

# Sacramento County

## Land Use Planning Program

### General Plan Safety Element Assessment Tier 1

September 8, 2016

Board of Forestry and Fire Protection



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**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.

Enclosed is the most expansive set of recommendations suggested by the Board, known as a Tier 1 Assessment. These recommendations are directed at communities that include:

- Overall high population densities; or
- High proportion of SRA or 20% or more of a city’s acreage is VHFHSZ LRA; or
- Population centers in or adjacent to VHFHSZ SRA, if there is no designated VHFHSZ LRA in the county; or
- Within the context of neighboring jurisdictions, the location of VHFHSZ in the jurisdiction creates an overall picture of contiguous fuels that threaten population or economic centers.

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?

A full list of communities to be evaluated under Tier 1 are listed below.

### Counties (alphabetical)

Alameda	Glenn	Monterey	San Diego	Solano
Alpine	Humboldt	Napa	San Joaquin	Sonoma
Amador	Kern	Nevada	San Luis Obispo	Stanislaus
Butte	Lake	Orange	San Mateo	Tehama
Calaveras	Lassen	Placer	Santa Barbara	Trinity
Alameda	Los Angeles	Plumas	Santa Clara	Tulare
Alpine	Madera	Riverside	Santa Cruz	Tuolumne
Contra Costa	Marin	Sacramento	Shasta	Ventura
Del Norte	Mariposa	San Benito	Sierra	Yolo
El Dorado	Mendocino	San Bernardino	Siskiyou	Yuba
Fresno				

### Cities (alphabetical by county)

<b>Alameda</b>	<b>Los Angeles con't</b>	<b>Napa</b>	<b>Riverside con't</b>	<b>San Mateo</b>
Oakland	Glendale	Calistoga	Lake Elsinore	Hillsborough
<b>Butte</b>	Glendora	<b>Nevada</b>	Murrieta	San Carlos
Paradise	Hidden Hills	Calistoga	<b>San Bernardino</b>	Woodside
<b>Contra Costa</b>	Irwindale	Grass Valley	Big Bear Lake	<b>Santa Barbara</b>
El Cerrito	La Canada Flintridge	Nevada City	Colton	Santa Barbara
Lafayette	La Habra Heights	Truckee	Grand Terrace	<b>Santa Clara</b>
Orinda	La Verne	<b>Orange</b>	Highland	Los Gatos
Richmond	Los Angeles	Aliso Viejo	Loma Linda	Monte Sereno
<b>El Dorado</b>	Malibu	Anaheim	Rancho Cucamonga	Saratoga
Placerville	Monrovia	Brea	Redlands	<b>Shasta</b>
South Lake Tahoe	Palmdale	Laguna Beach	San Bernardino	Redding
<b>Lake</b>	Palos Verdes Estates	Laguna Niguel	Yucaipa	Shasta Lake
Clearlake	Pasadena	Lake Forest	<b>San Diego</b>	<b>Siskiyou</b>
<b>Los Angeles</b>	Rancho Palos Verdes	Newport Beach	Encinitas	Dunsmuir
Agoura Hills	Rolling Hills	Rancho Santa Margarita	Escondido	Fort Jones
Avalon	Rolling Hills Estates	San Clemente	Poway	Mount Shasta
Azusa	San Dimas	Yorba Linda	San Diego	Weed
Beverly Hills	Santa Clarita	<b>Placer</b>	San Marcos	<b>Tuolumne</b>
Bradbury	Sierra Madre	Colfax	Santee	Sonoma
Burbank	Westlake Village	<b>Plumas</b>	<b>San Luis Obispo</b>	<b>Ventura</b>
Calabasas	Whittier	Portola	Atascadero	Moorpark
Claremont	<b>Marin</b>	<b>Riverside</b>	Pismo Beach	Ojai
Diamond Bar	Mill Valley	Banning	<b>San Mateo</b>	Simi Valley
Duarte	<b>Monterey</b>	Beaumont	Belmont	Thousand Oaks
	Carmel	Calimesa	Half Moon Bay	

## 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.

# Tier 1 General Plan Safety Element Recommendations

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 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. 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

**Additional Wildfire Protection Planning Recommendations:** Recommend referencing the local state CAL FIRE Amador-EI Dorado Unit Fire Plan for areas in SAC County in SRA, local response plans, CWPP, etc.

## 2.0 Land Use Planning:

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

**Recommendation:** Establish goals and policies for specific ordinances addressing 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:** Specify the local ordinances, code sections, or regulations addressing the above standards, particularly any ordinances that address right-of-way, easement, and other reasonable offsite and onsite improvements for a division of land which qualifies for a Parcel Map rather than a Tentative/Final Map under the Subdivision Map Act.

**Priority:** High  Medium  Low N/A

**Recommendation:** Develop fire safe development codes used as standards for fire protection for new development in State Responsibility Area (SRA) within the entity’s jurisdiction that meet or exceed statewide standards in Title14 California Code of Regulations Section 1270 et seq.

**Priority:** High  Medium  Low N/A

**Recommendation:** Adopt, and have certified by the Board, local fire safe ordinances which meet or exceed standards in 14 CCR § 1270 for State Responsibility Area.

**Priority:**  High  Medium  Low  N/A

**Recommendation:** Consider mitigation of previously developed areas that do not meet Title 14 California Code of Regulations Section 1270 et seq. or equivalent local ordinance.

**Priority:**  High  Medium  Low  N/A

- 2.2 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 firesafe 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

**Recommendation:** Discuss and/or include local fire hazard maps.

**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 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

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

**Priority:**  High  Medium  Low  N/A

- 2.4 When approving parcel maps and use permits, consideration is given to providing adequate water supply infrastructure that meets zoning and fire protection needs.  Yes  Partial  No

**Recommendation:** Develop a policy that approval of parcel maps is conditional based on meeting zoning requirements and fire safe development codes.

**Priority:**  High  Medium  Low  N/A

**Additional Land Use Planning Recommendations:**

**The current County SE Policy SA-23/SA-27 addresses the checked N/A boxes for Section 2.4.**

**3.0 Housing/Structures and Neighborhoods:**

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

3.2 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

**Recommendation:** Identify plans and actions for existing residential structures and neighborhoods, and particularly substandard residential structures and neighborhoods, to be improved to meet current fire safe ordinances pertaining to access, water flow, signing, and vegetation clearing.

**Priority:**  High  Medium  Low  N/A

3.3 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 structures with unique occupancy characteristics, are considered for appropriate and unique wildfire protection needs.

**Priority:**  High  Medium  Low  N/A

3.4 Fire engineering features for structures in VHFHSZ. Yes Partial No

**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

**Additional Housing/Structures and Neighborhoods Recommendations**

**Recommend incorporating current fire safe building codes or reference the location of where that information can be found.**

**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. Plans should address protection of natural resource financial values, establishment of fire resilient natural resources, protection of watershed qualities, and protection of endangered species habitats. Actions should consider prescribed burning, fuel breaks, and vegetation thinning and removal

**Priority:** High Medium Low N/A

**Recommendation:** Establish goals and policies for reducing the wildland fire hazards within the entity’s boundaries, especially on vacant residential lots and greenbelts and, with the relevant partners, on adjacent private wildlands or federal lands 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 facilitation of safe fire suppression tactics, standards for adequate access for firefighting, fire mitigation planning with agencies/private landowners managing open space adjacent to the GP area, water sources for fire suppression, and other fire prevention and suppression needs.

**Priority:** High Medium Low N/A

4.4 Urban forestry plans relative to fire protection. Yes Partial No  
**Recommendation:** Ensure residential areas have appropriate fire resistant landscapes and discontinuous vegetation adjacent to open space or wildland areas.

**Priority:** High  Medium  Low N/A

**Recommendation:** Evaluate and resolve existing laws and local ordinances which conflict with fire protection requirements. Examples include conflicts with vegetation hazard reduction ordinances and listed species habitat protection requirements.

**Priority:** High  Medium  Low N/A

4.5 Mitigation for unique pest, disease and other forest health issues leading to hazardous situations. Yes Partial No

**Recommendation:** Establish goals and policies that address unique pest, disease, exotic species and other forest health issues in open space areas for purposes of reducing fire hazard and supporting ecological integrity.

**Priority:** High  Medium  Low N/A

**Additional Conservation and Open Space Recommendations:**

Reference any plans or resource management activities related to Section 4.5 in the Safety Element or reference the location in where it is found.

**5.0 Circulation and Access:**

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 Standards for evacuation of residential areas in high hazard areas. Yes Partial No

**Recommendation:** Goals and policies should be established to delineate residential evacuation routes and evacuation plans in high or very high fire hazard residential areas.

**Priority:** High  Medium  Low N/A **Current Policy SA-23 partially covers this in the Safety Element. Recommend making reference to the location of the evacuation plan or plans that identify evacuation routes, including emergency vehicle access.**

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

**Policy SA-25 covers prevention programs. Recommend expanding on this policy to include vegetation management.**

**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

- 5.4 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 Defensible Space

- 6.1 Develop geographic specific fire risk reduction mitigation measures using fuel modification.  Yes  Partial  No

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

**Priority:**  High  Medium  Low  N/A

- 6.2 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](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

- 6.3 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

## 7.0 **Emergency Services:**

- 7.1 Map/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

- 7.2 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

- 7.3 Adequacy of training. Yes Partial No

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

**Priority:** High  Medium  Low N/A

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

**Recommendation:** Adopt the Standardized Emergency Management System 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 Emergency Services Recommendations:**

**Chapter 4.4.4 of the current LHMP identifies that there are agreements existing, but doesn't describe where these agreements can be found. Recommend including the location or referencing them in the Safety Element.**

## 8.0 **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.

8.1 Evaluation of redevelopment. Yes Partial No

**Recommendation:** In High and Very High Hazardous areas, ensure redevelopment utilizes state of the art fire resistant building and development standards to improve past ‘substandard’ fire safe conditions.

**Priority:** High Medium Low N/A

8.2 Long term maintenance of fire hazard reduction mitigation projects. Yes Partial No

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

**Priority:** High Medium Low N/A

8.3 Reevaluate hazardous conditions and provide for future fire safe conditions. Yes Partial No

**Recommendation:** Incorporate goals and policies that provide for reassessment of fire hazards following wildfire events. Adjust fire prevention and suppression needs for both short and long term fire protection.

**Priority:** High Medium Low N/A

**Recommendation:** Develop burn area recovery plans that incorporate strategic fire safe measures developed during the fire suppression, such as access roads, fire lines, safety zones, and fuel breaks, and helispots.

**Priority:** High Medium Low N/A

8.4 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

**Recommendation:** Identity flood and landslide vulnerability areas related to post wildfire conditions.

**Priority:** High Medium Low N/A

**Recommendation:** Establish goals and policies that address the intersection of flood /landslide/post fire burn areas into long term public safety protection plans. These should include treatment assessment of fire related flood risk to life, methods to control storm runoff in burn areas, revegetation of burn areas, and drainage crossing maintenance.

**Priority:**  High  **Medium**  Low  N/A

**Recommendation:** Encourage rapid post-fire assessment, as appropriate, 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

8.5 Restore sustainable landscapes and restore functioning ecosystems.  Yes  Partial  **No**

**Recommendation:** Develop burn area recovery plans, evaluation processes and implementation actions that encourage tree and biomass salvage, reforestation activities, create resilient and sustainable landscapes, and restore functioning ecosystems.

**Priority:**  High  Medium  **Low**  N/A

8.6 Incorporate wildlife habitat/endangered species considerations.  Yes  **Partial**  No

**Recommendation:** Establish goals and policies for consideration of wildlife habitat/endangered species into long term fire area recovery and protection plans, including environmental protection agreements such as natural community conservation plans.

**Priority:**  High  Medium  **Low**  N/A

8.7 Native species reintroduction.  Yes  Partial  **No**

**Recommendation:** Incorporate native species habitat needs as part of long term fire protection and fire restoration plans.

**Priority:**  High  Medium  **Low**  N/A

**Additional Post Fire Safety, Recovery and Maintenance Recommendations:**

**Recommend developing a recovery plan for SAC County and identifying the plan and referencing the location of where it can be found in the safety element.**

9.0 **Terrorist and homeland security impacts on wildfire protection:**

These recommendations are included to address fire protection needs related to terrorist acts or other homeland security preparedness and response actions. Both preparedness and incident response can adversely impact fire protection. Adverse effects include substantially decreasing emergency resources' availability, responsiveness and effectiveness by diverting resources, interrupting communications, or restricting emergency access.

9.1 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

9.2 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

9.3 Communication channels during incidents.  Yes  Partial  No

**Recommendation:** Establish goals and policies consistent with the Governor's Blue Ribbon Fire Commission of 2005 for communications and interoperability. Example goals and policies should address fire personnel capability to communicate effectively across multiple frequency bands and update and expansion of current handheld and mobile radios used on major mutual aid incidents.

**Priority:**  High  Medium  Low  N/A

**After a review of the General Plan Safety Element, the following recommendations have been made in reference to the Fire Hazard Planning (General Plan Technical Advice Series) and Office of Planning and Research (OPS).**

**Additional recommendations in addition to the recommendation outlined above:**

- **Recommend referencing all codes, local ordinances, and plans that are in place for the County within the safety Element. It has been noted that various plans are in existence, implementing them into the Safety element is recommended.**
- **Recommend adopting the maps for VHFHSZ identified by CALFIRE to the SE.**
- **Provide a reference or appendix that may include education programs and major evacuation routes. Reference Maps location or incorporate them into the Safety Element.**
- **Provide reference to the local Unit Strategic Fire Plan (Amador-El Dorado Unit), Infrastructure Master Plan/Local Hazard Mitigation Plan (LHMPs), Community Wildfire Protection Plans (CWPPs), Evacuation Plans, recovery/Rebuilding Plans, etc.**
- **Other recommendations provided in additional comments by each topic below.**
- **Recommend Adopting and Certifying by the Board, local fire safe ordinances that meet or exceed Standards in 14CCR for areas in the SRA.**

Department of  
Community Development  
Michael J. Penrose,  
Acting Director



**Divisions**  
Administrative Services  
Building Permits & Inspection  
Code Enforcement  
County Engineering  
Economic Development & Marketing  
Planning & Environmental Review

August 22, 2016

Board of Forestry and Fire Protection  
Safety Element Review  
PO Box 944246  
Sacramento, CA 94244-2460

Via Certified Mail # 7002-0510-0000-0145-3385

To Whom it May Concern:

Recently CAL FIRE representatives visited Sacramento County and made us aware of Senate Bill 1241 which requires Board of Forestry (BOF) review of Safety Elements. The visit occurred at a time when we were already updating our Safety Element to comply with the Requirements of SB-5 regarding floodplain management and had a hearing schedule set. We are already late on our SB-5 compliance and must complete our update in order to bring the Safety Element in to compliance with SB-5. The adoption hearing is currently set for October 18, 2016. Unfortunately, this does not provide the mandated 90-day BOF review time. We are hoping you understand the dilemma we are facing in complying with two separate mandated Safety Element updates on the heels of the staff reductions associated with the Great Recession. We hope you will assist us in reviewing the Safety Element faster than normal or agree to work with us instead on the next update which is tentatively set for approval next year. In either case, we are willing to work with you to increase public safety and readiness as envisioned by SB-1241.

We have attached the current, proposed Safety Element and Safety Element Background document for your review. The entire General Plan can be viewed here: <http://www.per.saccounty.net/PlansandProjectsIn-Progress/Pages/GeneralPlan.aspx> . If we can be of any assistance or provide any clarification please contact John Lundgren, at [lundgrenj@saccounty.net](mailto:lundgrenj@saccounty.net) or (916) 874-8043.

Sincerely,

A handwritten signature in black ink, appearing to be "J. Lundgren", written over a horizontal line.

John Lundgren, Senior Planner/Environmental Analyst

EC: Captain Carmel Mitchell, [carmel.mitchell@fire.ca.gov](mailto:carmel.mitchell@fire.ca.gov)  
Captain Darin McFarlin, [darin.mcfarlin@fire.ca.gov](mailto:darin.mcfarlin@fire.ca.gov)

# General Plan

## Safety Element

Adopted December 15, 1993  
Amended November 9, 2011  
Amended October 18, 2016

~~Unless otherwise noted as “(added 2011)” or “(updated 2011)”, the Safety Element text and maps were not updated as part of the November 9, 2011 amendment of the County General Plan.~~

**County of Sacramento**  
Community Planning and Development Department

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# SACRAMENTO COUNTY GENERAL PLAN SAFETY ELEMENT

## GOALS AND POLICIES

### Introduction

The purpose of the Safety Element is to identify and assess the potential for hazards to occur in Sacramento County and to formulate measures that provide adequate public protection. Sacramento County's physical setting and the projected rate of urban expansion create a potential for the residents of the County to be greatly affected by several hazards. Hazards can result from the action of nature, as in the case of earthquakes and floods; they can be man-made, as in the case of fires caused by arson or through carelessness. They can also originate from a combination of both natural and man-made causes, such as dam failure that results from an earthquake. This element examines both natural and man-made hazards, including seismic events, flooding, and fires. Minimizing and preventing these hazards are the focus of this Element. For a discussion of airport-related safety issues, the reader is referred to the Noise Element.

Sacramento County has been dealing with flood hazards since the Gold Rush, with dramatic flood events in 1862, 1878, 1902, and 1909. In response to the 1878 flood, State Engineer William Hammond Hall developed an integrated, comprehensive flood control plan for the Sacramento Valley. The plan subsequently came to include a system of levees, weirs and bypass channels to protect existing population centers. Construction began on Folsom Dam in 1951, and upon its completion, it saved Sacramento from a significant storm event in 1956. (Updated 2011)

The flood events of 1986 and 1997 demonstrated a need to reevaluate the protection afforded the community by its existing levee system and the control of American River flows at the Folsom Reservoir. Engineering analysis showed that improvement to Folsom Dam and to the American River levee system was of urgent concern. The levees along the American River have been recognized by FEMA as providing at least a 100-year level of flood protection. An additional reach of levee upstream of the Mayhew drain was recently improved and should be recognized by FEMA near the end of 2010 as providing 100-year level of protection as well. There are still various levee strengthening activities occurring along the American River and in 2008 improvements to Folsom Dam began that will allow improved management of flood water which could double the amount of flood protection along the American River. These improvements should be completed around the 2015 to 2018 timeframe. In 2006, California voters approved Proposition 1E to fund flood protection projects statewide. The 2007 levee improvement project on the Sacramento River serves to protect urban areas north of Freeport. Also, in 2007, the State legislature sponsored several flood protection bills in an effort to reduce risk of catastrophic failure of structural flood control systems including language regarding 0.5% annual flood hazards (known as 200-year flood). (Updated 2011)

Sacramento County is less affected by seismic events and other geologic hazards than other portions of the state. Nevertheless, some property damage has occurred in the past. The damage that was experienced has largely been the result of major seismic events occurring in adjacent areas, especially the San Francisco Bay area and, to a lesser extent, the foothills of the Sierras. The areas of Sacramento County most vulnerable to seismic and geologic hazards are those areas subject to liquefaction, the action of expansive soils, and subsidence. Seismic activity could have a significant impact on Delta levees, particularly those that are wet year-round. Additional policies related to the preservation of urban streams as floodways are discussed in the Conservation Element.

Fires, both urban and wildland, represent another type of hazard to which areas of the County may be exposed. Grass fires, caused by lightning, arson, or carelessness, can occur in the less developed portions of the County. Again, Sacramento County is less vulnerable to this type of hazard than surrounding counties with sparse and/or hillside development. Structure and other types of urban fires are a threat to any community and emergency planning must account for such a possible danger. The ability of government and other responsible agencies to respond to the needs of the population that has been subject to a hazard is another concern that this element assesses. An adequate circulation network is central to saving lives and minimizing property damage. Areas of special concern are those in the Delta near levees and the floodplains of rivers and streams where the danger from flooding is the greatest.

The Safety Element does not address issues involving the storage and/or transportation of hazardous materials in relationship to land use planning. The Sacramento County Hazardous Material Element addresses land use planning concerns associated with hazardous materials.

### **Seismic And Geologic Hazards**

**GOAL: Minimize the loss of life, injury, and property damage due to seismic and geological hazards.**

#### **Policies:**

- SA-1. The County shall require geotechnical reports and impose the appropriate mitigation measures for new development located in seismic and geologically sensitive areas.
- SA-2. The County shall protect citizens from the hazards of old architecture affected by seismic activity.
- SA-3. The County shall support efforts by Federal, State, and other local jurisdictions to investigate local seismic and geological hazards and support those programs that effectively mitigate these hazards.
- SA-4. The County shall prohibit development on ground surfaces which exceed 40 percent in slope, such as the bluff areas along the American River. Development shall be set back from these slopes at a distance established by the Zoning Code.

### Implementation Measures:

- A. The County shall designate generalized areas subject to seismic and geological hazards. Development proposals falling within these areas shall include a geotechnical report with appropriate mitigation measures if a seismic or geological hazard is found to exist. (PLANNING)
- B. The County shall draft an ordinance for consideration by the Board of Supervisors to establish a program for the removal or strengthening of poorly anchored parapets or architectural detailing on existing buildings. (PUBLIC WORKS)

### Flooding

**GOAL:** Minimize the loss of life, injury, and property damage due to flood hazards.

~~Some locations within Sacramento County are known to have some local flooding concerns. These local flood hazards are those that are not mapped as special flood hazard areas on the FEMA flood insurance rate maps. The affected parcels are tagged and noted in a database maintained by Sacramento County known as local flood hazard tags. Local flood hazards are treated the same as special flood hazard areas in terms of restrictions on development that serve to assure a reasonable level of protection against flooding. (Added 2011)~~

**Policies in this section address flood avoidance and emergency response, interagency coordination, location and design of public facilities, location and design of new development, floodplain fill, levee protection and the requirements of drainage plans. The policies required by Senate Bill-5 (Machado, 2007) on floodplain management are found in the Conservation Element, the Safety Element and the Safety Element Background document. Conservation Element policies CO-30 & CO-105a stress the importance of preserving natural drainage. Safety Element policies SA6a-c and SA-37 emphasize the importance of interagency coordination for maintenance of facilities and for emergency response. Policies SA-18a and b require levee setbacks that will allow regular maintenance or emergency repair. A key requirement of Senate Bill-5 is addressed in SA-22a which differentiates between flood-protection standards for project sites that are subject to the Urban Level of Flood Protection (ULOP) requiring 200-year flood protection, and project sites that are subject to the 100-year FEMA flood standard. (Added 2016)**

**The text and policies of this General Plan use the following definitions for classifying and managing areas subject to flooding. (Added 2016)**

1. **Flood Hazard Zone. This term is used to identify project sites that must be evaluated for potential flood hazards (SA-23) and to locate appropriate sites for public facilities (SA-7). It is defined by the State of California, and in this General Plan, as an area subject to flooding that is delineated as either a Special Flood**

**Hazard Area or an Area of Moderate Flood Hazard on an official Flood Insurance Rate Map (FIRM) issued by the Federal Emergency Management Agency (FEMA).**

- a. **Special Flood Hazard Area. This term is defined in the Sacramento County Flood Plan Management Ordinance as an area shown on the FEMA Flood Insurance Study and the FIRM as Zone A, AO, A1-30, AE, A99, AH or AR. These zones are lands covered by the floodwaters of the base flood (100-year) where the National Flood Insurance Program's floodplain management regulations apply.**
  - b. **Area of Moderate Flood Hazard. These areas are shown by the letter "X" on the Flood Insurance Rate Maps (FIRM). (Older maps use the letters "B" or "C".)**
2. **Local Flood Hazard Area. An area having risk of flooding in a base flood event as determined by the Floodplain Administrator, and which is supplemental to federally defined special flood hazard areas. The base flood elevation related to actual surveyed ground elevation is the local flood hazard area.**

**The Safety Element Background document contains data required by Senate Bill-5 primarily in the form of mapped data. (Added 2016)**

Any development located within the Central Valley Flood Protection Board's (CVFPB) jurisdiction is required to apply for a permit from the CVFPB per the California Code of Regulations, Title 23 Waters, Division 1, Article 3, Section 6. Their authority extends over (a) the levee section, (b) the waterward area between project levees, (c) a 10-foot-wide strip adjacent to the landward levee toe, (d) within 30 feet of the top of the banks of unleveed project channels, (e) within Designated Floodways adopted by the CVFPB, and (f) activities outside of these limits which could adversely affect the flood control projects. (Added 2011)

Additional floodplain information may be obtained by contacting the Sacramento County Department of Water Resources. The Sacramento County Floodplain Management Ordinance contains additional information regarding safety and development in or near designated floodplains. Historical data on flooding, including locally prepared maps of areas that are subject to flooding, areas that are vulnerable to flooding after wildfires, and sites that have been repeatedly damaged by flooding is available in the Sacramento County Multi-Hazard Mitigation Plan. (Added 2011)

**Policies:**

- SA-5. **A comprehensive drainage plan for major planning efforts shall be prepared for streams and their tributaries prior to any development within the 100-year floodplain and/or the 200-year floodplain in areas subject to the Urban Level of Flood**

**Protection**, defined by full watershed development without channel modifications. The plan shall:

- a. Determine the elevation of the future 100-year flood elevations and/or the 200-year flood in areas subject to the Urban Level of Flood Protection, associated with planned and full development of the watershed;
- b. Determine the boundaries of the future 100-year floodplain boundaries and/or the 200-year floodplain in areas subject to the Urban Level of Flood Protection, for both flood elevations (planned and full development) based on minimum 2-foot contour intervals;
- c. Assess the feasibility of gravity drainage into the existing flowline of the stream;
- d. Assess the feasibility of alternative means of drainage into the stream;
- e. Identify potential locations for sedimentation ponds and other stormwater treatment facilities;
- f. Determine practical channel improvements and/or detention basins to provide the flood control needs of the proposed development;
- g. Determine the location and extent of marsh, vernal pool and riparian habitat;
- h. Develop measures for protecting and mitigating natural habitat;
- i. Develop measures for protecting and mitigating for federal and state listed endangered species;
- j. Develop and ensure implementation of measures that would reduce vector larvae;
- k. Identify appropriate plant species to be included as part of the natural features of the comprehensive drainage plan. **(Modified 2016)**

SA-6. The County will ~~participate~~ **coordinate** with the City of Sacramento, the Army Corps of Engineers, the Sacramento Area Flood Control Agency, and other Federal, State and local governments and agencies to develop a plan to finance, develop and construct flood control project improvements to reduce flooding potential in Sacramento County. The construction of flood control projects along the Sacramento and American Rivers and the immediate connection of local streams to these rivers shall be included in these projects. Such projects should provide 200-year flood protection.

- SA-6a. The County will continue to coordinate with parties responsible for flood management facilities and structures (e.g., pump stations, levees, canals, channels, and dams) to provide proper maintenance and/or improvements. (Added 2016)**
- SA-6b. The County will continue to coordinate with relevant organizations and agencies (e.g., Federal Emergency Management Agency (FEMA) and State of California Department of Water Resources (CADWR)) when updating floodplain mapping, flood management plans, local hazard mitigation plans, and other emergency response plans to consider the impacts of urbanization and climate change on long-term flood safety and flood event probabilities. (Added 2016)**
- SA-6c. The County will continue to coordinate with local, regional, state, and federal agencies to maintain an adequate flood management information base, prepare risk assessments, and identify strategies to mitigate flooding impacts. (Added 2016)**
- SA-7. In accordance with the County Floodplain Management Ordinance, the County shall locate, when feasible, new essential public facilities outside of flood hazard zones<sup>†</sup>, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities; or identify construction methods or other methods to minimize damage if these facilities are located in flood hazard zones.
- SA-8. Maintain the structural and operational integrity of essential public facilities during flooding.
- SA-9. New and modified bridge structures should minimize any increase in water surface elevations of the 100-year floodplain, **or the 200-year floodplain in areas subject to the Urban Level of Flood Protection. (Modified 2016)**
- SA-10. Fill within the 100-year floodplain of creeks outside of the Urban Service Boundary is permissible to accommodate structures (e.g., residential, commercial, accessory) and septic systems, and only when the Board of Supervisors finds that the fill will not impede water flows or storm runoff capacity. Such development shall not cause an increase in base flood elevation of the 100-year floodplain exceeding 0.10 feet, unless analysis clearly indicated that the physical and/or economic use of adjacent property within the floodplain will not be adversely affected. A permit is required if the fill is within the jurisdiction of the Central Valley Flood Protection Board.

<sup>††</sup> A "flood hazard zone" is defined as an area subject to flooding that is delineated as either a special hazard area or an area of moderate or minimal hazard on an official flood insurance rate map issued by the Federal Emergency Management Agency.

- SA-11. The County shall implement the improvement of natural drainage channels and certain floodplains for urbanized or urbanizing portions of the County to reduce local flooding. Such improvements shall comply with the General Plan policies contained in the Conservation Element, Urban Streams, and Channel Modification Section.
- SA-12. The County shall continue local efforts that encourage implementation of the Federal Flood Insurance Program.
- SA-13. Where new upstream development in Sacramento County will increase or potentially impact runoff onto parcels downstream in a neighboring jurisdiction, such as the City of Sacramento, Sacramento County will coordinate with the appropriate neighboring jurisdiction to mitigate such impacts.
- SA-14. The County shall require, when deemed to be physically or ecologically necessary, all new urban development and redevelopment projects to incorporate runoff control measures to minimize peak flows of runoff and/or assist in financing or otherwise implementing Comprehensive Drainage Plans.
- SA-15. The County shall regulate, through zoning and other ordinances, land use and development in all areas subject to potential flooding and prohibit urban uses on unprotected flood land.
- SA-16. Deny creation of parcels that do not have buildable areas outside the 100-year floodplain, **or the 200-year floodplain in areas subject to the Urban Level of Flood Protection**, unless otherwise allowed in the Floodplain Management Ordinance. **(Modified 2016)**
- SA-17. For residential zoning, the area outside the 100-year floodplain, **or the 200-year floodplain in areas subject to the Urban Level of Flood Protection**, must be contiguous or reasonably situated to provide buildable area for a residence and associated structures. Examples of structures include swimming pools, sheds, barns, detached garages, and other outbuildings that are normally associated with residential development. There may be exceptions (such as the Delta area) as allowed in the Floodplain Management Ordinance. **(Modified 2016)**
- SA-18. Vehicular access to the buildable area of newly created parcels must be at or above the 10-year flood elevation. Exceptions may be made when the existing public street from which access is obtained is below the 10-year flood elevation. There may be exceptions (such as the Delta area) as allowed in the Floodplain Management Ordinance.
- SA-18a. Provide unobstructed access to levees on county-owned lands, whenever practicable, for maintenance and emergencies. Require setbacks and easements to provide access to levees from private property. (Added 2016)**

**SA-18b. Urban flood control levees should have adequate setbacks consistent with local, regional, State, and federal design and management standards. (Added 2016)**

SA-19. Creation of lots that require watercourse crossings for single lots, or that will likely encourage watercourse crossings to be built by property owners (lots with useable area on both sides of a watercourse) will not be allowed unless a detailed hydraulic study is approved by Water Resources and there is found to be no adverse impact in accordance with the County Floodplain Management Ordinance.

SA-20. Levees for the purpose of floodplain reclamation for development shall be strongly discouraged. Floodplain restoration shall be encouraged to provide flood protection and enhancement and protection of a riparian ecosystem.

SA-21. If levee construction is approved to reclaim floodplain for new development, 200-year flood protection is required.

SA-22. Areas within a 100-year floodplain, **or within the 200-year floodplain in areas subject to the Urban Level of Flood Protection**, shall not be upzoned to a more intensive use unless and until a Master Drainage Plan is prepared that identifies areas of the floodplain that may be developed. **(Modified 2016)**

**SA-22a. Sacramento County will evaluate development projects and all new construction located within a defined Flood Hazard Zone (FHZ) to determine whether the 200-year Urban Level of Flood Protection or 100-year FEMA flood protection applies, and whether the proposed development or new construction is consistent with that standard. Prior to approval of development projects or new construction subject to either standard, the appropriate authority must make specific finding(s) related to the following:**

a. **Urban Level of Flood Protection standard (200-year) applies to projects in a Flood Hazard Zone that meet certain criteria, developed by the State of California Department of Water Resources, related to urbanization, watershed size and potential flood depth.**

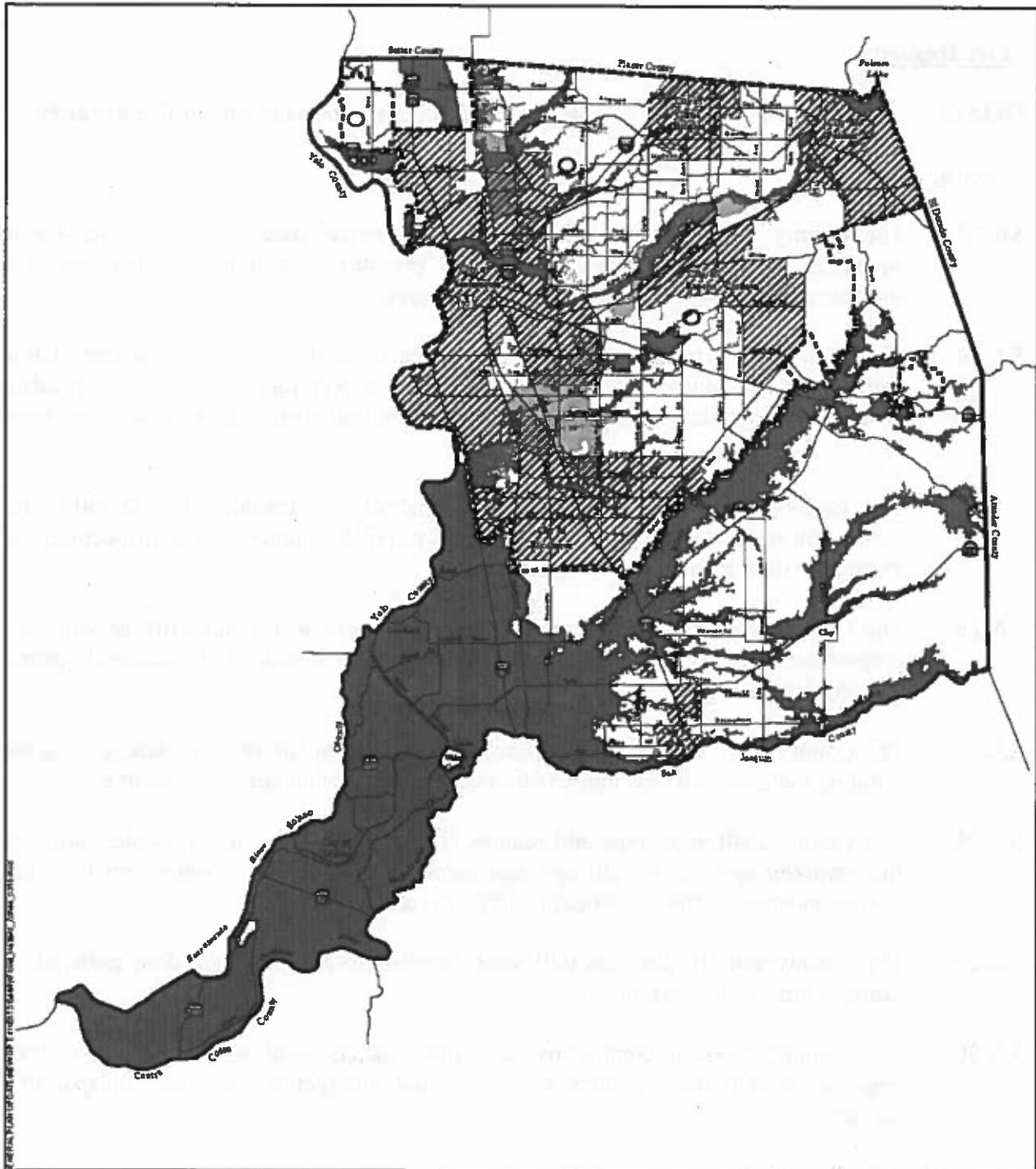
b. **Federal Emergency Management Agency (FEMA) standard of protection (100-year) applies to projects in a Special Flood Hazard Area that are not subject to the Urban Level of Flood Protection. (Added 2016)**

**SA-22b. New development shall be elevated as required by the applicable flood standards (100-year, or 200-year in areas subject to the Urban Level of Flood Protection) and should be constructed to be resistant to flood damage consistent with the Floodplain Management Ordinance. (Added 2016)**

**Implementation Measures:**

- A. Amend the Flood Combining Zone to further limit development within the 100-year floodplain. This zone should enhance flood protection and provide opportunities for reclamation of riparian habitats and recreation. (PLANNING, MSA - DWR)
- B. Update the County's zoning grid maps to reflect current ~~Floor~~ **Flood** Insurance Rate Maps (FIRM). (PLANNING, MSA - DWR)
- C. The County shall implement the improvement of natural drainage channels in urbanized or urbanizing portions of the County to reduce local flooding. (PLANNING, MSA - DWR)
- D. Update the County's floodplain elevations by coordinating with the California Department of Water Resources (CADWR) and the Federal Emergency Management Agency (FEMA). (PLANNING, MSA - DWR)





-  FEMA 100 Year Floodplain
-  FEMA 500 Year Floodplain
-  Cities
-  USB

## Flood Hazard Zones



\*For updated, larger scale information visit the County's website. <http://www.waterresources.sacounty.net/stormready/>

## **Fire Hazards**

**GOAL:**        **Minimize the loss of life, injury, and property damage due to fire hazards.**

### **Policies:**

- SA-23.    The County shall require that all new development meets the local fire district standards for adequate water supply and pressure, fire hydrants, and access to structures by firefighting equipment and personnel.
- SA-24.    The County shall require, unless it is deemed infeasible to do so, the use of both natural and mechanical vegetation control in lieu of burning or the use of chemicals in areas where hazards from natural cover must be eliminated, such as levees and vacant lots.
- SA-25.    The County shall work with local fire districts to develop high visibility fire prevention programs, including those which provide voluntary home inspections and awareness of home fire prevention measures.
- SA-26.    The County and fire districts shall develop programs to provide citizens with self-preparedness and community readiness skills for large or extended accidental, natural, and terrorist emergencies/incidents.
- SA-27.    The County shall require, where appropriate, the use of fire resistant landscaping and building materials for new construction developments that are cost effective.
- SA-28.    The County shall encourage and require, to the maximum extent feasible, automatic fire sprinkler systems for all new commercial and industrial development to reduce the dependence on fire department equipment and personnel.
- SA-29.    The County and fire districts will work together to regulate hazardous materials to mitigate emergency responses.
- SA-30.    The County, medical community, and fire districts shall work to improve EMS response system that includes first responder emergency care and transportation services.
- Properly locating resources to provide timely response
  - Paramedic services from every fire station

Implementation Measures:

- A. The County shall request the Fire Advisory Board to propose measures that will assist in the prevention of fire in new and existing structures throughout the County. (FIRE ADVISORY BOARD)
- B. The County, fire districts, and the public should explore and develop standards for property development incentives to reduce the cost of automatic fire sprinkler systems to developers and the end user who will live in these units.

Emergency Response

**GOAL: An Emergency Preparedness System that can effectively respond in the event of a natural or manmade disaster.**

The Sacramento County Multi-Hazard Mitigation Plan contains all relevant information regarding emergency response in the event of a catastrophic event. This document should be referenced for additional information relating to evacuation plans and emergency response for potential disasters such as flooding, dam failure, seismic activity, fire, and explosions,

Policies:

- SA-31. The County shall continue to maintain, periodically update, and test the effectiveness of its Emergency Response Plan.
- SA-32. The County will implement the Multi-Hazard Mitigation Plan in the planning and operations of the County to achieve the goals, objectives, and actions of the County's Multi-Hazard Mitigation Plan.
- SA-33. The County shall continue its coordinative efforts, including evacuation planning, with service agencies, the cities within the County, and cities within surrounding counties.
- SA-34. The County shall increase its efforts to inform and educate the general public of disaster response and emergency preparedness procedures.
- SA-35. The County shall ensure that the siting of critical emergency response facilities such as hospitals, fire, sheriff's offices and substations, and other emergency service facilities and utilities have minimal exposure to flooding, seismic and geological effects, fire, and explosions.
- SA-36. The County shall require that high intensity land uses proposed in areas highly susceptible to multiple hazards, such as the Delta, provide mitigation measures that include emergency evacuation routes. Consideration shall be given to the need for additional roads, particularly in the Delta, that may serve as evacuation routes. The

County Regional Emergency Operations Office has a study of evacuation routes for various levee breach scenarios for reaches of the Sacramento River north of Freeport and for the American River.

**SA-37. The County shall continue to maintain its response to flood emergencies by maintaining and updating the following:**

- a. **Flood Emergency Action Plan, to address potential flooding in levee and dam inundation areas, consistent with the California Water Code, and;**
- b. **Community flood evacuation and rescue maps, making them available to the public, as appropriate. (Added 2016)**

**Implementation Measures:**

- A. The County shall continue to provide a high visibility promotional program to inform the general public of disaster response and emergency preparedness procedures. (GENERAL SERVICES DEPARTMENT - EMERGENCY OPERATIONS)
- B. The County shall revise its zoning designations to include zones not suitable for essential services due to potential hazards. (PLANNING)

**Appendix (Added 2011-Modified 2016)**

**The following information is provided as a part of this General Plan, in compliance**  
**Compliance with the subsections of California Government Code Section 65302(g)(2)(A):**

- (i) **Flood Hazard Zones:** ~~Information is provided in 100/500-year floodplains map~~ **Map is included** in Safety Element, (Figure 1).
- (ii) **Floodplain Map:** Map is included in Safety Element Background, (Figure III-3).
- (iii) **US Army Corps of Engineers Flood Hazard Information:** ~~A request for information has been sent to USACE~~ **Information is available from the FEMA Flood Map Service Center (MSC).**
- (iv) **Designated Floodway Map:** Map is included in Safety Element Background, (Figure III-4).
- (v) **Dam Failure Inundation Map:** Text is provided in Safety Element Background, (~~page Page~~ 39), and map is **included** in Safety Element Background, (Figure III-10).
- (vi) **Awareness Flood Plain Map:** Map is ~~provided~~ **included** in Safety Element Background, (Figure III-5).
- (vii) **Levee Protection Zones:** Maps are ~~provided~~ **included** in Safety Element Background, (Figure III-7 and Figure III-8).
- (viii) **Project and Non-project Levee or Floodwall Failure Inundation Map:** Maps are ~~currently being updated; a placeholder is~~ **included** in Safety Element Background, (~~page 41~~) **Figure III-11.**
- (ix) **Historical Data on Flooding:** **Text is provided in Safety Element Background, starting on Page 21, and Map map** is included in Safety Element Background, (Figure III-2) ~~and text is included in Safety Element (page 4).~~
- (x) **Existing and Planned Development in Flood Hazard Zones:** Map is included in Safety Element Background, (Figure III-9).
- (xi) **Local, State and Federal Agencies with Responsibility for Flood Protection:** Text is ~~included in Safety Element Background (pages 23-24).~~ Reclamation Districts are as follows **The following agencies participate in flood-related data collection, planning and construction, and emergency response:**

**Local and Regional**

**Sacramento County Department of Water Resources**  
**Sacramento County Office of Emergency Services (OES)**  
**American River Flood Control District (ARFCD)**  
**Sacramento Area Flood Control Agency (SAFCA)**

**State of California**

**California Department of Water Resources (CADWR)**  
**Central Valley Flood Protection Board (CVFPB)**

**Federal**

**Federal Emergency Management Agency (FEMA)**  
**California-Nevada River Forecast Center (CNRFC)**

**Reclamation Districts: Information on Reclamation Districts is available at the Local Agency Formation Commission's (LAFCo) webpage. Reclamation Districts are as follows:**

<b><u>District Name</u></b>	<b><u>District Number</u></b>
Grand Island	(Reclamation-District 3)
Lower Andrus Island	(Reclamation-District 317)
Sherman Island	(Reclamation-District 341)
Sutter Island	(Reclamation-District 349)
Libby McNeil	(Reclamation-District 369)
Andrus Island	(Reclamation-District 407)
Pierson District	(Reclamation-District 551)
Walnut Grove	(Reclamation-District 554)
Upper Andrus Island	(Reclamation-District 556)
Tyler Island	(Reclamation-District 563)
(South of Freeport)	(Reclamation-District 744)
Randall Island	(Reclamation-District 755)
Cosumnes River	(Reclamation-District 800)
Ehrhardt Club	(Reclamation-District 813)
Natomas	(Reclamation-District 1000)
Glanville Tract	(Reclamation-District 1002)
Twitchell Island	(Reclamation-District 1601)
Brannan Island	(Reclamation-District 2067)
McCormack Williamson Tract	(District ReclamationD 2110)
Deadhorse Island	(Reclamation-District 2111)

# General Plan

# Safety Element

## **BACKGROUND TO THE 1993 GENERAL PLAN AS AMENDED**

~~Unless otherwise noted as “(added 2011)” or “(updated 2011)”, the Safety Element Background text and maps were not updated as part of the November 9, 2011 amendment of the County General Plan~~

**County of Sacramento**  
Planning and Community Development Department

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**SACRAMENTO COUNTY GENERAL PLAN  
SAFETY ELEMENT BACKGROUND**

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## GLOSSARY

<u>Acre-Feet</u>	The amount of water necessary to cover an acre one foot deep.
<u>Design Freeboard</u>	Distance between water level design and top of levees.
<u>FEMA</u>	Federal Emergency Management Agency.
<u>FIRM</u>	Federal Insurance Rate Map.
<u>NFIP</u>	National Flood Insurance Program.
<u>Non Project Levee</u>	Levees maintained privately or by local nonfederal agencies.
<u>One Hundred (100) Year Event</u>	A flood of such magnitude that it would have a one percent chance of occurring in a given year.
<u>Project Levee</u>	A federally maintained levee.
<u>Rural Stream</u>	A stream which is located outside of the Urban Services Boundary (see Land Use Element).
<u>Urban Stream</u>	A stream which is located within the Urban Services Boundary (see Land Use Element).
<u>USBR</u>	U.S. Bureau of Reclamation.
<u>Weir</u>	A dam built in a waterway to raise the water level or divert its flow.

# SACRAMENTO COUNTY GENERAL PLAN SAFETY ELEMENT

## Background Section

### SEISMIC AND GEOLOGIC HAZARDS TECHNICAL DISCUSSION

#### GEOLOGIC ENVIRONMENT OF SACRAMENTO COUNTY

The present-day landscape of Sacramento County has been shaped over time by the ongoing processes of erosion and deposition. Material eroded from the ancestral Sierra Nevada Mountains, formed over 100 million years ago, was deposited in an ancient sea that once occupied the Sacramento Valley floor. As this ancient sea receded from the valley about 10 to 15 million years ago, tectonic uplifts altered the geomorphology of the Sierra Nevada Mountains. Glaciation, volcanism, and a series of interglacial seas followed the uplifting, adding layers of sediment to the valley floor. Under the present geologic conditions, the alteration of the local geomorphology continues through stream erosion of the valley sediments and subsequent deposition in adjacent floodplains.

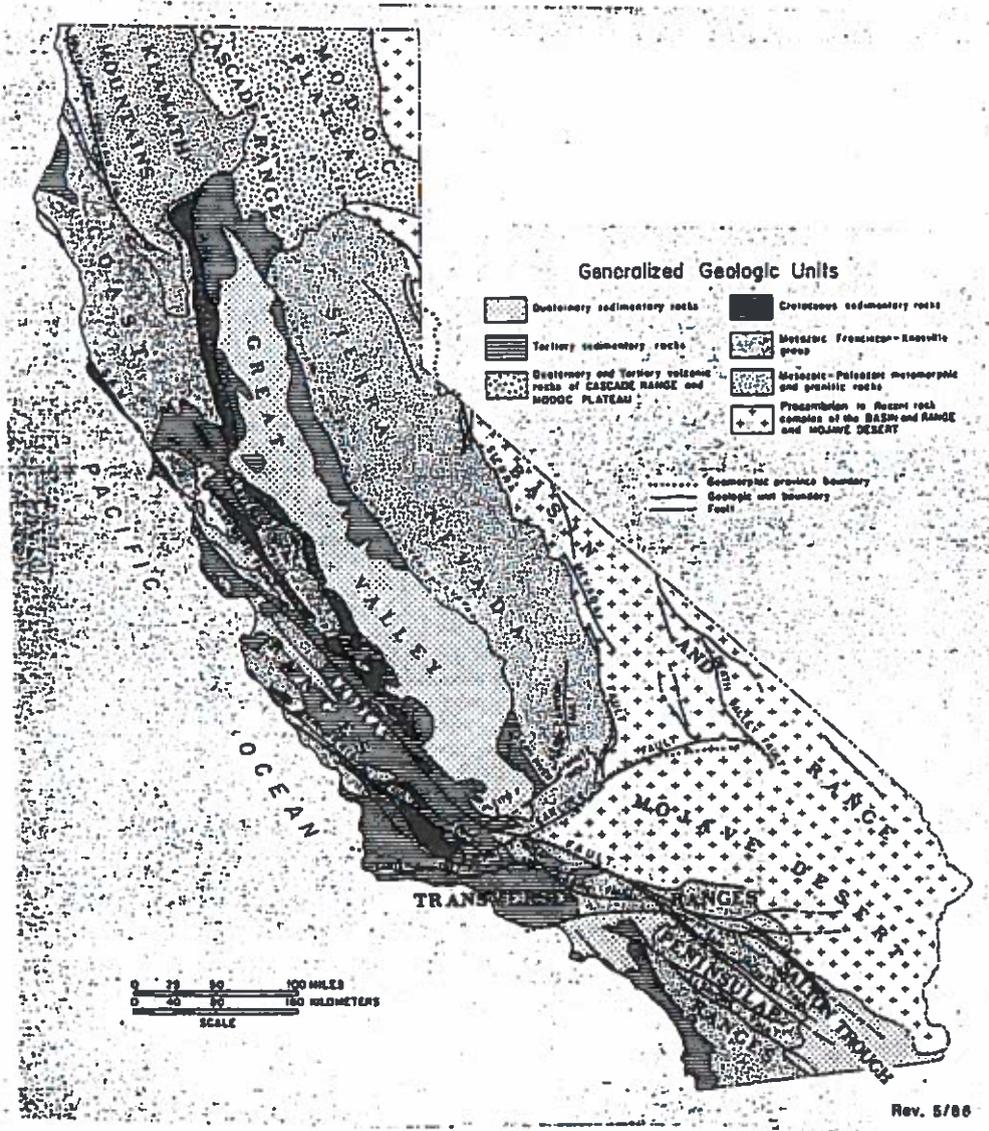
A "geomorphic province" is comprised of an area of similar geologic origin and erosional/depositional history. Sacramento County is situated in portions of two geomorphic provinces. By far the largest portion of the County lies in the Great Valley province. A small area in the northeastern part of the County is in the Sierra Nevada province (Figure II-1).

The Great Valley province is further divided into four geomorphic subunits, as described below:

The Delta - The Delta, characterized by Holocene deposits, includes the low-lying lands that extend along the County's western boundary. The boundary of the Delta is arbitrarily fixed at the zero-elevation contour, which coincides with the contact between the organic and inorganic soils. Prior to human intervention, this region was dominated by tidal marshes that were traversed by meandering sloughs. Over time, however, the sloughs were altered and the marshes drained. Numerous islands have been created by the construction of a system of artificial levees.

River Floodplain - Adjacent to the Delta province is the river floodplain. This subunit consists of unconsolidated inorganic soils which were formed by the deposition of sediment when flood waters overtopped the river's natural levees.

Figure II-1  
**Geomorphic Provinces and Some  
 Principal Faults of California**



Alluvial Plain - Further to the east of the floodplain is an extensive area of former floodplain that has been highly dissected by subsequent stream erosion. The geologic subunit is comprised of older, Quaternary, deposits. This area is underlain by soil which is characterized by layers of hardpan or dense, impervious clay.

Low Foothills - The low foothill area, located east of the alluvial plain, is typified by rolling, boulder-strewn topography and is underlain by moderately consolidated silts, sands, and clays of continental origin. The small area in the northeast part of the County within the Sierra Nevada geomorphic province consists of Pliocene and older deposits and is characterized by steep-sided hills and narrow, rocky stream channels. Stream patterns here are well established and are controlled principally by bedrock features (Figures II-2 and II-3).

## SEISMIC HAZARDS

### FAULTING

A fault is defined as "a fracture or fracture zone in the earth's crust along which there has been displacement of the sides relative to one another". For the purpose of planning there are two types of faults, active and inactive. Active faults have experienced displacement in historic time, suggesting that future displacement may be expected. Inactive faults show no evidence of movement in recent geologic time, suggesting that these faults are dormant.

Two types of fault movement represent possible hazards to structures in the immediate vicinity of the fault: fault creep and sudden fault displacement. Fault creep, a slow movement of one side of a fault relative to the other, can cause cracking and buckling of sidewalks and foundations even without perceptible groundshaking. Sudden fault displacement occurs during an earthquake event and may result in the collapse of buildings or other structures that are found along the fault zone when fault displacement exceeds an inch or two. The only protection against damage caused directly by fault displacement is to prohibit construction in the fault zone.

The Richter scale is used to quantify the magnitude or strength of an earthquake, while the Mercalli scale is used to measure the intensity as it relates to structural and cultural features. The Modified Mercalli (MM) Intensity Scale measures the intensity of ground shaking at any particular site in response to fault movement. The MM Intensity Scale is useful in planning for seismic safety, as it translates the intensity of earthquake shaking into possible damaging effects on structures. However, this scale should be used with caution because it relates to older structures (pre-1933) rather than to those build in accordance with modern building codes (Tables II-1 and II-2).



## HISTORICALLY ACTIVE FAULTS IN THE VICINITY OF SACRAMENTO COUNTY

<b>Maximum Fault Earthquake*</b>	<b>Approximate Distance from West Sacramento (Miles)</b>	<b>Historical Seismicity</b>	<b>Probable</b>
San Andreas	80	1906 (8.25)*	7.5
Vaca	35	1892 (6.5-7)	6.0
Hayward	60	1836, 1868 (7.25)	6.5-7
Calaveras	50	1861 (6.5-7)	6.5-7
Concord-Green Valley	45	1955 (5.4; small events on Green Valley; creep on Concord)	6.0
Midland	20	Possible source of major historic earthquake (1895?)	6.9
Dunnigan Hills	18	Unknown	6.0
Foothill Fault System	25	Oroville 1975	6.0

\*Richter Scale Readings

Source: Lighthouse Marina EIR/EIS, by E D A W, Inc., November, 1985.

TABLE II-2

MODIFIED MERCALLI SCALE OF EARTHQUAKE INTENSITY

<u>Scale</u>	<u>Effects</u>
I.	Earthquake shaking not felt.
II.	Shaking Felt by those at rest.
III.	Felt by most people indoors; some can estimate duration of shaking.
IV.	Felt by most people indoors. Hanging objects swing, windows and doors rattle, wooden walls and frames creak.
V.	Felt by everyone indoors; many estimate duration of shaking. Standing autos rock. Crockery clashes, dishes rattle, and glasses clink. Doors close, open, or swing.
VI.	Felt by everyone indoors and most people outdoors. Many now estimate not only the duration of the shaking, but also its direction and have no doubt as to its cause. Sleepers awaken. Liquids disturbed, some spilled. Small unstable objects displaced. Weak plaster and weak materials crack.
VII.	Many are frightened and run outdoors. People walk unsteadily. Pictures thrown off walls, books off shelves. Dishes or glasses broken. Weak chimneys break at rooflines. Plaster, loose bricks, unbraced parapets fall. Concrete irrigation ditches damaged.
VIII.	Difficult to stand. Shaking noticed by auto drivers. Waves on ponds. Small slides and cave-ins along sand or gravel banks. Stucco and some masonry walls fall. Chimneys, factory stacks, towers, elevated tanks twist or fall.
IX.	General fright. People thrown to the ground. Steering of autos affected. Branches broken from trees. General damage to foundations and frame structures. Reservoirs seriously damaged. Underground pipes broken.
X.	General panic. Conspicuous cracks in ground. Most masonry and frame structures destroyed along with their foundations. Some well-built wooden structures and bridges are destroyed. Serious damage to dams, dikes, and embankments. Railroads bent slightly.
XI.	General panic. Large landslides. Water thrown out of banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flatland. General destruction of buildings. Underground pipelines completely out of service. Railroads bent greatly.
XII.	General panic. Damage nearly total, the ultimate catastrophe. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.

Source: California Division of Mines and Geology, 1973.

The geological literature indicates that no major active faults transect the County; however, there are several subsurface faults in the Delta. The Midland fault, buried under alluvium, extends north of Bethel Island in the Delta to the east of Lake Berryessa and is considered inactive but possibly capable of generating a near 7.0 (Richter Scale) earthquake. This figure is speculative based on a 1895 earthquake measuring 6.9 on the Richter Scale with an epicenter possibly in the Midland Fault vicinity. However, oil and gas companies exploring the area's energy potential have identified several subsurface faults, none of which show any recent surface rupture. A second, presumably inactive, fault is in the vicinity of Citrus Heights near Antelope Road. This fault's only exposure is along a railroad cut where offsetting geologic beds can be seen. Neither the lateral extent of the trace, the magnitude of the offset, nor the age of faulting has been determined. To the east, the Bear Mountain fault zone trends northwest-southeast through Amador and El Dorado Counties. Geologists believe this series of faults has not been active in historic time. Figure II-4 identifies the faults in close proximity to Sacramento County.

While Sacramento County has experienced relatively little seismic activity, faulting in neighboring regions, especially the San Francisco Bay area and the Sierra Nevada, suggests that the County could be affected by future ground motion originating elsewhere (Table II-3). The greatest amount of groundshaking experienced in the County occurred on April 21, 1892, when an earthquake shook Yolo County between Winters and Vacaville. While the damage in Yolo County was severe, the damage in Sacramento County was substantially less. Damage to buildings in Sacramento was limited to statuary falling from building tops and cracks in chimneys. The 1906 San Francisco earthquake generated little shaking in Sacramento County and damage locally was limited to minor cracks in a local post office and jail. Similarly, Sacramento County suffered little damage from the October 17, 1989 Loma Prieta earthquake, which was felt over an area covering 400,000 square miles from Los Angeles to the California-Oregon border. The earthquake measured 7.1 on the Richter Scale; the epicenter was located along the San Andreas fault beneath the Santa Cruz Mountains, about 60 miles southeast of San Francisco. The San Francisco Bay region suffered over \$6 billion in property damage and 62 lives were lost.

### GROUNDSHAKING

Groundshaking is motion that occurs as a result of energy released during faulting. The damage or collapse of buildings and other structures caused by groundshaking is among the most serious seismic hazards. Damage to structures from this vibration, or groundshaking, is caused by the transmission of earthquake vibrations from the ground to the structure. The intensity of shaking and its potential impact on buildings is determined by the physical characteristics of the underlying soil and rock, building materials and workmanship, earthquake magnitude and location of epicenter, and the character and duration of ground motion. Much of the County is located on alluvium which increases the amplitude of the earthquake wave. Ground motion lasts longer and waves are amplified on loose, water-saturated materials than on solid rock. As a result, structures located on alluvium typically suffer greater damage than those located on solid rock.

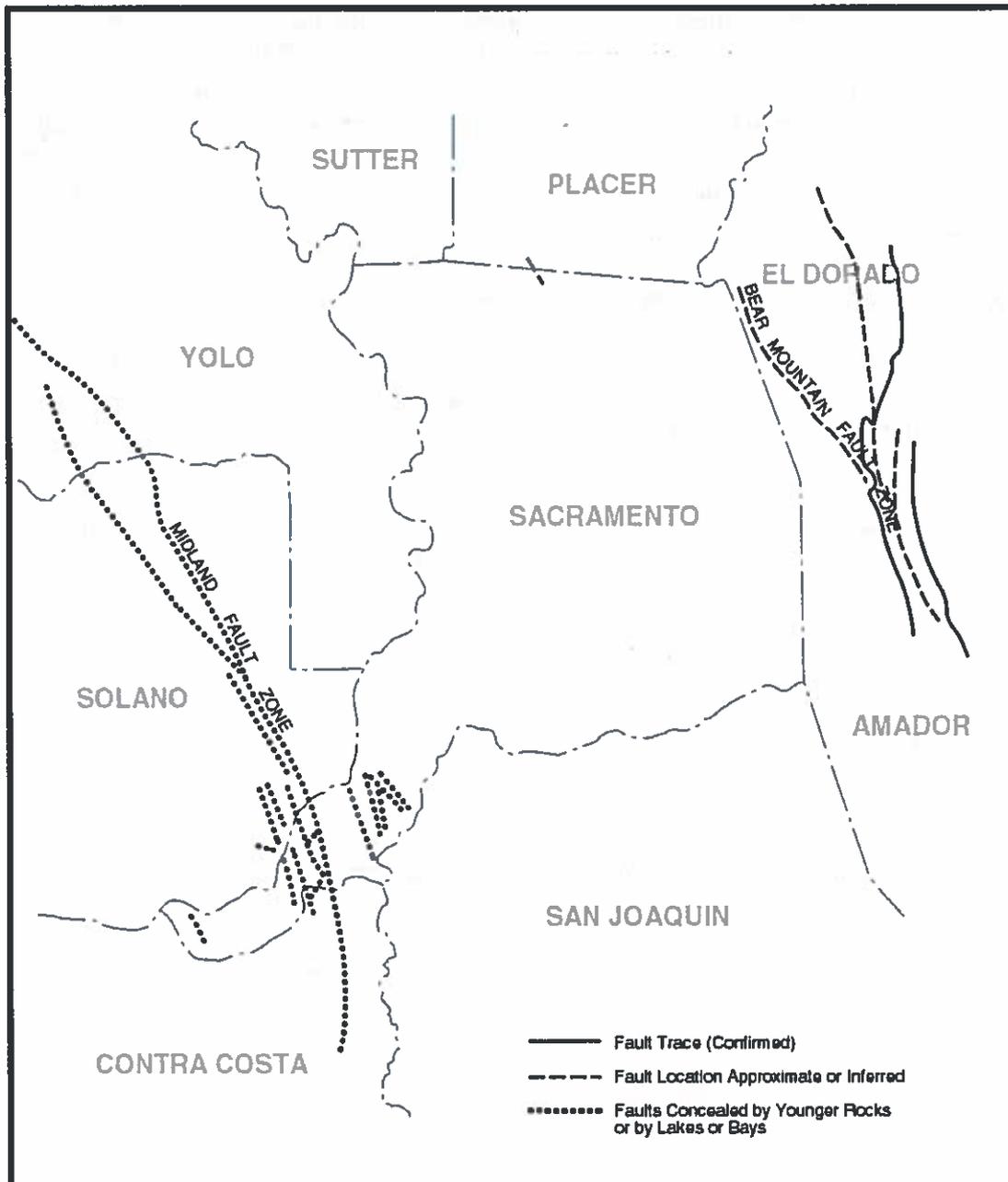


Figure II-4  
**Faults in the Environs of Sacramento County**

Prepared by the Sacramento County Planning and Community Development Department



**TABLE II-3**

**APPROXIMATE RELATIONSHIPS BETWEEN  
EARTHQUAKE MAGNITUDE AND INTENSITY**

<b><u>Richter Scale Magnitude</u></b>	<b><u>Maximum Expected Intensity (MM)*</u></b>	<b><u>Distance Felt (kilometers)</u></b>
2.0 - 2.9	I - II	0
3.0 - 3.9	II - III	15
4.0 - 4.9	IV - V	80
5.0 - 5.9	VI - VII	150
6.0 - 6.9	VII - VIII	220
7.0 - 7.9	IX - X	400
8.0 - 8.9	XI - XII	600

\*Modified Mercalli Intensity Scale.

Source: United State Geologic Survey, Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977.

Maps indicating the maximum expectable intensity of groundshaking for the County are available through several sources. The California Division of Mines and Geology has prepared a map of the state showing the eastern and central portions of the County in a relatively low intensity groundshaking zone while the western portion of the County is in a relatively moderate groundshaking zone (Figure II-5). Again, caution is advised in that the intensities shown are not applicable to modern earthquake-resistant construction. Since there are portions of the County where pre-1933 buildings exist, there is a threat to health and safety in case major groundshaking occurs.

Several actions to minimize the damage to buildings from earthquakes and ground shaking have occurred since 1933. The construction of schools is regulated by the Field Act passed in 1933, when regulation and enforcement of construction codes became highly restrictive. Building regulations which apply to hospital construction are even more restrictive because they must be fully functional after a disaster. The Uniform Building Code (UBC) adopted by the County applies to all structures and is usually updated on an annual basis. The UBC requires that structures be built to withstand groundshaking in areas of high earthquake hazards and that strong motion instruments be placed in larger buildings. These instruments are activated by strong groundshaking and record the response of the structure and the site of seismic activity. Buildings constructed prior to 1951 are not subject to UCB regulations. However, the Dangerous Building Code (County Code, Title 16, Chapter 22) provides abatement procedures, on a complaint basis, for existing structures deemed unsound.

### LIQUEFACTION

Liquefaction is a process whereby water in unconsolidated soils is subjected to pressure, usually produced by ground motion, causing these materials to behave as quicksand. The result is that the underlying soil literally flows out from under buildings.

The evaluation of potential for liquefaction is complex and factors that must be considered include soil type, soil density, groundwater table, and the duration and intensity of shaking. Liquefaction is most likely to occur in deposits of water-saturated alluvium or similar deposits of artificial fill.

Sacramento County has two areas that have been suggested as posing potential liquefaction problems - the downtown area and the Delta. While there is little published geologic information on the liquefaction potential of Delta soils, a geological and seismological study in 1972 indicated that the Housing and Redevelopment Agency building site located downtown at the intersection of 7th and I Streets has a potential for liquefaction. This study also concluded that potential liquefaction problems may exist throughout the downtown area where loose sands and silts are present below the ground water table.

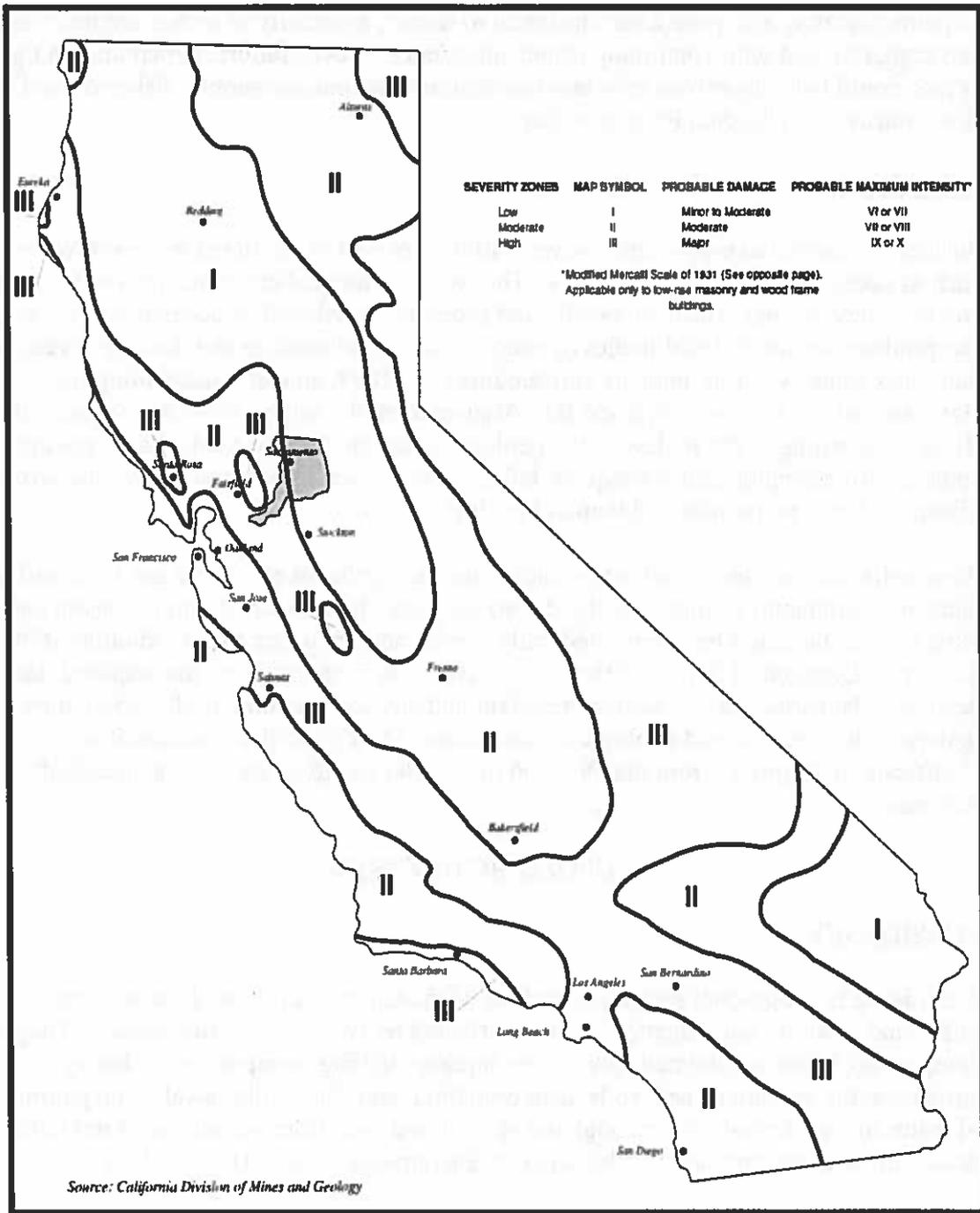


Figure II-5  
Maximum Expectable Earthquake Intensity

Prepared by the Sacramento County Planning and Community Development Department

Liquefaction may also pose a serious threat to levees, especially as levees are built larger and higher to deal with continuing island subsidence. Levee failure, depending on the extent, could have disastrous effects on agriculture, natural gas supply, fisheries, and salt water intrusion of the San Francisco Bay.

### SEICHES

Seiches are earthquake-generated waves within enclosed or restricted bodies of water, such as lakes, channels, and reservoirs. The waves generated can reach tens of feet high and have devastating effects on people and property. Earthquakes occurring miles away can produce seiches in local bodies of water which could overtop and damage levees and dams and cause water to inundate surroundings. In 1868, an earthquake along the Hayward fault in the San Francisco Bay Area generated a seiche along the Sacramento River. According to the review of the geologic research, 65% of the Delta levees are subject to overtopping and subsequent failure. Such levee failure could have disastrous effects on local economies and human life (Figure II-6).

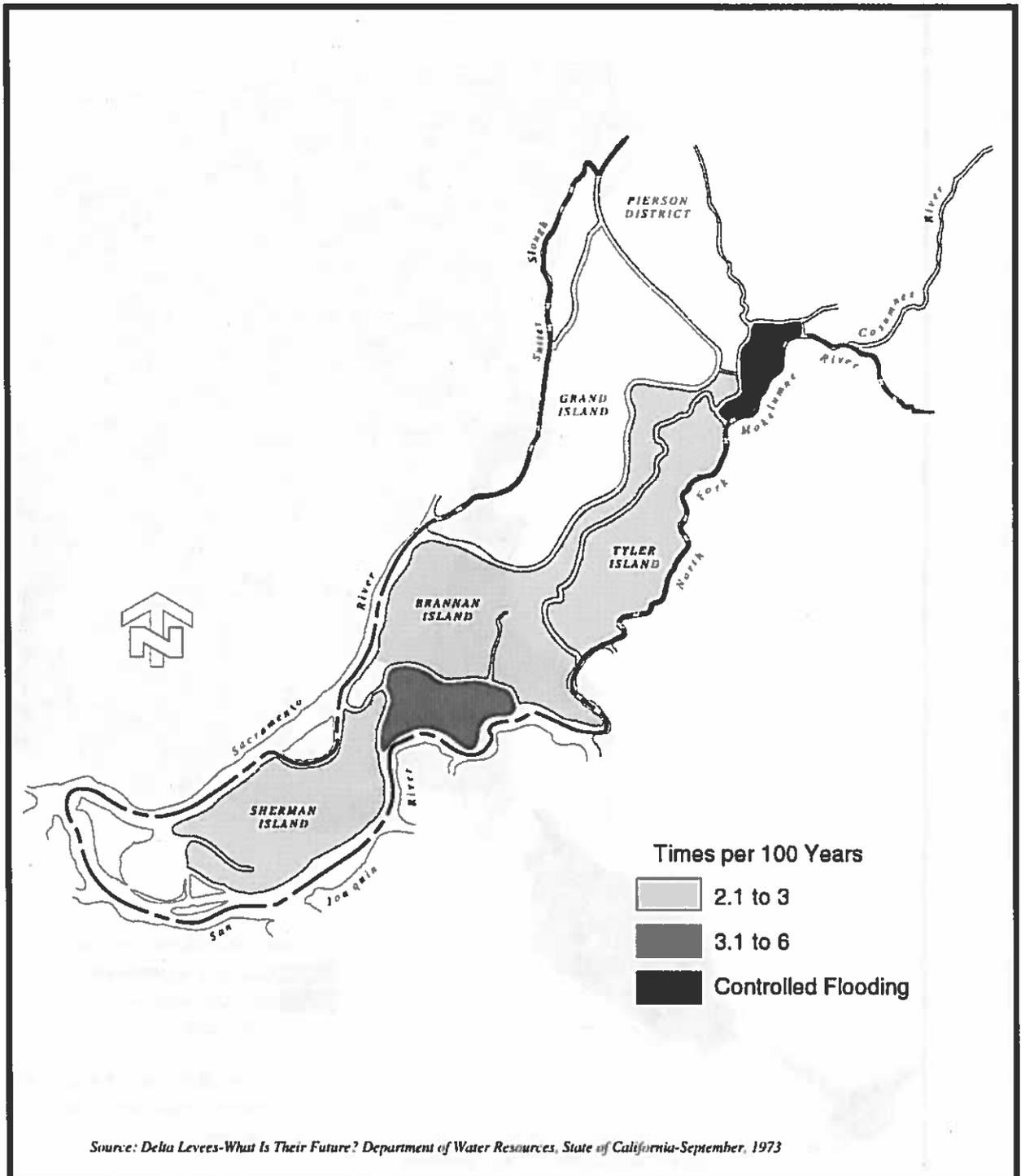
Reservoirs are sometimes subject to seiches during earthquakes. There are 12 significant dams in Sacramento County. Of these, two are under federal jurisdiction, Folsom and Nimbus, and the other ten are nonfederally owned and are under the jurisdiction of the California Division of Safety of Dams. The Division in recent years has required dam designs to be earthquake and seiche resistant and any construction or alteration must undergo a full seismic and geologic investigation. Only upon the issuance of a Certificate of Approval from the Division may water be stored exceeding specified volumes.

## GEOLOGIC HAZARDS

### SUBSIDENCE

Subsidence is the gradual settling or sinking of the earth's surface with little or no horizontal motion. Sacramento County is affected by five types of subsidence. They are compaction of unconsolidated soils by earthquake shaking, compaction by heavy structures, the erosion of peat soils, peat oxidation, and fluid withdrawal. The pumping of water for residential, commercial and agricultural uses from subsurface water tables causes the greatest amount of subsidence in Sacramento County (Figure II-7).

Subsidence has created major problems for flood control, particularly in the Delta. As levees sink under their own weight and are weakened by the erosive force of water, expensive periodic rebuilding is necessary. It is estimated that the Sacramento-San Joaquin Delta is subsiding at a rate of just over three inches per year. Many islands in the Delta that, at one time, were at or above sea level are now below sea level.

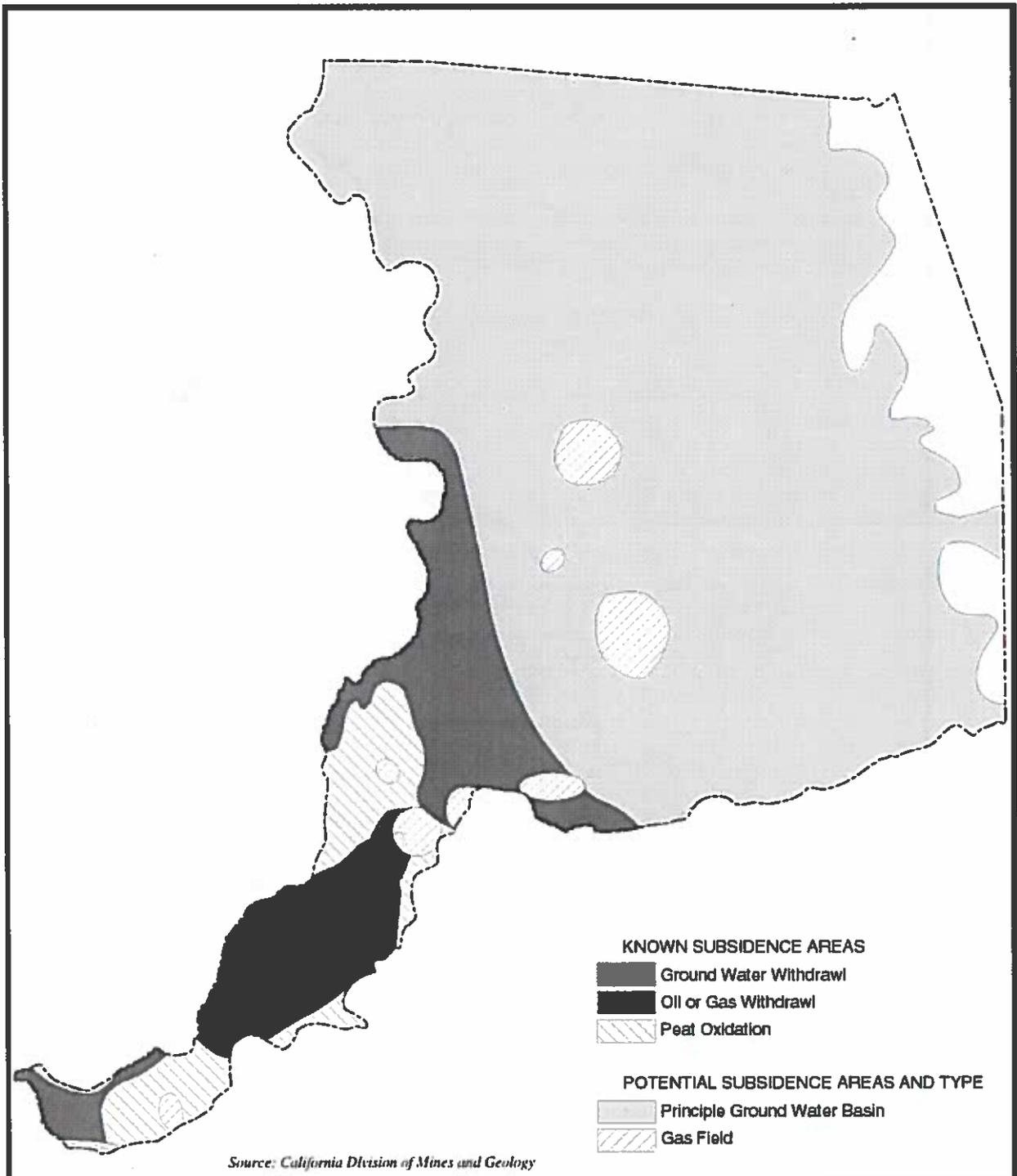


Source: Delta Levees-What Is Their Future? Department of Water Resources, State of California-September, 1973



Figure II-6  
**Estimated Frequency of Levee  
 Overtopping Under Present Conditions**

Prepared by the Sacramento County Planning and Community Development Department



**Figure II-7  
Known and Potential Subsidence  
Areas in Sacramento County**

Prepared by the Sacramento County Planning and Community Development Department



## EXPANSIVE SOILS

Expansive soils represent approximately one third of all soil types in Sacramento County (Figure II-8). They are largely comprised of clays, which greatly increase in volume when water is absorbed and shrink when dried. Expansive soils are of concern because building foundations may rise during the rainy season and fall during the dry season in response to the clay's action. If movement varies under different parts of the building, the result is that foundations creak, structural portions of the building are distorted, and doors and windows are warped so that they do not function properly.

In accordance with the State Subdivision Map Act, the County Grading Ordinance, and Chapter 70 of the Uniform Building Code, soil reports are required prior to issuance of building permits in areas where the potential for expansive soils is present. In practice, soil reports for all major commercial and industrial developments and approximately one-quarter of all residential subdivisions have been required prior to construction.

## LANDSLIDES

Landslide is a general term used for a falling mass of soil and rock. In Sacramento County, only a narrow strip along the eastern boundary, from the Placer County line to the Cosumnes River, is considered to have landslide potential. However, future slides on these slopes are expected to be minor in nature and do not pose a large scale threat to life or property. The American River Bluffs downstream from Folsom and in Fair Oaks and Carmichael are considered stable and are generally not subject to fracture or landslides (Figures II-9 and II-10).

## EROSION

Erosions is a natural geological process by which landforms are worn down or reshaped by wind and water and the eroded material is deposited elsewhere. While erosion occurs in Sacramento County, it does not appear to pose a significant hazard to property (Figure II-11).

Erosion from agriculture seems to pose little problem in most of the County. The central and western portions of the County are fairly level and very little erosion takes place in these areas unless poor farming practices leave large areas of soil exposed and dry and subject to wind erosion.

There is a greater potential for erosion in the eastern foothills of the County, but extensive grass cover protects most of the vulnerable soils. Also, there is little agricultural activity in this area because the soils are generally of poor quality. The grasses, therefore, remain undisturbed unless a fire or some other event exposes the soil.

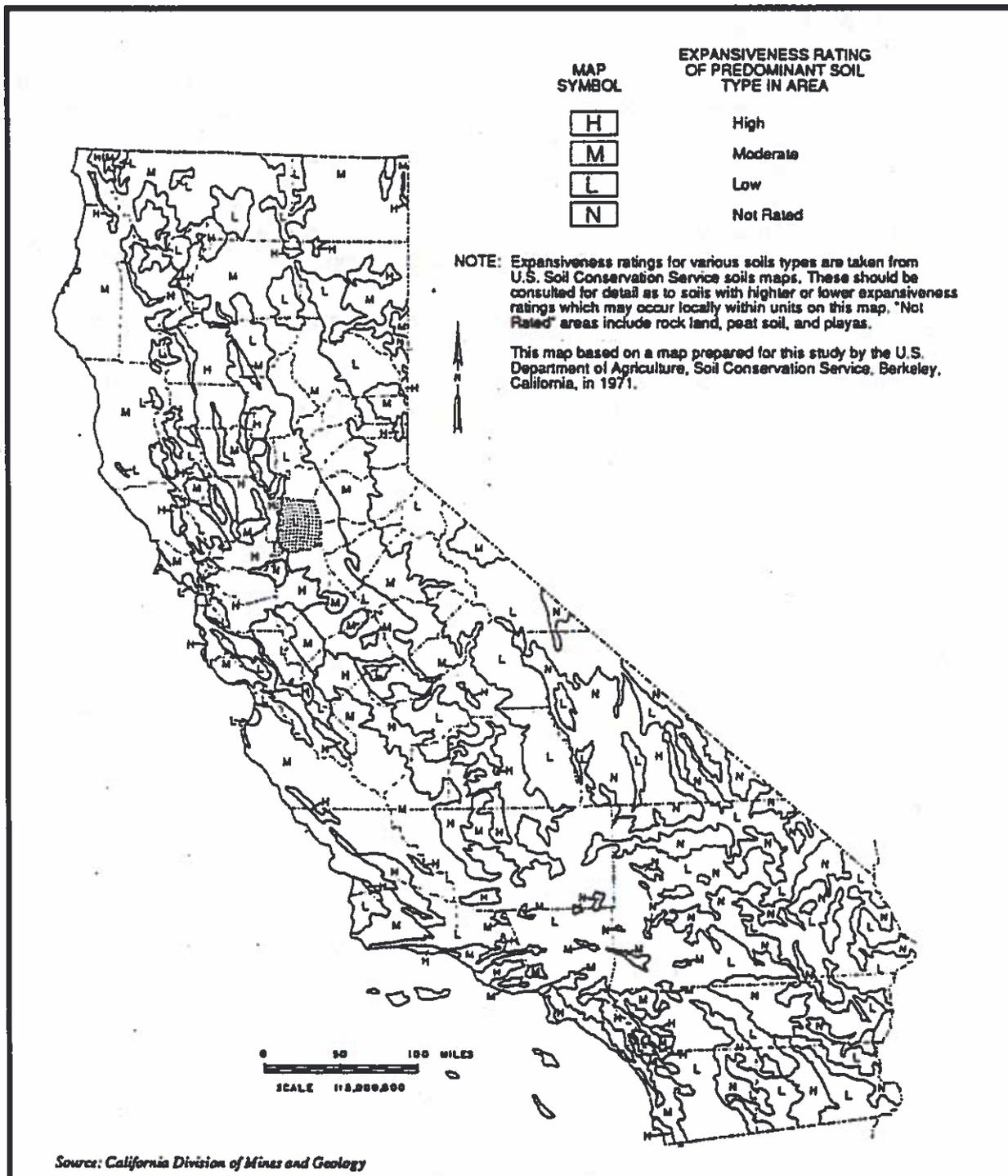


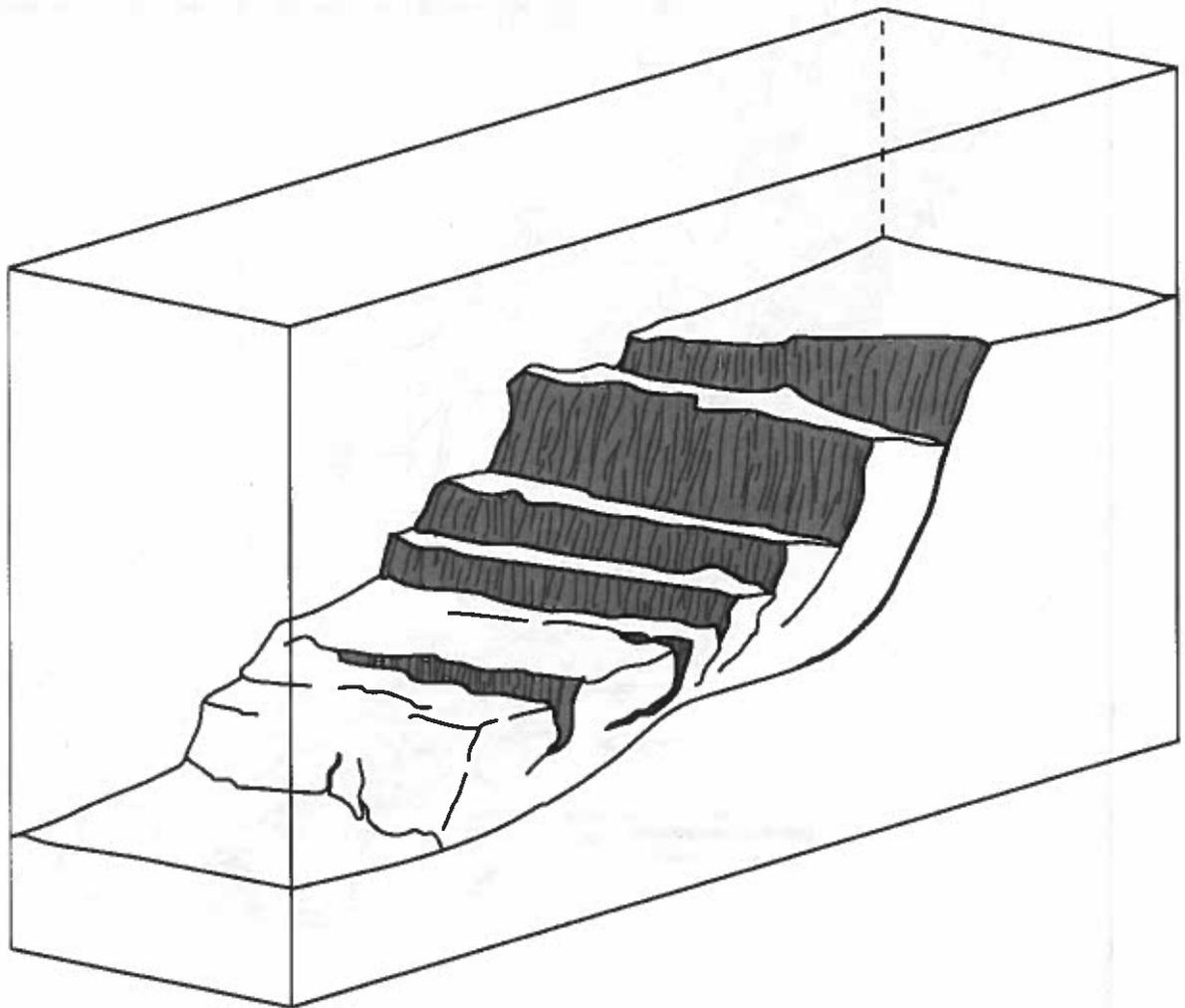
Figure II-8  
Expansive Soils in California

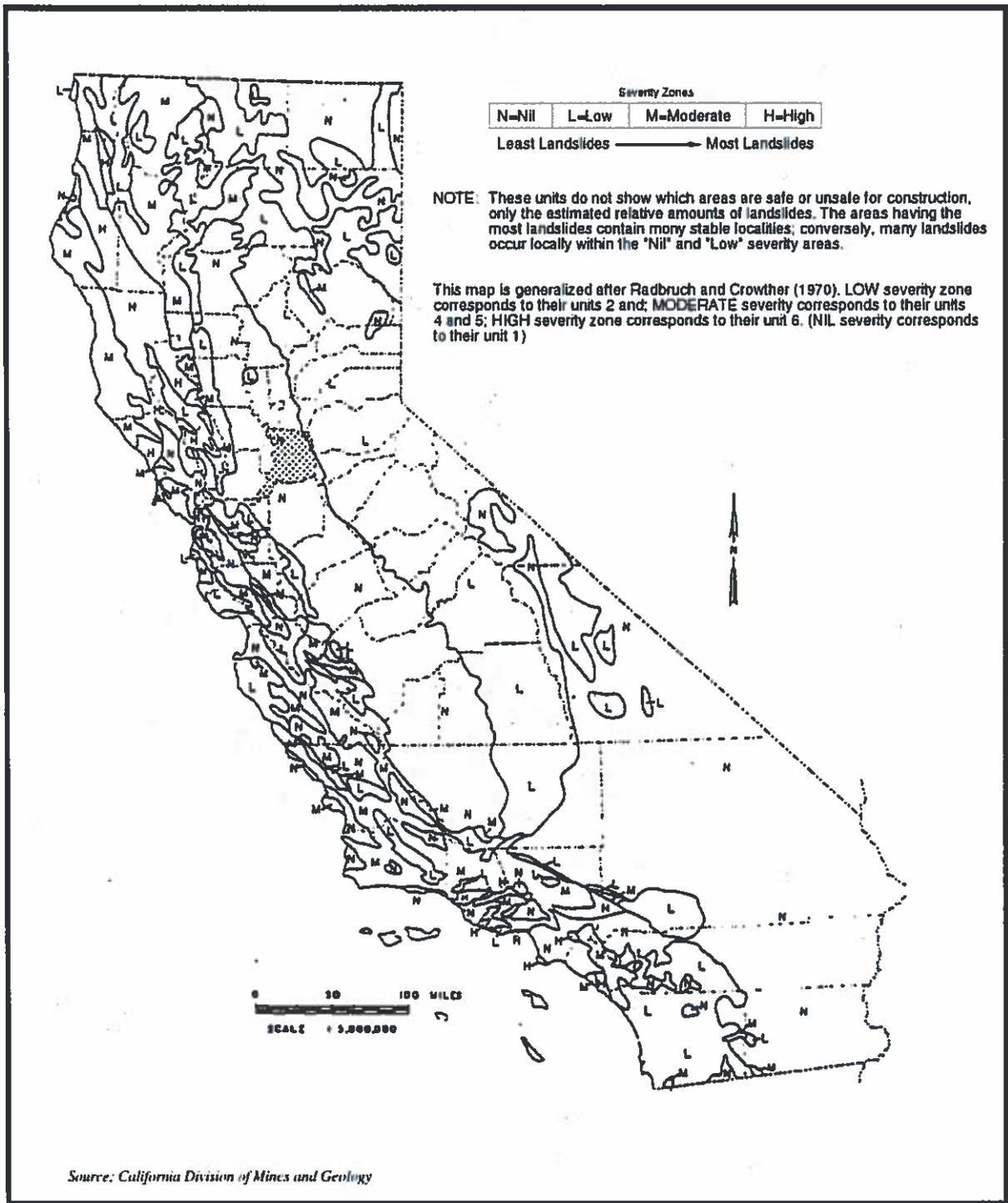
Prepared by the Sacramento County Planning and Community Development Department



Figure II-9

## LANDSLIDE ILLUSTRATION





**Figure II-10  
Relative Amounts of Landslides**

Prepared by the Sacramento County Planning and Community Development Department

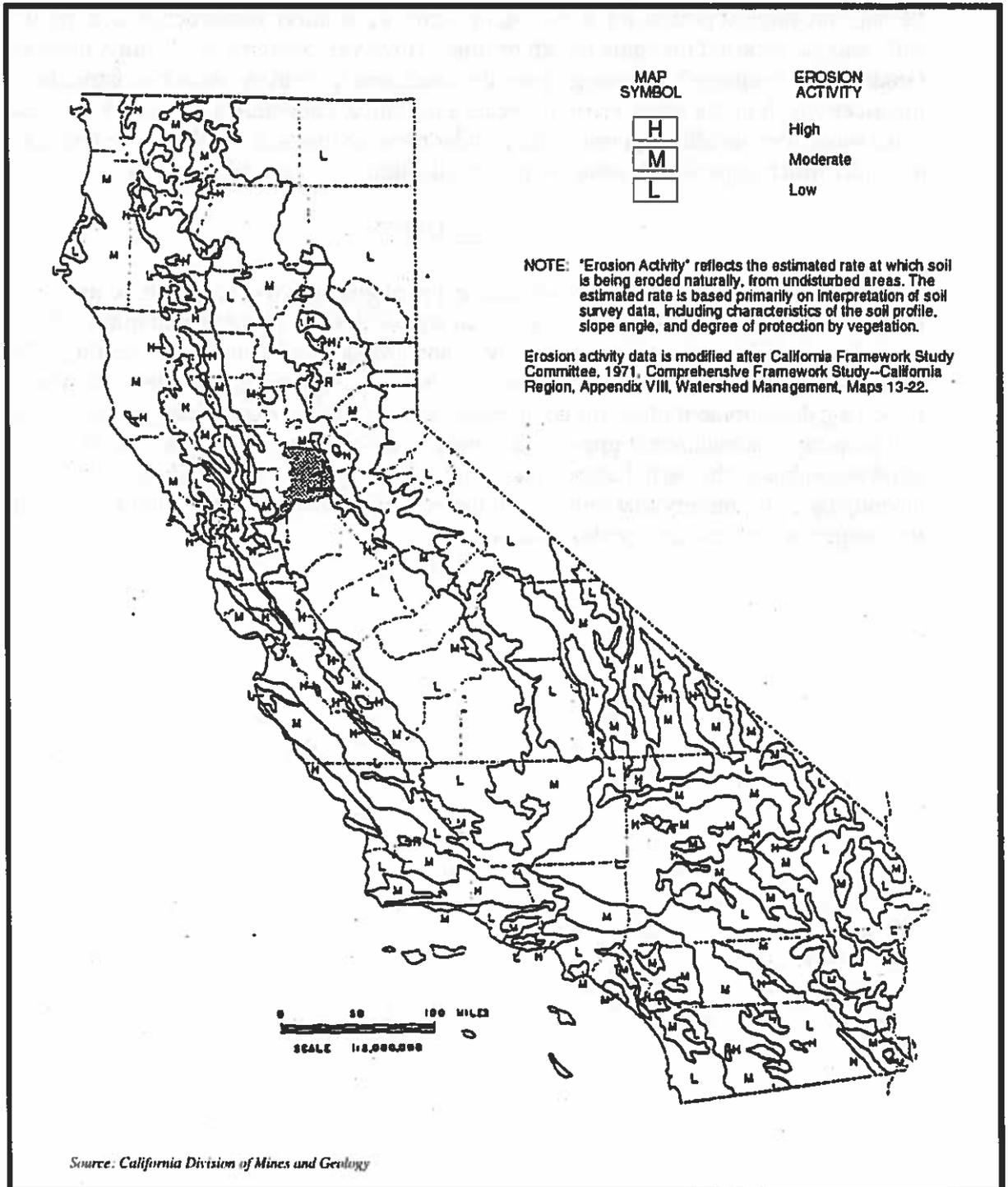


Figure II-11  
Erosion Activity

Prepared by the Sacramento County Planning and Community Development Department

Perhaps the highest potential for erosion to occur is a result of construction activity where soils may be exposed for some length of time. However, Sacramento County, through Grading and Drainage Ordinances, provides measures to limit or restrict construction practices which might cause erosion, create a nuisance, constitute a hazard, or obstruct waterways. Presumably a permit issued under these ordinances would not be granted for a project which appeared to generate potentially significant erosion hazards.

### CONCLUSION

Sacramento County is affected by seismic and geologic activity that could be disastrous to the economy and detrimental to the health and well being of the community. The general lack of dramatic geologic activity in and around the County is misleading. The potential for destructive geologic and seismic hazards is a serious consideration when reviewing development plans for commercial and residential expansion. To protect life and property it is incumbent upon policy makers, developers, and planners to be knowledgeable of the earth hazards facing this County, and to remain diligent in developing a community that protects, to the best of our ability, people and property from the dangers of seismic and geologic hazards.

SACRAMENTO COUNTY GENERAL PLAN  
SAFETY ELEMENT

**FLOODING  
TECHNICAL DISCUSSION**

INTRODUCTION

Flooding is the rising and overflowing of a body of water onto normally dry land. The initial force of flood waters can shatter structures and uplift vehicles. Floodwaters can transport large objects downstream which, in turn, can damage or remove stationary structures. Saturation can result in instability, collapse, or other damage. Objects can be buried or destroyed through sediment deposition. Floodwaters can break utility lines, interrupt services and potentially affect health and safety, particularly in the case of a broken sewer, domestic water, or gas lines. Standing water may cause septic tank failure, well contamination, and loss of crops. Roads, foundations and electrical circuits may also become damaged by standing water.

As of 2004, nearly 30% of the County's population lives within the 100-year floodplain, over 5,000 residences have previously been damaged by floods and the federal share of past damage to public facilities exposed to flood hazard has cost \$15 million. Considering the increasing rate of development and the condition of the current flood control system, greater protection from flood hazards is needed. Prudence in planning and locational analysis in the development process is warranted. (Updated 2011)

Historically, Sacramento County has always been vulnerable to flooding because of its relatively flat terrain and the number of water courses that traverse the County. Flooding frequently occurred before a flood control system existed. Early residents of downtown Sacramento were forced to build on top of the original town level to avoid floods. Flood zones in Sacramento County are still extensive. Several areas of the County are subject to flooding by the overtopping of rivers and creeks, levee failures, and the failure of urban drainage systems that cannot accommodate large volumes of water during severe rainstorms.

In Sacramento County, there are two main rivers and several tributaries to the east, north, and west that all flow towards the City of Sacramento (Figure III-1). The Sacramento River delineates the western borders of the City and most of the County of Sacramento. The American River flows west through the County and City and meets the Sacramento River just north of downtown Sacramento. During winter storms, the creeks and streams swell from runoff emptying into rivers already impacted by floodwaters. The volumes of water increase and the flood control system is tested as the rivers approach the County.

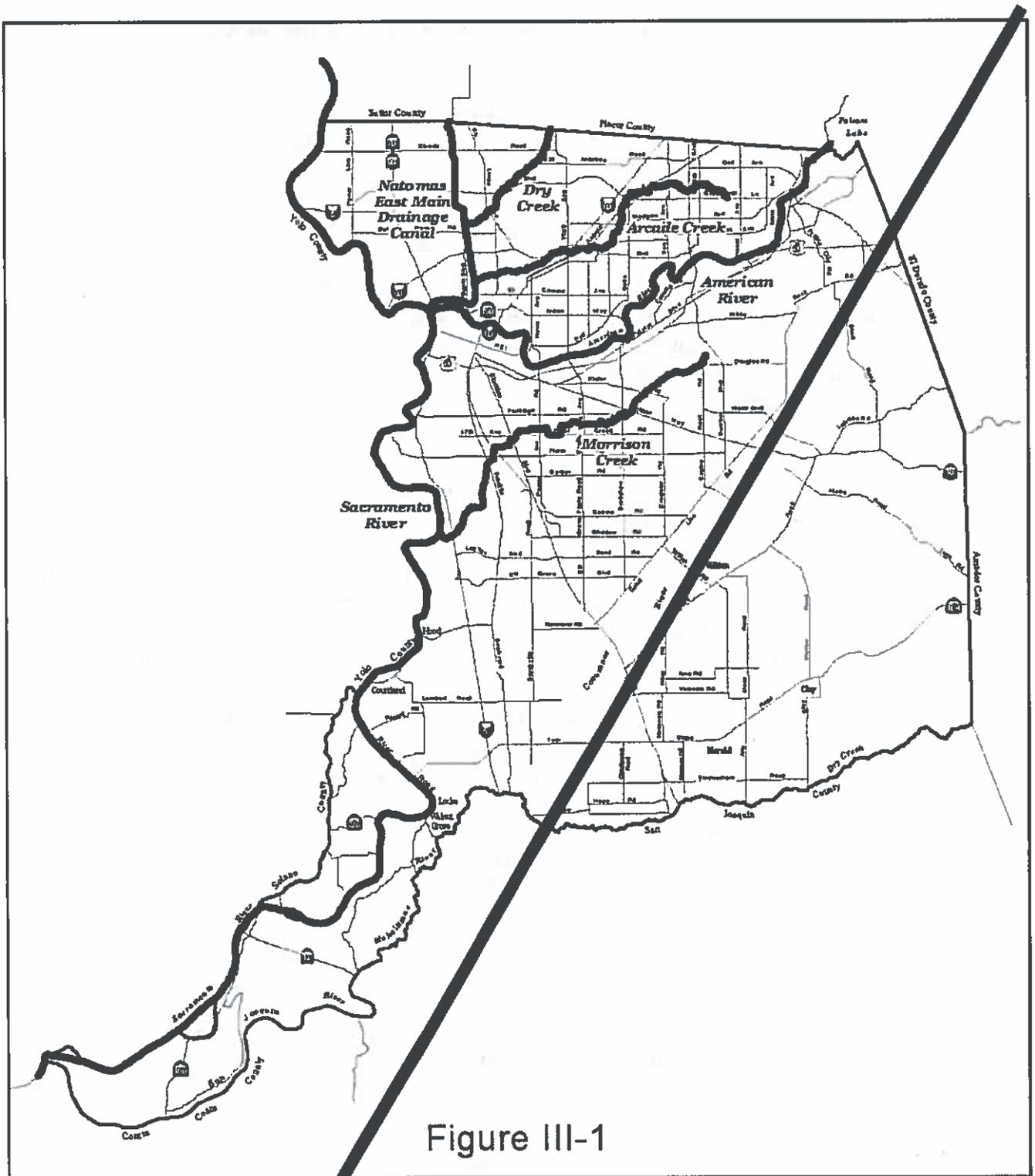


Figure III-1

## Sacramento County Waterways



Additional information may be obtained from the Sacramento County Department of Water Resources

Updated 2011

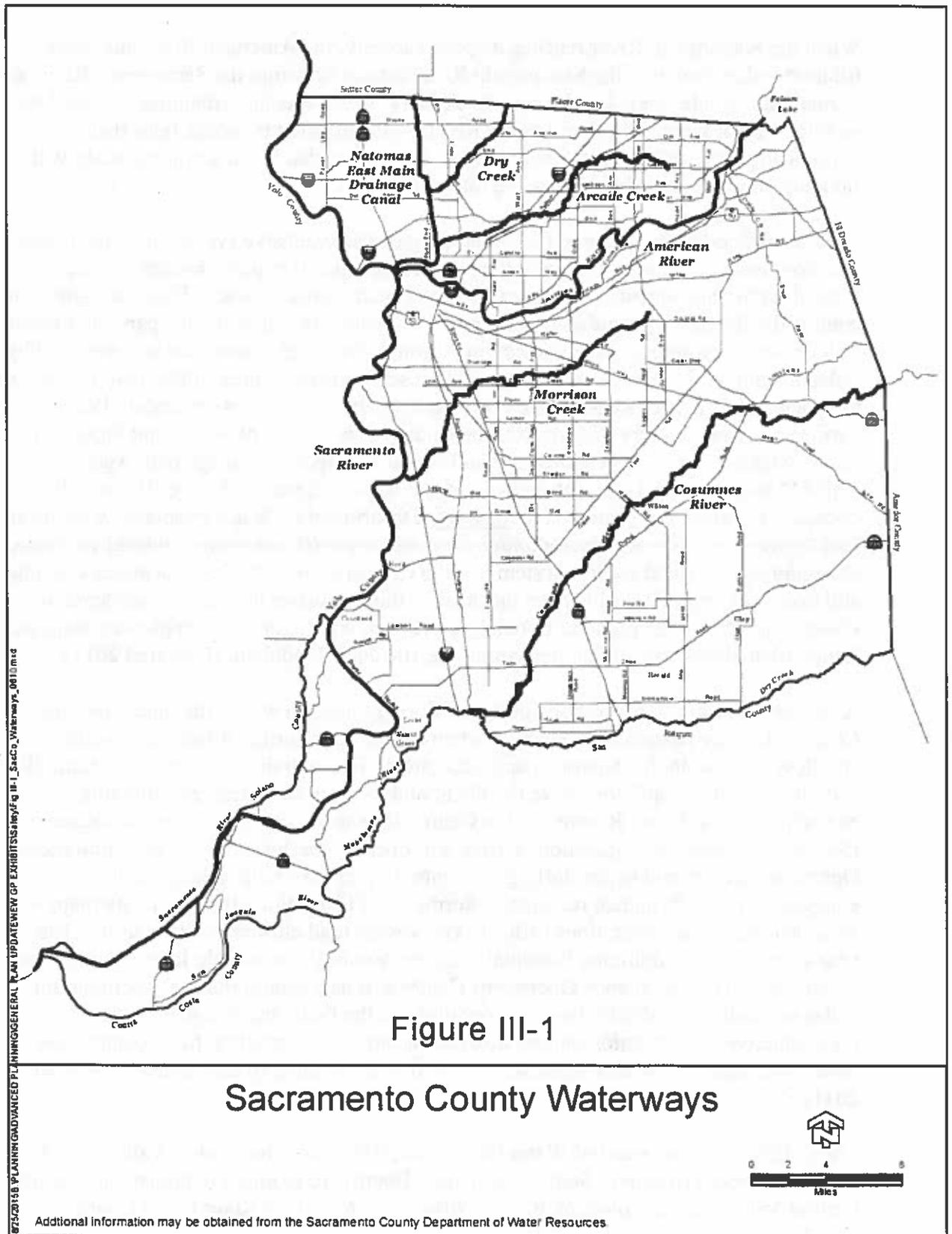


Figure III-1

Sacramento County Waterways

Additional information may be obtained from the Sacramento County Department of Water Resources

(Modified 2016)

When the Sacramento River reaches its peak capacity, the American River and other tributaries that flow into the Sacramento River cannot flow into the Sacramento River at a normal rate. Under these conditions, "backflows" occur causing tributaries to overflow and flood local areas. The Sacramento River is also affected by ocean tides that periodically raise and lower the water level. High tides that occur simultaneously with flooding conditions could increase the rate of flooding.

To control flooding in Sacramento County, there is an extensive system of dams, levees, overflow weirs, drainage pumping plants and flood control bypass channels strategically located on the Sacramento and American Rivers and various creeks. These facilities can control floodwaters by regulating the amount of water passing through a particular reach of the river. The amount of water flowing through the levee system can be controlled by Folsom Dam on the American River and the reserve overflow area of the Yolo Bypass on the Sacramento River. Regular inspection and repair of the levees are undertaken by various agencies. Figure III-7 depicts the Countywide system of levees and Figure III-8 shows which levees are accredited by the Federal Emergency Management Agency (FEMA) as providing 1-percent-annual-chance flood protection. Figure III-8 will be updated as needed and posted on the County Department of Water Resources website at [~~http://www.saccedwr.org~~](http://www.saccedwr.org). ~~(placeholder for a more specific address)~~. ~~Updated versions of Figure II.~~ The flood control system is quite extensive; nevertheless, localized flooding still occurs. Figure III-2 illustrates the areas within the urban portions of Sacramento County that have been prone to flooding in the past, and Figure III-9 depicts existing and future urban development that lies within the 100 year floodplain. **(Updated 2011)**

A variety of entities have responsibility for flood protection within the unincorporated County. County personnel take action when regular monitoring of weather conditions and flow releases in the American and Sacramento Rivers indicates that severe rainfall and other weather conditions have the likelihood to result in widespread flooding. In consultation with Water Resources, the County Executive, and the City of Sacramento, the County Emergency Operations Office will open up the Joint City/County Emergency Operations Center and begin staffing the center in preparation for a large scale emergency. (For 1% annual recurrence storms, the FEMA flood insurance rate maps will assist the emergency operations office to know what road closures will occur in a 100-year storm event. Additional floodplain information is also available from County Water Resources.) The Emergency Operations Center acts as a central point of coordination and communication of activities and conditions in the field, and is staffed with representatives of law enforcement, fire, health care, transportation, flood control and other local, state and federal agencies involved in responding to emergencies. **(Added 2011)**

The California Department of Water Resources (DWR) and the Central Valley Flood Protection Board (formerly State Reclamation Board) are required to prepare and adopt a Central Valley Flood Protection Plan by 2012. The American River Flood Control District, the Sacramento Area Flood Control Agency (SAFCA), and the California-Nevada River Forecast Center (CNRFC) also provide flood protection for Sacramento County. Formed by the State Legislature in 1927, the American River Flood Control District maintains the 40 miles of levees along the American River and portions of

Steelhead, Arcade, Dry and Magpie Creeks<sup>1</sup>. SAFCA was created by the City of Sacramento, the County of Sacramento, the County of Sutter, the American River Flood Control District and Reclamation District 1000 through a Joint Exercise of Powers Agreement to provide the Sacramento region with increased flood protection along the American and Sacramento Rivers<sup>2</sup>. (Added 2011)

CNRFC, a field office of the National Weather Service (NWS), is located in Sacramento. The NWS is an agency of the National Oceanic and Atmospheric Administration (NOAA) under the United States Department of Commerce. CNRFC assimilates hydrometeorological data, and provides river basin modeling and hydrologic forecast preparation for the California/Nevada region.<sup>3</sup> Additionally, there are twenty reclamation/ levee districts in Sacramento County (see list in Appendix to Safety Element). (Added 2011)

### THE 1986 FLOOD

In February of 1986, the flood control system was taxed when storms produced record flows in both the Sacramento and the American River watersheds. During the storm, the American River was over 16 percent higher than its design capacity. The Sacramento River was at its highest stages ever recorded. Recordings taken at the I Street Bridge near downtown Sacramento showed the river to have only two feet of freeboard (the distance between the water level and the top of the levee), although the system was designed to have at least three feet of freeboard.

During the 1986 flood, successive storms damaged 1,730 private homes and businesses. The storms caused close to \$50 million in public and private property damage, excluding damage to roads and other infrastructure. In the northern Delta, 1,600 people were evacuated and \$20 million in property damage occurred. Interstate 5, Interstate 80, State Highway 99, and numerous local roads were flooded.

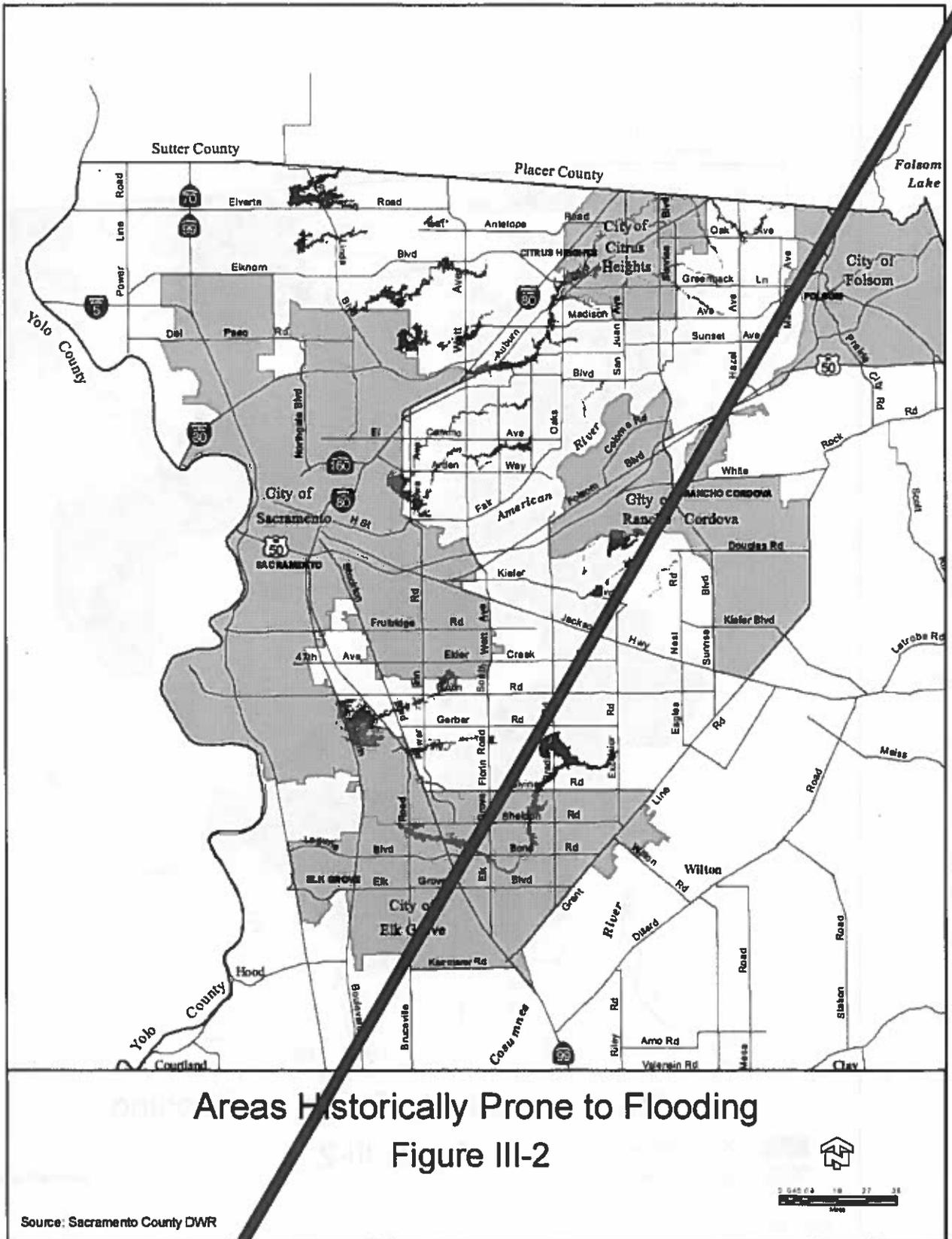
Before 1986, it was believed that Sacramento's 110-mile levee system was sufficient to withstand at least a 100-year flood (a flood having a one percent chance of being equalled or exceeded in any given year). The flood of February 1986 was, however, calculated to be about a 70-year flood (1.4 percent chance of occurrence in any given year). To withstand a 100-year flood, the river and levee system must be able to contain the 100-year flow and maintain adequate freeboard. The 1986 flood demonstrated that many levees were unstable and were not constructed with the required three feet of freeboard throughout most of the system. Studies conducted by the U.S. Army Corps of Engineers (Corps) indicated that the levees could only provide protection from about a 63-year flood. The Corps found that 32 of the 110 miles of the levee system in the Sacramento area require remedial work to bring them up to federal standards. Sixty-five percent of northern Delta levees are constructed and maintained by local owners and reclamation districts under less stringent standards than "project" or federally-maintained levees. As a

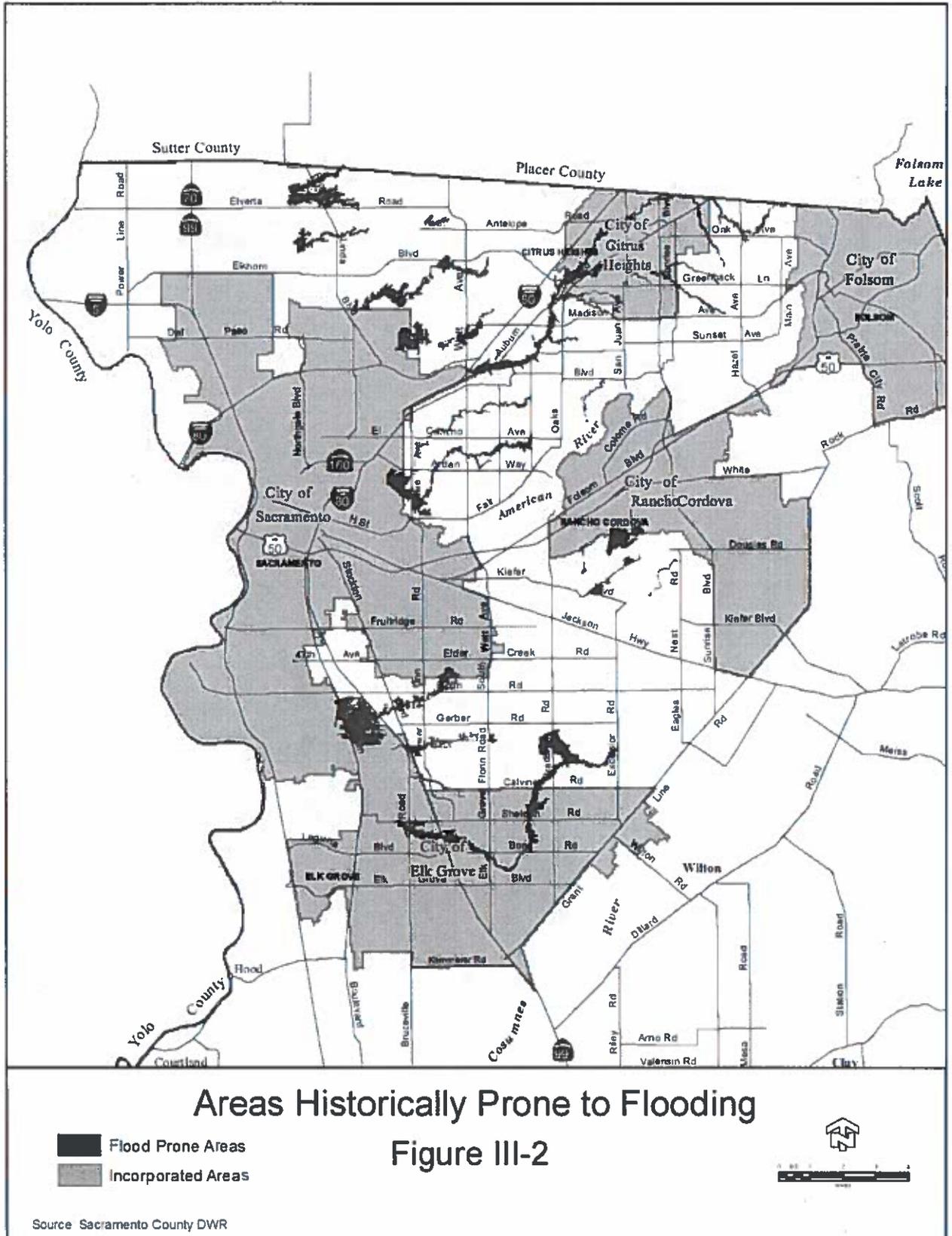
<sup>1</sup> American River Flood Control District, website:  
[http://www.arfcd.org/who\\_we\\_are.php](http://www.arfcd.org/who_we_are.php), accessed on May 3, 2010

<sup>2</sup> SAFCA, website:  
<http://www.safca.org/>, accessed on May 3, 2010

<sup>3</sup> National Weather Service California and Nevada River Forecast Center, website:  
[http://www.cnrfc.noaa.gov/about\\_us.php](http://www.cnrfc.noaa.gov/about_us.php), accessed on May 3, 2010

result of the Corps studies, significant additional area was included within the 100-year floodplain.





## FLOOD POLICY

### **Federal Flood Policy**

The Federal Emergency Management Agency (FEMA) is responsible for determining new flood elevations for Sacramento County based on Corps studies. FEMA is also responsible for distributing the Federal Insurance Rate Map (FIRM) which is used in the National Flood Insurance Program (NFIP). If an area is not protected from the 100-year flood, flood insurance, which is extremely costly, is required by most mortgage companies and savings and loan institutions. Sacramento County FIRM maps are available for viewing by contacting the County Water Resources Department. The National Flood Insurance Program is responsible for Flood Hazard Mapping. Flood hazard zones are geographic areas that the FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area. The following are the FEMA Flood Zone Designations for the Flood Insurance Rate Maps<sup>4</sup>: **(Updated 2011)**

#### **Zone A**

The flood insurance rate zone that corresponds to the 1% annual chance floodplain for requiring federal backed mortgages to purchase flood insurance; no depths or base flood elevations are shown within this zone. **(Added 2011)**

#### **Zone AE**

The flood insurance rate zone that corresponds to the 1% annual chance floodplain for requiring federal backed mortgages to purchase flood insurance. Base Flood Elevations (BFEs) are shown at selected intervals within this zone. New buildings constructed in this zone must be elevated to the BFE (i.e., the 1% annual chance flood level). **(Added 2011)**

#### **Zone AH**

Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.<sup>5</sup> **(Added 2011)**

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<sup>4</sup> USACE: USACE Sacramento District-- FEMA Flood Zone Designations, website:

<http://www.spk.usace.army.mil/projects/civil/natomascertification/FEMAZones.htm>, accessed on January 29, 2009

<sup>5</sup> FEMA: [http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/zone\\_ah.shtm](http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/zone_ah.shtm), accessed on June 28, 2010

### **Zone A99**

The flood insurance rate zone that corresponds to the 1% annual chance floodplain that will be protected by a federal flood protection system where construction has reached specified statutory milestones. No BFE or depths are shown in this zone. Mandatory flood insurance purchase requirements apply; however, no minimum building standards are required for this zone. **(Added 2011)**

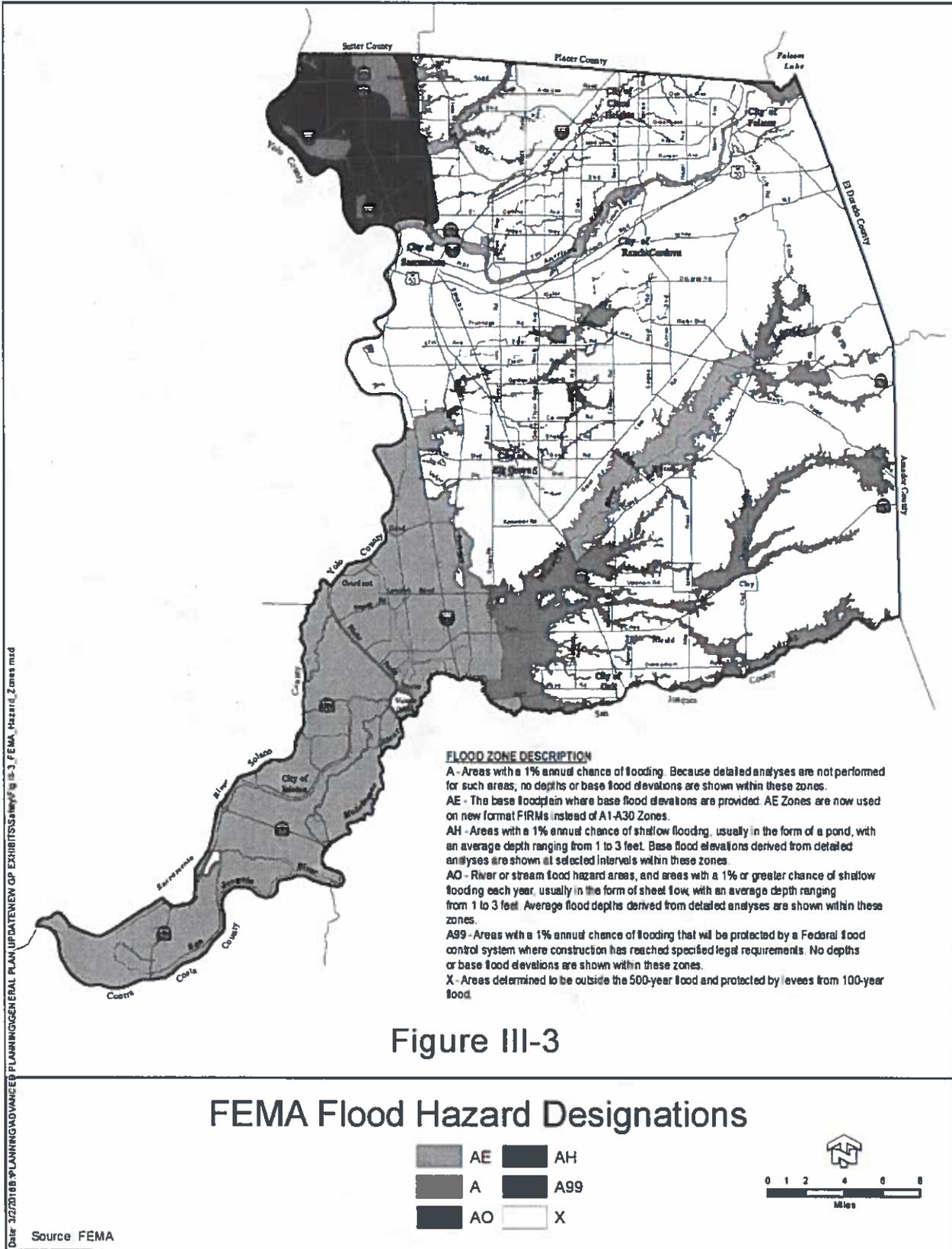
### **Zone AR**

The flood insurance rate zone used to depict areas protected from flood hazards by flood control structures such as a levee that are being restored. FEMA will consider using the AR designation for a community if the flood protection system has been deemed restorable by a federal agency in consultation with the local project sponsor; a minimum 3% annual chance level of flood protection is still provided to the community by the system and restoration of the flood protection system is scheduled to begin within a designated time period. Mandatory purchase requirements for flood insurance apply as do minimum building standards. **(Added 2011)**

### **Zone X**

The flood insurance rate zone that corresponds to areas outside the 1% annual chance floodplain; mandatory purchase requirements for flood insurance and minimum building standards do not apply to this zone. **(Added 2011)**





(Modified 2016)

## **State Department of Water Resources (DWR) Floodplain Mapping**

In an effort to provide information essential to community planning needs, DWR has initiated the Awareness Floodplain Mapping Project. The intent of the Awareness Floodplain Mapping project is to identify all pertinent flood hazard areas by 2015 for areas that are not mapped under the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) and to provide the community and residents an additional tool in understanding potential flood hazards currently not mapped as a regulated floodplain. The awareness maps identify the 100-year flood hazard areas using approximate assessment procedures. These floodplains will be shown simply as flood prone areas without specific depths and other flood hazard data. These maps are not FEMA regulatory floodplain maps; however, at the request of the community FEMA would include this data on their maps<sup>6</sup>. **(Added 2011)**

### **2007 Flood Legislation Package**

Pursuant to SB 5 (Machado, 2007) and AB 162 (Wolk, 2007), the California Department of Water Resources (DWR) and Central Valley Flood Protection Board (formerly State Reclamation Board) are required to prepare and adopt a Central Valley Flood Protection Plan (CVFPP) by 2012. As a basis for the CVFPP, DWR is required to prepare new 100 and 200 year floodplain maps. Upon the adoption of the CVFPP, the standard for flood protection for the Sacramento-San Joaquin Valley area will increase to a 200-year level (ability to withstand a 1 in 200 chance of flooding in any given year) in urban areas. **(Added 2011)**

Upon adoption of the CVFPP, jurisdictions will have 24 months to incorporate the measures of the plan into their General Plans, and 36 months to incorporate measures into their zoning ordinances. Upon DWR's finalization of the updated 100 and 200 year floodplain maps, they will be incorporated into the Safety Element of the General Plan. **(Added 2011)**

<sup>6</sup> CA DWR: Flood Management—Awareness Floodplain Maps, website: [http://www.water.ca.gov/floodmgmt/lra/fmo/fmb/fes/awareness\\_floodplain\\_maps/](http://www.water.ca.gov/floodmgmt/lra/fmo/fmb/fes/awareness_floodplain_maps/), accessed on February 2, 2009

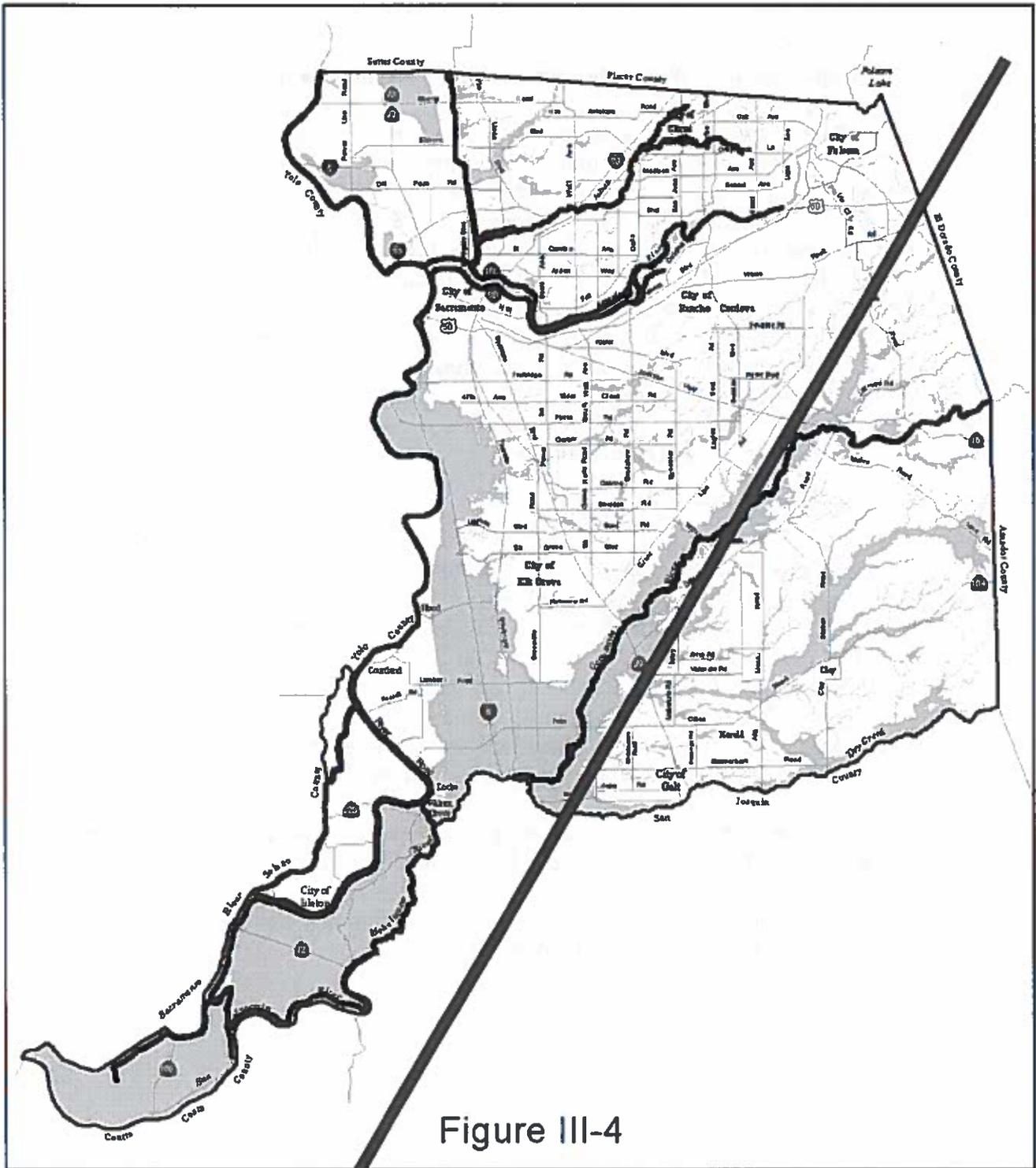


Figure III-4

**Designated Floodways**

- CVFPB Designated Floodways
- 100 Year Floodplain



Source: Floodway information provided by the Central Valley Flood Protection Board. Additional information may be obtained from the Sacramento County Department of Water Resources.

Updated: 2011





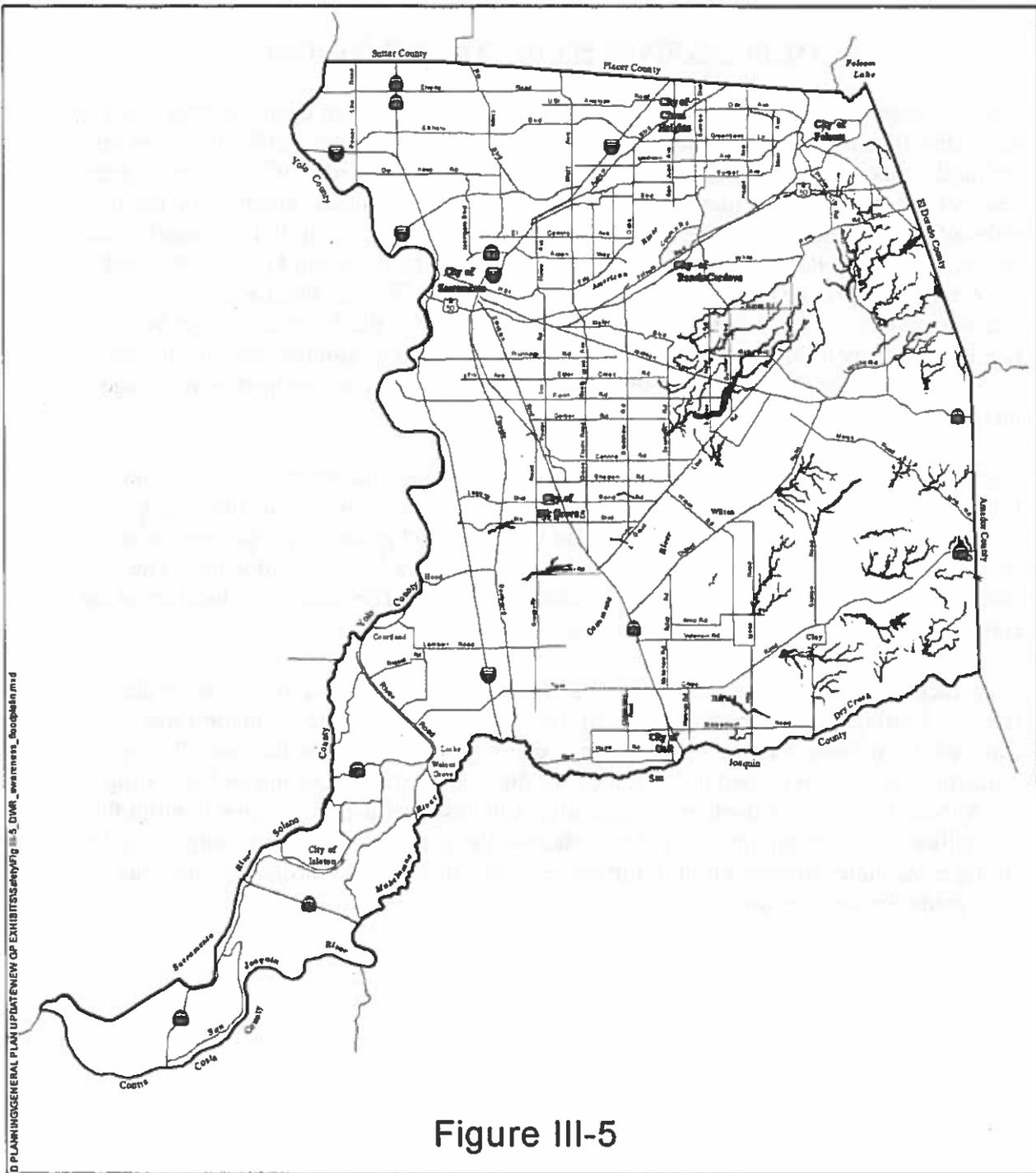


Figure III-5

### State DWR Awareness Floodplain Areas

Source: Ca State DWR. DWR Awareness Floodplain areas are flood prone areas that are not mapped under the FEMA National Flood Insurance Program

 DWR Awareness Floodplain



- This map will be updated with the 200-year floodplain data when it becomes available from the CA DWR
- Visit [www.water.ca.gov/floodmgmt/trafmo/fmb/tes/awareness\\_floodplain\\_maps](http://www.water.ca.gov/floodmgmt/trafmo/fmb/tes/awareness_floodplain_maps) for more information

**(Modified 2016)**

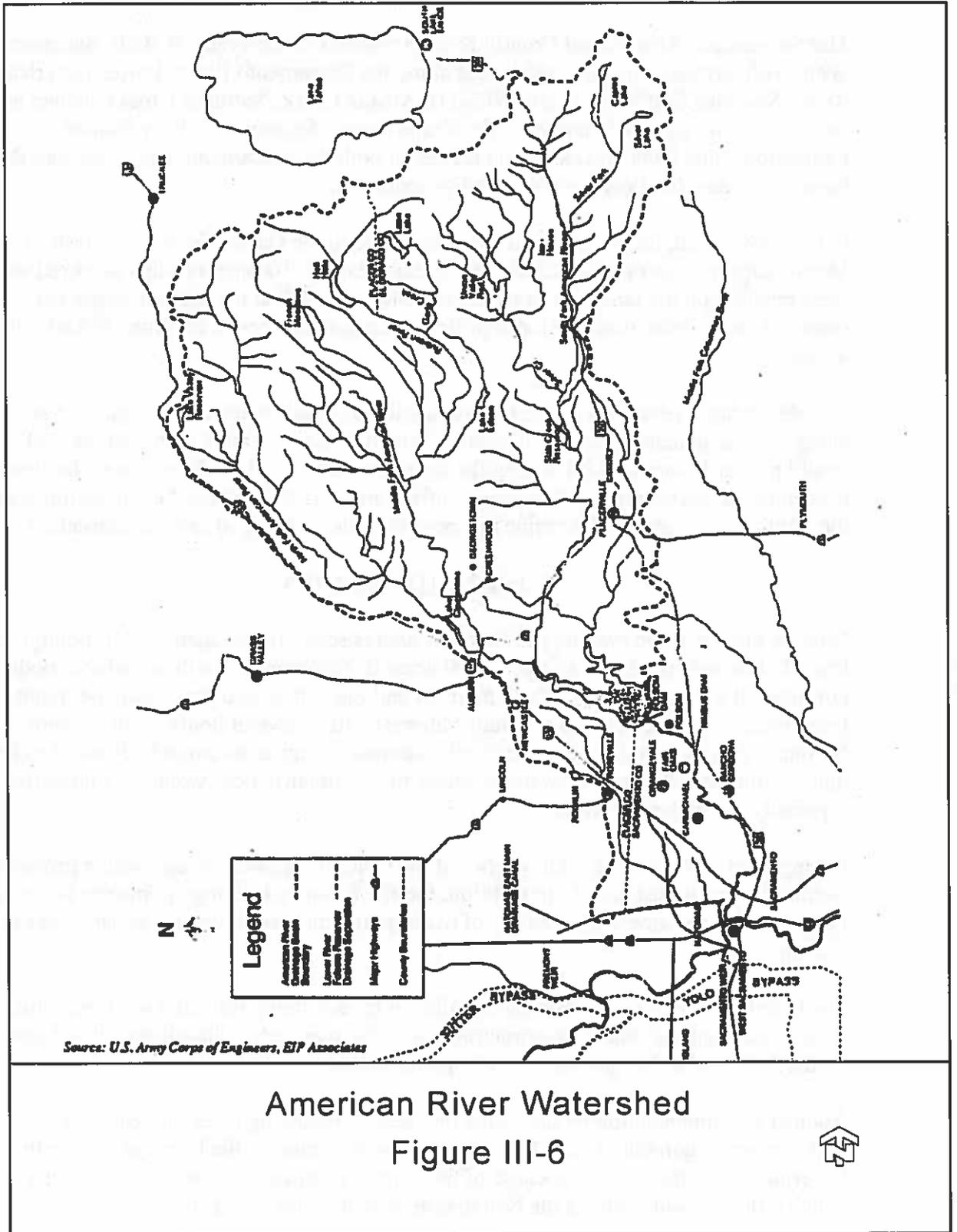
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## AMERICAN RIVER FLOOD CONTROL SYSTEM

The American River Flood Control System consists of the Folsom Dam, Nimbus Dam, an auxiliary dam at Mormon Island, eight earth-filled dikes, and four miles of levees on the north bank of the American River (from Howe Avenue to Arden Way). The System receives runoff from the American River Watershed which contains about 2,100 square miles of the western slope in the Sierra Nevada (Figure III-6). An initial reconnaissance report, "American River Investigation, January 1988" concluded that Folsom Dam and the American River levees are only capable of handling a 70-year flood event. Recommendations were to increase the carrying capacity of the American River below Nimbus Dam, modifying the Folsom Dam spillage, increasing storage capacity at Folsom Lake and, for greatest protection (200-year level), constructing a new upstream storage facility.

Since its completion in 1956, Folsom Dam has stopped three potentially catastrophic floods from occurring. The Flood of 1986 exceeded Folsom's design for flooding by almost 20 percent. The dam currently offers 63-year flood protection. An increase of one-hundred thousand acre-feet (AF) of storage would give 75-year protection. The Natomas area cannot be guaranteed these rates of protection because of its location at the confluence of the Sacramento and American Rivers.

Construction of the Auburn Dam began in 1967, but was suspended in 1975 after the Oroville Earthquake occurred. Soon after the earthquake, a seismic evaluation was demanded. According to the Corps, seismic concerns have been resolved and 200-year protection could be provided in some areas of the County by completing and operating the Auburn Dam. The Bureau of Reclamation still has federal authorization to build the 2.3 million acre-foot multipurpose dam. Meanwhile, there has been, and continues to be, strong environmental opposition to further upstream storage. No further decision has been made for completion of the dam.



## THE SACRAMENTO RIVER FLOOD CONTROL SYSTEM

The Sacramento River Flood Control System consists of the Fremont Weir, Sacramento Weir, Yolo Bypass Channel, and levees along the Sacramento River, Lower American River, Natomas East Main Drain (NEMD), Arcade Creek, Natomas Cross Channel and the Sacramento Bypass Channels. The Corps report "Sacramento River System Evaluation, June 1988" revealed that levees on both the Sacramento and American Rivers have inadequate freeboard and/or stability problems.

In the 1986 Flood, the Sacramento River levee along the Garden Highway, north of Metro Airport, began to slip. Before the danger passed, 10 separate slips occurred and were repaired on the land side of the levee. The river was at the highest stages ever recorded and erosion was causing significant damage to the weir facilities and adjoining levees.

In order to bring levees up to existing standards for flood protection, 32 miles of levees along the Sacramento River are in need of remedial work. This \$38 million project would primarily focus on increasing the flood protection. Also of concern is the Pocket (Greenhaven) section in the Sacramento urban area. The Corps has begun testing areas in the South Pocket area to determine the most feasible methods of levee construction.

## THE NATOMAS AREA

With its present levee system, the Natomas area is severely threatened by flooding if a levee failure occurs. Much of the 55,000 acres in Natomas is in a floodplain immediately northeast of the confluence of the American and Sacramento Rivers. A single major levee break could flood areas of South Natomas within several hours or, in western Natomas, in less than one hour. In North Natomas, many areas could be flooded in less than 15 minutes. The rate of warning under these circumstances would be ineffective, especially in residential areas.

During the 1986 Flood, several reaches of the Garden Highway levees, which protect the Natomas area, almost failed. In addition, the flood waters backing up into the Natomas East Main Drain came within inches of overtopping the west levees; the east levees did overtop.

The Corps has plans for modifying 60 miles of levees, doing remedial work on some, raising the height of others, constructing new levees, as well as installing a flood gate with a 3,500 cubic feet per second (cfs) pump station.

Another recommendation by the Corps includes constructing levee and channel improvements along the NEMD. An alternative is to modify the Fremont Weir either by lowering or lengthening it. Because of the current conditions of the levees, the rate at which a flood could occur in the Natomas area is of major concern.

## THE DELTA REGION

The Delta Region lies within a floodplain and is faced with a major flooding problem because of inadequate levee construction and maintenance, subsidence, seepage, erosion and seismicity. Flooding has occurred in some part of the Delta on the average of once every three and one-half to four years. While construction of upstream reservoirs has reduced the threat of overtopping, Delta levee failures continue to be a serious problem. Since 1950, levee failures have been twice as likely to be caused by foundation or levee instability than by overtopping. The condition of Delta levees is continually worsening and flooding frequency is increasing. Flood protection is generally inadequate except for those areas protected by federally built or "project" levees.

The Corps has estimated that there is likely to be two to three times the number of structural levee failures due to subsidence during the next 30 years as there has been in the last 30 years. Irrigated agricultural practices cause much of the subsidence. Organic soils on most Delta islands subside up to three inches a year which places increased hydrostatic pressure on the levees. Flooding is not limited to the winter storm season. Levee stability problems and the potential for liquifaction are year-round problems that can trigger flooding.

## THE MORRISON CREEK SYSTEM

The Morrison Creek System provides varying degrees of protection from a 40-year level to over a 100-year level. The Corps report, "Advanced Engineering and Design, Morrison Creek Stream Group, 1987, indicated that levees and channels lacked adequate capacity to handle a 100-year storm. Plans exist for improvements of channels and other facilities at Lambert Road.

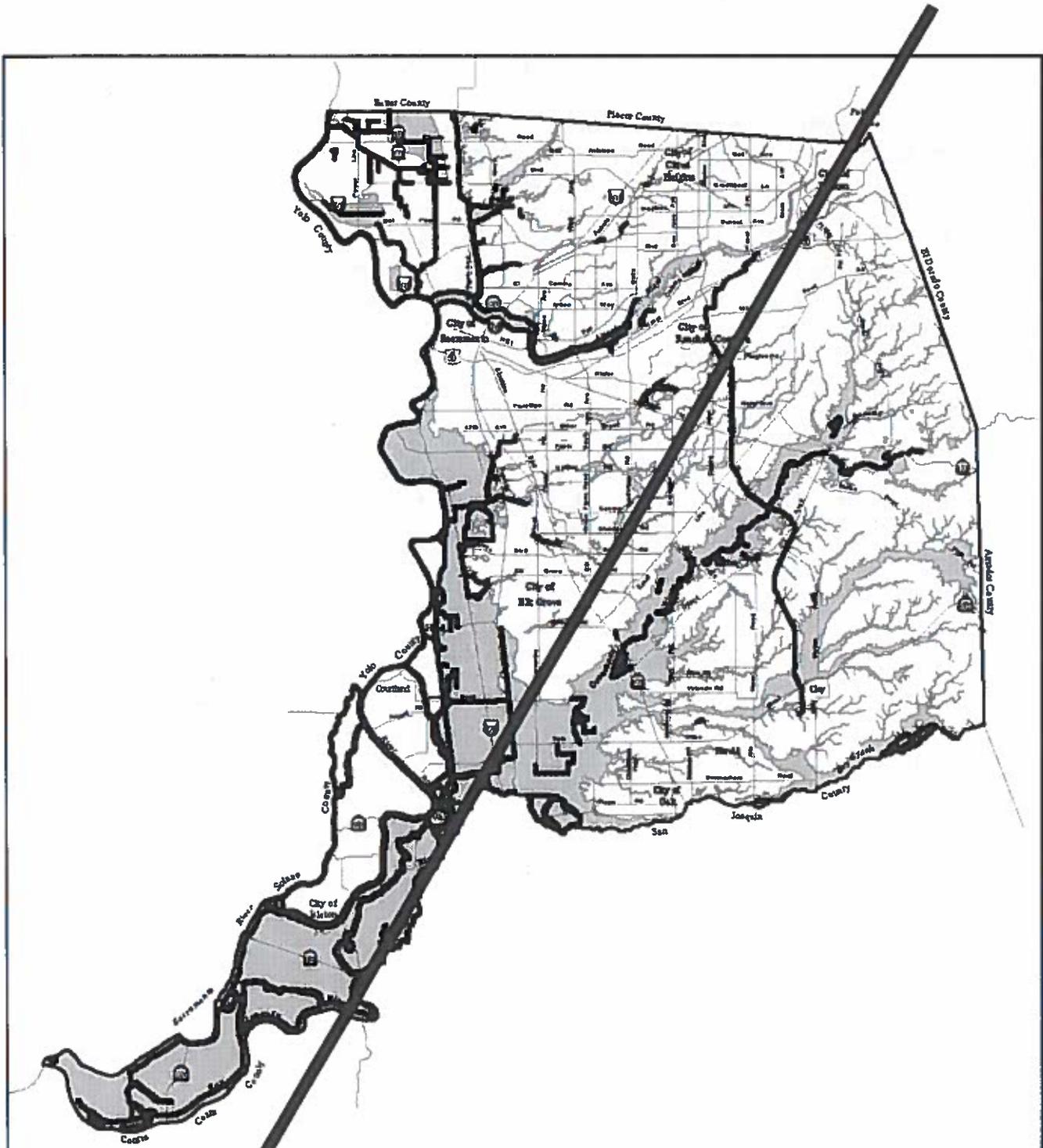


Figure III-7

### Sacramento County Levee System

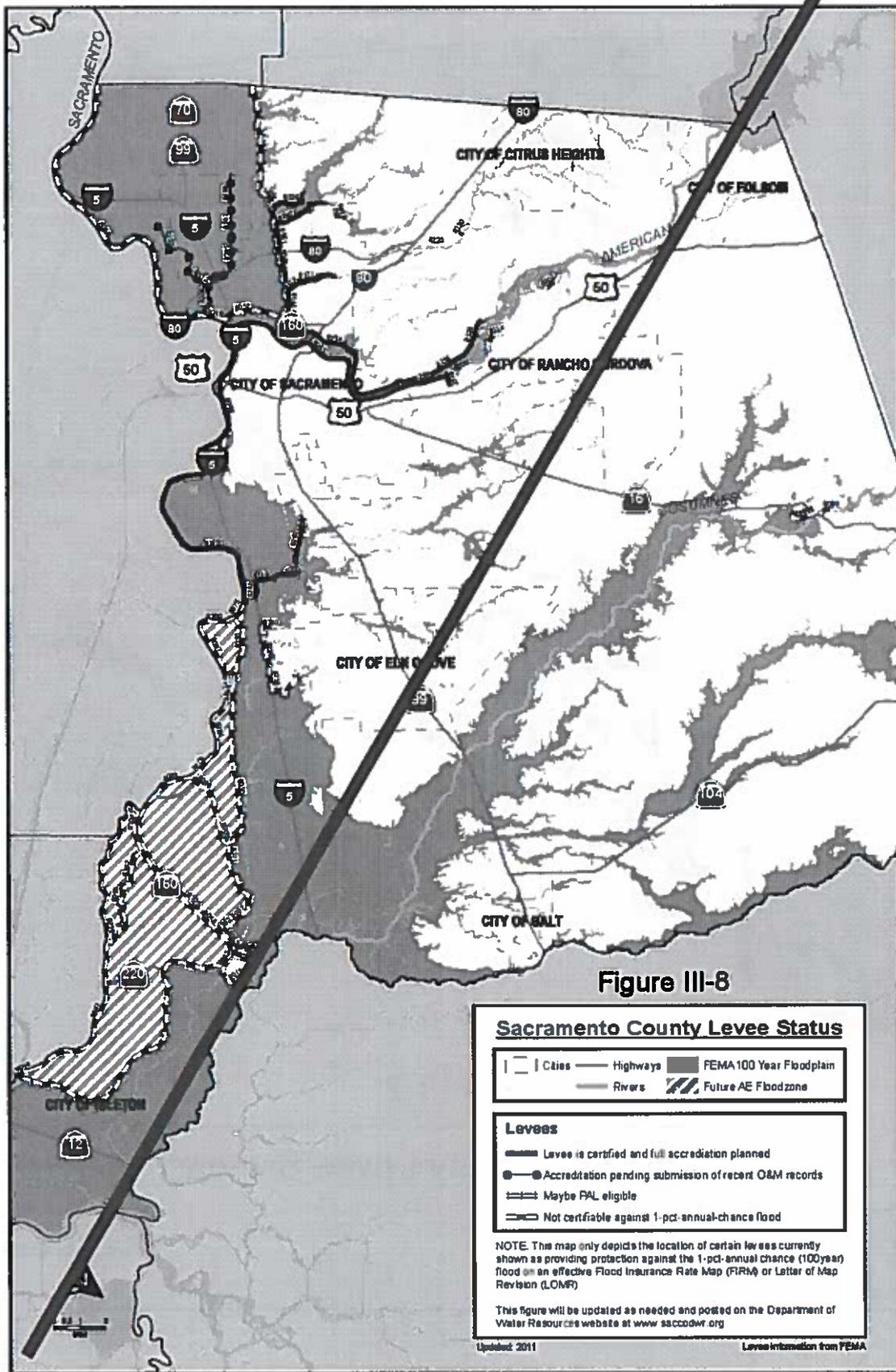
-  Sacramento County Levee System
-  100 Year Floodplain/Levee Protection Areas



Source: State DWR and Sacramento County DWR

Updated: 2011







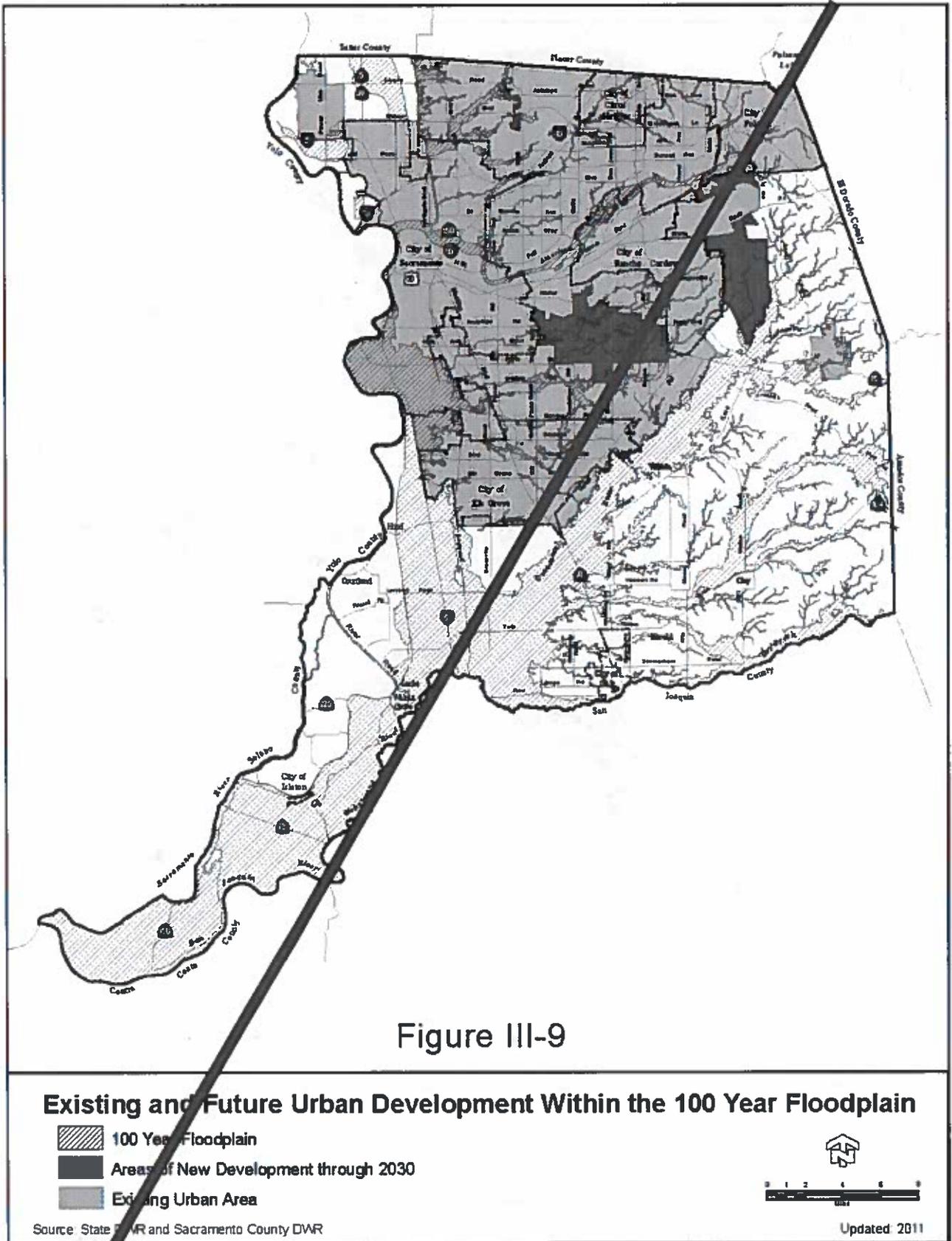


Figure III-9



## DAM FAILURES

Since the 1850's, hundreds of dams and reservoirs have been built in California to supply water for agriculture and domestic use, to allow for flood control, as a source of hydroelectric power, and to serve as a recreational facility. The storage capacity of these reservoirs range from a few thousand acre-feet to five million acre-feet. The water from these reservoirs eventually makes its way to the Pacific Ocean by way of several river systems. The river systems which flow through or near Sacramento County, and which may affect the population when flooding, are the Sacramento, Feather, American, Cosumnes, and the Mokelumne. There are four major and two minor dams which, if they fail, may impact the people and resources of this jurisdiction. The major dams are comprised of Shasta on the Sacramento, Oroville on the Feather, Comanche on the Mokelumne and Folsom on the American. The minor dams include Nimbus and Rancho Seco.

The State Office of Emergency Services (OES) provides local jurisdictions with hazard information based on data from the U.S. Bureau of Reclamation and the Department of Water Resources. Included in this information is a series of dam inundation maps for Sacramento County. Detailed inundation maps from the OES and County mapping projects are available at the Sacramento County Department of Water Resources.

Folsom Dam (including the earth-filled dikes) would have the greatest impact on the population of Sacramento County should it fail. The flood waters from this system would affect the cities of Sacramento, Folsom, Rancho Cordova and Elk Grove and the surrounding unincorporated area. Figure III-10 depicts the flood area. **(Updated 2011)**

The earthen dikes to the north of Folsom Dam would impact those people in the relatively low areas of Sacramento County leading to Roseville. The water would then flow into the Natomas Area of the City of Sacramento and then, depending on which levees held, this water could fill the old Lake Natomas bed and possibly flood the North Highlands and Rio Linda areas. Failure of the earthen dikes to the south of Folsom Dam would impact the City of Folsom immediately. Water would then flow into the American River basin, eventually arriving in downtown Sacramento.

Nimbus Dam has a capacity of 8,760 acre-feet. The Flood Operations Branch, Department of Water Resources, State of California, believes that the American River Channel will not flood unless the levees fail or there is a catastrophic release. The Sacramento Municipal Utility District (SMUD) inundation map indicates that a failure of the Rancho Seco Dam would flow to the Laguna Creek Basin and stop approximately at Highway 99 near Galt. Failure of Shasta Dam would affect populations south along the Sacramento River basin to about Knights Landing where it would lose momentum. An Oroville Dam failure would impact populations southwest along the Feather River basin to the Natomas Basin. A failure at Comanche Dam would affect the Delta and possibly slow the flow of other rivers through the Delta.



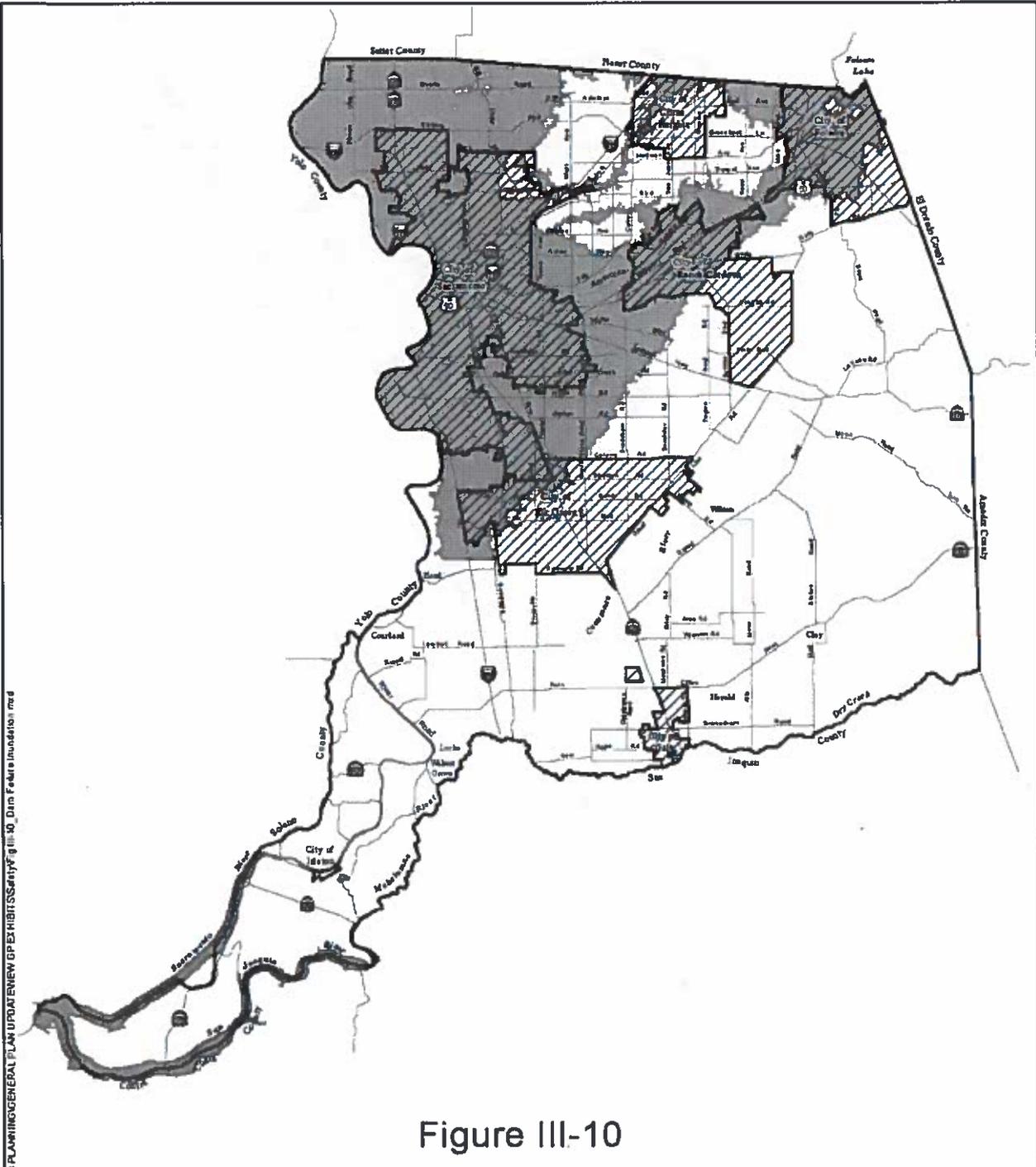


Figure III-10

### Folsom Dam Failure Flood Area

Folsom Dam failure inundation area provided by the Governor's Office of Emergency Services.

- Folsom Dam Inundation Area
- Major Waterways
- Cities



Additional information may be obtained from the Sacramento County Department of Water Resources.

**(Modified 2016)**

Date: 12/20/15B:\PLANNING\AD\AN\ED\PLANNING\GENERAL PLAN\UPDATE\VIEW GP EXHIBIT\SS\city\Fig III-10\_Dam Failure Inundation.mxd

**Project/non-Project Levee Failure Map**

~~This map will be inserted at this location when the data become available from the California Department of Water Resources.~~

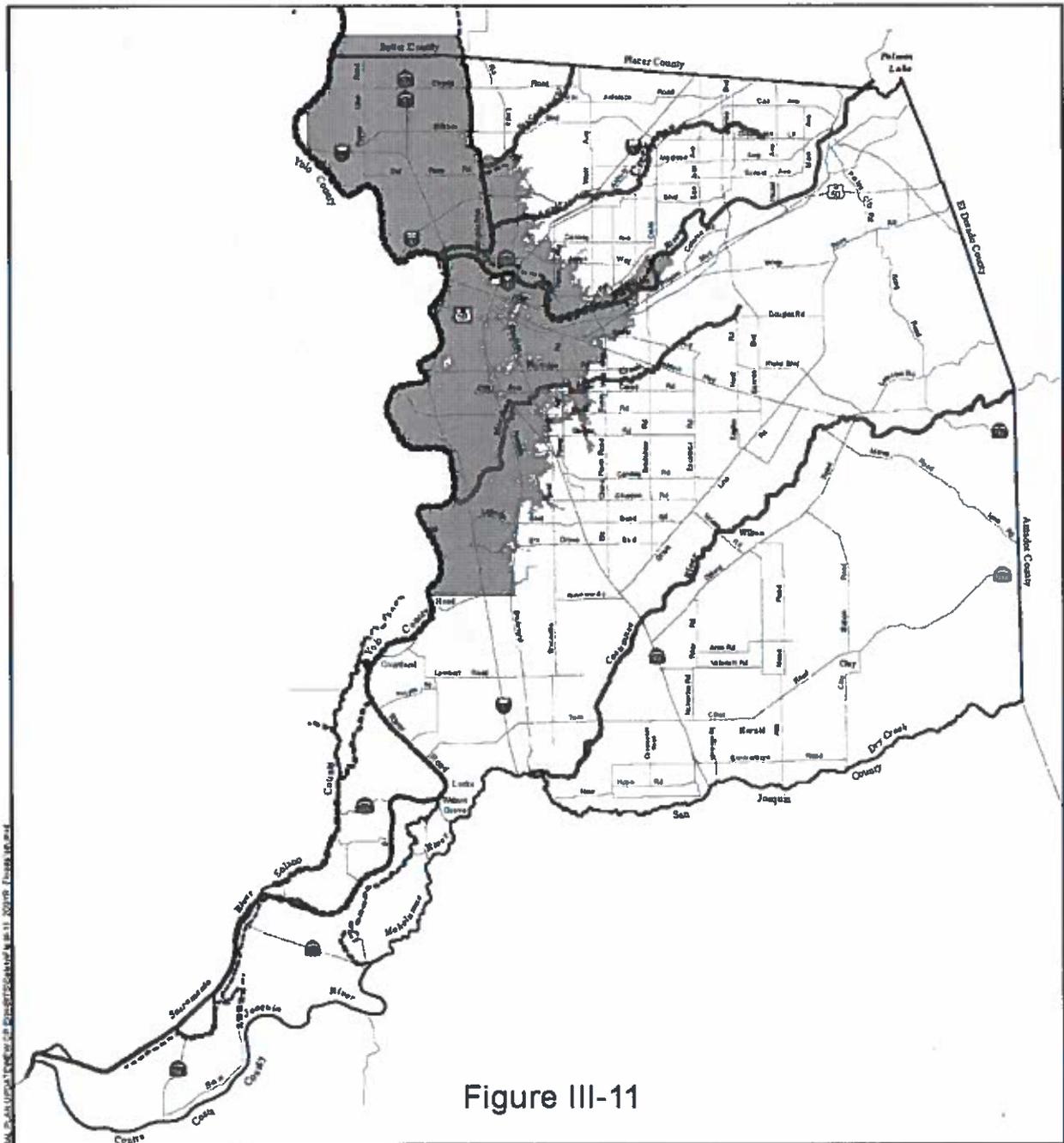


Figure III-11

### 200 Year Floodplain Protected by State Project Levees

- Project Levees
- Major Waterways
- 200 Year Floodplain



Source: FEMA, State DWR, USACE and Sacramento County DWR

**(Added 2016)**

## **SACRAMENTO COUNTY GENERAL PLAN SAFETY ELEMENT**

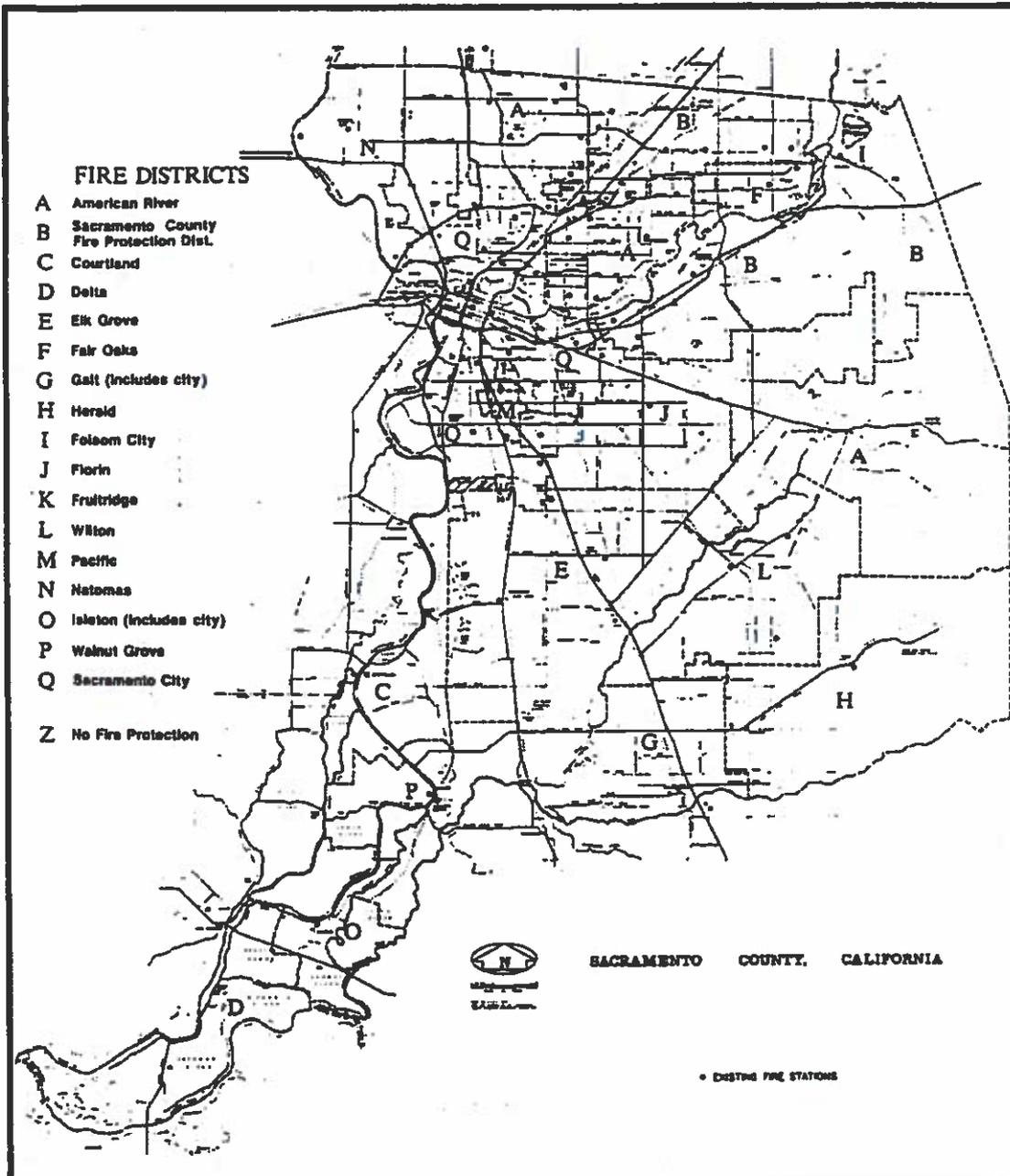
### **FIRE HAZARDS TECHNICAL DISCUSSIONS**

Sacramento County is served by 17 fire protection districts (Figure IV-1). These districts range in size from the Delta Fire Protection District which serves a 1989 population of 893 persons to the City of Sacramento which serves approximately 340,000 persons. These districts also vary in the physical size of the area served, the type of area served (urban, rural, or a combination of both), the amount of fire equipment available, the overall operation and management capability of district personnel, and the condition of the existing water system (water supply and pressure).

The level of service provided to the area served by each fire protection district is rated by the insurance industry according to Insurance Services Office (ISO) ratings. Approximately 40 percent of the rating is based on the water system and the remaining 60 percent of the rating is based on other characteristics of the particular fire protection district. While ISO ratings focus upon the level of service afforded to commercial structures, the level of service to both commercial and residential structures are combined to establish a rating that serves as a guide for determining the fire insurance premiums for property owners within the district's boundaries. The higher the ISO rating, the lower the level of service that can be provided. Many fire protection districts covering both an urban and rural area have two ISO ratings, since many properties in the rural areas may be located over 1,000 feet away from a fire hydrant and are located over five miles from a fire station--two criteria by which ISO ratings are based.

State law requires cities and counties to address fire hazards and divides these hazards into two categories; urban and wildland fires. In Sacramento County, urban fires are those that pose a threat to urban facilities and structures including the following:

- Lumber yards;
- Petroleum tanks;
- Industrial and commercial buildings;
- Residential dwelling units; and
- Communities of a historical nature, such as Locke, where wood-frame buildings were constructed before fire codes existed or standards were imposed on buildings that abut one another.



**Figure IV-1  
General Fire Station Locations**

Prepared by the Sacramento County Planning and Community Development Department

Wildland fires are those fires that pose a threat to the more rural areas of the County. Grass fires and peat fires are the two main types of wildland fires of concern in Sacramento County. Grass fires are an annual threat in the unincorporated area of the County, especially recreational areas such as the American River Parkway. Peat fires are unique to the Delta where peat is subject to spontaneous combustion. Once started, these fires become very difficult to control. Peat can still burn some distance underground even when the upper layers of peat are saturated with water over an extended period of time. Once the ground has dried out, a peat fire may return to the surface.

While the urbanized areas do not have fire hazards associated with high levels of vegetation, the intensity and type of development play a major role in the incidence of structural fires. Modern building codes adopted by Sacramento County are designed to address safety measures that minimize fires and the loss of life. High quality industrial and commercial structures pose significantly less of a fire hazard than other types of structures because they are usually supplied with fire detection systems and extinguishing devices. Petroleum tanks are now required to be built with dikes surrounding the tanks to minimize the fire hazard outside the storage area.

**TABLE IV-1**  
**NUMBER OF FIRES IN 1988 BY INCIDENT**  
**SACRAMENTO COUNTY EXCLUDING SACRAMENTO CITY**

	<u>Number</u>	<u>Percent</u>
Buildings	914	22.8%
Grass	1,393	34.8%
Vehicle	1,002	25.0%
Refuse	446	11.1%
Outside Structure	116	2.9%
Explosion	3	0.1%
Crops	7	0.2%
Mobile Home	21	0.5%
Other	102	2.5%
Unknown	3	0.1%
<b>Total</b>	<b>4,007</b>	<b>100.0%</b>

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## SACRAMENTO COUNTY GENERAL PLAN SAFETY ELEMENT

### EMERGENCY PREPAREDNESS TECHNICAL DISCUSSION

The Sacramento County Office of Emergency Operations, established in 1973, is vested with the responsibility of coordinating all public and private support agencies in the event of extraordinary emergency situations associated with natural disasters and technological incidents. These agencies include law enforcement, fire and rescue, health, public works, transportation, welfare, and communications.

In addition to the role of coordination in the event of an emergency, the Office of Emergency Operations is responsible for collecting and maintaining the individual support plans relating to specific types of emergencies. Currently, three sets of plans are maintained by the Emergency Operations Center, including supporting documentation to a master preparedness plan known as the Multi-Hazard Functional Plan. The format of this document is in accordance with guidelines established by the Governor's Office of Emergency Services. Essentially, the Multi-Hazard Functional Plan consolidates all hazard-specific plans prepared by several agencies throughout the County into a single document. The State is developing the California Emergency Plan which will include an update of local area plans as part of an overall state emergency response plan.

The second set of plans is the Rancho Seco Off-site Emergency Response Plan which provides the framework for protecting members of the public and emergency response workers in the event of an emergency at the Rancho Seco Nuclear Generating Station. Since the closure of the plant in June, 1989, the nature of a potential emergency has changed considerably. The Sacramento Municipal Utility District has developed revisions to the plan to address the long term defueled condition of the plant. The main focus of the plan will be to provide for the protection of on-site personnel and the protection of the public by communication with off-site agencies. This plan differs from earlier versions in that an Emergency Planning Zone of approximately 10 miles in radius, an Emergency News Center, and an Emergency Operations Facility and Emergency Response Organization staffing for off-site support are no longer included. The plan revision has been submitted to the U.S. Nuclear Regulatory Commission for review.

The third plan, the Sacramento County Hazardous Materials Incident Response Plan, contains measures to protect the health and welfare of the population, public and private property, and natural resources (environment) from incidents involving hazardous materials. The plan specifically outlines methods and procedures that decision makers and County regulatory and response agencies will use for managing, tracking, containing, removing, and disposing of hazardous materials that are released or threatened to be released in Sacramento County.

The ability to implement an emergency response plan can be strongly affected by land use decisions made by the County. For example, in case of an emergency, there may be a need to evacuate large numbers of people from a given area. If the road network has been poorly

planned and not designed to serve population densities, it could hamper the ability of emergency response workers to move people out of the area in a timely manner. Also, if high density or other sensitive land uses are allowed to develop near facilities that could cause a major emergency situation, the evacuation of large numbers of people becomes more difficult. In terms of response to an emergency, therefore, an adequate circulation network and less intensive land uses near critical facilities becomes central to saving lives and minimizing property damage.

TABLE OF CONTENTS

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Tousson R. Topozada, Senior Seismologist, California Division of Mines and Geology.

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Hal Armstrong, Division Chief, Public Safety/Education, Fair Oaks Fire Protection District.

Joseph B. C. Twyman, Supervisor of Survey Services, ISO Commercial Risk Services, Inc.

Alta Widener, Staff Analyst, California State Fire Marshal's Office.

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Craig McCoy, Emergency Program Coordinator, Sacramento County Office of Emergency Operations.

Russel T. Fehr, Senior Analyst, Sacramento County Administration and Finance Agency.

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Donna Dean, Drainage Planner, Department of Public Works, Water Resources Division.

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