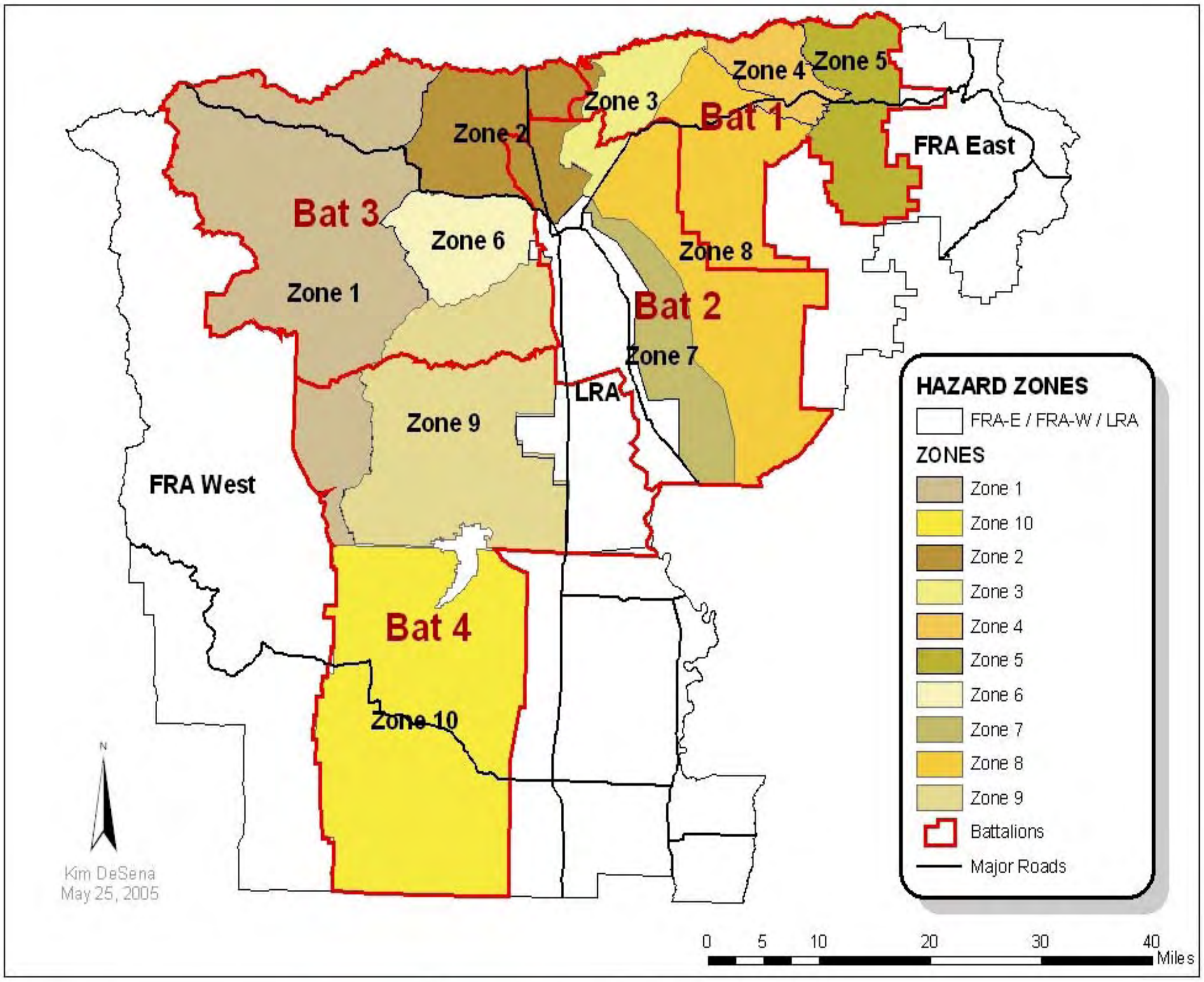


Tehama Glenn Unit ~ Battalions and Zones

IV. The Fire Situation

A. General Description – The Local Fire Problem

California has some of the most complex ecosystems in the world with over 600 recognized individual ecotypes. Human impact on the land has forever changed many of these ecotypes and as greater numbers of people come into contact with the land, the changes become more profound. The full spectrum of fire management issues are represented in the Tehama-Glenn Unit, from wildland/urban interface issues and associated mechanical thinning treatments, to wildfire response and fire suppression, to prescribed fire as a land management tool.

This impact takes the form of extensive development adjacent to wildlands—called *wildland/urban interface*--or small developments built within and surrounded by wildlands--called wildland/urban intermix. Construction within the wildland urban interface or intermix has not only added a new fuel load component, it has shifted the focus of firefighting tactics to life, safety, and structure protection. The impacts brought about by people, however are not all negative with regard to fire risk as many landowners modify the fuels on their property in order to provide for fire defense. However, many individuals totally disregard the hazard and do nothing to protect themselves against wildland fire.

The effects of poor logging practices have changed the once mature forests, dominated by relatively few large conifers and little under-story fuels, with natural surface-fire-regimes into second growth forests where catastrophic fire is more prevalent. Mixed conifers and hardwoods with a relatively heavy accumulation of understory fuels make them prone to intense fire behavior and typify these second growth forests. Moreover, environmental and political constraints, including fire suppression, have added to the fuel accumulation, particularly understory fuels, in the second growth forests.

Chaparral in the middle elevations requires fire for regeneration. Fire maintains habitat values associated with chaparral by prompting sprouting for deer browse and maintaining an open structure for other wildlife and livestock. On the west side of the Tehama/Glenn Unit, chaparral is actively being managed within the Sunflower CRMP project area. On the east side, where access is poor and lightning strikes are frequent, a minimally altered fire regime continues and maintains the ecological health of the ceanothus dominated chaparral there. Agency fire exclusion practices have proved to be less successful on the east side.

Low elevation oak-woodlands and grasslands have been dramatically altered by the invasion of exotic species, such as yellow star thistle (*Centaurea solsticialis*) and medusa-head grass (*Taeniatherum caput-medusae*) that compete with native plants and reduce forage quality. In Tehama County, some landowners are controlling invasive weeds through prescribed fire in late spring. This is an example of a contemporary application of fire as a land management tool. Chemical treatments of exotic weeds are also practiced.

Human intervention is neither wholly the problem nor wholly the solution to the fire situation. Understanding the fire environment within each ecosystem, including the complexities brought by people, and having sufficient resources to address fire issues specific to each ecosystem almost defies resolution. Despite the best efforts of fire service professionals, resource managers and other stakeholders, large, damaging, costly fires will continue. The relative success of fire safe planning and hazardous fuel reduction efforts are largely dependent upon the understanding of the fire environment within a particular ecosystem, cooperation on the part of stakeholders, and the availability of resources, financial and otherwise.

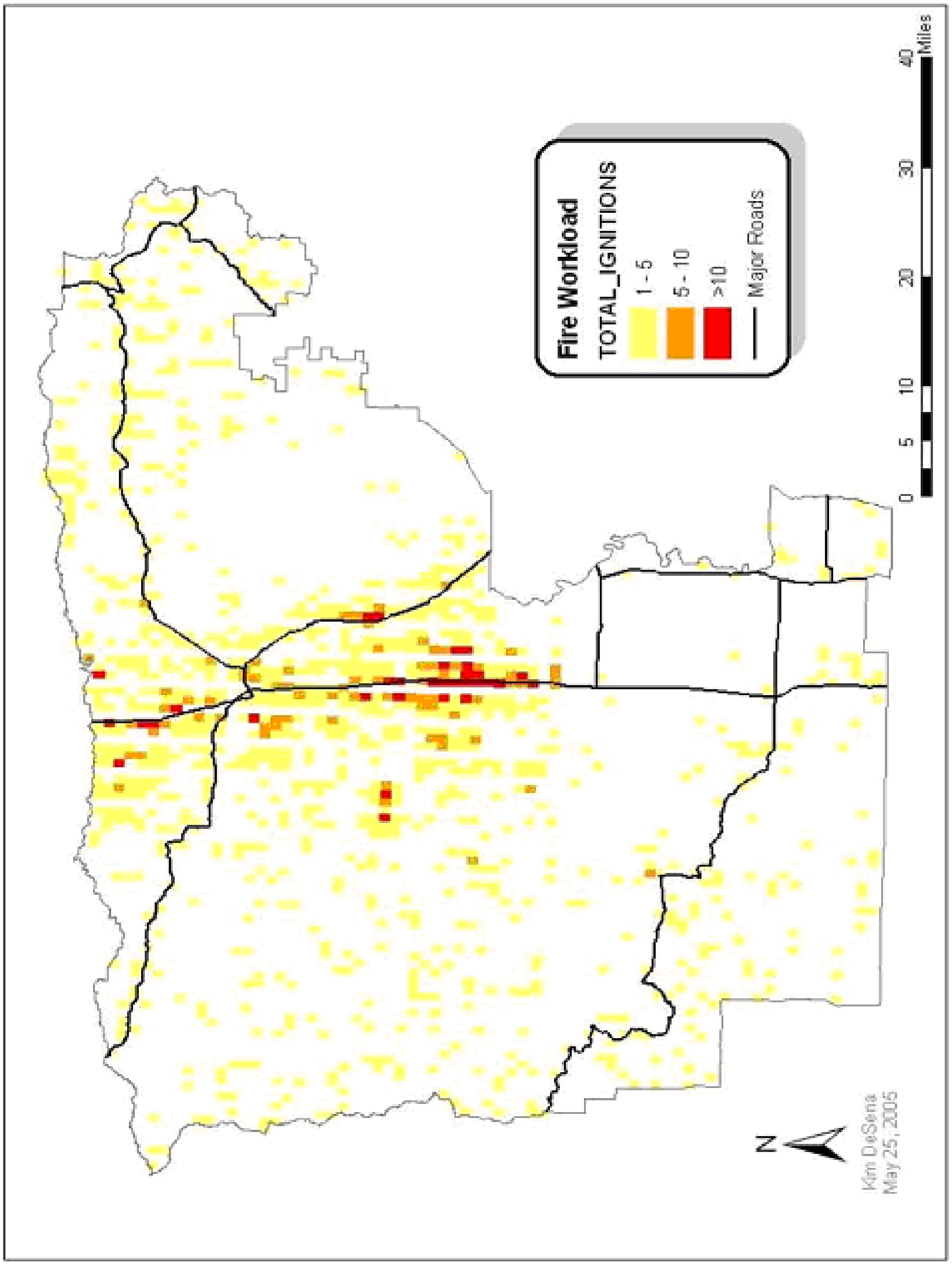
B. Desired Future Condition

It is through the forum of Fire Safe Councils that industrial, agricultural, homeowner, environmental, and governmental concerns find common ground, applying science, politics and available resources for the common benefit of reducing the risk of fire on a watershed-by-watershed basis. The ultimate goal of this document is to ensure that minimal loss occurs during a potentially catastrophic wildfire within the urban interface, through homeowner's compliance of defensible space, evacuation procedures in an emergency, and active participation in all other efforts of fire prevention.

C. Ignition Workload Assessment (Level of Service)

The success of firefighting is the result of many complex factors, including the mobilization of critical resources in a timely manner. The California Department of Forestry and Fire Protection (CDF) does not fight fire alone; rather it relies on the assistance of federal and local government firefighting resources through a series of interagency agreements. Interagency agreements include the Cooperative Fire Protection Agreement, delineating the use of local government resources by state and federal firefighting agencies [CDF, U.S. Fish & Wildlife Service (USFWS), U.S. Forest Service (USFS), Bureau of Land Management (BLM) & National Park Service (NPS)], and local mutual and automatic aid agreements whereby local entities agreements where local entities agree to share resources during emergencies. There are many such agreements between federal, state and local jurisdictions within Tehama and Glenn counties.

Ignition workload assessment focuses on identifying areas with the potential of experiencing unacceptable loss and high suppression cost fires. In this assessment, Unit staff analyzed historical ignition data by damage, cause, intensity, and vegetation type. Workload patterns can be used to infer areas in the unit with a higher potential for costly damaging fires. This data allows the unit to develop appropriate workload management strategies and tactical actions including prevention and suppression.



Tehama Glenn Unit Fire Workload

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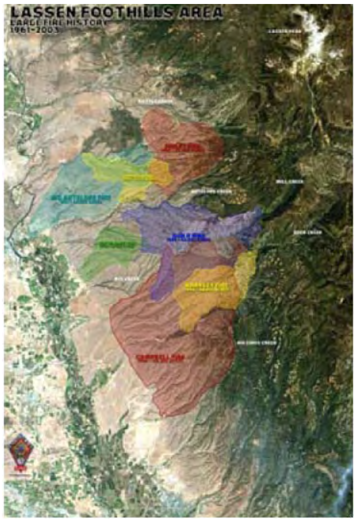
D. Fire History



Wildfire history is a significant factor in the pre-fire management planning process. The fire plan assessment framework incorporates detailed information for determining the most beneficial locations for pre-fire management projects, an idea of the level of service within the Unit's State Responsibility Area and information about assets at risk. Fire history is a piece of the puzzle that allows Unit personnel to learn from the effects of past fires and allows fire control agencies, like CDF and fire safe councils, the opportunity to implement pre-fire management plans. Identifying where the largest and most damaging fires have occurred is a necessary step in preparing for future wildfire and focused pre-fire management plans. Moreover, knowledge of fire history and fire behavior for particular areas allows fire control officers to develop better strategies for the deployment of critical firefighting resources.

Below is the wildfire history for the Tehama-Glenn Unit between 1994 and 2004 and maps representing fire history for the past 100 and past 10 years. The fires shown are 300 acres and larger. The maps display significant patterns that are being used in the pre-fire planning process. Tehama and Glenn Counties both have an extensive history of large and damaging fires, most of which have burned within the urban interface area resulting in not only the loss of property but life. The following tables and figures show the fire history of Tehama and Glenn Counties.

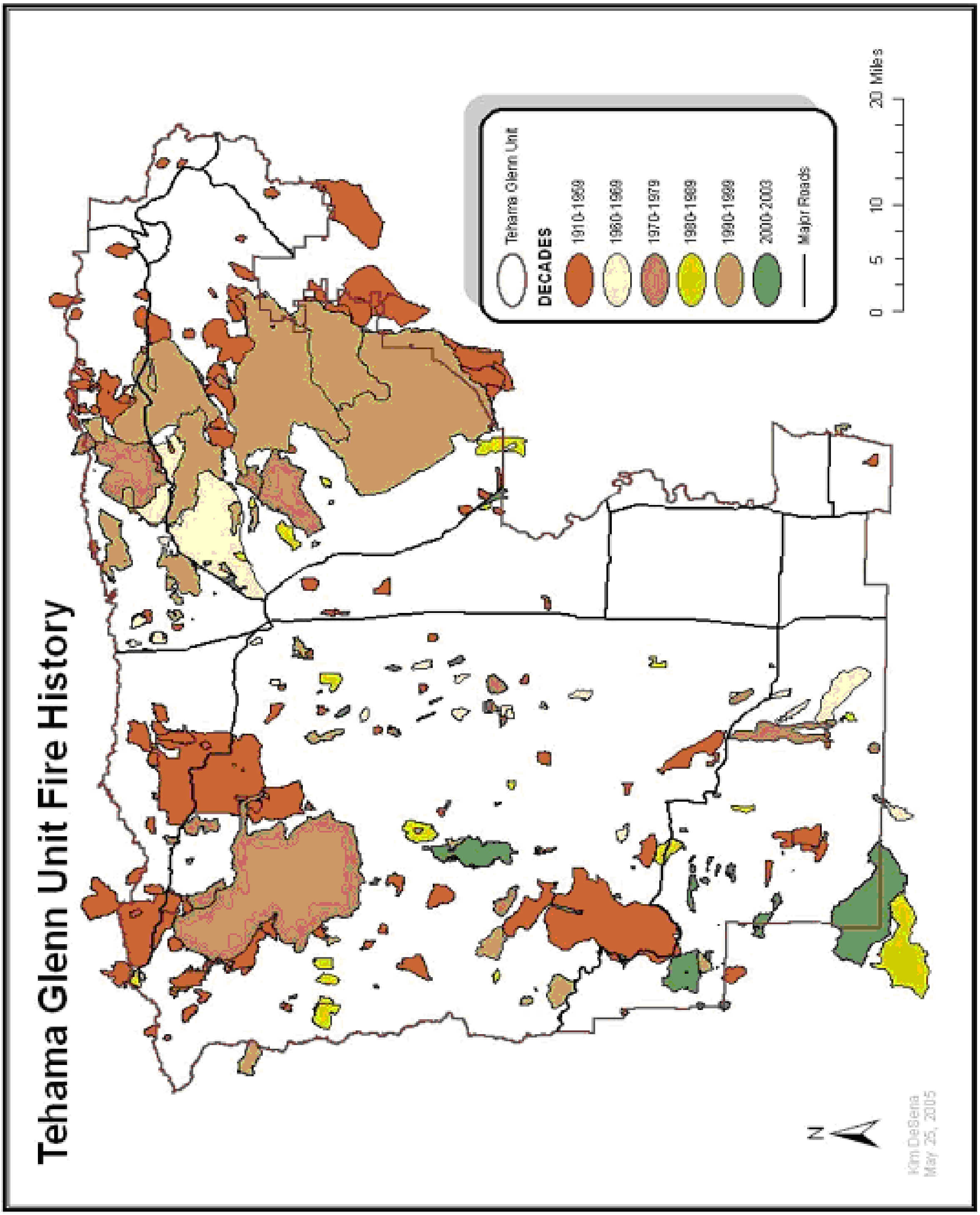
		Zone											Total
	Cause	1	2	3	4	5	6	7	8	9	10	LRA*	
1	Undetermined	18	40	10	10	3	10	13	4	91	7	162	368
2	Lightning	15	14	5	12	9	0	1	9	20	9	6	100
3	Camp Fire Escape	1	1	1	0	0	0	0	1	6	2	9	21
4	Smoking	0	23	0	3	4	5	5	3	26	2	77	148
5	Burn Barrel/ Debris Burn Escape	6	26	3	8	2	12	2	1	45	5	171	281
6	Arson	5	42	6	4	0	17	9	7	29	4	55	178
7	Equipment Use	17	116	16	10	9	47	29	11	179	30	317	781
8	Playing W/Fire	4	18	0	3	0	0	0	1	7	3	31	67
9	Other	8	65	10	6	1	15	7	18	52	9	96	287
10	Vehicle Use	23	68	14	8	6	16	12	10	95	11	178	441
11	Railroad	0	7	0	0	0	0	0	0	0	0	1	8

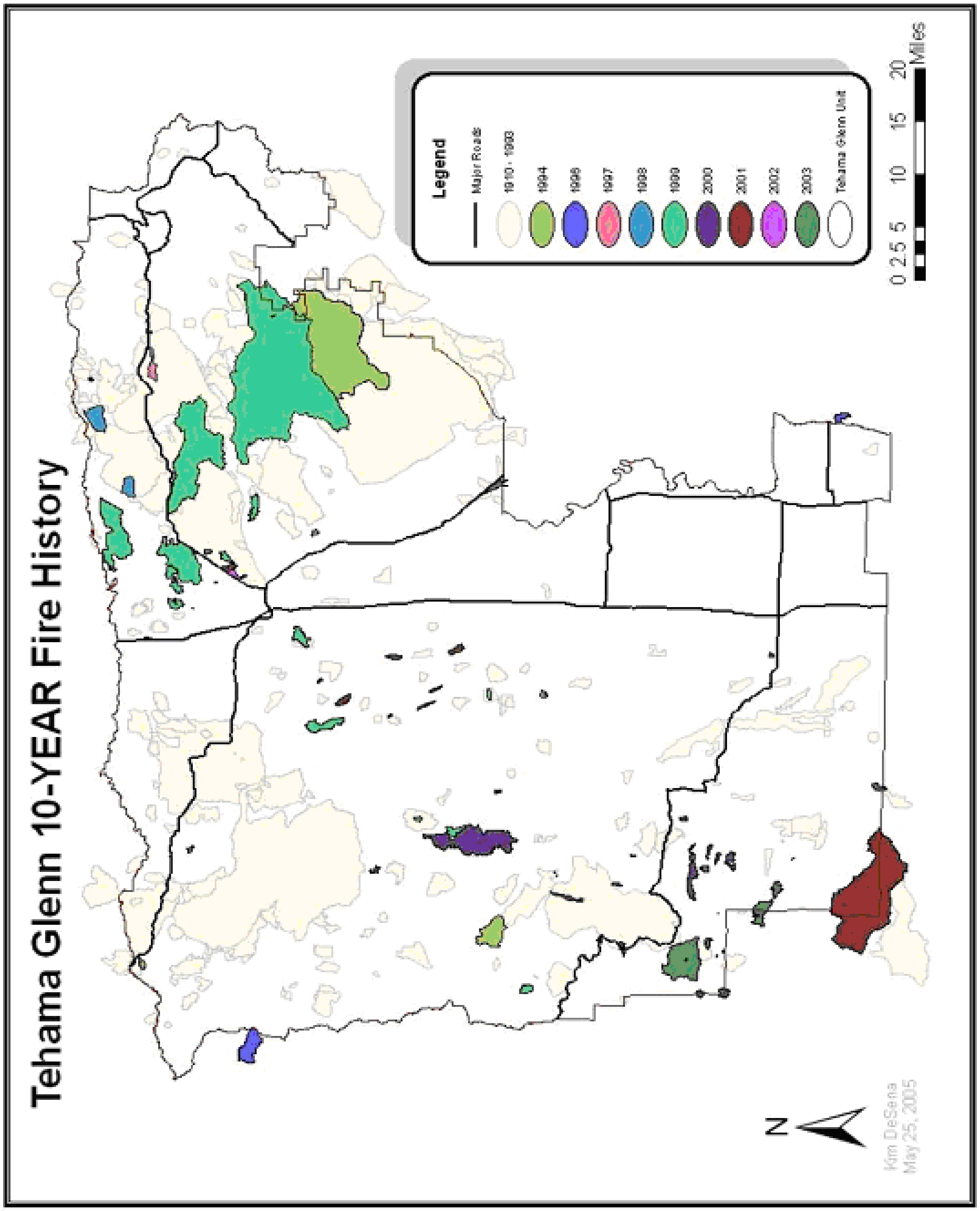
12	Powerline	0	8	0	4	4	3	1	1	10	6	41	78
	Total	97	428	65	68	38	125	79	66	560	88	1144	2758

Table. Fire Cause Summary Report (1994 to 2004)

California Department of Forestry and Fire Protection, Tehama-Glenn Unit

*LRA: Local Response Area


Tehama Glenn Unit Fire History
Tehama Glenn Unit
DECADES
1910-1959
1960-1969
1970-1979
1980-1989
1990-1999
2000-2003
Major Roads
0
5
10
20 Miles
N
Kim DeSena
May 25, 2005


Tehama Glenn 10-YEAR Fire History
Legend
Major Roads
1910 - 1993
1994
1996
1997
1998
1999
2000
2001
2002
2003
Tehama Glenn Unit
0 2.5 5 10 15 20 Miles
N
Kim DeSena
May 25, 2005

E. Vegetative Wildfire Fuels

Photo Below is an aerial shot over the Gun II Fire (1999). Typical post-fire stand showing incomplete consumption but nearly complete mortality. Post-fire conditions may increase fire hazard during the following years due to the snags and dead and down material unless the timber is salvaged soon after the fire.

The fuel assessment layer exemplifies the local fire hazard situation. Fuels assessment is a useful tool in assisting pre-fire planners and fire safe councils target critical areas for fuel treatment.

This assessment evaluates current flammability of a particular fuel type, given location on the slope, average bad weather conditions, ladder fuels, and crown density.

Fuel, in the context of wildland fire, refers to all combustible material available to burn within a given area of land. Grass, brush and timber are the most common fuels found in
Tehama and Glenn County's ecosystems. Each fuel has its' own burning characteristics based on several inherent factors. These factors include moisture content, volume, live to dead vegetation ratio, size, arrangement and the general chemistry of the plant species. All of these contribute to a fire's spread, its intensity, and ultimately, its threat to assets.

Fuel loading is measured in tons per acre. Grass is considered a light fuel with approximately 0.75 ton per acre. On the other end of the spectrum, thick brush, a heavy fuel, can have a volume of over 21 tons per acre. Fire intensity is directly related to fuel loading. Grass burns rapidly with a short period of intense heat output. Brush, on the other hand, has a long sustained high heat output making it more difficult to control. With this in mind, it is prudent to identify areas containing heavy concentrations of fuel and target these areas for hazard reduction. Timber has a high fuel loading based on tons per acre. However, fire intensity can be higher or lower based on the percentage of the vegetation that is available to the fire. Conifer and oak trees where there are few ladder fuels that carry flames into the canopy can often be immune to a fire in the understory.

1. Hazardous Fuels Assessment – Fuel Models

Fuel arrangement is critical in wildland fire behavior, as it is linked to how readily the fuel burns and a fire spreads. Fine fuels that have not been compacted, such as grass, spread fire rapidly since more of its surface can be heated at one time. Compacted fuels, such as pine litter, on the other hand burn more slowly because heat and air only reaches the top of the fuel. Vertical arrangement refers to the continuity of fuel from the forest floor to the tree canopy. The vertical arrangement of fuels measures the extent to which burnable vegetation on the ground such as grass or pine needles is connected to the tops of the trees. Fire burning in grass or pine needles near the ground may spread to brush, snags and low tree branches to the crown of over-story trees. When there is a continuous burnable constituent from the ground to the crown, it is considered a "ladder fuel". Ladder fuels are an extremely influential factor in fire spread and behavior, often turning a ground fire *into* a crown fire. Crown or canopy closure refers to the density of a forest created by *treetops. It is important* in the lateral progression of fire from tree to tree through the forest canopy.

In an attempt to estimate fire behavior, the U.S. Forest Service has developed 13 fuel models that categorize fuels by their burn characteristics shown in the table below. Four general groups, also known as planning belts, are used to classify fuels: grass, brush, timber and logging slash. The following is a brief description of the fuel models commonly found in CDF's wildland protection area of Tehama and Glenn Counties:

Source material: Anderson, Hal E. 1982 Aids to Determine Fuels Models For Estimating Fire Behavior. United States Department of Agriculture, Forest Service. General Technical Report INT-122. Ogden Intermountain Range and Experiment Station)

2. Fuel Model Types

<u>Fuel Model 1</u>: This model is used for short (generally below knee level or about 1-foot tall) fine-textured grass, which best represents Northern California grasslands and savannas. Less than one-third of the area includes taller other vegetation like shrubs or trees. Fuel loading in fuel model 1 range from ½ to ¾ of a ton per acre. Fires in fuel model 1 burn rapidly with flame lengths averaging 4 feet. This is probably the most common fuel model within the Tehama-Glenn Unit, reflective of nearly all of the grasslands found in Tehama and Glenn Counties below an elevation of approximately 1000 feet. Timberlands that are clear-cut and replanted may temporarily become FM1 if a substantial grass stand is allowed to become established. As the seedlings begin to assert dominance over the site during years 5-15, the setting may transition into a brush model

<u>Fuel Model 2</u>: Like fuel model 1, fuel model 2 is dominated by grass about 1 to 2-feet tall, usually under an oak-woodland or timber over-story. The larger particle size in these shrubs and the litter from the tree over-story increases intensity, but fire spread rate is reduced because canopy slows wind effect and shades fuels. Four to five tons of fuel is found per acre and the fuel bed depth is 1-2 feet. This type of fuel can be found in the foothills in the eastern and western portion of the unit east and west of Red Bluff.

Fuel Model 3. Not found locally. May represent commercial wheat or rice operations.

Fuel Model 4: This is a brush model and is characterized by stands of mature brush 6 feet or more in height with continuous, inter-linking crowns, and ranging from 15 to 80 tons per acre. Fires in this fuel model burn intensely (50+ foot flame lengths) and spread relatively quickly. This fuel type is found in some areas in the eastern and western foothills of the Unit.

Fuel Model 5: Fuel model 5 is composed of the same mixes of vegetation as Fuel Model 4, but individual plants are shorter, usually sparser, and less mature with little or no dead component. This model occurs on poor soils, on recent burns and may occur under tree over-stories. Fires in this fuel type do not burn as intensely (6-13 foot flame lengths), nor as rapidly, due to higher concentrations of live to dead fuel. This fuel type is not common in Tehama and Glenn Counties. It may represent a recently burned chamise field and some of the brush land on serpentine soils such as portions of the foothills around Colyer Springs Road (a.k.a. chrome-mining lands). This model may also represent the fuels under a shaded fuel break where the grass does not immediately recolonize the site. Shaded fuel breaks along roads above the Hazen Road elevation have the potential to have lighter burning potential because the brush is vastly reduced but the site does not become a grass model. The jury is still out to see if we can sustain our fuel breaks as a low—intensity type. If so, it could be modeled as a FM5.

Fuel Model 6: This fuel model consists of vegetation, which is taller and more flammable than that of fuel model 5, but not as tall or as dense as fuel model 4. Fires in this model will burn in the foliage of standing vegetation; wind speed is the critical factor. Fires burn with an average flame length of 6 feet and spread at a rate of 2,112 feet/hour. Interior live oak, young chemise aged 10-30 years, and manzanita are all associated with this fuel model. In many instances, a fuel model 5 will evolve into a fuel model 6 by the latter part of summer. This fuel type is found interspersed with fuel model 4 in the foothills. In timber plantations, pole stands may best be represented as brush models prior to the time that the canopies begin to be isolated from the ground. Conifer pole plantations evolve to FM4 or FM6 depending on intermediate cultural treatments such as pruning, thinning and slash treatment.

Fuel Model 8: This model reflects slow burning, low intensity fires burning in the leaf or needle litter under a conifer or hardwood canopy. Fuel model 8 contains few fine fuels (about 1-2 tons per acre) consisting of compacted leaf and short needle conifer litter and is absent an under story shrub layer. These fires do not pose a threat unless low fuel moisture or high winds allow the fire to spread into the canopy. This model is found in black-oak dominated woodland, in high elevation true-fir stands and locally in areas treated for fuel reduction. It represents the ideal model; where fire behavior is characterized by low-intensity, slow burning ground fire. This type of vegetation is found in small western portions of Tehama County in the narrow band between chaparral and mixed-conifer timberland and in elevations over 6000 feet where white and red firs dominate.

Fuel Model 9: Much like fuel model 8 this model has little or no shrub layer but has more fine fuels (about 2-4 tons per acre), which is deeper, and "fluffier" like oak leaves and long conifer needles. Fires in this model also burn with more intensity and higher rates of spread, especially under windy conditions. This model is found in a wide range of areas under timber stands, which have been treated for fuel reduction, or have seen low intensity fires over the last decade. This fuel type is found in vast acres in the 2,500 to 4,000 foot ponderosa pine dominated elevation of eastern Tehama County. Fuel Model 9 is also extremely prevalent throughout far western portions of the Unit.

Fuel Model 10: Fuel model 10 usually has a shrub or immature tree under story with loadings of fine fuels of about 3 to 4 tons per acre and heavy loadings of 12+ tons per acre. Fires in this timber model burn with greater intensity (6-10 foot flame lengths) with moderate rates of spread. Torching of individual trees is common and can cause embers to start new "spot" fires ahead of the main fire. Crown fires are also a substantial threat in this fuel type. In dry conditions, or with high winds, fires in fuel model 10 can be very difficult to control. This model is characterized by stands of overstocked managed timberland and unmanaged natural conifer stands that can be found in the far eastern and western portions of the unit.

Fuel Model 11: Fuel model 11 results from timber operations where a heavy slash component is still present. FM11 can consist of the felled boles of a thinned stand (pre-commercial) or the limbs and tops from a heavy logging operation. Recent deposited slash ("red slash") may be 3+ feet deep and will have about the same burning characteristics as Fuel Model 4. Aged slash will likely burn more like Fuel Model 10. Loading is about 12 tons-per-acre and the fuel bed depth is about 1-foot. Where a commercial biomass operation is conducted coincidental with the timber operation, or where other fuel-reduction treatments (underburning, pile & burn) are conducted, the slash represented by FM11 does not form. This fuel model is found in the actively managed commercial timberlands both on the east and west sides.

National Wildfire Coordinating Group Fuel Models
Tehama-Glenn Unit Description

Fuel Model #	Fuel bed depth (feet)	Tons per acre (live)	Tons per Acre (dead)	Flame Length (feet)	Spread Rate (feet/hour)	Comments
1	1	0	.74	4	5195	Dry grass. Common in areas under 1000' elevation.
2	1	.5	4	6	2331	Dry grass with 1/3 to 2/3 brush or tree canopy. Very common above 1000'.
3	2.5	2.5	3.01	12	6926	Grass model, not found locally.
4	6	5.01	16.03	19	4995	Thick brush with heavy dead component.
5	2	2	3.5	4	1199	Young or green brush with fire in the litter only.
6	2.5	2.5	6	6	2131	Mature or dry brush with foliage that will burn when exposed to wind.
7	2.5	2.5	4.87	5	1332	Brush model, not found locally.
8	.2	.2	5	1	107	Timber or hardwood with fire burning in light litter underneath. No shrub.
9	.2	.2	3.48	2.6	499	Timber with fire in slightly heavier litter then model 8

Fuel Model #	Fuel bed depth (feet)	Tons per acre (live)	Tons per Acre (dead)	Flame Length (feet)	Spread Rate (feet/hour)	Comments
10	1	1	12.02	4.8	526	Timber with shrub/immature tree understory, heavy dead material underneath.
28	1	1	11.52	3.5	400	Light logging slash from a partial thinning operation
97						Agricultural Lands
98						Water
99						Barren/Rock/Other

Shading denotes predominant fuel models of Tehama and/or Glenn Counties.

The local distribution of the fuel models is illustrated in the above table. It can be noted that the diversity of combustible material, both in terms of species and arrangement, increases with elevation. Models 1 and 2 (grass fuel models) are found at lower elevations up to about 1,500 feet, progressing into brush and from their timber at the 2,300-foot elevation generally. Local conditions, known as microclimates also affect fuel type and density. For instance, north-facing slopes tend to retain more soil moisture and receive less sun favoring the development of hardwood and succulent species. In contrast, southern exposures are subject to more open growth conditions, grass, brush and conifer species, which have adapted to drier, poor soil conditions.
The first step in defining hazardous fuels is the development of a vegetation coverage layer for the Tehama-Glenn Unit using GIS. Planning belts have been established to categorize the various fuel types in to four general areas (grass, brush, timber, and woodland) consisting of similar fuels. Moreover, these zones have similar fire behavior characteristics that impact fire suppression activities, and are based on the Fire Behavior Prediction System (FBPS) fuel modeling correlation.

The vegetation within the planning belts is then categorized into the FPBS fuel model coverage as described in the National Wildfire Coordinating Group Fuel Models on the previous page. After the vegetation coverage was completed, Arcview GIS was used to display the vegetation coverage overlaid with the Unit's fire history. Through analysis, the impact on surface fuel characteristics because of past fires was factored into the creation of a final vegetation layer. The final product is a more accurate account of the current "post fire" vegetation coverage's throughout the Unit, and thus, FBPS fuel characteristics.

The final phases of determining fuel hazard ratings for the Tehama-Glenn Unit involves the combining of crown fuel characteristics and surface fuel characteristics. The method attributes additional ladder and crown fuel indices to surface fuels in a given area. If the vegetation data provide sufficient structural detail, the method inputs these additional indices from that data. If the vegetation data lacks structural detail, the method inputs indices based on the fuel model alone. In the Tehama-Glenn Unit, the majority of indices were based on the FPBS fuel models.

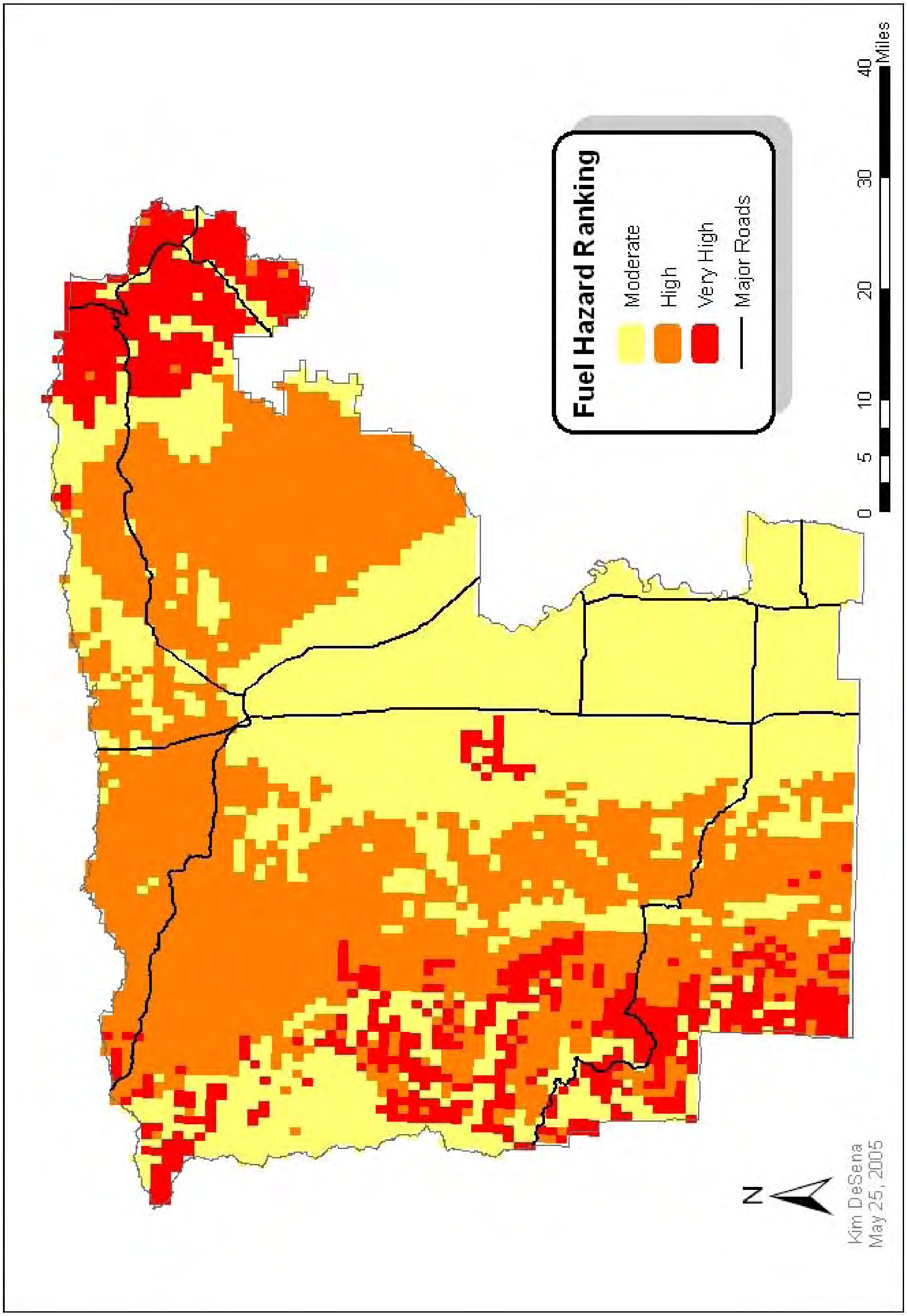
The total hazard rating includes not only hazards posed by surface fire, but also hazards by involvement of canopy fuels. The hazard ranking method includes this additional hazard component by adjusting and upgrading the surface hazard rank according to the value of the ladder and crown fuel indices. Specifically, the surface hazard rank increases a maximum of one class in all situations where the sum of the ladder and crown fuel indices is greater than or equal to two.

The assessment method calculates expected fire behavior for unique combinations of topography and fuels under a given weather condition. While the BEHAVE Fire Behavior Prediction System (Andrews 1986) provides estimates of fire behavior under severe fire weather conditions for each of the FPBS fuel models located on six slope classes. Each fuel model combined with each slope class receives a surface hazard rank.

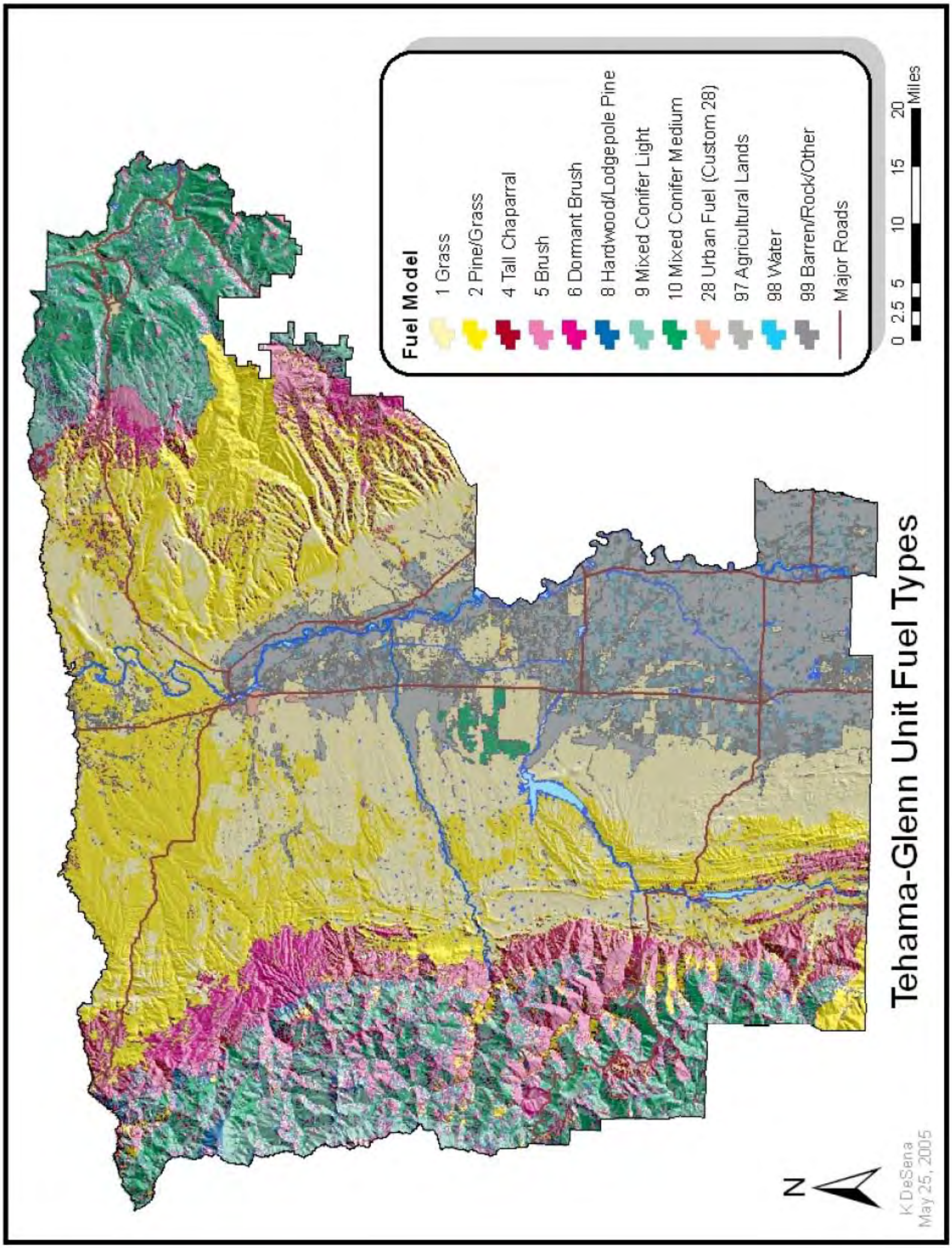
The potential fire behavior drives the hazard ranking. A rank is attributed to each Q81st (450 acre parcel) within the Tehama-Glenn Unit's state responsibility area (SRA). The ranking method portrays hazard ratings as moderate, high or very high. Stakeholders within the
Tehama-Glenn Unit having an interest in ecosystem management, fuels management, and pre-fire management can use the map displaying the fuel hazard ranks as another tool to determine pre-fire management prescriptions.

Knowledge of fire behavior in a given fuel type is paramount in developing a community defense plan against wildfire. Fires in grass burn rapidly, but can be stopped by a roadway or plowed firebreaks. Fires in brush often burn with an intensity that prevents fire crews from safely applying water to the flame front. Timber fires can ignite new fires (called spot fires) miles ahead of the main blaze, hampering control efforts. Only wide scale pre-fire management programs can reduce the potential of a wildfire catastrophe.

Another issue related to fuels that are not in the FPBS is housing density. The introduction of humans has added fuel, in the form of structures, increasing the total fuel loading.



Fuel Hazard Ranking
Tehama and Glenn Counties


Tehama-Glenn Unit Fuel Types
Fuel Model
1 Grass
2 Pine/Grass
4 Tall Chaparral
5 Brush
6 Dormant Brush
8 Hardwood/Lodgepole Pine
9 Mixed Conifer Light
10 Mixed Conifer Medium
28 Urban Fuel (Custom 28)
97 Agricultural Lands
98 Water
99 Barren/Rock/Other
Major Roads
0 2.5 5 10 15 20 Miles
N
K DeSena
May 25, 2005

F. Structure Fuels

Population increases in wildland areas have raised strategic concerns about wildfire protection. Based on fire records for 1985-1994, an estimated 703 homes are lost annually to wildfire in California. Within Tehama and Glenn counties, several communities lie within the wildland urban interface. Topography features, vegetative fuel loading, and severe weather potential raise threat to structures within these areas. Preventative measures are in place to aid firefighters in the suppression of structure fire exposure to a wildland fire. The Fire Safe Council and the State of California, including individual counties, provide the public

Research shows roofing, defensible space, and fire prevention measures within the home ignition zone play the largest role in home survival. Geographically, Tehama and Glenn counties have less than 10% of structures with untreated wood-shake roofs. Most of these homes can be found amongst the urban interface within the Wilcox and Surrey Village areas. Greater than 90% of the homes in both counties have class B roofs or greater. During a wildfire event, wood-shake roofs create a greater risk to structure ignitability, fire damage, ultimate structure loss, and hampered fire suppression efforts due to greater exposure to fire embers, radiated heat, or surface fire spread. Fire suppression efforts typically become hampered with higher water consumption during structure fire suppression efforts, equipment and personnel commitment, and exposure to other structures.

Because of historical catastrophic loss of structures in the wildland urban interface, laws and regulations are in place for the best interest of the public. On a yearly basis, each Battalion within the counties perform LE38 inspections of clearance around structures (Public Resource Code 4291), typically prior to fire season, to aid residences in the compliance and understanding of the regulation parameters in anticipation of a wildfire event. It is up to each Californian to be aware of, and practice fire safety. Tehama County Ordinance 1537 includes Chapter 9.14, known as the "Tehama County Fire Safe Regulations", in affect after October 1, 1991. The Fire Safe Regulations constitute the basic wildland fire protection standards of the California Board of Forestry. These regulations have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building construction and development in Tehama County. Items identified include basic road access, signing and building numbering, private water supply reserves for emergency fire use, and vegetation modification.

Fire department personnel attend stakeholder meetings, to aid the public with information and possible resources to utilize for fuel management projects in high priority/fire hazard areas.

Tehama County Fire Prevention and Education Officer (TCFPEO) plays a key role in the placement and construction of new construction projects. During plot plan and project plan review, building site placement is considered and recommendations and special mitigation requirements are placed on structures that do not have adequate room for vegetation clearance.

The TCFPEO works cooperatively with the Tehama County Sheriffs Office and the Office of Emergency Services to develop documents for public reference in the form of Fire Prevention Calendars and a Multi-Hazard Emergency Evacuation Plan.

The calendars prompt homeowners about upcoming fire season conditions as well as provide information to prepare their homes and property.

The Multi-Hazard Emergency Evacuation Plan for the communities of Tehama County provide a detailed checklist for homeowners which emphasizes the need for pre-incident preparation as well as proper procedures to follow during an emergency. These plans were developed by the TCFPEO to address the critical needs of fire department and law enforcement personnel during emergencies such as wild land fires, hazardous material leaks, floods, other natural disasters and homeland security emergencies.

G. Frequency of Severe Fire Weather

<u>Description of Severe Weather Analysis</u>

Fire behavior is dramatically influenced by weather conditions. Large, costly fires are frequently, though not always, associated with sever fire weather. Severe fire weather is typified by high temperatures, low humidity and strong surface winds. The Fire Plan's weather assessment considers different climates of California, from fog shrouded coastal plains to hot, dry interior valleys and deserts to cooler windy mountains. Each of these local climates experiences a different frequency of weather events that lead to severe fire behavior (severe fire weather). The Fire Plan's weather assessment uses a Fire Weather Index (FWI) developed by USDA Forest Service researchers at the Riverside Fire Lab. This index combines air temperature, relative humidity, and wind speed into a single value index. This index can be calculated from hourly weather readings such as those collected in the California Remote Automatic Weather Station (RAWS) data collection system. The FWI does not include fuel moistures or fuel models. The FWI includes topography only to the extent that the RAWS station weather readings are influenced by local topography.

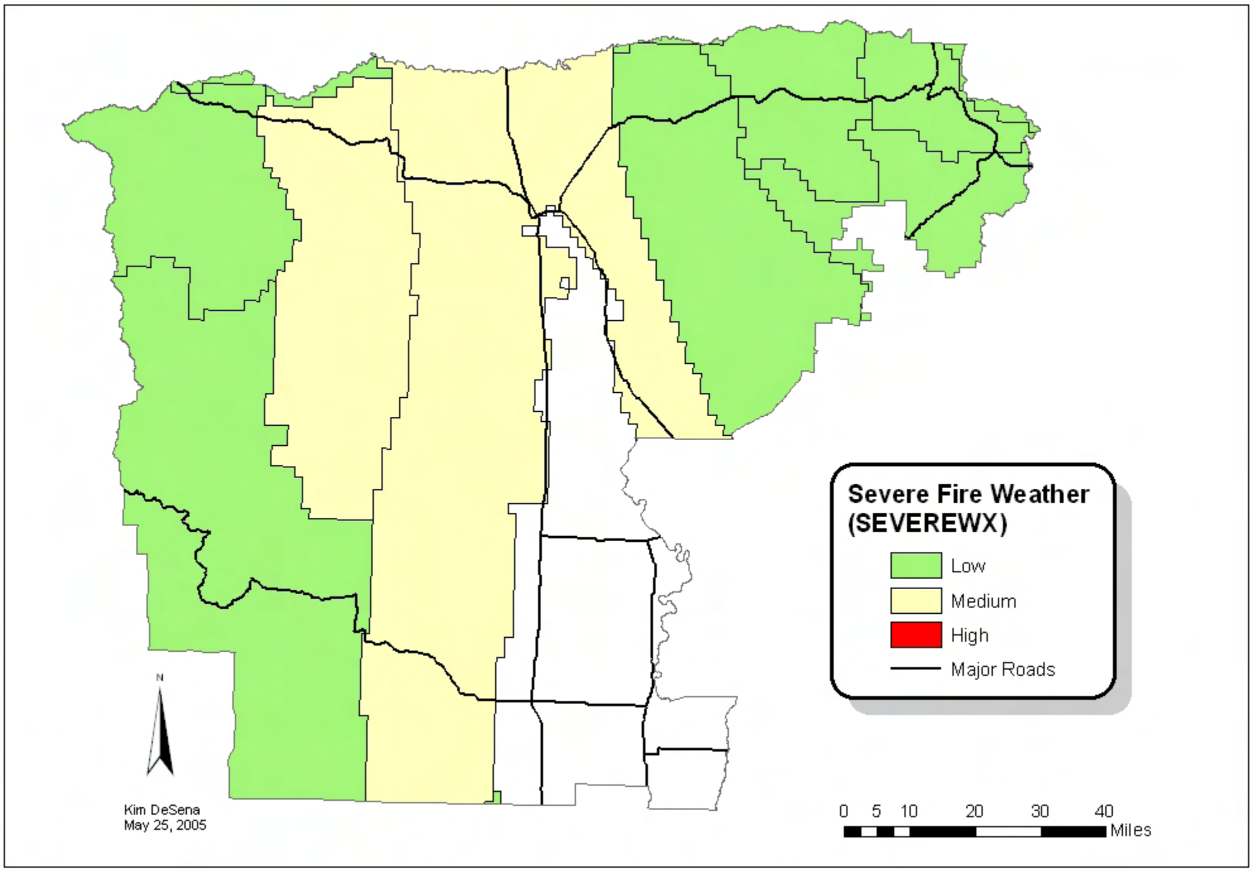
Severe Weather Analysis Parameters

FWI CUTOFF	START LOW RANK	START MED RANK	START HIGH RANK
29.725	0%	5%	20%

STATION	OWNER	LATITUDE	LONGITUDE	ELEVATION	WXSCORE %	WXRANK
Lassen Lodge LAS	CDF	40.34	121.70	4000	0.24	L
Corning CRG	CDF	39.93	122.16	294	6.38	M
Eagle Peak EPF	USFS	39.92	122.64	3713	5.83	M
Manzanita Lake MNZ	USFS	40.54	121.58	5871	2.44	L
Thomes Creek TCK	CDF	39.85	122.61	1040	5.14	M
Cohasset CST	CDF	39.89	121.77	1670	1.41	L
Pattymocus PMC	USFS	40.28	122.87	3889	0.26	L
Chester CHS	USFS	40.28	121.23	4530	3.02	L
Alder Springs ADS	USFS	39.65	122.72	4500	0.76	L
Stonyford STY	USFS	39.36	122.54	1200	0.72	L
Yolla Bolla YBL	USFS	40.33	123.06	4786	2.46	L

SevereWx and WxScore

[SevereWx]/[WxInSeas] The weather score is a percentage of the number of days of severe weather during the designated fire season. This table reflects the RAWS data collected over the last ten years. Non-fire season data is not considered, as the fuels are not in a state in which they readily burn, regardless of the severity of weather. Naturally, there are rare exceptions to this; however, it is not feasible to factor in all possible contingencies. Moreover, including this data would only serve to weaken the representative impact that severe weather plays in fire behavior. This table reflects a ten-year average of RAWS data.
The WxSCORE intensity rating is lumped into three categories, low, medium and high, to create a severe fire weather frequency ranking (**WxRANK**).



Severe Fire Weather (SEVEREWX)

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Zone	Battalion(s)	Fuels	Topography	Access	Water Supply	Level of Service	Primary Assets
1 Paskenta, Red Bank, R-Ranch	3 4	Oak-woodland; chaparral brush	Rolling to steep hills	Limited: mostly rugged, difficult terrain	Limited: steep drainages, seasonal ponds and streams	3 fire stations, 1 conservation camp	Structures, rangeland, agricultural land, timber, watershed
2 Bowman, Dibble Creek, Lake California, Wilcox	1 2 3	Grass rangeland, oak-woodland, brush	Rolling to steep hills	Moderate to Limited: some rugged terrain	Moderate: water sources range from adequate to limited	3 fire stations	Structures, people, rangeland, agricultural land, watershed
3 Bend, Dales, Hog Lake	1 2	Grass, grass-dominated oak-woodland	Flat terrain to rolling hills	Good	Moderate to limited: few dependable year-round sources	No fire stations (serviced by CDF in Red Bluff and Manton)	Structures, rangeland, watershed
4 Manton, Ponderosa Sky Ranch	1	Oak-woodland; chaparral brush; conifer	Broad ridges, steep canyons	Limited	Limited: few ponds, minimal access to streams	2 fire stations	Structures, rangeland, agricultural land, timber
5 Mill Creek, Mineral	1	Mixed conifer woodland	Broad ridges, steep canyons	Moderate: high-ways, county & logging roads	Limited: few ponds, minimal access to streams	4 fire stations	Structures, timber
6 Live Oak, West Red Bluff	3	Grass rangeland, oak-woodland, brush	Rolling hills	Good, moderate in western portion of zone	Variable limited to Good	2 fire stations	Structures, rangeland
7 Vina Plains	2	Grass, grass-dominated oak-woodland	Flat terrain to rolling hills	Moderate	Variable	No fire stations (serviced by TCFD in Los Molinos and CDF in Red Bluff)	Structures, rangeland, agricultural land, fisheries
8 Ishi, Paynes Creek	1 2	Oak-woodland; chaparral brush	Broad ridges, steep canyons	Limited	Limited	2 fire stations, 1 conservation camp	Structures, rangeland, timber, fisheries
9 Flournoy, Paskenta, Rancho Tehama	3 4	Grass rangeland, oak-woodland, brush	Rolling hills	Moderate	Variable limited to moderate	2 fire stations, 1 conservation camp	Structures, rangeland, agricultural land
10 Glenn County (SRA)	4	Grass rangeland, oak-woodland, brush	Rolling to steep hills	Moderate to limited: some rugged terrain	Variable limited to moderate	1 fire station 1 conservation camp	Structures, rangeland, agricultural land, watershed