

For example, no VHFHSZ appear on the Alameda County map, even though all of the conditions exist to qualify certain areas as VHFHSZ. Unfortunately, the hazard assessment system developed because of the Bates bill was not applied effectively throughout the state, resulting in non-identification of certain hazardous areas. This problem could be rectified with updated assessments of hazards by local jurisdictions and with proactive zoning conducted by local governments.

This graph demonstrates levels of local agency compliance with fire safe codes in and out of VHFHSZ.

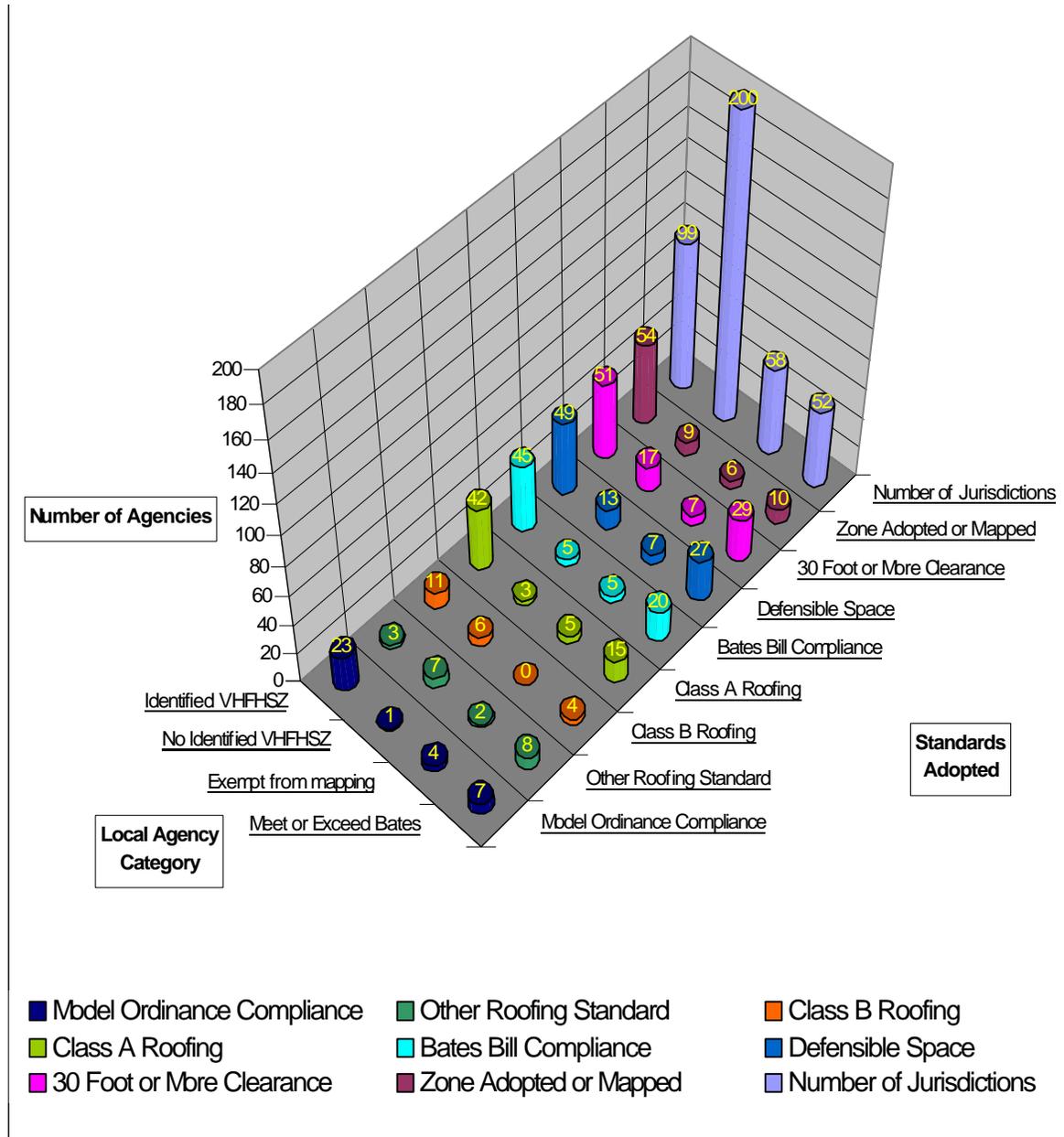


Figure 3.13 – Local Agency Fire Safe Code Compliance

### 3.3d. Fire Safe Standards

The vegetative clearance and structural requirements enacted in GC 51182 via AB 337 match the regulations of PRC 4291, which had been effective in the SRA since 1985. AB 337 also included a minimum Class B roofing requirement pursuant to [Health and Safety Code section 13108.5](#), which was cross-referenced to [PRC 4201](#) and [GC 51178](#), so that roofing regulations would be applicable in the LRA and the SRA. The logic behind this new roofing minimum requirement was that the areas that were being rated tended to be in moderately to densely populated areas. An ignition-resistant roof covering could mean a significant reduction in the probability and rate of fire spread from house to house via [firebrands](#).

It was only a matter of time before state lawmakers mandated additional fire safety regulations in VHFHSZ, which could be one reason some LRA agencies did not participate in the original hazard assessment. During the implementation of the AB 337 assessment reviews by CDF and the local agencies, a series of severe fires now known as the Southern California Firestorm occurred in 1993. In the aftermath of this disaster, which destroyed 1,171 structures, House Speaker Willie Brown authored [Assembly Bill 3819](#). This new law addressed the roofing requirements in not only LRA VHFHSZ per GC 51178, but also in SRA areas rated as High and Very High fire hazard severity per PRC 4201. AB 3819 increased the roofing requirements in these areas to Class A via [Health and Safety Code 13132.7](#), and to Class B in all other areas of the state, special circumstances excepted. The legislation also required that the [Office of the State Fire Marshal](#) develop and adopt a [Model Ordinance for the Defensibility of Space and Structures](#), which could be used by local authorities as an example of a typical and desirable set of pre-fire safety regulations to be adopted and enforced at the local level. Any jurisdiction which enacted (or already had) local regulations in substantial compliance with the Model Ordinance was exempted from the Class A roofing requirement, and could retain minimum Class B roof coverings throughout its jurisdiction, ostensibly since many other fire safe tactics would already have been employed there.

Due to the fact that many jurisdictions were exempted from the AB 337 mapping project for various reasons, a number of jurisdictions to which AB 3819 was meant to apply had not adopted zones as recommended by CDF per [GC 51178](#) (AB 337). Hence, the new Class A roofing requirement would not be enforced in the exempted and undesignated areas via this code. Technically, all areas with a designated VHFHSZ should comply with this model ordinance in its entirety, but compliance has been far from swift and less than total to date. Local jurisdictions can reserve the right to adopt standards equally or more stringent than those written into California law. Unfortunately, concerns regarding insurance coverage, vegetation management costs, and disposal issues have hindered progression of fire hazard zoning laws and enforcement. These issues are discussed in more detail in the other reports prepared by the [University of California Forest Products Laboratory](#) (UCFPL) for the [Federal Emergency Management Agency](#) (FEMA) and the [Office of Emergency Services](#) (OES) under the [Fire Hazard Mitigation Grants Program](#), and in other volumes in the [I-Zone Series](#).

In 1995, Assemblywoman Valerie Brown's [AB 747](#) took the roofing requirements yet one step further. This bill's passage essentially outlawed the use of wood roofing on any new structure or on a re-roof of 50% or more of the roof area of any existing structure in the entire state of California. Its built-in timeline specifies the only avenue by which a roofing manufacturer may comply with the ten-year wood shake shingle testing procedure in order to receive approval as Class A or B. This legislation may, unfortunately, place too much emphasis on the type of roof covering and too little emphasis on the roof assembly, which includes the underlying paper, plywood, and eave assemblies. Banning untreated wood shakes alone does not necessarily create fire-resistant roofing. This issue is discussed in much more detail in other reports prepared by the UCFPL, which address [structural ignition potential](#).

Assembly Member Dutra introduced new roofing regulations in February 1999 via [Assembly Bill 423](#). The bill, which became law January 1, 2000, updates fire-retardant roofing regulations as they occur throughout California. Previously, these regulations were only triggered by new construction or a repair or re-roof of at least 50% of the total roof area. This bill alters these requirements such that fire-retardant roofing regulations would be triggered by *any* repair or alteration of the roof covering, specifying that fire-retardant roofing must be used even in small repair jobs if the structure is located in a designated hazard zone. Additionally, if 50% or more of the roof covering is replaced within any one year period, AB 423 states that the *entire* roof covering must be replaced with fire-retardant materials as specified. The new law also addresses the fact that the [State Insurance Commissioner](#) must accept these regulations in connection with “replacement cost” insurance policies. The main purpose of this legislation, though, was to clarify the roofing regulations such that the “50% loophole” is removed, in order to circumvent use of non-fire-retardant roof coverings through partial re-roofs and small repairs.

For more information on roofing requirements in California, all of these regulations can be found in [Health and Safety Code §13108.5 and 13132.7](#).

### **3.3e. Periodic Review**

*“ The [CDF] director shall periodically review the areas in the state identified as very high fire hazard severity zones pursuant to this chapter, and as necessary, shall make recommendations relative to very high fire hazard severity zones. This review shall coincide with the review of state responsibility area lands every five years and, when possible, fall within the time frames for each county's general plan update. Any revision of areas included in a very high fire hazard severity zone shall be made in accordance with Sections 51178 and 51179” (GC § 51181).*

This CDF responsibility for a five-year review of LRA VHFHSZ was fulfilled via a document titled [Wildland Fire Hazard Assessment](#) (1999). The review was conducted by contacting local agencies, mainly those with identified VHFHSZ, to determine what local actions had been taken to comply with or improve on the requirements of AB337 (Bates). It has been determined by CDF that any future hazard re-assessment will be conducted statewide, so as to avoid inconsistencies that result from assessments conducted by county or by jurisdiction. This review indicated that not all VHFHSZ jurisdictions have complied with the state mandates. CDF does not play an enforcement role in state mandates that are meant to apply to LRA.

### **3.4. Updates of Classifications and Designations**

According to [GC 51179](#), a local agency has the right to accept, reject or modify the CDF VHFHSZ identification in its jurisdiction. As usual, any new recommendations would be subject to local ratification or rejection. As long as there is substantial evidence on the record to support local findings, local agencies can conduct their own hazard assessments, make their own classifications and designate hazard areas as they see fit. As a result, the role played by CDF in the LRA is merely informational. If a local agency decides to change or update the CDF recommendations, they must go through the steps outlined in [Government Code Sections 51175-51189](#), and they should notify the Board of Forestry, CDF and the public of any changes. These changes are not rebuttable by CDF or the Board, however, so such a notification is just a formality to keep state agencies informed of local actions.

Because there are so many local jurisdictions, all of whom can update and change their own VHFHSZ boundaries, it would stand to reason that an update of the original VHFHSZ maps by CDF could be considered futile.

### **3.5. Tools for Hazard Assessment**

There are many other hazard assessment systems available and in use today. The [Department of Housing and Urban Development](#), [CDF](#), [ISO](#) and many other organizations have introduced different methods for different purposes. Below are described a few assessment systems that are comprehensive and comparatively easy to use. For detailed information on these and other hazard assessment options, please see the *Wildland Fire Hazard Assessment* publication of the *I-Zone Series*.

#### **3.5a. Bates Bill System**

As described in Section 2 of this guide, the Bates bill (AB 337) was a direct result of the great loss of homes and lives in the Tunnel Fire of 1991 in the Oakland/Berkeley Hills. CDF, given the responsibility to carry out the state mandate, formed a working group to determine how to proceed. The group, comprised of state and local representatives, decided upon a system involving fuel, topography (slope), weather, and dwelling density as the foundation for the system, and added additional mitigation factors to adjust the score upward or downward. The raters (in almost all cases one local representative and one CDF or Contract County representative) had the opportunity to adjust the score down by one point for certain mitigation measures. They also had the option of increasing the score by one point for certain factors known to contribute to fire spread. To qualify as a [Very High Fire Hazard Severity Zone \(VHFHSZ\)](#), an area had to score 10 or more points. Potentially, the range of scores (including the mitigating factors) could range from a low of 1 to a high of 16.

This system uses a resolution of one square mile, with three fuel classes. The rater's instructions specify that no area under 640 contiguous acres (or one square mile) should be identified as a VHFHSZ. This limits VHFHSZ to areas that show a broad pattern of hazards over a significant portion of the land, excluding "island" areas within the LRA that are hazards in and of themselves, but that are not subject to the larger wildland interface threat.

The following criteria and factors developed under AB 337 for rating fire hazards in the LRA are easy to use and were developed by CDF with this in mind. The recommended system was given an extensive field test by different members of the working group, and was then implemented. A copy of the rating form is found on the following pages.

**CRITERIA**

**CLASSIFICATION**

**POINTS**

**A. Fuel** (NFPA 299). For each zone a fuel hazard rating shall be assigned. Where fuel types vary within a zone, the rating assigned for the zone shall be that which best represents the predominant fuel type.

*Type*

- 1. Small, light fuels (Grass, Weeds, Shrubs) +1
- 2. Medium fuels (Brush, Large Shrubs, Small Trees) +2
- 3. Heavy fuels (Timber, Woodland, Large Brush, or Heavy Planting of Ornamentals) +3

**B. Topography—Slope** (NFPA 299 and FEMA). For each zone a Slope Hazard Rating shall be assigned. Where slopes vary within an area, the rating for the area shall be that which best represents the predominant slope range.

- 1. Flat to mild slope (0-9.9%) +1
- 2. Mild to Medium Slope (10-19.9%) +2
- 3. Medium to Moderate Slope (20-39.9%) +3
- 4. Moderate to Extreme Slope (40% +) +4

**C. Dwelling Density** (1991 Census or a local ordinance with higher standards). For each zone a dwelling rating shall be assigned. A check with each area for local ordinances regarding dwelling density must be accomplished before setting this factor.

- 1. Low (less than one structure per 10 acres) +1
- 2. Medium (one structure per 5 to 10 acres) +2
- 3. High (one structure per 0 to 5 acres) +3

**D. Weather** (instructions for zoning fire hazard severity in State Responsibility lands in California). The ratings (EXH 1) show what each county is rated. This information is obtained for each county by using the Burning Index (BI). Weather is a major part of the BI system. The information for developing BI systems came from weather stations throughout the state.

- 1. Moderate +1
- 2. High +2
- 3. Very High +3

By adding the highest number for the four factors, you will have a total of 13 points. The point spread between ten (10) and thirteen (13) points represents the combination of factors needed to make up a Very High Fire Hazard Severity Zone.

*Continues on next page*

**MITIGATION MEASURES**

These mitigation measures are points, plus or minus, that a local agency may use to mitigate a rating within its area, and could cause a higher or lower rating for the benefit of the local agency.

**FACTORS—MINUS**

**POINTS**

- 1. Infrastructure—meets or exceeds minimums of ISO 8, NFPA 1231, PUC 103, or PRC 4290 -1
- 2. Housing or roofing ordinances (Class A, B, or better roof), sprinklers required, firesafe construction fuel modification, local option -1
- 3. PRC 4291 Ordinance or better (Natural Resource Protection) -1

**OTHER FACTORS—PLUS**

- 1. Rough topography with steep canyons or draws that would impede responding personnel and equipment. +1
- 2. Area with a history of high fire occurrence, related to surrounding areas, because of heavy lightning, railroad fires, debris burning, arson, etc. +1
- 3. Area subject to severe fire weather such as strong winds and lightning, and has constant seasonal weather patterns that contribute to increased fire activity. +1
- 4. Heavy concentration of flammable ornamentals or vegetation introduced by humans. +1

**TOTAL POINTS** \_\_\_\_\_

**VERY HIGH FIRE HAZARD SEVERITY ZONE ? YES / NO**

**DESCRIPTION OF ZONE:**

- 1. LATITUDE AND LONGITUDE \_\_\_\_\_
- 2. TOWNSHIP, SECTION, RANGE \_\_\_\_\_
- 3. NARRATIVE OF ZONE \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

DATE \_\_\_\_\_ SIGNATURE OF RATER \_\_\_\_\_

This rating system is reasonable, and could be adopted in most of California, with or without minor modifications. These might include reducing the minimum size of the area rated from 640 acres to perhaps 320 acres or even smaller, such as a subdivision. The weather component could be adjusted to reflect local conditions rather than countywide conditions, which in some cases result in coastal areas rated too high and other areas too low. The fuel types on the rating form are easy to determine using the descriptions provided. The slope percent may require some field work with an abney or other device, or one could locate a county map showing these slope classes through the USGS, one's county or local planning department, or on the CDF home page (<http://www.fire.ca.gov>). Ordinances for adoption of state mandates are found in the Appendix.

In summary, the Bates System with or without modification does work, and has the advantage of being applicable statewide. A disadvantage is that a large number of local agencies decided not to acknowledge it. This means that the actual number of Very High Fire Hazard Severity Zones should be much higher than the number identified as part of the original Bates review. If fuels, topography, and weather with these criteria could be mapped using remote sensing to assure objectivity and accuracy, this system could produce a much more effective hazard assessment. The information could then be used by local agencies, perhaps with additional criteria, to achieve hazard maps that are useful to individual jurisdictions.

### **3.5b. Fire Hazard Zoning Working Group System**

The Working Group assigned to the Fire Hazard Zoning grant project evaluated the above and many other assessment systems and synthesized them into one system they feel can be applied most effectively throughout the state, with whatever local modifications are needed. Below are sample hazard assessment maps developed using the Working Group's system. The group was established in 1997 and was comprised of personnel from state, federal, and local agencies with varying fire protection responsibilities. The following section outlines their findings and recommendations relative to a single, adaptable system.

The GIS based fuel ranking and validation process described under the Fire Plan System is the starting point for the fire hazard zoning project coordinated by the State Fire Marshal's Office, and developed by the Working Group. The project proposes to combine the effects of fuels, topography (elevation, slope, and aspect) and weather. The current California State Fire Plan fire hazard mapping system and this system are both summarized to grid cells equaling approximately 450 acres (Q81) from the USGS topographical maps. Each Q81 is limited to one fuel model, whichever is most prevalent. This helps to ensure that the final map will be a manageable, cohesive product that can give an accurate picture of significant fire hazard patterns throughout the state, rather than just a detailed representation of fuel model existence. A product such as this, showing broad patterns along with moderate detail in mixed areas, can be a useful planning tool for fire prevention and protection agencies trying to allocate resources and enforce mitigation standards.

The following bullet points summarize the proposed process.