

## ***APPENDIX C - General Recommendations (taken from CWPP)***

The following general recommendations were taken from the 2010 San Mateo County - Santa Cruz County CWPP. The plan identifies “high priority” areas, where fuel reduction projects should take precedence. When individual projects are implemented, site specific guidelines shall be developed by the persons/agency responsible for project development. Any proposed project shall conform to all applicable local, county, and state regulations concerning fuel modification projects. The following general recommendations are not intended to be site specific, but rather a tool to aid in the development of appropriate prescriptions.

### **Reduction of fuels adjacent to roads**

Overgrown vegetation on or adjacent to the traveled road surface makes access difficult for fire fighters and equipment. Additionally, roadside vegetation, including tree limbs, brush, and grass is responsible for numerous fire starts each year. This is a problem adjacent to all types of roads in both counties. There are many narrow, one-lane roads that often make it difficult for emergency vehicles to access a fire area while residents are simultaneously leaving. During a wildland fire, ingress/egress may be obstructed by roadside vegetation. Vegetation impeding and growing into the road right of way should be reduced to a level allowing greater ease of access for emergency response personnel and equipment, and to reduce the number of roadside fire starts. This vegetation removal is also used for the safety of fire suppression personnel using roads as fire control lines.

County Public Works and Caltrans routinely conduct roadside clearing for access, visibility and fire safety. Historically, this work was accomplished through a combination of chemical and mechanical means. In recent years, there has been increasing public pressure to eliminate the use of chemicals as a roadside treatment. Most of this work has been completed with mechanical mowers and masticators.

Both local and state fire codes specify clearing of at least 10-feet on each side of a road or driveway and up to 15-feet vertical clearance over. Unfortunately, the specifications are inconsistent across the numerous county jurisdictions. A priority should be set to attempt standardization for these requirements across each County.

### **Strategically placed fuel breaks (including shaded fuel breaks)**

The primary goal of a fuel break or shaded fuel break project is to change the behavior of a fire entering the fuel-altered zone. To reduce large flame lengths and high energy output, fuels should be modified to reduce flame length and decrease energy output. Changing fire behavior may be the key to allowing fire crews to protect people and property from wildland fire. Effective fuel breaks may:

- Act as an anchor point for indirect attack on wildland fires.
- Allow for fire fighter to use fire as operational tool (firing out).
- Support safer ingress/egress for emergency responders.

With reduced fuel adjacent to a roadways and structures, flame lengths, fire activity, and heat production will be reduced, making it safer for firefighters to access the area and protect structures in the community.

A fuel break typically refers to the removal of all or the majority of vegetation in a specific strategic area. A shaded fuel break refers to “thinning” of vegetation in a specific area with the remaining vegetation shading the ground. Non-shaded fuel breaks are typically used in non-residential, less visible areas. For the purposes of large scale wildland firefighting, these type of fuel breaks are preferable to shaded fuel breaks because they make little to no fuel available combustion. However, shaded fuel breaks are often preferred because they are less invasive to sensitive resources on the landscape and often have more support from adjacent property owners.

The type and size of fuel reduction projects should be determined on a project by project basis. The widths of roadside shaded fuel breaks generally range from 10 feet up to 50 feet, and in certain instances may even be wider. Strategic fuel breaks can be as wide as 400 feet. The responsible fire agency as well as the community should collaboratively develop projects that meet the needs of the stakeholders.

Shaded fuel breaks can be placed around individual structures, a community or neighborhood identified to be at risk. For example, after a community has developed defensible space out to 100 feet from structures, they may wish to augment that with an extended fuel break. Depending on the topographical location of the community, an extended fuel break around the residences may be of strategic importance. There is no specific prescription for this type of project. It should be developed in collaboration with the community and responsible fire agency, and be adapted to local environmental constraints.

There are many communities and neighborhoods identified as priority areas in this document where a roadside fuel break would be beneficial. Stakeholders in both counties consistently agreed, reducing fuel loading adjacent to roads is one of the most important and highest priority projects. There is no standard distance recommended from the roads edge, other than more is often better. Extended fuel reduction projects may be reduced in some areas with continued maintenance and treatment of roadside grass and continued trimming of vegetation. Roadside fuel breaks are typically between 10 and 40 feet wide. The exact distance should be based on fuel type, slope, aspect, and be environmentally feasible.

Other general recommendations include maintaining defensible space around the home. This is discussed in the “Reducing Structural Ignitability” section of the CWPP.

There are a variety of methods used to create a fuel break or shaded fuel break, however, the primary method is manual labor using chainsaws. Locally, many fuel reduction projects are completed by CAL FIRE inmate fire crews, residents, and private contractors. Although chainsaws are the primary vegetation removal tool, other methods may include livestock, mowing, or other mechanical means such as a masticator. Treatment of the removed vegetation can be accomplished by a variety of methods, listed below.

- Chipping – A variety of chippers available for use in both counties. The Santa Cruz County Fire Chiefs Association offers a chipping program, utilized through local agencies. In San Mateo County, chipping programs have been developed through Fire Safe San Mateo County. Independent contractors with chippers are available for hire in both counties. When a fuel reduction project requires use of a chipper, vegetation to be treated should be placed in a location easily accessible to a chipping crew arranged in a manner to allow for efficient chipping. Such specifications are determined in project planning according to the size of the chipper. Depending on the location and project goals, the chips will be either left on site, or be taken away for proper disposal.
- Pile burning – Vegetation is typically placed in manageable piles to be burned by qualified personnel at a later date. Though this is a very effective means of fuel treatment, vegetation piles can become an increased fire hazard if left untreated. Other factors to consider are the risk of escape and smoke management and air quality restrictions. The agency having jurisdictional authority should be contacted prior to burning for information on all applicable fire and air quality rules and regulations. In general, guidelines for pile burning include:
  - Burn only during daylight hours.
  - Have adequate fire tools and water onsite.
  - Always have an adult in attendance.
  - Piles shall be no larger than 4-feet x 4-feet and no taller than 4-feet.
  - 10-foot clearance around each pile

Additionally, burning can only occur on “burn days” set by:

- Santa Cruz County – Monterey Bay Area Unified Air Pollution Control Board 1-800-225-2876
  - San Mateo and Santa Clara Counties – Bay Area Air Quality Management District 1-800-435-7247
- Lop and Scatter – This method of fuel treatment involves the cutting and spreading of cut material, so that it does not extend above a predetermined height above the ground. This can be

between 12 and 24 inches. Material is spread out to prevent continuous fuels and to allow for quicker decomposition. Care should be taken to not spread cut material in sensitive locations, as identified during the planning process. This method may be used in an area removed from roadways and homes, and in projects with low amounts of cut vegetation.

- Removal to off-site location – If there are no feasible on-site treatments, vegetation can be removed to an appropriate off-site location.

### **Masticators**

Another option for reducing fuel involves the use of a masticator. Masticators are a mechanical means of vegetation removal, in which spinning blades “masticate” or “chew” vegetation. The masticator head can be attached to the end of an excavator arm or to the front of a tracked or wheeled vehicle such as a dozer or loader. They are primarily used in fuel break situations, rather than shaded fuel breaks, due in part, to the large swath of vegetation they remove. Masticators cut, as well as treat the vegetation they remove, pulverizing the vegetation into a loose “chip like” material, obviating the need for a chipper. Masticators are very effective in roadside and ridge top fuel breaks. Smaller masticators are now being used in some shaded fuel breaks.

Controlled / Broadcast / Prescribed Burns involves the burning of surface fuels in a predetermined area, under the supervision of trained fire personnel. Prescribed burns are planned in detail, occurring only when favorable conditions exist. A prescribed fire takes place under predetermined weather and fuel conditions. Other factors affecting prescribed burning include resource availability and atmospheric conditions favorable for adequate smoke dispersion. Prescribed burns have been implemented on State Parks, Peninsula Open Space Trust, Midpeninsula Regional Open Space District lands and several private ranches for the purpose of fuel reduction and habitat improvement. While prescribed fire is an effective means of reducing fuels in the wildland, it is not widely used as treatment locally for a variety of reasons including: limited resources available for burning, smoke management, negative public perception of burning, and the potential threat of escape. CAL FIRE will cooperate with interested landowners to determine opportunities for the appropriate use of controlled burning.

### ***APPENDIX D – Landscape Level Needs (taken from CWPP)***

#### **Road data**

Whether private, dirt, rock or paved, there is agreement between stakeholders that proper mapping and identification of road systems throughout the counties is a high priority. Complete and accurate road mapping is vital during a wildland fire incident. Proper mapping allows emergency responders to locate and manage an incident. In many instances, out of county emergency responders do not know the local road systems in the vicinity of the wildfire. The Counties of San Mateo and Santa Cruz both have Geographic Information Systems (GIS) personnel who maintain county data. Although the county roads data is accurate, there are large areas where data is lacking. These omissions primarily occur in the

more rural areas of the counties and on large private and public landholdings such as parks or preserves, and managed timberland. Over the past several years, CAL FIRE has begun compiling roads data, utilizing a variety of sources. These roads data were helpful during the large wildfires of 2008 and 2009.

- This process should continue into the future. Collaboration between stakeholders to prepare a comprehensive map and inter-operable system is a priority.

Road and Bridges and Water in the WUI – In terms of new construction within the WUI, there are many common standards in terms of access, road width, water supply, and bridge specifications. These standards take into consideration the risk of wildland fire and the needs of responding fire agencies. There was, however, considerable construction in the WUI prior to modern fire code. There are, throughout both counties, numerous residences accessed by narrow, unmaintained roads, sometimes by inadequate bridges. This coupled with a limited water supply can result in disaster during a wildfire. The following issues should be strategically addressed:

- Identifying inadequate bridges and plan for fixes.
- Identify existing water supplies in the wildland.
- Identify locations for additional wildland water supplies.
- Identify, prioritize, and mitigate high risk roads in the WUI

### **Truck Trails/Fire Roads**

There are numerous “truck trails” or “fire roads” located throughout both counties, most of which are historic logging roads, referred to as truck trails for the purpose of this plan. The current conditions of truck trails are varied. Many are maintained at minimal levels, while others are neglected, often because of insufficient resources. Some have been abandoned due to poor initial location, improper construction, and failures due to landslides or washouts. Truck trails bisect a variety of properties of both public and private ownership. The importance of these roads in the event of a wildfire cannot be overstated. For example, the Warnella truck trail and shaded fuel break provided critical ingress and egress access to the Lockheed Fire in 2009. In northern Santa Cruz and most of San Mateo County, numerous truck trails provide access to the primarily roadless areas between the coast and Hwy 35. When a wildland fire affects these parts of San Mateo and Santa Cruz Counties, the truck trails will be of vital importance. Accurate mapping, appropriate maintenance, relocation of problem areas, and consideration of abandoning failed sections is needed on all truck trails.

### **Structure Protection Planning**

One of the common difficulties during the wildfire season in California is when fire crews respond to regions they are unfamiliar with. This problem is compounded when responders have limited information on roads, number of structures, evacuation routes, water supply, and other hazards. The Santa Cruz County Fire Chiefs have begun a project identifying pre-determined protection planning zones. The

zones will be identified by local fire officials and will include pre-packaged information, which will be provided to first responders in the event of an emergency. This is an ongoing project.

Fuel Breaks, Shaded Fuel Breaks and Roadside Fuel Breaks have been previously discussed in the plan. This plan has identified areas where fuel reduction projects should take place. There is a need to further investigate environmentally and socially acceptable landscape level fuel breaks. Part of the benefit of bringing multiple parties to the table, is that priority areas and assets at risk have become identified. This allows planners to consider not only community or neighborhood specific projects but also landscape level projects.

## **Eucalyptus**

Eucalyptus was introduced into California in the mid 1800's both as a windbreak and for fiber production. It has thrived in California's climate and has since spread throughout the state. Eucalyptus is responsible for the displacement of numerous native species. Because of its invasive nature and proclivity to burn rapidly and violently, eucalyptus has been identified as one of the highest priority tree species recommended for fuel modification or removal. Eucalyptus as a wildland fuel was observed in Santa Cruz County during the 2008 Trabing Fire and prior to that, the Oakland Hills Fire in 1991. Both fires resulted in losses of property and residential structures and in the case of Oakland, loss of life. Historically, there have been eucalyptus fires adjacent to the community of El Granada (Wicklow Property) which involved loss of life and property. Reports of embers observed falling 2 to five miles downwind illustrates the danger of a fully involved Eucalyptus stand.

Eucalyptus was imported into the local area in the early 1900's for several uses, including fuel for powering locomotives. Numerous windrows were planted in the area and this species was found to exhibit strong adaptation and rapid growth. What was planted over 100 years ago as single or double wide rows of trees, have expanded to extensive and dense forested areas. Recent estimates of expansion of Eucalyptus groves are 3 lineal feet per year. Eucalyptus is so successful in colonizing new ground to the exclusion of native species that a common comment during scoping sessions for this CWPP have been to request that the species be declared a noxious weed or an invasive pest, and be eradicated.

Eucalyptus stands frequently grow in excess of 80' tall and have a propensity to generate copious amounts of ground litter. Vertical ground litter accumulations of 3' or more of dry leaves, branches, bark are not uncommon. Because of peeling bark, small branches and sprouts, many eucalyptus stands exhibit fuels from the ground to canopy. Fire behavior in these stands can become extreme.

Flame length 1 and a half times the height of the stand is frequent in large stand replacement fires. Other examples of these conditions can be found in southern Australia in the frequent large catastrophic fires. This becomes a huge factor in fire control when residential and other structures are built within and adjacent to these stands.

There are several locations throughout the counties, where residents live in close proximity to large eucalyptus stands. Consideration should be given to addressing the potential risk to lives and property where this situation exists. Several projects have been completed as pilot projects to thin or remove stands in the San Mateo County. Projects such as the Wicklow Project by POST and Coral Reef project by the RCD, CALFIRE and Cabrillo Unified School District. There are current plans to thin and remove eucalyptus in the area of the Trabing Fire of 2008.

Potential projects needed across the landscape include:

- Identifying and mapping eucalyptus stands in both Counties.
- Identify risks to lives and property;
- Mitigate risk to lives and property through appropriate vegetation management projects (thinning, removal, and pruning).