

Merced County

Land Use Planning Program

General Plan Safety Element Assessment Tier 2

July 26, 2016

Board of Forestry and Fire Protection



Contents

Purpose and Background

Methodology for Review and Recommendations

Review Process and Timeline

Tier 2 Recommendations

Purpose and Background: The State Board of Forestry and Fire Protection (Board) is required to review and make recommendations for the safety element of general plan updates in accordance with Government Code (GC) 65302.5. The review and recommendations apply to those general plans with State Responsibility Area (SRA) (Public Resources Code (PRC) 4125) or Very High Fire Hazard Severity Zone Local Responsibility Area (VHFHSZ LRA) (GC 51177(i), PRC 4125).

The statutory requirements for the Board review and recommendations pursuant to GC 65302.5 (a)(1) and (2), and (b) are as follows:

- *“The draft elements...to the fire safety element of a county’s or a city’s general plan...shall be submitted to the Board at least 90 days prior to... the adoption or amendment to the safety element of its general plan [for each county or city with SRA or VHFHSZ].”*
- *“The Board shall... review the draft or an existing safety element and report its written recommendations to the planning agency within 60 days of its receipt of the draft or existing safety element....”*
- *“Prior to adoption of the draft element..., the Board of Supervisors... shall consider the recommendations made by the Board... If the Board of Supervisors...determines not to accept all or some of the recommendations..., the Board of Supervisors... shall communicate in writing to the Board its reasons for not accepting the recommendations.”*

Methodology for Review and Recommendations: The Board established a standardized method to review the safety element of general plans. The methodology includes 1) examining the safety element for inclusion of factors that are important for mitigation of wildfire hazard and risks, and 2) making recommendations related to these factors. The evaluation factors and recommendations below were developed using CAL FIRE technical documents and input from local fire departments.

The Tier 2 recommendations below apply to communities with

- Medium amounts of VHFHSZ Zone acreage or 10 to 20% of acreage is VHFHSZ LRA; or
- Medium population densities; or
- VHFHSZ that does not encroach on population centers or does not add significantly to contiguous high fire hazard fuels at a regional level.

The counties assigned Safety Element Assessment Tier 2 are **Colusa, Imperial, Inyo, Kings, Merced, Modoc, and Mono**. There are 48 cities, listed below, evaluated under Tier 2.

As local fuels, boundaries, populations, and other variables change throughout time, Board staff have the discretion to re-assign a jurisdiction into a lower or higher assessment tier. Staff will consider:

- Variations in population and population density; or
- Changes in proportion of land designated VHFHSZ (lower or higher); or
- Firefighting capabilities (paid, volunteer, equipment, etc) and contract changes; or

- Past planning efforts and involvement of organizations such as local Fire Safe Councils and new initiatives or efforts that have emerged over time; or
- Changes to the context of VHFHSZ within the region – does the VHFHSZ in a jurisdiction combine with neighboring fuels to create a continual pattern of very high fire risk in a way that it hadn't previously?

Cities (alphabetical by county)					
Alameda	Monterey	Riverside con't	San Diego	Shasta	
Berkeley	Monterey	Palm Springs	Carlsbad	Anderson	
Piedmont	Orange	Perris	Chula Vista	Siskiyou	
Pleasanton	Fullerton	Riverside	Del Mar	Etna	
Calaveras	Irvine	San Jacinto	El Cajon	Yreka	
Angels Camp	Laguna Woods	Temecula	Solana Beach	Sonoma	
Los Angeles	Mission Viejo	Wildomar	Vista	Santa Rosa	
Arcadia	Orange	San Bernardino	San Luis Obispo	Tehama	
West Covina	Riverside	Chino Hills	San Luis Obispo	Red Bluff	
Marin	Corona	Fontana	Santa Clara	Ventura	
Larkspur	Hemet	Hesperia	Morgan Hill	Camarillo	
Mendocino	Jurupa Valley	Rialto	San Jose	Fillmore	
Ukiah	Menifee	Upland		Ventura	
	Moreno Valley	Yucca Valley			

Review Process and Timeline

The county/local jurisdiction and CAL FIRE Land Use Planning staff will receive and review technical guidance documents, the Board assessment, and relevant information from CAL FIRE and the Governor's Office of Planning and Research.



The county or local jurisdiction will work closely with CAL FIRE Land Use Planning staff during the development of the general plan and the safety element in particular.



At least 90 days prior to the adoption or amendment of the General Plan: The county or local jurisdiction will submit the safety element to the Board of Forestry & Fire Protection for review. Jurisdictions are encouraged to send safety elements to the Board prior to the 90 day statutory requirement for greater collaboration.



No more than 60 days later: The Board will consider staff recommendations and approve as-is or with changes at the next Board meeting. This deadline may be modified upon mutual agreement between Board staff and local jurisdictions.

Standard List of General Plan Safety Element Recommendations

Jurisdiction: Merced County	Notes:	CAL FIRE Unit: Madera-Mariposa-Merced	Date Received:
County: Merced County	LUPP Reviewer: Kevin Lindo	Unit Contact: John Morgan	Date Reviewed:

Please click on the appropriate box to “check” whether the plan satisfies each point. Standard recommendations are included in the checklist but please highlight or add additional comments as necessary.

1.0 Inter-agency Wildfire Protection Planning

1.1 General Plan references and incorporates County or Unit Fire Plan: Yes Partial No

Recommendation: Identify, reference or create (if necessary) a fire plan for the geographic scope of the General Plan. The General Plan should incorporate the general concepts and standards from any county fire plan, fire protection agency (federal or state) fire plan, and local hazard mitigation plan. Identify or reference the local Unit Fire Plan and, if applicable, the Community Wildfire Prevention Plan.

Priority: High Medium Low N/A

Recommendation: Ensure fire plans incorporated by reference into the General Plan contain evaluations of fire hazards, assessment of assets at risk, prioritization of hazard mitigation actions, and implementation and monitoring components.

Priority: High Medium Low N/A

1.2 Map or describe existing emergency service facilities and areas lacking services, specifically noting any areas in SRA or VHFHSZs. Yes Partial No

Recommendation: Include descriptions of emergency services including available equipment, personnel, and maps of facility locations.

Priority: High Medium Low N/A

Recommendation: Initiate studies and analyses to identify appropriate staffing levels and equipment needs commensurate with the current and projected emergency response environment.

Priority: High Medium Low N/A

Recommendation: Establish goals and policies for emergency service training that meets or exceeds state or national standards.

Priority: High Medium Low N/A

1.3 Inter-fire service coordination preparedness/mutual aid and multi-jurisdictional fire service agreements. Yes Partial No

Recommendation: Adopt the Standardized Emergency Management Systems for responding to large scale disasters requiring a multi-agency response. Ensure and review mutual aid/automatic aid and other cooperative agreements with adjoining emergency service providers.

Priority: High Medium Low N/A

Additional Wildfire Protection Planning Recommendations:

1.3- Information exists within Public Facilities and Utilities in the 2030 General Plan Background report (sec 7.8, pg. 7-58). Identify the mutual aid areas within the county and provide links to the mutual aid or automatic aid agreements identifying the aid providers and response plans. I recommend this to be referenced within the Safety Element, which can be an external link.

2.0 Land Use:

2.1 Disclose wildland urban interface hazards including, Fire Hazard Severity Zone designations and other vulnerable areas as determined by CAL FIRE or fire prevention organizations. Describe or map any Firewise Communities or other fire safe communities as determined by the National Fire Protection Association, Fire Safe Council, or other organizations.

Yes Partial No

Recommendation: Specify whether the entity has a Very High Fire Hazard Severity Zones (VHFHSZ) designation pursuant GC 51175 and include a map of the zones that clearly indicates any area designated VHFHSZ.

Priority: High Medium Low N/A

Recommendation: Adopt CAL FIRE recommended Fire Hazard Severity Zones including model ordinances developed by the Office of the State Fire Marshal for establishing VHFHSZ areas.

Priority: High Medium Low N/A

2.2 Goals and policies include mitigation of fire hazard for future development. Yes Partial No

Recommendation: Adopt fire safe development codes to be used as standards for fire protection for new development in Very High Fire Hazard Severity Zones (VHFHSZ) within the entity's jurisdiction that meet or exceed statewide standards in 14 California Code of Regulations Section 1270 et seq and have them certified by the Board of Forestry.

Priority: High Medium Low N/A

Recommendation: Establish goals and policies for specific ordinances, or specify the current existing ordinances, code sections, or regulations, that address evacuation and emergency vehicle access; water supplies and fire flow; fuel modification for defensible space; and home addressing and signing.

Priority: High Medium Low N/A

Recommendation: Consider mitigation of previously developed areas that do not meet Title14 California Code of Regulations Section 1270 et seq. or equivalent local ordinance.

Priority: High Medium Low N/A

- 2.3 The design and location of new development provides for adequate infrastructure for the safe ingress of emergency response vehicles and simultaneously allows civilian egress during an emergency: Yes Partial No

Recommendation: Develop pre-plans for fire prone areas that address civilian evacuations to temporary safety locations.

Priority: High Medium Low N/A

Recommendation: Develop a policy that approval of parcel maps and tentative maps is conditional based on meeting regulations adopted pursuant to §4290 and 4291 of the Public Resources Code, particularly those regarding road standards for ingress, egress, and fire equipment access.

Priority: High Medium Low N/A

- 2.4 Fire suppression defense zones. Yes Partial No

Recommendation: Establish goals and policies that create wildfire defense zones for emergency services, including fuel breaks or other staging areas where WUI firefighting tactics could be most effectively deployed.

Priority: High Medium Low N/A

- 2.5 Prioritizing asset protection from fire when faced with a lack of suppression forces.
 Yes Partial No

Recommendation: Identify and prioritize protection needs for assets at risk in the absence of response forces.

Priority: High Medium Low N/A

Recommendation: Establish fire defense strategies (such as fire ignition resistant areas) that provide adequate fire protection without dependency on fire resources (both air and ground) and could serve as safety zones for the public or emergency support personnel.

Priority: High Medium Low N/A

Additional Land Use Planning Recommendations: Provide information regarding any Local Hazard Mitigation Plans or Community Wildfire Protection Plans that may exist for the VHFHSZ areas within the county. Information can be provided as a link within the Safety Element.

3.0 **Housing:**

- 3.1 Incorporation of current fire safe building codes. Yes Partial No

Recommendation: Adopt building codes for new development in State Responsibility Areas

or incorporated areas with VHFHSZ that are based on those established by the Office of the State Fire Marshal in Title 19 and Title 24 CCR, referred to as the "Wildland Urban Interface Building Codes."

Priority: High Medium Low N/A

Recommendation: Ensure new development proposals contain specific fire protection plans, actions, and codes for fire engineering features for structures in VHFHSZ. Examples include codes requiring automatic sprinklers in VHFHSZ.

Priority: High Medium Low N/A

3.2 Consideration of diverse occupancies and their effects on wildfire protection.

Yes Partial No

Recommendation: Ensure risks to uniquely occupied structures, such as seasonally occupied homes, multiple dwelling structures, or other unique structures/owners, are considered for appropriate wildfire protection needs.

Priority: High Medium Low N/A

3.3 Fuel modification around homes. Yes Partial No

Recommendation: Establish ordinances in SRA or VHFHSZ for vegetation fire hazard reduction around structures that meet or exceed the Board of Forestry and Fire Protection's Defensible Space Guidelines for SRA and the Very High Fire Hazard severity zones, including vacant lots.

See http://www.bof.fire.ca.gov/pdfs/Copyof4291finalguidelines9_29_06.pdf

Priority: High Medium Low N/A

Recommendation: Reduce fuel around communities and subdivisions, considering fuels, topography, weather (prevailing winds and wind event specific to the area), fire ignitions and fire history.

Priority: High Medium Low N/A

Recommendation: Include policies and recommendations that incorporate fire safe buffers and greenbelts as part of the development planning. Ensure that land uses designated near high or very fire hazard severity zones are compatible with wildland fire protection strategies/capabilities.

Priority: High Medium Low N/A

3.4 Identification and actions for substandard fire safe housing and neighborhoods relative to fire hazard area. Yes Partial No

Recommendation: Identify and map existing housing structures that do not conform to contemporary fire standards in terms of building materials, perimeter access, and vegetative hazards in VHFHSZ or SRA by fire hazard zone designation.

Priority: High Medium Low N/A

Recommendation: Identify plans and actions to improve substandard housing structures and neighborhoods. Plans and actions should include structural rehabilitation, occupancy reduction, demolition, reconstruction, neighborhood-wide fuels hazard reduction projects, community education, and other community based solutions.

Priority: High Medium Low N/A

3.5 Assessment and projection of future emergency service needs. Yes Partial No

Recommendation: Ensure new development includes appropriate facilities, equipment, personnel and capacity to assist and support wildfire suppression emergency service needs. Future emergency service needs should be:

- Established consistent with state or national standards.
- Developed based on criteria for determining suppression resource allocation that includes elements such as identified values and assets at risk, ignition density, vegetation type and condition, as well as local weather and topography.
- Local Agency Formation municipal services reviews for evaluating level of service, response times, equipment condition levels and other relevant emergency service information.

Priority: High Medium Low N/A

Additional Housing/Structures and Neighborhoods Recommendations:

3.1) Reference or create a link as to where the “Wildland Urban Interface” Building Codes can be located. This will guide the user to the current building standards utilized within the jurisdiction.

4.0 Conservation and Open Space:

4.1 Identification of critical natural resource values relative to fire hazard areas. Yes Partial No

Recommendation: Identify critical natural resources and other “open space” values within the geographic scope of the General Plan.

Priority: High Medium Low N/A

4.2 Inclusion of resource management activities to enhance protection of open space and natural resource values. Yes Partial No

Recommendation: Develop plans and action items for vegetation management that provides fire damage mitigation and protection of open space values.

Priority: High Medium Low N/A

Recommendation: Establish goals and policies for reducing the wildland fire hazards within the entity’s boundaries and, with the relevant partners, on adjacent private wildlands, federal lands, vacant residential lots, and greenbelts with fire hazards that threaten the entity’s jurisdiction.

Priority: High Medium Low N/A

4.3 Integration of open space into fire safety effectiveness. Yes Partial No

Recommendation: Establish goals and policies for incorporating systematic fire protection improvements for open space. Specifics policies should address fire mitigation planning with agencies/private landowners managing open space adjacent to the General Plan area, water sources for fire suppression, and other fire prevention and suppression needs.

Priority: High Medium Low N/A

Additional Conservation and Open Space Recommendations: Information may be available from the following sources: Unit Fire Plan, Local Hazard Mitigation Plan, CWPP and or Local Fire Safe council and should be included as an external link.

5.0 Circulation:

5.1 Adequate access to high hazard wildland/open space areas. Yes Partial No

Recommendation: Establish goals and policies for adequate access in Very High Fire Hazard Severity Zones that meet or exceed standards in Title 14 CCR 1270 for lands with no structures, and maintain conditions of access in a suitable fashion for suppression access or public evacuation.

Priority: High Medium Low N/A

5.2 Incorporate a policy that provides for a fuel maintenance program along roadways in the agency having jurisdiction. Yes Partial No

Recommendation: Develop an adaptive vegetation management plan that considers fuels, topography, weather (prevailing winds and wind event specific to the area), fire ignitions and fire history.

Priority: High Medium Low N/A

5.3 Emergency response barriers. Yes Partial No

Recommendation: Identify goals and policies that address vital access routes that if removed would prevent fire fighter access (bridges, dams, etc.). Develop an alternative emergency access plan for these areas.

Priority: High Medium Low N/A

5.4 Adequacy of existing and future transportation system to incorporate fire infrastructure elements. Yes Partial No

Recommendation: Establish goals and policies for proposed and existing transportation systems to facilitate fire infrastructure elements such as turnouts, helispots and safety zones.

Priority: High Medium Low N/A

6.0 Post Fire Safety, Recovery and Maintenance:

The post fire recommendations address an opportunity for the community and landowners to re-evaluate land uses and practices that affect future wildfire hazards and risk. They also provide for immediate post-fire life and safety considerations to mitigate potential losses to life, human assets and critical natural resources.

6.1 Develop post-fire priorities and goals for the recovery of the built and natural environments.

Yes Partial No

Recommendation: Reevaluate hazardous conditions and provide for future fire safe conditions. Evaluate redevelopment in high or very high fire hazard severity zones.

Priority: High Medium Low N/A

Recommendation: Restore sustainable landscapes and restore functioning ecosystems. Incorporate wildlife habitat/endangered species considerations.

Priority: High Medium Low N/A

Recommendation: Provide polices and goals for maintenance of the post-fire-recovery projects, activities, or infrastructure.

Priority: High Medium Low N/A

6.2 Post fire life and safety assessments. Yes Partial No

Recommendation: Develop frameworks for rapid post-fire assessment and project implementation to minimize flooding, protect water quality, limit sediment flows and reduce other risks on all land ownerships impacted by wildland fire.

Priority: High Medium Low N/A

Additional Recommendations:

- Recommend providing a link or reference to the Building Codes and Local Ordinances that pertain to development within the SRA or VHFHSZ that are being described within the Safety Element and Background Report.



**DEPARTMENT OF COMMUNITY
AND ECONOMIC DEVELOPMENT**

Mark J. Hendrickson
Director

2222 M Street
Merced, CA 95340
(209) 385-7654
(209) 726-1710 Fax
www.co.merced.ca.us

Equal Opportunity Employer

July 1, 2016

Mr. Matt Dias, Acting Executive Officer
State Board of Forestry and Fire Protection
P.O Box 944246
Sacramento, CA 94244-2460

Re: County of Merced Safety Element (Senate Bill 1241)

Dear Mr. Dias:

The County of Merced is in the process of updating its Housing Element, which is due to the State Department of Housing and Community Development by July 29, 2016. As part of this update process, the County seeks review and comment of the Safety Element from the State Board of Forestry and Fire Protection to comply with Senate Bill 1241.

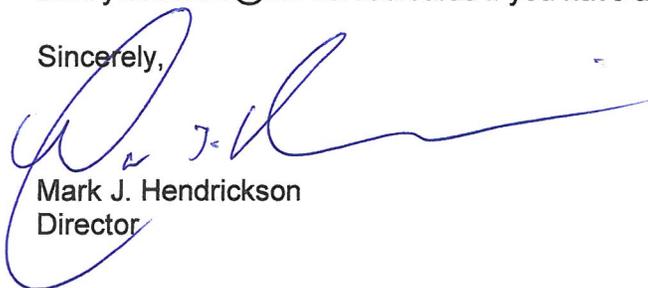
The General Plan and Background Report can be found on the County website at the following link:

<http://www.co.merced.ca.us/index.aspx?NID=100>

The Background Report portion of the Safety Element addressing "Fire Hazards" is on Pages 10-53 to 10-77 with both text and figures.

Please contact Sandy Saechao at (209) 385-7654 ext. 4163 or via email at sandy.saechao@co.merced.ca.us if you have any questions.

Sincerely,



Mark J. Hendrickson
Director



HEALTH AND SAFETY ELEMENT

INTRODUCTION

This element provides the policy context for protecting County residents and properties from unreasonable risks associated with hazards. People and communities are subject to potential harm from natural forces, such as flooding and earthquakes, as well as from human-caused hazards such as noise and aviation. Balancing human safety with environmental protection poses an urgent challenge for decision-makers. For example, by directing human activities to areas that are less susceptible to flooding and wildfire, the County can reduce risks to human safety. Similarly, by controlling the extent and intensity of certain land uses and activities in sensitive natural areas, the County can dramatically reduce negative impacts on unique natural resources. Goals and policies in this element are organized under the following headings:

- Geologic and Seismic Hazards
- Flood Hazards
- Fire Hazards
- Airport Safety
- Hazardous Materials
- Adaptation to Climate Change
- Noise
- Environmental Justice

GEOLOGIC AND SEISMIC HAZARDS

The County has a responsibility to guide the location and type of new development in the County to minimize risks posed by geologic and seismic hazards. As the County moves forward with plans for economic growth and urbanization, concerns for human safety will ensure that the location of new development and improvement of existing facilities minimizes the risk of geologic and seismic hazards. The policies in this section address the geologic and seismic hazards of Merced County.

Goal HS-1	Minimize the loss of life, injury, and property damage of County residents due to seismic and geologic hazards.
------------------	---

Policy HS-1.1: Structure Location and Compliance (RDR)

Require that all new habitable structures be located and designed in compliance with the Alquist-Priolo Special Studies Zone Act and related State earthquake legislation.

Policy HS-1.2: Financial Assistance for Seismic Upgrades (RDR/FB)

Support efforts to obtain financial assistance from Federal and State agencies in order to implement corrective seismic safety measures required for existing County buildings and structures.

Policy HS-1.3: Dam Inundation Areas (RDR)

Require all new structures located within dam inundation areas to conform to standards of dam safety as required by the State Division of Safety of Dams.

Policy HS-1.4: Ensure Earthquake Resistant Design (RDR)

Require earthquake resistant design for proposed critical structures such as hospitals, fire stations, emergency communication centers, private schools, high occupancy buildings, bridges and freeway overpasses, and dams that are subject to County permitting requirements.

Policy HS-1.5: Public Education (RDR)

Encourage educational programs to inform the public of earthquake dangers in Merced County.

Policy HS-1.6: Landslide Areas (RDR)

Prohibit habitable structures on areas of unconsolidated landslide debris or in areas vulnerable to landslides.

Policy HS-1.7: Hillside Development (RDR)

Discourage construction and grading on slopes in excess of 30 percent.

Policy HS-1.8: Grading Standards (RDR)

Require that the provisions of the International Building Code be used to regulate projects subject to hazards from slope instability.

Policy HS-1.9: Unstable Soils (RDR)

Require and enforce all standards contained in the International Building Code related to construction on unstable soils.

FLOOD HAZARDS

Economic growth and prosperity in Merced County is partially dependent upon Federal, State, and local agency cooperation on regional and local flood management systems. Large areas of Merced County continue to be subject to inundation during floods, with approximately 380,010 acres in the FEMA floodplain. The physical risks associated with potential flooding and regulatory requirements for floodplain management are important aspects of future land use decisions throughout the County, and guide the local and community-level emergency response needs.

Recent legislation has strengthened flood protection regulations in California. This legislation requires the California Department of Water Resources and Central Valley Flood Protection Board to prepare and adopt a Central Valley Flood Protection Plan (CVFPP) by 2012. The legislation also establishes certain flood protection requirements for local land use decision-making based on the CVFPP. This law sets a higher standard for flood protection for the San Joaquin Valley area. It sets an urban level of flood protection necessary to withstand a 1 in 200 chance of a flood event occurring in any given year (200-year flood) for areas developed or planned to have a population of at least 10,000. It also requires the County to collaborate with cities to develop a flood emergency response plan. The policies in this section address flooding hazards in Merced County.

Goal HS-2

Minimize the possibility of loss of life, injury, or damage to property as a result of flood hazards.

Policy HS-2.1: Floodplain Management Priorities (RDR/MPSP)

Prepare and adopt a floodplain management program in flood hazard areas that gives priority to regulation of land uses over development of structural controls as a method of reducing flood damage.

Policy HS-2.2: Countywide Flood Emergency Plan (RDR/MPSP)

Coordinate with the cities in Merced County to develop a Countywide flood emergency plan that is consistent with city general plans.

Policy HS-2.3: Countywide Flood Control Authority (MPSP/IGC)

Work with the cities in Merced County to establish a Countywide flood control authority to coordinate efforts and develop opportunities for expanded Federal funding.

Policy HS-2.4: Coordination to Improve Flood Control (FB/IGC)

Coordinate with State and local flood management agencies to develop funding mechanisms to finance the design and construction of flood facilities.

Policy HS-2.5: Flood Control Project Funding (FB)

Support the efforts of local districts and communities in obtaining funding for local flood control projects.

Policy HS-2.6: Flood Risk Consideration (RDR)

Prohibit new development in existing undeveloped areas (i.e., area devoted to agriculture or open space that is not designated for development) protected by a State flood control project without appropriately considering significant known flooding risks and taking reasonable and feasible action to mitigate the potential property damage to the new development resulting from a flood.

Policy HS-2.7: Finding of Flood Protection for New Development (RDR)

The County shall not enter into a development agreement, approve any building permit or entitlement, or approve a tentative or parcel map unless it finds one of the following:

- a) The flood control facilities provides 200-year level of protection in urban and non-urban areas consistent with the current Central Valley Flood Protection Plan;
- b) Conditions imposed on the development will protect the property at a 200-year level of protection in urban and non-urban areas consistent with the current Central Valley Flood Protection Plan; or
- c) The local flood management agency has made “adequate progress” on the construction of a flood protection system which will result in protection equal or greater than the 200-year flood event in urban and non-urban areas consistent with the current Central Valley Flood Protection Plan.

Policy HS-2.8: Floodwater Diversion (RDR)

Require new flood control projects or developments within areas subject to 100- and 200-year frequency floods are done in a manner that will not cause floodwaters to be diverted onto adjacent property or increase flood hazards to property located elsewhere.

Policy HS-2.9: Minimize Public Facility Impacts (RDR/MPSP)

Encourage all agencies that operate public facilities, such as roads, structures, wastewater treatment plants, gas, electrical, and water systems within areas subject to 100- and 200-year frequency floods to locate and construct facilities to minimize or eliminate potential flood damage.

Policy HS-2.10: Essential Facility Location (RDR)

Prohibit the construction of essential facilities (including hospitals, healthcare facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities) in the 100- and 200-year floodplain, unless it can be demonstrated that the structural and operational integrity of the facility can be maintained during flood events.

Policy HS-2.11: National Flood Insurance Program (SO)

Continue to participate in the National Flood Insurance Program (NFIP).

Policy HS-2.12: Relocation Assistance (IGC)

Support State and local flood management agencies to provide relocation assistance or other cost-effective strategies for reducing flood risk to existing economically disadvantaged communities located in non-urbanized areas.

Policy HS-2.13: Open Space Use (RDR)

Encourage open space uses in flood hazard areas.

Policy HS-2.14: Multi-Purpose Flood Control Projects (RDR)

Encourage multi-purpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the County's streams, creeks, and lakes.

Policy HS-2.15: Flood Control Design (RDR)

Encourage flood control designs that respect the natural topography and vegetation of waterways while retaining dynamic flow and functional integrity.

Policy HS-2.16: Adapting Infrastructure to Climate Change (RDR/MPSP)

Encourage increased stormwater and flood protection infrastructure capacity in order to accommodate changes in precipitation and extreme weather events.

Policy HS-2.17: Flood Control Facility Construction (RDR)

Permit the construction of County flood control facilities in existing developments located within flood hazard areas to proceed only after a complete review of the environmental effects and project costs and benefits.

Policy HS-2.18: Public Awareness Programs (PI)

Prepare public awareness programs to inform the general public and potentially affected property owners of flood hazards, potential dam failure inundation, and evacuation plans.

Policy HS-2.19: Mutual Aid Resource (RDR)

Coordinate and use mutual aid resources to augment local resources in order to perform rescue operations, secure utilities and inundated areas, and control traffic in event of dam failure.

Policy HS-2.20: Multi-Hazard Functional Plan Update (RDR)

Prepare and include provisions for mutual aid efforts within the County Multi-Hazard Functional Plan.

FIRE HAZARDS

Both urban and wildland fire hazards exist in Merced County, creating the potential for injury, loss of life, and property damage. Urban fires primarily involve the uncontrolled burning of residential, commercial, or industrial structures due to human activities. As the County continues to experience increased urbanization through new development and expanded road systems, the need for improved safety planning will intensify. While new development will bring new challenges for fire safety, it will also bring new opportunities to enhance and expand existing services and facilities to serve the County's growing demand for fire protection services. The policies in this section address fire hazards in Merced County.

Goal HS-3	Minimize the exposure of County residents and public and private property to the effects of urban and wildland fires.
------------------	---

Policy HS-3.1: Adequate Water Supplies for Fire Suppression (RDR)

Require adequate water supplies be available for fire suppression prior to occupancy of any structure in urban areas where a public water system does not exist prior to occupancy of any structures located in the County.

Policy HS-3.2: Minimum Peak-load Water Supply Standards (RDR)

Establish minimum peak-load water supply standards for developments with public water systems.

Policy HS-3.3: Sprinkler Systems (RDR)

Require sprinkler systems in areas where a fire department determines alternate fire protection measures are not adequate or to comply with State law.

Policy HS-3.4: Smoke Detectors (RDR)

Encourage installation and maintenance of smoke detectors in existing residences and commercial facilities that were constructed prior to the requirement for their installation.

Policy HS-3.5: Vegetation Clear Zones (RDR)

Encourage and maintain vegetation "clear zones" around new and existing residential structures in areas designated as having a high or extreme fire hazard severity and assist property owners in identifying how the clear zones should be maintained.

Policy HS-3.6: Weed Abatement (RDR)

Encourage weed abatement programs throughout the County in order to promote fire safety.

Policy HS-3.7: Road Fire Buffers (RDR)

Encourage fire buffers along heavily traveled roads within high and extreme hazard zones by thinning, disking, or controlled burning. Plan parks, golf courses, utility corridors, roads, and open space areas so they can serve a secondary function as a fuel break.

Policy HS-3.8: Cluster Development (RDR)

Encourage cluster developments in areas identified as subject to high or extreme fire hazard in order to provide for more localized and effective fire protection measures, such as consolidations of fuel build-up abatement, firebreak maintenance, firefighting equipment access, and water service provision.

Policy HS-3.9: Building Permit Review (RDR)

Require all buildings and structures to be constructed to fire safety standards prescribed in the Building Code and the County Fire Prevention Ordinance. Where minimum fire flow water pressure is not available to satisfy Fire Department standards, alternate fire protection measures shall be identified and incorporated into the development.

Policy HS-3.10: Emergency Equipment Access – New Development (RDR)

Require safe all-weather access for fire and other emergency equipment as part of the subdivisions and building permit application review process.

Policy HS-3.11: Emergency Equipment Access – Existing Development (RDR)

Encourage the construction of safe all-weather access for fire and emergency equipment to serve existing residential uses in areas designated as having a very high fire hazard severity.

Policy HS-3.12: Fire-Resistant Vegetation (RDR)

Require that development in high fire hazard areas have fire-resistant vegetation, cleared fire breaks separating communities or clusters of structures from native vegetation, or a long-term comprehensive vegetation and fuel management program.

Policy HS-3.13: Uniform Fire Code (RDR)

Require the Uniform Fire Code to be used as a guide for project-level fire prevention and suppression activities, including site access, water supply, fire protection systems, and the use of fire resistant building materials.

AIRPORT SAFETY

The aviation system of Merced County, consisting of four municipal airports and one County-administered airport, is a vital economic resource to be preserved, maintained, and enhanced for future generations. While the promotion of compatible land uses around airports is necessary to address safety concerns, it has the added advantage of maintaining or expanding airport capabilities, improving delivery of products and services, and preserving previous investments. Encroachment due to incompatible land use is one of the greatest threats to increasing the capability and capacity of the County's aviation system. The policies in this section address airport safety in Merced County.

Goal HS-4

Promote the safe operation of airports and the safety of Merced County residents by requiring that any new development within the airport area of influence be consistent with the requirements of the Merced County Airport Land Use Commission's compatibility plan and compliant with Federal Aviation Administration regulations.

Policy HS-4.1: Airport Land Use Compatibility Plan (RDR)

Require that development around public use airports be consistent with the safety policies and land use compatibility guidelines contained in the Merced County Airport Land Use Commission's adopted Airport Land Use Compatibility Plan, and ensure that development near private airstrips addresses land use compatibility issues and complies with Federal Aviation Administration regulations.

Policy HS-4.2: Compliance with FAA Regulations (RDR)

Require that development within the airport approach and departure zones is in compliance with Part 77 of the Federal Aviation Administration Regulations (FAA regulations that address objects affecting navigable airspace).

HAZARDOUS MATERIALS AND WASTE

Merced County has an aggressive program of tracking and inspecting hazardous materials and waste. The information about hazardous materials and wastes is important to future land use and growth management decisions. The County tracking system includes the collection of data related to underground storage tanks, hazardous material spill sites, and landfills. The policies in this section address the problem of hazardous materials and wastes, as well as the location, storage, transportation, and safety of such hazardous materials.

Goal HS-5

Protect Merced County residents, visitors, and property through providing for the safe use, storage, transport, and disposal of hazardous materials and wastes.

Policy HS-5.1: Compliance with Safety Standards (RDR)

Require that hazardous materials are used, stored, transported, and disposed of in a safe manner, in compliance with local, State, and Federal safety standards.

Policy HS-5.2: Hazardous Material and Waste Transport (IGC)

Coordinate with the California Highway Patrol to establish procedures for the movement of hazardous wastes and explosives within the County.

Policy HS-5.3: Incompatible Land Uses (RDR)

Prohibit incompatible land uses near properties that produce or store hazardous waste.

Policy HS-5.4: Contamination Prevention (RDR)

Require new development and redevelopment proposals that have suspected or historic contamination to address hazards concerns and protect soils, surface water, and groundwater from hazardous materials contamination by conducting Phase I Environmental Site Assessments (ESA) according to the American Society for Testing and Materials (ASTM) standards and applicable Department of Toxic Substances Control (DTSC) remediation guidelines. Also, complete additional Phase II Environmental Site Assessments and soil investigations, and any identified or needed remediation when preliminary studies determine such studies are recommended.

Policy HS-5.5: Household Hazardous Waste (PI)

Continue to administer educational programs to inform the public about household hazardous waste and the proper methods of disposal.

Policy HS-5.6: Hazardous Waste Residual Repositories (RDR/MPSP)

Prohibit hazardous waste residual repositories (as defined by the Merced County Hazardous Waste Management Plan) to be located in significant wetland and threatened species habitats or adjacent to State and Federal wildlife refuges or management areas.

ADAPTATION TO CLIMATE CHANGE

Emissions of greenhouse gases into the atmosphere, predominantly as a result of the burning of fossil fuels, is increasing the potency of the greenhouse effect and leading to global climate change. The potential effects of climate change include sea level rise, saltwater intrusion, diminished water supply, increased wildfire risk, increased frequency and magnitude of flooding, habitat loss, and possible impacts to public health and the local economy, including agriculture. The policies in this section seek to protect the County from and facilitate adaptation to the potential effects of climate change.

Goal HS-6

Plan for the eventual impacts of climate change through adaptive management strategies and responses in order to mitigate climate change impacts while protecting the quality of life for current and future County residents.

Policy HS-6.1: Development Restrictions in High Risk Areas (RDR) 🌐

Prohibit development in areas that may be more severely impacted by climate change, including areas at high risk of wildfire or flooding, unless proper design mitigation is included in the project.

Policy HS-6.2: Climate Change Monitoring and Adaptation (RDR) 🌐

Prepare an analysis that monitors the impacts of climate change and use adaptive management to develop new strategies and modify existing strategies to respond to the impacts of climate change.

Policy HS-6.3: New Agricultural Crops (RDR/PSR) 🌐

Coordinate with University of California Cooperative Extension in efforts to identify new agricultural crop choices/varieties that accommodate a longer growing season and are resistant to heat, insects, and disease. Also identify agricultural production methods such as planting dates and irrigation methods to adapt to changes in the climate.

Policy HS-6.4: Public Health Facilities and Program (RDR) 🌐

Support the expansion of public health facilities and programs that address increases in extreme weather events (e.g., heat waves) and reduced air quality.

Policy HS-6.5: Early Warning System (RDR) 🌐

Prepare and maintain an early warning system for disease outbreaks and extreme heat events.

Policy HS-6.6: Emergency Planning (RDR) 🌐

Support emergency planning for disease outbreaks and extreme weather events.

Policy HS-6.7: Public Awareness (PI) 🌐

Support public awareness of water conservation measures, agricultural changes, storm and flood preparedness, forest/range fire protection, air quality issues, extreme weather events, and disease prevention.

NOISE

While most noise is common and frequently an integral part of daily living, exposure to excessive noise is often cited as a health problem in terms of general well-being and contribution to undue stress and annoyance. There are many sources of noise in the County including traffic on Interstate 5; State Routes 33, 59, 99, 140, and 152; local roads; railroad operations; aircraft operations; commercial uses; active recreation areas; and outdoor play areas.

The following noise level standards have been developed in order to quantify noise impacts in the County. Table HS-1 shows the noise level standards for noise-sensitive areas affected by traffic, railroad, or airport noise sources in the County. Table HS-2 shows the interior and exterior noise level standards for noise-sensitive areas affected by existing non-transportation noise sources in the County. In addition to these standards, the policies in this section address ways to reduce or eliminate existing and future conflicts between land uses and noise.

TABLE HS-1 Noise Standards for New Uses Affected by Traffic, Railroad, and Airport Noise			
New Land Use	Sensitive ¹ Outdoor Area - Ldn	Sensitive Interior ² Area - Ldn	Notes
All Residential	65	45	3
Transient Lodging	65	45	3,4
Hospitals & Nursing Homes	65	45	3, 4, 5
Theaters & Auditoriums	---	35	4
Churches, Meeting Halls, Schools, Libraries, etc.	65	40	4
	65	40	4
Office Buildings	65	45	4
Commercial Buildings	---	50	4
Playgrounds, Parks, etc.	70	---	
Industry	65	50	4

Notes:

1. Sensitive Outdoor Areas include primary outdoor activity areas associated with any given land use at which noise-sensitivity exists and the location at which the County’s exterior noise level standards are applied.
2. Sensitive Interior Areas includes any interior area associated with any given land use at which noise-sensitivity exists and the location at which the County’s interior noise level standards are applied. Examples of sensitive interior spaces include, but are not limited to, all habitable rooms of residential and transient lodging facilities, hospital rooms, classrooms, library interiors, offices, worship spaces, theaters. Interior noise level standards are applied within noise-sensitive areas of the various land uses with windows and doors in the closed positions.
3. Railroad warning horn usage shall not be included in the computation of Ldn.
4. Only the interior noise level standard shall apply if there are no sensitive exterior spaces proposed for these uses.
5. Since hospitals are often noise-generating uses, the exterior noise level standards are applicable only to clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

**TABLE HS-2
Non-Transportation Noise Standards
Median (L50) / Maximum (Lmax)¹**

Outdoor Area ²			Interior ³	
Receiving Land Use	Daytime	Nighttime	Day or Night	Notes
All Residential	55 / 75	50 / 70	35 / 55	
Transient Lodging	55 / 75	---	35 / 55	4
Hospitals & Nursing Homes	55 / 75	---	35 / 55	5, 6
Theaters & Auditoriums	---	---	30 / 50	6
Churches, Meeting Halls, Schools, Libraries, etc.	55 / 75	---	35 / 60	6
Office Buildings	60 / 75	---	45 / 65	6
Commercial Buildings	55 / 75	---	45 / 65	6
Playgrounds, Parks, etc.	65 / 75	---	---	6
Industry	60 / 80	---	50 / 70	6

Notes:

1. These standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards in this table, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.
2. Sensitive Outdoor Areas include primary outdoor activity areas associated with any given land use at which noise-sensitivity exists and the location at which the County's exterior noise level standards are applied.
3. Sensitive Interior Areas includes any interior area associated with any given land use at which noise-sensitivity exists and the location at which the County's interior noise level standards are applied. Examples of sensitive interior spaces include, but are not limited to, all habitable rooms of residential and transient lodging facilities, hospital rooms, classrooms, library interiors, offices, worship spaces, theaters. Interior noise level standards are applied within noise-sensitive areas of the various land uses with windows and doors in the closed positions.
4. Outdoor activity areas of transient lodging facilities are not commonly used during nighttime hours.
5. Since hospitals are often noise-generating uses, the exterior noise level standards are applicable only to clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
6. The outdoor activity areas of these uses (if any) are not typically used during nighttime hours.
7. Where median (L50) noise level data is not available for a particular noise source, average (Leq) values may be substituted for the standards of this table provided the noise source operates for at least 30 minutes. If the source operates less than 30 minutes the maximum noise level standards shown shall apply.

Goal HS-7

Protect residents, employees, and visitors from the harmful and annoying effects of exposure to excessive noise.

Policy HS-7.1: Noise Standards for New Land Uses (RDR)

Require new development projects to meet the standards shown in Tables HS-1 and HS-2, at the property line of the proposed use, through either project design or other noise mitigation techniques.

Policy HS-7.2: Acoustical and Groundborne Vibration Analysis Requirements (RDR)

Require development project applicants to prepare an acoustical analysis as part of the environmental review process when noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels shown in Tables HS-1 and HS-2. Require an analysis of groundborne vibration for proposed residential and other sensitive projects (including but not limited to hospitals and schools) located within 1,000 feet of a rail line with at least 30 operations per day or an existing industrial groundborne vibration source. The acoustical and groundborne vibration analyses shall:

- a) Be the responsibility of the applicant;
- b) Be prepared by qualified persons experienced in the fields of environmental noise and groundborne vibration assessment and architectural acoustics;
- c) Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions;
- d) Estimate projected future (20 year) noise levels relative to the standards shown in Tables HS-1 and HS-2 at the property line of the proposed use, and, as applicable, estimate project future groundborne vibration levels using a maximum vibration standard of 70 VdB;
- e) Recommend appropriate mitigation to achieve compliance with the adopted policies and standards in this element, including setbacks from groundborne vibration sources causing adverse levels of vibration; and
- f) Estimate interior and exterior noise, and groundborne vibration exposure after the prescribed mitigation measures have been implemented at the property line.

Policy HS-7.3: Existing Rural Sources (RDR)

Discourage new noise sensitive land uses in rural areas with authorized existing noise generating land uses.

Policy HS-7.4: New Noise or Groundborne Vibration Generating Uses (RDR)

Require new commercial and industrial uses to minimize encroachment on incompatible noise or groundborne vibration sensitive land uses. Also consider the potential for encroachment by residential and other noise or groundborne vibration sensitive land uses on adjacent lands that could significantly impact the viability of the commercial or industrial areas.

Policy HS-7.5: Noise Generating Activities (RDR)

Limit noise generating activities, such as construction, to hours of normal business operation.

Policy HS-7.6: Multi-Family Residential Noise Analysis (RDR)

Require noise analyses be prepared for proposed multi-family, town homes, mixed-use, condominiums, or other residential projects where floor ceiling assemblies or party-walls shall be common to different owners/occupants to assure compliance with the State of California Noise Insulation Standards.

Policy HS-7.7: Noise or Vibration Impacted Residential Area Monitoring (RDR)

Consider any existing residential area “noise or vibration impacted” if the exposure to exterior noise exceeds the standards shown in Table HS-2 or if groundborne vibration levels exceed 70VdB. Identify and evaluate potential noise or groundborne vibration impacted areas and identify possible means to correct the identified noise/land use incompatibilities.

Policy HS-7.8: Project Design (RDR)

Require land use projects to comply with adopted noise and vibration standards through proper site and building design, such as building orientation, setbacks, natural barriers (e.g., earthen berms, vegetation), and building construction practices. Only consider the use of soundwalls after all design-related noise mitigation measures have been evaluated or integrated into the project or found infeasible.

Policy HS-7.9: Transportation Project Construction/Improvements (RDR)

Require transportation project proponents to prepare all acoustical analysis for all roadway and railway construction projects in accordance with Policy HS-7.2; additionally, rail projects shall require the preparation of a groundborne vibration analysis in accordance with Policy HS-7.2. Consider noise mitigation measures to reduce traffic and/or rail noise levels to comply with Table HS-1 standards if pre-project noise levels already exceed the noise standards of Table HS-1 and the increase is significant. The County defines a significant increase as follows:

<u>Pre-Project Noise Environment (Ldn)</u>	<u>Significant Increase</u>
Less than 60 dB	5+ dB
60 - 65 dB	3+ dB
Greater than 65 dB	1.5+ dB

Policy HS-7.10: Aircraft Noise (RDR)

Prohibit new noise-sensitive development within the projected future 60 dB Ldn noise contours of any public or private airports.

Policy HS-7.11: Train Whistle Noise (IGC)

Support improvements to at-grade crossings in urban areas in order to eliminate the need for train whistle blasts near or within communities.

Policy HS-7.12: New Project Noise Mitigation Requirements (RDR)

Require new projects to include appropriate noise mitigation measures to reduce noise levels in compliance with the Table HS-2 standards within sensitive areas. If a project

includes the creation of new non-transportation noise sources, require the noise generation of those sources to be mitigated so they do not exceed the interior and exterior noise level standards of Table HS-2 at existing noise-sensitive areas in the project vicinity. However, if a noise-generating use is proposed adjacent to lands zoned for residential uses, then the noise generating use shall be responsible for mitigating its noise generation to a state of compliance with the standards shown in Table HS-2 at the property line of the generating use in anticipation of the future residential development.

Policy HS-7.13: Noise Exemptions (RDR)

Support the exemption of the following noise sources from the standards in this element:

- a) Emergency warning devices and equipment operated in conjunction with emergency situations, such as sirens and generators which are activated during power outages. The routine testing of such warning devices and equipment shall also be exempt provided such testing occurs during daytime hours.
- b) Activities at schools, parks, or playgrounds, provided such activities occur during daytime hours.
- c) Activities associated with County-permitted temporary events and festivals.

Policy HS-7.14: Transportation Noise Mitigation Program (MPSP/SO)

Adopt a countywide transportation noise mitigation program to reduce transportation noise levels at existing sensitive land uses.

Policy HS-7.15: New Project Groundborne Vibration Mitigation Requirements (RDR)

For residential projects within 1,000 feet of a rail line with at least 30 operations per day, or an existing industrial or commercial groundborne vibration source, require new residential projects to include appropriate groundborne vibration mitigation measures to reduce groundborne vibration levels to less than 70 VdB within structures. However, if a groundborne vibration-generating use is proposed adjacent to lands zoned for residential uses, then the groundborne vibration-generating use shall be responsible for mitigating its groundborne vibration generation to a state of compliance with the 70 VdB standard at the property line of the generating use in anticipation of the future residential development.

ENVIRONMENTAL JUSTICE

Merced County is committed to making land use, environmental, and resource protection decisions that are predictable and fair. The policies in this section ensure that Merced County will make decisions that are fair and equitable for every resident, regardless of age, race, culture, or income.

Goal HS-8

Ensure the fair treatment of all visitors, residents, employees, and property owners, regardless of age, race, culture, and income with respect to land use and environmental decisions.

Policy HS-8.1: Environmental Justice (SO)

Require the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of land use and environmental laws, regulations, and policies. Ensure that no part of the community suffers disproportionately from adverse human health or environmental effects, and strive to provide all residents to live in a clean and healthy community.

Policy HS-8.2: Equal Public Participation (SP)

Ensure that all community residents have meaningful opportunities to participate in all public decision-making processes, including Planning Commission and Board of Supervisor actions.

Policy HS-8.3: Equitable Distribution of New Public Facilities and Services (RDR)

Promote the equitable distribution of new public facilities and services that increase and enhance the entire community's quality of life.

IMPLEMENTATION PROGRAMS

Health and Safety Element Implementation Programs						
		2014-2015	2016-2020	2021-2030	Annual	Ongoing
Program HS-A: Floodplain Mapping (RDR, IGC, PSR) Continue to participate in the Federal Flood Insurance Program and maintain flood hazard maps and other relevant floodplain data and revise/update this information as new State and Federal information becomes available.		✓				✓
Implements Which Policy	HS-2.11					
Responsible Department	Public Works					
Supporting Department	Community and Economic Development					
Program HS-B: Floodplain Management Ordinance (RDR) Update and periodically review the Special Flood Hazard Areas provisions contained in the County Code to ensure adequate protection for structures located within identified flood zones.		✓				
Implements Which Policies	HS-2.1 through HS-2.19					
Responsible Department	Community and Economic Development					
Supporting Department	Public Works					
Program HS-C: Countywide Flood Emergency Plan (RDR, MPSP) Prepare, maintain, and implement a Countywide Flood Emergency Plan that is consistent with city adopted general plans. The plan should be prepared in coordination with cities in Merced County and address the requirements of Senate Bill 5.			✓			
Implements Which Policies	HS-2.2					
Responsible Department	Public Works					
Supporting Department	Community and Economic Development					
Program HS-D: Countywide Flood Control Authority (MPSP/IGC) Establish, in coordination with cities in Merced County, a Countywide Flood Control Authority that will be responsible for coordinating local flood control efforts and identifying opportunities for additional Federal funding.			✓			
Implements Which Policies	HS-2.3					
Responsible Department	Board of Supervisors					
Supporting Department	County Administration					

Health and Safety Element Implementation Programs						
		2014-2015	2016-2020	2021-2030	Annual	Ongoing
Program HS-E: Dam Failure Evacuation Plan (MSPS) Prepare and implement Dam Failure Evacuation Plan(s) and provide public information on dam failure preparedness.						
Implements Which Policies	HS-2.18, HS-2.19		✓			
Responsible Department	Fire Departments					
Supporting Department	Community and Economic Development Public Works					
Program HS-F: Critical Area Flooding and Drainage Plan (MSPS) Continue to implement the Critical Area Flooding and Drainage Plan.						
Implements Which Policies	HS-2.1 through HS-2.19					✓
Responsible Department	Public Works					
Supporting Department	Community and Economic Development					
Program HS-G: Noise Sensitive Land Uses Near Airports (PS, MPSP) The County shall review all noise sensitive land uses, including but not limited to hospitals, schools and residential dwellings, at the building permit or discretionary review stage for compatibility with noise exposure from any public use airport as identified in the current Airport Land Use Compatibility Plan.						
Implements Which Policies	HS-4.1, HS-4.2, HS-7.1 through HS-7.12					✓
Responsible Department	Community and Economic Development					
Supporting Department	Public Works					
Program HS-H: Household Hazardous Waste (PI) Prepare, maintain, and implement a program to educate the public about household hazardous waste and the proper method of disposal. This can include updates to the County website, newsletters, and other informational materials.						
Implements Which Policies	HS-5.5		✓			
Responsible Department	Environmental Health Division					
Supporting Department	Community and Economic Development					
Program HS-I: Climate Change Adaptation Analysis (RDR) Prepare an analysis that monitors the impacts of climate change and use adaptive management to develop new strategies and modify existing strategies to respond to the impacts of climate change.						
Implements Which Policies	HS-6.2	✓				
Responsible Department	Community and Economic Development					

Health and Safety Element Implementation Programs						
		2014-2015	2016-2020	2021-2030	Annual	Ongoing
Supporting Department						
Program HS-J: Agricultural Crop Identification Study (RDR/PSR) Prepare an analysis that identifies new agricultural crop choices and varieties that accommodate a longer growing season and are resistant to heat, insects, and disease. Also identify agricultural production methods such as planting dates and irrigation methods to adapt to changes in the climate and protect the local economy.		✓				
Implements Which Policies	HS-6.3					
Responsible Department	University of California Cooperative Extension (through a contract with Merced County)					
Supporting Department	Agricultural Commissioner					
Program HS-K: Noise Control Standards (RDR) Update and enforce the Noise Control standards contained in the County Zoning Code as necessary to be consistent with the policies and standards within this element.						✓
Implements Which Policies	HS-7.1 through HS-7.12					
Responsible Department	Community and Economic Development					
Supporting Department	Environmental Health, Building Division					
Program HS-L: Noise Sensitive Land Uses Near Major Transportation Noise Sources (RDR/MPSP/SO) For roadways, railways, and other sources of transportation noise estimated to produce noise levels in excess of General Plan standards, document the locations of all existing noise sensitive land uses, including but not limited to hospitals, schools, and residential dwellings. Predict noise levels at the noise sensitive land uses. If noise levels exceed General Plan standards, identify feasible mitigation measures, including a funding source for implementation of the measures. The mitigation program could include, but should not be limited to, the following specific elements for noise abatement consideration where reasonable and feasible: noise barrier retrofits; truck usage restrictions; reduction of speed limits; use of quieter paving materials; building façade sound insulation; traffic calming; additional enforcement of speed limits and exhaust noise laws; and signal timing.		✓				
Implements Which Policies	HS-7.1 through HS-7.12					
Responsible Department	Community and Economic Development					
Supporting Department	Environmental Health, Building Division					

10.4 Fire Hazards

Introduction

This section describes the existing conditions of fire hazards in Merced County, including urban, wildland, and other fire hazards, as well as responsible agencies and fire prevention measures currently in place. As Merced County continues to experience increased urbanization through new development and expanded road systems, the need for improved safety planning will intensify. While new development will bring new challenges for fire safety, it will also bring new opportunities to enhance and expand existing services and facilities to serve the county's growing demand for fire protection services.

Key Terms

Assets at Risk. Assets at risk due to wildfires in California include life and safety; timber; range; recreation; water and watershed; plants; air quality; cultural and historical resources; unique scenic areas; buildings; and wildlife, and ecosystem health.

At-risk Community. An interface community within the vicinity of Federal lands that is at high risk from wildfire, or a group of homes and other structures with basic infrastructure and services within or adjacent to Federal land where conditions are conducive to large-scale wildland fire disturbance, or where a significant threat to human life or property exists as a result of a wildfire fire disturbance event.

California Department of Forestry and Fire Protection (CAL FIRE). The State department charged with protecting the residents of California from fires, responding to emergencies, and protecting and enhancing forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens.

Defensible Space. The area within the perimeter of a parcel where basic wildfire protection practices are implemented, providing the key point of defense from an approaching wildfire or escaping structure fire. The establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures such as tree trimming and the removal of brush adjacent to residences characterize defensible space.

Fire Hazard. A measure of the likelihood of an area burning and how it burns (example: intensity, speed, embers produced), without considering modifications such as fuel reduction efforts. Fire Hazard is a way to measure the physical fire behavior so that people can predict the damage a fire is likely to cause.

Fire Hazard Severity Zones (FHSZ). California Public Resources Code (PRC 4201-4204) and California Government Code 51175-89 direct 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), then define the range of various mitigation strategies that could be applied to reduce risk associated with wildland fires.

Fire Risk. A measure of the potential for damage a fire can do to the area under existing conditions, including any modifications such as defensible space, irrigation and sprinklers, and ignition resistant building construction. These modifications reduce fire risk.

Fire Threat. Fire Threat is a combination of two factors: (1) fire frequency, or the likelihood of a given area burning, and (2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme.

Fire and Resource Assessment Program (FRAP). Fire and Resource Assessment Program, a branch of the California Department of Forestry and Fire Protection.

Fuel. Vegetative material, live or dead, which is combustible during normal summer weather.

Fuel Break. Fuel breaks are wide strips of land on which trees and vegetation has been permanently reduced or removed. These areas can slow, and even stop, the spread of a wildland fire because they provide fewer fuels to carry the flames. They also provide firefighters with safe zones to take a stand against a wildfire, or retreat from flames if the need arises.

Greenbelts. Areas where vegetation is removed around structures and/or replaced with more fire resistant vegetation.

Insurance Services Office Ratings. Public protection classifications are designated by the State Insurance Services Office (ISO). The ISO bases its classifications on a number of factors, including fire department location, equipment, staffing, water supply, and communications abilities. Ratings range from 1 to 10, with 1 being the best possible fire protection, and 10 being the worst.

Level of Service (LOS). The Level of Service (LOS) rating is a ratio of successful fire suppression efforts to the total fire starts. It divides the annual number of small fires extinguished by initial attack by the total number of fires. Success is defined as those fires that are controlled before unacceptable damage and cost are incurred. This is a relative system, attempting to measure the relative impact of fire on the various assets at risk. The level of service rating (the score of successes in initial attacks) can be used to compare one area of the state with another, recognizing that the assets at risk may be quite different.

State Responsibility Areas (SRA). Areas classified by the State Board of Forestry and Fire Protection as being the primary financial responsibility of the State for preventing and suppressing fires. These lands include: lands covered wholly or in part by timber, brush, undergrowth or grass, whether of commercial value or not; lands that protect the soil from erosion, retard run-off of water, or accelerated percolation; lands used principally for range or forage purposes; lands not owned by the Federal Government; and lands not incorporated. Lands are removed from SRA when housing densities average more than three units per acre over an area of 250 acres.

Wildland Urban Interface. The wildland–urban interface (WUI) is commonly described as the zone where structures and other human development meet and intermingle with undeveloped wildland or vegetative fuels.

W.A.F. L. Score. A tool that calculates the combination of four fire plan assessment criteria (weather, assets at risk, fuel, and level of service) into an aggregate score, which can be used to help target areas with high fire hazard and prioritize projects for ground fuel reduction. Theoretically, those areas with the highest W.A.F.L. score would have the first priority for funding of any given project or pre-fire program.

Regulatory Setting

Federal

Healthy Forests Restoration Act (HFRA). Legislation passed in 2003 that gives incentives for communities to engage in comprehensive forest planning and prioritization. It includes statutory incentives for the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) to give consideration to the priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects. The Act emphasizes the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects.

State

Section 700-716, Public Resources Code. Establishes, generally, the authority of the California Department of Forestry and Fire Protection.

Section 4125-4136, Public Resources Code. Establishes State Responsibility Areas (SRAs), requires the development of fire plans to protect them, and places them under the jurisdiction of the California Department of Forestry and Fire Protection.

Section 4290, Public Resources Code. Establishes minimum fire safety standards for development in State Areas of Responsibility (SRA). This includes: (1) Road standards for fire equipment access; (2) Standards for signs identifying streets, roads, and buildings; (3) Minimum private water supply reserves for emergency fire use; (4) Fuel breaks and greenbelts.

Section 4291, Public Resources Code. Requires a minimum of 100 feet of clearance for fire safety surrounding all structures on State responsibility lands in California. The State requirements do not supersede more stringent local regulations.

2007 California Building Code, Chapter 7A, Wildland-Urban Interface Fire Area Building Standards. On September 20, 2007 the Building Standards Commission approved the Office of the State Fire Marshal's emergency regulations amending the California Code of Regulations (CCR), Title 24, Part 2, known as the 2007 California Building Code (CBC). These new codes include provisions for ignition resistant construction standards in the wildland urban interface and require implementation of PRC §4291.

701A.3.2 New Buildings Located in Any Fire Hazard Severity Zone. New buildings located in any Fire Hazard Severity Zone within State Responsibility Areas, any Local Agency Very-High Fire Hazard Severity Zone, or any Wildland-Urban Interface Fire Area for which an application for a building permit is submitted on or after January 1, 2008, shall comply with all sections of this chapter. This includes provisions that the local building official provide certification that the proposed building complies with building standards for materials and construction methods for wildfire exposure prior to construction; that the local building official certify upon completion of construction that the building was constructed in compliance with building standards for materials and construction methods for wildfire exposure; and that prior to building permit final approval, the property is in compliance with vegetation clearance requirements prescribed in PRC §4291. Specifically, any new building located within a Very High Fire Hazard Severity Zone, or any Wildland-Urban Interface Fire Area must meet the requirements of the new codes. These zones are also used by local governments when updated General Plan Safety Elements.

Section 4740-4741, Public Resources Code. Provides for the California Department of Forestry and Fire Protection to assist local governments in the prevention of wildland fires.

Sections 9.24.020-9.24.360 Fire Prevention, except Section 9.24.310, Merced County Code. Establishes the fire prevention code of the county based on the “Uniform Fire Code” (2000). Enacted for the public need in the extinguishment of fires, and the prevention, elimination or minimization of fire hazard for the safety of life and property in the county.

Chapter 9.25 Weed Abatement, Merced County Code. Provides for the removal of weeds, rubbish, and other material that result in a fire hazard, and establishes a method of recovering cost for removal.

Fire Safety Planning

Planning for fire safety in Merced County incorporates concepts of the National Fire Plan, the California Fire Plan, and individual CAL FIRE Unit Fire Plans, as well as Community Wildfire Protection Plans (CWPP). Fire Plans outline the fire situation within each CAL FIRE Unit. CWPPs do the same for communities. Each identifies prevention measures to reduce risks, informs and involves the local community or communities in the area, and provides a framework to diminish the potential loss due to wildfire. Currently (2009), there are no CWPPs prepared for communities in Merced County.

National Fire Plan

The National Fire Plan was developed under Executive Order 11246 in August 2000, following a landmark wildland fire season, with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. The National Fire Plan addresses five key points: Firefighting, Rehabilitation, Hazardous Fuels Reduction, Community Assistance, and Accountability. The plan is implemented by the USDA Forest Service and the Department of the Interior and provides assistance to communities that have been or may be threatened by wildland fire. Agencies provide support for educating citizens and a variety of grant programs including Rural, State, and Volunteer Fire Assistance and Economic Action Programs. To help protect people and their property from potential catastrophic wildfire, the National Fire Plan directs funding to be provided for projects designed to reduce the fire risks to communities.

California Fire Plan

The Strategic California Fire Plan is the State’s road map for reducing the risk of wildfire. The Fire Plan is a cooperative effort between the State Board of Forestry and Fire Protection and the California Department of Forestry and Fire Protection. The plan was finalized in June 2010 and directs each CAL FIRE Unit to prepare locally specific Fire Management Plans. The purpose of the plan is to determine the best ways to utilize and live with the risk of wildfire. As such, the plan emphasizes what needs to be done long before a fire starts and looks to reduce firefighting costs and property losses, increase firefighter safety, and contribute to ecosystem health. The plan builds upon concepts first developed in the 1996 California Fire Plan that led to collaborative efforts in fire prevention (CALFIRE 2010).

CAL FIRE Unit and Contract County Fire Plans. In compliance with the California Fire Plan, individual CAL FIRE Units are required to develop Fire Management Plans for their areas of responsibility. These documents assess the fire situation within each of CAL FIRE’s 21 Units and six contract counties. The plans include stakeholder contributions and priorities, and identify strategic areas for pre-fire planning and fuel treatment as

defined by the people who live and work with the local fire problem. The plans are required to be updated annually.

- **Madera-Mariposa-Merced Unit Fire Management Plan, 2009.** The goal of the Madera-Mariposa-Merced (MMU) 2009 Fire Plan is to reduce costs and losses from wildfire within the unit. This action plan identifies the process that MMU CAL FIRE Unit will take to achieve this goal. The plan identifies and prioritized target areas that will receive the majority of prefire management activities. The target areas have been identified based on criteria provided from the battalion chief and the Fire Management Plan assessment process (CALFIRE 2009).

Existing Conditions

Both urban and wildland fire hazards exist in Merced County, creating the potential for injury, loss of life, and property damage. Urban fires primarily involve the uncontrolled burning of residential, commercial, or industrial structures due to human activities. Wildland fires affect grass, forest, and brushlands, as well as any structures on these lands. Such fires can result from either human made or natural causes.

The type and amount of fuel, topography, climate, and the availability of water for firefighting are the primary factors influencing the degree of fire risk. Vegetation fires comprise the majority of fires in Merced County according to CAL FIRE. Most of the fires are caused by human activities involving motor vehicles, equipment, arson, and burning of debris.

As Merced County continues to grow and more rural lands are developed, the potential for wildland fires will increase. Proper land use planning and investment in fire protection resources are key steps to reducing the potentially devastating effects of wildland fires and thereby safeguarding the people and property of Merced County.

Urban Fire Hazards

Urban fires primarily involve the uncontrolled burning of residential, commercial, and industrial structures due to human-made causes. Factors that exacerbate urban structural fires include substandard building construction, highly flammable materials, delay in response time, and inadequate fire protection services. The Merced County Fire Department is responsible for fighting urban fires within unincorporated Merced County, and for providing fire protection under contract to several incorporated cities, including the City of Livingston.

In the years 2001-2008, fires in structures accounted for approximately 20 percent of the Merced County Fire Department's call volume from fires (Scott Newman 2009). Fires in residential occupancies make up the vast majority of these structure fire calls. The type of building (i.e. residential, commercial, or industrial) determines the number and type of equipment sent in response to a fire emergency. Predominantly rural Merced County has not dealt with a large high-rise fire threat, although planned development may introduce this fire-safety concern. The University of California-Merced campus near Lake Yosemite will likely contain some buildings that will exceed the County's present height limits, as there are currently (September 2009) plans for several buildings that are four (4) or more stories. Although, the UC-Merced campus has plans in subsequent phases for the construction of an on-campus fire station, it has not yet been constructed (UC-Merced, 2009). At this time the primary responder for the campus is City of Merced Fire Department Station 55 located three miles southwest of the campus. UC-Merced also has long-term plans for campus fire-fighting

services (UC-Merced, 2008). Further, the City of Merced Fire Protection Master Plan would accommodate future growth in the Merced area through the construction of up to nine new stations. A station is planned to be located within one mile of the UC-Merced campus, near Bellevue Road and G Street. This station would be constructed when its services are needed based on development levels. The Merced County Fire Department does not own any aerial apparatus to provide fire protection to high-rise buildings, and can only rely on mutual aid from the City of Merced for such a need on the UC campus (Scott Newman 2009).

The Merced County Fire Department currently reviews development plans and building permits for compliance with the Uniform Building Code and Merced County Fire Code. The County Fire Code (Uniform Fire Code Section 10.301 (c)) requires developers to provide approved water supplies capable of delivering adequate fire flow for fire protection to all premises upon which buildings or portions of buildings are constructed. Water supply may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of supplying the required fire flow. In setting the requirements for fire flow, the Fire Chief may be guided by the standards published by the Insurance Services Office, "Guide for Determination of Required Fire Flow."

The Insurance Services Office (ISO), the body that rates fire departments and assigns public protection classifications for the establishment of fire insurance rates, suggests that "the built upon area of a city should have a first due engine company within one and one-half (1½) miles." The present ISO ratings for Merced County are a Level 5 for areas with fire hydrants and a Level 8 for areas without hydrants, but within five miles of a fire station. The remainder of the County has a Fire Insurance Rating of 9. The higher the Insurance Rating number the lower the level of service and the higher the cost for a homeowner's fire insurance. An area with no organized fire protection services is assigned a Class 10 rating. See Section 7.8 Fire Protection for additional discussion of Merced County fire protection services.

Wildland Fire Hazards

Throughout California, communities are increasingly concerned about wildfire safety as increased development occurs in the foothills and mountain areas, and subsequent fire control measures have affected the natural cycle of the ecosystem. Suppression of natural fires allows the understory to become dense, creating the potential for larger and more intense wildland fires. Wind, steepness of terrain, and naturally volatile or hot-burning vegetation also contribute to the potential for wildland fires. Where human access exists in wildland areas, such as the Sierra Nevada and foothills, the risk of fire increases because of a greater chance for human carelessness and historic and current fire management practices. Human activities such as smoking, debris burning, and equipment operation are the major causes of wildland fires.

Wildland fire hazards exist in varying degrees over approximately 90 percent of Merced County on that portion of the county's 1,984 square miles not covered by water and urban uses. The fire season extends approximately 5 to 6 months, from late spring to fall, and is influenced by a combination of climatic, vegetative, and physiographic conditions.

The rolling foothills on the county's east and west sides, although well grazed, are not immune to extensive burning. There is some fuel loading in the foothill region, especially in those areas unaffected by fire for many years. In hilltop areas water supplies can be rapidly depleted, hampering fire control efforts. Structures with wood shake roofs ignite easily and produce embers that contribute to fire spread. The aftermath of wildland fire produces areas of potential landslide because burned and defoliated areas are exposed to winter rains that saturate the soil. The county is fortunate to have relatively few homes built on slopes with

vegetation in close proximity. However, as the county continues to grow and development encroaches further into wildland interface areas, the potential for wildland fires will increase.

The county's valley floor is composed of irrigated agricultural land, grassland, and marsh and wetland areas created by the San Joaquin River and its tributaries. This region of Merced County tends to be less susceptible to wildland fires than foothills due to the presence of abundant water resources. Nonetheless, wildland fires can occur here, damaging valuable agricultural and recreational lands and wildlife habitats.

Merced County's large tracts of range and wildland pose a major fire threat. Much of this land is in the State Responsibility Areas, directly protected by CAL FIRE fire engines responding from State-owned fire stations. Figure 10-16 depicts the State Responsibility Areas (SRA), Federal Responsibility Areas (FRA), and Local Responsibility Areas (LRA) in Merced County. The Merced County Fire Department is not principally responsible for the wildland fire protection in the SRA, but responds as initial attack automatic aid to many of these areas. The Los Banos Forest Fire Station is closed at the end of fire season and the Merced County Los Banos and Santa Nella Fire Stations are the first responders to the entire Pacheco Pass corridor along State Route 152. Wildland fires can be very labor intensive and vast commitments of resources are often required. A large fire may require the fire apparatus to remain at the scene for several days, causing equipment and staffing problems within the County Fire Department.

The county is criss-crossed with major traffic arteries and this leads to an abundance of vehicular fires, including both passenger and commercial type vehicles. Commercial vehicles carry every conceivable type of cargo, including all types of hazardous materials. Many times the contents of the truck or trailer is not known until after the fire has been attacked. Firefighters are exposed to these materials, causing injuries or health problems. The run-off water from firefighting operations can also cause environmental damage. An additional danger is the road itself, as traffic continues to move past the incident as firefighters work at extinguishing the fire.

Rural and outlying areas have the added problem of insufficient water supplies to deliver adequate streams to control the spread of a fire. Water must be delivered to the scene of the emergency through the use of water tenders, two of which are dispatched to every report of a structural fire fought by the Merced County Fire Department. One of these water tenders is maintained by a career firefighter and a Paid Call Driver/Operator usually drives the closest. If a qualified career firefighter/driver is not available, delivery of water to the scene may be delayed due to travel time of the dispatched water tender that is staffed by a career firefighter.

Fire Hazard Rating and Models

To assist state and local entities in assessing the hazards associated with wildland fires, particularly in the wildland urban interface (WUI), CAL FIRE's Fire and Resource Assessment Program (FRAP) has developed a series of computer models to assess fire hazard. FRAP's data collection and models provide detailed analysis and mapping of fuels, fire weather, historical fire occurrences, and ignition location and frequency, all of which they have analyzed and modeled to develop fire hazard severity rankings for lands throughout California. Other models used in wildfire planning determine fire threat based on fuel type, calculate all the fire parameters to determine a rank to prioritize fuel reduction projects, and measure the fire protection agencies level of successful fire suppression.

Fire Hazard Severity Zones (FHSZ)

Determining wildfire hazards and severity zones in Merced County involves assessing the presence of fire prone vegetation, weather, topography, assets at risk, and the fire protection system's ability to deal with the occurrence of wildfire (i.e. Levels of Service). Each parameter helps determine where a fire is likely to start as well as once ignited, the direction it will spread, the intensity at which it can burn, and how efficiently fire protection services can respond. Identifying Fire Hazard is a way to measure the physical fire behavior so that people can predict the damage a fire is likely to cause. Fire hazard measurement includes the speed at which a wildfire moves, the amount of heat the fire produces, and the burning fire brands (i.e. sparks/embers) that the fire sends ahead of the flaming front. The FRAP fire hazard model considers several parameters to determine wildfire hazard severity zones, including: topography, such as steepness of slopes, since fires burn faster as they burn up-slope; weather (e.g. temperature, humidity, and wind), which have a significant influence on fire behavior; and the surface vegetation fuel coverage, also known as wildland fuels.

California Public Resources Code (PRC 4201-4204) and California Government Code 51175-89 direct 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), then define the application of various mitigation strategies to reduce risk associated with wildland fires. CAL FIRE completed public hearings for the adoption of FHSZ for SRAs in 2007, and adopted FHSZ maps for SRAs in November 2007 as shown in Figure 10-17. In compliance with consultation requirements, CAL FIRE issued draft maps for Fire Hazard Severity Zones in Local Responsibility Areas (LRA) and transmitted them to local agencies for input. As a result of this consultation, CAL FIRE determined in November 2008 that Merced County has no Very High Fire Hazard Severity Zones within LRAs.

Fire Threat

Fire Threat is a combination of two factors: (1) fire frequency, or the likelihood of a given area burning, and (2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes.

To assess Fire Threat, CAL FIRE has developed a Fuel Rank assessment methodology to identify and prioritize pre-fire projects designed to reduce the potential for large catastrophic fire. The fuel ranking methodology assigns ranks based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, temperature, and fuel moistures). CAL FIRE also uses Fire Rotation class intervals, which are calculated from fifty years of fire history on land areas grouped into "strata" based on fire environment conditions. These strata are defined by climate, vegetation, and land ownership. The Fire Rotation interval is the number of years it would take for past fires to burn an area equivalent to the area of a given stratum. Finally, Fire Rotation values are grouped into classes. In the fire threat analysis, more frequent fire is ranked higher to reflect a greater concern for non-fire tolerant assets such as housing. CAL FIRE then calculated a numerical index of fire threat based on the combination of fuel rank and fire rotation, which are grouped into four threat classes. For assessing threat of wildland fire to people, FRAP buffers this Fire Threat attribute depending on whether it is an urban area or area of little or no threat, and all other areas; this reflects the greater resistance that urban areas and areas of little or no threat (such as agriculture lands) offer to the spread of wildland fire.

Figure 10-18 depicts the county fire threat and fuel levels as modeled by FRAP based on frequency, or likelihood of a fire in a given area and potential fire behavior or hazard. The rating is divided into four classes: extreme, very high, high, and moderate fire threat. For example, an area may be susceptible to high fire risk and hazards within a location identified as a WUI because the surrounding environment is undeveloped forest, typically on the edge of an urban area containing assets at risk.

W.A.F.L Score

In order to target critical fire hazard areas and prioritize projects for ground fuel reduction, the fire plan assessment process uses a W.A.F.L. tool to calculate the combination of assessments on weather, assets at risk, fuels, and level of service (LOS) to provide an aggregate score or ranking. The four components can result in a High, Medium, or Low ranking. The results are intended to assist fire planning efforts and funding to focus on areas that have high values or high-risk areas with severe fire weather and a demonstrated low LOS. In Figure 10-19, the W.A.F.L. score map shows there is high fire hazard along State Route 152 in the SRA adjacent to the San Luis Reservoir. To facilitate the fire assessment process mandated by the California Fire Plan, both the W.A.F.L. Score and the LOS rating are shown on an overlay grid system in which U.S. Geological Survey (USGS) 7-1/2 minute quadrangles are divided by nine columns and nine rows, with resulting cells that are approximately 450 acres in size. According to CAL FIRE, grid cells of this size give an adequate level of resolution for setting planning unit and statewide priorities.

Level of Service Rating. As a component to the W.A.F.L. score, the LOS rating is a ratio of successful fire suppression efforts to the total fire starts. Success is defined by fires that are controlled before unacceptable damage and cost are incurred and where initial attack resources are sufficient to control wildfires. The LOS uses a Geographic Information System (GIS) that overlays a 10 year history of wildfires onto a map and derives the average annual number of fires by size, severity of burning, and assets lost. This data provides a LOS rating, a relative system of evaluation based on a damage-plus-cost analysis of fire protection performance. The level of service rating (the score of successes in initial attacks) can be used to compare one area of the state with another, recognizing that the assets at risk may be quite different. This gives CAL FIRE a powerful tool for setting program priorities and defining the benefits of the programs. The level of service rating also provides a way to integrate the contribution of various program components (fire prevention, fuels management, engineering and suppression) toward the goal of keeping damage and cost within acceptable limits. Figure 10-20 shows the LOS in Merced County. Most areas in Merced County showed an LOS of 100 percent.

Fuel Ranking. Fuel, in the context of wildland fire, refers to all combustible material available to burn on an area of land. Each fuel has its own burning characteristics based on factors such as moisture content, volume, arrangement, crown cover, size, and the plants genetic makeup. In an attempt to predict fire spread, the U.S. Forest Service has developed 13 fuel models that categorize fuels by their burn characteristics. The fuel model characteristics have been used to determine planning belts for a certain area. Knowledge of fire behavior in various fuel types is essential for designing a defensive plan against wildfire. Fires in grass burn rapidly but can be stopped by a roadway or plowed fire breaks. Fires in brush often burn with an intensity that prevents fire crews from safely applying water to the flame front. Fires in timber can ignite new fires (called spot fires) miles ahead of the main blaze, making control efforts very difficult and dangerous. Wide scale pre-fire management programs can help reduce the likelihood of a potential wildfire catastrophe.

Figure 10-21 shows surface fuel model vegetation types in the county, which have a large influence on fire behavior. CAL FIRE's surface fuel model identifies Grass as the most common fuel found in the county. The Grass fuel model is considered a light fuel that burns rapidly with a short period of intense, maximum heat output (MMU 2005). Another common fuel type in the county is the Pine/Grass fuel model, which burns slower but more intensely than Grass and is found in areas of Merced County with higher fire hazard (see Figure 10-17 and Figure 10-21).

Fire Prevention and Suppression

In recognition of the severity of wildland fire hazards in certain areas of California, the State enacted legislation (California Public Resources Code, Section 4291) requiring local jurisdictions to adopt minimum recommended standards pertaining to road standards for fire equipment access, standards for identifying streets, roads, and buildings, minimum private water supply reserves for emergency fire use, and fuel breaks and greenbelts to achieve fuel reductions. With certain exceptions, all new development and construction in SRAs after July 1, 1991, must meet the new standards. The State requirements would not supersede more stringent local regulations should they be developed.

Recent changes (2005) to Public Resources Code (PRC) 4291 expand the defensible space clearance requirement maintained around buildings and structures from 30 feet to a distance of 100 feet. These guidelines are intended to provide property owners with examples of fuel modification measures that can be used to create an area around buildings or structures to create defensible space. A defensible space perimeter around buildings and structures provide firefighters a working environment that allows them to protect buildings and structures from encroaching wildfires as well as minimizing the chance that a structure fire will escape to the surrounding wildland. These guidelines apply to any person who owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material, and located within a State Responsibility Area.

Wildland Urban Interface Building Standards

In September 2005, emergency regulations amending the California Code of Regulations (CCR), Title 24, Part 2, known as the 2007 California Building Code (CBC), were adopted to bring increased protection to buildings located in WUI areas and reinforce implementation of PRC §4291. The broad objective of the Wildland-Urban Interface Fire Area Building Standards is to establish minimum standards for materials and material assemblies and provide a reasonable level of exterior wildfire exposure protection for buildings in WUI Fire Areas. Protecting a building from wildfire takes a two-pronged approach: removing flammable materials from around the building, and constructing the building of fire-resistant material. The amended emergency building standards in WUI areas went into effect in all SRA areas as of January 2008. Figure 10-22 shows WUI areas in the county and location of county fire stations.

Fire Facilities Impact Fee

In 1991, the County commissioned a report for the Interim Fire Facilities Impact Fee. A combination of the square footage of facilities and the cost of replacement equipment was used to determine the basic level of service and to project future needs for fire facilities. As an alternative measure, the report suggested that the department provide one fire station per 6,000 service population. The service population is defined as the total of residents and employees within the department's service area. Levels of service in 2005 had

diminished to 9,100 service population per station. The report called for the construction of 20 new fire stations by the year 2010. In 2007, the County constructed the first new station in 30 years, the Franklin/Beachwood/McSwain Fire Station 61, located at Gurr Road near State Route 140; there are no plans to add any additional fire stations at this time due to lack of funds (May 2011). Staffing levels have been upgraded at two stations, and staff level upgrades will continue at the remaining stations as funds are available. (Moore 2012).

Response times in the county have increased due to rapid growth without a corresponding growth in fire protection facilities and staffing. Therefore, as the county continues to grow, the risks of injury, loss of life, and property damage will also increase. To address the need for additional funding, the County in 2005 amended its Fire Facilities Impact fees to \$591 per single-family unit, \$533 per multi-family unit, and \$0.272 per square foot to \$0.635 per square foot for commercial uses, depending on density and type. This fee schedule is reviewed and updated as appropriate.

The potential for fire increases as residential and recreational developments encroach further into the wildlands. The Facility Impact Fee described above is an example of one method the County employs to reduce potential loss of life and property by wildfire. The County, through its General Plan policies, should ensure that basic fire safety practices are implemented. These practices should include such basic measures as: ensuring that building codes are properly enforced; eliminating and reducing the use of fire-promoting building materials, such as woodshake roofs; developing and/or retaining green belts and open space corridor; using prescribed burning to control fuel loads; requiring proper road construction and adequate water systems, and perhaps most importantly, proper land use planning and zoning.

Please See Next Page

MERCED COUNTY GENERAL PLAN

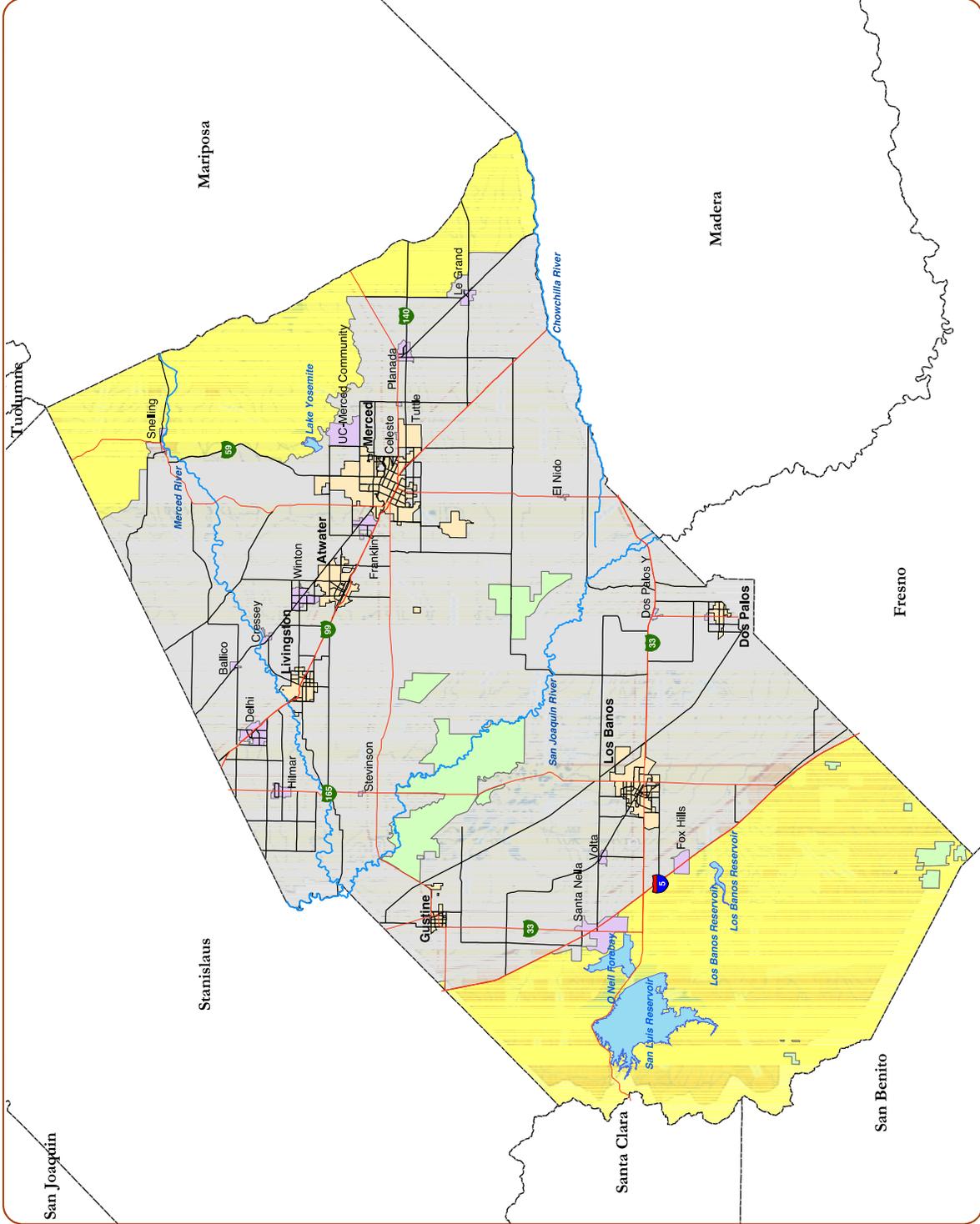
Legend

- FRA (Federal Responsibility Area)
- SRA (State Responsibility Area)
- LRA (Local Responsibility Area)

Sources:
 Merced County (2006), California Department of
 Forestry and Fire Protection (CalFIRE)
 Fire and Resource Protection Program (2009)



Figure 10-16
State Responsibility Areas
in Merced County

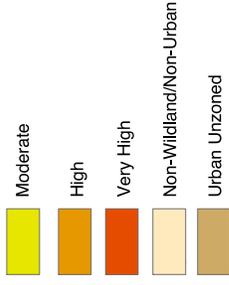


This page is intentionally left blank.

MERCED COUNTY GENERAL PLAN

Legend

Fire Hazard Severity Zones



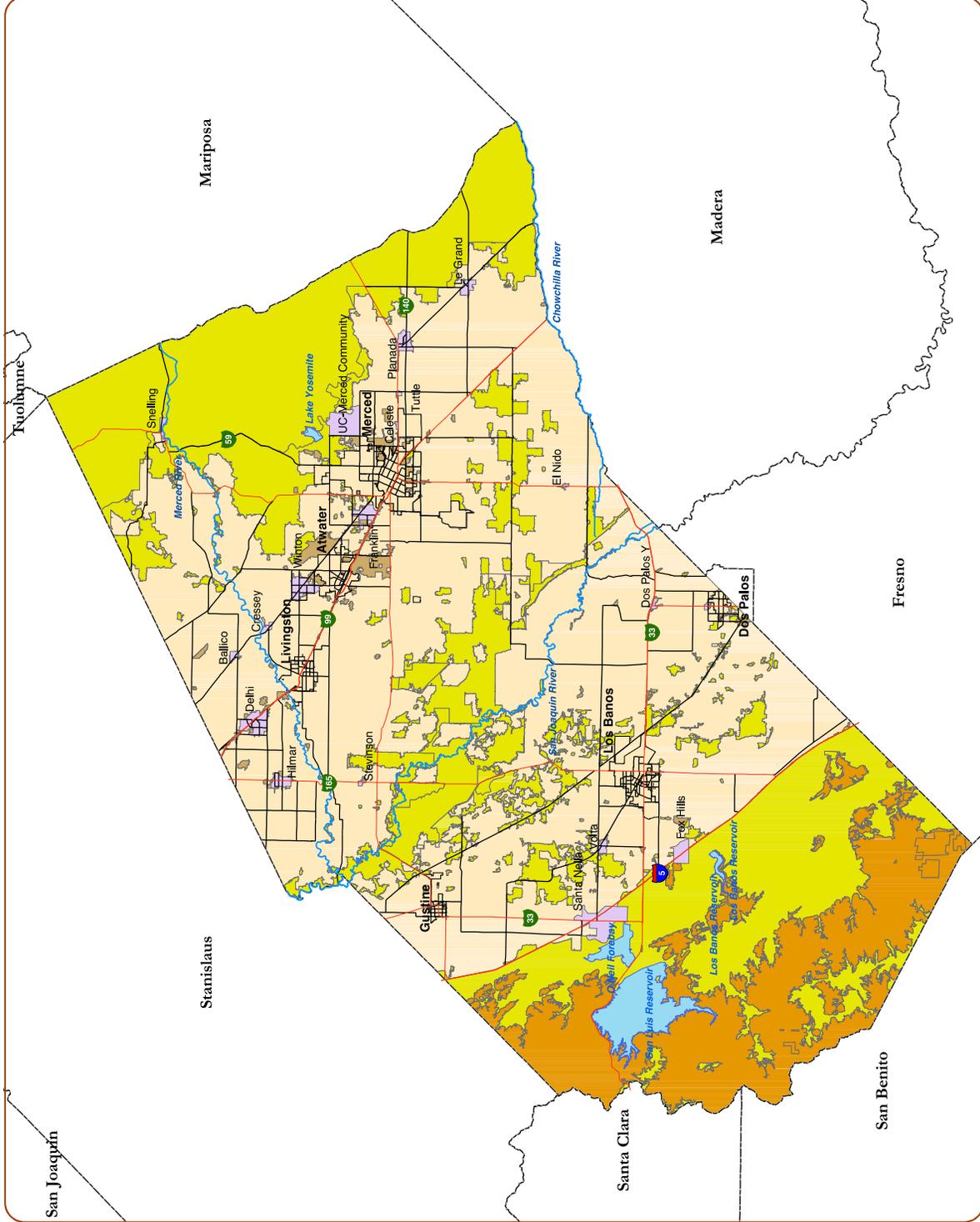
Sources:
 Merced County (2006), California Department of
 Forestry and Fire Protection (CalFIRE)
 Fire and Resource Protection Program (2009)



mintierharnish
 planning consultants



**Figure 10-17
 Fire Hazard Severity Zones
 In Merced County**



This page is intentionally left blank.

This page is intentionally left blank.

MERCED COUNTY GENERAL PLAN

Legend

Weather, Assets at Risk, Fuels, and LOS (W.A.F.L. Score)

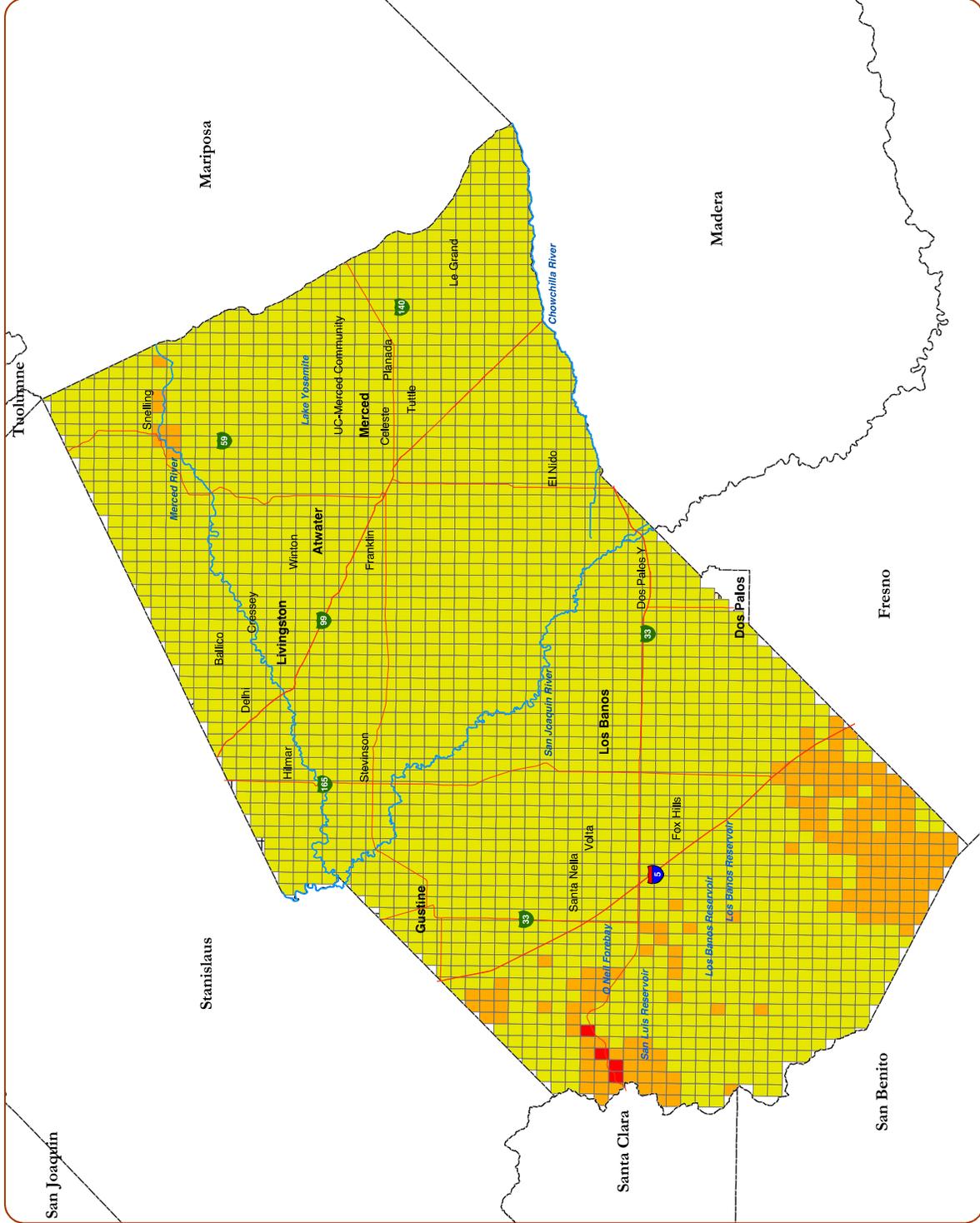
- Low (Top 50% to Top 20%)
- Medium (Top 20% to Top 5%)
- High (Top 5%)

Sources:
 Merced County (2006), California Department of Forestry and Fire Protection (CalFIRE)
 Fire and Resource Protection Program (2009)

The W.A.F.L. is a fire planning tool that combines weather, assets at risk, fuels and level of service (LOS) (e.g. workload) used to target critical fire hazard areas and prioritize projects. The four components will result in a High, Medium or Low ranking. Results focus on areas that have high values or high risk areas with severe fire weather and a demonstrated lo LOS.



**Figure 10-19
W.A.F.L. Score and Fire Threat
in Merced County**



This page is intentionally left blank.

This page is intentionally left blank.

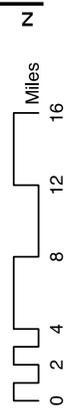
MERCED COUNTY GENERAL PLAN

Legend

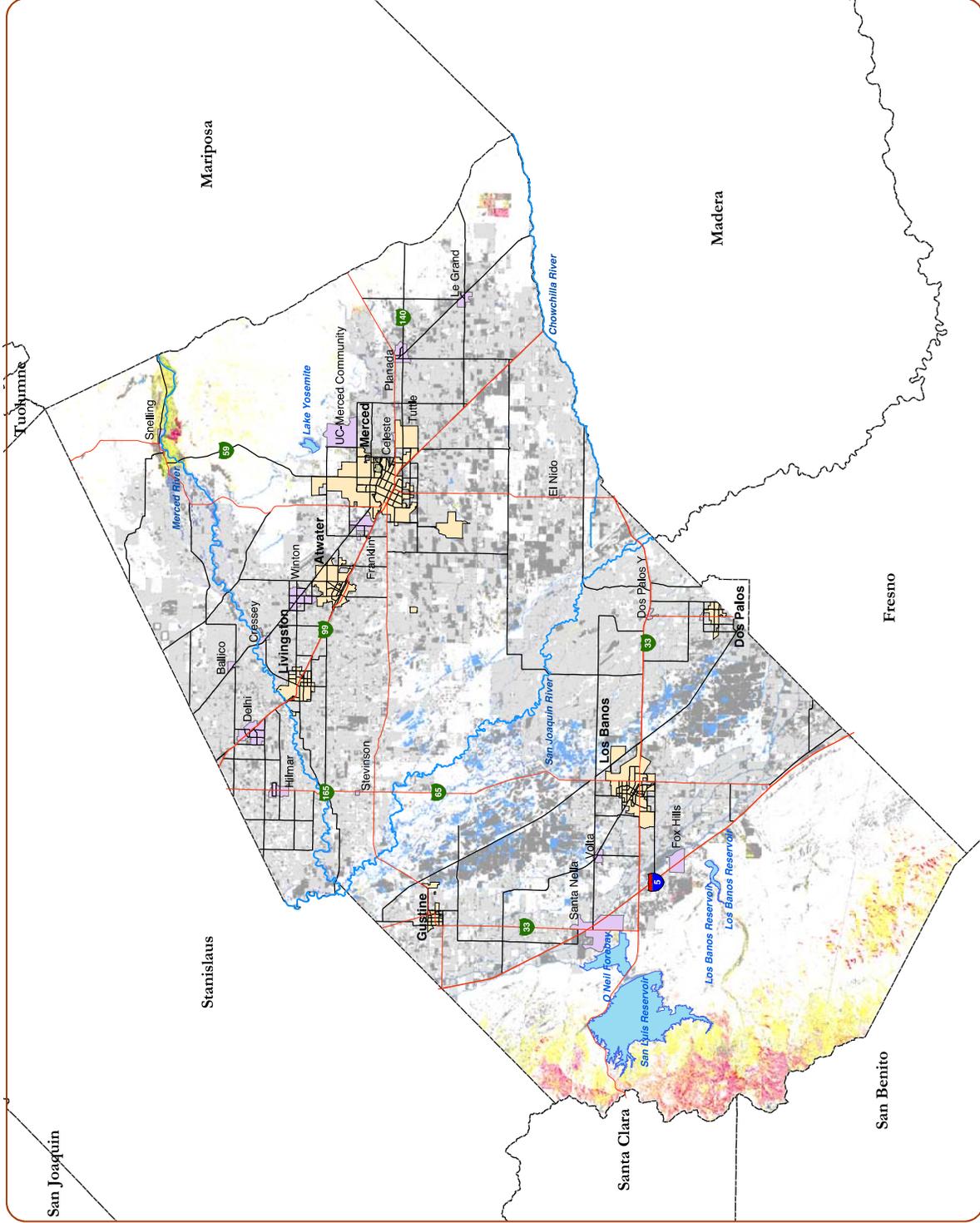
Surface Fuel Model Vegetation Types

- Grass
- Pine/Grass
- Tall Chaparral
- Light Brush
- Intermediate Brush
- Intermediate Brush
- Heavy Conifer
- Urban
- Agriculture
- Water
- Barren

Sources:
 Merced County (2006), California Department of Forestry and Fire Protection (CalFIRE)
 Fire and Resource Protection Program (2009).
 Data developed by translating vegetation data into fuel characteristics used to predict fire behavior (i.e. flame length, rate of spread).



**Figure 10-21
Surface Fuels in Merced County**



This page is intentionally left blank.

MERCED COUNTY GENERAL PLAN

Legend

Wildland Urban Interface (WUI)

- Outside the WUI
- Within the WUI
- Fire Stations

Sources:
 Merced County (2006), California Department of Forestry and Fire Protection (CalFIRE)
 Fire and Resource Protection Program (2009)

Wildland Urban Interface (WUI) is a potential treatment zone, in which projects could be conducted to reduce wildland fire threats to people. It is also known as the area where communities and wildland vegetation meet.



**Figure 10-22
 Wildland Urban Interface Areas
 and Fire Stations in Merced County**

