III. Assessment

Process

The Fire Plan process for assessing wildland fire protection involves collecting data, validating the data with input from stakeholders and then assembling the data into an easy to use format. The four components to the Fire Plan assessment process are Level of Service, Assets at Risk, Fuels, and Weather. The data for the four components are obtained from CAL Fire's Fire and Resource Assessment Program (FRAP) computer databases and Unit level archives. Once the data has been reviewed and validated, it is assembled and assigned to a land area. To arrive at a common land area unit to assemble the assessment data, a 9 by 9 grid, forming 81 equal area blocks of land, divides U.S. geological Survey 7.5 minute quadrangle maps. Each block of land contains approximately 450 acres and is referred to as a quad 81st. The entire data for the Unit has been compiled down to the quad 81st. When the data is viewed in the form of a map, problem areas are easily identified and can be addressed by prioritizing the areas for prefire projects. The prefire projects can range from on the ground fuel load reduction to public awareness campaigns.

Even though the Fire Plan assessment process has not been completed for the Fresno-Kings Unit, the Unit is pressing forward with the information that is available since it is an immediate priority to implement projects that address the threat of wildfire in our communities. The use of "on the ground" knowledge, Geographic Information Systems (GIS) information, FRAP data, local data and input from the Highway 168 Fire Safe Council has allowed the Unit to begin making well-grounded decisions in prefire management. The Fire Plan assessment process will continue and as data is reviewed and validated it will be incorporated into the Unit Prefire Management Plan. When the Fire Plan assessment is completed, it is anticipated that the data will validate the decisions that have been made in the Unit in regards to Prefire Management up to that time.

Stakeholders

Stakeholders are defined as any person, agency, or organization with a particular interest – a stake – in fire safety and protection of assets from wildfires. The process of identifying and involving stakeholders in the Fresno-Kings Unit is an ongoing effort. Early in the Fire Plan implementation, process the Fresno-Kings Unit determined the need for a forum to meet and involve stakeholders in the Fire Plan process. Local Fire Safe Councils act as a forum for stakeholders to share and validate fire safety and fire planning information.

The Fresno-Kings Unit initiated a local Fire Safe Council in 1998. The Fire Safe Council called the Highway 168 Fire Safe Council has become an outstanding forum for stakeholders in Northeastern Fresno County to meet and share their thoughts and concerns related to fire management. The Highway 168 Fire Safe Council has empowered local citizens and encouraged interagency cooperation and teamwork. The Highway 168 Fire Safe Council hired a coordinator and has established an office in Prather. Overall the Highway 168 Fire Safe Council has been popular and a true success story.
See Appendix B for a list of the current stakeholders represented in the Highway 168 Fire Safe Council.

A side benefit to the Highway 168 Fire Safe council has been the opportunity to meet and work with CAL Fire's cooperators such as the U.S. Forest Service. The Fresno-Kings Unit has been able to develop a cooperative working relationship with the Sierra National Forest. This relationship has lead to shared information and area planning for prefire projects. This cooperative working relationship will help the Highway 168 Fire Safe Council in future federal grant funding opportunities.

Some of the key issues that are being addressed by the stakeholders in the Highway 168 Fire Safe council are public awareness/education and funding sources for prefire projects. The Council has been actively working with CAL FIRE and the US Forest Service to develop public awareness and education projects. Currently the Council is working on a second mailer insert that will be mailed to all foothill and mountain residents addressing fire safety and fire hazard reduction. The Council is currently working with CAL FIRE and Sierra National Forest on grant funding for several new projects related to fire hazard reduction.

In March of 2005, the Fresno-Kings Unit initiated an additional local Fire Safe Council in the Southeastern portion of Fresno County. This new Fire Safe Council is called the Oak to Timberline Fire Safe Council and has rapidly developed into an energetic group of varied stakeholders. In 2008 they produced the emergency evacuation map and handout packet for Southeastern Fresno County.
See Appendix B

Ignition Workload Assessment

Fire Protection in the Fresno-Kings Unit is a cooperative effort. Interagency and Master Mutual Aid Agreements allow the various fire protection agencies to work together and accomplish the goal of providing fire protection in the most efficient manner. Keeping this in mind, the Level of Service Assessment is really an assessment of fire protection in the SRA of Fresno and Kings Counties and not an actual assessment of the fire protection provided by just CAL FIRE alone.

Public Resources Code Section 4130, directs the Board and CAL FIRE to "classify all lands within SRA into types of land based on cover, beneficial use of water from watersheds, probable damage from erosion and fire risks and hazards; to determine the intensity of protection to be given each such type of land. A plan for adequate statewide fire protection of state responsibility areas shall be prepared by the board in which all land of each type shall be assigned the same intensity of protection and the estimated cost of such intensity of protection shall be determined." The Board's approach was to develop the California Fire Plan. The Level of service looks at the initial attack success and major fire failure rates.

Level of Wildland Protection Services (LOS)

The LOS rating (see The LOS rating is a Chart 4, Level of Service) is a ratio of successful fire suppression new fire plan efforts to the total fire workload, a method to measure initial attack assessment system success and failure rates throughout California wildlands.

The LOS uses a Geographic Information System (GIS) that overlay a 10-year history of wildfires onto vegetation type map and derives the average annual number of fires by size, severity of burning and assets lost. This data allows a LOS Success (and Failure) Rate calculation:

SUCCESS RATE =

Annual number of fires that was small and extinguished by initial attack

total number of fires

SUCCESS RATE = X percent

This results in an initial attack success rate in percentage of fires by vegetation type and by area. Similar areas can be compared locally, regionally or statewide using the GIS database.

Using the GIS databases, each wildland area of a community, unit, region or statewide, are ranked by age and type of vegetation to identify high-volume fuel areas that have accumulations of dead fuel with the potential for large conflagrations. Areas are ranked by high, medium, or low risk of potential as sites of large damaging conflagrations.

The California All Incident Reporting System (CAIRS) database has been validated back to 1981 for SRA fires. While calculating the Level of Service for the Unit, it has been determined that all fires, not just the SRA fires need validation. The LOS validation was completed in late 2004. An in depth explanation of the level of service rating and process can be found in the California Fire Plan.

The California Fire Plan can be downloaded at the CAL FIRE FRAP website:
http://frap.Cal Fire.ca.gov/fire_plan/

Assets at Risk

The primary purpose of wildland fire protection in the Fresno-Kings Unit is to protect the wide range of assets found in the Unit from the effects of wildfire. Table 1 lists the identified assets at risk that are found throughout the State of California as well as their asset value basis, level of disaggregation and level of value. All of the assets at risk in Table 1 are also found throughout the Unit. The California Fire Plan recommends that the limited fire protection resources should be allocated, at least in part, based on the value of the assets at risk. A detailed explanation of the quantification and valuation approaches for each asset may be found in the California Fire Plan.

Currently the Fresno-Kings Unit is reviewing and validating the base Assets at Risk data. Maps are going to be created to show the current preliminary value of the assets as high, medium, or low. Stakeholder input is critical to determining which assets at risk are present and what value they have. The maps created will be presented to various forums, such as the Highway 168 Fire Safe Council, to help validate the data. If representatives of the various assets at risk such as Southern California Edison, Pacific Gas & Electric Company (PG&E), Army Corps of Engineers, Bureau of Reclamation and the Department of Fish and Game are not present at the Highway 168 Forum, attempts will be made to meet with them individually in order to get their input in the validation process. Involving the various stakeholders in the validation process has the additional benefit of educating them about the problem and issues at hand. In the case of the Highway 168 Fire Safe Council, they will then be aware of the problem and will be more likely to help seek grant funding to address the problem.

***Table 1**. Assets at Risk Framework Summary*

Resource	Asset Value Basis	Level of Disaggregation	Levels of Value*
Life and safety	Non-economic values are not quantified	By population density	National, state and local
Air quality	Average dollar impact from particulate matter (PM10) emitted per acre burned; non-commodity assets also exist	Air quality basins (13) and basic fuel types (2)	National, state and local
Range	Dollar cost of replacement feed per acre of rangeland burned	Values by regions (8), cover types (9) and ownership classes (5)	State and local
Recreation on public wildlands	Average dollar loss per acre burned; non-commodity assets also exist	Statewide average by public ownership categories (5)	National, state and local
Structures	Average dollar loss per home burned; non-commodity assets also exist	Statewide average	State and local
Timber	Average dollar loss per acre burned	Values by regions (6) and ownership categories (4)	National, state and local
Water and watersheds	Range of economic impacts per acre for value of increased water yields; cost of sediment removal; loss of reservoir capacity; effects on hydroelectric generation; costs of watershed rehabilitation; non-commodity assets also exist	Statewide ranges of economic impacts	National, state and local
Wildlife, habitat, plants and ecosystem health	Qualitative discussion of the tradeoffs in fire impacts	Statewide	State and local
Other resource assets, cultural and historic resources, unique scenic areas	These non-commodity assets cannot be quantified adequately; descriptive enumeration only	Statewide (generically) or place-specific	National, state and local

**May or may not be cumulative.*

Communities at Risk

During the spring of 2001, a field validation process was conducted in the Fresno-Kings Unit to identify and validate communities at risk. This process was conducted based on a request from Congress, through the FY 2001 Appropriation Bill, that called for a list of "…all urban wildland interface communities, as defined by the Secretaries, within the vicinity of Federal lands that are at high risk from wildfire, as defined by the Secretaries". The following criteria were provided to help identify communities at risk:

- ***Interface*** exists where humans and their development meet or intermix with wildland fuels.
- ***Community*** is a defined area where residents live and are provided services such as fire protection, water, law enforcement, etc.
- ***Vicinity*** of Federal lands is defined as within the range in which fires can travel.
- ***High-risk*** exists where there is land condition that is characterized by high-risk fire regimes.

After receiving input from the USDA Forest Service and National Park Service, the following communities in Fresno and Kings Counties were identified as *Communities at Risk* and were placed on the National list in the Federal Register.

Auberry	**Friant**	**Pinehurst**
Avenal **	**Hume ***	**Prather**
Big Creek *	**Lakeshore ***	**Shaver Lake**
Dinkey Creek*	**Meadow Lakes**	**Squaw Valley**
Dunalp	**Piedra**	**Tollhouse**

** located in Federal Direct Protection Area*

*** Located in Local Responsibility Area*

The significance of a Community at Risk designation has become apparent recently with most Federal grant proposals for wildfire protection requesting information about Communities at Risk in the area of the proposed grant project to help rank the proposal.

Fuels

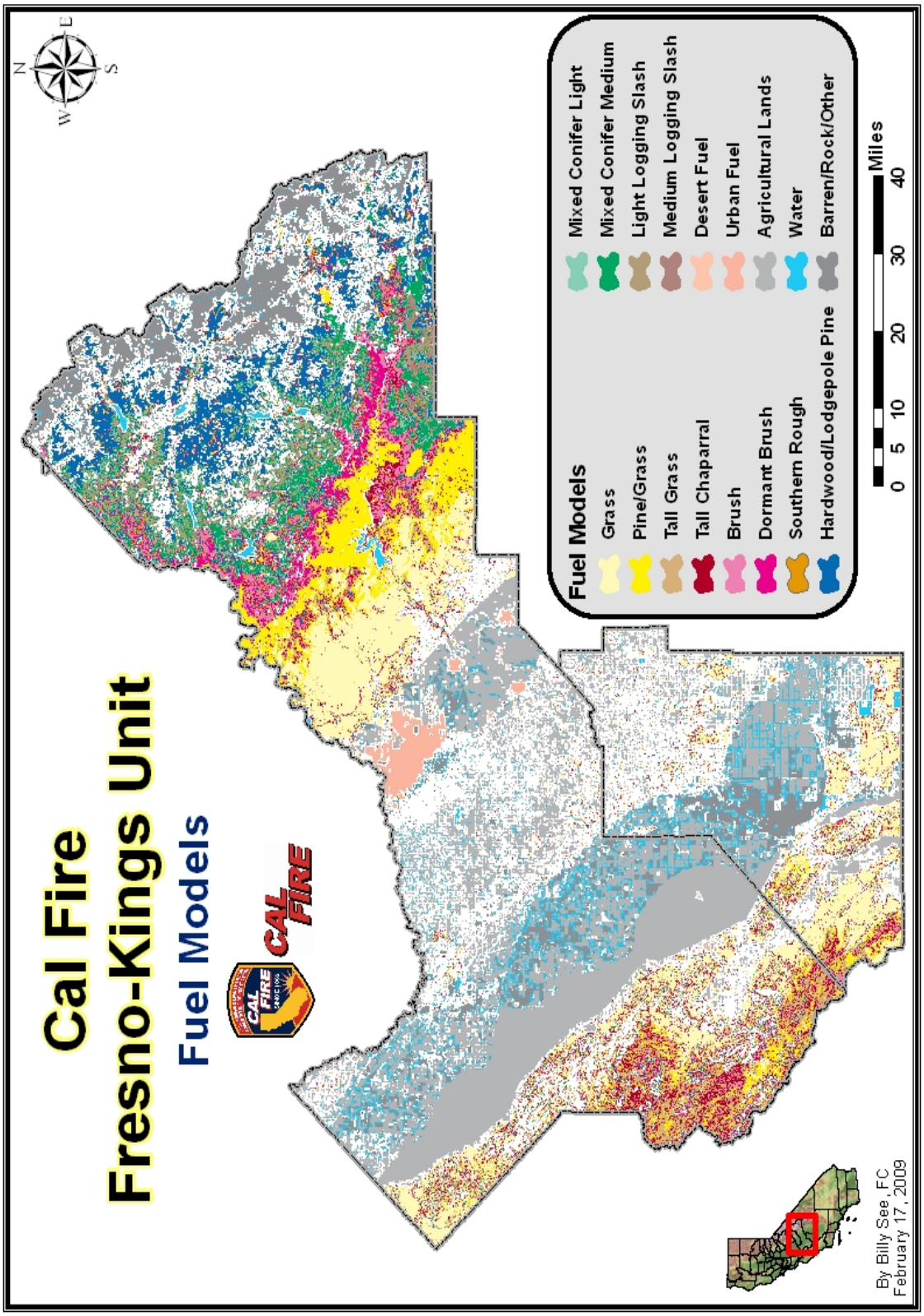
The term “fuels” refers to the vegetative cover on the landscape. We are concerned with fuels because of their significant influence on wildland fire behavior. The more extreme the wildland fire behavior the greater the threat to the assets at risk.

Fuels are commonly classified based on their expected influence on fire behavior. Factors such as fuel moisture, fuel loading (the mass of fuel per unit area), fuel depth, heat content of fuel, and the fuel particle density all affect the behavior of fire and therefore the classification of the fuels. The fuels validation process used by CAL FIRE classifies fuels into thirteen (13) fuel models that were initially established by the Fire Behavior Prediction System (FBPS). In addition to the standard thirteen (13) FBPS fuel models, six (6) custom fuel models are used to describe special circumstances. Table 2 lists fuel model classes (FBPS) and a general description of the vegetation types that typically fall into each class. These fuel models are based Hal Anderson's "Aids to Determining Fuel Models for Estimating Fire Behavior" (April 1982) published by the National Wildfire Coordinating Group.

Table 2 *- Fuel model classes (FBPS)*

Fuel Model Classes (FBPS)	
FBPS	**Description**
1	Short Grass
2	Timber/Grass
3	Tall Grass
4	Tall Chaparral
5	Brush
6	Dormant Brush
7	Rough
8	Closed Timber Litter
9	Hardwood Litter
10	Timber
11	Light Logging Slash
12	Medium Logging Slash
13	Heavy Logging Slash
14	Plantation/Burned last 15 years
15	Desert
28	Urban
97	Agricultural Lands
98	Water
99	Barren/Rock/Other

Map 3 – Fuel Models



Fire history plays an important role in modifying fuel model assignments in recently burned areas. Once an area burns during a wildfire, the fuels are at least initially partially consumed and/or changed. Over time, the vegetation re-grows and eventually returns to its state prior to the fire. Some fuel types return more quickly than others do to their prior state before the fire. After a wildfire and while the fuels are regenerating their flammability characteristics are significantly different from when they are fully mature. These characteristics affect the fire behavior if a fire was to return to the area. This variation in the way fuels affect fire behavior is accounted for in the validation process by assigning a different fuel model to some fuels as they re-grow. The process for accounting for this change in fire behavior is called the "Fuel Dynamics Pathways." The fuels can then be updated annually based on the fire history and the Fuels Dynamics Pathway.

Additional information about this process can be found on the CAL FIRE, Fire and Resource Assessment Program website at:

http://frap.Cal Fire.ca.gov/data/fire_data/fuels/fuelsfr.html.

Once the fuel types have been determined and validated by the local Unit, a fuel ranking process is started. CAL FIRE has developed a Fuel Rank assessment methodology that considers the current fuel model, slope class, ladder fuel, crown closure component, and difficulty of control rating to derive the fuel hazard rank for each quad 81st. The fuel rank process produces a map of the Unit that indicates areas of moderate, high and very high fuel ranking. CAL FIRE has determined that there are realistically no low hazard fuels in California.

Additional information about the fuel rank assessment methodology can be found at the CAL FIRE, Fire and Resource Assessment Program website at:

http://frap.Cal Fire.ca.gov/data/fire_data/fuel_rank/index.html.

Fire Hazard Severity Zones

PRC 4201 - 4204 and Govt. Code 51175-89 direct the California Department of Forestry and Fire Protection (CAL FIRE) to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), define the application of various mitigation strategies to reduce risk associated with wildland fires. Mapping of the areas, referred to as Very High Fire Hazard Severity Zones (VHFHSZ), is based on data and models of, potential fuels over a 30-50 year time horizon and their associated expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure (including firebrands) to buildings. Details on the project and specific modeling methodology can be found at http://frap.cdf.ca.gov/projects/hazard/methods.html. Local Responsibility Area VHFHSZ maps were initially developed in the mid-1990s and are now being updated based on improved science, mapping techniques, and data.

In late 2005 to be effective in 2008, the California Building Commission adopted California Building Code Chapter 7A requiring new buildings in VH FHSZs to use ignition resistant construction methods and materials. These new codes include provisions to improve the ignition resistance of buildings, especially from firebrands. The updated very high fire hazard severity zones will be used by building officials for new building permits in LRA. The updated zones will also be used to identify property whose owners must comply with natural hazards disclosure requirements at time of property sale and 100-foot defensible space clearance. It is likely that the fire hazard severity zones will be used for updates to the safety element of general plans.

Severity Zone classes

Class levels are applied to both wildland and urban/developed areas. Wildland zones are defined as relatively homogeneous areas 200 ac and largely dominated by native vegetation cover. They may include in holdings of non-burnable types including water, agricultural lands and barren/rock, but the majority of the landscape is covered by natural plant cover. Developed/Urban zones are areas that have a strong influence of human development, and are characterized by parcel sizes 2 acres or smaller and/or intermingled commercial properties. Contiguous Zones are a minimum of 20 acres in total size, and wildland enclaves within urban areas are a minimum of 20 acres.

- **Moderate**

  Either

  - Wildland areas supporting areas of typically low fire frequency and relatively modest fire behavior. Contributing factors may include a relatively short active fire season and/or low frequency of severe fire weather conditions; modest slope; low incidence of past large and damaging fires; dominant climax fuel types supporting modest surface fire regimes with respect to fire intensity and minimal areas supporting crown fire and associated firebrand development and reception; nearby or interspersed areas supporting non-wildland fuels (agriculture lands, water, rock/barren) may also be present.

  - Developed/urbanized areas with a very high density of non-burnable surfaces including roadways, irrigated lawn/parks, and low total vegetation cover (<30%) that is highly fragmented and low in flammability (e.g., irrigated, manicured, managed vegetation). These areas are classic high-density urban residential areas or commercial properties where wildland areas are removed by a large distance (>.5 mile) or if closer, only present modest fire hazards ((see above). If fire was to spread through these zones it would either be isolated and contained due to incidence of firebrands, or resulting from house-to-house ignitions under the most extreme weather conditions.

- **High**

  - Wildland areas supporting medium to high hazard fire behavior and roughly average burn probabilities. Typically characterized by climax fuels from surface strata only with flat to steep slopes in conjunction with relatively rare fire occurrence influenced by short fire seasons and/or significant moderation of fire weather conditions (e.g. marine influence on fuel moistures), or lesser hazard fuels types subject to more prevalent burn frequencies. Nearby forested areas supporting crown fire are isolated or non-existent. Slopes vary from flat to steep, depending on fuel hazards and burn probabilities.

  - Developed/urbanized areas with moderate vegetation cover and more limited non-burnable cover. Vegetation cover typically ranges from 30-50% and is only partially fragmented. Short-range lateral spotting may breech fuel discontinuities and allow some areas to spread as a flame front. Areas supporting tree cover should not result in significant torching. Adjacent nearby wildlands (within ¼ mile) are typically High Hazard zones (see above) or if farther away, more typical of Very High Hazard zones (see below). These areas lie midway between classic urbanized areas dominated by homes, roadways, and low flammability vegetation cover, and those developed areas where both surface and crown fuels are dense and continuous.

- **Very High**

  - Wildland areas supporting high-to extreme- fire behavior resulting from climax fuels typified by well-developed surface fuel profiles (e.g., mature chaparral) or forested systems where crown fire is likely. Additional site elements include steep and mixed topography and climate/fire weather patterns that include seasonal extreme weather conditions of strong winds and dry fuel moistures. Burn frequency is typically high, and should be evidenced by numerous historical large fires in the area. Firebrands from both short- (<200 yards) and long-range sources are often abundant.

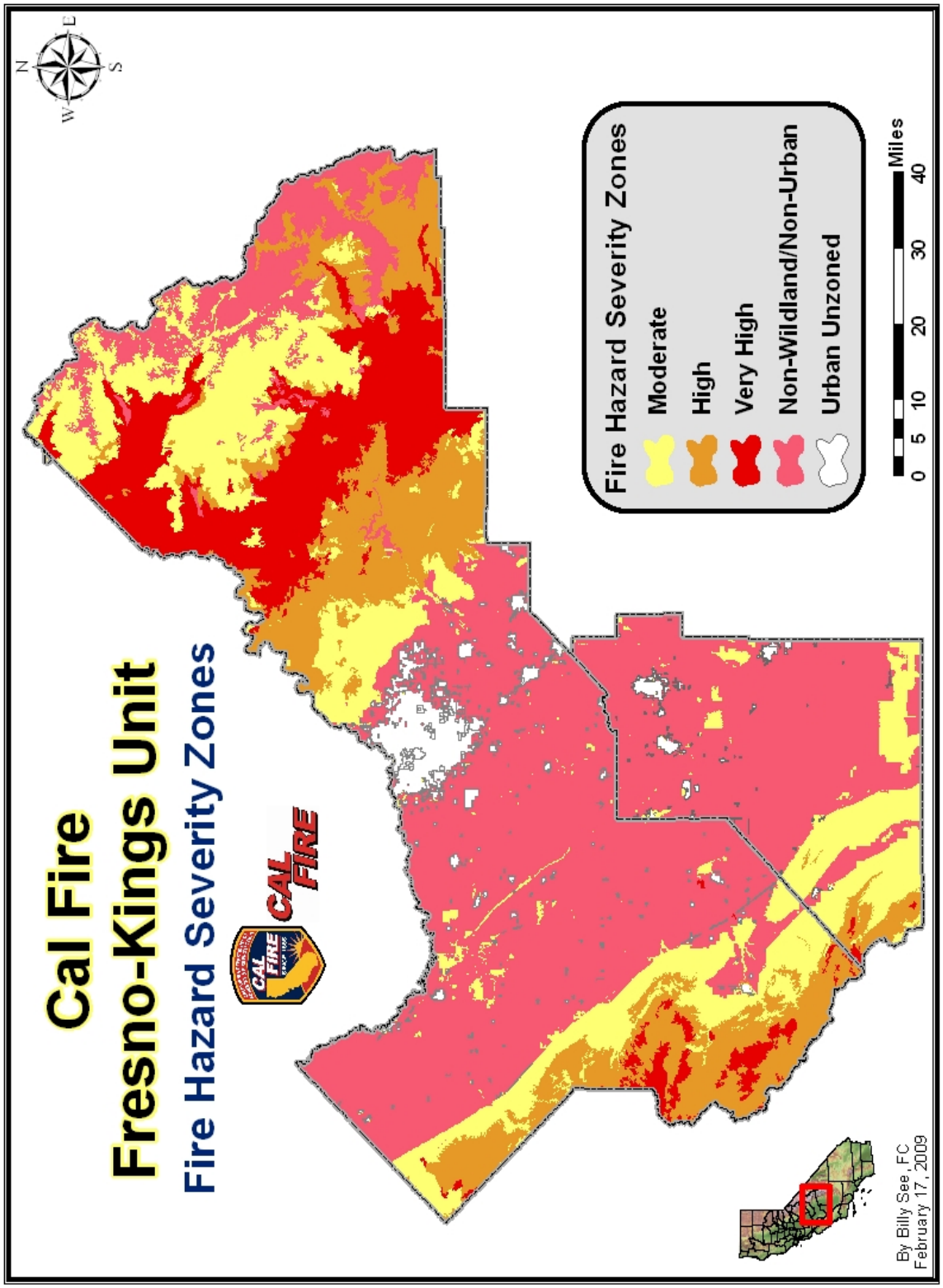
- Developed/urban areas typically with high vegetation density (>70% cover) and associated high fuel continuity, allowing for frontal flame spread over much of the area to progress impeded by only isolated non-burnable fractions. Often where tree cover is abundant, these areas look very similar to adjacent Wildland areas. Developed areas may have less vegetation cover and still be in this class when in the immediate vicinity (1/4 mile) of wildland areas zoned as Very High (see above).

- **Urban / non-zoned**
  - Developed areas spatially removed from proximity to wildland fire areas. Urban centers such as city centers ranging from 200 ft to ¾ miles way from Wildland zones, where the critical distance allowing for this classification is dependent on the nature of the fire hazards in those wildland areas.

- **Non burnable open Space**

  - Areas outside State Responsibility Areas (SRA) that are not classified as developed/urban or as a wildland zone, and are typically associated with nonflammable conditions: water, agricultural lands (excluding rangelands), and barren/rock areas. Similar areas within SRA are recoded to the Moderate class per state statute.

Map 4 –Fire Hazard Severity Zones



Fire History

As described above, fire history is an important part of assessing the fuels and ultimately the fuels ranking in the Unit Fire Plan Assessment. The fire history for the Fresno-Kings Unit has been validated in the field with the cooperation of the Sierra National Forest. The Unit has developed fire history collection criteria similar to Sierra National Forest's criteria. The Unit now collects fire perimeters for all fires 10 acres and larger. For fires less than 10 acres, a point of origin location is collected using latitude and longitude coordinates. These criteria will allow the Unit to easily share and analyze fire ignition and perimeter data with Sierra National Forest. To facilitate the collection of fire history in the field the Unit has purchased handheld Global Positioning System (GPS) receivers and mapping software for all of the State Fire Engines and Battalion Chiefs. This equipment and software has allowed the field personnel to collect fire perimeters and/or points of origin. These perimeters and points are then forwarded to the Prefire Engineer for inclusion in the annual fire history layer. The collection of the fire history by field personnel has allowed them to maintain their fire history for local planning purposes. The plan for collecting, storing, and analyzing the fire history data has been completed and adopted as a Standard Operating Procedure for the Fresno-Kings Unit.

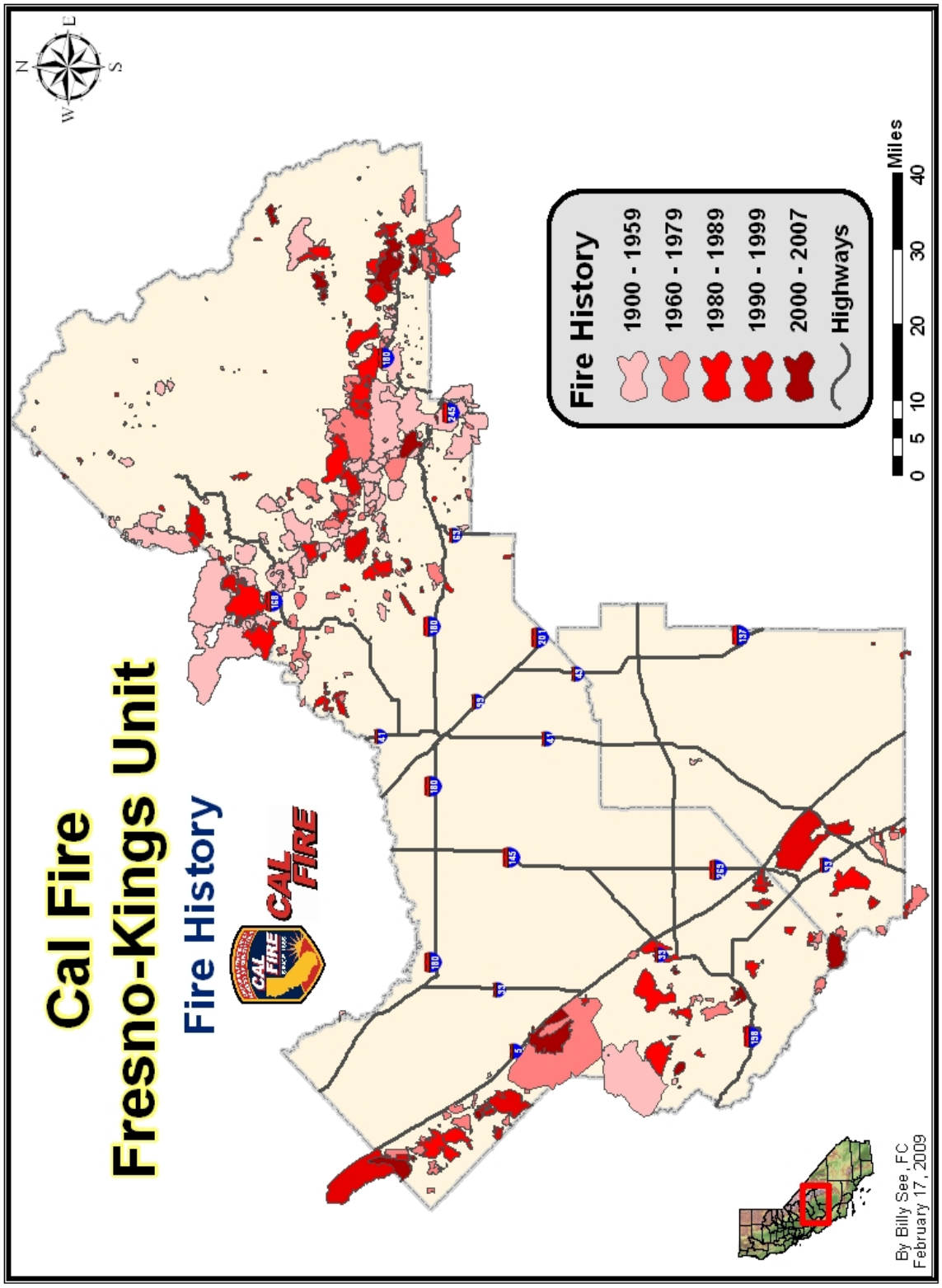
For additional information about the fire history data collection process, see Appendix B - the Fresno-Kings Administrative Procedures Manual, revision #100, 7100-01, Fire Protection Plan "Fire Plan,"

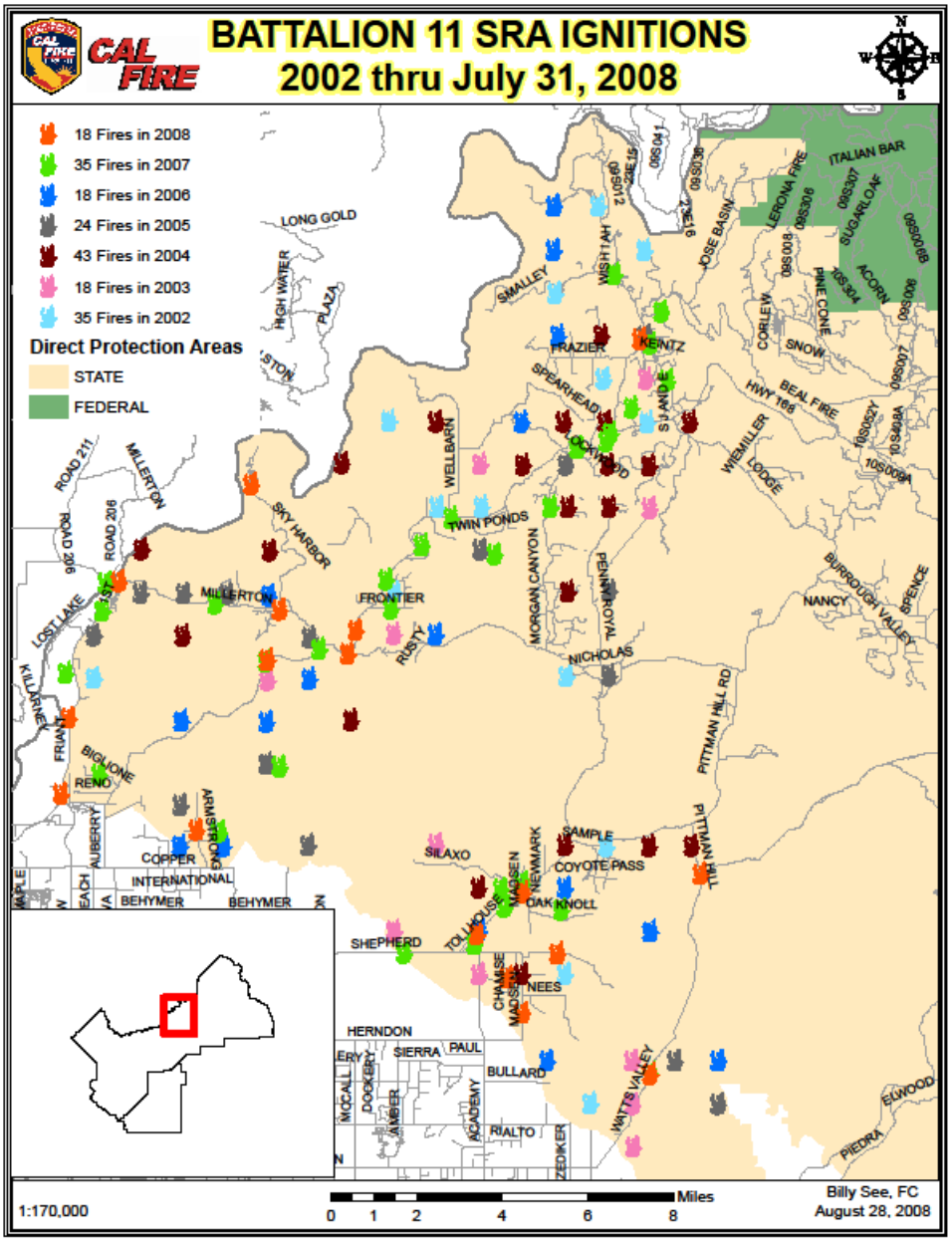
Frequency of Severe Fire Weather

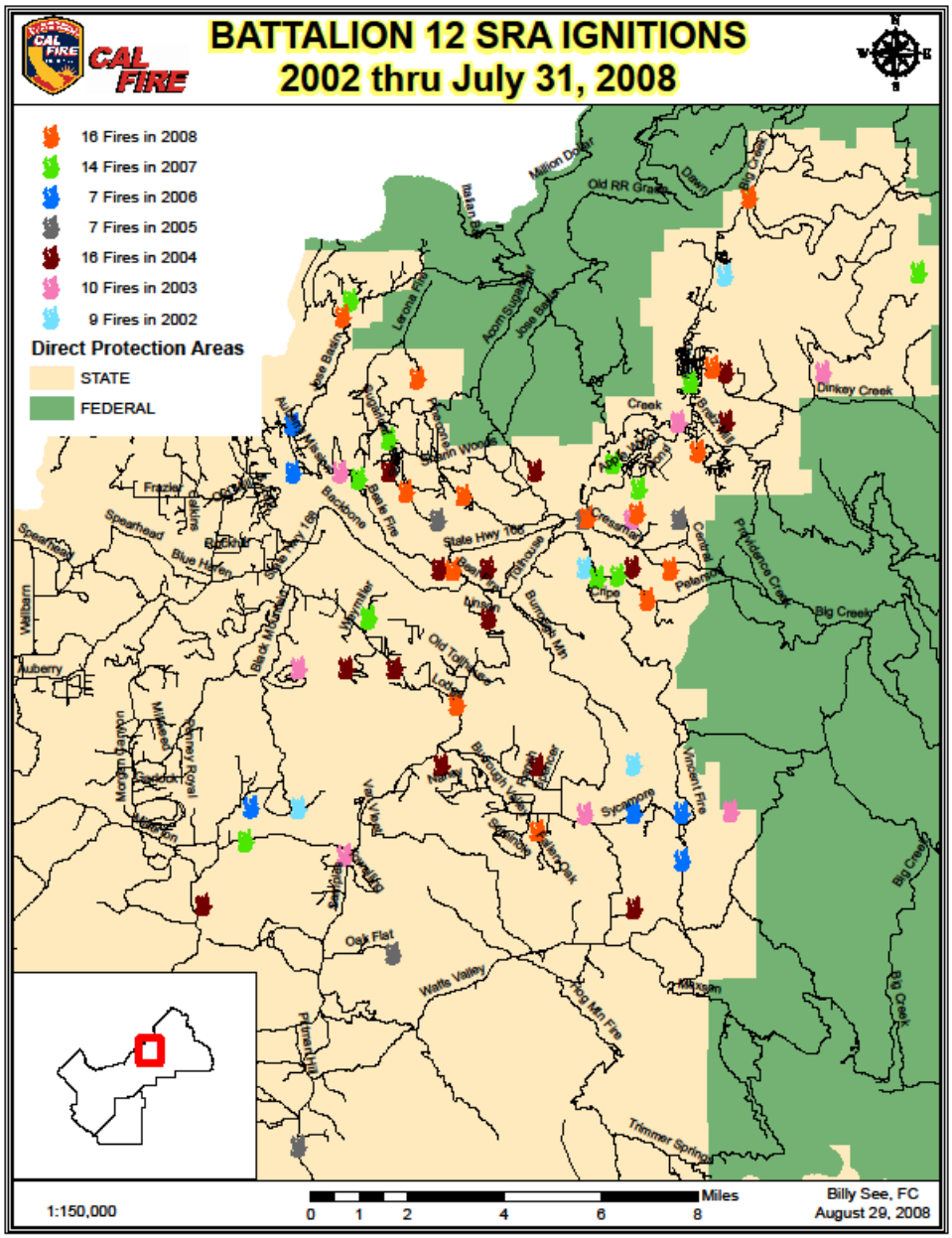
Weather has a significant influence on fire behavior. It is a very dynamic variable and it can be very hard to assign a weather value to a land unit. In the Fire Plan analysis, past weather data is used to calculate and assign a severe fire weather ranking to each quad 81st. The past weather data is obtained from Remote Automated Weather Stations (RAWS). Each quad 81st is assigned a RAWS to represent the local weather. There are several problems with this process. The first problem is the distribution of RAWS throughout the State. Some areas have a good distribution and others do not. The other problem is that many of the RAWS have incomplete historic weather data. In order to obtain useful data often times the quad 81st is assigned a RAWS that is a significant distance away and may not provide representative data for the quad 81st location.

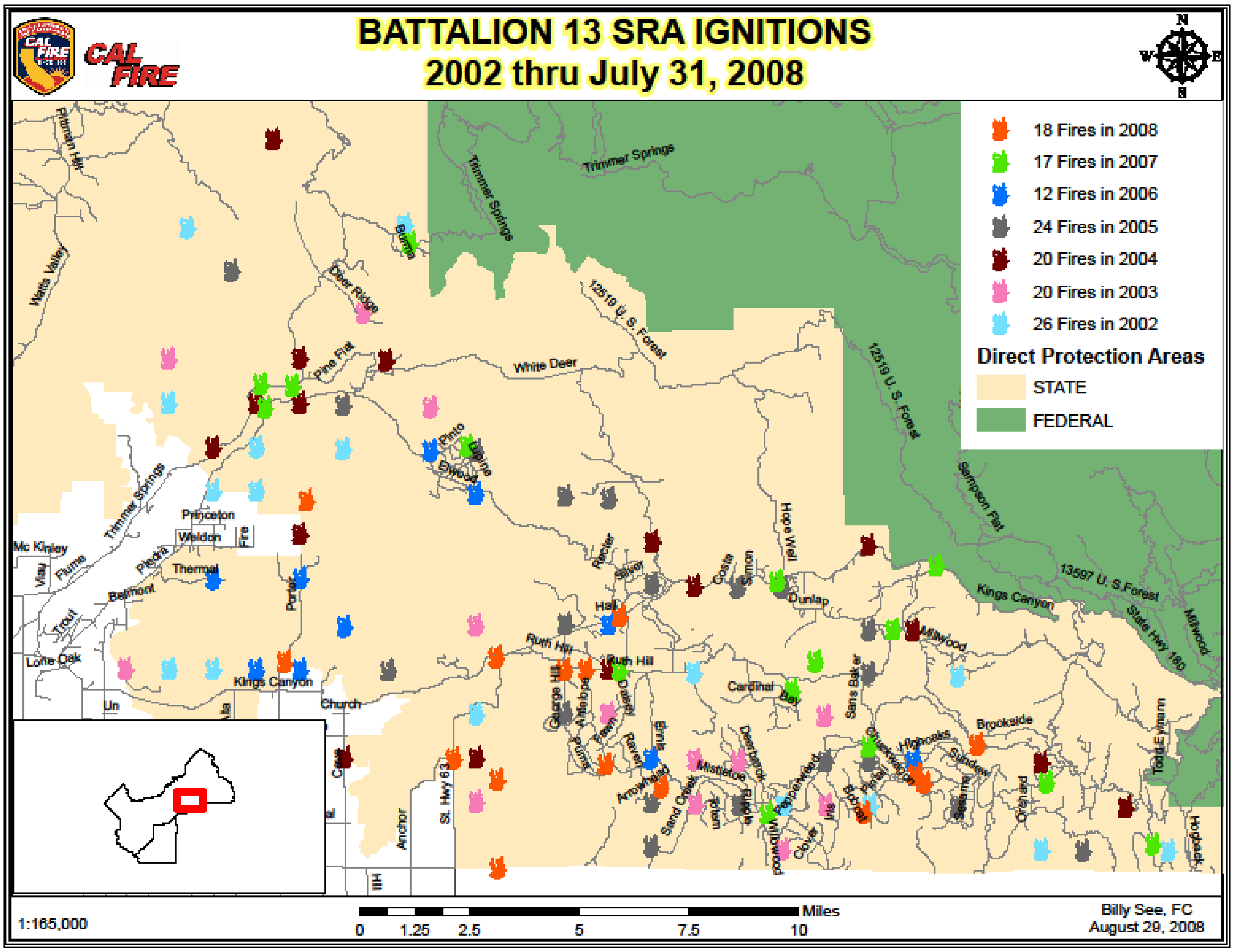
The Fire Plan analysis of the frequency of severe fire weather has not been completed for the Fresno-Kings Unit. The Unit is anticipating a new methodology that is being developed by CAL FIRE to assist in the Fire Plan assessment. No period for completion can be provided at this time. Recently the Panoche RAWS in western Fresno County was relocated. This RAWS has been out of service for several years and the new site will provide a more accurate reading of weather in an area of the Unit that experiences a high frequency of severe fire weather.

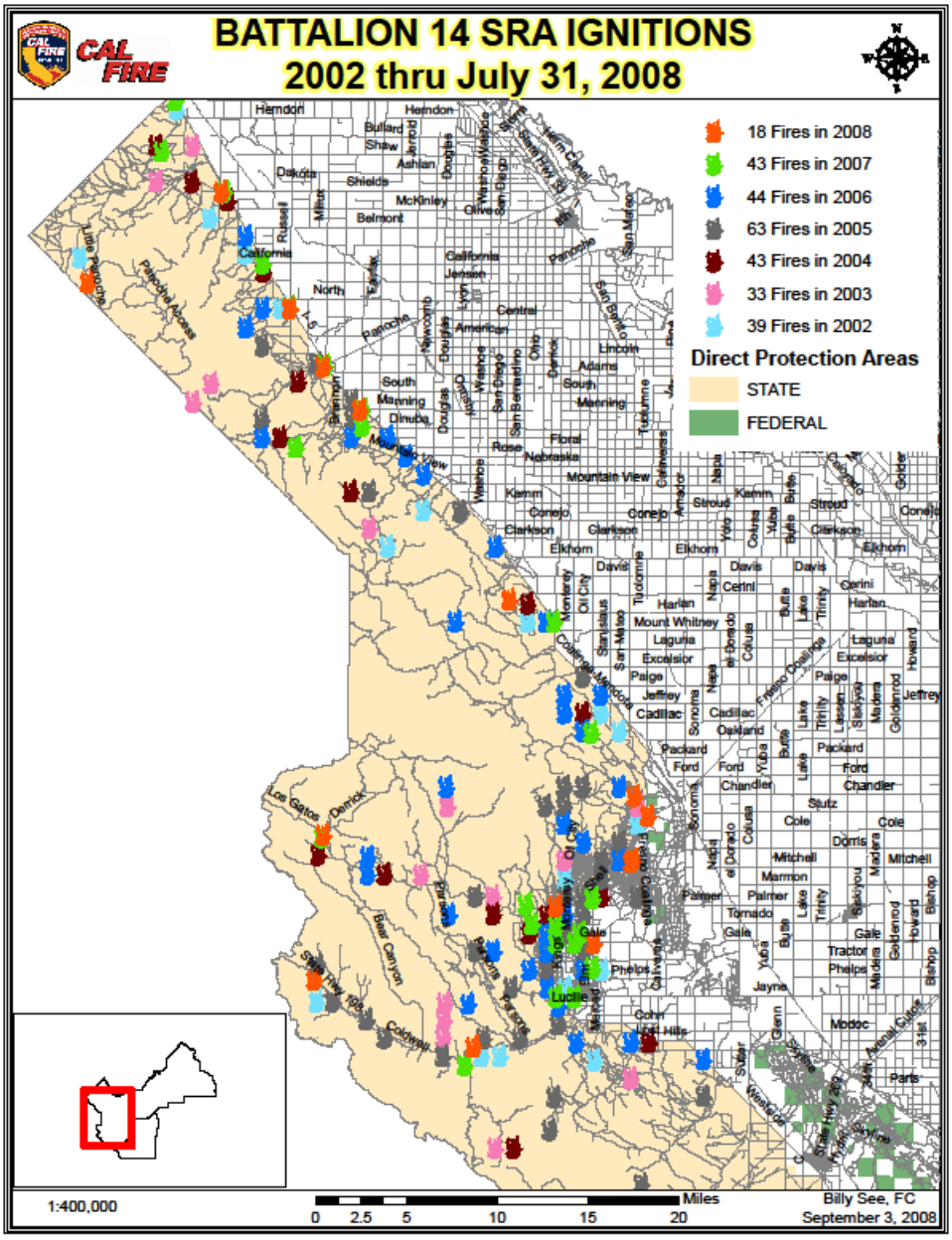
Map 5 – Fire History




BATTALION 11 SRA IGNITIONS
2002 thru July 31, 2008
CAL FIRE
18 Fires in 2008
35 Fires in 2007
18 Fires in 2006
24 Fires in 2005
43 Fires in 2004
18 Fires in 2003
35 Fires in 2002
Direct Protection Areas
STATE
FEDERAL
N
W
E
S
ITALIAN BAR
LERONA FIRE
SUGARLOAF
ACORN
PINECONE
LONG GOLD
HIGH WATER
PLAZA
SMALLEY
FRAZIER
KERNTZ
SNOW
BEAL FIRE
HWY 168
WELLBARN
SPEARHEAD
WIEMILLER
LODGE
ROAD 211
ROAD 206
MILLERTON
SKY HARBOR
TWIN PONDS
MORGAN CANYON
PENNYROYAL
FRONTIER
RUSTY
NICHOLAS
NANCY
BURROUGH VALLEY
SPENCE
LOST LAKE
KILLARNEY
FRIANT
BIG ONE
RENO
PITTMAN HILL RD
ARMSTRONG
AUBERRY
COPPER
INTERNATIONAL
BEHYMER
SILAXO
SAMPLE
NEWMARK
COYOTE PASS
OAK KNOLL
SHEPHERD
NEES
HERNDON
SIERRA
PAUL
BULLARD
RIALTO
WATTS VALLEY
ELWOOD
PIEDRA
1:170,000
0 1 2 4 6 8 Miles
Billy See, FC
August 28, 2008


BATTALION 12 SRA IGNITIONS
2002 thru July 31, 2008
16 Fires in 2008
14 Fires in 2007
7 Fires in 2006
7 Fires in 2005
16 Fires in 2004
10 Fires in 2003
9 Fires in 2002
Direct Protection Areas
STATE
FEDERAL
1:150,000
0 1 2 4 6 8 Miles
Billy See, FC
August 29, 2008


BATTALION 13 SRA IGNITIONS
2002 thru July 31, 2008
18 Fires in 2008
17 Fires in 2007
12 Fires in 2006
24 Fires in 2005
20 Fires in 2004
20 Fires in 2003
26 Fires in 2002
Direct Protection Areas
STATE
FEDERAL
1:165,000
Miles
0 1.25 2.5 5 7.5 10
Billy See, FC
August 29, 2008


BATTALION 14 SRA IGNITIONS
2002 thru July 31, 2008
18 Fires in 2008
43 Fires in 2007
44 Fires in 2006
63 Fires in 2005
43 Fires in 2004
33 Fires in 2003
39 Fires in 2002
Direct Protection Areas
STATE
FEDERAL
1:400,000
0 2.5 5 10 15 20
Miles
Billy See, FC
September 3, 2008

Relocation of Fire Apparatus – Battalion 13

With the goal of providing the highest level of service possible to the citizens of Fresno County and the State of California, the Unit is currently analyzing the placement of the second engine from Piedra. This engine was originally assigned to Sanger Headquarters until the early 1970's. The engine was moved from Sanger Headquarters to Piedra FFS to accommodate the additional personnel that were assigned to Sanger Headquarters when the department decided to deploy a helicopter and crew from that location. When the helicopter was moved away from Sanger Headquarters the engine was not returned to its original site.

In August of 2007 a California Fire Economic Simulator, Version2 (CEFS2) simulation of relocating the second engine from Piedra FFS to FCFPD Station 87 (South Fresno) was conducted. The CEFS2 analysis indicated that the engine relocation would not negatively change the level of service with in the Unit. The engine was placed at Station 87 on May 1, 2008 and response data was collected through November 1, 2008. The District Amador Agreement and the central location of the engine from Station 87, regardless of dispatch level, forced the CAD to recommend this engine to more SRA incidents. During this period there were 59 SRA responses as compared to 50 SRA responses from Piedra FFS. The engine from Station 87 was closer and faster to 47 of the 59 calls, equaling and 80% improvement of response times for this apparatus. While an 80% improvement in the operational effectiveness of this apparatus is certainly something to be proud of, the statistical data has lead staff to examine an alternate deployment site that appears to enhance the global response of the apparatus even further while also reducing the response times into Battalion 13.

On November 18, 2008, a CEFS2 simulation for relocating the second engine from the Piedra FFS to Sanger Headquarters was completed. The simulation results suggested that the current level of initial attack success on vegetation fires could be marginally improved by moving the engine to Sanger Headquarters. The Unit could reduce its response times significantly into Battalion 13 with this redeployment. In fact, using the previously collected statistics the Unit conducted a shadow analysis that assumes the responses for this apparatus were from Sanger Headquarters rather than Piedra FFS or Station 87. The analysis suggests that the Unit's global response times of this apparatus, will be improved by 97%. Moreover, response times into Battalion 13 will swing from a three minute increase to nearly an 8 minute reduction as a result of this apparatus being positioned on the Highway 180 corridor rather than the Piedra FFS. In March of 2009 the engine was moved from Station 87 to Sanger Headquarters where run data is being collected and analyzed for a possible blue book reallocation of the second engine from Piedra FFS to Sanger Headquarters.