Marin County Fire Department
In Collaboration with FireSafe Marin

Community Wildfire Protection Plan

July 2005
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Appendix

Fuel Model Map
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Cover: Marin County Fire Department firefighters attack the 2004 Mother’s Day fire in a blazing eucalyptus forest in Tamalpais Valley. Situated along the wildland-urban interface, this fire threatened, but burned no structures. Resources from outside the county were mobilized to help control this fire. Fire-prone forests have been identified as a high priority for removal in Marin.
1. Executive Summary

The fire problem in Marin County resides in the wildland-urban interface, where houses and businesses meet or intermingle with wildland vegetation. This is where wildfire poses the greatest risk to human life and property. Principal county stakeholders—those people with an interest in protecting their assets from wildfire—coordinate their public education and project management through FireSafe Marin. The California Fire Plan provides a framework that is applied in Marin for defining fire hazards and ranking assets at risk to identify areas where fire threats can be mitigated. A countywide assessment of the wildland-urban interface revealed that nearly 80,000 acres are ranked as having moderate to very high fire hazard ratings.

Marin County will reduce these hazards using an integrated approach that includes the following elements: (1) fuelbreak network, (2) fire-prone forest clearing, (3) access improvements, (4) wildfire awareness campaign, and (5) International Urban-Wildland Interface Code adoption. Nearly 40 miles of fuelbreaks will be constructed and maintained along ridge top emergency access roads, highways, and other existing barriers. About 20 percent of this fuelbreak network is already in place. Bluegum eucalyptus and Monterey pine forest within and immediately adjoining created fuelbreaks will be cleared. Overgrown roadside vegetation will be trimmed and turnouts will be improved along primary access roads in interface communities. A wildfire awareness campaign will be used to encourage individual and community responsibility for creating fire-safe conditions. Finally, Marin will be adopting (with local amendments) then enforcing the International Urban-Wildland Interface Code, which combines building standards with landscape planning to reduce losses caused by wildfire.

Even though the Marin County Fire Department has been successful in controlling a large portion of all wildland fires within its jurisdiction, one only needs to examine our fire history to understand the risk our communities face. This fire plan will allow the Marin County Fire Department to create a more efficient fire-protection system focused on meaningful solutions to better protect the communities in Marin. Being able to identify areas where cost-effective, pre-fire management investments can be made will help minimize citizen losses and reduce costs from a major wildfire.

Kenneth J. Massucco
FIRE CHIEF
2. Stakeholders

Stakeholders are people—individuals and groups—who have a high level of interest in the protection of their assets from wildfire. Nearly half of Marin County (193,000 acres) is managed for public benefit and borders residential areas, creating wildland-urban interface settings. The largest land manager is the federal government which manages the Golden Gate National Recreation Area, Point Reyes National Seashore, and Muir Woods National Monument. Federal lands border Sausalito, Tamalpais Valley, Mill Valley, Muir Beach, Bolinas, and Inverness. The State of California (State Parks, Fish and Game, Coastal Conservancy, and Caltrans) collectively manage the second largest portion of the county. Mt. Tamalpais State Park borders Mill Valley; China Camp borders San Rafael; and Angel Island is southeast of Tiburon. Three municipal water districts manage several watersheds that border Kentfield, Ross, San Anselmo, Fairfax, Novato, and Inverness. The County of Marin manages numerous parks and open space preserves, many of which are surrounded by or border cities. The other half of Marin is under private ownership within a developed eastern urban corridor and sparsely populated rural lands that typify western Marin. Contact information for the principal stakeholders is provided below.

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Woodacre, CA 94973-0518

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**Marin Municipal Water District**  
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3. Fire Safe Planning & Hazardous Fuel Reduction at a Glance

Marin County is 521 square-mile peninsula with numerous northwest-trending ridges bordered on the southwest by the Pacific Ocean and to the east by San Francisco Bay. Most of the 246,073 people who reside here are concentrated in the eastern developed urban corridor served by Highway 101, with extensive parklands on the southwest, and sparsely populated agricultural ranchland to the northwest. There are also several scattered communities along the Pacific coastline and Tomales Bay.

The greatest wildfire threat to human life and property in Marin is within the wildland-urban interface where homes intermingle with wildland vegetation (Figure 1). Here narrow, winding streets often restrict access and hilly terrain with overgrown vegetation creates unsafe fire conditions. Homes with wood siding and redwood decks that are surrounded by fire-prone landscaping further define the problem. In our opinion, five important issues that define Marin’s fire predicament are:

- Threat of wildfire spreading to or from parkland and open space areas,
- Unmanaged, fire-prone forestland,
- Community egress and emergency vehicle ingress during a wildfire,
- Public awareness of wildfire threat, and
- Lack of a set of coordinated codes that consider building materials, construction methods, and vegetation management standards.
Figure 1. The wildland-urban Interface of Marin County.
4. Fire Plan Assessments

Evaluations of assets at risk and fire hazards were completed countywide using a 50-acre grid. First, the wildland-urban interface areas (WUI) were mapped and housing density was quantified within each 50-acre analysis area. Second, the contributions that vegetation type (fuels), hillside steepness (slope), and hillside orientation (aspect) have on fire behavior were ranked for each 50-acre analysis area. This information was combined to identify relative priorities for action—areas where risks to assets and fire hazards are high. Level of service was also evaluated for the past 5 years.

A. Assets at Risk Assessment

Assets at risk are valued resources that can be damaged or destroyed by wildland fire. In addition to protecting citizen and firefighter safety, the California Fire Plan identifies the following assets warranting consideration in pre-fire planning: watersheds and water, wildlife, habitat, special status plants and animals, scenic-cultural-historic areas, recreation, rangeland, structures, and air quality. For this plan however, we have focused on the most highly valued asset—structures—with the greatest at-risk structures within the wildland-urban interface (Figure 2).

B. Hazard Assessment using Fuels, Slope, and Aspect

In addition to weather and the effect that seasons have on plant moisture levels, there are three fixed variables that affect fire behavior: fuels, slope, and aspect. A combined hazard rank for each of these variables was calculated for each 50-acre cell (Figure 3).

**Fuels.** The following surface fuel types that are prevalent in Marin are mapped in the appendix: Annual grassland (Model 1), Grass under oak (Model 2), Chaparral (Model 4), Coastal Scrub (Model 5), Oak-Bay-Madrone hardwood forest (Model 8), Conifer with moderate fuel loading (Model 9), and Conifer or Eucalyptus with heavy fuel loading (Model 10).

**Slope.** Slope is a measurement of hillside steepness in percent. Keeping all other factors constant, fires burn more rapidly on steep hillsides than on gradual ones. On hillsides, vegetation above the flame-front is closer to the flame, which causes preheating of the unburned fuel due mostly to convection, but radiation as well.

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1 The California Fire Plan prescribes a 450-acre grid; this level of analysis was too general for local planning purposes.

Consequently, as slope increases, so does the rate of fire spread. Rates of fire spread increase and productivity of fire suppression resources decrease as slope becomes steeper. The slope assessment map is in the appendix.

**Aspect.** Aspect is the hillside cardinal direction. In northern latitudes, south-facing hillsides receive more direct sunlight during the day relative to north-facing slopes. The ambient fuel temperature on a southwest-facing slope is significantly higher in the late afternoon because of the increased radiant solar energy received by fuels on these aspects. As a result, fuel on south, southwest, and west-facing hillsides are already at an elevated temperature and require less energy to be raised to their ignition temperature. The aspect assessment map is in the appendix.

**C. Combining Assets and Hazards**

Assessments of assets and fire hazards within the wildland-urban interface were combined to identify areas of high priority for treatment (Figure 4).

**D. Level of Service**

The California Legislature directed the Board of Forestry, the California Department of Forestry and Fire Protection, and contract counties including Marin to deliver a fire-protection system that provides an equal level of protection for lands of similar type (Public Resources Code §4130). To evaluate this standard, we used an analysis process that defines a level of service rating that is applied to the wildland areas. The rating is expressed as the percentage of fires that are successfully extinguished with initial-attack resources. The level of service rating provides a powerful tool for setting program priorities and defining program benefits. The level of service rating also provides a way to evaluate the contribution of various program components (fire prevention, fuels management, engineering and suppression) toward the goal of keeping damage and cost within acceptable limits. During the past 5 years, (2000-2004) a total of 458 wildland fires occurred within the jurisdiction of the Marin County Fire Department. Vehicular and power line fires were the two most common known causes of fires. Fires ranged in size from small roadside spots to 330 acres, averaging 1.0 acre (excluding the two largest fires). Extended attack was required in all cases where fires burned more than 10 acres; additional support in the form of a hand crew was also needed where fires burned in heavy fuels. Level of Service is calculated as follows:

\[
\text{Level of Service} = \frac{\text{Fires Extinguished by Initial Attack}}{\text{Total State Responsibility Area Fires}} \times 100 = \frac{442}{458} \times 100 = 97\%
\]
Figure 2. Structure risk assessment within the wildland-urban interface.
Figure 3. Assessment of fire hazards created by fuels, slope, and aspect.
Figure 4. Combined assessment of assets at risk and fire hazards.
5. Plan of Action

Marin County will reduce identified hazards to protect homes at risk using an integrated approach that includes the following elements:

(1) Fuelbreak Network. Create 40 miles of fuelbreaks.
(2) Fire-Prone Forest Clearing. Clear eucalyptus and Monterey pine stands.
(3) Access Improvements. Trim roadside vegetation and provide additional turnouts.
(4) Wildfire Awareness Campaign. Community outreach to wildland-urban interface neighborhoods.

A. Fuelbreak Network

The backbone of fuels modification in Marin is a fuelbreak system that extends from the shore of San Francisco Bay in Sausalito to Lagunitas (Figure 5). This 24-mile-long, 100-foot-wide fuelbreak generally follows ridge top emergency access roads and incorporates natural (existing grassland) or human-made features (e.g., golf course). In addition, there are lateral fuelbreaks that extend from the primary fuelbreak to the east, and one fuelbreak system dedicated to protecting one community called Pacheco Valle. Descriptions of these fuelbreaks and estimated costs for implementation and 5-year maintenance are provided in Tables 1 and 2. About 20 percent of these planned fuelbreaks have already been completed.
Figure 5. Principal fuelbreak system from San Francisco Bay to Lagunitas.
Table 1. Primary fuelbreak system from the shore of San Francisco Bay to Lagunitas.

<table>
<thead>
<tr>
<th>Fuelbreak Name</th>
<th>Description</th>
<th>Total Length (miles)</th>
<th>Length Completed (miles)</th>
<th>Percent Complete (%)</th>
<th>Estimated Implementation Cost ($)</th>
<th>Estimated Maintenance Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sausalito</td>
<td>Shore of San Francisco Bay, over Waldo Tunnel, Alta Avenue Fire Road.</td>
<td>2.3</td>
<td>0</td>
<td>0</td>
<td>38,150</td>
<td>13,850</td>
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<tr>
<td>Marin City</td>
<td>Alta Avenue Fire Road to Tennessee Valley Road</td>
<td>1.3</td>
<td>0.6</td>
<td>50</td>
<td>19,450</td>
<td>7,700</td>
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<tr>
<td>Tamalpais Valley</td>
<td>Tennessee Valley Road to 3-Corners (intersection of Hwy 1 and Panoramic Hwy)</td>
<td>3.0</td>
<td>0</td>
<td>0</td>
<td>76,550</td>
<td>18,450</td>
</tr>
<tr>
<td>Homestead Valley</td>
<td>3-Corners, Panoramic Highway to Mountain Home Inn</td>
<td>2.4</td>
<td>1.3</td>
<td>53</td>
<td>16,150</td>
<td>14,600</td>
</tr>
<tr>
<td>Mill Valley</td>
<td>Mountain Home Inn, Gravity Car Grade, Old Railroad Grade to Blithdale Ridge</td>
<td>2.5</td>
<td>0.6</td>
<td>26</td>
<td>60,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Kent Woodlands</td>
<td>Blithdale Ridge Fire Road, Indian Fire Road, Crown Road, Phoenix Lake</td>
<td>2.2</td>
<td>1.3</td>
<td>57</td>
<td>39,200</td>
<td>13,450</td>
</tr>
<tr>
<td>San Anselmo</td>
<td>Phoenix Lake to Deer Park</td>
<td>1.5</td>
<td>0.6</td>
<td>42</td>
<td>21,650</td>
<td>9,250</td>
</tr>
<tr>
<td>Fairfax</td>
<td>Deer Park, Sky Oaks, Meadow Club Golf Course to Fairfax-Bolinas Road.</td>
<td>2.6</td>
<td>1.1</td>
<td>44</td>
<td>41,750</td>
<td>13,900</td>
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<tr>
<td>Woodacre</td>
<td>Fairfax-Bolinas Road, Pine Mountain Fire Road to intersection with Conifer Fire Rd.</td>
<td>3.1</td>
<td>0.1</td>
<td>4</td>
<td>73,150</td>
<td>18,850</td>
</tr>
<tr>
<td>San Geronimo</td>
<td>Intersection of Conifer Fire Road and Pine Mountain Fire Road to Sir Francis Drake Boulevard at Lagunitas</td>
<td>3.4</td>
<td>0.0</td>
<td>0</td>
<td>81,600</td>
<td>20,400</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>24.3</strong></td>
<td><strong>5.7</strong></td>
<td><strong>23</strong></td>
<td><strong>$467,650</strong></td>
<td><strong>$145,450</strong></td>
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Table 2. Lateral and isolated community fuelbreaks

<table>
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<tr>
<th>Fuelbreak Name</th>
<th>Description</th>
<th>Total Length (miles)</th>
<th>Length Completed (miles)</th>
<th>Percent Complete (%)</th>
<th>Estimated Implementation Cost ($)</th>
<th>Estimated Maintenance Cost ($)</th>
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</thead>
<tbody>
<tr>
<td>Blithdale Ridge</td>
<td>Indian Fire Road along Blithdale Ridge</td>
<td>1.8</td>
<td>0.9</td>
<td>50</td>
<td>43,636</td>
<td>10,909</td>
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<tr>
<td>Corte Madera Ridge</td>
<td>From Blithdale Ridge along Corte Madera Ridge</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>31,515</td>
<td>7,879</td>
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<td>Kent Woodlands South</td>
<td>Indian Fire Road to Evergreen Fire Road, Ridgecrest Road, Rancheria Road, and Blue Ridge Road</td>
<td>2.0</td>
<td>1.5</td>
<td>75</td>
<td>48,485</td>
<td>12,121</td>
</tr>
<tr>
<td>Kent Woodlands North</td>
<td>Crown Road and Goodhill Road</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>18,182</td>
<td>6,061</td>
</tr>
<tr>
<td>Cascade Canyon (Fairfax)</td>
<td>Meadow Club to Camp Tamarancho</td>
<td>1.7</td>
<td>0</td>
<td>0</td>
<td>41,212</td>
<td>10,303</td>
</tr>
<tr>
<td>Iron Spring Road (Fairfax)</td>
<td>Iron Spring Road</td>
<td>0.9</td>
<td>0</td>
<td>0</td>
<td>16,364</td>
<td>5,455</td>
</tr>
<tr>
<td>Pacheco Valle</td>
<td>Ponti Fire Road, Chicken Shack Fire Road to Alameda del Prado; Defensible space around Pacheco Valle development</td>
<td>7.4</td>
<td>0</td>
<td>0</td>
<td>134,545</td>
<td>44,848</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>16.1</strong></td>
<td><strong>2.4</strong></td>
<td><strong>15</strong></td>
<td><strong>$333,393</strong></td>
<td><strong>$97,576</strong></td>
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(1) Fuelbreak Accomplishments

Funding from the National Fire Plan has enabled Marin to implement numerous key vegetation management projects along the system of fuelbreaks. Following are highlights of those projects coincident with the principal county fuelbreak.

Alta Avenue Fuel Break Project

French broom is an invasive, non-native shrub that is gradually altering the fuel complex in Marin. The principal way this shrub invades an area is along disturbed roadsides where it replaces grassland and native shrub land. One heavily infested area was along the Alta Avenue Emergency Access Road that separates lands of the Golden Gate National Recreation Area from the community of Marin City—once home for Navy ship builders in Sausalito during WWII. This project cleared French broom from both sides of this ridge top road; Monterey cypress trees were also treated by pruning the lower branches and separating the canopy that once arched the roadway.

Marinview Community Fuel Reduction Project

Marinview typifies the wildland-urban interface communities in Marin County. Steep hillsides with narrow streets, homes with wood siding and overgrown gardens, and neglected neighborhood open space areas. This project helped reduce fuel hazards by clearing County-owned parklands of brush, thinning overstocked stands of Monterey pine, and cutting blue gum eucalyptus. Community awareness of individual responsibility was raised by creating defensible space around a home along a highly traveled portion of the main access road.
Indian Fire Road Fuel Break Project

Dense stands of decadent brush on the slopes of Mt. Tam have not burned in decades. A partnership including Kentfield Fire Protection District, Marin County Fire, and Marin Municipal Water District created an extensive fuelbreak along the west-facing slope of Windy Ridge. This break separates Marin’s treasured municipal watershed from one of the county’s highest valued neighborhoods: Kent Woodlands.

Evergreen Fire Road Fuel Break Project

The Marin County Fire Department has created a 10-person fire crew for all phases of wildland fire operations and vegetation management. Pictured here, they are clearing a shaded fuelbreak lateral between the Indian Fire Road and the top of Evergreen Avenue on lands managed by the Marin County Open Space District. This District manages 33 preserves countywide that adjoin neighborhoods and create opportunities for fuels management that will protect homes from a wildfire.
Ralston White Retreat Fuel Reduction Project

The great Mt. Tam fire of 1929 burned 2,500 acres and destroyed 117 homes in Mill Valley. This blaze escaped from a burning pile of brush on the estate of Ralston White. This fire may have been slowed by a strategically sited fuelbreak. Today, the threat of fire moving down the slope of Mt. Tam is dramatically reduced by a 100-foot-wide fuelbreak along the Old Railroad Grade. This break is part of the Marin Municipal Water Districts 10-year vegetation management plan that will be updated soon. In addition, the project cleared defensible space around the main building of the estate, cleared roadside vegetation, and created a lateral fuelbreak from the Old Railroad Grade to Ralston Avenue.

Phoenix Lake

The Marin Municipal Water District actively controls French broom in grasslands and beneath oak canopies within the County’s fuelbreak system. Repeated controlled burning has been shown to detrimentally affect oak trees. Use of goats to control broom was discontinued, because goats indiscriminately eat native plants and strip bark from Pacific madrone trees. The District has adopted an integrated management approach that includes limited burning, mechanical removal, and herbicide application.
B. Fire-Prone Forest Clearing

Forests comprised of fire-prone trees create especially hazardous conditions characterized by accumulated down material and leaves rich in volatile oils that burn hotter than wood. In Marin, a vast Bishop pine forest near Inverness helped fuel the 1995 Mount Vision Fire that destroyed 45 homes and burned 12,000 acres. Bluegum eucalyptus planted extensively in Marin for a variety of reasons helped fuel the 2004 Mother’s Day Fire in upper Tamalpais Valley. Monterey pine was widely planted in residential neighborhoods during the past 40 years. These trees are reaching maturity and are infested with the pitch canker fungus. Fire-prone forests that occur along the fuelbreak system will be treated under this plan.

(1) Forest Clearing Accomplishments

Alexander Avenue Eucalyptus Removal Project

Eucalyptus with its highly flammable leaves and shredded bark is one of the more alarming fuel hazards in Marin. This project included removal of a grove of blue gum eucalyptus and treating overgrown brush in Sausalito. Steep slopes and limited access provided a challenge met with the help of the US Army Corps of Engineers. The photo at right shows the converted Navy aircraft recovery vessel—the floating hazard recovery ship called Raccoon—that was used to winch eucalyptus from the shore, crane it on deck, then offload it to waiting trucks.
Four Corners Pine Removal Project

Four corners is an intersection along a ridgeline that separates Homestead Valley and State and Federal parklands. These crossroads form a key thoroughfare linking Tamalpais Valley, Mill Valley, Muir Woods National Monument, and Mt. Tamalpais State Park. A 2-acre stand of Monterey pines had developed near this intersection and represented a threat to motorists in the event of wildfire. Our objective was to convert this pine stand to grassland. The trees were felled. Logs were used for lumber; branches and leaves were chipped for electrical generation. Cooperators included California State Parks and Fire Safe Marin.

Panoramic Pines Pine Removal Project

Panoramic Highway is a steep, narrow, two-lane roadway that provides access to more than 300 homes above Mill Valley. This suburban neighborhood is immediately along the urban-wildland interface overlooking Muir Woods National Monument and Mount Tamalpais State Park. One segment of Panoramic Highway bordered a dense stand of Monterey pines. These trees were planted about 20 years ago and had become infected with pitch canker that creates dead branches and eventually kills the entire tree. The fuels present will both increase fire intensity and the potential for down-wind spot fires. This project removed a 2-acre stand of trees by cutting, piling and burning.
B. Access Improvements

Neighborhood roadways that serve as principal evacuation routes also provide access for emergency personnel and equipment during a wildfire. Conflicts created along narrow winding roadways can be reduced through roadside vegetation management and construction of pullouts. At least one principal roadway in each wildland-urban interface community will be selected for treatment using treatment standards established in Public Resource Codes §4290 and §4291 for roadside access as well as standard forestry fire hazard reduction practices. Work will generally include the following:

- A maximum 30-foot vegetation treatment zone will be created along both sides of roadways, measured from the pavement or "useable" road edge. Accepted forestry and fire risk reduction practices will be used to treat the vegetation.
- Limbs overhanging traffic lanes will generally be removed to a minimum height of 15 feet. Dense crown contact over the road will be thinned where necessary to reduce horizontal fuels contact.
- Trees in the treated zone will be limbed to a minimum of eight feet above grade (or one-third their height if under 24-feet overall) and hazardous understory and dead material removed out to the vicinity of the drip line.
- Shrubs will be separated by twice their height or greater depending on slope factors, or grouped into separate "islands," maintaining the same spacing criterion.
- Improved roadway safety lanes (pullouts) will be a minimum of 10-feet wide and 30-feet long with a minimum 25-foot taper on each end.

C. Wildfire Awareness Campaign

FireSafe Marin is providing a community wildfire awareness campaign for urban-wildland interface communities. The objective of this work will be to increase overall awareness of the wildland-urban interface fire hazard issues that affect residents. It
will build on the highly successful FireSafe Marin outreach efforts by taking a more comprehensive, multi-modal approach to wildfire prevention education and training. The program will consist of three parts:

- **Part 1 – Develop and facilitate educational mailings and publications.** Mailings will develop awareness of local disaster councils, invite residents to a meeting in their neighborhood, educate residents about disaster preparedness, and provide follow-up information from neighborhood meetings. The publication will be “Living in the Wildland-Urban Interface in Marin County.” It will be a detailed educational handbook on creating defensible space, developing a firesafe neighborhood, planning for seniors and disabled in the event of wildfire, and crafting a safe evacuation plan for families and neighborhoods.

- **Part 2 – Develop and coordinate neighborhood meetings and community outreach events.** Meetings will inform neighborhoods of disaster liaison groups and their local emergency response system; provide wildland fire protection information on defensible space and firewise building materials; introduce community preparedness database and provide an opportunity to update contact information; survey additional information on emergency-related needs and resources, fire education interests; and provide opportunities to sign up for defensible space home evaluations. Outreach events with educational displays will be provided at the Fire and Life Safety Fair, Marin County Fair, Marin Home and Garden Show, and local farmers’ markets.

- **Part 3 – Develop Database of Contact Information, Emergency Response needs, and Fire Education Interests.**

### E. International Urban-Wildland Interface Code Adoption

In light of the disastrous 2003 fire season in Southern California a closer examination of current and proposed policies, as well as existing and proposed codes and standards is certainly warranted, especially since one of the major factors affecting the amount of damage sustained by communities and the number of lives lost was the proximity of dwellings to open space. In the case of the Cedar Fire (San Diego County) much of these “open space” lands had not been maintained but left in a “natural” setting. In many areas, the open space would weave in and out of development forming a wick from the vegetation to the developed areas. Many examples of this exist throughout Marin County.
Both Section 4291 of the California Public Resources Code and Appendix II-A of the Uniform Fire Code are clearly inadequate to meet the challenge of the UWI fire hazard. Neither has any provision whatsoever for fire hardening structures, other than 4291’s provision for reducing the amount of defensible space if the structure is of non-combustible construction. Both sections only address “defensible space” and even then give the AHJ no real basis for arriving at a rational size for a defensible space zone. Also, if Section 4291 applies to the area in question, Section 51184 of the Government Code relieves owners of unimproved parcels of any responsibility for maintaining clearance from structures on the other side of the property line. While Appendix II-A of the CFC addresses the property line situation, and Marin County has adopted Appendix II-A, it still uses prescriptive criteria; i.e., “a one size fits all” solution to defensible space requirements. However, it is apparent that undeveloped parcels lacking vegetation management may provide a conduit for fire to transition from the wildlands into the urban interface.

Again, neither code provides a framework for modifying the required defensible space based on aspect, vegetation type, or slope other than a general statement that the AHJ may require greater defensible space (up to 100 feet) if the conditions warrant the increase. It is clear that these prescriptive code provisions do not work in the UWI zone. Even given flat ground, a 30-foot defensible space zone around a structure is not going to suffice to protect the structure if there is 12-foot pyrophytic vegetation just outside the 30-foot zone.

In contrast, the UWIC at least provides a framework to conduct a rational analysis of both potential and existing building sites to determine defensible space and ignition resistance in new construction, and defensible space requirements in the case of existing structures. However, “ignition resistance” in the UWI code is based on resistance to fire penetration for a given time; i.e., a 1-hour rated assembly per a wall-furnace test such as ASTM E-119. This does not address surface flame spread characteristics, or fire ember production. Therefore, Marin County has amended the International Code Council UWI to include the proposed emergency building standards for UWI areas recently placed before the California Building Standards Committee for consideration. These standards, while having fire resistive standards for different building elements; i.e., “1-hour fire resistive construction” for example, they also contain alternatives in lieu of prescriptive fire resistance requirements that focus instead on ignition and flame propagation resistance requirements based on standard fire tests.

As recent fire history shows, neither defensible space/access/water supply (fire code), nor ignition resistance construction/building standards can be applied in a vacuum. They need to be used in conjunction with each other to adequately address the urban-wildfire interface fire problem. Thus, Marin County has also amended the International
Code Council UWI Code to include the requirement for a Vegetation Management Plan. The plan is required to delineate defensible space, which in turn is dependent on the type and configuration vegetation/fuel present, the proposed fuel modifications, slope, aspect, and the types and locations of proposed plantings. At the time of this writing, the Draft UWI Ordinance has been completed, along with the required “Findings of Fact”. The Marin County Fire Chief’s Association is in the process of distributing the draft ordinance to the various constituent jurisdictions for modification to local conditions and subsequent adoption. The proposed ordinance would only apply to those new structures, or substantially remodeled structures located within the interface zone as defined by the Marin County Fire Plan, and/or those areas designated by the local fire authority.
Figure A1. Fuel™ assessment map for Marin County. Annual grassland (Model 1), Grass under oak (Model 2), Chaparral (Model 4), Coastal Scrub (Model 5), Oak-Bay-Madrone hardwood forest (Model 8), Conifer with moderate fuel loading (Model 9), Conifer or Eucalyptus with heavy fuel loading (Model 10), Urban (Model 28), Agriculture (Model 97), Water (Model 98), Barren (Model 99).

Figure A2. Slope assessment map for Marin County.
Figure A3. South, Southwest, or West-Facing Aspects within Marin County.