry *Rubus discolor* (is found extensively in the area, including east and north of Trinity Village, in the Oden Flat area, bordering Salyer Loop Road, bordering and north of Fountain Ranch Road, and east of Riverview Estates, where it covers whole meadows)
- English ivy, *Hedera helix* (occurs in proximity to the town of Willow Creek and other nearby urban centers)
- Dalmatian toadflax, *Linaria dalmatica* (occurs at the boundary between Shasta-Trinity and Six Rivers National Forests along Highway 299)
- Dyer's woad, *Isatis tinctoria* (was recently hand pulled along Highway 69 on the Hoopa reservation; however, this population could spread along Highways 96 and 299, and beyond)

“All of the noxious weeds currently occurring on the MTWA AREA have been introduced since the mid-1800's. In addition, the types of human disturbance on the Forest today are far different from those of previous cultures. Particularly susceptible areas to weed infestations are those sites associated with roads and road access; residential, commercial and agricultural developments; and recreational activity. Areas at greatest risk to noxious weed infestation include sites of ground disturbance; change in canopy closure [more open]; vehicular, human, and pack animal traffic, and proximity to existing weed populations.”

“Wildfires can create vast areas of disturbed land, and certain weeds prefer such sites that are recently disturbed by fire. The Forest Service has in place a weed prevention policy for fire fighting activities to help minimize weed introduction in burn areas.”

“The Forest Service implements and enforces pest management through prevention, detection, evaluation, suppression, and monitoring. The Forest Service is making focused efforts to prevent the further dispersal of noxious weeds by requiring that all restoration, erosion control, and roadside materials (e.g., gravel, fill, straw, weed-free seed mixes) be weed-free. Provincial Guidelines for road related activities such as construction and maintenance are being developed to minimize risk of introduction or spread of noxious weeds (Koop & Yost in prep.)”

The Downriver FFMP area is within the Weed Management Area for Trinity County, where there is opportunity for cooperative weed management by federal, state, county, and local government and individuals. As fuel reduction projects recommended in this fire plan have the potential to disturb the ground enough to allow invasion of noxious weeds, it behooves landowners to contact the Trinity County Weed Management Co-op (Mark Lockhart, Trinity County Agricultural Commissioner, 530-623-1356) to learn about control strategies.

Wildlife and Fish

Threatened and Endangered Species & Species of Concern

No federally listed endangered wildlife species are known to inhabit or use the Downriver FFMP area. Three federally listed threatened species are found in this area, the northern spotted owl (NSO) (*Strix occidentalis caurina*), willow flycatcher (*Empidonax traillii*), and the bald eagle (*Haliaeetus leucocephalus*). The marbled murrelet (*Brachyramphus marmoratus*) is suspected of inhabiting the area. Seven Forest Service sensitive species (from the SRNF LRMP) are found in or in the vicinity of the plan area, the American peregrine falcon (*Falco peregrinus anatum*), northern goshawk (*Accipiter gentiles*), American marten (*Martes Americana*), Pacific fisher (*Martes pennanti*), northwestern pond turtle (*Clemmys marmorata marmorata*), foothill yellow-legged frog (*Rana boylii*), and the southern torrent salamander (*Rhyacotriton variegates*). Other Forest Service sensitive species suspected to be in or in the vicinity of the plan area are the great gray owl (*Strix nebulosa*), California wolverine (*Gulo gulo luscus*), Pacific western big-eared bat (*Plecotus townsendii townsendii*), and the northern red-legged frog (*Rana aurora aurora*).

There are some California species of special concern (SSC) found in the plan area. These species are not listed under either the federal Endangered Species Act or the California Endangered Species Act, but are either declining at a rate that could result in listing or have historically occurred in low numbers, and known threats to their persistence currently exist. “The species of special concern list is divided into three categories: Highest, Second, and Third priorities. These categories are defined on the basis of the urgency of the situation. Species in the Highest Priority category face immediate extirpation of their entire California population or their California breeding population if current trends continue. In several cases, extirpation as breeding species has already occurred. Species in the Second Priority category are definitely on the decline in a large portion of their range in California, but their populations are still sufficiently substantial that danger is not immediate. Species in the Third Priority category are not in any present danger of extirpation and their populations within most of their range do not appear to be declining seriously; however, simply by virtue of their small populations in California, they are

vulnerable to extirpation should a threat materialize” (see <http://www.dfg.ca.gov/hcpb/species/ssc/ssc.shtml>).

California species of special concern (as of May 2003) found in the Downriver FFMP area are the osprey (*Pandion haliaetus*) and Pacific western big-eared bat in the second category, and the golden eagle (*Aquila chrysaetos*), northern goshawk, and Pacific fisher in the third category. The southern torrent salamander, northern red-legged frog, foothill yellow-legged frog, and northwestern pond turtle are also SCSs, but their category is unknown.

Numerous NSO activity centers and suitable nesting and roosting habitat are located on Six Rivers National Forest lands, both within and outside of the plan area. Some of the roosting and nesting habitat is found on or in the immediate vicinity of private lands. Some of this habitat has been set aside on USFS lands in Critical Habitat Units, as 100-acre LSRs.

Bald eagles are found along the river corridors and a bald eagle network territory, the "Todd Ranch/South Fork Trinity River Territory", has been designated along the South Fork of the Trinity River from south of the Downriver FFMP area to just west and east of Salyer. No existing or historic nests have been discovered along the Trinity River corridor, but there is a nest site in the area between Low Bridge and the SPI property to the north. The Trinity River corridor is considered foraging habitat.

The Hudson Creek residential area is barely within a designated marbled murrelet zone (Zone 1) and all but the area north and south of Gray Falls campground and picnic area is within the designated Marbled Murrelet Zone 2. A small amount of critical habitat has been designated for marbled murrelet in the upper Hudson Creek drainage. However, no marbled murrelets have been found during multiple surveys in or in the vicinity of the Downriver FFMP area.

There is a peregrine falcon nest site and USFS designated territory (Gray Creek territory) that encompasses national forest lands from east of the Ziegler Point ridge to the Six Rivers NF boundary and south and east of the Trinity River to the South Fork of the Trinity River, as far south as Low Bridge.

There is northern goshawk habitat in the fire plan area, but the only nest discovered is west of Willow Creek in the East Fork of Willow Creek drainage. Goshawks “use a variety of forest types, forest ages, structural conditions, and successional stages (Reynolds 1992). They typically nest in old-growth and mature coniferous and hardwood stands with high canopy closures and an open understory. Nests are usually located in the largest tree in the stand (Squires & Reynolds 1997) and on low gradient north-facing slopes or benches near water and small openings (Reynolds et al. 1982, Zeiner et al. 1990). Snags and dead-topped trees are important for observation and prey-plucking perches (Zeiner et al. 1990). Goshawks feed primarily on birds, but small mammals are also taken. Foraging habitat typically consists of open, unfragmented mature stands with small forest openings and meadows (Hall 1984).” (USFS MTWA) Goshawks are thought to be in decline due to harvesting of larger trees and the increase in understory vegetation, which hampers foraging, due to suppression of fires.

There have been numerous sightings of Pacific fishers in the fire plan area and they appear to be sustaining themselves. “Moderate to high quality Pacific fisher habitat is similar to that preferred by NSOs. Fishers occupy mid-elevation, multi-storied mature and old-growth mixed conifer and deciduous-riparian habitats. These habitats have moderate to dense canopy closure (>50 percent), scattered patches with six to eight large snags per acre, and abundant accumulations of downed woody debris (Buck et al. 1983). Fishers use cavities in large trees, snags, logs, rock areas, brush piles, and concentrations of downed woody debris for denning and nesting. In the west, all natal and maternal dens were found in large diameter snags or logs (Powell & Zielinski 1994). Hardwoods are also important because they provide mast crops that affect potential prey species of the fisher (Powell & Zielinski 1994). Fishers often forage in proximity to accumulations of dead wood; therefore, both standing snags and downed log densities are important. Fishers use ridges and streamside areas covered by closed canopy forests when moving between quality habitat areas. According to Powell & Zielinski (1994), the fisher's limited ability to disperse across open habitats, its large home range size, and low fecundity make it sensitive to habitat

alterations such as extensive regeneration logging.” “Large black oaks appear to be in decline in the MTWA area as well as surrounding areas primarily due to their intolerance to the shade caused by emergent Douglas-firs. Under natural and Native American-influenced fire regimes, there were likely greater densities of large black oaks across the landscape. This factor could be influencing the trend in local populations of fishers.” (USFS MTWA)

Little is known about populations of American marten in the fire plan area. “Preferred habitat is characterized by multi-storied, multi-species, mid-high elevation (>3,000-feet), late seral coniferous forests with >40% canopy cover. Moderate and high quality habitats contain key habitat elements such as large snags and downed wood, which are important for denning and resting. They also require travel corridors comprised of closed canopy forests to move between foraging areas (Freel 1991).” It is thought that “habitat loss and fragmentation as well as unsuitable low elevation hardwoods create unfavorable conditions for this species to persist.” (USFS MTWA)

No confirmed detections of Townsend’s big-eared bat have occurred in the fire plan area. “Townsend’s big-eared bats are generally associated with caves but also use abandoned mineshafts and buildings for colonial breeding and roosting. Cave-like basal hollows in Redwoods have been documented locally. It is likely that tanoak and cedars would provide potential habitat as well (T. Weller pers. comm.). Metal bridges with concrete footings are used as night roosts by females with their pre-volant juveniles primarily because of the latent heat they retain. Structures where the temperature does not remain below freezing are suitable for hibernation. Townsend’s big-eared bats are extremely sensitive to human disturbance, especially from spelunkers.” “Population trends for this species are believed to be decreasing within the state of California as a result of sealing off mines and caves for safety reasons, the deterioration of abandoned buildings, and an increase in recreational spelunking. Population and trends are difficult to determine because individuals move between roosts; however, monitoring of large aggregations over time is recommended (T. Weller, pers. comm.).” (USFS MTWA)

Although no willow flycatcher nests (or nesting activity) have been found in the fire plan area, migrating birds have been observed. “Willow flycatchers typically nest within approximately five feet of the ground in dense willow and other riparian shrubs in wet meadows or willow/alder-dominated riparian zones with open areas for foraging. They appear to prefer both the presence of low dense shrubs, such as willows (*Salix* sp.) and/or alders (*Alnus* sp.), and still or slow moving water within their breeding territories. This type of habitat is not readily available within the MTWA area, and the existing vegetation information is not specific enough to quantify. Based on available information, the best habitat is probably found along the Trinity River and Willow Creek, where the density of willow and alder is greatest.” (USFS MTWA)

“In California, several subspecies of the willow flycatchers have shown both historic and recent population declines. The primary cause of these declines is probably the loss and degradation of the riparian habitats and nest parasitism by brown-headed cowbirds. Additionally, willow flycatchers generally construct their nests along the edges of willow thickets clumps where they are vulnerable to incidental destruction by cattle. Livestock grazing can also indirectly affect willow flycatcher habitat by altering vegetation and hydrology. Livestock can graze the lower branches of riparian deciduous shrubs and consume or trample young riparian plants.” (USFS MTWA)

Northwestern pond turtles have been sighted on the Trinity and South Fork Trinity Rivers and in ponds. “The northwestern pond turtle is generally found along rivers, tributaries, and other waterbodies with exposed basking sites, such as rock, logs, or mud banks, and deep water and terrestrial refugia. This species uses both the terrestrial and aquatic landscapes and displays seasonal cycles of activity and overland journeys. They exhibit a high degree of site fidelity in both aquatic and terrestrial environments. Spring through late summer turtles use aquatic landscapes for foraging, mating, and refuge. Autumn through spring turtles over-winter (i.e., terrestrial aestivation and hibernation) on land clear of hazardous high flows (~ 200 meters from water).” (USFS MTWA)

“Adult turtles inhabit portions of rivers with relatively low velocities and deep water. Juveniles and hatchlings are relatively poor swimmers and are found in warm, shallow, and slow waters of main river channels (typical of edge water) as well as in nearby ponds and vernal pools with emergent vegetation. Emergent basking sites such as rocks and floating logs are favored by adults and juvenile turtles.” (USFS MTWA)

“Research shows that, along the mainstem and South Fork Trinity river adults start leaving the aquatic environment in August and return in April and May after over-wintering; gravid females make multiple journeys to nesting sites (e.g., river terrace) during summer (Reese 1996). Eggs are laid in shallow holes dug by females in friable soils with sparse vegetation and good solar exposure (Holland 1991). Nest sites have been found as far as 400 meters from the water at a Trinity River site. Incubation of eggs ranges from May through September, although at certain locations where winters are severe, hatchlings likely over-winter within the nest. Hatchlings emerge from the nest and travel to water during August and September, unless they over-winter, and then they emerge in March.” (USFS MTWA)

“Available information indicates that pond turtles in the Klamath River drainage are in serious condition (Jennings & Hayes 1994). Much of the concern is based on the lack of young turtles in this population and the implications for future population viability. Other attributing factors include habitat loss and degradation, predation, and competition by exotic species, such as bullfrogs. Pond turtle adults can live for decades and have relatively high survivorship because once they attain their adult size (at 8 to 10 years) the number of predators decreases. Over-land migration trips can be in excess of four trips a year, often requiring road crossings, which put the adults at risk with vehicle traffic. Collecting young turtles as pets or "rescuing" migrating turtles on the roads (often gravid females enroute to nest sites) impacts reproductive success. Exotic turtles from pet stores get released in occupied waters and introduce exotic diseases that kill pond turtles (Holland 1991). Turtles are most vulnerable to predation when in the egg stage and when they are juveniles and subadults. Due to their high degree of nest site fidelity, the eggs are preyed upon year after year by meso-carnivores and reptiles (e.g., skunks, raccoons, foxes, bobcats, and snakes). These same predators, including bullfrogs, consume small turtles as well. Suitable upland nesting areas are decreasing due to brush encroachment into grassy openings that were historically kept open by fire and due to residential development on river terrace (often optimal nesting bench habitat).” (USFS MTWA)

The southern torrent salamander has been found within the fire plan area on an unnamed tributary of Quinby Creek and 0.5-1.0 miles east of Salyer near the Trinity River. “Southern torrent salamanders are nearly always seen in or within the splash zone of cold (8° –12° C), clear streams, seepages, or waterfalls and below 3,900 feet (1,200 m) elevation (Nussbaum et al. 1983). Their typical haunt is the splash zone, where a thin film of water runs between or under rocks. Seepages running through talus provide ideal habitat. Larvae are sometimes found with adults, but they usually occur in slightly deeper water. Larvae may be abundant in gravel with water percolating through it, while metamorphosed individuals may be found in humid forest habitats generally close to flowing water (Nussbaum et al. 1983). According to Welsh et al. (1992), southern torrent salamanders avoid open riparian or aquatic habitats and relatively fast and deep water situations.” (USFS MTWA)

The foothill yellow-legged frog has been seen along the Trinity River and undoubtedly inhabits the South Fork of the Trinity River as well. “The foothill yellow legged frog is found in or near rocky streams in a variety of habitats, including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types. Adults often bask on exposed rock surfaces near streams. Egg clusters are attached to gravel or rocks in moving water near stream margins. Foothill yellow-legged frogs have been observed along Coon Creek. This species has been observed along the Trinity River within the MTWA area (Halligan 1997, 1998, 1999).” (USFS MTWA)

“Populations of foothill yellow-legged frogs are declining or absent in much of the southern portion of their historic range. In this area, although yellow-legged frogs are not uncommon in suitable habitats, this

species is at risk due to exotic predators and poorly timed water releases from upstream reservoirs that scour egg masses from their oviposition substrates and leave egg masses high and dry during the ramping-down of flows releases. Additionally, decreased waterflows can force adult frogs to move into permanent pools where they may be more susceptible to predation.” (USFS MTWA)

“Coho salmon and their habitat have been listed under the Endangered Species Act (ESA). The MTWA area contains designated critical habitat for the threatened Southern Oregon/Northern California Evolutionary Significant Unit (ESU) of coho salmon. Due to the long-term decline of chinook and steelhead runs in the Trinity sub-basin, the Pacific Southwest Region of the Forest Service has put these two species on a regional sensitive species list to help ensure that Forest Service activities do not result in a trend towards listing them under the ESA.” (USFS MTWA)

Wildlife

The Downriver FFMP area provides habitat for a wide variety of wildlife. As few current or up-to-date wildlife surveys have been completed in the area, historic population levels and the current status of wildlife species within the area are poorly understood. “Based on existing survey information, species range maps, incidental wildlife sighting reports (SRNF Wildlife Sightings Database hereafter USFS 2002a), Zeiner et al. (1988, 1990a, and 1990b), the CNDDb (CDFG 2002b), and the California Wildlife Habitat Relationship database, Version 8.0 (CWHR, hereafter CDFG 2002c), there are an estimated 34 reptile and amphibian, 147 bird, and 64 mammal species present or likely to occur” within the fire plan area. (USFS MTWA)

With its variety of habitats, there are numerous wildlife species known or suspected to occur in the Downriver FFMP area, including Pacific fisher (special status species), black-tailed deer, black bear, coyote, gray fox, weasel, bobcat, mountain lion, pine marten, ring-tailed cat, muskrat, mink, skunks, raccoon, gray squirrel, ground squirrel, northern flying squirrel, dusky footed wood rat, gophers, shrews, moles, red tree voles, mice, and bats.

Some special status bird species known to occur in the area include bald and golden eagle, osprey, northern goshawk, northern spotted owl, and willow flycatcher. Other bird species include red-tailed hawk, Cooper's hawk, great horned owl, pygmy owl, hairy woodpecker, Downy woodpecker, pileated woodpecker, flicker, raven, Steller's jay, California and mountain quail, blue grouse, great blue heron, belted kingfisher, merganser, wood duck, teal, mallards, hummingbirds, flycatchers, swallows, varied thrush, chickadees, nuthatches, warblers, towhees, sparrows, finches, blackbirds and numerous other species.

Special status amphibians include the foothill yellow-legged frog. Other species include the western toad, bull frog, and Pacific tree frog. Among the reptiles are the western pond turtle (special status species), racer snake, gopher snake, garter snake, common and mountain kingsnake, and the western rattlesnake.

Fish

Known native fishes in the Downriver FFMP area include “anadromous fall chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), winter steelhead trout (*Oncorhynchus mykiss*), green sturgeon (*Acipenser medirostris*), white sturgeon (*Acipenser transmontanus*), Pacific lamprey (*Lampetra tridentata*), resident rainbow trout (*Oncorhynchus mykiss*), speckled dace (*Rhinichthys osculus*), three-spine stickleback (*Gasterosteus aculeatus*), Klamath small scale sucker (*Catostomus rimiculus*), prickly sculpin (*Cottus asper*), and riffle sculpin (*Cottus gulosus*). Non-native species include brook trout (*Salvelinus fontinalis*), American shad (*Alosa sapidissima*), brown bullhead (*Ameiurus nebulosus*), golden shiner (*Notemigonus crysoleucas*), and green sunfish (*Lepomis cyanellus*).” (USFS MTWA)

“Recreational fishing for resident fish is allowed within part of the analysis area. Although angling for salmon and steelhead is allowed within the mainstem Trinity River, no fishing for these species is allowed

in the MTWA area drainages. This restriction is in place to protect spawning adult salmonids and rearing juveniles prior to their outmigration.” (USFS MTWA)

“The 1964 flood and timber management activities greatly degraded fish habitat, especially anadromous habitat. These factors affected the MTWA area and most anadromous habitat in Northwestern California. Substantial habitat recovery has occurred since the 1964 flood, but wild anadromous fish populations have generally not recovered in the Klamath basin. The coho numbers in the MTWA area are extremely low. Coho salmon and their habitat have been listed under the Endangered Species Act (ESA). The MTWA area contains designated critical habitat for the threatened Southern Oregon/Northern California Evolutionary Significant Unit (ESU) of coho salmon. Due to the long-term decline of chinook and steelhead runs in the Trinity sub-basin, the Pacific Southwest Region of the Forest Service has put these two species on a regional sensitive species list to help ensure that Forest Service activities do not result in a trend towards listing them under the ESA.” (USFS MTWA)

“There are many causes for the general decline of anadromous salmonids in California, and scientists are not all in agreement as to which causes are most deleterious to the different fish stocks. Although it is recognized that many problems exist at larger scales than the analysis area, it is beyond the scope of this document to focus on fisheries problems outside the analysis area.” (USFS MTWA)

“Sharber Creek is a tributary to the Trinity River and is contained in a 2,050-acre watershed. The legal location of its mouth is T6N, R5E, Section 13. Sharber Creek supports both steelhead trout and chinook and coho salmon. There is approximately 6,300 feet of anadromous habitat. A waterfall blocks further upstream migration. A culvert fish passage restoration project currently in the planning stage will allow for improved access to the upper 5,800 feet of stream.” (USFS MTWA)

“Hawkins Creek is tributary to the Trinity River and its watershed encompasses about 2,600 acres. The legal location of its mouth is T6N, R6E, Section 20. The stream gradient averages 11 percent between the mouth and the Road 7N04 crossing. There is a sharp drop of 15 feet at the mouth, which is a barrier to anadromous migration until the river level rises. Another barrier to migration exists at the county Hawkins Bar Road culvert. The creek is considered anadromous only for the lower 600 feet, although its potential for steelhead could be improved.” (USFS MTWA)

For more information on aquatic species, their habitat, and the effects of land and resource management activities, refer to the USFS “Mainstem Trinity Watershed Analysis” and the “Lower South Fork Trinity Watershed Analysis”.

CHAPTER 3. RECOMMENDED WILDFIRE DEFENSE PROJECTS

This fire management plan is a product of the goals and objectives of the downriver community in general, as identified in 1) the “Recommendations on Trinity County Values at Risk from Fire and Pre-Fire Fuels Treatment Opportunities drawn from Community Meetings 1999/2000”, a report to the Trinity County Fire Safe Council from the Trinity County Resource Conservation District (TCRCD) and Watershed Research and Training Center (WRTC), 2) from several meetings at the Salyer VFD with South Fork Road residents and VFD and USFS fire personnel, and 3) from informal discussions with landowners and local USFS fire personnel. This chapter recommends specific projects that are consistent with community goals, with general project descriptions and map references (see ‘Project Locations’ maps for each area). No projects will occur on private properties that do not meet individual landowner’s personal goals. The recommended projects are representative of the types of fuel treatments that would be beneficial for reducing the adverse effects of wildfire in the downriver area, but are not necessarily inclusive of all such projects in all locations. This document can be used as a source of information for designing other projects.

Land and resource managers are increasingly incorporating both ecologic and economic principles when developing management practices for integrated fire protection strategies. Probably the greatest single advancement in ecosystem management is the recognition of the need to plan projects on a landscape, or ecosystem level. Managing vegetation over a landscape that includes residential areas, industrial and non-industrial forest lands, and public lands can help maintain long-term soil productivity, provide for vegetation and wildlife diversity, maintain aesthetics, and reduce fire, disease and insect risks, while providing greater fire safety.

USFS, CDF, VFD, and private resource and fire managers recognize that the expansion of homes into the 'wildland-urban interface' (WUI) has created the potential for a devastating loss of lives, dwellings, and forest resources. Foresters, ecologists, wildlife biologists and fire managers are developing new strategies to allow safer coexistence of people and wild lands. Prescriptions for maintaining healthy, fire resistant forest conditions often call for reduced tree and shrub densities and use of low intensity prescribed fire. Forests with modified fuels will appear more open and park-like than the often crowded forests that presently exist. Open forests will often produce more forage for deer and other wildlife and increase the prey base for many predators. These practices will also reduce the intensity of wildfires that often have deleterious effects on soil.

Wildfire pre-suppression (pre-fire) projects involving manipulations of vegetation need to consider possible adverse effects on the protective soil cover, wildlife habitat, water quality, air quality, cultural resources, and aesthetics. Most land managers, downriver residents, and members of the public will support some timber harvesting and fuel modification projects when these activities will:

- improve forest health, reduce the potential for stand replacing wildfires, and provide safe travel for residents and fire fighters
- protect and/or enhance soil stability
- maintain and/or enhance water and air quality
- maintain and/or enhance critical or limited wildlife habitat
- protect forest views through design of fuel breaks, hazard reduction projects, and other fire defense preparations to high aesthetic standards.

The projects recommended below are divided into those on public and private lands. Only a brief summary of projects on public lands (Six Rivers National Forest) are presented as these projects are described in detail in USFS documents. Some of these projects have been completed or partially completed as of the writing of this plan and are so noted and mapped on 'Project Locations' maps and the 'Fire Access & Infrastructure Map'.

A. Six Rivers National Forest Wildfire Pre-fire Projects

The following is from the USFS MTWA: "While little can be done with the risk of lightning ignitions, much can be done towards the prevention of human ignition starts. Several strategies could be considered to help minimize risk of wildfire ignition, especially the human-caused risk, and protect key communities from the threat of catastrophic wildfire. The risk of fire starts is an issue that could be directed to prevention efforts within the communities themselves, with a focus primarily on demographics of concern for "Incendiary" and "Miscellaneous" ignition causes. Public involvement that crosses agency boundaries and includes urban interface education, cooperative community involvement, planning, and preparedness could be considered. Cross-jurisdictional cooperation in the development of local fire safe councils could be implemented as well as cooperation in efforts to promote local building standards that link home and landscape design with degree of wildfire risk. This would likely include the involvement of citizen groups and homeowner associations and education on the emphasis of reducing fire risk and creating defensible space around homes and communities of concern. The Forest Service should continue to work cooperatively with other agencies and with fire safe councils and other groups to facilitate the acceptance of fuel treatments around communities through education efforts focused on the risks of fire occurrence."

"The Forest Service could consider the creation of community defense zones where fuels are modified to increase protection from wildfire entering the communities and to reduce the chance of fire spreading into the wildland from the community. Such zones would also increase the effectiveness of suppression efforts and firefighter safety. Zones could be located to facilitate the best protection considering areas with high fire risk and integrated with natural barriers within, adjacent to, or near communities."

"This WA has highlighted a number of important elements that should be considered in the development of fuel treatments and priority areas:

- Fire severity is related to topographic position and slope. Upper slopes, ridge tops, and south- and southwest-facing aspects typically have the more severe fire behavior and effects.
- There is a high potential for wildlife habitat loss for key species due to high fuel loads and extensive dense multi-layer canopies.
- There is a potential in the USFS MTWA area for severe fire to continue to threaten northern spotted owl habitat. Also, historical fire regimes that previously held in check the growth of sub-canopy have been altered, allowing increased growth that may have negatively affected some habitat elements required by the species.
- Studies have shown that effective fire suppression efforts have reduced the extent of wildfires and resulted in accumulation of ladder fuel components and denser stands.
- The Willow Creek sub-watershed has the highest percentage of area occupied by soils with a predicted high burn damage susceptibility and high to extreme predicted fire behavior.
- A high risk of stand replacement fire exists in a substantial fraction of riparian reserves and poses a significant concern.
- The onset of sudden oak death disease (SOD) could affect the extent and severity of future wildfires, negatively affecting suppression effectiveness and strategies.
- The shaded fuel breaks within the Megram Fire provided an example of effective fuel treatments, including mechanical treatments and understory burning.
- The most complicated and largest wildland/urban interface is the high-density population centers along the Trinity River corridor.
- Treating fuel profiles in their entirety is critical for effective fuels treatments. Crown bulk density and related surface fuel conditions are key. Treating single elements of the fuel profile is less effective."

“All of the information points to the conclusion that there is a need to change the trend of altered fire regimes in the USFS MTWA area. There are several opportunities to do this through fuels management projects applied independently or cooperatively with harvest practices and through land stewardship programs. The key to the overall fuels strategy should be cohesive and integrated management and planning to accomplish broad objectives rather than focusing on isolated single objectives. Treatment strategies should consider all ecosystem components.”

The table below, from the USFS MTWA, shows potential fuel treatment strategies that were identified. These treatments would also be applicable to the South Fork of the Trinity area.

Proposed Treatment Strategies	Applications
Prescribed Fire	Applied over large areas where opportunities still exist and multiple treatments applied over time can restore fire dependent regimes
Shaded Fuelbreaks	Identify strategic locations where fuelbreak systems can be located to support prescribed fire treatments as well as urban protection. Integrate fuelbreak systems with other features that provide a cohesive strategy throughout the watershed or forest.
Timber Harvest	Use timber harvesting to modify vegetation so that vegetation conditions progress towards the range of conditions that would support natural fire regimes. Look for opportunities to build compatible combinations of surface fuel loads, crown bulk densities, surface to live crown ht., etc., within the fire adapted vegetation types.
Wildland/Urban Interface Risk Reduction	Provide a wildland/urban interface protection plan that considers cooperative relationships, interagency agreements, and public education on associated community risk. Construct defensible fuel profiles around community zones through active fuels management projects, harvest practices, stewardship agreements, and community involvement.
Natural high hazard fuel area	Fuels treatments should focus on those areas of high concern (Condition Class 2 and 3) within the watershed. Areas of high SOD (if it is found to occur), heavy mortality from past fires, heavy mortality from insect attack, large blow down areas, etc., should be targeted.
Other Strategies	The following types of treatments should be considered as opportunities arise (e.g., funding availability, cooperative projects with private landowners, multi-agency projects, etc.): Mechanical fuel treatment Hand Pile/Burn treatment Preattack Planning Treatments across jurisdictions Stewardship opportunities Plantation protection treatment Treatments for Condition Class I areas to maintain Condition Class I status

In regard to prescribed fire, “There has been a change in potential fire effects, from low/moderate severity fires to high severity fires, that has placed communities and resources at risk. The need for proactive and integrated management of fire to reach a more natural fire regime is apparent, through fuels management, prescribed burning, and wildland fire use. However, because of the dense accumulation of fuels and vegetation across the landscape, mechanical fuels treatment (which could include commercial removal of merchantable trees, tree thinning, mechanical piling, and/or hand piling) may be necessary prior to fire reintroduction for a large proportion of the watershed. This preburning treatment may prove to be critical in order to avoid damaging the Forest’s resources during prescribed burning.” (USFS MTWA)

In light of the above, the USFS is in various stages of completion of or planning for the following projects.

1. Completed Projects

In October 1999, when the Megram Fire advanced rapidly toward Willow Creek, Salyer, and Hawkins Bar, the USFS constructed fire lines with dozers along sections of Waterman Ridge. In the years following the fire, the USFS has connected the dozer lines from the Trinity County boundary on Campbell Ridge east to the divide between Cedar Creek and the New River. Large woody material was removed from the dozer lines and decked (consolidated) and the lines have been maintained as fuelbreaks.

There were also about 150 acres of small plantations along Waterman Ridge that were severely burned during the fire. These plantations have been commercially thinned and woody debris has been hand piled and burned.

During the fire, brush and trees were cut along the Ziegler Point Road (USFS Road 4) to clear the way for fire traffic. In the following years this woody debris was removed by an excavator and dump trucks and the slash was burned.

During the Megram Fire the dozer line on Waterman Ridge was extended part way down the spur ridge toward Trinity Village, on and in the vicinity of road 6N30.

In 1999, 80 acres in four units on Campbell Ridge were commercially thinned in the Thick Thin Timber Sale. Following the harvest, an understory burn was conducted to reduce the slash.

2. Partially Completed Projects

In response to the community meetings conducted in Salyer and Hawkins Bar, which identified priority fuel hazard reduction projects in the downriver area, Six Rivers National Forest, in collaboration with the Trinity County Fire Safe Council, Trinity County Resource Conservation District, Salyer Volunteer Fire Department, and the Hawkins Bar Volunteer Fire Department, developed the "Salyer/Hawkins Bar Community Protection Plan". This plan proposed to create defensible space around some of the main residential areas in Salyer and Hawkins Bar by first establishing a buffer of low density fuels along the boundary between public and private property and then by widening this buffer on public lands by understory burning. These treatments are in various stages of completion, as follows:

a. Salyer Area

In Salyer, north of the Trinity River, the USFS had proposed to conduct understory burns in the area bounded on the south by the Salyer VFD station, on the west by trail 5E40 on Campbell Ridge, and on the north and east by Sharber Creek and private property. To protect the private property, a 200-foot buffer was to be constructed on the National Forest adjacent to the private property. Trees and shrubs in this buffer were to be thinned and pruned to remove ladder fuels, with the resulting slash piled and burned.

To date TCRCDC crews have completed most of the buffer along private property, except for pile burning, from the Salyer VFD station to Campbell Ridge Road, and portions have been completed from there to Sharber Creek northeast of Salyer Heights. An understory burn has also been completed by USFS crews on about 80 acres, bounded on the south by Campbell Ridge Road and on the west by Campbell Ridge. The rest of the buffer and underburning will be completed in 2006.

b. SuzyQ Road

The proposal for the SuzyQ Road area was to thin and prune trees to remove ladder fuels, cut shrubs and dead wood, and then to pile and burn the resulting slash, from the private property boundary south to the Trinity River and to create a 200-foot buffer along the east property boundary. This part of the project was completed in 2005 by RCD crews, with USFS crews doing the burning.

c. Trinity Village

In the Trinity Village area, the proposal was similar to that for the Salyer area. Trees were thinned and pruned, shrubs and dead wood cut, and slash piled and burned, from the southeast boundary of Trinity Village to the Trinity River and in a 200-foot buffer along the north and west boundaries of the private property to Hawkins Creek. This part of the project was completed in 2005 by the TCRCD, with USFS crews doing the burning.

In the fall of 2005 the USFS conducted an understory burn on 120 acres in the Ziegler Point Road area, from the north boundary of Trinity Village and the private property to its north, to Hawkins Creek, to a bit north of the intersection of the Ziegler Point Road and USFS Road 6N29. This burn reduced hazardous surface fuels, consisting of woody debris, brush, and saplings, to enhance firefighter and public safety and to protect private property and residences. This completed a continuous fuelbreak to the west and north of Trinity Village, from the Trinity River and the private property to Waterman Ridge.

3. Planned Projects

a. Trinity River Community Protection Plan

The USFS is planning to do fuel treatments on about 500 acres of the National Forest that is imbedded within or adjacent to private property, from Gray Falls to the Trinity County line north of Hudson Creek. It intends to maximize the use of equipment, such as chippers and masticators, where there is access. In areas that are too steep for equipment, the USFS will conduct understory burns, after protecting trees from fire damage through minimal pruning (to minimize slash).

b. South Fork Trinity River Community Protection Plan

The USFS plans to treat fuels in a 200-foot buffer adjacent to private property in the Ammon Ranch area. Trees would be thinned and pruned and slash piled and burned. The primary purpose of this treatment would be to provide firefighter access for protecting the Ammon Ranch community and for underburning the slopes between it and Hennessey Ridge.

c. Fire Safe Planning (per the Trinity County Fire Safe Council)

The “Recommendations on Trinity County Values at Risk from Fire and Pre-Fire Fuels Treatment Opportunities drawn from Community Meetings 1999/2000”, a report to the Trinity County Fire Safe Council from the Trinity County Resource Conservation District (TCRCD) and Watershed Research and Training Center (WRTC), recommended creating logical wildland fire control points between South Fork Road and Hennessey Ridge. One of these points is along a ridge located to the east of Todd Ranch. The USFS proposes to build a shaded fuelbreak along this ridge, from the lower end of the ridge to just south of the terminus of Road 5N02 on Hennessey Ridge.

d. Hennessey Ridge Fuelbreak

The Six Rivers National Forest began building a fuelbreak along Hennessey Ridge in the 1970s. This fuelbreak, located along the ridge from the Six Rivers National Forest boundary on the south into Section 24 on the north, where the “World’s Largest Tanoak” is located, was built in stages, using timber sales. The USFS plans to complete the north end of this fuelbreak with approximately 250-300 acres of commercial thinning sales, followed by underburning to reduce slash. It has also conducted and plans to conduct more maintenance burns on sections of the old fuelbreak. There are a number of plantations within this fuelbreak that are densely stocked with conifers and hardwoods that need to be thinned to adequately serve as fuelbreaks. These will be thinned as funds become available and after the higher priority fuels reduction projects are completed adjacent to residential areas.

B. Area-Wide Projects

Area-wide projects are those that benefit individual landowners and visitors to the area, as well as people living well away from the area. These can be projects, such as fuelbreaks, that are on single ownerships or cross ownership boundaries. They provide an opportunity to bring together resource agencies, industrial and non-industrial forestland managers, and area residents for common purposes, to limit the spread and severity of fires and to increase the safety of the residents in the plan area. Some of the benefits of these cooperative, landscape level projects include reduced fire danger, with potentially lower suppression costs and reduced losses of life, property, and resources, improved community coordination of fire defenses and resources, and public education on the benefits of fire planning.

Project 1 - Area-Wide Ridgetop Shaded Fuelbreaks

The SRNF has created shaded fuelbreaks in the fire plan area on the tops of the main ridges (Waterman Ridge and Hennessey Ridge) and a spur ridge (the Ziegler Point Ridge between Quinby and Hawkins Creeks). A fuelbreak has been partially completed on Campbell Ridge and is planned to run from the Trinity River to Waterman Ridge. These fuelbreaks provide control lines for fire suppression, anchor points for suppression backfires and pre-suppression controlled burns (for fuel hazard reduction), and travel routes and safety zones for firefighters and equipment.

The established area-wide fuelbreaks were created between the early 1970s and 2005. Fuelbreaks in the vegetation types found in the planning area generally need to be maintained every 5-10 years. They will all need to be maintained by periodic prescribed burning, mowing, masticating, grazing, herbicide spraying, and/or clearing and chipping of underbrush. Burning could be done using crews from the USFS, CDF, High Rock Conservation Camp, Trinity County Resource Conservation District, Watershed Research and Training Center, and/or contract crews, such as Firestorm.

The USFS also plans to build a fuelbreak between Todd Ranch on South Fork Road and the terminus of USFS 5N02 on Hennessey Ridge, which is in a moderate to very high "Fuel/Fire Severity Hazard Zone (Condition Classes 2 & 3). It also plans to extend the existing Hennessey Ridge fuelbreak north to the private land. This extension should go down one or both of two spur ridges, to SR 299 at Salyer or to Oden Flat. Both locations would be mostly through zones of Condition Class 3 fuels and would help protect Salyer, Oden Flat, and Hawkins Bar residents.

The Hennessey Ridge fuelbreak could also be extended down a spur ridge to the Salyer Roadside Rest Area and Tunnel Ridge, which would help protect Hawkins Bar and the proposed Hennessey Ridge Research Natural Area to the southeast. Fuels in Condition Classes 1-3 are found along this ridge. Another good location, which would help protect Burnt Ranch, would be to run a fuelbreak from Hennessey Ridge down the ridge dividing Gray Creek from Hennessey Creek (the boundary between SRNF and S-T NF) to SR 299. The fuels along this ridge are primarily in Condition Class 3.

Fuelbreak specifications will vary depending upon landowner objectives, vegetative cover, location, topography, accessibility, soil conditions, and available manpower and funds. Fuelbreaks should be wide enough to stop a crown fire and allow it to drop to the ground, where control efforts would be more effective. The following are suggested specifications for fuelbreaks, taken in part from those developed for the Weaverville office of the NRCS by Baldwin, Blomstrom, Wilkinson and Associates.

- a. Fuelbreaks should be located to take advantage of existing fire barriers, such as roads, natural openings, areas of exposed soil, and meadows. Where needed, timber stand improvements, timber harvests, slash disposal, mowing, and/or prescribed fire should be used to reduce the fuel hazard on lands bordering the fuelbreaks.
- b. Ideally, fuelbreaks should be easily accessible by fire crews and equipment at many points.
- c. Fuelbreaks should be designed so that they incorporate and imitate the forms of natural openings in the forest.

- d. Portions of fuelbreaks visible from residential areas, SR 299, and county roads should be visibly pleasing.
- e. Fuelbreak corridors should be at least 200 feet wide and ideally centered within a 1320-foot wide area where some level of fuel modification is done.
- f. Ground cover (duff, needles and low forbs) should be retained to keep soil erosion to a minimum, especially on steep slopes.
- g. Low growing vegetation (shrubs and suppressed trees) that act as fuel ladders should be thinned and removed under tree canopies, but more shrub canopy cover should be retained on steep slopes.
- h. Emphasize retention of tree species that are adapted to fire and beneficial to wildlife, such as Douglas-fir and ponderosa pine. These conifer species, when mature, have thick bark and can survive low to moderate intensity fires.

California black oak, Oregon white oak, canyon live oak, tanoak, and Pacific madrone are more resistant to crown fire than conifers. Although relatively low intensity surface fires can kill these hardwoods, they will resprout. Oaks and madrones also provide acorns or berries, as well as habitat for a variety of wildlife.

- i. Thin trees to encourage open stands. Spacing between residual trees depends on a number of factors, including the size and species of trees, the amount, size, and species of understory vegetation retained, soil type, steepness of slope, position of the fuelbreak in relation to the topography, aspect, and the characteristics of the adjacent forest and landscape.

For maximum protection from crown fires, the crowns of mature conifers (single trees or clusters of several trees) should be spaced from 10-30 feet apart, depending upon the slope. The maximum canopy closure should range from 50-70%, depending upon slope and aspect. Where slash and low growing fuels are minimal in and adjacent to the fuelbreak, a spacing of 10-15 feet is adequate. This more closed canopy will increase shading, thereby reducing the regrowth of low growing vegetation.

Intermediate trees should be thinned so that crowns are about 6 feet apart. The spacing between crowns will not be uniform. Many spaces will be larger, but few should be smaller than the recommended distances. Favor retaining Douglas-fir, ponderosa pine, oaks, tanoak, and madrone. Always favor trees, regardless of species, with full, healthy crowns on at least 40% of the bole.

- j. Prune residual trees up at least 10 feet, provided that full, healthy crowns are left on at least 40% of the bole. Where vegetation is retained under the canopy of a tree, prune up three times the height of the vegetation. Disposal of limbs will depend upon site conditions. Where there is a lot of exposed soil, place limbs in a fashion to protect the soil surface. Where litter or vegetation is abundant, scatter limbs in sparser areas, pile and burn in openings, and/or leave for wildlife cover.
- k. Retain a minimum of 2 snags (>20 inches dbh and 20 feet tall) per acre if no safety or fire control conflicts exist. But snags on ridges are not recommended due to their tendency to catch fire and spread embers over long distances.
- l. Retain a minimum of 5-6 logs (greater than 10 inches in diameter and 10 feet long) per acre, except in fire safety areas (see 'Fire Access & Infrastructure Map'). Logs should be scattered, not concentrated together, and be pulled away from the base of trees.
- m. Provide islands of preferred plant species (up to 30% by area) within fuelbreak areas for browsing wildlife. Trees within these islands should be pruned at least three times the height of the browse species that are left.
- n. Rather than convert hardwoods to conifers, retain hardwood stands, as they tend to be resistant to crown fires and rapid spread of ground fires, are beneficial for many species of wildlife, and help protect soil from erosion. Also, most hardwoods will sprout vigorously from the stump when cut, which will increase surface fuels.
- o. Fuelbreaks should be designed to allow for the use of prescribed fire, mowing, masticating, and/or chipping in order to provide long-term maintenance of the area. Seedlings and brush will rapidly appear in an open forest stand and must be removed periodically. Prescribed fire, mowing, masticating, and/or chipping on flatter slopes are perhaps the best ways to control excess

reproduction while maintaining ecosystem conditions promoting healthy, large trees and a sustainable open forest stand.

Project 2 - Roadside Shaded Fuelbreaks

State Route 299, which borders or bisects several residential areas, is a heavily traveled highway, especially during the fire season. Campbell Ridge Road, Salyer Loop Road, Fountain Ranch Road, and portions of South Fork Road are also heavily traveled county roads at all times of year. Roads internal to residential areas and driveways are less well traveled. A fire along any of these roads could temporarily block access by fire engines as well as egress into or out of the area by residents and visitors.

Roads, in addition to providing travel routes, can act as firebreaks for some types of fire and provide control points for fire suppression. But roads are also a common location for fire ignitions. Fuel modification alongside roads can reduce the availability of fuels for such ignitions as well as slow the rate of spread and reduce fire intensity once fuels are ignited. This increases the time before fires build up enough energy to become difficult to control and thus increases the effective response time for fire control resources to arrive and control fires. The following is a list of roads where fuelbreaks are recommended (see 'Project Locations' maps). Priority roads for treatment are noted. Roadside shaded fuelbreak specifications are shown after this list.

A. State Route 299 (see 'Hawkins Bar Project Locations' & 'Salyer Project Locations' maps)

SR 299, a designated Scenic Highway, experiences heavy traffic during the fire season, and has a history of fire starts in its vicinity. A shaded fuelbreak on both public and private lands, from the planning area boundary east of Gray Flat to the bridge over the South Fork of the Trinity River, would reduce flammable fuels while maintaining the aesthetics. It would also effectively increase the zone of defensible space, which should increase the safety of fire suppression forces and emergency vehicles. A 100-foot buffer is advisable, although there are many locations where little to no work needs to be done due to large road cuts and fills and/or a lack of significant flammable vegetation.

B. Gray Flat (Ranch) Area (see 'Hawkins Bar Project Locations' map)

There are five roads/driveways accessing the residential area of Gray Flat (Ranch) from SR 299, all of which are a high priority for treatment. These are bordered by moderate to heavy fuels, which would be highly hazardous if they were burning. Ammon Road, Grey's Flat Road, and Pony Creek Road are named and signed roads. The two roads to the southwest of these are unnamed. These are all narrow roads, mostly with uneven surfaces, that will be hazardous enough during fire emergencies, without the addition of burning fuels. A minimum 50-foot buffer is advisable. Treatment of the fuels along SR 299 and in the western area of Gray Flat will enhance the safety of the residents.

C. Hawkins Bar Area (see 'Hawkins Bar Project Locations' map)

1. Except for Trinity Court, some sections of the roads in Trinity Village are bordered by moderate to heavy fuels. In some places it appears that the vegetation was retained as a privacy screen, but in other places that is not apparent. Although these fuels are hazardous to the immediate surroundings, they are in general not a hazard to the village as a whole, due to the defensible space that most homeowners have created around their houses. Never-the-less, it would be prudent to lower the density of the shrub layer and ladder fuels, to prevent torching during a fire, and to remove the deadwood on the ground to lower fire intensity and rate of spread. A 50-foot buffer should be sufficient.
2. Madrone Trail is a rough, narrow, native surface road that links Madrone Lane with Flame Tree Road. While it appears to be lightly used, it could be a valuable link between the fire station on Trinity Court and Flame Tree Road. Treating the fuels along this road would also provide one more area of defensible space between Trinity Village and the upland area. A 50-foot buffer should be sufficient.
3. Just north of Madrone Trail is Coon Creek Road, which is narrow toward the end and bordered in sections by moderate to dense fuels. A 50-foot buffer should be sufficient.

4. All of the homes on Fisher Road are on a flat on the south side of the road. The topography on the north side of the road is gradual at first but then rises steeply. Ladder fuels, shrubs, and deadwood are limited along most of the county road, but in some areas are denser. A 50-foot buffer should be sufficient.

D. Salyer Area (see 'Salyer Project Locations' map)

1. Fountain Ranch Road is a heavily traveled access road to the residential areas southwest and east of Sharber Creek and is a high priority for treatment. This is a dead end road, with numerous short roads and driveways intersecting it. A safety zone has been identified just east of Knoll Road, a driveway that intersects Fountain Ranch Road about ¼-mile east of Salyer Loop Road. Some sections of Fountain Ranch Road, between Ferguson Road and Councilman Road, are bordered by moderately flammable fuel, which could temporarily halt traffic and increase fire intensity in the area if it were to burn. A 50-foot buffer should be sufficient along this road. One section of the road is bordered on the north side by steep, high cutbanks, with vegetation hanging down them. It is impractical and unnecessary to remove vegetation from these cutbanks, other than at the base, as they are already acting as a fuel break.
2. At the beginning of Councilman Road and between Arneson Lane and the end of the road, are patches of understory fuels that should be treated to lower the fuel hazard. A 50-foot buffer should be sufficient. This is a high priority for treatment.
3. Salyer Loop Road is a heavily traveled access road to the Salyer Heights residential area and is a high priority for treatment. Since a section of the Campbell Ridge Road south of Hudson Creek slid out, it is now the only road into the area south of Hudson Creek for emergency vehicles and out of the area for residents. Some sections of the road are bordered by highly flammable fuels, which could temporarily halt traffic if it were to burn. A 50-foot buffer should be sufficient to protect traffic along the road. This buffer will need to be re-treated periodically where there are blackberries as they grow back quickly.
4. Peach Orchard Lane, at the south end of Salyer Heights, is a native surface road that accesses houses, peach orchards, and a potential safety zone. This road is a high priority for treatment. It is bordered by moderately dense fuels on the lower (south) side, which drops off steeply. A fire burning uphill from the south would effectively close this road to vehicles or foot traffic as it passed. The fuels on the uphill side have been treated recently. A 50-foot buffer along the lower side of the road, to where the road emerges from the trees, should be sufficient.
5. The section of Campbell Ridge Road on private property, just west of Salyer Heights, crosses a steep slope. This is a high priority for treatment. The USFS has treated the understory fuels in a 200-foot-wide buffer along the boundary of the private property to the north (upslope) and plans to do an understory burn to reduce fuels upslope. It would be advisable to also treat the fuels on both sides of the road for 50 feet to increase the total width of the buffer between the USFS underburn and both the road and the property below the road.

E. Hudson Creek Area (see 'Hudson Creek Project Locations' map)

1. Campbell Ridge Road is a heavily traveled access road to a subdivision along the Trinity River that is a high priority for treatment. The residents of this area have historically driven to Willow Creek for social and economic activities. But a section of this road south of Hudson Creek slid out in December of 2005, making it a dead end road for those living south of the slide. Although the Trinity County Department of Transportation expects to repair the road by the end of 2006, the only way out now for those living south of the slide is through Salyer, over a section of the road that is in many places too narrow for vehicles to pass and has few turnouts. This will hamper the flow of emergency vehicles into the area and residents out of the area during a fire emergency. Some sections of the road are bordered by highly flammable fuels, which could temporarily halt traffic if it were to burn.

The USFS plans to treat a 200-foot buffer uphill (east) of Campbell Ridge Road in the Hudson Creek area, and then to underburn the upslope area to reduce fuels, increase the safety of residents, and

increase opportunities for control of wildfires. To enhance the USFS buffer, it is advisable to treat a 50-100 foot buffer on the private property on both sides of Campbell Ridge Road.

2. Sign Tree Road PVT, which is located on SRNF lands for the first 0.1 mile, connects with Campbell Ridge Road. Toward the end of the road, between the road and the small creek, is a patch of blackberries intermixed with other fuel that is a potential fuel hazard. It is advisable to treat these fuels for 50 feet from the road. The blackberries will grow back rapidly if they are not controlled, but the buildup of dead canes will be eliminated.

3. Baldwin Creek L.P. Pvt road connects to Campbell Ridge Road via Sign Tree Road PVT and is a high priority for treatment. Baldwin Creek L.P. Pvt road is a narrow, graveled road that accesses homes along the Trinity River through Erin Lane and several unnamed driveways. It is bordered by dense, tall, highly flammable fuels along the last 0.2 mile. These should be treated for a minimum of 50 feet along each side of the road. Fuel reduction in the entire area has been recommended in Project 3 below.

4. An unnamed spur road south of Sign Tree Road PVT that runs southwest from Campbell Ridge Road has a fuel buildup on the east side that should be treated in a 50-foot buffer. This is a lower priority as the road may access only one residence.

5. Woods Road (signed "Jenkins") runs south from Campbell Ridge Road to access homes, where it dead ends. It is bordered by moderately dense vegetation that includes ladder fuels. Treatment is advisable within a 50-foot buffer on either side of the road.

F. South Fork Road Area (see 'South Fork Road Project Locations' map)

1. South Fork Road is a frequently traveled road as far as Low Bridge (Escot Farms) during the fire season. From that point south it is less traveled. It is bordered by concentrations of highly flammable fuels (generally tanoak, Douglas-fir, and shrubs) in places. In other places it is bordered by high cutbanks and/or steep fills that are sparsely vegetated, which effectively act as fuelbreaks.

In general the road narrows the further south it goes, with sections from the vineyard house to the end of the road where it would be difficult for two large vehicles to pass. So it behooves the residents and land and fire managers to reduce the fuel hazards along the road wherever possible so that in the event of a wildfire, fire intensity will not be so great as to restrict travel along the road.

Funding already obtained through the TCRCF for the 'Lower South Fork Road Fuel Reduction Project' will do just that, by treating fuels on private lands in 100-foot buffers along sections of South Fork Road. Connecting roads and driveways will not be treated under this project, nor will SPI lands. To complete this roadside fuelbreak to SR 299, those portions of the road on the USFS lands that are interspersed with private property, from the Carpenter Ranch north, should also be treated.

2. The driveway signed 'Weber' accesses a pond where fire engines can draft water. The Weber's have informally given permission to use their pond, but it has not yet been surveyed to see what, if any, improvements would be required. It may be advisable to remove some of the vegetation along the driveway to improve access for fire vehicles.

3. USFS Road 6N68, signed "Martin's & McCoy's" is a dead end, native surface road that runs west through national forest lands to access a pond (north of the road), and then through private land, to access dwellings and a ranch. It is gated and signed "Ken & Darlene McCoy" about 0.25 mile west of South Fork Road. Surface fuels have been removed and trees pruned up 6' in a 50' buffer along the north side of the road as far as the McCoy's gate. If it is determined that the pond would be suitable for development as a water drafting site, a roadside shaded fuelbreak 50-100 feet wide should be created on both sides of the access road to the pond. Slash should be piled and burned, chipped, or hauled offsite (firewood).

4. An unnamed road (signed "Escot, Peaches, Trinity Retreat Center") accesses "Low Bridge" ('No Bridge' now!), a popular place for swimming and boating on the South Fork of the Trinity River. As the approach to Low Bridge is chip sealed, with a turnaround a few hundred feet up the road from the river, it is also a location with high potential for filling water tenders and fire engines, and it is a mapped safety zone and helicopter landing site. The first 0.2 mile of this road is bordered by light to

moderate fuels while the last 0.15 mile is bordered by moderate to heavy fuels. It is advisable to treat the fuels along this road to reduce the chance of a fire starting in this high risk area or of a fire blocking access to the river by vehicles and to improve the helicopter landing site. A 100 foot buffer is advisable.

5. An unnamed road (signed “River Access - Todd Ranch”) accesses a trail to the South Fork of the Trinity River, a popular put in for kayaking down the river, and a mapped safety zone and helicopter landing site. The access road is narrow and dead ends in a large meadow, but there are a couple of turnarounds for fire engines. The road to the meadow is bordered by open oak woodlands, with light to moderate fuels, but the last section of road is adjacent to dense forest. Fire risk in this area is low during the fire season as most of the kayaking occurs in the spring when the river is high. It is advisable to treat the fuels along this road to reduce the chance of a fire blocking access to the safety zone. A 50 foot buffer is advisable.

6. An unnamed road just north of Surprise Creek accesses a cable crossing over the South Fork of the Trinity River, a potential site for drafting water for fire vehicles. The existing dirt access road is narrow and dead ends at a turnaround on a ledge well above the river. Part of the road is bordered by dense shrubs, part is through a meadow, and part is bordered by a conifer forest, with light to moderate fuels. This area attracts some swimmers to the Surprise Creek swimming hole, so risk during the fire season is moderately low. If further study determines that this site should be improved for water drafting, the road should be widened, graded, and graveled and the most hazardous fuels treated to reduce the chance of a fire blocking access to the river. A 50 foot buffer is advisable.

G. Friday Ridge Road & Sandy Bar Area (see ‘South Fork Road Project Locations’ map)

1. Friday Ridge Road (Humboldt County Road 8L - 100) and USFS Road 6 are traveled frequently during the summer to access Sandy Bar Road, which runs to Sandy Bar on the South Fork of the Trinity River. Although these roads are in Humboldt County, outside of the fire plan area, they lead to the popular Sandy Bar swimming area. There have been many human-caused fires in this area, and it is probable that fires could jump the South Fork into the fire plan area.

Friday Ridge Road and USFS 6 are bordered by dense grass and forbs on the shoulders and in the drainage ditches and dead and live white oak, Douglas-fir, and Pacific madrone saplings and manzanita where the Friday Fire burned in 2003. This will always be a zone of high risk of fire starts, so it would be prudent to treat the fuels immediately and on a periodic basis along these roads, at least as far as Sandy Bar Road.

2. Sandy Bar Road is a narrow, dirt road bordered by highly flammable surface and ladder fuels, which should be treated to reduce the fuel hazard. Along some sections of the road there are Douglas-fir and canyon live oak ladder fuels. On another section there is dense greenleaf manzanita up to 12 feet tall. The parking area at Sandy Bar has dense vegetation adjacent to it, including grass, clover, forbs, blackberries, coyote brush, and poison oak under buckeye, Pacific madrone, white oak, alder, and Douglas-fir. Given the high use in this area, it would be prudent to remove the ladder fuels and prune the lower limbs from the surrounding trees out for 200 feet from the parking area to lower the fuel hazard. This will always be a zone of high risk for fire starts, so it would be prudent to treat the fuels on a periodic basis around the parking area and along the entire access road.

Ideally, fuelbreaks should be wide, with fuels treated to reduce 1) ladder fuels, so that fire will not enter tree crowns and 2) surface fuels, to slow the rate of fire spread sufficiently to allow fire control resources time to arrive on the scene before fires reach denser fuels. For more remote areas this is unlikely, due to the delay time in reporting fires and the travel time required over slow roads. Fuelbreak specifications will vary depending upon landowner objectives, vegetative cover, location, topography, accessibility, soil conditions, and available manpower and funds. See Project 1 ‘Area-wide Ridgetop Shaded Fuelbreaks’ (above) for fuelbreak construction specifications additional to those below.

2.1 Remove trees and brush - Trees that constrict views along road edges, prevent two vehicles from safely passing each other, or act as fire ladders should be removed. Brush and small trees should be

removed within 100 feet of SR 299, 50-100 feet of the edge of county roads, 50 along private roads, and a minimum of 10-20 feet along driveways. Minimum tree removal should include those marked by a forester or fire professional. Each landowner or right-of-way owner should determine additional tree removal. In most cases on private lands, commercial tree removal may be done under a Timber Harvest Plan exemption.

Work could be done using crews from the USFS, CDF (High Rock Conservation Camp), TCRCO, WRTC, Hoopa Valley or Tsnungwe Tribes, and/or contract crews.

- 2.2 Prune trees** - Dominant and co-dominant trees should be pruned up to 16 feet above the ground, but always leaving at least 40% of the bole in live crown. As canyon live oak limbs tend to droop near to the ground, it is better to prune the ends of the branches up high enough so that surface fires are unable to ignite the foliage. If possible, provide at least 200 feet of sight distance along county and ungated private roads. In places with limited turnouts, longer sight distances are necessary to assure fire vehicle traffic safety and to minimize delays.
- 2.3 Prune trees** - Thinning should follow guidelines ‘f-o’ under Project 1, ‘Area-Wide Ridgetop Shaded Fuelbreaks’.
- 2.4 Dispose of vegetation** – Vegetation removed from the fuelbreaks should be chipped for biomass (or the chips scattered over the ground), piled and burned, removed from the site, or otherwise treated so as to eliminate it as a fuel source.
- 2.5 Maintain fuelbreaks** – As roadsides are well lit, vegetation will likely reoccupy fuelbreaks relatively quickly, requiring periodic maintenance. Prescribed burning, mowing, and/or grazing of young underbrush in the fuelbreaks are quick and relatively inexpensive methods to maintain them.

Project 3 – Understory Thinning for Fuel Reduction (see ‘Project Locations’ maps)

Some forested areas adjacent to residential areas have understory fuels that could potentially intensify fires, increase their rate of spread, and/or cause fires to move into the crowns of individual trees or groups of trees. These understory fuels typically consist of sapling- and or pole-sized trees, shrubs, grass and forbs, and/or deadwood (snags, logs, limbs, cones, leaves).

There are also forested areas where the crowns of the overstory trees are touching and/or intermingled. If understory ladder fuels were to carry fire into the canopies of these forests, under the right circumstances a crown fire would result. Such fires are difficult to control and could move rapidly through dense canopies, pushed by the winds that are common during the summer. But most crown fires require surface fires to maintain the heat necessary for them to advance. If understory vegetation is adequately thinned, and maintained in a reduced state, the likelihood of a crown fire developing or advancing will be lowered. And if the overstory canopy is thinned, it will be more difficult for a fire to move through the canopy.

Thinning to remove understory saplings (1-6” DBH), poles (6-11” DBH), and some small sawtimber-size (12-24” DBH) trees (suppressed, intermediate, and some co-dominants) is known as thinning from below. This type of thinning is recommended in forests with excessive stocking of trees, especially those with overly dense ladder fuels, and/or where prescribed fire will be applied under pole to small sawtimber-size trees to reduce surface and ladder fuels.

Whether thinned trees will have market value depends in part upon tree species, size, density, and quality, stand size and location, and the existence of and distance to markets. Where there is adequate value, thinned trees could be utilized for whatever products are most economically feasible. If thinned trees are used for commercial purposes, (defined by the Z’ Berg-Nejedly Forest Practice Act of 1973 as the “cutting or removal of trees which are processed into logs, lumber, or other wood products and offered for sale, barter, exchange, or trade . . .), harvesting and resource protections are required and must follow the Forest Practice Rules for timber sales.

When there is too little value for a commercial sale, thinned trees can be treated in a variety of ways, 1) by piling and burning, 2) by piling in openings and leaving unburned for wildlife habitat, 3) by scattering away from the trunks of residual trees (or leaving in place) before broadcast understory burning, 4) by lopping and scattering without burning, and/or 5) by placing over bare soil areas.

Areas where understory thinning is a priority are those 1) with dense fuel ladders or pole size stands, 2) near residential areas, 3) within areas bordered by shaded fuelbreaks, and 4) adjacent to road corridors, especially along SR 299 and well-used county roads. The following areas on private property have been identified for potential understory fuel treatments (see 'Project Locations' maps), with priority areas noted:

- a. Gray Flat, from Pony Creek Road west to the boundary between the USFS and private property (priority area)
- b. Hawkins Bar, from the road south of the burned store and residences to the northwest of it up the hill for about 100 feet
- c. SuzyQ Road area
 - 1) in a band along the southwest and west edge of the loop road to the southwest of SR 299
 - 2) in a band along the northwest edge of the private property to the northeast of SR 299
- d. Oden Flat area
 - 1) in a band on the south and west side of the lower flat west of SR 299
 - 2) in the densely forested area east of SR 299
- e. Salyer
 - 1) in a band behind the Salyer Store and Lazy Double B Campground & RV Park and between these two businesses
 - 2) in a band on the west side of Salyer Heights and in a corner between Salyer Court and Campbell Ridge Road (priority area)
 - 3) in a band north of Campbell Ridge Road and west of Salyer Heights (priority area)
- f. Hudson Creek area (priority area)
 - 1) in a band to the east of Campbell Ridge Road in various locations
 - 2) in an area west of Baldwin Creek Road

Understory thinning should follow guidelines 'f-o' under Project 1, 'Area-Wide Ridgetop Shaded Fuelbreaks'.

Project 4 – Prescribed Fire for Fuel Reduction

Prescribed fire is one recommended method to reduce logging and thinning slash and/or naturally occurring fine fuels that could increase fire intensity and rate of spread. Prescribed fire typically takes the form of 1) burning individual piles of slash, 2) burning non-piled concentrations of slash, 3) broadcast burning slash and litter, or 4) broadcast burning brushfields. It is used to burn slash created by human activity, naturally occurring forest litter, and brushfields. Fuels to be burned can be burned as they are, manipulated prior to burning and/or be burned at different times of the year to achieve different levels of fuel consumption.

In general, it is recommended that late fall, 'cool' prescription fires be done on a 10 to 20 year cycle and after forests are thinned or harvested. 'Cool' fires are desirable to prevent complete burning of duff and litter. If it is likely that burning will expose extensive areas of soil that will be exposed to winter rainfall, it is probably better to treat slash in some other manner.

Thinning or removal of understory sapling to pole-sized trees is recommended where prescribed fire will be applied. Priority burning units correspond to priority understory thinning units, as described above under Project 3, 'Understory Thinning for Fuel Reduction'.

Project 5 – Sign Roads to Facilitate Fire Suppression Access

The ability to drive quickly to a fire without getting lost can mean the difference between saving or losing homes, lives, or forest resources. While local fire personnel may know (or not) access routes, out of area firefighters generally do not. Adequate signing of access roads and current maps that include road names are critical to suppression efforts and firefighter safety. This fire plan has a map with the current names of all the major roads, but some of these roads are not signed at either the point of origin or at critical junctions. Some short roads/driveways to individual houses or to residential areas that are signed are not included on this map due to space limitations. It is suggested that these be added to maps used by local fire stations. At a minimum, signs should be placed at the following locations [see ‘Transportation System (Fire Access)’, pages 22-35, for descriptions of roads referenced in parentheses]:

- a. Terminus of Wallen Ranch Road and beginning of “Ziegler Point Road” (B7)
- b. Junction of SuzyQ Road (C2) and “West” (C2a), “North” (C2b), and “South” (C2c) SuzyQ Roads
- c. Junction of SuzyQ Road (C2) and an unnamed branch (C2d)
- d. Junction of SR 299 and Tunnel Flat Trail (D1) north of the Salyer Roadside Rest Area (the current sign is worn and barely visible)
- e. Junction of SR 299 and the road (E2) to the Riverside Mobile Home Park at Oden Flat
- f. Junction of SR 299 and the road (E3) on the west side at Oden Flat that runs southwest and forks three times to access dwellings
- g. Junction of SR 299 and the road up the hill at the Lazy Double D Campground and RV Park (F1)
- h. Junction of Salyer Loop Road and the road (c.) to the Salyer VFD firehouse (F3c)
- i. Junction of Salyer Loop Road and the road (d.) to the east 0.35 miles from SR 299 (F3d)
- j. Junction of Salyer Loop Road and the road (f.) to the east 0.5 miles from SR 299 (across from Rails Road) (F3f)
- k. Junction of Salyer Loop Road and the road (i.) to the north 1.15 miles from SR 299 (F3i)
- l. Junction of South Fork Road and Hennessey Road (G2l).
- m. Junction of South Fork Road and the road (G2w) to the cable crossing down river from Surprise Creek

Project 6 – Assess, Map, Sign, and Provide Access to and Protection for Water Sources

The ability to refill fire engines and water tenders quickly and efficiently can mean the difference between saving or losing homes and other structures, lives, or forest resources. Roads adequate for fire engines and water tenders to access pools in creeks, ponds, or other water sources may need to be constructed, reconstructed, or maintained. Water sources need to be protected from drying up or filling in with sediment. Signing of water sources is critical to aid firefighters in their location. Some water sources have been signed by the USFS and VFDs.

6.1 Assess the adequacy of water sources and access roads – The water sources identified on the “Fire Access and Infrastructure Map” should be assessed during late summer by fire personnel to determine whether they will provide an adequate supply of water for filling fire engines or water tenders. The access roads to these water sources, including turnarounds, should also be assessed to determine their suitability for fire engines and water tenders. At a minimum, the following water sources should be assessed (also see Appendix B):

- a. A pond (P5) in the NW ¼, SW ¼, Sec 23, T6N, R5E just north of South Fork Road, accessed by a gated dirt road
- b. A pond (W11) in the NE ¼, NW ¼, Sec 25, T6N, R5E on Wayne & Diane Weber’s property west of South Fork Road
- c. A pond (W12) on USFS and Nick, Anne, and Alicia Martin’s property in the NW ¼, SW ¼, Sec 25, T6N, R5E past the gate and north of the road to Ken & Darlene McCoy’s ranch
- d. A site (W13) at “Low Bridge” on Boyd Kimball Dyer’s property in the NW ¼, SE ¼, Sec 1, T5N, R5E is accessed through Dr. Holmes Escot’s property. The chip-sealed access road is wide initially, but full of potholes, and then narrows as it approaches the South Fork of the Trinity

- where the bridge used to be. The surface on the last .15 mile is in good shape. This road needs to have the potholes filled, three turnouts rebladed, some minor slough from cutbanks removed, brush and understory ladder fuels removed back 50-100 feet, and a sign installed at South Fork Road indicating a water drafting site. A 30-foot lift from the river will require piping and a pump. As “Low Bridge” is a popular site for water activities, it may be inadvisable to install permanent equipment that could be stolen or vandalized.
- e. A site (W14) where South Fork Road crosses a creek just south of the driveway on John & Phyliss Jurin’s property, in the NE ¼, NE ¼, Sec 13, T5N, R5E. The creek at this site was flowing in late summer 2005.
 - f. A site (W15) where South Fork Road crosses a creek (near the south terminus of the overgrown road that originates at the Todd Ranch) in the SE ¼, NW ¼, Sec 19, T5N, R6E. The creek at this site was flowing in late summer 2005.
 - g. A site (W16) on USFS lands where there is a cable crossing of the South Fork of the Trinity, just north of Surprise Creek in the NE ¼, NE ¼, Sec 25, T5N, R5E. A minimum 50 foot lift and 100 foot horizontal run would be required to pump from the river. Pipe already exists on site, but a pumping system would need to be installed. Improvements would need to be made to the access road, including turnouts, rolling dips, surfacing, an adequate turnaround at the end of the road for water tenders, and possibly reconstruction of some sections to reduce the grade.
 - h. A site (W17) where South Fork Road crosses Surprise Creek in the NW ¼, NW ¼, Sec 30, T5N, R6E. Surprise Creek was flowing at this site in late summer, 2005.
 - i. A site where South Fork Road once crossed Coon Creek in the NW ¼, NE ¼, Sec 30, T5N, R6E. The decommissioned road would need to be reconstructed so that vehicles could back down to the creek to draft water.
 - j. A site (W18) on USFS lands where Hennessey Road crosses an unnamed creek in the NW ¼, NW ¼, Sec 31, T6N, R6E east of the SPI clear cut. There was water in this creek in late 2005. The pool at the inlet to the culvert may need to be deepened and widened.
 - k. A site (W19) on private property where Hennessey Road crosses an unnamed creek in the NW ¼, NW ¼, Sec 8, T5N, R6E on private lands. Water flows in this creek in even the driest years (at least 1 gpm). A storage tank would need to be installed below the culvert.

6.2 Upgrade the water system at the USFS Salyer Work Center – The water system at the USFS Salyer Work Station, which consists of a hydrant that is gravity fed from two 20,000-gallon tanks that are supplied with water through a two-inch line from a pump in the Trinity River, needs to be upgraded. This system supplies both the USFS and the Salyer VFD and is critical for both community and wildland fire protection.

6.3 Seal the pond (P5) on South Fork Road – A pond (P5) in the NW ¼, SW ¼, Sec 23, T6N, R5E just north of South Fork Road, accessed by a gated dirt road, has been in place for only a few years. It has not yet adequately sealed, so goes dry in July. Adequate sealing could eventually increase the length of time this pond would be serviceable.

6.4 Locate & map hydrants on the Indian Health System water system in the Ammon Ranch area on South Fork Road – An Indian Health System water system is located in the Ammon Ranch area (contact Bill Oakes, 629-2901). It is evidently a good water system, but its capacity and location were not ascertained during preparation of this plan. If this system has fire hydrants, those should be located on the ‘Fire Access and Infrastructure Map’ and described in Appendix B.

6.5 Obtain Mary Arey’s maps from the Trinity County Planning Department – Mary Arey GPS’d all the water storage sites and road junctions in the Downriver FFMP area for the Trinity County Planning Department. These sites and junctions were plotted on maps. Copies of these maps should be obtained by fire responders and added to the maps in this fire plan.

6.6 Locate and assess the adequacy of water sources in the Burnt Ranch area – There are a number of potential water sources that are located in the Burnt Ranch area. The suitability of these sites, and the willingness of the landowners to have them used during a fire emergency, should be determined. The following may be suitable water sources:

- a. Burnt Ranch Store area: culvert on Hennessey Creek with a shut off to allow water to pond
- b. Underwood Mountain Road area: ponds on various properties [Eleanor Jones, Anna Rose, Galen (last name unknown), and others]
- c. Hennessey Road area: ponds on various properties (Don Decker and others)

6.7 Obtain permission to access water sources and develop agreements – When suitable water sources have been identified, obtain the permission of landowners and/or agencies to use them. Develop written (preferable) agreements between landowners and fire departments regarding water source use conditions and liability, including improvement and protection of sources, access to them, and rehabilitation following use.

6.8 Provide a map and list of water sources to fire fighting agencies - Maps and lists of the types, capacities, refill rates, and locations of water sources, including ponds, watercourses, tanks, hydrants (include type and size of fittings), pumps, and power supplies, would be helpful should fire engines or water tenders need to refill their tanks. A copy of these maps and lists should be provided, at a minimum, to the USFS fire stations at Willow Creek, Salyer, and Burnt Ranch, the Burnt Ranch, Hawkins Bar, Salyer, and Willow Creek VFDs, the CDF fire stations at Weaverville and Fortuna, and to one or more permanent residents in each community who are actively involved in community fire protection.

6.9 Sign readily accessible water sources (ponds, watercourses, pools, fire hydrants, water tanks) - A simple sign can be posted on roads and driveways indicating that a water source, including type (i.e. pond, river, creek, hydrant) and capacity, is available for emergency fire fighting and refilling of engines and water tenders. Signs should be metal, painted with reflective paint, and be clearly visible from the road. Ideally, signs should be standardized and include the name and number of the person to contact if there is a locked gate. Signs are recommended, at a minimum, at the following locations, provided they are all adequately developed for water drafting and permission to do so is obtained from the property owners:

- a. Junction of Denny Road and the unnamed road to the pond east of Trinity Village and Denny Road
- b. End of Fountain Ranch Road (directing to Sharber Creek) and Sharber Creek
- c. Junction of South Fork Road and the unnamed dirt road to a pond in the NW ¼, SW ¼, Sec 23, T6N, R5E
- d. Junction of South Fork Road and the unnamed graveled road (signed ‘Weber’) to a pond in the NE ¼, NW ¼, Sec 25, T6N, R5E
- e. Junction of South Fork Road and USFS Road 6N68 (signed ‘Martins & McCoys’ at road junction) to a pond in the NW ¼, SW ¼, Sec 25, T6N, R5E
- f. Gate on USFS Road 6N68 (signed ‘Ken & Darlene McCoy’) to a pond in the NW ¼, SW ¼, Sec 25, T6N, R5E
- g. Junction of South Fork Road and the unnamed chip sealed road (signed ‘Escot – Peaches – Trinity Retreat Center’) to Low Bridge on the South Fork of the Trinity in the NW ¼, SE ¼, Sec 1, T5N, R5E
- g. Junction of the driveway (signed ‘Escot Farms’) and the chip sealed road to Low Bridge on the South Fork of the Trinity in NW ¼, SE ¼, Sec 1, T5N, R5E
- j. Junction of South Fork Road and unnamed dirt road to the South Fork of the Trinity River cable crossing to Patrick Culvar’s place in the NE ¼, NE ¼, Sec 25, T5N, R5E
- k. Signs at suitable locations for other water sources that are identified and subsequently developed

6.10 Protect the water supplies at individual homes and in residential areas – Any exposed water pipes, pumps, electrical lines, generators, propane tanks, or other equipment and infrastructure necessary for providing water for fire protection should be protected from fire. Clear flammable vegetation in the vicinity of water supply infrastructure and bury pipes and electrical lines, and/or cover them with heat reflecting material or other suitable heat retarding cover, as appropriate.

Project 7 – Assess Potential Pools and Ponds on the Trinity and South Fork of the Trinity Rivers as Helicopter Fills and Develop Maps

The ability to refill helicopter buckets or attached tanks quickly and efficiently can mean the difference between losing or saving homes and other structures, lives, and/or forest resources. Road access is minimal in the steep terrain in the immediate vicinity of residential areas, adequate road access for rapid refilling of fire engines and water tenders is limited, and the safety of fire personnel and vehicles on narrow, winding, dead end roads is a high priority. Fire suppression by ground forces may be hampered for all of these reasons. It is therefore likely that helicopters will be used during fire suppression. Identifying reliable and safe water sources close to residential areas is critical to aid in fire suppression efforts.

- 7.1 Assess the suitability of pools on the Trinity and South Fork of the Trinity Rivers -** A pre-attack assessment of the Trinity and South Fork of the Trinity Rivers as water sources suitable for helicopter fills should be made by a qualified person to assess for safety hazards to helicopters. Suitable locations should be identified during low flows, mapped, and described using latitude and longitude coordinates.
- 7.2 Assess the suitability of ponds in the Trinity and South Fork of the Trinity River corridors -** An assessment should be made during late summer of four ponds in the Trinity River corridor and one pond on South Fork Road, as water sources suitable for helicopter fills (see Appendix C). The following ponds should be assessed:
- a. on Gray Flat, a pond (P1) on property owned by Dan (Charles) & Rebecca Aalfs (530-629-3941) southeast of Grey's Flat Road: It is evidently more than 3 feet deep and retains water all year.
 - b. in Hawkins Bar, a pond (P2) east of Trinity Village and Denny Road. This pond is on property owned by Red and Frances Hunt (916-489-4882), Harold & Joyce Wells (Larkspur – unlisted phone), and others: It is 10-11 feet deep, but water weeds that grow densely during the summer may hamper the ability to fill buckets.
 - c. in Salyer, a pond (P3) on the east side of the Trinity river east of Oden Flat. This pond is on property owned by Alex & Gloria Fulton (707-826-2926 & 530-629-4696): This pond is evidently small and dries up in late summer. The landowners may eventually increase the size of the pond.
 - d. in Salyer, a pond (P4) north of Salyer, the Trinity River, and Fountain Ranch Road in open fields between Salyer Loop Road and Knoll Road: This pond is on property owned by Colleen McCullough (530-629-3341). It is a small pond that the landowner believes will only yield a few buckets.
 - e. on South Fork Road, a pond (P5) on property owned by Ken & Darlene McCoy (530-629-3156) in the NW ¼, SW ¼, Sec 23, T 6 N, R 5 E just north of South Fork Road: This is a small pond at the west end of a long, narrow meadow between tall trees. The depth is unknown and the pond is known to go dry in July.
- 7.3 Provide an aerial photo map of pools and ponds to fire fighting agencies –** The 'Aerial Fire Access & Infrastructure Map', showing the ponds and surrounds, including hazards such as telephone and power lines, should be provided to pilots. Pools in the rivers suitable for filling buckets should be added to the map as they are identified. A copy of this aerial photo map should be provided, at a minimum, to the USFS fire station at Willow Creek, the Hawkins Bar, Salyer, and Willow Creek VFDs, the CDF fire station at Fortuna, to the air attack bases likely to respond to fires in the area, and to one or more permanent residents in each community who are actively involved in community fire protection.
- 7.4 Provide a list of pools and ponds to fire fighting agencies –** The list of 'Mapped Ponds' in Appendix C, which corresponds to the 'Aerial Fire Access & Infrastructure Map', should be provided to the fire responders in 7.3 above. As pools in the rivers suitable for filling buckets are identified, they should be added to the list.

Project 8 - Develop New Water Sources

South Fork Road is a long road (~11.8 miles) with limited places for water tenders and fire engines to draft water. There are four existing ponds and seven watercourses that may be suitable for drafting water, with or without improvement. The condition of these ponds and watercourses should be assessed during late summer (low water conditions) by qualified fire personnel. Suitable sites and their access roads should be improved as needed, with the permission of the landowners. Keys or combinations should be made available to fire personnel if gates are locked by their owners. The sites, and their access roads, should be identified with metal signs painted with reflective paint. Sites that have been tentatively identified (see 'Fire Access and Infrastructure Map') are listed in Appendix B, 'Mapped Engine Fills'.

There is a water system on the Wallen Ranch in the Hawkins Bar area that is supplied by an 8-inch pipe via a water ditch from Hawkins Creek. A 2-inch pipe continues onto the ranch to supply water for irrigation. This system could be upgraded by installing a larger pipe to the ranch house to fill temporary pools for filling helicopter buckets or to directly fill fire engines and water tenders. The access road to the house and any hydrants that are installed should be graveled or surfaced if fire vehicle use is anticipated.

Project 9 – Improve and Sign Safety Areas

There is limited road access within the plan area, with many narrow, steep, dead end, and/or gated roads into residential areas. The topography is generally steep adjacent to or in the vicinity of residential areas, with cliffs and very steep slopes in the inner gorges of the rivers and many of the tributary creeks. This makes foot travel difficult and increases the chance of firefighters getting hurt or lost. Situations could arise during wildfires where escape routes for firefighters, residents, and visitors are blocked. For these reasons, potential safety areas have been identified and shown on the 'Fire Access and Infrastructure Map'.

These areas were identified based on their proximity to rivers and/or the sparseness of flammable fuels in their vicinity. Helicopter landing sites shown on the map would in some cases provide a measure of safety in the event of a fire blowup. Three of the safety areas west of South Fork Road are only accessible over steep, narrow, graveled, and/or gated roads. It should be stressed that these areas are primarily for firefighters who are equipped for fire emergencies. If at all possible, residents in the watershed should exit areas threatened by wildfire via SR 299 or one of the county roads.

The safety zones along South Fork Road are all in meadows or fields between the road and the South Fork of the Trinity River. The safety zones at the Jurin Ranch and the McCoy Ranch are behind locked gates, and the access roads to those zones and the one at Todd Ranch are steep and narrow. At "Low Bridge" there is a safety zone next to the river that is adequate for people, but not for many vehicles. At Sandy Bar there is a large gravel bar that would provide a safe area for vehicles and people. The old mill yard southeast of the junction of SR 299 and Friday Ridge Road is a large safety zone, but is behind a locked gate.

The Trinity River area has a few safety zones that are suitable in an emergency, but only the Salyer site east of Knoll Road (off of Fountain Ranch Road) and the Peach Orchard Lane site (off of Salyer Loop Road in Salyer Heights) have been identified on the 'Fire Access and Infrastructure Map'. The other sites are much smaller and access is more problematic.

If fire were to block the access roads to SR 299, Gray Flat residents could walk to the open gravel bar to the northeast of the residential area. Residents in the Hawkins Bar and Suzy Q Road area could get to the Trinity River by vehicle or foot on one of several roads. This would require unlocking gates on two roads (River Road and the end of Hawkins Bar Creek Road) in Trinity Village. They could also access the pond to the east of Trinity Village on foot or by vehicle. There is a large meadow (Wallen Ranch) to the west of the Ziegler Point Road and north of Trinity Village, accessed by a gated road, which would be an adequate safety zone.

Most of the identified safety zones are on private property. In some cases the landowners have given permission to use these zones, but other landowners were not contacted. Fire responders in the fire plan area should request permission from landowners to use safety zones and agree on the terms of use.

- 9.1 Improve and maintain safety areas shown on the ‘Fire Access and Infrastructure Map’** – The safety areas should be improved and checked annually to insure they meet the following conditions:
- a) If possible, improve access so vehicles can easily enter, exit, and park in the safety areas.
 - b) Within 100 feet of the safety areas, remove all snags, dead top trees, and trees with heart rot or heavy mistletoe infections that could fall into the safety areas (ex. a 40 foot snag within 40 feet of a safety area would be removed, but retained if it occurred 60 feet from the safety area perimeter).
- 9.2 Sign safety areas with ‘Safety Area’ signs** - Signs provide fire fighters unfamiliar with the area with landmarks. They should clearly designate the routes to and the locations of safety areas. Signs should be metal and should be painted with reflective paint.
- 9.3 Provide maps to fire fighting agencies** – Maps showing the location and size of safety areas and the type of route marking should be provided to all agencies responsible for fire suppression in the plan area, including local volunteer and agency fire stations.

Project 10 – Assess, Improve, Sign, and Record Helicopter Landing Sites

Due to the limited road access within the plan area, with many narrow, steep, dead end, and/or gated roads into residential areas, it is likely that helicopters will at some time be used during fire or medical emergencies. A number of helicopter landing sites were identified by residents and fire personnel during the meetings in Salyer and Hawkins Bar during development of the “Recommendations on Trinity County Values at Risk from Fire and Pre-Fire Fuels Treatment Opportunities drawn from Community Meetings 1999/2000”. Other potential locations were identified during development of this plan (see ‘Fire Access and Infrastructure Map’). These sites were assessed by a CDF helicopter pilot (Jim Eastman) in February 2006 to confirm that they are indeed suitable and to determine what, if any, improvements should be made.

Most of the property owners of lands where sites were identified were contacted and gave verbal permission to land helicopters. All landowners should be contacted by local fire responders for permission and if possible, written agreements should be obtained and necessary improvements should be made as soon as possible to the sites, surroundings, and access roads. Directional signs (metal & reflective) should be placed on access roads to suitable sites and on the sites themselves. The coordinates of these sites have been derived from GIS and the locations recorded on the ‘Fire Access & Infrastructure Map’. A list of helicopter landing sites, with physical and legal descriptions, coordinates, access routes, site descriptions, and landowner contact information is in Appendix D and should be made available to all air attack and fire stations.

Project 11 – Assess Traffic on South Fork Road

It is believed that from 50-100 vehicles use South Fork Road during the summer to access the South Fork of the Trinity River at Low Bridge, the SPI property in Section 36, Todd Ranch, and Surprise Creek and the trailhead at Coon Creek. This level of vehicle traffic increases the risk of fire ignitions and accidents. In the event of a fire emergency, because of the narrow road, congestion could hamper fire suppression efforts. It has been suggested that it would be useful for the Trinity County Department of Transportation to get an accurate picture of the vehicle use on South Fork Road during the summer. Counters could be placed at the beginning of the road, south of the road to the McCoy Ranch, south of the road to Low Bridge, and south of the road to Todd Ranch to determine the general destination of the vehicles and volume of traffic. Counters should be read on a monthly basis and left for a year to determine use during all seasons.

Project 12 – Provide Call Boxes on South Fork Road

The ability to communicate via telephone is limited toward the south end of South Fork Road. Not all houses have telephone service and cell phones experience “dead zones”. It has been recommended that call boxes be installed at strategic intervals along the road for emergencies. Residents and visitors alike would then be able to call 911 during fire or medical emergencies.

Project 13 – Increase Clearances on PG&E Power Lines

PG&E owns a high-voltage electrical transmission line that parallels SR 299 through the plan area, as well as numerous low-voltage electrical transmission lines that service residences and businesses. These transmission lines are vulnerable to trees falling on them and either starting fires or putting the lines out of commission. It was recommended by some residents along South Fork Road that the clearances adjacent to the lines be increased in width. It is recommended that fire planners from the USFS and VFDs and representatives from the local communities discuss this with PG&E representatives to determine what, if anything can be done to increase clearances.

C. Residential Projects

Four immediate concerns face fire fighters if a rapidly moving fire starts in, or around, the communities or residential areas within the Downriver FFMP area. First, fire fighters would need to concentrate on accessing the fire scene while allowing residents to evacuate. Second, protection of homes and evacuation of residents would be a priority over containing a rapidly building fire. Third, the relatively dense home site development in some areas would limit the ability of fire fighters to burn out ('back fire') the area between the on-coming fire and natural fuel breaks without risking homes and other property. Fourth, the limited safety zones and escape routes could put residents and fire fighters at risk if they are over run by fire. In the worst case scenario, fire fighters would concentrate on evacuation, not try to protect structures, and thus be unable to take effective action against the fire.

Two fires in 2003, the Friday Fire in June and the Loma Fire in September, motivated some residents to install water holding ponds and others to reduce the fuels around their homes. Although many residents have reduced hazardous fuels on their properties, some with the help of Trinity County Resource Conservation District crews, there remain localized areas where more fuel/fire hazard reduction is advisable. This can be accomplished by treating surface fuels to reduce their flammability, reducing ladder fuels by “thinning from below”, and opening the forest canopy by sanitation-salvage harvesting and/or commercial thinning. Some of these treatments may produce commercial quality logs while others may produce no marketable products. Timber harvesting, even for safety reasons, will be constrained on some parcels because of visual, soil, wildlife, tree felling hazard, and/or philosophical concerns of the owners. Objectives for and definitions of a healthy forest, value, and fire risk will invariably differ between owners. The following recommended projects are consistent with community goals, but no site-specific projects will occur that do not meet an individual landowner’s personal goals.

Project 14 - Residential Area Defensible Space Fuelbreaks

Within the residential areas moderate, and in some cases heavy, overstocking of small diameter hardwood and conifer trees occurs on some parcels. Over-stocked stands favor shade tolerant species and reduce tree growth, often resulting in trees taking 15 years, or more, to gain one inch in diameter. Stress in overstocked stands increases the likelihood of disease or tree mortality, which can lead to an increase in dead fuels. In addition, fuel ladders occur that can rapidly carry a fire into tree crowns, hampering control.

- 14.1 Defensible space** - Defensible landscape designs should be built into areas around homes. Clear flammable vegetation and dead fuels within 100 feet of homes and other buildings. Use irrigation, fire resistant plants and/or other techniques shown in Appendix E to reduce the susceptibility of homes to fire damage.
- 14.2 Fuel modification** - Fuel modification within 100-150 feet of homes should be considered by landowners. Treatments should be similar to those done in fuelbreak areas, except that irrigated

areas and the use of fire resistant landscaping can allow greater vegetative cover (refer to Appendix E).

Defensible Space Fuel Modification Distances			
Percent Slope	Distance From House		
	Uphill	Sidehill	Downhill
Level to 20%	100 feet	100 feet	100 feet
21% to 40%	150 feet	150 feet	200 feet
41% to 60%	200 feet	200 feet	400 feet

Reduce fire hazard and improve forest health around homes by breaking up the vertical and horizontal continuity of fuels. One or more of the following general stand treatment needs can be found in most residential areas:

- a) **Understory thinning/fuel reduction** - Tree crowns in some yards are overlapping and there are numerous small trees in the understory. This fuel condition presents a risk of rapid movement of fire into the crowns of overstory trees as well as rapid horizontal fire spread through the crowns. These stands should be thinned to remove ladder fuels, to favor the larger trees with better crowns, and to create breaks between individual trees or clumps of trees.

Recommended Distances Between Tree Crowns by Percent Slope	
Percent Slope	Distance Between Tree Crowns
Level to 20%	10 feet
21% to 40%	20 feet
41% to 60%	30 feet

- b) **Overstory thinning** - Some residential areas are in a dense to moderately dense forest. Thinning should be done in these stands to remove suppressed or intermediate trees in order to favor the healthy dominant and co-dominant trees. This treatment would improve growth on the residual trees and reduce fire danger by breaking up the continuity of tree crowns while removing potential ladder fuels, especially smaller conifers. Commercial timber harvesting, however, would have to meet landowner objectives for visual quality, wildlife and other values. Clean-up of logging slash would be necessary to achieve improved fire protection. Any sale of wood products from a timber harvest would require filing of a Timber Harvest Plan, or exemption, with CDF. If trees are harvested within 150 feet of structures approved and legally permitted by the County Building Department, a simple timber harvest plan exemption may be filed. An exemption may also be filed to remove dead, dying, and diseased trees anywhere on the property in amounts of less than 10% of the average volume per acre. Under the Forest Fire Prevention Exemption, trees of up to 18 inches in diameter at the stump can be removed to create a shaded fuelbreak, provided slash is treated to minimize flame heights in the event of a wildfire.

Project 15 - Residential Area Emergency Fire Vehicle Access

If access to homes is unsafe for fire engines and crews, firefighters will likely leave them unprotected. In some cases driveways will need to be signed and upgraded to expedite access by emergency fire engines. In other cases, heavy brush or dense trees along access roads will need to be cleared or thinned to provide visibility and protection from intense heat if a fire should approach the roads.

- 15.1 Sign driveways with 911 addresses and name(s)** - Signs provide fire fighters unfamiliar with the area with landmarks. In addition, they allow for improved response, not only for fire fighters, but

for all emergency responses. Trinity County Ordinance #1124-2 requires 911 addresses to be placed at all residences so that they are legible and easily visible from the road upon which the premises front. Numbers are required to be at least three inches in height and preferably made from reflective material for ease of night viewing. These addresses can be obtained from the Trinity County Planning Department. Although not required, signs could also include the resident's(s') last name.

- 15.2 Provide gate access** – In the event of a fire, locked gates may hamper access. Emergency response agencies need to obtain keys and combinations to these locks, have their own locks added to the gates, or have permission to cut locks (but replace them later).
- 15.3 Sign culverts, septic tanks, or other sensitive areas to indicate weight capacity** - Engine operators can more quickly and safely drive to homes when bridges, culverts and other crossings are clearly marked as being capable of supporting the weight of the engines. Fire engines weigh between 17½ to 20 tons, water tenders more. Consult the Caltrans Highway Design Manual, “Minimum Thickness of Cover for Culverts” table to determine adequacy for engine crossing. Any soft ground, septic tanks, buried water lines or other hazards to equipment should be marked to protect them and equipment.
- 15.4 Construct turnarounds in driveways** - Most modern fire engines require a minimum of 27-35 feet radius to be able to turn around, although a smaller distance will suffice if there is a turning space to back into. If an engine cannot safely enter and exit a driveway it may have to leave a home unprotected or set up a hose lay from the road. Residents can check with the Hawkins Bar or Salyer Volunteer Fire Departments to determine if their driveways are adequate.
- 15.5 Construct turnouts** - In residential areas construct 10 x 30-foot turnouts approximately every 400 feet along access roads where visibility or terrain act as bottlenecks to safe travel. Some turnouts already exist and minor tree removal and grading will allow other locations to be quickly developed into turnouts. Use existing flats and natural turnouts whenever possible rather than constructing new turnouts that require excavation into slopes. Obtain landowner permission for all turnouts.
- 15.6 Clear brush and small trees along driveways** – Some sections of access roads are lined with heavy brush or dense trees that limit visibility and/or will support intense fire with long flame lengths. This vegetation should be cleared, thinned, and/or pruned within 10-50 feet of the roads, as specified below.
- a) **Remove trees and brush** - Trees along road edges that constrict views, prevent two vehicles from safely passing each other, or act, as fire ladders should be removed. Brush and small trees should be removed within 30-100 feet of the edge of main roads and within 10-20 feet of the edge of other roads. Minimum tree removal should include those marked by a forester or fire professional. Additional tree removal should be determined by each landowner. Commercial tree removal on private lands may be done under specified conditions using several THP exemptions.

Strips of dense brush and/or trees can be left at strategic locations to provide privacy screening for homes and yards, provided there is sufficient cleared area around them to prevent rapid fire spread. But it should be recognized that these strips, because they have denser fuels, might catch fire from flying embers (spotting fires) during wildfires.
 - b) **Prune trees** - Dominant and co-dominant trees should be pruned up to 16 feet above the ground, but always leaving at least 40% of the bole in live crown. Smaller trees should be pruned at least three times the height of any vegetation under them. As canyon live oak limbs tend to droop near to the ground, it is better to prune the ends of the branches up high enough so that surface fires are unable to ignite the foliage. If possible, provide at least 200 feet of sight distance along roads. In places with limited turnouts, longer sight distances are necessary to assure fire vehicle traffic safety and to minimize delays.

Project 16 – Maximize Personal Safety During Fire Emergencies

Personal safety during a fire emergency is the highest priority for virtually all people. Most people in the planning area live in houses on dead end roads that are bordered by forests that are generally dense and have hazardous fuels. Some houses do not have telephone service over land lines and are thus dependent on cell phones, which can only send and receive signals in limited areas (especially true in the lower South Fork Road area). Power and telephone lines are sometimes non-functional, especially during fire or storm events. It is therefore highly desirable to have multiple means of communication.

16.1 Develop an ‘early warning system’ for residents - An ‘early warning system’ between neighbors can be useful to inform other residents of potential danger in the event of a fire in, or potentially affecting, residential areas. Residents at widespread locations may not be aware of a fire in other portions of the watershed. Early warning can facilitate orderly actions by residents at more remote locations. This system can also be used to determine if a fire, or other event, even requires action by landowners well away from the incident.

Phone trees are one method for warning people. Each person who is designated to contact one or more people should report to a pre-designated person responsible for tabulating the names of all people contacted. That person should then report to the lead and/or local fire agency whether any residents are potentially in the path of the fire and whether all residents have evacuated the area. Phone trees should be updated annually before the beginning of fire season. The South Fork Road community expects to have a phone tree in place by June 2006.

16.2 Establish a backup method to contact and track the location of residents - Due to the limitations on phones noted above, a backup method for informing neighbors needs to be devised. This should be a combination of methods to insure that no one is unaccounted for. Two immediate neighbors with phones could drive to the more isolated houses to warn people, and then call the person responsible for keeping track of who has been contacted and evacuated. A “fire emergency board” could be placed along exit routes at locations where most or all of the traffic leaving an area would have to pass. As residents passed, they could write their names on a blackboard, hang pre-numbered or pre-named tags on hooks on a board, or check their names off on a checklist. Someone would need to check this board and relay the information to the responsible person, who would then pass it on to the fire agency. Someone would also need to be responsible for maintaining the board in a serviceable condition.

16.3 Sign evacuation routes and safety zones – The city of Ashland, Oregon has posted fire evacuation signs on streets used for evacuation during fires. It would be advisable to do the same on major county roads in the fire plan area, as visitors in particular might otherwise become lost and find themselves on a dead end or gated road during a fire emergency. It would also be advisable to place signs to designated safety zones at regular intervals along access roads. Signs should be metal and should be painted with reflective paint.

16.4 Prepare a fire response “how to” booklet for residents – A fire emergency can cause considerable confusion, with residents unclear on how to act. It would be quite helpful if a booklet were prepared by fire and emergency managers that outlined how residents could best respond to different fire emergencies. At a minimum this booklet should have maps showing evacuation routes and safety zones, instructions on how to evacuate and use safety zones, what to do if trapped by fire, and phone numbers of people to call to a) get fire information, b) provide fire and medical information, and c) inform of their whereabouts.

Project 17 - Community Education

The Downriver FFMP is a synthesis of information from community meetings, individual landowner consultations, on-site reviews, recommendations from fire experts from the Hawkins Bar and Salyer VFDs, USFS, CDF, and the TCRC, and literature reviews. Annual or semi-annual community fire planning meetings with resource managers and fire professionals from the above agencies and organizations would be beneficial. These meetings would be an opportunity for residents to establish and/or update a phone list of neighbors to warn in the event of a fire, to remind landowners of the danger of fuel build up around

homes, to encourage maintenance of fuelbreaks along roads, to plan the periodic maintenance of community fuel breaks, and to inform new residents about fire management issues.

- 17.1 Establish an annual fire meeting** – Meet annually or semi-annually as a community with fire and resource professionals from the Hawkins Bar, Salyer, and Willow Creek VFDs, CDF, USFS, and TCRCDD to update a phone list of neighbors to warn in the event of a fire, to remind landowners of the danger of fuel build up around homes, to encourage maintenance of fuelbreaks along roads, to plan the periodic maintenance of community fuelbreaks, and to inform new residents about fire management issues.
- 17.2 Erect Fire Awareness Signs** – Residents of the downriver communities are quite aware of the danger from fire, but visitors to the area may not be. It is advisable to place fire awareness signs along well-traveled county roads and SR 299.

Funding Sources

There are two programs available to forest landowners that cost share stewardship and forest improvement projects, the federal Environmental Quality Incentives Program (EQIP) and the state California Forest Improvement Program (CFIP). These are cooperative programs that assist eligible landowners with technical and financial assistance for planning, reforestation, thinning, wildlife habitat improvement and other investments that enhance forest resources, such as soils, water quality, recreation, and timber growth and quality. These programs can assist in creating shaded fuel breaks, fuel modifications, and defensible zones around homes and other buildings, improving water quality, and doing other projects as determined on a site specific basis.

EQIP - This is a program administered by the Natural Resources Conservation Service (NRCS). Eligibility for EQIP requires the landowner to be a producer of agricultural products on property that is zoned to allow that use. Conservation practices funded under this program are those that reduce soil erosion, improve water quality and forest health, conserve water, and protect grazing land. Forest practices funded by this program are firebreaks, fuelbreaks, thinning, slash disposal, tree/shrub pruning, site preparation, prescribed burning, and tree/shrub planting. Practices are funded at a 50% cost share rate of up to \$10,000 per year and \$50,000 per five-year contract. Applications can be submitted at any time of year, but the cutoff date for funding in any fiscal year is November 30. Contact the NRCS office at #3 Horseshoe Lane, Weaverville, CA 96093, (530) 623-3991 and/or <http://www.nrcs.usda.gov/programs/eqip> for further information.

CFIP - To qualify for CFIP, administered by CDF, a landowner needs a minimum of 20 acres of forested land zoned to allow forest resource management, although two or more contiguous landowners can cooperate to meet the 20-acre minimum size requirement. The minimum project size is 5 acres, with no minimum acreage requirements for land and resource conservation projects. A landowner may apply for a practice at any time of year. The CFIP requires a management plan and a 10-year land use agreement. Project boundaries, cost estimates, prescriptions for proposed practices and a work schedule are included in the plans. The program will cost share the management plan and projects for up to 75% of costs, up to a maximum allowable cost. A copy of the 2005 CFIP Guide, Vol. 1 can be obtained at http://www.fire.ca.gov/php/rsrsrc-mgt_forestryassistance_cfip.php. Also contact Jim Robbins, CDF forester at (707) 725-4413 and/or the Forest Stewardship Helpline at 1-800-738-TREE for further information.

APPENDIX A

RECOMMENDED PROJECT MITIGATION MEASURES

Mitigation Measure	Fuelbreak Areas	Watercourse Zones	Homes & Roads	Other Treatment Areas
FB#1	All areas of disturbance			
FB#2				
FB#3	All areas of disturbance			
FB#4				
FB#5	All areas of disturbance			
T&E#1, 2, & 3	All areas of disturbance			
S#1		No Tractor Operations		
S#2				
S#3				
S#4		No Tractor Operations		
S#5				
S#6				
S#7	All areas of disturbance			
WLPZ#1				
WLPZ#2				
WLPZ#3				
WLPZ#4				
WLPZ#5				
WLPZ#6				
CR#1, 2 & 3	All areas of disturbance			
FH#1 & 2	All areas of disturbance			
FH#3				
FH#4				
FH #5	Locations as appropriate			

Fuelbreak Mitigation Measures

FB# 1 - Maintain stand diversity by retaining a minimum of 5-10 ft² basal area per acre of hardwoods in addition to the conifers.

FB# 2 - Protect large diameter snags (20" dbh & 20' tall) and large downed logs (10" diameter and 8' long), consistent with landowner and safety objectives, by clearing away light fuels within 10' of such snags/logs.

FB# 3 - If snag and cavity nesting trees must be removed, consider placement of wildlife structures, such as roost poles, platforms, artificial cavities and nest boxes, and placement of large logs within treated areas.

FB# 4 - Emphasize retaining canopy closure and concentrate treatments on pruning ladder fuels and ground fuels.

FB# 5 - Trees should not be pruned to less than 40% live crown.

Threatened and Endangered Species

T&E # 1 - Consult the California Department of Fish and Game Natural Diversity Database for known occurrences of rare, endangered or sensitive species habitat in, and adjacent to, areas where site disturbing activities are to occur.

T&E # 2 - If an occurrence of rare, endangered or sensitive species habitat is likely, survey prior to ground disturbing operations. If present, designate Special Treatment Areas, projects, and timing of operations to benefit, or at least not adversely affect, the protected species.

T&E # 3 - Inspect the area for live trees and snags with visual evidence of use as nesting and roosting sites for rare, endangered, or threatened species. Such snags must be retained, unless they are a safety or fire hazard. Snags that are safety or fire hazards must be felled. Retain other snags, especially where found within watercourse and lake protection zones.

Soils

Soil # 1 - Limit tractor operations to less than 40 percent slopes, with contour windrowing of slash on slopes over 25 percent. Leave effective berms of residual soil to impede surface water flow.

Soil # 2 - Tractor piling of slash should only be done by equipment with a brush rake.

Soil # 3 - Tractor operations should only be done when the soil is dry or on snow.

Soil # 4 - Flag an equipment exclusion zone (using the CA Forest Practice Rule setbacks) to prohibit equipment operations near perennial and ephemeral streams or the bottoms of drainages.

Soil # 5 - Water breaks (waterbars) should be constructed in treated areas using the spacing guidelines in the CA Forest Practice Rules to minimize surface runoff.

Soil # 6 - Flag or otherwise delineate potential landslide prone and other unstable areas and prohibit heavy equipment operations on these areas.

Soil # 7 - Evaluate and describe any unusual circumstances or project site conditions (e.g. soil type, slope % or aspect, size of project, soil moisture) that could result in surface erosion effects not adequately mitigated by the above mitigation measures. Provide for additional environmental evaluation of these areas as needed.

Water Resources, Wetlands and Riparian Areas

WLPZ # 1 - Flag or otherwise designate watercourse and lake protection zones where ground-disturbing equipment will be precluded.

WLPZ # 2 - Prevent slash and debris deposition within watercourse and lake protection zones. Accidental depositions should be cleaned up immediately.

WLPZ # 3 - No machinery should be serviced adjacent to streams, lakes, within wet meadows, marshes and other wet areas, or in other areas where such servicing will permit grease, oil, or fuel, or other toxic substances to enter lakes, streams or wet areas.

WLPZ # 4 - Flag any domestic water supply sources within operation areas to protect water quality.

WLPZ # 5 - Discuss with equipment operators and woods bosses how activities in the vicinity of the protection area will be carried out to prevent water quality degradation.

WLPZ # 6 - Flag, or otherwise delineate equipment exclusion zones around wet meadows, marshes, and other wet or sensitive areas.

Prehistoric & Historic Cultural Resource Values

CR # 1 - An archeological records search and project review should be made by the Northeast Information Center at Chico State University for projects on private lands that have not been previously reviewed.

CR # 2 - Survey project areas for prehistoric and/or historic resources and if sites are located, flag equipment exclusion zones and prepare other appropriate mitigation measures necessary to protect the site.

CR # 3 - If any archeological or historical resources are inadvertently encountered during or after operations, contact CDF immediately to arrange for an evaluation by a professional archaeologist, if necessary. Cease all project activities near the discovered site until appropriate protection measures are developed.

Forest Health Recommended Actions

FH # 1 - Treat all slash and other fine fuels generated from project activities. To prevent the infestation of residual stands of three-needle pines with Ips and Dendroctonus beetles, slash created between November 1-May 15 should be immediately treated by chipping, burning, lopping, or hauling off-site.

FH # 2 - To prevent the infestation of pine stands with root rot pathogens after precommercial thinning, apply Sporax® to thinned stumps.

FH # 3 - Encourage residential landowners to plant understocked areas, thin overstocked areas, and prune trees to improve form, aesthetics and reduce fire hazard.

FH # 4 - Encourage residential landowners to salvage dead, damaged, dying and diseased trees where it is a hazard to residents.

FH # 5 - Enhance wildlife habitat through the use of habitat modification and construction of nesting boxes, platforms, wildlife piles, guzzlers etc.

APPENDIX B
MAPPED ENGINE FILLS

Mapped Engine Fills

A number of water drafting sites are, or may be suitable for filling fire engines or water tenders. Ponds with potential for helicopter bucket fills are mapped as “P”, but are also suitable for fire engines and water tenders. Water drafting sites mapped as “W” are suitable only for fire engines and water tenders. Both of these drafting sites are described below.

Water Drafting Sites in the Trinity River Corridor

(P1)

physical location: Gray Flat: between SR 299 and the Trinity River

legal: SW ¼, SW ¼, Sec 27, T6N, R6E, HBM (as shown on “Fire Access & Infrastructure Map” - SW ¼, SE ¼, Sec 28 on USFS recreation map)

longitude: -123°, 29.806’

latitude: 40°, 51.761’

access route: SR 299, northeast on paved Grey’s Flat Road, take right fork (0.1 mile from SR 299), through locked gate, past house to pond (access beyond the locked gate and to pond needs to be ascertained)

description: This pond is evidently more than 3 feet deep and there are reported to be no obstructions or tall trees near it (this needs to be confirmed).

landowner: Dan (Charles) & Rebecca Aalfs (530-629-3941)

(P2)

physical location: Hawkins Bar: east of Trinity Village and Denny Road

legal: NW ¼, NW ¼, Sec 28, T6N, R6E, HBM

longitude: -123°, 30.914’

latitude: 40°, 52.39’

access route: SR 299, east on Denny Road, right (southeast) on dirt road just past Trinity Village sign and Lone Pine Road, through locked gate to pond

description: Pond is 10-11 feet deep, but water weeds grow densely during the summer, which may hamper the ability to fill buckets. The area to the south and west of the pond is forested.

landowner: Red and Frances Hunt (916-489-4882), Harold & Joyce Wells (Larkspur – unlisted phone), and others

(W1)

physical location: Hawkins Bar: Flame Tree Road, northwest of Denny Road and Hawkins Creek

legal: SW ¼, SW ¼, Sec 21, T6N, R6E, HBM (as shown on “Fire Access & Infrastructure Map” and on the USFS recreation map)

longitude: -123°, 30.874’

latitude: 40°, 52.590’

access route: SR 299, east on Denny Road, left (northwest) on Flame Tree Road, cross Hawkins Creek to covered reservoir and hydrant on left at first bend in the road

description: This is a hydrant and a covered reservoir, which is the water supply for Trinity Village. The reservoir is supplied from Hawkins Creek.

landowner: D. Joseph Simera, Kneeland, CA (707-444-9385)

(W2)

physical location: Hawkins Bar: south of Trinity Village, where River Road meets the Trinity River

legal: SW ¼, SW ¼, Sec 20, T6N, R6E, HBM

longitude: -123°, 32.037'

latitude: 40°, 52.496'

access route: SR 299 to Denny Road, follow Denny Road across bridge over the Trinity River to Trinity Village, left (west) on Hawkins Bar Road, left (south) on River Road, through gate and down road to the Trinity River

description: This site is the Trinity River, accessed over a road to a gravel bar.

landowner: Francis Matthews II, San Francisco, CA (unlisted phone)

(P3)

physical location: open meadow east of SR 299, Oden Flat, and the Trinity River

legal: SW ¼, SW ¼, Sec 18, T6N, R6E, HBM

longitude: -123°, 33.213'

latitude: 40°, 53.421'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, follow past "End of County Road" sign and pavement (~ 1.35 miles from Salyer Loop Road), through locked gate on road paralleling river, through Riverview Estates, through two more locked gates, to road to left (east) to pond (the access route beyond the locked gates needs to be ascertained)

description: This is a small pond that dries up in the summer. The landowners plan to eventually deepen and widen the pond.

landowner: Alex & Gloria Fulton (707-826-2926 & 530-629-4696)

(W3)

physical location: Riverview Estates area: Sharber Slough, west of Riverview Estates on the north bank of the Trinity River

legal: SW ¼, NW ¼, Sec 13, T6N, R5E, HBM

longitude: -123°, 33.803'

latitude: 40°, 53.744'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, follow past "End of County Road" sign and pavement (~ 1.35 miles from Salyer Loop Road), through locked gate on road paralleling river to Riverview Estates, right (south) on road to Trinity River (the access route beyond the locked gate needs to be confirmed)

description: This drafting site is on the Trinity River (Sharber Slough) and is accessed by a road through the Peckham's property. The suitability of this site and needed improvements need to be ascertained and permission to use the site needs to be obtained from the landowners.

landowner: William & Kristen Peckham (530-629-2262)

(W4)

physical location: Riverview Estates area: Peckham Creek at crossing of access road to Riverview Estates

legal: SW ¼, NW ¼, Sec 13, T6N, R5E, HBM

longitude: -123°, 33.737'

latitude: 40°, 53.884'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, follow past "End of County Road" sign and pavement (~ 1.35 miles from Salyer Loop Road), through locked gate on road paralleling river to Riverview Estates, to crossing of the first creek (Peckham Creek) past the locked gate

description: Peckham Creek is an unofficially named, perennial (per the quad map), spring-fed creek. This site is used as a water source by landowners in the area. It was not visited because it is behind a locked gate. The suitability of this site needs to be ascertained and permission obtained for its use.

landowner: Michael Christians, American Hydroponics (707-822-5777)

(W5)

physical location: End of Fountain Ranch Road area: Sharber Creek at crossing of access road to Riverview Estates

legal: NW ¼, NE ¼, Sec 13, T6N, R5E, HBM

longitude: -123°, 34.002'

latitude: 40°, 53.841'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, follow road past the "End of County Road" sign and pavement (~ 1.35 miles from Salyer Loop Road) to the first creek (Sharber Creek)

description: Sharber Creek is a perennial creek with a good flow, which lessens toward the end of summer. The area near the road is heavily vegetated with blackberries. This site may need to be improved before water can be drafted. The landowner should be contacted regarding its use.

landowner: Kenneth & Darlene McCoy (530-629-3156)

(W6)

physical location: End of Fountain Ranch Road area: Gravel Road north of Councilman Road

legal: SE ¼, NW ¼, Sec 13, T6N, R5E, HBM

longitude: -123°, 34.187'

latitude: 40°, 53.608'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, left (east) on Councilman Road (~ 1.15 miles from Salyer Loop Road), right (north) on Gravel Road (first road) to hydrant on first property to the left (west)

description: This is a hydrant at the back of the Wolfe's property. It is part of the Carpenter Waterworks, owned by Walter (Gary) Carpenter (530-629-3828), and is evidently fed by a 20,000-gallon storage tank that is supplied by water pumped from the Trinity River. (Gary Carpenter could not be contacted to confirm the capacity of the storage tank, other existing hydrant locations, and terms of use.)

landowner: Raymond & Linda Wolfe (707-822-6407)

(W7)

physical location: End of Fountain Ranch Road area: Fountain Ranch Road west of Councilman Road

legal: NE ¼, SW ¼, Sec 13, T6N, R5E, HBM

longitude: -123°, 34.187'

latitude: 40°, 53.608'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road for approximately 1.0 mile, hydrant is on left (north) side of road (the exact location of this hydrant needs to be determined)

description: This is a hydrant on the Bishop property. It is part of the Carpenter Water System, owned by Walter (Gary) Carpenter (530-629-3828), and is fed by a 20,000-gallon storage tank that is supplied by water pumped from the Trinity River. The exact location of this hydrant needs to be determined as the landowner could not be contacted. (Gary Carpenter could not be contacted to confirm the capacity of the storage tank, other existing hydrant locations, and terms of use.)

landowner: Tina Bishop, Salyer, CA (unlisted phone)

(P4)

physical location: Salyer: north of SR 299, the bridge over the Trinity River, and Fountain Ranch Road in open fields between Salyer Loop Road and Knoll Road

legal: SE ¼, NW ¼, Sec 14, T6N, R5E, HBM

longitude: -123°, 35.155'

latitude: 40°, 53.746'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, left (west) on driveway (~ 0.2 mile from Salyer Loop Road) before Knoll Road, follow road to pond (the access route on private property beyond Fountain Ranch Road needs to be confirmed)

description: This is a small pond whose depth is unknown. The landowner indicated that only a few buckets would empty the pond. The north to east quadrant is forested and the other quadrants are open fields. There is a low fence in the vicinity and a high voltage power line about 500 feet to the south.

landowner: Colleen McCullough (530-629-3341)

(W8)

physical location: Salyer Heights: north of Campbell Ridge Road, west of Salyer Court

legal: NW ¼, SE ¼, Sec 11, T6N, R5E, HBM

longitude: -123°, 34.832'

latitude: 40°, 54.397'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, left (west) on paved road, left (northwest) on Campbell Ridge Road in Salyer Heights, right (north) at last driveway to right (north) before the first sharp right bend in the road (access to this site needs to be confirmed)

description: The nature of this site was not determined. It may be a hydrant at the Kramer house. It was identified as a water drafting site during the 1999/2000 community meetings to identify values at risk, fire infrastructure, and pre-fire projects. (the existence and suitability of this site needs to be ascertained)

landowner: Cappy Kramer (unlisted phone)

(W9)

physical location: Salyer Loop Road: southwest of Salyer Heights at unnamed creek

legal: SE ¼, SW ¼, Sec 11, T6N, R6E, HBM

longitude: -123°, 35.219'

latitude: 40°, 54.163'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, left (west) to first creek past Rails Road

description: There is a private water system at an unnamed, intermittent creek. A spring-fed, 10,000-gallon water tank overflows into an 800-gallon tank. The landowner has given permission to the Salyer VFD to pump water from the small tank and if necessary, from the large tank. The water system was adversely affected by the December 2005 storms and is in need of repair.

landowner: Lee Duey (530-629-2041)

(W10)

physical location: USFS Salyer Work Center: east of SR 299, Oden Flat, and the Trinity River

legal: NE ¼, SW ¼, Sec 14, T6N, R5E, HBM

longitude: -123°, 35.133'

latitude: 40°, 53.423'

access route: SR 299, north into USFS Salyer Work Center (exact location of hydrant needs to be confirmed)

description: This is a hydrant at the USFS Salyer Work Station that is gravity fed from two 20,000-gallon tanks that are supplied with water through a two-inch line from a pump in the Trinity River. This system, which supplies both the USFS and the Salyer VFD, needs to be upgraded.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118) or Salyer Work Center (530-629-2114)

Water Drafting Sites in the South Fork of the Trinity River Corridor

(P5)

physical location: South Fork Road: north of South Fork Road at the west end of a narrow meadow

legal: NW ¼, SW ¼, Sec 23, T6N, R5E, HBM

longitude: -123°, 35.612'

latitude: 40°, 52.634'

access route: SR 299, south on South Fork Road ~ 1.2 miles, right (north) on dirt road, through locked gate to pond

description: This is a small pond at the west end of a long, narrow meadow between tall trees. The landowner says that this is a shallow pond that has been in place for only a few years. It has not yet adequately sealed, so goes dry in July. Adequate sealing could eventually increase the length of time this pond would be serviceable.

landowner: Ken & Darlene McCoy (530-629-3156)

(W11)

physical location: South Fork Road: west of South Fork Road at southeast end of Ammon Ranch area

legal: NE ¼, NW ¼, Sec 25, T6N, R5E, HBM

longitude: -123°, 34.183'

latitude: 40°, 52.199'

access route: SR 299, south on South Fork Road ~ 3.1 miles, right (west) on graveled road, signed "Weber", to pond

description: This is a small, all year pond. The depth, access, and amount of water, if any, during the latter part of the fire season are unknown. (access and condition of this pond need to be ascertained)

landowner: Wayne & Diane Weber (530-629-2568)

(W12)

physical location: South Fork Road: west of South Fork Road and north of USFS Road 6N68, south of Ammon Ranch area

legal: NW ¼, SW ¼, Sec 25, T6N, R5E, HBM

longitude: -123°, 34.530'

latitude: 40°, 51.955'

access route: SR 299, south on South Fork Road ~ 3.55 miles, right (west) on graveled road (USFS 6N68), signed "Martin's & McCoy's", through locked gate signed "Ken & Darlene McCoy" ~ 100 yards to pond on right (north) side of road

description: This is a small, all year pond fed by artesian springs. The depth and amount of water during the latter part of the fire season is unknown. This pond supplies both the Martin's and the McCoy's, so they need to be consulted regarding terms for its use.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118) & Nick, Anne, and Alicia Martin (530-629-2028)

(W13)

physical location: Low Bridge: road to the east of Low Bridge on the South Fork of the Trinity River

legal: NW ¼, SE ¼, Sec 1, T5N, R5E, HBM

longitude: -123°, 34.084'

latitude: 40°, 50.076'

access route: SR 299, south on South Fork Road ~ 6.8 miles to chip-sealed road to right (southwest), signed "Escot, Peaches, Trinity Retreat Center", follow road to left to Low Bridge and the South Fork of the Trinity River

description: The river is accessed by a chip-sealed road to a bridge that no longer spans the river. There is a wide, flat area past a gate where engines and water tenders can turn into in order to back down to the river. The river is about 30 feet below the end of the road.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118) & Boyd Kimball Dyer, c/o Helen Pitre, P.O. Box 919, Trinidad, CA 95570-0919 (707-677-3991)

(P6)

physical location: South Fork Road: east of South Fork Road

legal: SE ¼, SE ¼, Sec 12, T5N, R5E, HBM

longitude: -123°, 33.743'

latitude: 40°, 49.059'

access route: SR 299, south on South Fork Road ~ 8.4 miles, left (east) on dirt road (unnamed) through locked gate to pond

description: A small pond more than 3 feet deep fed by a perennial creek. There are hardwood trees in the vicinity but clearance is adequate for filling buckets.

landowner: Audrey Beeson (Hoopa – unlisted phone)

(W14)

physical location: South Fork Road: creek crossing south of P6

legal: NE ¼, NE ¼, Sec 13, T5N, R5E, HBM

longitude: -123°, 33.689'

latitude: 40°, 48.974'

access route: SR 299, south on South Fork Road ~ 8.5 miles to unnamed creek crossing 0.1 mile south of 'Carpenter Ranch' sign on driveway

description: South Fork Road crosses a small creek (shown as intermittent on the quad map) that was running in late 2005. The adjacent landowner thought it ran most of the time. The culvert under the road could be temporarily plugged and water drawn from the resulting pool, if the pond to the north is drawn down and unusable. There would be a lift of about 25-30 feet.

landowner: John & Phyliss Jurin (707-442-4098)

(W15)

physical location: South Fork Road: creek crossing southeast of Todd Ranch

legal: SE ¼, NW ¼, Sec 19, T5N, R6E, HBM

longitude: -123°, 32.960'

latitude: 40°, 47.838'

access route: SR 299, south on South Fork Road ~ 10.6 miles to a creek crossing shortly before an old plantation

description: South Fork Road crosses a small creek (shown as intermittent on the quad map) that was running in late 2005. The culvert under the road could be temporarily plugged and water drawn from the resulting pool, provided the creek is running during a fire emergency. There would be a lift of about 10-20 feet.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118)

(W16)

physical location: South Fork of the Trinity River: at cable crossing of the river

legal: NE ¼, NE ¼, Sec 25, T5N, R5E, HBM

longitude: -123°, 33.569'

latitude: 40°, 47.312'

access route: SR 299, south on South Fork Road ~ 11.3 miles to an unnamed, 1-lane dirt road on the right that runs south and west to a cable crossing over the South Fork of the Trinity River to Patrick Culvar's place. There is a turnaround at the end of the road. The access road is in poor condition and has a steep section with a gully that formed during the December 2005 storms. It is passable by a 4-wheel drive fire engine but it is unlikely that a water tender could negotiate the grade and rough surface, or turn around at the end without improvements to the road.

description: The end of the road is on a bench about 50 feet above and 100 feet to the east of the river.

Piping and a pump would need to be installed to pump out of the river.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118)

(W17)

physical location: South Fork Road: crossing of Surprise Creek

legal: NW ¼, NW ¼, Sec 30, T5N, R6E, HBM

longitude: -123°, 33.229'

latitude: 40°, 47.237'

access route: SR 299, south on South Fork Road ~ 11.45 miles to the crossing of Surprise Creek

description: South Fork Road crosses Surprise Creek (shown as perennial on the quad map) that was running in late 2005. The culvert under the road could be temporarily plugged and water drawn from the resulting pool, provided the creek is running during a fire emergency. There would be a lift of about 20-30 feet.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118)

(W18)

physical location: Hennessey Road: crossing of unnamed creek to east of SPI clear cut

legal: NW ¼, NW ¼, Sec 31, T6N, R6E, HBM

longitude: -123°, 33.323'

latitude: 40°, 51.413'

access route: SR 299, south on South Fork Road 4.0 miles to Hennessey Road (Trinity County Road 435, signed "Primitive Road – Not Winter Maintained") to left (southwest), follow road (1-lane dirt road with turnouts) to first creek crossing

description: Hennessey Road crosses an unnamed creek (shown as intermittent on the quad map). The culvert under the road could be temporarily plugged and water drawn from the resulting pool, provided the creek is running during a fire emergency. The pool at the inlet of the culvert filled during the December 2005 storms, so it may need to be dug out to allow adequate water to collect. There would be a lift of about 5-10 feet. It was identified as a water drafting site during the 1999/2000 community meetings to identify values at risk, fire infrastructure, and pre-fire projects. (the flow in this creek during late summer needs to be confirmed)

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118)

(W19)

physical location: Hennessey Road: crossing of unnamed creek

legal: NW ¼, NW ¼, Sec 8, T5N, R6E, HBM

longitude: -123°, 32.256'

latitude: 40°, 49.796'

access route: SR 299, south on South Fork Road 4.0 miles to Hennessey Road (Trinity County Road 435, signed "Primitive Road – Not Winter Maintained") to left (southwest), follow road (1-lane dirt road with turnouts) to first creek crossing after entering private property

description: Hennessey Road crosses an unnamed, perennial creek (shown as intermittent on the quad map) that flows about 1 gpm during late summer. This is a reliable source of water that did not dry up during the drought in 1977. The landowner suggested that a large diameter, shallow stock tank (18' x 2') could be located below the culvert to store water for a fire emergency.

landowner: James & Mary Carpenter (530-629-3998)

(W20)

physical location: Hennessey Road: waterhole number 29

legal: SE ¼, NW ¼, Sec 8, T5N, R6E, HBM

longitude: -123°, 32.005'

latitude: 40°, 49.604'

access route: SR 299, south on South Fork Road 4.0 miles to Hennessey Road (Trinity County Road 435, signed "Primitive Road – Not Winter Maintained") to left (southwest), follow road (1-lane dirt road with turnouts) past private property to waterhole on north side of road

description: A small (30' x 50') pond, identified with a USFS sign as "Waterhole 29", is just north of the road. In late summer it has no surface water but is just a damp area. It may be possible to dig this pond deeper so there is water in late summer, but care should be taken to not penetrate the clay layer that is holding the water.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118)

APPENDIX C
MAPPED PONDS

Mapped Ponds

A number of ponds that may be suitable for filling helicopter water buckets, fire engines, or water tenders are found in the Downriver FFMP area. Ponds with potential for helicopter bucket fills (as well as for fire engines and water tenders) are mapped as “P” and those suitable only for fire engines and water tenders are mapped as “W”. These ponds, potential hazards, access roads, and survey needs are described below.

Ponds in the Trinity River Corridor

(P1)

physical location: Gray Flat: between SR 299 and the Trinity River

legal: SW ¼, SW ¼, Sec 27, T6N, R6E, HBM (as shown on “Fire Access & Infrastructure Map” - SW ¼, SE ¼, Sec 28 on USFS recreation map)

longitude: -123°, 29.806’

latitude: 40°, 51.761’

access route: SR 299, northeast on paved Grey’s Flat Road, take right fork (0.1 mile from SR 299), through locked gate, past house to pond (access beyond the locked gate and to pond needs to be ascertained)

description: This pond is evidently more than 3 feet deep and there are reported to be no obstructions or tall trees near it (this needs to be confirmed).

landowner: Dan (Charles) & Rebecca Aalfs (530-629-3941)

(P2)

physical location: Hawkins Bar: east of Trinity Village and Denny Road

legal: NW ¼, NW ¼, Sec 28, T6N, R6E, HBM

longitude: -123°, 30.914’

latitude: 40°, 52.39’

access route: SR 299, east on Denny Road, right (southeast) on dirt road just past Trinity Village sign and Lone Pine Road, through locked gate to pond

description: This pond is 10-11 feet deep, but water weeds grow densely during the summer, which may hamper the ability to fill buckets. The area to the south and west of the pond is forested.

landowner: Red and Frances Hunt (916-489-4882), Harold & Joyce Wells (Larkspur – unlisted phone), and others

(P3)

physical location: east of SR 299, Oden Flat, and the Trinity River

legal: SW ¼, SW ¼, Sec 18, T6N, R6E, HBM

longitude: -123°, 33.213’

latitude: 40°, 53.421’

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, follow past “End of County Road” sign and pavement (~ 1.35 miles from Salyer Loop Road), through locked gate on road paralleling river, through Riverview Estates, through two more locked gates, to road to left (east) to pond (the access route beyond the locked gates needs to be ascertained)

description: This is a small pond that dries up in the summer. The landowners plan to eventually deepen and widen the pond. There are trees to the east and south of the pond.

landowner: Alex & Gloria Fulton (707-826-2926 & 530-629-4696)

(P4)

physical location: Salyer: north of SR 299, the bridge over the Trinity River, and Fountain Ranch Road in open fields between Salyer Loop Road and Knoll Road

legal: SE ¼, NW ¼, Sec 14, T6N, R5E, HBM

longitude: -123°, 35.155'

latitude: 40°, 53.746'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, left (west) on driveway (~ 0.2 mile from Salyer Loop Road) before Knoll Road, follow road to pond (the access route on private property beyond Fountain Ranch Road needs to be ascertained)

description: This is a small pond whose depth is unknown. The landowner indicated that only a few buckets would empty the pond. The north to east quadrant is forested and the other quadrants are open fields. There is a low fence in the vicinity and a high voltage power line about 500 feet to the south.

landowner: Colleen McCullough (530-629-3341)

Ponds in the South Fork of the Trinity River Corridor

(P5)

physical location: South Fork Road: north of South Fork Road at the west end of a narrow meadow

legal: NW ¼, SW ¼, Sec 23, T6N, R5E, HBM

longitude: -123°, 35.612'

latitude: 40°, 52.634'

access route: SR 299, south on South Fork Road ~ 1.2 miles, right (north) on dirt road, through locked gate to pond

description: This is a small pond at the west end of a long, narrow meadow between tall trees. The landowner says that this is a shallow pond that has been in place for only a few years. It has not yet adequately sealed, so goes dry in July. Adequate sealing could eventually increase the length of time this pond would be serviceable.

landowner: Ken & Darlene McCoy (530-629-3156)

(W11)

physical location: South Fork Road: west of South Fork Road at southeast end of Ammon Ranch area

legal: NE ¼, NW ¼, Sec 25, T6N, R5E, HBM

longitude: -123°, 34.183'

latitude: 40°, 52.199'

access route: SR 299, south on South Fork Road ~ 3.1 miles, right (west) on graveled road, signed "Weber", to pond

description: This is a small, all year pond; depth, access, and amount of water, if any, during the latter part of the fire season are unknown. (access to and condition of this pond need to be ascertained)

landowner: Wayne & Diane Weber (530-629-2568)

(W12)

physical location: South Fork Road: west of South Fork Road and north of USFS Road 6N68, south of Ammon Ranch area

legal: NW ¼, SW ¼, Sec 25, T6N, R5E, HBM

longitude: -123°, 34.530'

latitude: 40°, 51.955'

access route: SR 299, south on South Fork Road ~ 3.55 miles, right (west) on dirt road (USFS 6N68), signed "Martin's & McCoy's", through locked gate signed "Ken & Darlene McCoy" ~ 100 yards to pond on right (north) side of road

description: This is a small, all year pond fed by artesian springs. The depth and amount of water during the latter part of the fire season is unknown. This pond supplies both the Martin's and the McCoy's, so they need to be consulted regarding terms for its use.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118) & Nick, Anne, and Alicia Martin (530-629-2028)

(P6)

physical location: South Fork Road: east of South Fork Road

legal: SE ¼, SE ¼, Sec 12, T5N, R5E, HBM

longitude: -123°, 33.743'

latitude: 40°, 49.059'

access route: SR 299, south on South Fork Road ~ 8.4 miles, left (east) on dirt road (unnamed) through locked gate to pond

description: This is a small pond more than 3 feet deep fed by a perennial creek. There are hardwood trees in the vicinity, but clearance is adequate for filling buckets.

landowner: Audrey Beeson (Hoopa – unlisted phone)

APPENDIX D
MAPPED HELICOPTER LANDING SITES

Mapped Helicopter Landing Sites

A number of sites are suitable for landing helicopters. These sites have been assessed and approved for use by a CDF helicopter pilot (Jim Eastman) during a survey on February 17, 2006 and are mapped as "H" on the small and large versions of the 'Fire Access & Infrastructure Map' and on the 'Aerial Fire Access & Infrastructure Map'. Verbal permission to use these sites has been given by some landowners, but all landowners should be contacted to obtain permission. These sites should be signed. It has been suggested that during a fire emergency, fluorescent pink flagging, or equivalent, be tied to vegetation to act as a wind direction indicator. The sites and potential hazards are described below.

Landing Sites in the Trinity River Corridor

(H1)

physical location: Gray Flat, between SR 299 and the Trinity River

legal: NE ¼, SE ¼, Sec 28, T6N, R6E, HBM (as shown on the 'Fire Access & Infrastructure Map' - NW ¼, SE ¼, Sec 28 on the USFS recreation map)

longitude: -123°, 29.978'

latitude: 40°, 51.865'

access route: SR 299, northeast on Grey's Flat Road, left (west) fork (~ 0.1 mile from SR 299) to fork in road and locked gates, right fork (northeast) to field on the right (east)

description: A small field with a fence to the southwest and northwest, tall trees to the northwest, an orchard and a house to the northeast, a power line to the southwest and northwest of the roads, and a house to the west. Helicopters could also land in a field to the west.

landowner: Anita Hilfiker (530-629-3578)

(H2)

physical location: Hawkins Bar, on Denny Road just northeast of the bridge over the Trinity River

legal: SW ¼, NW ¼, Sec 28, T6N, R6E, HBM

longitude: -123°, 31.016'

latitude: 40°, 52.078'

access route: SR 299, east on Denny Road, across bridge over the Trinity River, on right (southwest) side of road just past bridge. Fuel trucks could access this site, but fueling would likely hamper traffic and spills might enter the Trinity River.

description: A paved turnout on the southwest (river) side of Denny Road. Landing here will interfere with traffic on the County Road and vehicles may present a hazard to landing. There is a steep cutbank to the northeast of the road and a steep drop off to the river to the southwest. There is a low guardrail on the southwest side of the road.

landowner: Trinity County Department of Transportation

(H3)

physical location: Hawkins Bar: Wallen Ranch, northeast of Trinity Village, northwest of Denny Road, and west of Wallen Ranch Road and Hawkins Creek

legal: SE ¼, NW ¼, Sec 21, T6N, R6E, HBM (as shown on both the 'Fire Access & Infrastructure Map' and the USFS recreation map)

longitude: -123°, 30.706'

latitude: 40°, 52.979'

access route: SR 299, east on Denny Road, across bridge over the Trinity River and follow Denny Road to Wallen Ranch Road, left (north) on Wallen Ranch Road, left (west) at Wallen Ranch sign, straight on dirt road through gate to site, which is west of the house, in a field. Fuel trucks could access this site.

description: A field to the west side of a house. A power line runs south to north between the landing site and the house to the east and there is a large conifer to the west of the landing site. Frank Wallen has given verbal permission to use this site for landing helicopters. If a lot of trucks will use the road, he wants it graveled.

landowner: Frank Wallen (530-629-2993)

(H4)

physical location: SuzyQ Road area: northeast of SR 299, on the lower flat near the base of the slope up to the upper flat

legal: SW ¼, NW ¼, Sec 20, T6N, R6E, HBM

longitude: -123°, 32.196'

latitude: 40°, 52.846'

access route: SR 299, north on SuzyQ Road, follow road to lower flat, left (west) at first fork (~ 0.4 mile from SR 299), through trees to opening and vineyard, landing site is in the field on the left (south) side of the road at the base of the hillside.

description: A field to the south side of the road and vineyard. A steep hillside with trees is to the south and trees and a row of grapes are to the east. A vineyard is to the north and an out building is to the west.

landowner: Kent & Teresa Zawatzky, Blue Lake, CA (unlisted phone)

(H5)

physical location: large meadow east of SR 299, Oden Flat, and the Trinity River

legal: SW ¼, SW ¼, Sec 18, T6N, R6E, HBM

longitude: -123°, 33.243'

latitude: 40°, 53.469'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, follow past "End of County Road" sign and pavement (~ 1.35 miles from Salyer Loop Road), through locked gate on road paralleling river, through Riverview Estates, through two more locked gates, to road to left (east) to pond. Fuel trucks could access this site. (the access route beyond the locked gates needs to be ascertained)

description: The middle meadow of three large meadows to the east of the access road. There are blackberries growing extensively on the southern meadow and portions of the middle and northern meadows. A power line runs through the southern meadow and along the road in the middle meadow. A fenced vegetable garden is planned to be installed on some portion of the property and should be avoided as a landing spot.

landowner: Alex & Gloria Fulton (707-826-2926 & 530-629-4696)

(H6)

physical location: Salyer: north of SR 299, Salyer, the Trinity River, and Fountain Ranch Road in open fields just west of Knoll Road

legal: NE ¼, NW ¼, Sec 14, T6N, R5E, HBM

longitude: -123°, 35.066'

latitude: 40°, 53.857'

access route: SR 299, north on paved Salyer Loop Road, across bridge over the Trinity River, right (east) on paved Fountain Ranch Road, left (north) on gated Knoll Road (~ 0.25 mile from Salyer Loop Road), follow road to landing site. Fuel trucks could access this site. (the access route beyond the locked gate needs to be ascertained)

description: An open field to the northwest of a house. There is a low fence in the vicinity and a low voltage power line about 250 feet to the southwest.

landowner: Colleen McCullough (530-629-3341)

(H7)

physical location: on a flat east of the four lane section of SR 299, south of the Campora Propane Company facility, and north of the confluence of the Trinity River and the South Fork of the Trinity River

legal: SW ¼, SW ¼, Sec 10, T6N, R5E, HBM

longitude: -123°, 36.513'

latitude: 40°, 54.069'

access route: SR 299, east on Kimco Road to the landing site in a field to the north. Fuel trucks could access this site.

description: An open field to the north of Kimco Road, east of SR 299, and south of the Campora Propane Company facility. There is a low fence in the vicinity and trees south of Kimco Road. There is a low voltage power line on the east side of SR 299 and on the south side of Kimco Road.

landowner: Richard & Margaret Nolan(d), Hoopa, CA (unlisted phone)

Landing Sites in the South Fork of the Trinity River Corridor

(H8)

physical location: Friday Ridge Road area: an open field southwest of the SR 299 bridge over the South Fork of the Trinity River

legal: SE ¼, SW ¼, Sec 15, T6N, R5E, HBM

longitude: -123°, 36.219'

latitude: 40°, 53.207'

access route: SR 299, southwest on Friday Ridge Road and immediately left (south) on a gated, paved road (signed 'Hoopa Valley Redimix Plant') to the landing site. Fuel trucks could access this site.

description: An open field to the left (east) of the paved road to the Hoopa Valley Tribe Road Department Ready-mix Enterprise plant.

landowner: Sawnsion Mining Company, 2280 Saxon St., Martinez, CA 94553 (unlisted phone)

(H9)

physical location: a sand bar north of the South Fork of the Trinity River at the end of Sandy Bar Road (USFS Road 6N52)

legal: SE ¼, NW ¼, Sec 22, T6N, R5E, HBM

longitude: -123°, 36.234'

latitude: 40°, 52.86'

access route: SR 299, west on paved Friday Ridge Road for ~ 0.85 mile, left (south) on paved USFS Road 6 (signed "6 – Sandy Bar") for ~ 0.25 mile, left (northeast) on dirt USFS Road 6N52 (signed "Sandy Bar"), follow road past the first flat at the junction of a dirt spur road to the left (north) to a parking area northwest of the South Fork of the Trinity River

description: A sand bar to the southeast of the parking area at the end of Sandy Bar Road.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118)

(H10)

physical location: South Fork Road area: west of South Fork Road near the north end of a long, narrow meadow surrounded by forest

legal: SW ¼, NW ¼, Sec 23, T6N, R5E, HBM

longitude: -123°, 35.432'

latitude: 40°, 52.773'

access route: SR 299, south on South Fork Road ~ 0.9 mile to a dirt road to right (west), through locked cable gate to landing. Fuel trucks could access this site.

description: A small log landing near the north end of a long, narrow meadow between tall trees.

landowner: Ken & Darlene McCoy (530-629-3156)

(H11)

physical location: South Fork Road area: west of and below South Fork Road on a flat above and to the east of the South Fork of the Trinity River

legal: SE ¼, SE ¼, Sec 22, T6N, R5E, HBM

longitude: -123°, 35.724'

latitude: 40°, 52.383'

access route: SR 299, south on South Fork Road ~ 1.45 miles to a gated, dirt road to the right (southeast), down to the end of the road at a landing site

description: A small, grass opening on a flat surrounded by low conifers and hardwoods

landowner: Ken & Darlene McCoy (530-629-3156) and USFS, Six Rivers NF, Lower Trinity RD (530-629-2118)

(H12)

physical location: Ammon Ranch area: open field west of abandoned cars

legal: NE ¼, NE ¼, Sec 26, T6N, R5E, HBM

longitude: -123°, 34.715'

latitude: 40°, 52.273'

access route: SR 299 to South Fork Road, ~ 2.4 miles south, dirt road to right (southwest) to landing site in a field north and west of two roads. Fuel trucks could access this site.

description: A field north and east of two intersecting roads. There is a low tension power line south of the road that is south of the landing site.

landowner: Jane Henderson, Ashland, OR (unlisted phone)

(H13)

physical location: McCoy Ranch: large field on the McCoy Ranch west of South Fork Road, between the river and the road

legal: SW ¼, SE ¼, Sec 26, T6N, R5E, HBM

longitude: -123°, 35.057'

latitude: 40°, 51.621'

access route: SR 299, south on South Fork Road ~ 3.55 miles to dirt road (USFS 6N68) to the right (west), signed "Martin's & McCoy's", through a locked gate signed "Ken & Darlene McCoy" to a landing site on a large field to the south of the house (the access route beyond the locked gate needs to be ascertained)

description: A large field with no obstructions.

landowner: Ken & Darlene McCoy (530-629-3156)

(H14)

physical location: South Fork Road: east of South Fork Road at a landing at the junction of two skid roads in a recently logged area

legal: SE ¼, SW ¼, Sec 36, T6N, R5E, HBM

longitude: -123°, 34.220'

latitude: 40°, 50.842'

access route: SR 299, south on South Fork Road ~ 5.75 miles south to a gated, dirt road to the left (east), through the gate a short distance to a landing site on a log landing. Fuel trucks could access this site, but a key would be required for the SPI gate.

description: A log landing at the junction of two skid roads. Slash in the immediate vicinity should be removed so as not to interfere with helicopter rotors.

landowner: Sierra Pacific Industries, Tom Walz (530-623-4301)

(H15)

physical location: South Fork Road: a small, grassy opening on a flat just north of South Fork Road and west of an abandoned vineyard

legal: NW ¼, NE ¼, Sec 1, T5N, R5E, HBM

longitude: -123°, 33.953'

latitude: 40°, 50.595'

access route: SR 299, south on South Fork Road ~ 6.3 miles to the landing site on a small, grassy opening just north of South Fork Road and west of an abandoned vineyard. Fuel trucks could access this site.

description: A small, grassy opening at the base of and north of a steep, forested hillside, with forest to the west, an abandoned vineyard to the east, and trees to the south.

landowner: Walter Wood & Judi Nelson (707-499-6815)

(H16)

physical location: Low Bridge: road to the east of Low Bridge on the South Fork of the Trinity River

legal: NW ¼, SE ¼, Sec 1, T5N, R5E, HBM

longitude: -123°, 34.024'

latitude: 40°, 50.106'

access route: SR 299, south on South Fork Road ~ 6.8 miles to a chip-sealed road to the right (southwest), signed “Escot, Peaches, Trinity Retreat Center”, follow road to left to a landing site on a chip-sealed road to the east of Low Bridge and the South Fork of the Trinity River. Fuel trucks could access this site.

description: A chip sealed road with shrubs and low growing trees around it. Before this is used as a landing site, vegetation should be removed within 75 feet of the road, to remove both the hazard to helicopters and the fuel hazard.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118) & Boyd Kimball Dyer, c/o Helen Pitre, P.O. Box 919, Trinidad, CA 95570-0919 (707-677-3991)

(H17)

physical location: Jurin Ranch: large field on the Jurin Ranch west of South Fork Road, between the river and the road

legal: NW ¼, SE ¼, Sec 12, T5N, R5E, HBM

longitude: -123°, 34.034'

latitude: 40°, 49.425'

access route: SR 299, south on South Fork Road ~ 7.4 miles to a graveled road to right (southwest), signed “Carpenter Road”, down to the flat and a gate, through the gate to a landing site on a large field to the east of the South Fork of the Trinity River (the access route beyond the locked gate needs to be ascertained)

description: A large field with no obstructions.

landowner: John & Phyliss Jurin (707-442-4098)

(H18)

physical location: Todd Ranch: large field southwest of the house on the Todd Ranch, west of South Fork Road, between the river and the road

legal: SW ¼, SW ¼, Sec 18, T5N, R6E, HBM

longitude: -123°, 33.333'

latitude: 40°, 48.264'

access route: SR 299, south on South Fork Road ~ 9.1 miles to a dirt road to the right (southeast) signed “River Access – Todd Ranch”, down the road past a house to a large, grassy field.

description: A large field at the base of a steep, forested hillside to the east, with conifers and hardwoods on the west edge.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118)

(H19)

physical location: South Fork Road: trailhead (loop road) at the end of South Fork Road

legal: NE ¼, NW ¼, Sec 30, T5N, R6E, HBM

longitude: -123°, 33.093'

latitude: 40°, 47.134'

access route: SR 299, south on South Fork Road ~ 11.8 miles to the end of the road. Fuel trucks could access this site.

description: A small (50' x 150'), level opening at the trailhead where vehicles park. Brush, ladder fuels, and dense, short trees surround the parking area. These should be treated to decrease the fuel hazard and the hazard to helicopters.

landowner: USFS, Six Rivers NF, Lower Trinity RD (530-629-2118)

(H20)

physical location: Friday Ridge Road area: on a flat at the junction of Sandy Bar Road (USFS Road 6N52) and an unnamed dirt road to the north, between a hill to the southeast and USFS Road 6 to the east

legal: NW ¼, NW ¼, Sec 22, T6N, R5E, HBM

longitude: -123°, 36.663'

latitude: 40°, 53.126'

access route: SR 299, west on paved Friday Ridge Road for ~ 0.85 mile, left (south) on paved USFS Road 6 (signed "6 – Sandy Bar") for ~ 0.25 mile, left (northeast) on a dirt road, USFS Road 6N52 (signed "Sandy Bar"), follow road to the first flat at the junction of a dirt spur road to the left (north), the landing site is northeast of Sandy Bar Road

description: A field to the northwest of the junction of Sandy Bar Road and a spur road to the north. This site is on a flat between a forested hillside to the northwest and a forested knoll to the southeast.

landowner: Gerber Trust & Gleason Trust, Diana Wells, P.O. Box 157, Westley, CA 95387-0157 (unlisted phone)

APPENDIX E
WILDFIRE HOME PROTECTION

DEFENSIBLE SPACE GUIDELINES

A. The Home Zone 0 feet to 6 feet

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

Treatment:

1. Remove all fuels within this zone. Examples are conifer trees, brush, dry grass, leaves, needles, woodpiles and flammable ornamentals.
2. Remember to clean leaves and needles from roofs and gutters.
3. This zone can be landscaped with gravel, concrete or left bare to mineral soil. Replacing vegetation with less flammable plants, green lawn and flowerbeds, if well watered, is a good choice.

B. The Yard Zone 6 feet to 30 feet

Goal: To prevent a fire from moving from ground fuels to brush or tree crowns and to slow the rate of fire spread. (This zone should be sufficient for grasslands and is integrated into fuel reduction treatments for brush and timberlands.)

Reduces fuels so reduces fire intensity

Reduces potential danger to fire crews

Preserves overstory vegetation

Treatment:

1. Limit the litter layer to less than 3 inches.
2. Remove fine, dead, standing vegetation.
3. Clip dead twigs and branches from brush and trees.
4. Eliminate fuel ladders (continuous fuel from ground to tree crowns).
5. Prune tree limbs to at least 10 feet above the ground.
6. Remove tree limbs overhanging roof eaves and within 15 feet of chimneys.
7. Thin trees to separate crowns by 15 feet*. Favor hardwoods over conifers.
8. Break up the horizontal continuity of fuels by use of low-flammability plants, flowerbeds,
green lawns, gravel or concrete. Watering reduces flammability.

* The distance between tree crowns should increase with increasing slope steepness. The recommended distances are:

Recommended Distances Between Tree Crowns by Percent Slope	
Percent Slope	Distance Between Tree Crowns
Level to 20%	10 feet
21% to 40%	20 feet
41% to 60%	30 feet

C. The Brush or Screen Zone 30 feet to 75 feet

Goal: To keep a wildland fire on the ground, thereby minimizing intense burning and damage to overstory trees. (This is the primary zone for fire suppression. Although 75 feet of fuel reduction appears adequate for brush covered lands, further effort is necessary on forested lands.)

- Treatment:**
1. Separate patches and clumps of understory vegetation so they are spaced horizontally and vertically from overstory trees.
 2. Eliminate fuel ladders (continuous fuel from ground to tree crowns)
 3. Prune tree limbs to at least 10 feet above the ground.
 4. Thin trees to separate crowns by at least 12 feet*. Favor hardwoods over conifers.
 5. Use vegetation to screen for privacy.

D. The Woodland or Forest Zone 75 feet to 150 feet#

Goal: To provide a space in which a fire will cool down, slow down, and stay on the ground, thereby maintaining fire safety in the community. (This zone can provide cover for wildlife. Views within this zone can be enhanced to be more aesthetically pleasing.)

- Treatment:**
1. Separate patches and clumps of understory vegetation so they are spaced horizontally and vertically from overstory trees.
 2. Remove dead material from brush and trees.
 3. Eliminate fuel ladders (continuous fuel from ground to tree crowns)
 4. Prune tree limbs to at least 10 feet above the ground.
 5. Thin trees to separate crowns by at least 10 feet*. Favor hardwoods over conifers.

This distance varies depending upon slope steepness. The recommended distances are:

Defensible Space Distances			
Percent Slope	Distance From House		
	Uphill	Sidehill	Downhill
Level to 20%	100 feet	100 feet	100 feet
21% to 40%	150 feet	150 feet	200 feet
41% to 60%	200 feet	200 feet	400 feet

After evaluating your property and talking with your neighbors, you can use the *FOUR Rs* to meet defensible space guidelines.

Removal: Eliminate entire plants, particularly trees or shrubs. Example: Cut understory white firs and manzanita.

Reduction: Remove parts of plants to reduce available fuels. Example: Prune limbs and twigs. Mow dry grass.

Replacement: Substitute less flammable plants for those that are more flammable. Example: Remove some conifer and plant oaks. Remove tall manzanita and plant pinemat manzanita or squaw carpet.

Re-arrangement: Combine the above methods. Include regular watering of plants.