4.3 Jurisdictional Elements

Thus far, the planning process has identified the natural hazards posing a threat to the Sutter County Planning Area and described, in general terms, the vulnerability of the county and communities to these risks. DMA regulations require that the HMPC evaluate the risks associated with each of the hazards identified through the planning process. For multi-jurisdictional plans, the regulations also require that the risks be further evaluated where a jurisdiction's risks vary from the risks facing the entire planning area. This section of the plan presents a summary, where data permits, of the possible impacts of identified hazards by participating jurisdiction. Note that data is provided only where the risk or impacts vary from those previously identified as impacting the entire Planning Area. If no additional data is included, it should be assumed that the risk and impacts to the affected jurisdiction would be similar to that previously described for the county.

The HMPC has determined that the risk for the following hazards varies throughout the Planning Area:

- Flood
- Wildfire

The following sections present the jurisdictional elements for participating jurisdictions, including:

Unincorporated Sutter County

Incorporated Communities

- City of Yuba City
- City of Live Oak

Districts

- Gilsizer Drainage District
- Levee District One
- RD1001
- RD1500
- RD70 & RD1660

For the unincorporated county and incorporated communities, the following information is provided:

- Jurisdictional Background data
- Hazard Summary
- Vulnerability Assessment for Mapped Hazards: Flood and Dam Failure
- Capability Assessment (i.e., in section 4.4)
- Mitigation Action Strategy Projects (i.e., in section 5.0)

Information specific to participating districts is compiled in one district section.

UNINCORPORATED SUTTER COUNTY

Population: 39,890
Area: 607 Square Miles
Elevation: 35-2,100 feet above msl

Community Profile

Sutter County is part of the Central Valley of California which is drained by the Sacramento and San Joaquin Rivers. The county encompasses approximately 607 square miles (388,358 acres), which can be divided into two general topographical areas: a valley area and the Sutter Buttes. . State Route 20 and State Route 99 are the primary regional transportation corridors within the County. A map of Sutter County is included at the end of this section.

Geologically, the Great Valley province is characterized by a great thickness of generally flat-lying sedimentary rocks overlain by alluvial soils. The alluvial soils of the Central Valley range in thickness from a few inches near the foothills to more than 200 feet near the Sacramento River. In Sutter County, the sedimentary rocks are of both marine and continental origin frequently imbedded within tuff-braccias.

The topography of Sutter County is comprised primarily of the gentle flatlands of the Sacramento River Valley. The eastern part of the county is an alluvial terrace with elevations of 35 to 80 feet. The only prominent topographic feature within the county is the Sutter Buttes (32,000 acres), a remnant volcano with a peak elevation approximately 2,000 feet above the surrounding valley floor.

Sutter County shares the mild climate of the San Joaquin and Sacramento Valleys. Temperatures range from lows around 36 degrees Fahrenheit (°F) in January to summer month highs around 96°F. The County receives an annual average rainfall of 30 inches.

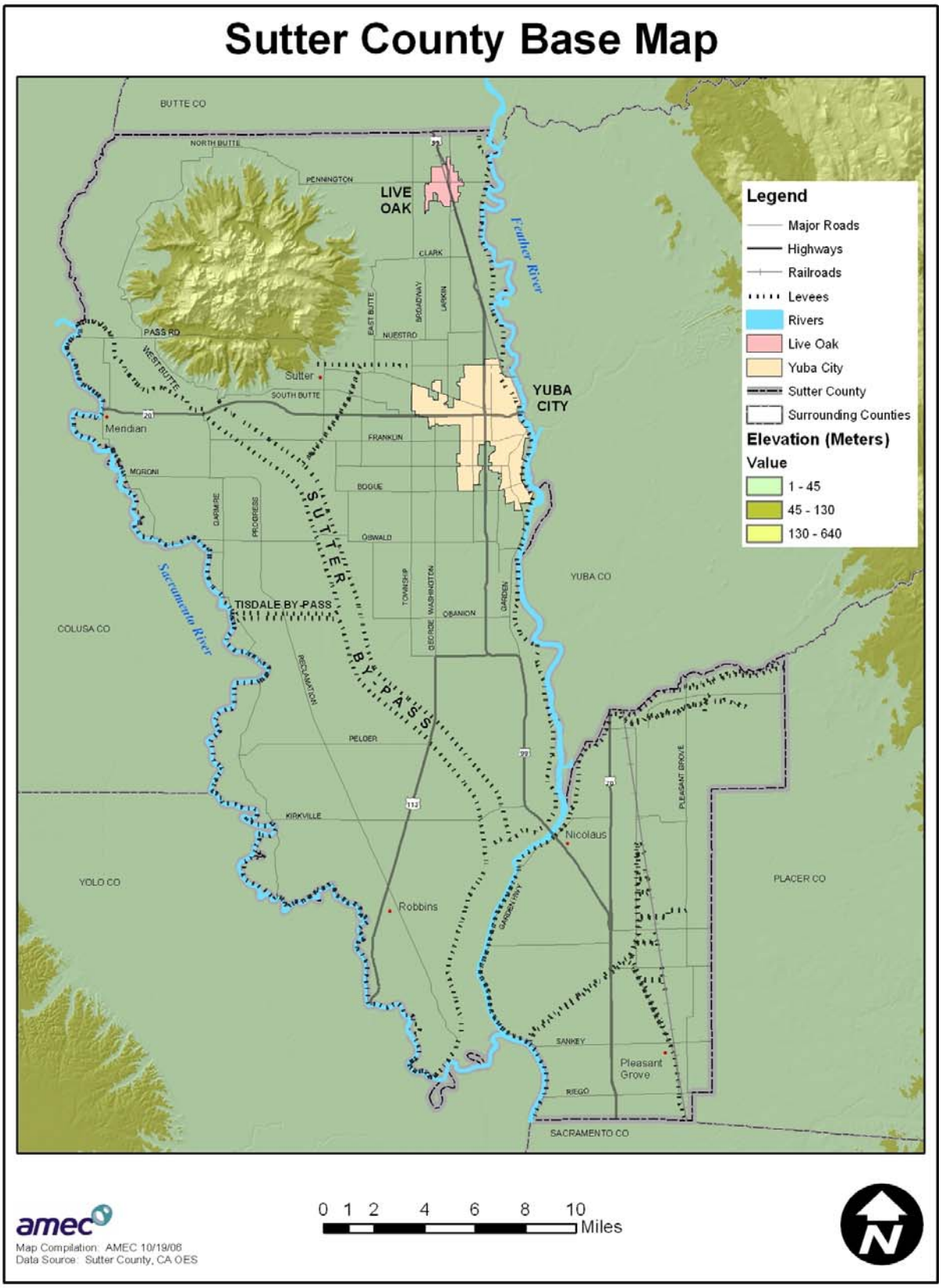
Named in honor of John Augustus Sutter, Sutter County was one of the original counties in the State of California when the State entered the Union on September 19, 1850. During the first two years of its existence the county seat went to four towns in succession: Oro, Nicolaus, Auburn, and Vernon. The first permanent settlement in the county was an adobe built by John Sutter near Hock farm in 1841. In 1849, Samuel Brannan, Pierson B. Reading, and Henry Cheever laid out Yuba City, marking the beginning of planned settlement in the county. By 1850, three towns were established in the county: Vernon, Nicolaus, and Yuba City. Sutter County remained principally an agricultural area without cities until the incorporation of Yuba City in 1908 and Live Oak in 1947. Consequently, Sutter County's population was primarily rural until the 1960's when the urban and suburban population finally exceeded the rural farm population.

Today, Sutter County is still primarily rural, with one small, but expanding, urban center – Yuba City, the county seat. According to the 1992 Census of Agriculture, 81.9 percent of the county's

acreage is classified as being in farms. This is the third highest land percentage of all counties in California. The county is well known for its rice, walnut, peach, tomato, and prune production.

Only 4.6 percent of lands within Sutter County are owned by public agencies. This includes the following percentages (of parcels over 1 acre in size) taken from the General Plan: Federal - .81% (3,145 acres), State – 1.92% (7,460 acres), County – 1.20% (4,657 acres), Other Local Agencies - .71% (2,777 acres). The USFS is the primary federal land owner in Sutter County. State lands are primarily under the control of the DFG and the DWR.

According to the 2000 Census, Sutter County has a population of 78,510 and 88,520 was the projected population estimate for 2005. The population estimate for unincorporated Sutter County was 37,110 in 2000 and projected to be 39,890 in 2005. The County General Plan estimates a growth rate of 1.7 percent annually to 2015 with a projected future population of 109,280. The majority of the county's population resides in its two incorporated cities, Live Oak and Yuba City. The primary employment industries in Sutter County are the government, service industry, and trade jobs. Employment growth has averaged an annual 1.2 percent increase since 1990.


Sutter County Base Map
BUTTE CO
NORTH BUTTE
PENNINGTON
LIVE OAK
CLARK
Feather River
EAST BUTTE
BROADWAY
LARKIN
PASS RD
NUESTRO
WEST BUTTE
Sutter
SOUTH BUTTE
YUBA CITY
Meridian
FRANKLIN
MORONI
BOGUE
CARMIRE
PROGRESS
SUTTER BYPASS
OSWALD
TOWNSHIP
WASHINGTON
GEORGE
OBANION
GARDEN
YUBA CO
Sacramento River
TISDALE BY-PASS
COLUSA CO
RECLAMATION
PELDER
KIRKVILLE
Nicolaus
PLEASANT GROVE
YOLO CO
PLACER CO
Robbins
GARDEN HWY
SANKEY
Pleasant Grove
RIEGO
SACRAMENTO CO
Legend
Major Roads
Highways
Railroads
Levees
Rivers
Live Oak
Yuba City
Sutter County
Surrounding Counties
Elevation (Meters)
Value
1 - 45
45 - 130
130 - 640
0 1 2 4 6 8 10
Miles
amec
Map Compilation: AMEC 10/19/06
Data Source: Sutter County, CA OES

Hazard Summary

Based on information provided by the HMPC, a hazard summary for unincorporated Sutter County is provided below.

SUMMARY HAZARD ANALYSIS: UNINCORPORATED SUTTER COUNTY				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Agricultural Hazards				
Dam Failure				
Drought	Likely	Significant	Critical	Medium
Earthquakes				
Floods	Likely	Significant	Catastrophic	High
Landslides				
Natural Health Hazards: West Nile Virus				
Severe Weather: Extreme Temperatures				
Severe Weather: Severe Fog	Highly Likely	Significant	Limited	Medium
Severe Weather: Winterstorms	Likely	Significant	Limited	Low
Severe Weather: Tornadoes				
Soil Hazards: Erosion				
Soil Hazards: Expansive Soils				
Soil Hazards: Land Subsidence				

SUMMARY HAZARD ANALYSIS: UNINCORPORATED SUTTER COUNTY				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Wildfires				
Volcano				

Guidelines:

Frequency of Occurrence
Highly Likely: Near 100% probability in next year.
***Likely*:** Between 10 and 100% probability in next year, or at least one chance in ten years.
***Occasional*:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
***Unlikely*:** Less than 1% probability in next 100 years.

Spatial Extent
***Limited*:** Less than 10% of planning area
***Significant*:** 10-50% of planning area
***Extensive*:** 50-100% of planning area

Potential Magnitude
***Catastrophic*:** More than 50% of area affected
***Critical*:** 25 to 50%
Limited: 10 to 25%
***Negligible*:** Less than 10%

Significance (Your subjective opinion)—***Low***, ***Medium***, ***High***

Information provided by the HMPC identified the following hazard as the most significant to the County:

- Floods

Vulnerability Assessment

This vulnerability assessment quantifies the vulnerability of unincorporated Sutter County in the event of a catastrophic event and also provides an assessment of the areas' vulnerability to floods and wildfire.

Assets and Values at Risk

Utilizing Sutter County assessor data, the total assessed values for the unincorporated portions of Sutter County are:

UNINCORPORATED SUTTER COUNTY 2006 Roll Values							
Property Type	Units Improved	Total Improved Value	Total Improved Land Value	Units Unimproved	Total Unimproved Land Value	Grand Totals Units	Grand Totals $$
Residential	4,801	$ 534,420,864	$ 189,438,365	8	$ 158,065	4,809	$ 724,017,294
Commercial	122	$ 29,854,420	$ 13,105,122	31	$ 2,005,448	153	$ 44,964,990
Industrial	129	$ 430,677,636	$ 22,699,038	64	$ 2,834,424	193	$ 456,211,098
Agricultural	3,688	$ 354,782,090	$ 607,557,286	2,595	$ 420,964,402	6,283	$ 1,383,303,778
Institutional	100	$ 26,000,444	$ 8,981,493	442	$ 12,157,995	542	$ 47,139,932
Other	52	$ 2,476,133	$ 2,543,252	607	$ 9,463,670	659	$ 14,483,055
Total	**8,892**	**$ 1,378,211,587**	**$ 844,324,556**	**3,747**	**$ 447,584,004**	**12,639**	**$ 2,670,120,147**

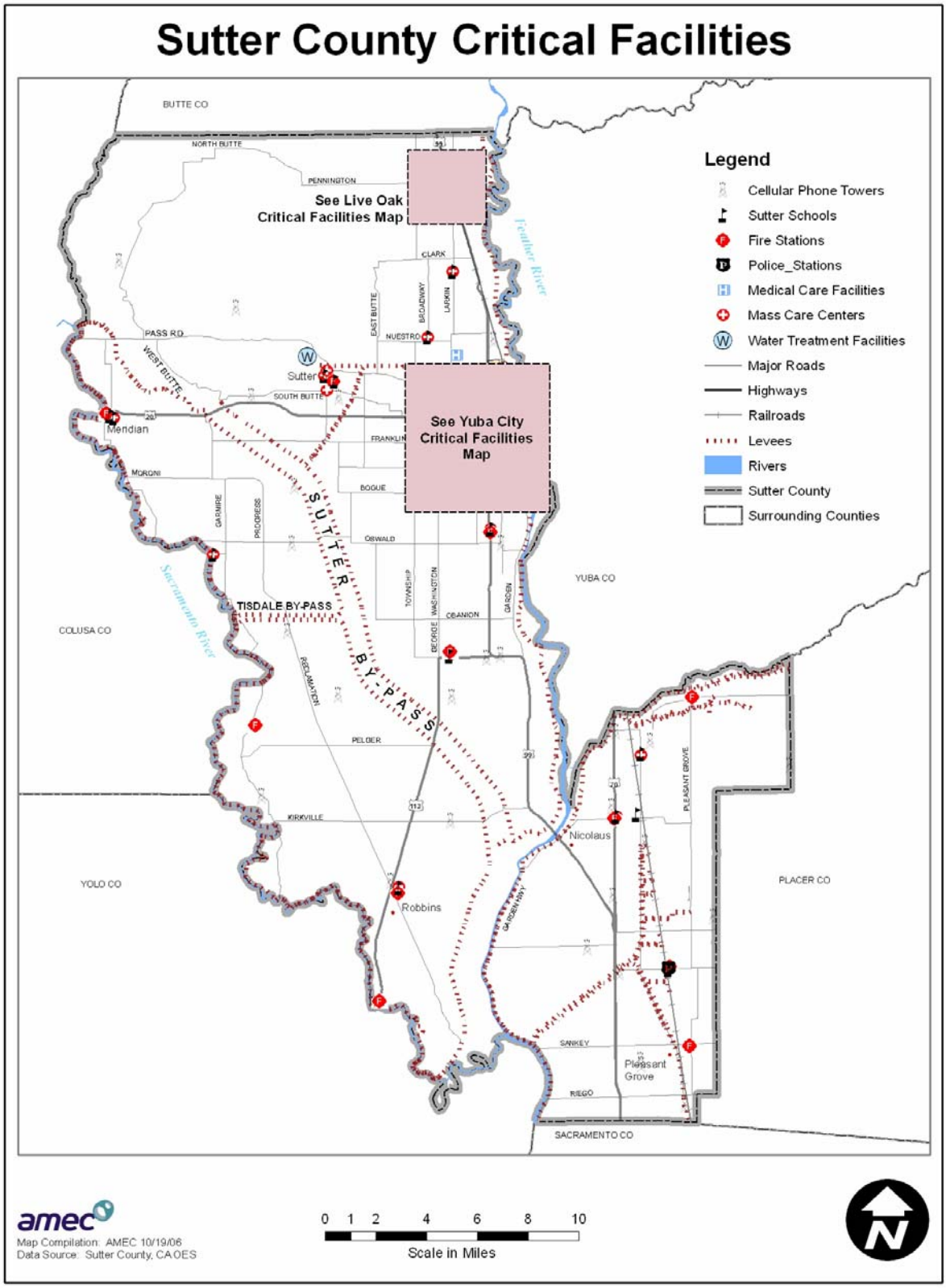
Critical Facilities Inventory

The critical facilities in Unincorporated Sutter County are listed below and provided in the map that follows.

Unincorporated Sutter County Critical Facilities	
Owner	**Critical Facility**
Various	Cellular Phone Tower
Verizon Wireless	Cellular Phone Tower
Airtouch	Cellular Phone Tower
At&T	Cellular Phone Tower
Nextel	Cellular Phone Tower
Airtouch	Cellular Phone Tower
Nextel	Cellular Phone Tower
American Tower Co.	Cellular Phone Tower
American Tower Corp.	Cellular Phone Tower
Nextel	Cellular Phone Tower
Airtouch & At&T	Cellular Phone Tower
	Cellular Phone Tower
Airtouch	Cellular Phone Tower
American Tower	Cellular Phone Tower
At&T And Sbc	Cellular Phone Tower
Sprint Pcs	Cellular Phone Tower
Nextel	Cellular Phone Tower
Rcs Wireless	Cellular Phone Tower
Airtouch And Nextel	Cellular Phone Tower
At&T	Cellular Phone Tower
Airtouch & Nextel	Cellular Phone Tower
Cingular Wireless	Cellular Phone Tower
At&T	Cellular Phone Tower
	Cellular Phone Tower
Sba Comm.	Cellular Phone Tower
	Cellular Phone Tower
Nextel	Cellular Phone Tower
At&T And Nextel	Cellular Phone Tower

Unincorporated Sutter County Critical Facilities	
Owner	**Critical Facility**
Nextel	Cellular Phone Tower
	Cellular Phone Tower
American Tower Corp.	Cellular Phone Tower
Mci	Cellular Phone Tower
Meridian #65	Fire Station
Sutter #6	Fire Station
Oswald-Tudor #8	Fire Station
Sutter Basin	Fire Station
Oswald Tudor #2	Fire Station
Sutter Basin	Fire Station
Sutter Basin	Fire Station
East Nicolaus #2	Fire Station
East Nicolaus #85	Fire Station
Pleasant Grove #9	Fire Station
Pleasant Grove #2	Fire Station
Sutter County Sheriff	Police Station
Brittan School	Mass Care Center
Meridian Elementary School District	Mass Care Center
Sutter High School	Mass Care Center
Sutter United Methodist Church	Mass Care Center
Sutter Youth Organization	Mass Care Center
Winship Elementary School	Mass Care Center
Encinal School	Mass Care Center
Live Oak Church Of The Brethren	Mass Care Center
Nuestro School	Mass Care Center
Adventist Christian School	Mass Care Center
Barry School	Mass Care Center
Central Gaither School	Mass Care Center
Grace Baptist Church/Christian Sch	Mass Care Center
Lincrest School	Mass Care Center
Robbins School	Mass Care Center
Yc Assembly Hall Of Jehovah'S Witn	Mass Care Center
Browns Elementary School District	Mass Care Center
Marcum-Illinois School District	Mass Care Center
Pleasant Grove School	Mass Care Center
Colusa County Fairgrounds	Mass Care Center
Placer County Fairgrounds	Mass Care Center
Silver Dollar Fairgrounds	Mass Care Center
Willow Glen Care Center Nursing Home	Medical Care Facility
Sungarden Rest Home Nursing Home	Medical Care Facility
Brittan Elementry School District	School
Browns Elementry School District	School
East Nicolaus Joint Union High School	School

Unincorporated Sutter County Critical Facilities	
Owner	**Critical Facility**
District	
Marcum-Illinois Union School District	School
Franklin Elementry School District	School
Encinal Elementry School	School
Meridian Elementary School District	School
Nuestro Elementary School District	School
Pleasant Grove Joint Union School District	School
Sutter Union High School District	School
Winship Elementary School District	School
Barry Elementary School	School
Central Gaither Elementary School	School
Lincrest Elementary School	School
Robbins Elementary School	School
Meridian School District	School
Grace Christian Academy And Pre-School	School
Adventist Christian School	School
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Seepage Station	Wastewater Treatment Facility
Water Tank	Wastewater Treatment Facility


Sutter County Critical Facilities
BUTTE CO
NORTH BUTTE
PENNINGTON
See Live Oak Critical Facilities Map
CLARK
Feather River
EAST BUTTE
BROADWAY
LARKIN
NUESTRO
PASS RD
WEST BUTTE
Sutter
SOUTH BUTTE
Meridian
See Yuba City Critical Facilities Map
FRANKLIN
MORONI
BOGUE
GARMIRE
PROGRESS
SUTTER BY-PASS
OSWALD
TOWNSHIP
WASHINGTON
GARDEN
YUBA CO
Sacramento River
TISDALE BY-PASS
COLUSA CO
CEANION
GEORGE
RECLAMATION
PELDER
KIRKVILLE
Nicolaus
PLEASANT GROVE
YOLO CO
Robbins
GRIDLEY HWY
PLACER CO
SANKEY
Pleasant Grove
RIEGO
SACRAMENTO CO
Legend
Cellular Phone Towers
Sutter Schools
Fire Stations
Police_Stations
Medical Care Facilities
Mass Care Centers
Water Treatment Facilities
Major Roads
Highways
Railroads
Levees
Rivers
Sutter County
Surrounding Counties
amec
Map Compilation: AMEC 10/19/06
Data Source: Sutter County, CA OES
0 1 2 4 6 8 10
Scale in Miles
N

Cultural and Natural Resources at Risk

Cultural and natural resources in unincorporated Sutter County include those previously identified in the county inventory and as identified below:

Cultural Resources

- State Historical Landmarks
  - Sutter Hock Farm
  - Site of Propagation of the Thompson Seedless Grape
  - Portions of Bogue Road
  - East of Garden Highway, north of Tudor – Sutter's Hock Farm and area
  - Northeast corner Township and O'Banion Roads – Site of Old Bailey Home
  - Southwest corner Garden Highway an O'Banion Road – Old C.E. Sullivan Ranch
  - Star Bend Road (north of Tudor) – Approximate area of A.Fl Abbott Ranch
  - Tudor Road – Old Saunders Home
  - Wilson Road – Wilson Station
  - Kirkville Road – Chandler Station Site
  - Nicolaus – Site of Sam Brannan's "White House"
  - Nicolaus – Town of Nicolaus
  - East Nicolaus – Town of East Nicolaus
  - Rio Oso, Pleasant Grove and Bear River – Scenic Drive, Towns of Rio Oso and Pleasant Grove
  - North of Verona – Drive, Town of Verona
  - Kirkville – Townsite
  - .2 miles south of Tisdale Weir on Cranmore Road - Wooley's Grave
  - Cranmore – Townsite
  - Tisdale Road – Hunter Children burial site
  - Grimes – Grimes Ferry Crossing and Town of Brimes
  - Wilbur Road, Meridian – Brick house
  - Sycamore – Sycamore Ferry Crossing and Town of Sycamore
  - State Highway 20 – Site of Old Meridian Grammar School
  - Corner of Third and Bridge – Old Sacramento Northern Railroad Station Building
  - Meridian – Town of Meridian
  - Pass and West Butte Roads – Townsite of West Butte
  - Pass and West Butte Roads – Original West Butte School
  - Pass Road – Stone Fences
  - Sutter Buttes, north of Pass Road – Unusual rock formations and strata
  - Sutter Buttes, north of Pass Road – Old Moore Betty House
  - Pass Road – House of Carl DeWitt
  - Pass Road – Fremont Monument
  - Pass Road – Old George E. Britton House
  - Acacia Avenue – Town of Sutter
  - South Butte Road – Stohlman Cemetery
  - South Butte Road – Slough School

- West Butte Road – The Thompson Seedless Grape originated here near where the William Thompson Sr. Ranch was located
- West Butte Road – Fredrick Tarke House
- West Butte Road – Near the site of the firs oil well in 1866
- West Butte Road – Rock fence on west side of road
- West Butte Road – Early settlement of Noyesburg
- West Butte Road – Farm country, hunting refuge, and Bragg Canyon
- West Butte Road – Abandoned titan missile site
- North Butte Road – Old Pierce House
- North Butte Road – Spillman Grave site
- North Butte Road – Pennington Townsite
- North Butte Road – Site of North Butte School and Lodge historical marker
- North Butte Road – Site of Peace Valley Cemetery, Historical Monument
- North Butte Road – Old Cornelius Williams House
- Pennington Road – Dow Brove, site of Farm Bureau picnics in 1920s
- East Butte Road – Site of Camp Bethel
- East Butte Road – Albert N. Smith House
- East Butte Road – E.J. Howard House
- East Butte Road – Old Union District Grammar School site
- Butte House Road – Site of Old Butte House
- 2234 California Street, Sutter – Old Felts Building
- Corner of California and Nelson Streets, Sutter, Native Daughters of the Golden West Hall, Local 226
- Butte House Road – Sutter Cemetery
- Acacia Avenue, Sutter – Old Sacramento Northern Railway Depot
- Humphrey Road – Site of early Humphrey Station Stop
- Clark Road – Old House of "Southern Style"
- Live Oak Highway – Sutter's Hock Farm Historical Monument
- Live Oak Highway – Site of Berg station, Southern Pacific Railroad
- Live Oak Highway – Site of the old Berg Ranch

Natural Resources

- Northern Hardpan Vernal Pool
- Coastal and valley Freshwater Marsh
- Great Valley Cottonwood Riparian Forest
- Great Valley Mixed Riparian Forest
- Sutter Buttes
- Sutter Wildlife Reserve
- Bicentennial Living Witness Tree

Development Trends

According to the 2015 Housing Element of the Sutter County General Plan, growth in the unincorporated county continues at a steady rate. From 2000 to 2015, population is projected to grow by 10,420 from 37,110 to 47,530. This is an annual growth rate of 1.7%. In order to

accommodate this growth rate, unincorporated Sutter County is expected to need an additional 17,597 housing units by 2015. This is a 28.1% increase over unincorporated area housing units in 2000. However, potential housing based on vacant and underdeveloped land can only support a maximum of 4,705 residential units based on a mix of high density, medium density, and low density areas. Maps included on pages 147-150 provide an inventory and assessment of parcels available for single and multi-family residential development. All parcels included in the inventory are within the spheres-of-influence and near the cities of Live Oak and Yuba City.

Vulnerability to Flood

Flood Problem Description

Unincorporated Sutter County is susceptible to four types of floods: localized flooding, riverine (slow rise) flooding, levee failure/overtopping, and dam failure as previously described in Section 4.1 of the Risk Assessment.

The Sutter County Waterway System

Positioned on an alluvial plain between the Sacramento River on the west and the Feather River on the east, the Sutter County Planning Area lies entirely within the Sacramento River watershed and within the Sutter and Butte Drainage basins. In the southeastern portion of the county lies another alluvial plain situated south of the Bear River and east of the Feather River. These alluvial plains were geologically formed by water running over the stream banks during naturally occurring historic floods.

Sutter County includes both natural and manmade waterways. In addition to the Sacramento, Feather, and Bear Rivers, natural waterways include Coon Creek, Pleasant Grove Creek, Markham and Auburn Ravines in the southeastern portion of the county, the Snake River on the east side of the Sutter Buttes, and other smaller streams and sloughs located throughout the county. Manmade waterways form an extensive network and are used for flood control as well as to convey irrigation water and to provide drainage channels from the croplands. Manmade waterways include, the Sutter and Tisdale Bypasses, the Natomas Cross Canal, the Natomas East Main Drainage Canal, Gilsizer Slough.

Drainage and stormwater runoff, in addition to natural waterways, all contribute to potential flooding in unincorporated Sutter County and are all discussed in this section.

The more notable of these features are described in further detail below.

Sacramento River. The Sacramento River, the largest river in the State, extends for approximately 70 miles along the western border of Sutter County. Historically, the river has carved out a wide floodplain outside of its existing banks. The river provides drainage for all of Sutter County and the Sacramento Valley through a system of levees and bypasses completed in the 1920s. The final outlet of the water is the Delta and eventually, the San Francisco Bay. The river supports various

recreational and boating activities, agricultural irrigation and diverse wildlife habitats. No communities in Sutter County use the river as a source of domestic or municipal water supply.

The State DWR established the Sacramento River Flood Control Project to implement flood protection programs for the river and its tributaries. The upper portion of the river is controlled by Shasta Dam, Whiskeytown Dam and Keswick Dam.

Feather River. The Feather River extends approximately 45 miles through Sutter County, forming part of the east Sutter County boundary. The Feather River reaches its confluence with the Sacramento River at the southern County boundary near Verona. Similar to the Sacramento River, the Feather River provides for recreational activities, agricultural irrigation and a diverse wildlife habitat. The river is listed as navigable below the City of Yuba City; however, due to siltation caused by past mining practices in the Sierra Foothills and lack of maintenance, only small boats can pass.

The Feather River is also part of the Sacramento River Flood Control Project managed by the State DWR. Upstream the river is controlled by the Oroville Dam in Butte County.

Bear River. The Bear River roughly parallels about 11 miles of the eastern County boundary, entering the County from Placer County and crossing the boundary at several points. The river flows in a south-southwest direction until it joins the Feather River about one mile north of the town of Nicolaus. Although smaller than either the Sacramento or Feather Rivers, the Bear River also provides recreational opportunities, agricultural irrigation water and a diverse wildlife habitat. River flows are controlled by the Camp Far West Reservoir in Yuba County.

Sutter Bypass. The Sutter bypass, part of the Sacramento Flood Control Project, is an artificial flood control corridor approximately 3/4 mile wide, bordered by two parallel channels. The Bypass extends from the Sacramento River in the northwest portion of the County, north of Pass Road, and proceeds west of the Sutter Buttes continuing generally in a south-southeast direction for approximately 27 miles where it intercepts the Feather River about three miles south of Nicolaus. The Sutter Bypass collects flood overflow water from the Sacramento River after passing through Butte Slough and the Butte Sink.

Tisdale Bypass. The Tisdale Bypass, another flood control corridor, extends for approximately four miles due west from the Sutter Bypass.

Major Sources of Flooding/Problem Areas

Floodwaters are a common occurrence for communities adjacent to and in the lowlands of rivers in Sutter County. Normally, wintertime storm floodwaters are kept within defined limits by levees, dykes, and open lowlands and cause no damage. Dams located outside Sutter County boundaries such as Oroville, Bullards Bar, and Shasta also help control floodwaters. But, occasionally, a combination of frequent storms, extended heavy rain, and melting snow results in floodwaters exceeding normal high-water boundaries and causing damage.

Given their location relative to the county, the Feather and Sacramento Rivers and associated tributaries present the greatest flood potential to the Sutter County Planning Area including areas of the unincorporated county.

Flooding during periods of excessive rainfall can occur anytime in the Planning Area during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration. Flooding is more severe when previous rainfall has created saturated ground conditions. According to the 1998 FIS for the county, the severity of flooding is often intensified by backwater conditions between stream systems. This occurs when floodwater elevations are increased in lower portions of tributary streams due to the backwater effect from main streams reducing hydraulic gradients and flow-storage areas. The 1998 FIS identified several areas where the high flow of floodwaters cause backwater conditions on other channels:

- High flows on the Sacramento River generate backwater conditions on the lower reaches of the American River and the Cross Canal.
- The American River peak 100-year flows induce backwater conditions in the lower reach of the Natomas East Main Drainage Canal.
- High flows on the Natomas East Main Drainage Canal cause backwater conditions on the lower reaches of Arcade and Dry Creeks.
- High flows on Cross Canal create backwater conditions on Pleasant Grove Creek Canal.

Localized flooding also occurs throughout the county with several areas of primary concern. According to the Sutter County Department of Public Works, numerous roads throughout the county are subject to flooding in heavy rains. In addition to flooding, damages to these areas during heavy storms include, pavement deterioration, washouts, landslides/mudslides, debris areas, and downed trees. The amount and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff. These areas and the types of damages are presented in the following table. Photos of these areas during flood conditions are included in Appendix F.

Unincorporated Sutter County
Localized Flooding Areas

No.	Road Name	Flooding	Pavement Detoriation	Washouts	Landslide Or Mudslides	Debris	Downed Trees
1	Pass Rd	x	x	x	x	x	
2	West Butte Rd.	x	x	x		x	
3	North Butte Rd.	x	x	x		x	x
4	East Butte Rd.	x	x	x		x	x
5	South Butte Rd.	x	x	x		x	x
6	Powell Rd.	x	x	x		x	x
7	Pennington Rd.	x	x	x		x	x
8	Butte House Rd.	x				x	x
9	Kellogg Rd.	x	x	x	x	x	x
10	Lower Pass Rd.	x	x	x		x	x
11	Almond Orchard Rd.	x				x	
12	Hagaman Rd.	x					
13	Metterr Rd.	x	x				
14	Fifield Rd	x		x	x	x	
15	Keyes Rd.	x	x	x			
16	Catlett Rd.	x		x		x	
17	Howsley Rd.	x	x			x	
18	Pleasant Grove Rd.	x	x	x		x	
19	Brewer Rd.	x	x	x		x	x
20	Sacramento Ave.	x	x	x		x	x
21	Reclamation Rd.		x		x		
22	Subaco Rd..		x	x	x		
23	Hicks Rd.	x	x			x	x
24	Hughes	x	x			x	x
25	Oswald	x	x			x	x

Also of concern to the county is the Live Oak Canal area between Pease Road and Schlag Road. The Live Oak canal drains approximately 1/3 of the Yuba City Area and approximately ½ of the Yuba City rural area. Most of the problems are caused by heavy rains combined with inadequate pipe capacity due to increased development in the Yuba City rural area.

FEMA mapping, Insurance Coverage, Claims Paid, and Repetitive Losses

Unincorporated Sutter County joined the NFIP on September 24, 1984. The following table identifies the existing FIRM maps for the unincorporated county.

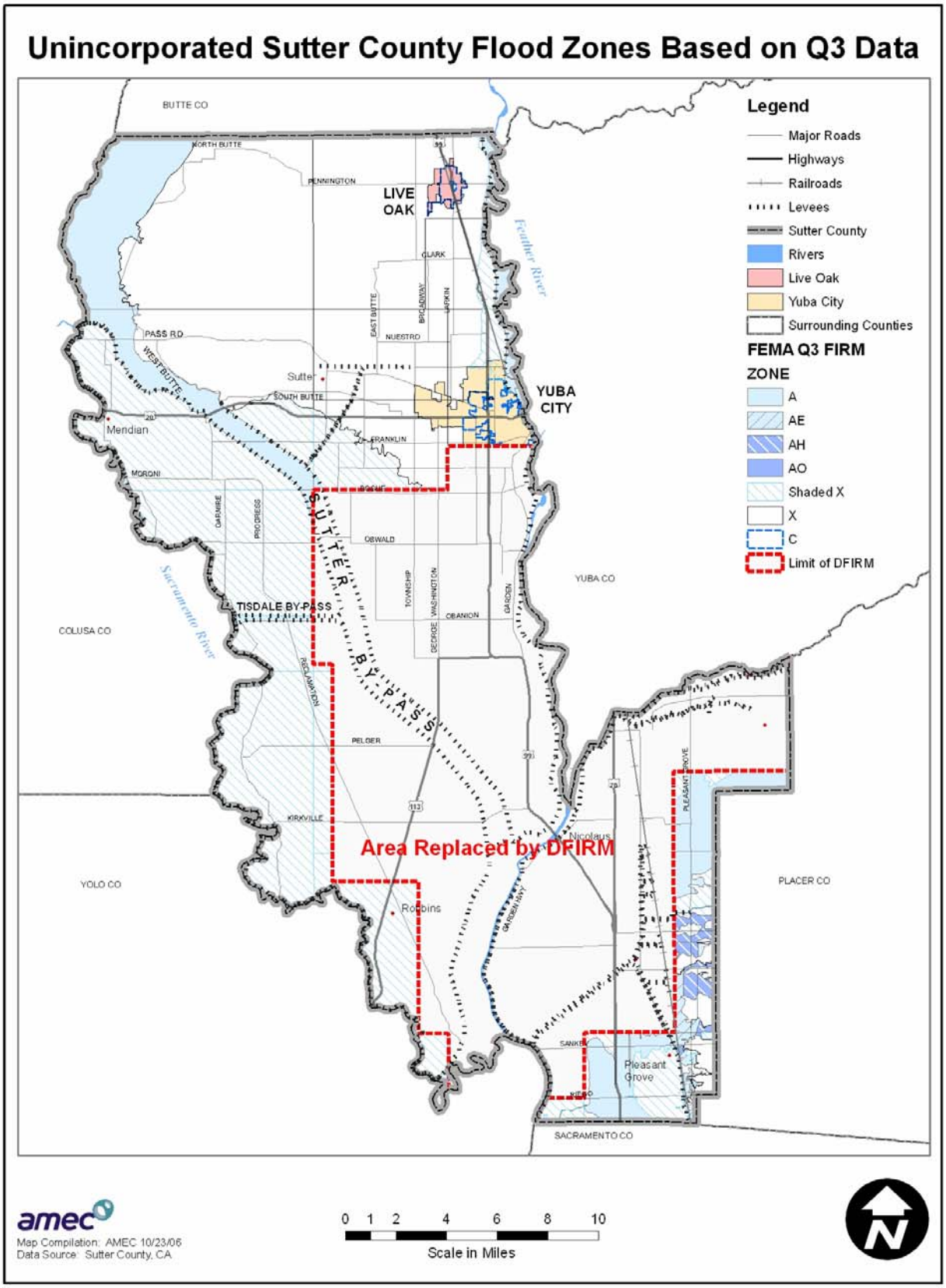
FEMA FIRMs

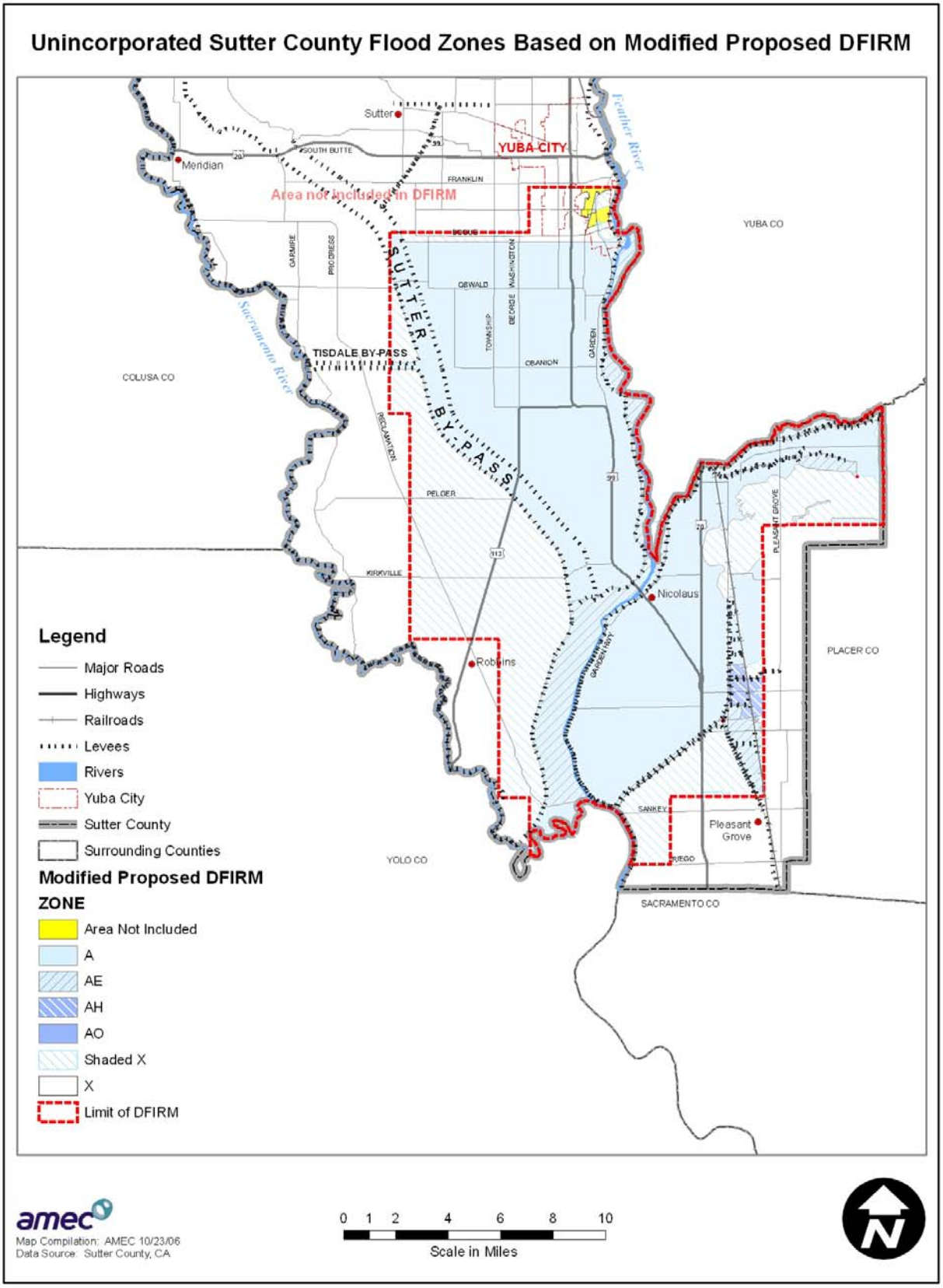
UNINCORPORATED SUTTER COUNTY	
Map Number	**Effective Date**
0603940025B	04/05/1988
0603940035B	04/05/1988
0603940045B	04/05/1988
0603940075B	04/05/1988
0603940085B	04/05/1988
0603940090B	04/05/1988
0603940095B	04/05/1988
0603940125B	04/05/1988
0603940150B	04/05/1988
0603940175B	04/05/1988
0603940200B	04/05/1988
0603940225B	04/05/1988
0603940250D	07/06/1998
0603940255B	04/05/1988
0603940265D	07/06/1998
0603940280C	07/06/1998
0603940285D	07/06/1998
0603940305D*	07/06/1998

*LOMR-F dated 01/23/2003 exists for this map.

However, the southern portion of the county is in the process of having several of the FIRMs (identified above) replaced by the new preliminary draft DFIRMs, dated August 2006, as previously described in Section 4.1 of this plan. It is anticipated that new DFIRMs for the northern portion of the county will replace the remaining paper FIRMs sometime in the next two to three years. The major change associated with these updated maps is that the new DFIRMs do not recognize the existing levee system as being certified. As a result, most of the properties designated as Zone X or Zone C (outside the floodplain) in the paper maps are being re-categorized into 100-year and 500-year flood zones.

As a result of these ongoing map changes, in order to most accurately reflect the current status of FEMA floodplain mapping within the Sutter County Planning Area, the methodology previously described in the vulnerability assessment (on pages 158-164) for the entire Planning Area was followed in creating vulnerability maps and determining values at risk to the 100-year and 500-year flood events for unincorporated Sutter County. The maps on the following pages illustrate the FEMA floodplain data for the unincorporated county.


Unincorporated Sutter County Flood Zones Based on Q3 Data
Legend
Major Roads
Highways
Railroads
Levees
Sutter County
Rivers
Live Oak
Yuba City
Surrounding Counties
FEMA Q3 FIRM
ZONE
A
AE
AH
AO
Shaded X
X
C
Limit of DFIRM
BUTTE CO
YUBA CO
COLUSA CO
YOLO CO
PLACER CO
SACRAMENTO CO
LIVE OAK
YUBA CITY
Feather River
Sacramento River
SUTTER BYPASS
TISDALE BY-PASS
Area Replaced by DFIRM
Sutter
Meridian
Nicolaus
Robbins
Pleasant Grove
NORTH BUTTE
PENNINGTON
CLARK
EAST BUTTE
BROADWAY
LARKIN
NUESTRO
PASS RD
WEST BUTTE
SOUTH BUTTE
FRANKLIN
MORONI
OBWALD
TOWNSHIP
WASHINGTON
GARDEN
OBANION
GEORGE
PELGER
KIRKVILLE
RECLAMATION
PROGRESS
OAKMORE
PLEASANT GROVE
SANKEY
GARDEN HWY
Scale in Miles
0 1 2 4 6 8 10
amec
Map Compilation: AMEC 10/23/06
Data Source: Sutter County, CA


Unincorporated Sutter County Flood Zones Based on Modified Proposed DFIRM
Sutter
Meridian
YUBA CITY
Feather River
Area not included in DFIRM
SOUTH BUTTE
FRANKLIN
YUBA CO
CARMIRE
PROGRESS
GRIDLEY
WASHINGTON
GEORGE
TOWNSHIP
GARDEN
OBANION
SUTTER BYPASS
Sacramento River
TISDALE BY-PASS
COLUSA CO
RECLAMATION
PELDER
KIRKVILLE
Nicolaus
PLEASANT GROVE
PLACER CO
Robbins
GARDEN HWY
SANKEY
Pleasant Grove
RIEGO
YOLO CO
SACRAMENTO CO
Legend
Major Roads
Highways
Railroads
Levees
Rivers
Yuba City
Sutter County
Surrounding Counties
Modified Proposed DFIRM
ZONE
Area Not Included
A
AE
AH
AO
Shaded X
X
Limit of DFIRM
amec
Map Compilation: AMEC 10/23/06
Data Source: Sutter County, CA
0 1 2 4 6 8 10
Scale in Miles
N

NFIP Insurance data indicates that as of 09/12/2006, there are 4,292 flood insurance policies in unincorporated Sutter County resulting in $1,243,764,000 in Insurance in Force. Of these, 94 are located in the A-type Zones; 316 standard and 3,882 preferred policies are located in the B, C, & X Zones. Historically, there have been 87 claims for flood losses totaling $2,304,245. 23 claims were for properties located within the A-type zones and 21 standard and 25 preferred policy holder claims were for properties located within the B, C & X Zone. Only seven of these claims were for Post-FIRM structures. Within the unincorporated county there are a total of three RL buildings within the 100-year floodplain, with six losses totaling $119,096.32. Outside of the 100-year floodplain, there are a total of five RL buildings, with 11 losses totaling $109,237.09.

Values at Risk

The following paragraphs describe the values at risk within unincorporated Sutter County using various data:

- FEMA Q3 Data and Proposed DFRIM Data
- FEMA Q3 Data
- Proposed DFRIM Data

FEMA Q3 Data and Proposed DFRIM Data Floodplain Analysis

After evaluating available insurance flood loss data, the next step was to quantify the flood vulnerability for the unincorporated county. The HMPC used GIS to model and quantify potential flood vulnerability to unincorporated Sutter County within the mapped floodplain areas using FEMA's Q3 and proposed DFIRM floodplain data (as shown in the above maps and described on pages 158-164) and overlaying the information on Sutter County's GIS parcel layers for improved parcels. The parcel layer was linked with the assessor's data to quantify the value of property that potentially lies in a floodplain.

The result of this flood vulnerability analysis presented on the following page summarizes the values at risk in the floodplain of the unincorporated portions of Sutter County.

Unincorporated Sutter County
Flood Hazard – Improved Parcels
Based on FEMA Q3 Data

Unincorporated Sutter County								
	Zone A		Zone AE		Zone AH		Zone AO	
Property Type	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**
Residential	8	$ 559,777	5	$ 399,589	2	$ 278,777	-	$ -
Commercial	1	$ 58,591	2	$ 322,165	1	$ 38,395	-	$ -
Industrial	5	$ 17,240,984	-	$ -	-	$ -	-	$ -
Institutional	4	$ 71,933	-	$ -	-	$ -	-	$ -
Agricultural	120	$ 8,718,373	30	$ 2,170,036	23	$ 2,495,715	2	$ 120,552
Other	-	$ -	1	$ 10,000	-	$ -	-	$ -
Total	**138**	**$ 26,649,658**	**38**	**$ 2,901,790**	**26**	**$ 2,812,887**	**2**	**$ 120,552**

	Shaded Zone X		Zone X		Zone C		Total	
Property Type	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Parcels**	**Improved Value**
Residential	300	$ 23,970,208	2,388	$ 273,196,313	-	$ -	2,703	$ 298,404,664
Commercial	21	$ 4,347,253	39	$ 6,989,031	-	$ -	64	$ 11,755,435
Industrial	40	$ 38,751,231	35	$ 20,049,844	-	$ -	80	$ 76,042,059
Institutional	12	$ 4,795,353	45	$ 14,224,490	-	$ -	61	$ 19,091,776
Agricultural	516	$ 43,907,488	1,282	$ 134,591,314	-	$ -	1,973	$ 192,003,478
Other	7	$ 326,362	29	$ 1,331,067	-	$ -	37	$ 1,667,429
Total	**896**	**$ 116,097,895**	**3,818**	**$ 450,382,059**	**-**	**$ -**	**4,918**	**$ 598,964,841**

Unincorporated Sutter County
Flood Hazard – Improved Parcels
Based on Proposed DFIRM

Unincorporated Sutter County								
	Zone A		Zone AE		Zone AH		Zone AO	
Property Type	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**
Residential	642	$ 62,017,725	28	$ 5,624,801	2	$ 183,586	-	$ -
Commercial	27	$ 4,113,233	2	$ 647,514	-	$ -	-	$ -
Industrial	33	$ 349,657,890	-	$ -	-	$ -	-	$ -
Institutional	21	$ 1,413,474	4	$ 159,221	-	$ -	-	$ -
Agricultural	1,403	$ 137,879,775	77	$ 4,687,515	10	$ 759,998	1	$ 4,162
Other	9	$ 396,309	3	$ 398,114	-	$ -	-	$ -
Total	**2,135**	**$ 555,478,406**	**114**	**$ 11,517,165**	**12**	**$ 943,584**	**1**	**$ 4,162**

	Zone X 500		Zone X		Total	
Property Type	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Parcels**	**Improved Value**
Residential	43	$ 4,523,642	1,376	$ 162,928,291	2,091	$ 235,278,045
Commercial	2	$ 431,951	27	$ 12,906,287	58	$ 18,098,985
Industrial	6	$ 3,084,311	10	$ 1,893,376	49	$ 354,635,577
Institutional	3	$ 205,616	11	$ 5,130,357	39	$ 6,908,668
Agricultural	164	$ 11,795,898	59	$ 7,627,940	1,714	$ 162,755,288
Other	-	$ -	3	$ 14,281	15	$ 808,704
Total	**218**	**$ 20,041,418**	**1,486**	**$ 190,500,532**	**3,966**	**$ 778,485,267**

Base on this analysis, unincorporated Sutter County has significant assets at risk to the 100-year and greater floods. Combining the different types of A Zones (from both tables) which all indicate a risk to the 100-year flood, results in 2,466 improved parcels for a total of $600,303,490 located within the 100-year floodplain. There are also 1,114 improved parcels within the 500-year floodplain totaling $136,139,313.

Comparing these numbers to the insurance data, of the 8,884 total parcels and 2,466 parcels at risk to the 100-year flood, 4,292 of those parcel owners maintain flood insurance. Of these 4,292 policy holders, based on the old FIRMs, only 94 are actually in the 100-year floodplain.

These values can be refined a step further. When a flood occurs seldom does the event cause total destruction of an area. Potential losses from flooding are related to a variety of factors including flood depth, flood velocity, building type, and construction. The percent of damage is primarily related to the flood depth. FEMA's flood benefit/cost module uses a simplified approach to model flood damage based on building type and flood depth. The values at risk in the tables above were further refined assuming an average damage estimation of 20% of the total building value. The 20% damage estimate utilized FEMA's Flood Building Loss Table based on an average flood depth of 4 feet for two-story buildings with no basement.

Application of the 20% damage estimate to the Improved Parcel Value of $600,428,204 results in an estimated $120,085,640 at risk to damage from a 100-year flood within the unincorporated portions of the county. Thus there is a 1% chance in any given year of a 100-year flood causing $120,085,640 in damages. While there are several limitations to this model, it does present a methodology to estimate potential damages. Note, this model may include structures located within the 100-year floodplain that are elevated at or above the level of the base flood elevation, according to local floodplain development requirements. Also, it is important to keep in mind that these assessed values are well below the actual market value of improved parcels located within the 100-year floodplain. Thus the actual value of assets at risk is significantly above those included in the above calculation and tables.

FEMA Q3 Data Floodplain Analysis

The above assessment of values at risk to the 100-year flood utilizes the FEMA Q3 data currently in force for the northern portion of the county combined with the proposed DFIRM data for the southern portion of the county. This methodology was used to best reflect the current flood risk within the Planning Area given the changing status of the FEMA flood maps during this planning process. In order to really appreciate the impact of the DFRIM process to the Planning Area, it is helpful to step back and look at the flood risk and vulnerability using only the FEMA Q3 data for the entire area. As previously described, most of the properties designated as Zone X or Zone C (outside the floodplain) in the Q3 data (paper maps) are being re-categorized into 100-year and 500-year flood zones in the new DFIRMS. As such, looking at the numbers in the DFIRM table above, a large portion of those properties falling in the collective A zones (i.e., 2262 properties) are actually outside of the 100-year floodplain in the older Q3 data. Thus, using only the Q3 data, the values at risk to the 100-year and greater flood would be much less then the $600,428,204 (for the 2,466 located within the 100-year floodplain)

and the $136,139,313 (for the 1,114 improved parcels within the 500-year floodplain) as detailed above.

Proposed DFIRM Data Floodplain Analysis

The first analysis above focused on evaluating impacts to the unincorporated county based on the current (or proposed) FEMA floodplain mapping for the city which includes both the FEMA Q3 data (for most of the county) and the new Draft DFIRM mapping (for areas within the southern portion of the county). Additional DFIRMs will be developed based on the results of the Upper Feather River Study that will replace the remaining Q3 data. This analysis assumes that the resulting DFIRMs covering the remaining portion of the county will be similar in outcome to the DFIRMS generated from the Lower Feather River Study. As previously stated, the major change associated with these updated maps is that the new DFIRMs do not recognize the existing levee system as being certified. As a result, most of the properties designated as Zone X or Zone C (outside the floodplain) in the paper maps (and Q3 data) are being re-categorized into 100-year and 500-year flood zones.

Assuming that DFIRM maps apply to the entire county, county parcel and assessor data were used to provide a worst-case scenario of assets at risk to a 100-year or greater flood. The table below summarizes total assets at risk within the unincorporated county. Until the new study and maps are complete, the actual number and types of parcels falling within the 100-year and 500-year flood zones cannot be determined. As a result, it can only be assumed that the entire county is potentially at risk to flooding without the benefit of levees providing 100-year or more protection.

Unincorporated Sutter County
Total Assets at Risk to the 100-year or greater Flood
(Based on proposed DFRIM mapping of entire County)

UNINCORPORATED SUTTER COUNTY 2006 Roll Values							
	Units	Total Improved	Total Improved	Units	Total Unimproved	Grand Totals	
Property Type	Improved	Value	Land Value	Unimproved	Land Value	Units	$$
Residential	4,801	$ 534,420,864	$ 189,438,365	8	$ 158,065	4,809	$ 724,017,294
Commercial	122	$ 29,854,420	$ 13,105,122	31	$ 2,005,448	153	$ 44,964,990
Industrial	129	$ 430,677,636	$ 22,699,038	64	$ 2,834,424	193	$ 456,211,098
Agricultural	3,688	$ 354,782,090	$ 607,557,286	2,595	$ 420,964,402	6,283	$ 1,383,303,778
Institutional	100	$ 26,000,444	$ 8,981,493	442	$ 12,157,995	542	$ 47,139,932
Other	52	$ 2,476,133	$ 2,543,252	607	$ 9,463,670	659	$ 14,483,055
Total	**8,892**	**$ 1,378,211,587**	**$ 844,324,556**	**3,747**	**$ 447,584,004**	**12,639**	**$ 2,670,120,147**

Critical Facilities at Risk

Critical facilities are those community components that are most needed to withstand the impacts of disaster. Included in this classification are police and fire stations, hospitals, schools that serve as emergency shelters, and lifeline utilities; power, water and sewer system components. A map of the critical facilities within the unincorporated portions of the County is located on page 185. Within the Planning Area many critical facilities are protected by the extensive flood

control system. To additionally protect them individually from the potential failure of the structural flood control systems may be very difficult to justify on a benefit/cost ratio analysis. Still, the impact to the community, should the statistically unlikely catastrophic flood event occur, would be astonishing if also these critical facilities are damaged or destroyed.

Cultural and Natural Resources at Risk

Sutter County has significant cultural and natural resources located throughout the county as previously described. Risk analysis of these resources was not possible due to data limitations. However, natural areas within the floodplain often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters.

Development Trends in Hazard Area

The development trend in the Sutter County Planning Area is steady, significant growth, especially within the existing urban areas.

The Housing Element of the Sutter County General Plan expects the population in the unincorporated county to grow to 47,530 by 2015. This is an additional 10,420 people from the 2000 census estimate of 37,110. Such growth will consume acres of previously undeveloped areas and the impacts may overwhelm existing drainage and flood control facilities.

Master planning for stormwater runoff and adherence to floodplain management regulations for new development should help both new and existing development from the impacts of the 100-year flood.

Vulnerability to Wildfire

Wildfire is primarily a concern to the unincorporated portions of Sutter County. The Sutter Buttes area is identified as a very high fire threat as shown on the map on page 164. All other areas within the county are identified as either a Little to No Threat or a Moderate Threat. Although there have been no large damaging fires in recent history within the county, the potential exists for a damaging fire to occur, especially in the Sutter Buttes and other grassland areas.

Assets/Values at Risk

As previously described, 28 improved parcels valued at $3,970,499 are located within 2,400 meters of the Sutter Buttes. The Towns of Sutter and Meridian are also in somewhat close proximity to the Sutter Buttes, and depending on the nature and extent of a fire in the area, may also be at risk.

The following inventories identify other assets at risk to the Very High Threat of wildfire in unincorporated Sutter County.

Critical Resources

- Cell Towers
- Police, fire, schools, and other critical facilities located in and around the Towns of Sutter and Meridian

Cultural Resources

Cultural resources at risk include those previously described for the county in and around the Sutter Buttes area.

Natural Resources

- Natural resources at risk include those previously described for the county in and around the Sutter Buttes area. Of specific concern is the Sutter Buttes themselves.

Other Identified Hazards: Agricultural Hazards, Dam Failure, Drought, Earthquakes, Severe Weather, and West Nile Virus.

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the Sutter County Planning Area. Thus, the risk assessment for the Sutter County Planning Area also includes and directly corresponds to the unincorporated portions of the county and all incorporated jurisdictions.

CITY OF YUBA CITY

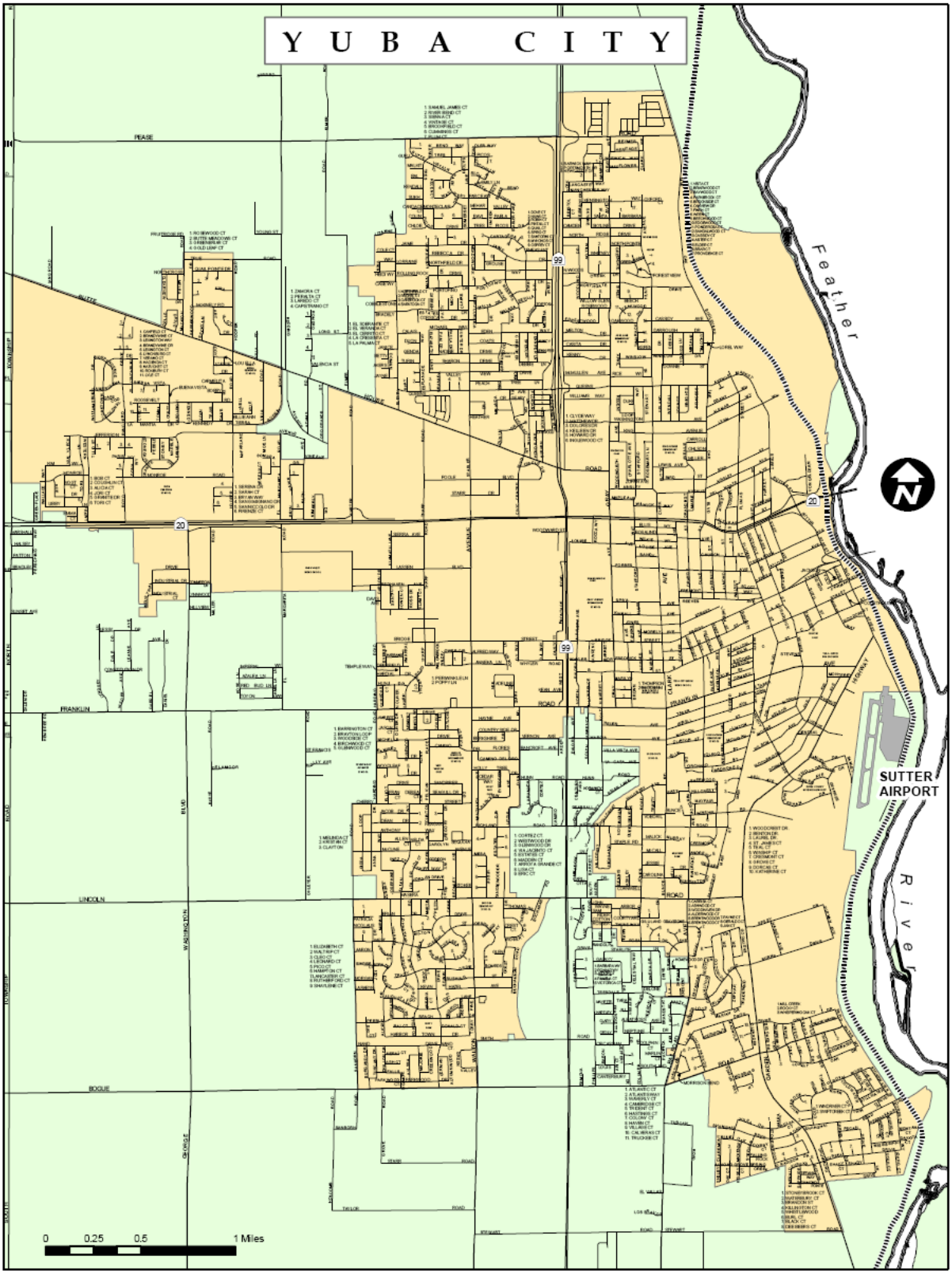
Population: 60,507
Area: 13.887
Elevation: 59 feet above msl

Community Profile

Yuba City (see map on the following page) lies in the northern portion of California's Central Valley, situated in eastern Sutter County on the western bank of the Feather River. Primarily undeveloped agricultural land exists to the north, west, and south of the city. The Sutter Buttes are located to the northwest of the city. The primary transportation corridors are Routes 99 and Route 20. Route 99 leads due south to Sacramento and north to Oroville and Chico; Route 20 links Yuba City to Colusa and I-5 to the west and Grass Valley and the Sierra Nevada range to the east. State Routes 70 and 65 lead south from Marysville, connecting the region to Sacramento and to Sacramento's northern suburbs – Roseville and Rocklin.

On July 27, 1849, at the start of the California Gold Rush, Sam Brannan, Pierson Reading and Henry Cheever purchased land from John Sutter's vast Rancho Nuevo Helvetia holding, near Sutter's Hock Farm. The trio hoped to lay out a town (that developed into the town of Yuba City) that would become the distribution center for supplies going to the gold mines in the nearby Sierra Nevada Mountains. In September 1849 the city was laid out in blocks and squares, leveling Indian burial mounds on the site. The name of that Indian Rancheria was "Youboom". The name appearing on the earliest map was "Yubu" and later changed to Yuba. Yuba City became the county seat of Sutter County in 1856 and was officially incorporated on January 23, 1908. Following incorporation the city soon found ethnic diversity taking root. Mexican immigration to the Sutter County region began in the early 20th Century, followed by the arrival of traditionally agrarian Sikh Indian immigrants. More than a quarter of current city residents now claim either Mexican or Indian heritage.

Yuba City is the center of agricultural and commercial activities in Sutter County. Approximately 75 percent of farmland in Yuba City is classified as Farmland of Statewide Importance and another 15 percent is classified as Prime Farmland. In addition, Yuba City is currently an employment center for the Sutter County region and a bedroom community to Sacramento. However, employment growth has increased at a faster rate than population growth in the last decade and the city now contains more jobs than employed residents. According to the U.S. Census, Yuba City had a population of 36,760 in 2000; 2006 population estimates are at 60,507. Development is occurring in the city to accommodate the rapid population growth. New development is primarily occurring in the Harter Specific Plan Area and the Lincoln East area within the city sphere-of-influence just beyond the current city boundary. Yuba City's sphere-of-influence includes all of the Yuba City Urban Area including the Tierra Buena Area and the Yuba City Urban Area Fringe (approximately 19,350 acres). The boundary of this area is Pease Road to the north, Township Road to the west, Oswald Road to the south and the Feather River to the east.



(Source: Sutter County GIS)

Hazard Summary

Based on information provided by the City of Yuba City, a hazard summary for the City is provided below.

SUMMARY HAZARD ANALYSIS: CITY OF YUBA CITY				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Agricultural Hazards				
Dam Failure				
Drought	Likely	Significant	Critical	Medium
Earthquakes				
Floods	Likely	Significant	Catastrophic	High
Landslides				
Natural Health Hazards: West Nile Virus				
Severe Weather: Extreme Temperatures				
Severe Weather: Severe Fog	Highly Likely	Significant	Limited	Medium
Severe Weather: Winterstorms	Likely	Significant	Limited	Low
Severe Weather: Tornadoes				
Soil Hazards:Erosion				
Soil Hazards: Expansive Soils				
Soil Hazards: Land Subsidence				
Wildfires				
Volcano				

SUMMARY HAZARD ANALYSIS: CITY OF YUBA CITY				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**

Guidelines:

Frequency of Occurrence
Highly Likely: Near 100% probability in next year.
***Likely*:** Between 10 and 100% probability in next year, or at least one chance in ten years.
***Occasional*:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
***Unlikely*:** Less than 1% probability in next 100 years.

Spatial Extent
***Limited*:** Less than 10% of planning area
***Significant*:** 10-50% of planning area
***Extensive*:** 50-100% of planning area

Potential Magnitude
***Catastrophic*:** More than 50% of area affected
***Critical*:** 25 to 50%
Limited: 10 to 25%
***Negligible*:** Less than 10%

Significance (Your subjective opinion)—***Low***, ***Medium***, ***High***

Information provided by the HMPC identified the following hazard as the most significant to the City of Yuba City:

- Floods

Vulnerability Assessment

This vulnerability assessment quantifies the vulnerability of City of Yuba City in the event of a catastrophic event and also provides an assessment of the areas vulnerability to floods and wildfire.

Assets/Values at Risk

Utilizing Sutter County assessor data, the total assessed values for the City of Yuba City are:

CITY OF YUBA CITY 2006 Roll Values							
	Units	Total Improved	Total Improved	Units	Total Unimproved	Grand Totals	
Property Type	Improved	Value	Land Value	Unimproved	Land Value	Units	$$
Residential	15,893	$ 2,364,181,182	$ 720,568,875	35	$ 4,198,380	15,928	$ 3,088,948,437
Commercial	793	$ 462,986,037	$ 168,461,437	115	$ 41,274,950	908	$ 672,722,424
Industrial	305	$ 98,995,131	$ 30,322,762	88	$ 21,859,440	393	$ 151,177,333
Agricultural	40	$ 4,851,612	$ 4,525,987	14	$ 3,168,316	54	$ 12,545,915
Institutional	101	$ 95,232,482	$ 10,728,610	138	$ 12,425,746	239	$ 118,386,838
Other	48	$ 6,090,314	$ 2,115,466	945	$ 56,343,411	993	$ 64,549,191
Total	**17,180**	**$ 3,032,336,758**	**$ 936,723,137**	**1,335**	**$ 139,270,243**	**18,515**	**$ 4,108,330,138**

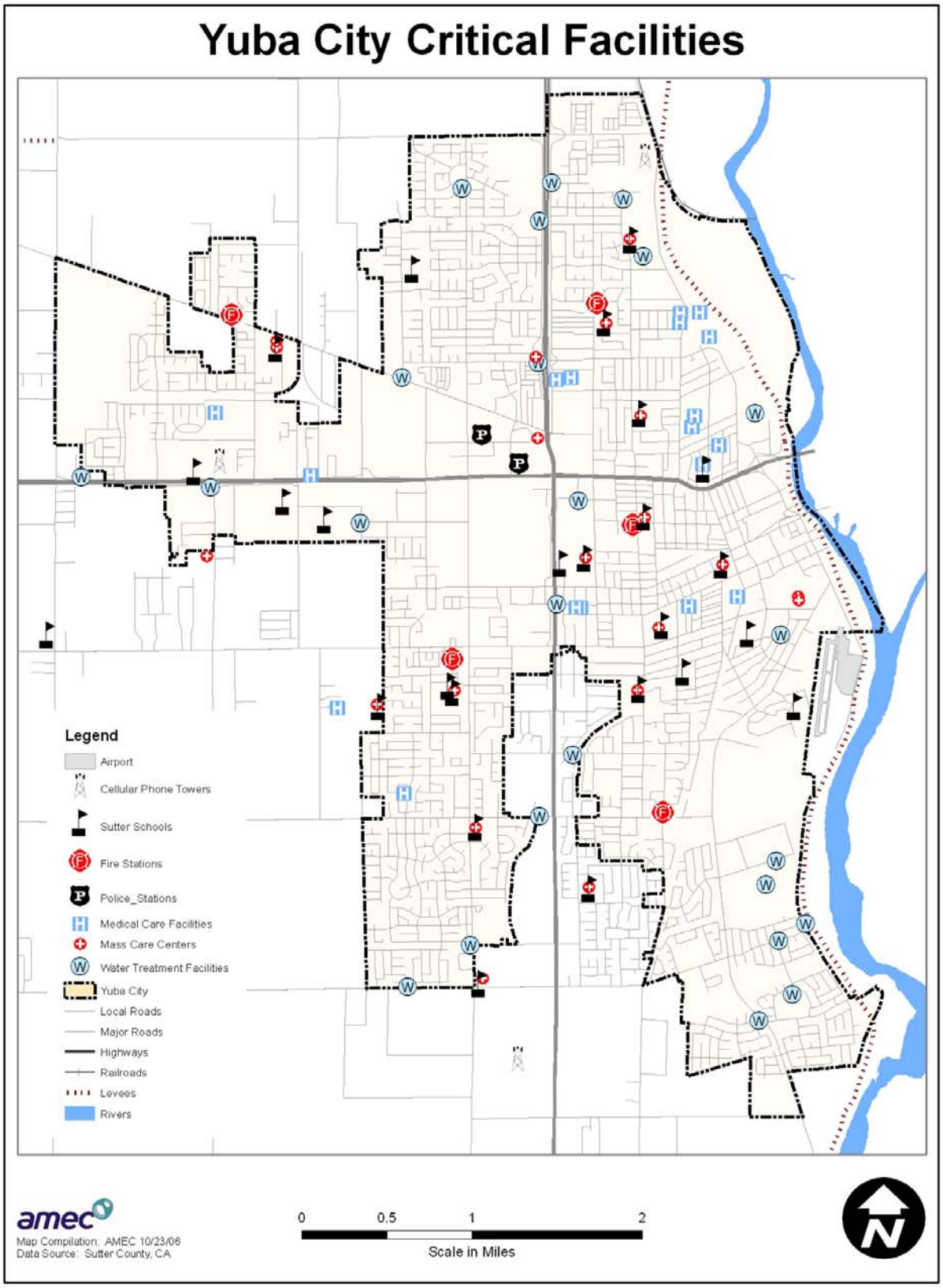
Critical Facilities Inventory

The critical facilities in the City of Yuba City are listed below and provided in the map that follows.

Yuba City Critical Facilities	
Owner	**Critical Facility**
Verizon Wireless	Cellular Phone Tower
Airtouch	Cellular Phone Tower
Yuba City Fire #7	Fire Station
Yuba City Fire #2	Fire Station
Yuba City Fire #1	Fire Station
Yuba City Fire #4	Fire Station
Yuba City Fire #3	Fire Station
California Highway Patrol Office	Law Enforcement Agency
Sutter County Sheriff's Department/County Jail	Law Enforcement Agency
Yuba City Police Department	Law Enforcement Agency
Tierra Buena Elementary School	Mass Care Center
Albert Powell High School	Mass Care Center
Andros Karperos School	Mass Care Center
April Lane School	Mass Care Center
Bridge Street School	Mass Care Center
Church Of Christ	Mass Care Center
First Lutheran School	Mass Care Center
Gray Avenue Middle School	Mass Care Center
King Avenue School	Mass Care Center
St. Isidore's School	Mass Care Center
Yuba City High School	Mass Care Center
Veterans Memorial Hall	Mass Care Center
Lincoln School	Mass Care Center
Yuba/Sutter Fairgrounds	Mass Care Center
Tierra Buena Elementary School	Mass Care Center
Sierra Vista Facility	Medical Care Facility
Fremont Hospital	Medical Care Facility
Sutter Yuba Mental Health Hospital	Medical Care Facility
North Valley Behavioral Health Hospital	Medical Care Facility
Courtyard Assisted Living Nursing Home	Medical Care Facility
Emmanuel Health Care Center Nursing Home	Medical Care Facility
Fountains Skilled Nursing Home	Medical Care Facility
Yuba City Care Center Nursing Home	Medical Care Facility
Feather River Surgery Center Surgical Center	Medical Care Facility
Sutter North Surgery Center Surgical Center	Medical Care Facility
Barreras Senior Care Nursing Home	Medical Care Facility
Creekside Country Manor Nursing Home	Medical Care Facility

Yuba City Critical Facilities	
Owner	**Critical Facility**
Dorothy's Care Home Nursing Home	Medical Care Facility
Golden Years Residential Nursing Home	Medical Care Facility
Konda's Assisted Living Nursing Home	Medical Care Facility
Summerfield Care Center Nursing Home	Medical Care Facility
Yuba City Manor Nursing Home	Medical Care Facility
Rcca Colusa Nursing Home	Medical Care Facility
Sutter County Sheriff	Police Station
Yuba City Police Department	Police Station
Feather River Academy	School
Yuba City Unified School Distict	School
Gray Avenue Middle School	School
Albert Powell High School	School
Andros Karperos School	School
April Lane Elementary School	School
Yuba City High School	School
Bridge Street Elementary School	School
Butte Vista School	School
Child Development Programs	School
King Avenue Elementary School	School
Lincoln Elementary School	School
Park Avenue Elementary School	School
Tierrra Buena Elementary School District	School
West Walton Elementary School	School
Faith Christian High School	School
Faith Christian Elementary School	School
St. Isadore'S Catholic School	School
First Baptist Academy	School
First Lutheran Elementary School	School
River Valley High School	School
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility

Yuba City Critical Facilities	
Owner	**Critical Facility**
Storm Lift Station	Wastewater Treatment Facility
Storm Lift Station	Wastewater Treatment Facility
Storm Lift Station	Wastewater Treatment Facility
Storm Lift Station	Wastewater Treatment Facility
Storm Lift Station	Wastewater Treatment Facility
Wastewater Treatment Plant	Wastewater Treatment Facility
Water Treatment Plant	Wastewater Treatment Facility


Yuba City Critical Facilities
Legend
Airport
Cellular Phone Towers
Sutter Schools
Fire Stations
Police_Stations
Medical Care Facilities
Mass Care Centers
Water Treatment Facilities
Yuba City
Local Roads
Major Roads
Highways
Railroads
Levees
Rivers
amec
Map Compilation: AMEC 10/23/06
Data Source: Sutter County, CA
0
0.5
1
2
Scale in Miles
N

Cultural and Natural Resources at Risk

Cultural and natural resources in City of Yuba City include those previously identified in the County inventory and as detailed below:

Cultural Resources

- 774 B Street – E.G. Van Arsdale House
- 819 Shasta Street – A.C. McLaughlin Law Office
- 442 B Street – Sutter County Canning/Packing Company
- 334 C Street – The Stabler-Swinson House
- 241 C Street – Butler House
- 212 C Street – Old Harkey House
- 500 2nd Street – Sanborn Law Office
- 446 2nd Street – Sutter County Courthouse
- 446 2nd Street – Sutter County Hall of Records
- 423 2nd Street – Thomas D. Boyd House
- 422 2nd Street – McCampbell House
- 413 2nd Street – Rose Carpenter House
- 379 2nd Street – McGruder House
- 360 2nd Street – Eugene Boyd House
- 329 2nd Street – William O'Banion House
- Harter Road – Harter House
- 2078 Colusa Highway – Jake Onstott House

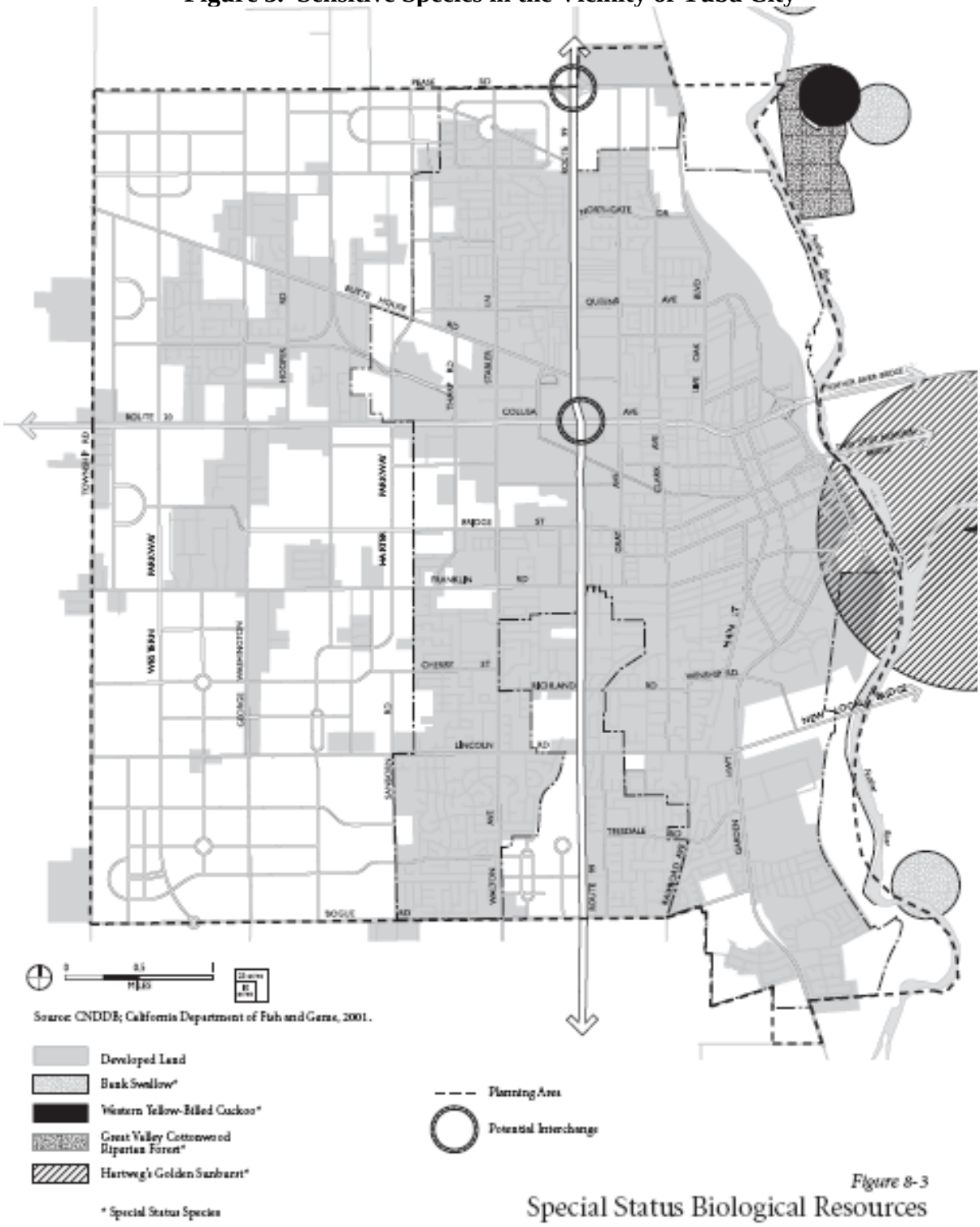
Natural Resources

The list of protected plant and wildlife species previously identified in the county inventory includes information regarding the potential for a particular species to occur in the City of Yuba City. Those species with a moderate or high potential are listed below.

- Hartweg's Golden Sunburst (High)
- Western Yellow billed cuckoo(Moderate)
- Bank swallow (Moderate)

The following map taken from the City of Yuba City General Plan Update shows the locations of sensitive species recorded in the vicinity of Yuba City.

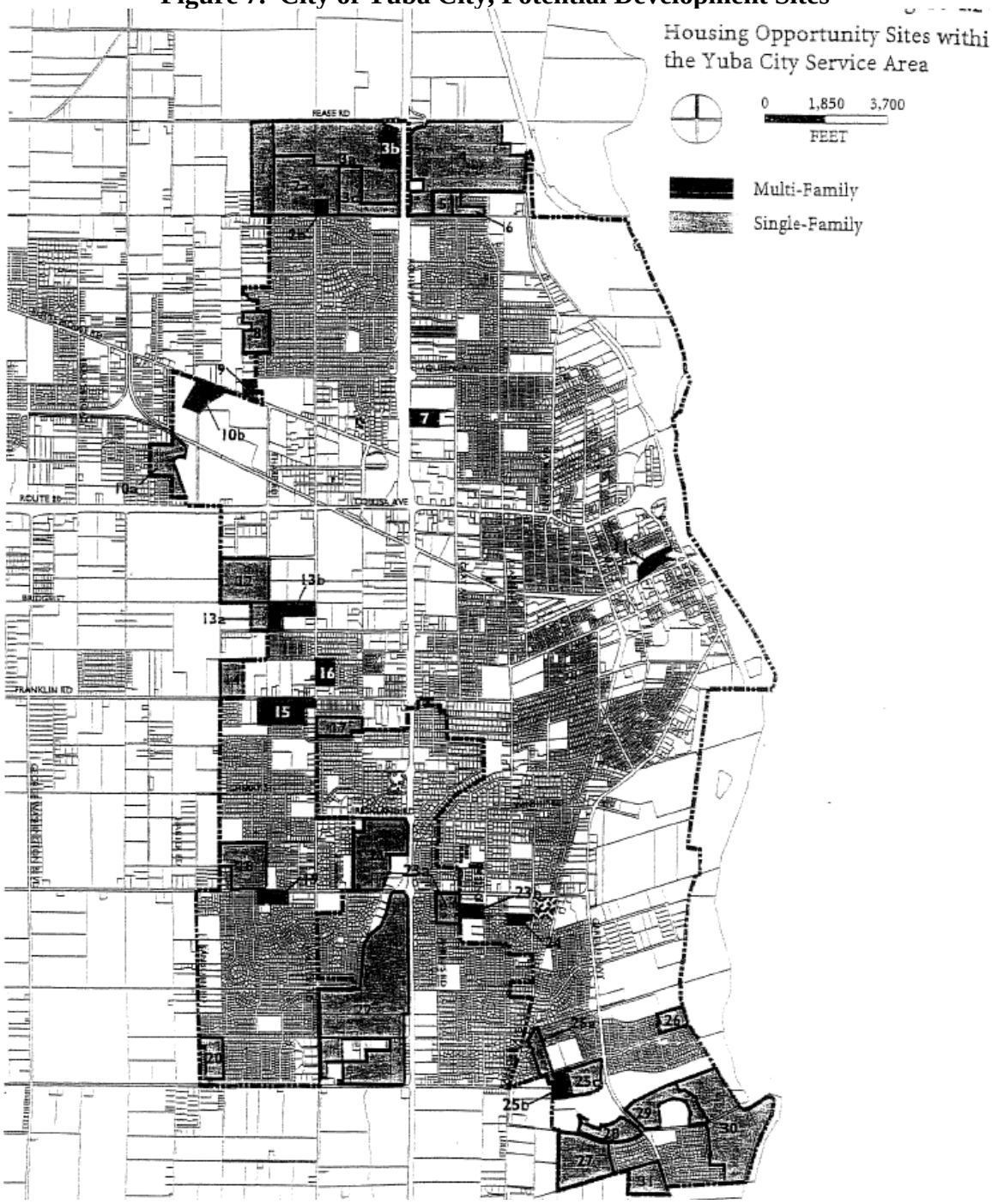
Figure 3. Sensitive Species in the Vicinity of Yuba City



Development Trends

According to the 2003 Housing Element of the City of Yuba City General Plan, growth in the city is increasing rapidly. Between 2000 and 2006, the population of the city increased from 36,760 to 60,507. New development areas identified in the Yuba City General Plan include the Harter area on the north side of Shanghai Bend Road, west of Garden Highway and the Lincoln East area on the north side of Lincoln Road, east of Sanborn Road. The following map shows these areas.

Figure 7. City of Yuba City, Potential Development Sites



Vulnerability to Flood

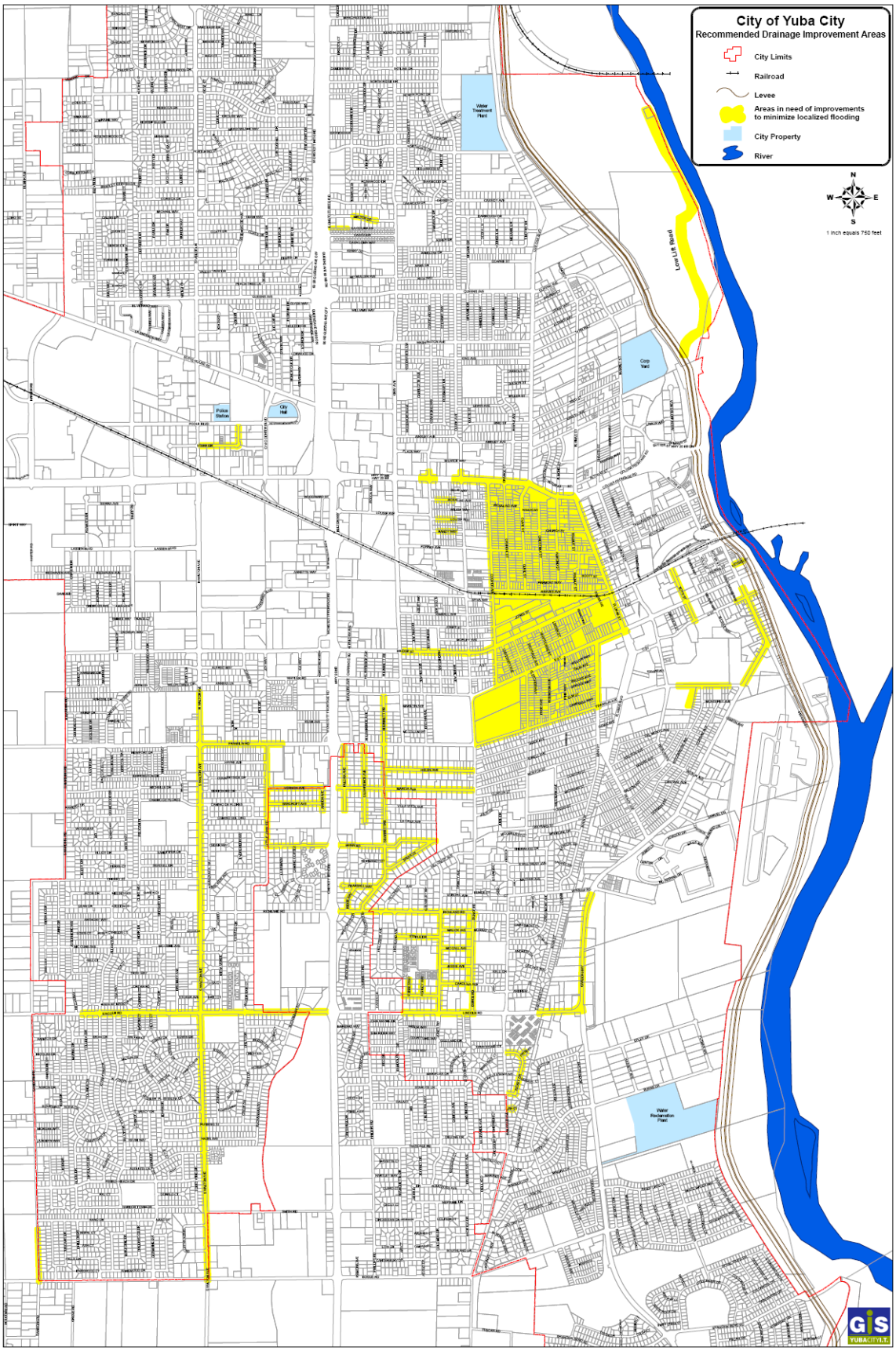
Flood Problem Description

Located on the banks of the Feather River, flooding is a significant hazard to the City of Yuba City. Yuba City is susceptible to four types of floods: localized flooding, riverine (slow rise) flooding, levee/overtopping failure, and dam failure as detailed in Section 4.1 of the Risk Assessment. As previously described, structural flood control measures, including a complex system of levees, earthen embankments, bypasses and weirs, provide the primary defense against flooding in Yuba City and the county.

According to the Yuba City General Plan, the greatest potential threat to the Yuba City Urban Area is flooding resulting from failure of levees along the Feather River. At the time the plan was written, it estimates that approximately 20,000 parcels and upwards of $1 billion in property would be impacted by a failure in the levee system. As previously described in Section 4.1, the USACE has identified several improvements for levees along the Sacramento and Feather rivers in order to increase the level of flood protection.

In addition to a damaging flood resulting from a dam or levee failure, the urban area is highly susceptible to flooding from stormwater runoff. As development continues to occur in the urban area, the increase in impervious surfaces will result in increased overall run-off at an accelerated rate. Ongoing improvements to the drainage infrastructure are being designed and constructed to accommodate this increase in run-off; however, removing run off and flood waters from the urban area does not in itself resolve drainage issues. Lack of downstream channel maintenance and limited flow capacity within the Sutter Bypass can backup flood waters and also contribute to localized flooding issues within the urban area. A map detailing Recommended Drainage Improvement Areas within the City of Yuba City is provided on the following page.

City of Yuba City Recommended Drainage Improvement Areas



(Source: City of Yuba City, Departments of Public Works/GIS)

The Yuba City Waterway System

The Feather River, as previously described, forms the eastern boundary of Yuba City. Drainage facilities within the Yuba City Urban Area include:

- Gilsizer Slough
- Live Oak Canal
- City Systems (facilities within or serving Yuba City)
- Local Improvements (facilities within or serving improvement districts)

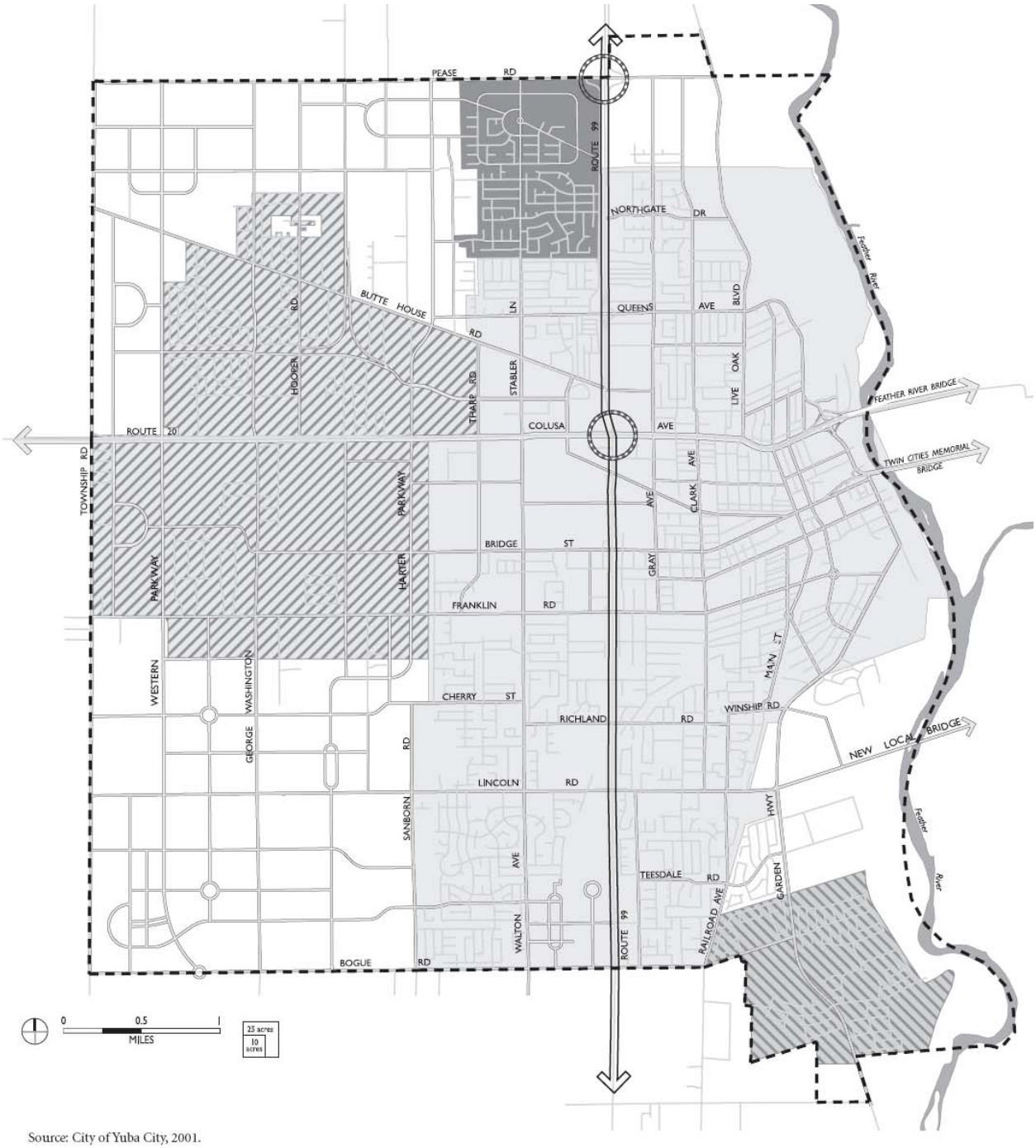
These are described in more detail below.

Gilsizer Slough. The Gilsizer Slough is a natural drainage channel that historically drained the Yuba City and the area south of the urban area. Originally, the Gilsizer Slough was a slough that used to be open to the Feather River in the 1800's, but was closed off to the river to be used as a drainage route for the city. Presently, the Slough discharges to the State Drain, which flows north to State Pumping Plant No. 2, and then into the Sutter Bypass. Tributaries to the Gilsizer Slough include all of Gilsizer County Drainage District, except for a small area of the city north of Colusa Highway which is pumped directly to the Feather River.

Live Oak Canal. The Live Oak "Canal has historically carried stormwater run-off from areas north of Pease Road in an area that is now part of the Tierra Buena County Drainage District. The area north of Pease road is now drained by the State East Interceptor Canal.

City Facilities. Portions of north and south Yuba City are drained to holding ponds. This water is then pumped over the levee into the Feather River. The Garden Highway/Bogue Road area is also pumped into the Feather River. Other drainage projects for the city have been planned and are included in the City's Capital Improvement Program (CIP) for 2110-2006.

A map detailing Drainage Facilities in the Yuba City Urban Area is on the following page.



Source: City of Yuba City, 2001.

- Gilsizer Drainage Area
- North Yuba Drainage Area
- South Ponds Drainage Area
- County Drainage Area

Figure 9-5
Drainage Facilities

(Source: Yuba City General Plan 2004)

FEMA Maps, Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Yuba City joined the NFIP on March 23, 1984. The following table identifies the existing FIRM map for the City.

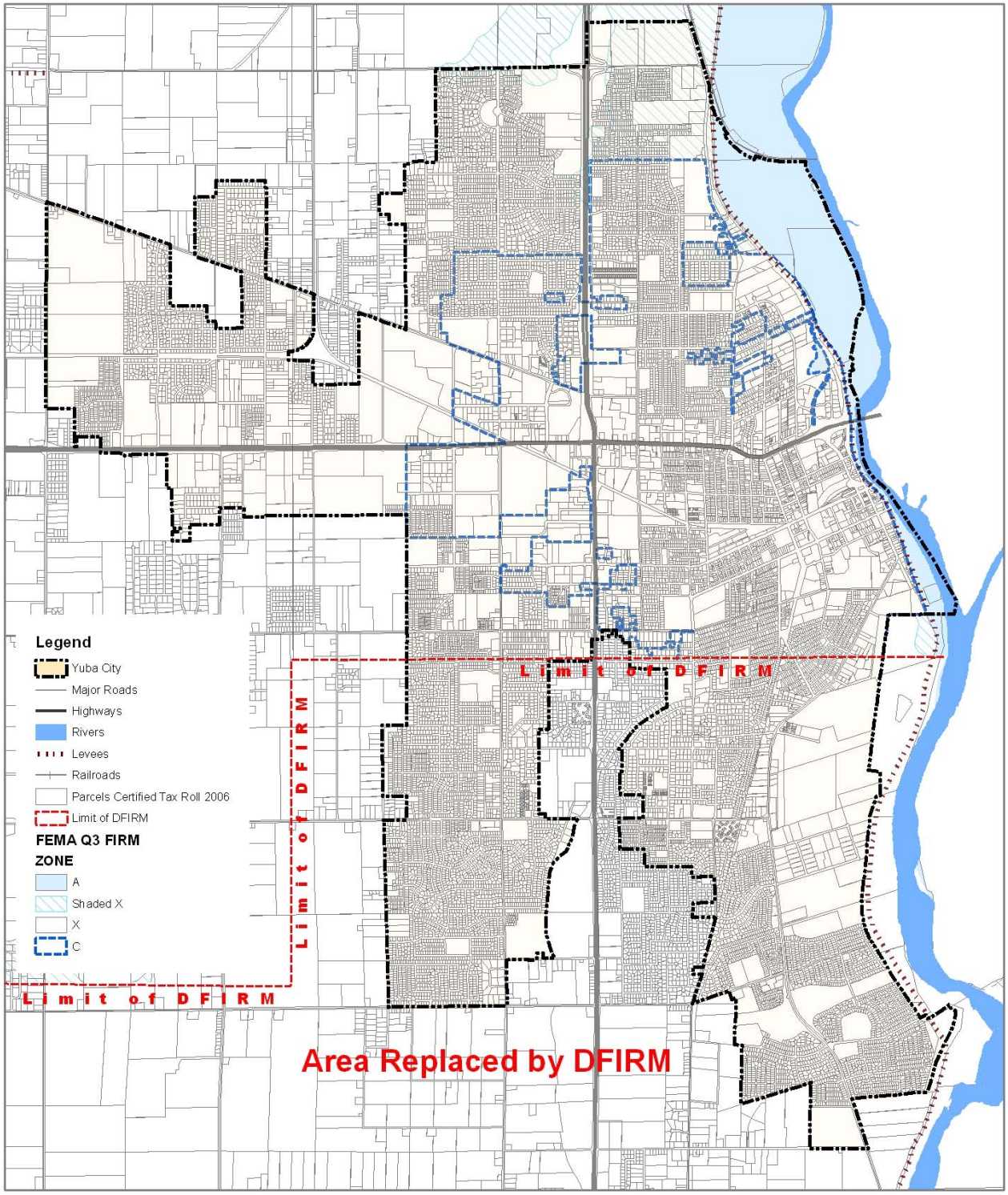
FEMA FIRMs

CITY OF YUBA CITY	
Map Number	**Effective Date**
0603960005B	03/23/1984

In addition, the new preliminary draft (August 2006) DFIRM resulting from the Lower Feather River Study, includes portions of Yuba City in the remap. It is anticipated the DFIRMs generated using the Upper Feather River Study will be out in the next 1-2 years. Once complete, these new DFIRMs will replace the old paper FIRMs. The major change associated with these updated maps is that the new DFIRMs do not recognize the existing levee system as being certified. As a result, most of the properties designated as Zone X or Zone C (outside the floodplain) in the paper maps are being re-categorized into 100-year and 500-year flood zones.

As a result of these ongoing map changes, in order to most accurately reflect the current status of FEMA floodplain mapping within the Sutter County Planning Area, the methodology previously described in the vulnerability assessment (on pages 158-164) for the entire Planning Area was followed in creating vulnerability maps and determining values at risk to the 100-year and 500-year flood events for the City of Yuba City. The maps on the following pages illustrate the FEMA floodplain data for the City of Yuba City.

Yuba City Flood Map / FEMA Q3 Floodplain



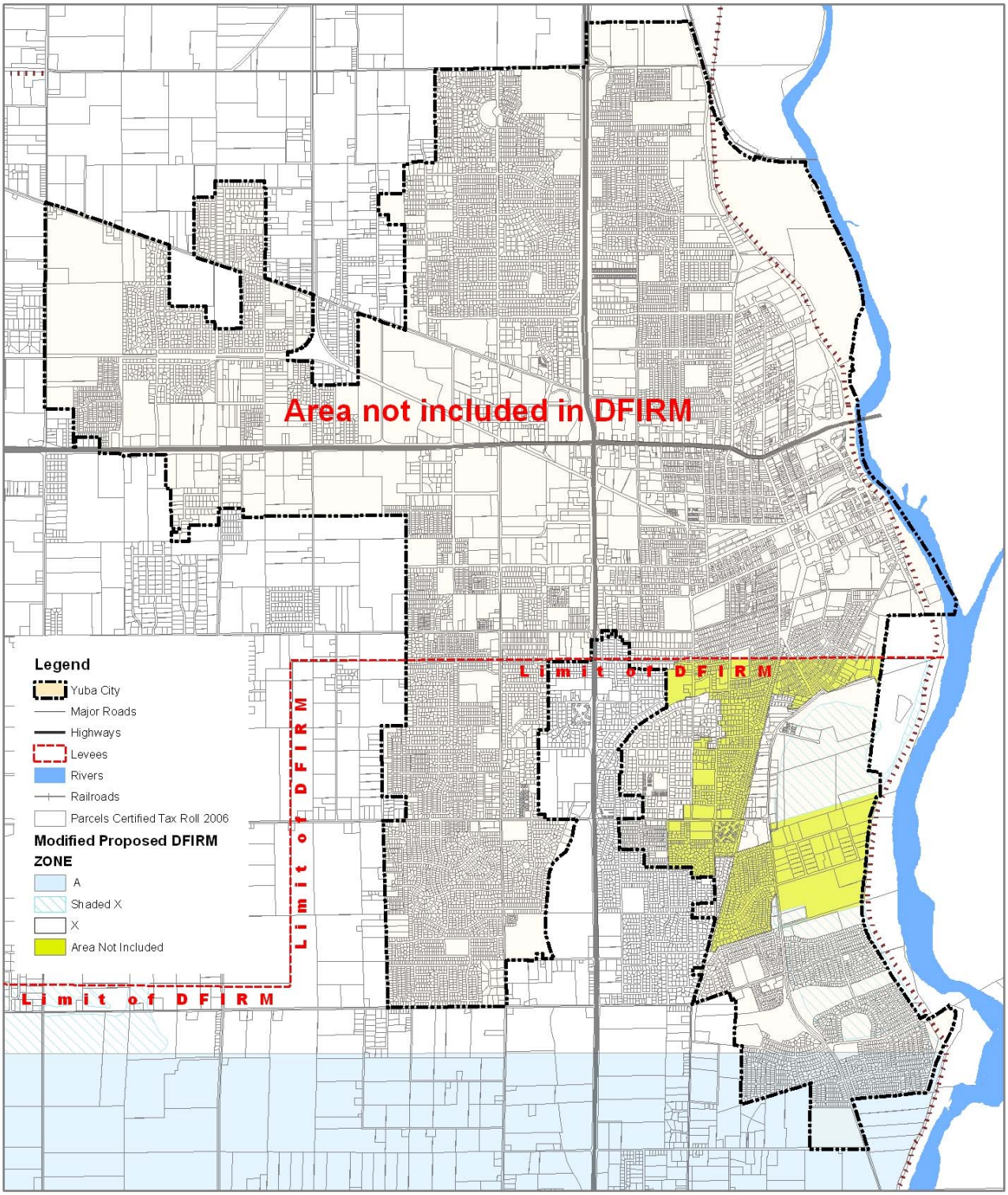
amec

Map Compilation: AMEC 10/23/06
Data Source: Sutter County, CA

0 0.5 1 2
Scale in Miles

N

Yuba City Flood Map / Proposed DFIRM Floodplain



amec

Map Compilation: AMEC 10/23/06
Data Source: Sutter County, CA

0 0.5 1 2

Scale in Miles

NFIP Insurance data indicates that as of August 21, 2006 there are 2,753 flood insurance policies in the City of Yuba City resulting in $727,970,500 in Insurance in Force. Of these, all are located in the B, C, & X Zones with 428 standard policies and 2,325 preferred policies.. Historically, there have been four claims for flood losses totaling $15,571. Three claims were for Pre-FIRM structures and one claim for a Post-FIRM structure. There are no RL properties within the city limits.

Values at Risk

The following paragraphs describe the values at risk within the City of Yuba City using various data:

- FEMA Q3 Data and Proposed DFRIM Data
- FEMA Q3 Data
- Proposed DFRIM Data

FEMA Q3 Data and Proposed DFRIM Data Floodplain Analysis

After evaluating available insurance flood loss data, the next step was to quantify the flood vulnerability for the City of Yuba City. The HMPC used GIS to model and quantify potential flood vulnerability to the City of Yuba City within the mapped floodplain areas using FEMA's Q3 and DFIRM floodplain data (as shown on the above maps and described on pages 158-164) and overlaying the information on Sutter County's GIS parcel layers for improved parcels. The parcel layer was linked with the assessor's data to quantify the value of property that potentially lies in the floodplain.

The result of this flood vulnerability analysis summarizes the values at risk in the floodplain of the City of Yuba City as provided below.

Yuba City Q3 Zone Summary										
	Zone A		Shaded Zone X		Zone X		Zone C		Total	
Property Type	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Parcels**	**Improved Value**
Residential	-	$ -	278	$ 57,310,819	3,943	$ 717,509,599	6,171	$ 719,655,723	10,392	$ 1,494,476,141
Commercial	-	$ -	6	$ 3,588,487	79	$ 52,923,394	680	$ 395,138,776	765	$ 451,650,657
Industrial	-	$ -	8	$ 2,241,866	85	$ 18,848,845	159	$ 73,268,259	252	$ 94,358,970
Institutional	-	$ -	4	$ 740,328	19	$ 21,323,080	73	$ 63,981,319	96	$ 86,044,727
Agricultural	1	$ 15,727	2	$ 169,769	29	$ 2,632,824	-	$ -	32	$ 2,818,320
Other	-	$ -	-	$ -	22	$ 3,245,055	15	$ 1,321,405	37	$ 4,566,460
Total	**1**	**$ 15,727**	**298**	**$ 64,051,269**	**4,177**	**$ 816,482,797**	**7,098**	**$ 1,253,365,482**	**11,574**	**$ 2,133,915,275**

Yuba City DFRIM Zone Summary								
	Zone A		Shaded Zone X		Zone X		Total	
Property Type	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Parcels**	**Improved Value**
Residential	647	$ 116,291,595	605	$ 101,479,836	4,249	$ 651,933,610	5,501	$ 869,705,041
Commercial	-		-	$ -	28	$ 11,335,380	28	$ 11,335,380
Industrial	-		3	$ 1,063,865	50	$ 3,572,296	53	$ 4,636,161
Institutional	-		1	$ 7,713,800	4	$ 1,473,955	5	$ 9,187,755
Agricultural	1	$ 1,018,734	-	$ -	7	$ 1,014,558	8	$ 2,033,292
Other	1	$ 250,000	1	$ 113,031	9	$ 1,160,823	11	$ 1,523,854
Total	**649**	**$ 117,560,329**	**610**	**$ 110,370,532**	**4,347**	**$ 670,490,622**	**5,606**	**$ 898,421,483**

Yuba City DFRIM and Q3 Zone Summary										
	Zone A		Shaded Zone X		Zone X		Zone C		Total	
Property Type	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Parcels**	**Improved Value**
Residential	647	$ 116,291,595	883	$ 158,790,655	8,192	$ 1,369,443,209	6,171	$ 719,655,723	15,893	$ 2,364,181,182
Commercial	-	$ -	6	$ 3,588,487	107	$ 64,258,774	680	$ 395,138,776	793	$ 462,986,037
Industrial	-	$ -	11	$ 3,305,731	135	$ 22,421,141	159	$ 73,268,259	305	$ 98,995,131
Institutional	-	$ -	5	$ 8,454,128	23	$ 22,797,035	73	$ 63,981,319	101	$ 95,232,482
Agricultural	2	$ 1,034,461	2	$ 169,769	36	$ 3,647,382	-	$ -	40	$ 4,851,612
Other	1	$ 250,000	1	$ 113,031	31	$ 4,405,878	15	$ 1,321,405	48	$ 6,090,314
Total	**650**	**$ 117,576,056**	**908**	**$ 174,421,801**	**8,524**	**$ 1,486,973,419**	**7,098**	**$ 1,253,365,482**	**17,180**	**$ 3,032,336,758**

Base on this analysis, Yuba City has significant assets at risk to the 100-year and greater floods. Combining the different types of A Zones (from the two maps) which indicate a risk to the 100-year flood results in 650 improved parcels for a total of $117,576,056 located within the 100-year floodplain. There are also 908 improved parcels valued at $174,421,801 at risk to the 500-year flood.

Comparing these numbers to the insurance data, of the 15,871 total parcels and 650 parcels at risk to the 100-year flood, 2,753 of those parcel owners maintain flood insurance. Of these 2,753 policy holders, based on the old FIRMs, only 1 policy holder is considered to be in the 100-year floodplain.

Application of the 20% damage factor to the above values at risk for improved parcels of $117,576,056, results in $23,515,211.2 at risk of damage to the 100-year flood.

FEMA Q3 Data Floodplain Analysis

The above assessment of values at risk to the 100-year flood utilizes the FEMA Q3 data currently in force for most of the city combined with the proposed DFIRM data for the very southern portion of the city. This methodology was used to best reflect the current flood risk within the Planning Area given the changing status of the FEMA flood maps during this planning process. In order to really appreciate the impact of the DFRIM process to the Planning Area, it is helpful to step back and look at the flood risk and vulnerability using only the FEMA Q3 data for the entire area. As previously described, most of the properties designated as Zone X or Zone C (outside the floodplain) in the Q3 data (paper maps) are being re-categorized into 100-year and 500-year flood zones in the new DFIRMS. Thus, using only the Q3 data, the values at risk to the 100-year and greater flood would include the following:

- Zone A (100-year): 1 improved parcels totaling $15,727
- Shaded Zone X (500-year): 908 improved parcels totaling $174,421,801
- Zone X & C (outside the floodplain): 16,721 improved parcels totaling $4,636,870,506

Clearly, the flood risk in the city is substantially less using only FEMA Q3 data.

Proposed DFIRM Floodplain Analysis

The first analysis above focused on evaluating impacts to the City of Yuba City based on the current FEMA floodplain mapping for the city which includes both the FEMA Q3 data (for most of the city) and the new Draft DFIRM mapping (for areas within the very southern portion of the city). Additional DFIRMs will be developed based on the results of the Upper Feather River Study that will replace the remaining Q3 data. This analysis assumes that the resulting DFIRMs covering the remaining portion of the city will be similar in outcome to the DFIRMS generated from the Lower Feather River Study. As previously stated, the major change associated with these updated maps is that the new

DFIRMs do not recognize the existing levee system as being certified. As a result, most of the properties designated as Zone X or Zone C (outside the floodplain) in the paper maps (and Q3 data) are being re-categorized into 100-year and 500-year flood zones.

Assuming that DFIRM maps apply to the entire city area, county parcel and assessor data were used to provide a worst-case scenario of assets at risk to a 100-year or greater flood. The table below summarizes total assets at risk within the City. Until the new study and maps are complete, the actual number and types of parcels falling within the 100-year and 500-year flood zones cannot be determined. As a result, it can only be assumed that the entire city is potentially at risk to flooding without the benefit of levees providing 100 year or more protection.

City of Yuba City
Total Assets at Risk to the 100-year or greater Flood
(Based on proposed DFRIM mapping)

CITY OF YUBA CITY 2006 Roll Values							
	Units	Total Improved	Total Improved	Units	Total Unimproved	Grand Totals	
Property Type	Improved	Value	Land Value	Unimproved	Land Value	Units	$$
Residential	15,893	$ 2,364,181,182	$ 720,568,875	35	$ 4,198,380	15,928	$ 3,088,948,437
Commercial	793	$ 462,986,037	$ 168,461,437	115	$ 41,274,950	908	$ 672,722,424
Industrial	305	$ 98,995,131	$ 30,322,762	88	$ 21,859,440	393	$ 151,177,333
Agricultural	40	$ 4,851,612	$ 4,525,987	14	$ 3,168,316	54	$ 12,545,915
Institutional	101	$ 95,232,482	$ 10,728,610	138	$ 12,425,746	239	$ 118,386,838
Other	48	$ 6,090,314	$ 2,115,466	945	$ 56,343,411	993	$ 64,549,191
Total	**17,180**	**$ 3,032,336,758**	**$ 936,723,137**	**1,335**	**$ 139,270,243**	**18,515**	**$ 4,108,330,138**

Critical Facilities

Critical facilities are those community components that are most needed to withstand the impacts of disaster. Included in this classification are police and fire stations, hospitals, schools that serve as emergency shelters, and lifeline utilities; power, water and sewer system components. A map of the critical facilities within the City of Yuba City is located on page 206. Within the Planning Area many critical facilities are protected by the extensive flood control system. To additionally protect them individually from the potential failure of the structural flood control systems may be very difficult to justify on a benefit/cost ratio analysis. Still, the impact to the community, should the statistically unlikely catastrophic flood event occur, would be astonishing if also these critical facilities are damaged or destroyed.

Cultural and Natural Resources at Risk

Yuba City has significant cultural and natural resources located throughout its boundaries as previously described. Risk analysis of these resources was not possible due to data limitations. However, natural areas within the floodplain often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters.

Development Trends

The development trend in the Sutter County Planning Area is steady, significant growth, especially within the existing urban areas.

The Housing Element of the Sutter County General Plan expects the population in Yuba City to grow to 53,570 by 2015. This is an additional 17,710 people from the 2000 census estimate of 35,860. Such growth will consume acres of previously undeveloped areas and the impacts may overwhelm existing drainage and flood control facilities.

Master planning for stormwater runoff and adherence to floodplain management regulations for new development should help both new and existing development from the impacts of the 100-year flood.

Vulnerability to Wildfire

Wildfire is of limited concern to Yuba City. There is no history of large, damaging fires in or around Yuba City in recent history. According to the fire threat map included on page 164, areas near the city are of moderate threat to wildfire. Based on this information, the vulnerability of the city to Wildfire is limited and no further analysis was conducted.

Other Identified Hazards: Agricultural Hazards, Dam Failure, Drought, Earthquakes, Severe Weather, and West Nile Virus.

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the Sutter County Planning Area. Thus, the risk assessment for the Sutter County Planning Area also includes and directly corresponds to the unincorporated portions of the county and all incorporated jurisdictions, including the City of Yuba City.

CITY OF LIVE OAK

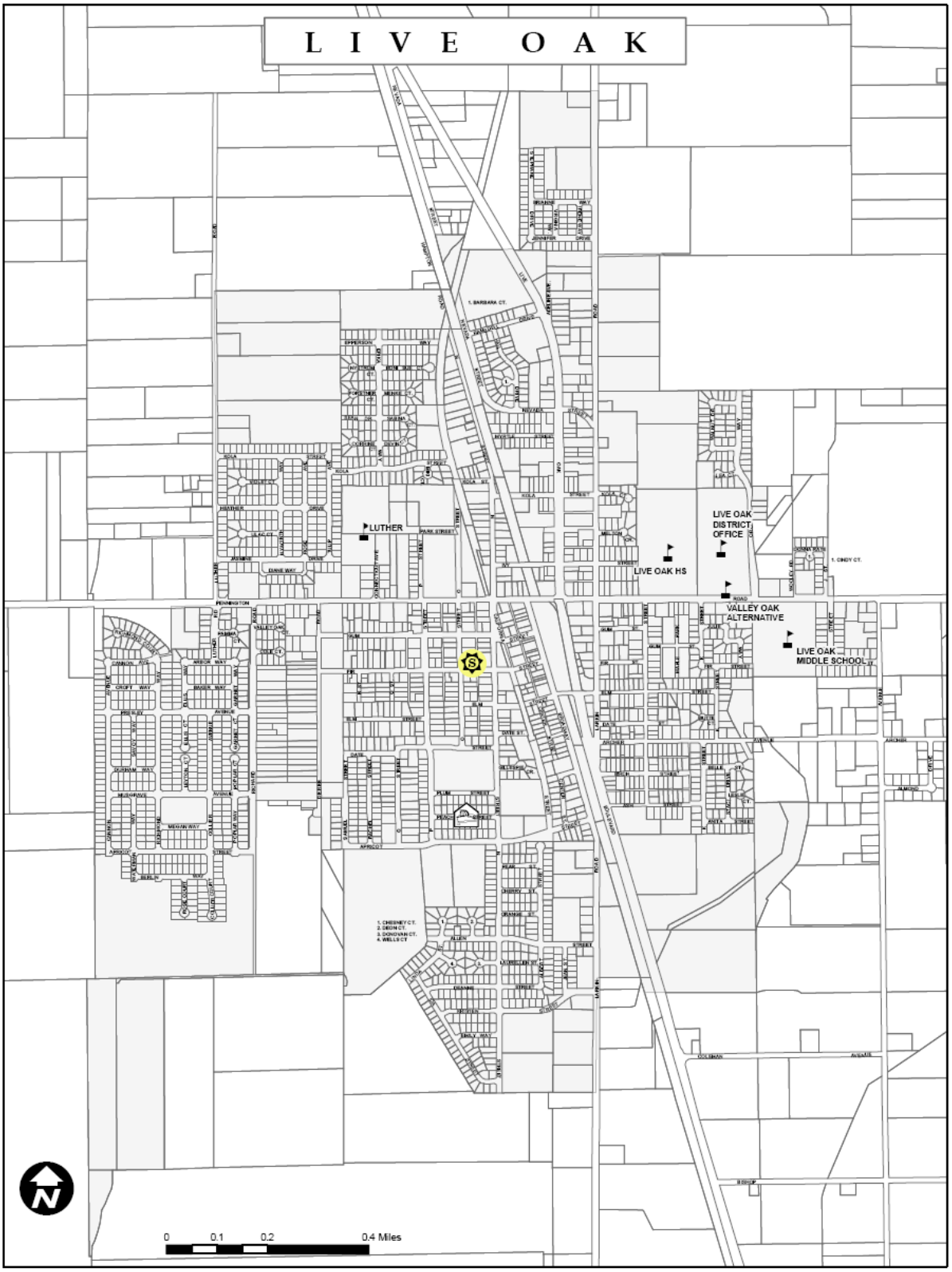
Population: 6.229
Area: 7,200 acres
Elevation:

Community Profile

Located in Sutter County, Live Oak is a small but growing city located along State Highway 99 and a mainline Union Pacific railroad line in a mostly agricultural area of the Sacramento Valley (See city map on the page that follows.) Named for the beautiful groves of live oak trees, the town was first settled in 1866 by A.M. McGrew. The town is located within a portion of the Rancho Boga Mexican land grant on the west side of the Feather River. The town grew with the advent of the California-Oregon Railroad in the 1870's and became the main point in Sutter County for shipping agricultural produce. Live Oak was the second city to be established in Sutter County and was incorporated in 1947. The City has a range of residential, commercial, industrial, civic, and other land uses. Most commercial properties are located along Highway 99, which divides the eastern portion and western portions of the community. The City is surrounded by orchards and other agricultural-related land uses.

Live Oak's population has increased dramatically since 1950 (1,770 population) and was one of the fastest growing cities in the area between 1990 and 2000. According to the 2000 Census report, the population of Live Oak is 6,229. Development in the city to accommodate future growth is occurring primarily within the City sphere-of-influence, beyond the current city limits. The boundary for the sphere-of-influence is set at the Butte County line on the north, Township Road on the west, Paseo Road on the south and the Feather River on the east. Total area for the Live Oak sphere-of-influence is approximately 7,200 acres. In addition, the city is making an effort to rehabilitate existing dilapidated structures within the city limits to provide additional housing options to residents.

Topography in the City of Live Oak is very flat due to its location in the Sacramento Valley, near the Feather River. Soils in most of the City of Live Oak consist of the Conejo-Tisdale soil classification, which is deep to very deep, level to very level well-drained loam and clay loam typically found on terraces. These soils are classified as soils of statewide importance. The remaining areas of the city are comprised of Live Oak sandy clay loam and Marcum-Gridley clay loam soil complex.



(Source: Sutter County GIS)

Hazard Summary

Based on information provided by the City of Live Oak, a hazard summary for the city is provided below.

SUMMARY HAZARD ANALYSIS: CITY OF LIVE OAK				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Agricultural Hazards				
Dam Failure				
Drought	Likely	Significant	Critical	Medium
Earthquakes				
Floods	Likely	Significant	Catastrophic	High
Landslides				
Natural Health Hazards: West Nile Virus				
Severe Weather: Extreme Temperatures				
Severe Weather: Severe Fog	Highly Likely	Significant	Limited	Medium
Severe Weather: Winterstorms	Likely	Significant	Limited	Low
Severe Weather: Tornadoes				
Soil Hazards: Erosion				
Soil Hazards: Expansive Soils				
Soil Hazards: Land				

SUMMARY HAZARD ANALYSIS: CITY OF LIVE OAK				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Subsidence				
Wildfires				
Volcano				

Guidelines:
Frequency of Occurrence
Highly Likely: Near 100% probability in next year.
***Likely*:** Between 10 and 100% probability in next year, or at least one chance in ten years.
***Occasional*:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
***Unlikely*:** Less than 1% probability in next 100 years.

Spatial Extent
***Limited*:** Less than 10% of planning area
***Significant*:** 10-50% of planning area
***Extensive*:** 50-100% of planning area

Potential Magnitude
***Catastrophic*:** More than 50% of area affected
***Critical*:** 25 to 50%
Limited: 10 to 25%
***Negligible*:** Less than 10%

Significance (Your subjective opinion)—***Low***, ***Medium***, ***High***

Information provided by the HMPC identified the following hazard as the most significant to the City of Live Oak:

- Floods

Vulnerability Assessment

This vulnerability assessment quantifies the vulnerability of the City of Live Oak in the event of a catastrophic event and also provides an assessment of the areas vulnerability to floods and wildfire.

Values at Risk

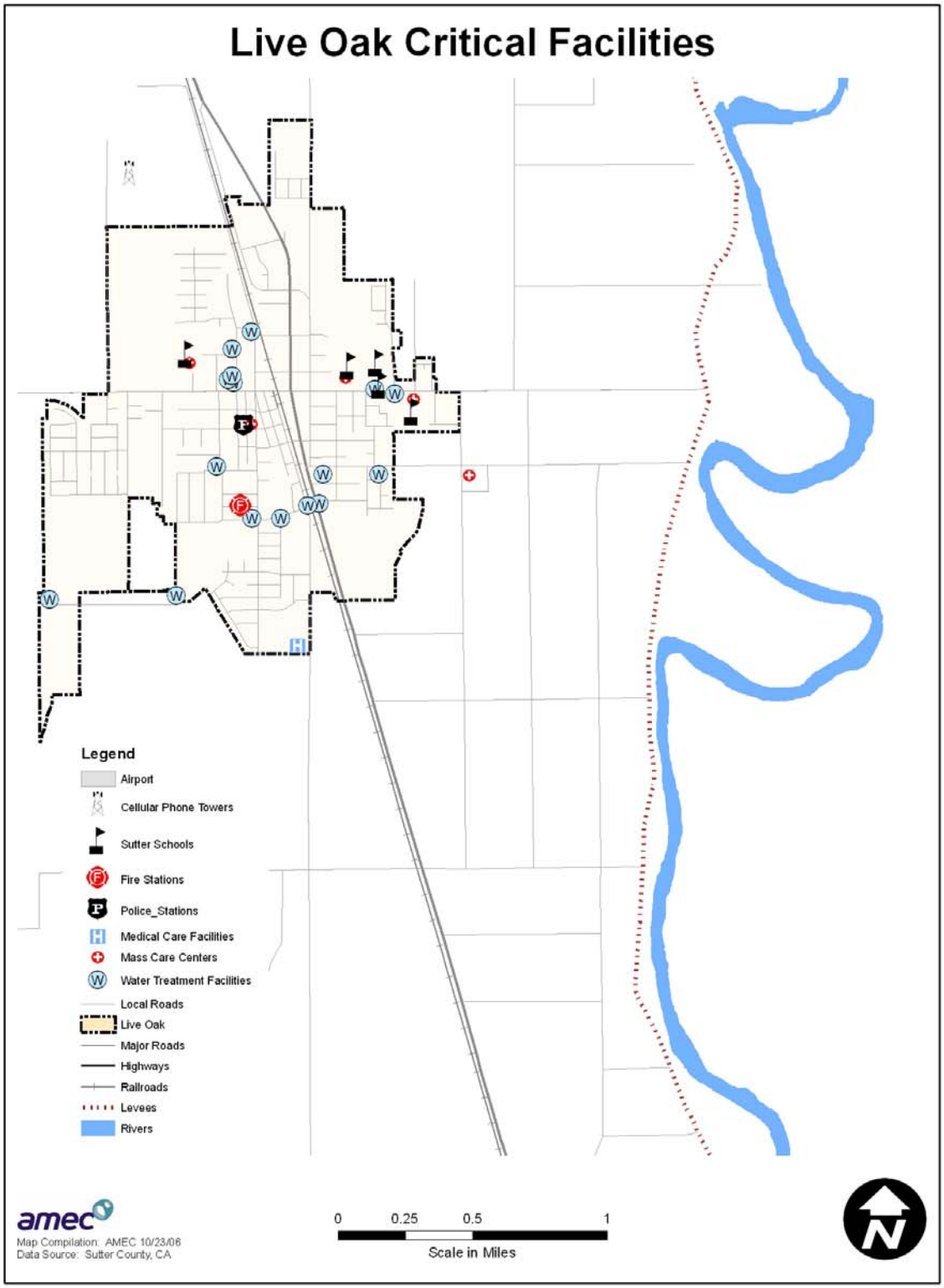
Utilizing Sutter County assessor data, the total assessed values for the City of Live Oak are:

CITY OF LIVE OAK 2006 Roll Values							
Property Type	Units Improved	Total Improved Value	Total Improved Land Value	Units Unimproved	Total Unimproved Land Value	Grand Totals Units	Grand Totals $$
Residential	1,790	$ 177,821,695	$ 65,617,918	-	$ -	1,790	$ 243,439,613
Commercial	61	$ 13,866,546	$ 3,362,066	21	$ 734,075	82	$ 17,962,687
Industrial	9	$ 7,061,320	$ 1,172,035	1	$ 14,353	10	$ 8,247,708
Agricultural	16	$ 1,243,271	$ 894,090	15	$ 9,027,369	31	$ 11,164,730
Institutional	29	$ 5,577,812	$ 748,192	46	$ 341,800	75	$ 6,667,804
Other	13	$ 1,212,626	$ 607,593	719	$ 9,188,362	732	$ 11,008,581
Total	**1,918**	**$ 206,783,270**	**$ 72,401,894**	**802**	**$ 19,305,959**	**2,720**	**$ 298,491,123**

Critical Facilities Inventory

The critical facilities in the City of Live Oak are listed below and provided in the map that follows.

Live Oak Critical Facilities	
Owner	**Critical Facility**
Live Oak #5	Fire Station
Church Of The Nazarene	Mass Care Center
Live Oak Middle School	Mass Care Center
Live Oak High School	Mass Care Center
Luther Elementary School	Mass Care Center
Live Oak Manor Nursing Home	Medical Care Facility
Sutter County Sheriff	Police Station
Live Oak Unified School District	School
Live Oak High School	School
Live Oak Middle School	School
Luther Elementary School	School
Valley Oak Alternative High School	School
Sewer Lift Station	Wastewater Treatment Facility
Water Well	Wastewater Treatment Facility
Water Well	Wastewater Treatment Facility
Water Well	Wastewater Treatment Facility
Water Tank	Wastewater Treatment Facility
Sewage Lift Station	Wastewater Treatment Facility
Water Well	Wastewater Treatment Facility
Storm Water Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Water Well	Wastewater Treatment Facility
Storm Water Lift Station	Wastewater Treatment Facility
Water Well	Wastewater Treatment Facility
Storm Water Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Sewer Lift Station	Wastewater Treatment Facility
Waste Water Treatment Plant	Wastewater Treatment Facility


Live Oak Critical Facilities
Legend
Airport
Cellular Phone Towers
Sutter Schools
Fire Stations
Police_Stations
Medical Care Facilities
Mass Care Centers
Water Treatment Facilities
Local Roads
Live Oak
Major Roads
Highways
Railroads
Levees
Rivers
amec
Map Compilation: AMEC 10/23/06
Data Source: Sutter County, CA
0
0.25
0.5
1
Scale in Miles
N

Cultural and Natural Resources at Risk

Cultural and natural resources in City of Live Oak include those previously identified in the County inventory and as detailed below:

Cultural Resources

- Live Oak Historic Commercial District
- Pennington Road – One of the first houses in Live Oak, built for Louis Schnepel
- Larkin Road – One of the first houses in Live Oak

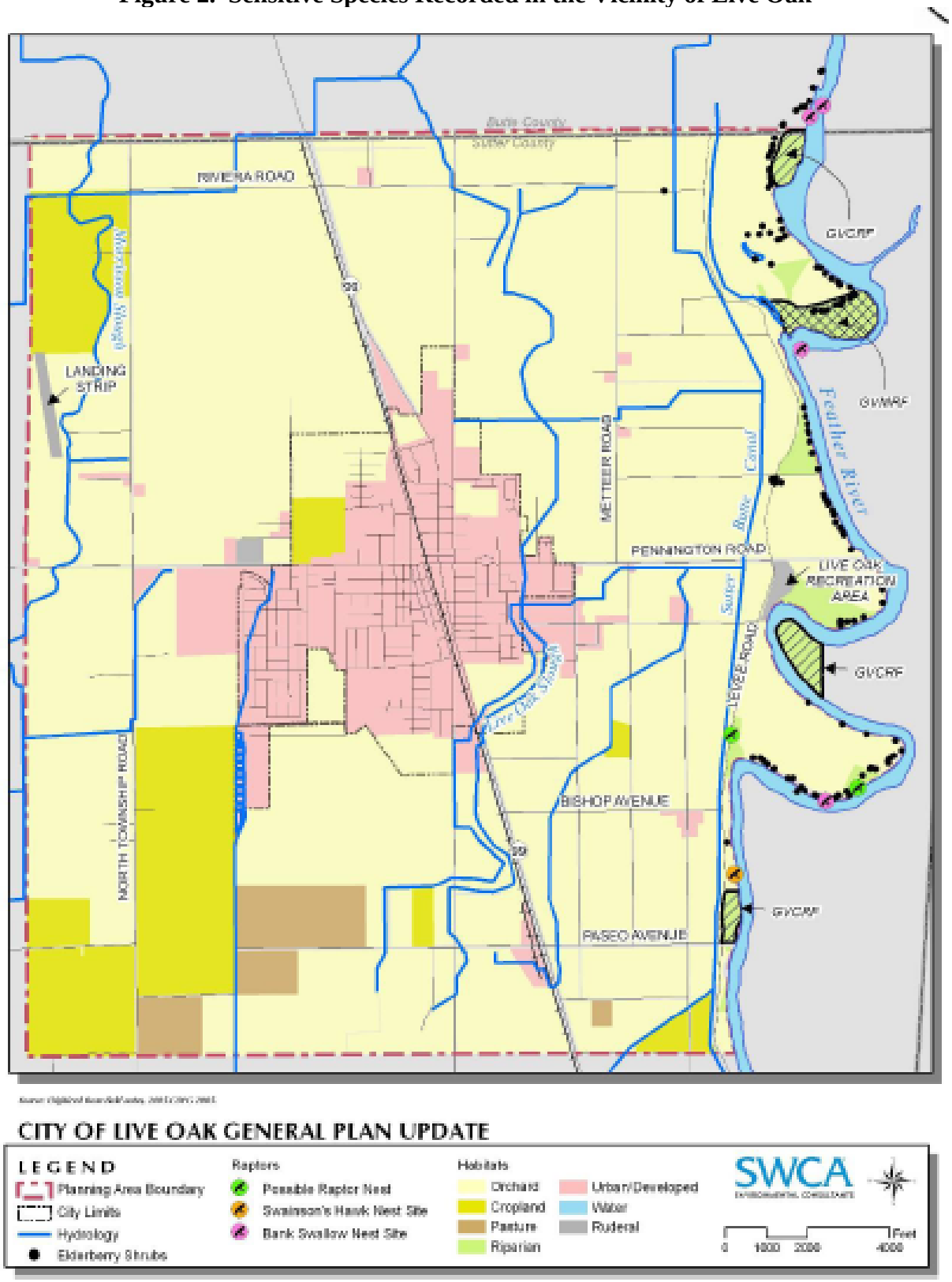
Natural Resources

The list of protected plant and wildlife species previously identified in the county inventory includes information regarding the potential for a particular species to occur in the City of Live Oak. Those species with a moderate or high potential are listed below.

- Rose mallow (High)
- Swainson's hawk
- Western Yellow billed cuckoo(Moderate/High)
- Burrowing owl (Moderate)
- Tricolored blackbird (High)
- Giant garter snake (Moderate/High)
- Central Valley spring-run salmon (High)

The following map taken from the Live Oak General Plan Update shows the locations of sensitive species recorded in the vicinity of Live Oak.

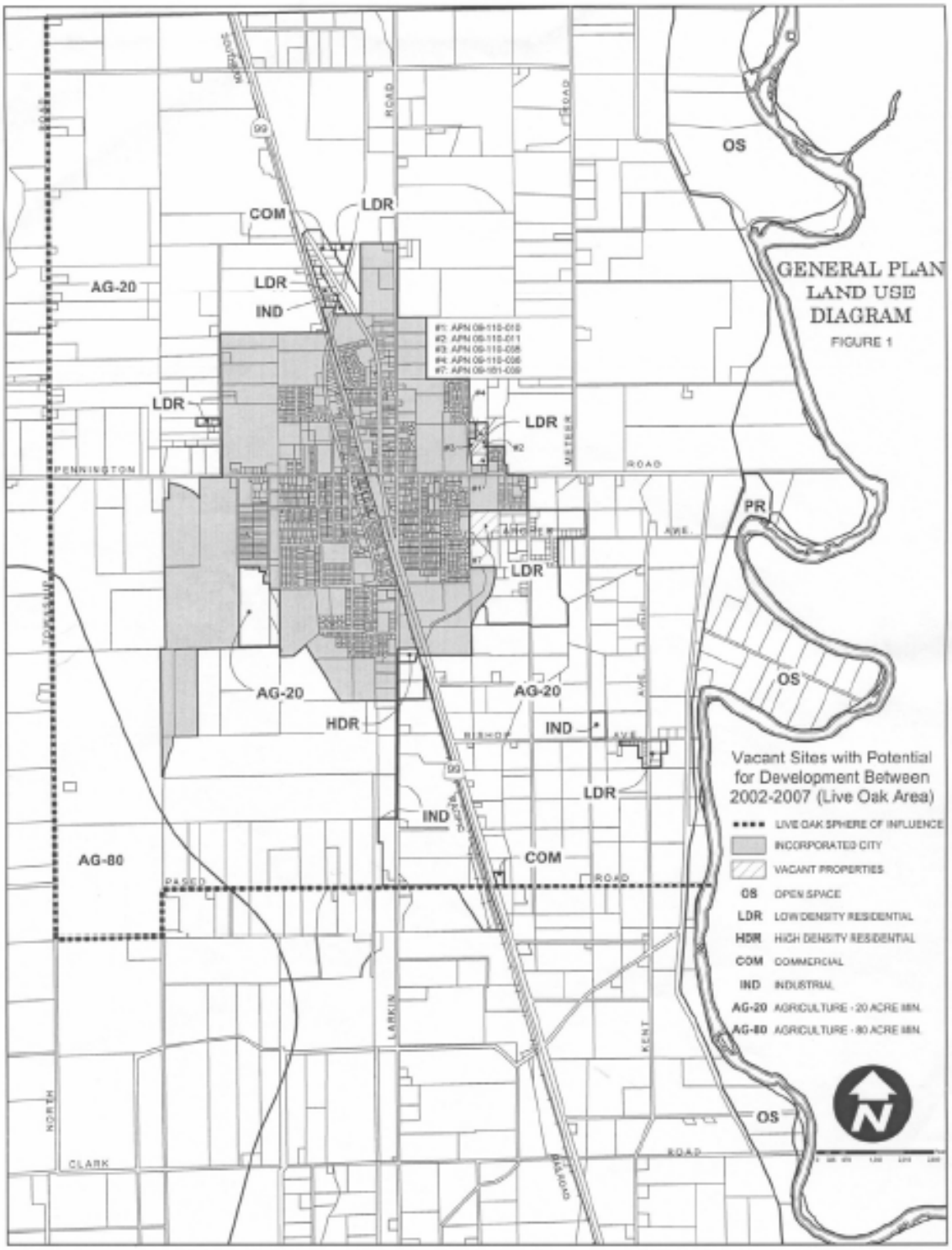
Figure 2. Sensitive Species Recorded in the Vicinity of Live Oak



Development Trends

According to the 2006d General Plan Background Report, growth in the city is increasing. Between 2000 and 2015, the population of the city is projected to increase from 5,540 to 8,810. New development areas within the city are primarily concentrated in the northeast portion of the City sphere of influence. Under the SACOG preferred scenario for development, an average of 100 new homes would be constructed each year. The following map shows this area.

City of Live Oak Potential Development Sites



Vulnerability to Flood

Flood Problem Description

Flooding is a significant concern to the City of Live Oak. The City of Live Oak is also susceptible to four types of floods: localized flooding, riverine (slow rise) flooding, levee/overtopping failure, and dam failure as previously described in Section 4.1 of the Risk Assessment.

Located in the northeast portion of the county, Live Oak is built near the Feather River which borders eastern boundary of the city. According to the City of Live Oak General Plan Background Report, other notable hydrologic features within the area include irrigation laterals, canals and sloughs that are used for water supply and flood control. These include the following:

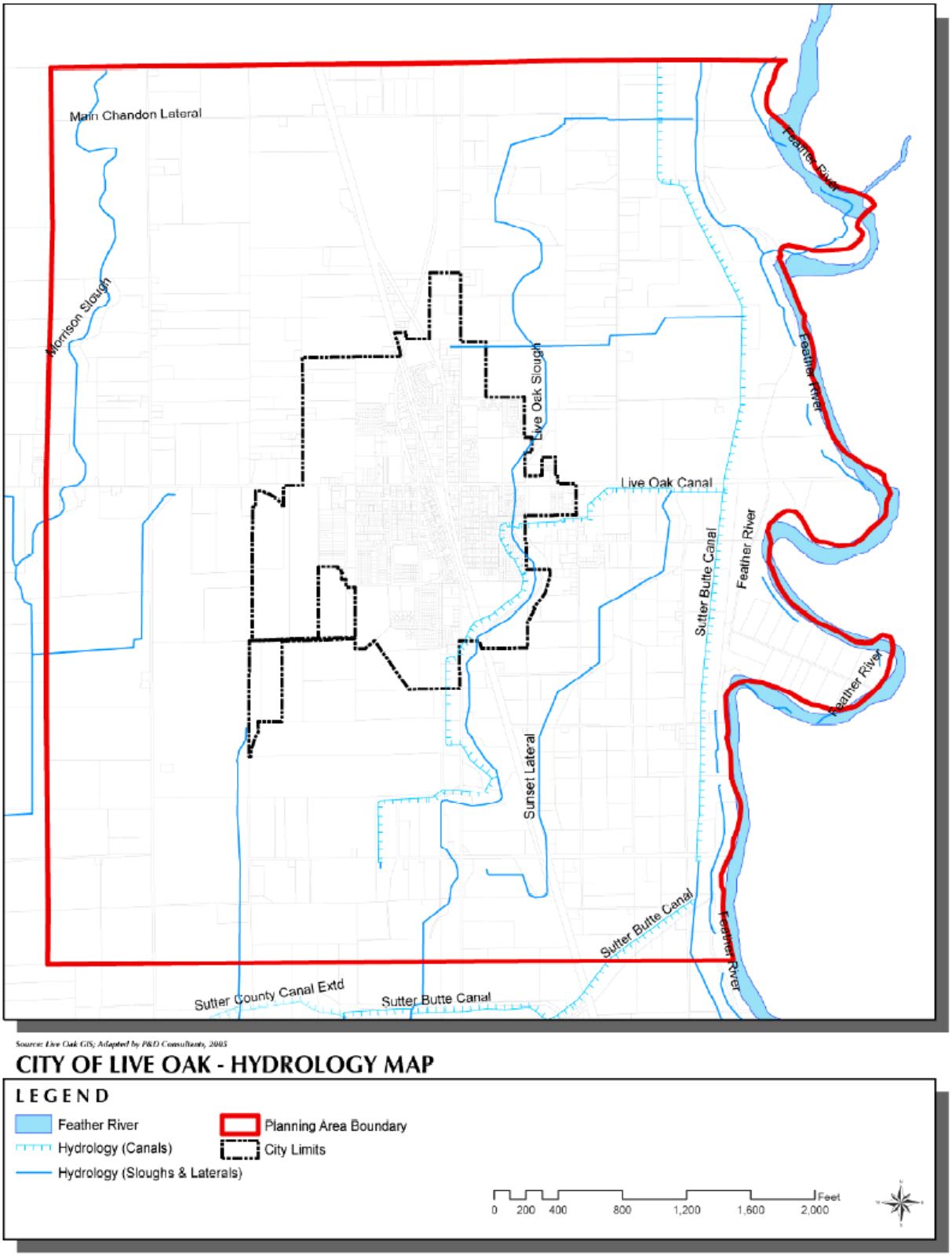
- Main Chandon Lateral
- Morrison Slough
- Live Oak Slough
- Live Oak Canal
- Sunset Lateral

A map of these drainages is provided on the following page.

Live Oak is primarily susceptible to flooding by the Live Oak Slough, which runs along the east side of the city. This water body potentially affects an area bounded by Juniper Street, Larkin Road, Pennington Road, L Street, Archer Avenue, State Highway 99, and the Southern Pacific Railroad right-of-way, which is designated as being in flood hazard zone A (100-year floodplain) on the Sutter County Flood Insurance Rate Map. The rest of the City is in area C, an area of minimal flooding and considered outside both the 100-year and 500-year floodplains

According to the Safety Element Background Report to the General Plan, the potential for a major flood event in the Live Oak area is primarily a function of the integrity of the reservoir, levee, and bypass systems that provide flood protection. Historically, damage from flooding has occurred following levee failure.

The Background Report indicates that there are no levee problem areas within the Live Oak Planning Area. However, one problem area in Sutter County close to the Live Oak Planning Area lies along the west side of the Feather River. The problem area starts approximately 0.1 miles south of the southern boundary of the Planning Area and continues for approximately 0.2 miles to the south. This area is near Koch Lane between approximate river miles 35.6 and 37.6 (levee miles 3.9 and 5.3). During high water, seepage and boils occur near the landslide levee toe. The USACE relocated an open drainage ditch away from the toe at the levee at the north end of this problem area under the Marysville/Yuba City Levee Reconstruction Project. A consultant to Levee District 9 recommended installing a previous toe drain over the entire site to control seepage, but no improvements have been made. This area is illustrated in the Levee Problem Site Map in Section 4.1.



Source: Live Oak GIS; Adapted by P&D Consultants, 2005

CITY OF LIVE OAK - HYDROLOGY MAP

FEMA Maps, Insurance Coverage, Claims Paid, and Repetitive Losses

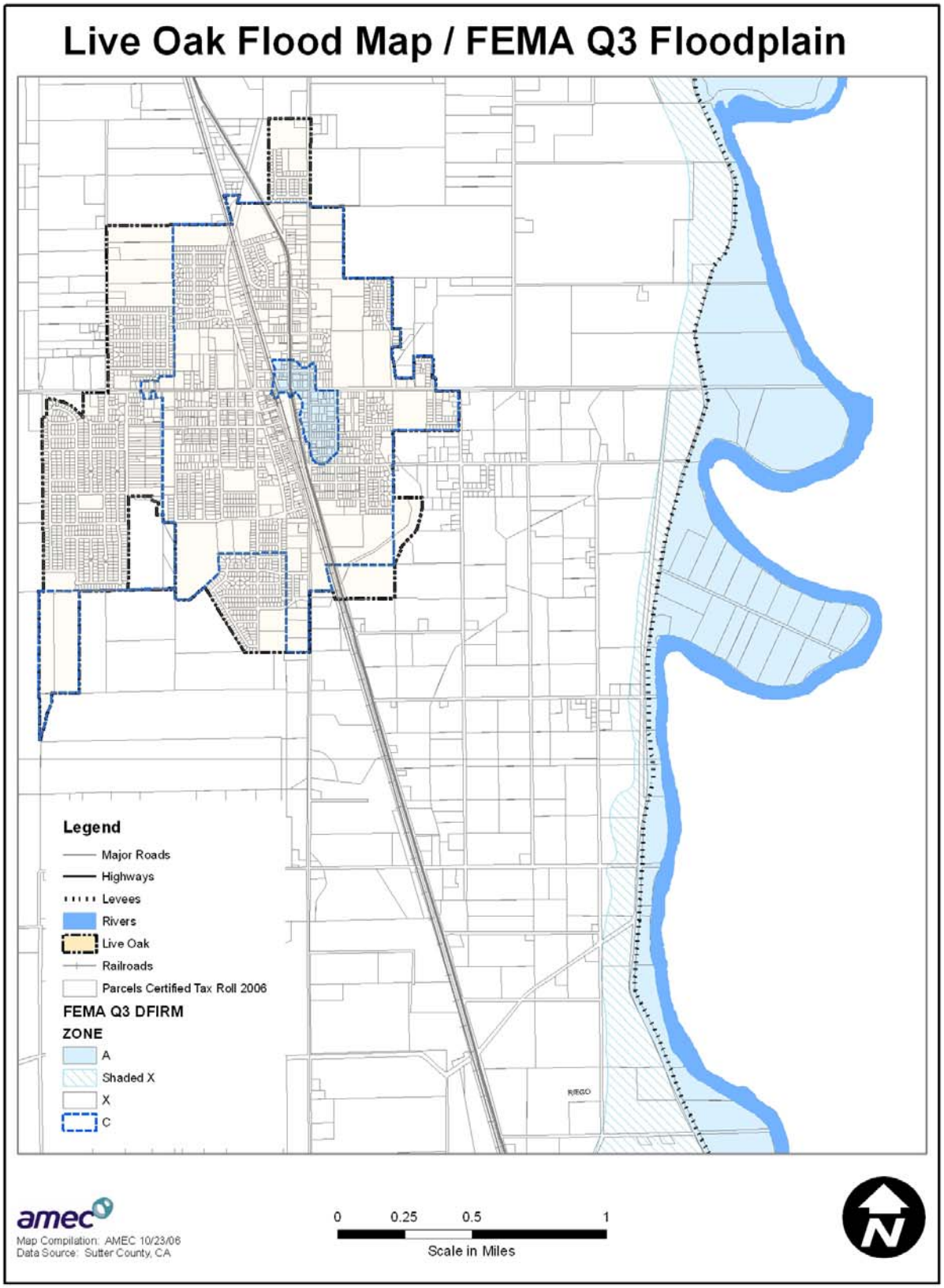
The City of Live Oak joined the NFIP on March 23, 1984. The following table identifies the existing FIRM map for the City.

FEMA FIRMs

CITY OF LIVE OAK	
Map Number	**Effective Date**
0603950001C	03/23/1984

In addition, it is anticipated that the DFIRMs generated using the Upper Feather River Study will be out in the next two to three years. Once complete, these new DFIRMs will replace the old paper FIRMs for the Live Oak area. The major change associated with these updated maps is that the new DFIRMs do not recognize the existing levee system as being certified. As a result, most of the properties designated as Zone X or Zone C (outside the floodplain) in the paper maps are being re-categorized into 100-year and 500-year flood zones.

As a result of these ongoing map changes, in order to most accurately reflect the current status of FEMA floodplain mapping within the Sutter County Planning Area, the methodology previously described in the vulnerability assessment (on pages 158-164) for the entire planning area was followed in creating vulnerability maps and determining values at risk to the 100-year and 500-year flood events for the City of Live Oak. The map on the following page illustrates the FEMA floodplain data for the City of Live Oak.


Live Oak Flood Map / FEMA Q3 Floodplain
Legend
Major Roads
Highways
Levees
Rivers
Live Oak
Railroads
Parcels Certified Tax Roll 2006
FEMA Q3 DFIRM
ZONE
A
Shaded X
X
C
amec
Map Compilation: AMEC 10/23/06
Data Source: Sutter County, CA
0
0.25
0.5
1
Scale in Miles
N

NFIP Insurance data indicates that as of August 21, 2006 there are 103 flood insurance policies in the City of Live Oak resulting in $22,550,700 in Insurance in Force. Of these, 20 are located in the A zone, and 83 are located in the B, C, & X Zones with 7 standard policies and 76 preferred policies.. Historically, there have been seven claims for flood losses totaling $66,660. Five claims were for Pre-FIRM structures; the other two weren't accounted for. There is one RL building within the City limits, with three RL losses totaling $30,444.53.

Values at Risk

After evaluating available insurance flood loss data, the next step was to quantify the flood vulnerability for the City of Live Oak. The HMPC used GIS to model and quantify potential flood vulnerability to City of Live Oak within the mapped floodplain areas using FEMA's Q3 and DFIRM floodplain data and overlaying the information on Sutter County's GIS parcel layers for improved parcels. The parcel layer was linked with the assessor's data to quantify the value of property that potentially lies in a floodplain.

The result of this flood vulnerability analysis summarizes the values at risk in the floodplain of the City of Live Oak as provided below.

Live Oak								
	Zone A		Zone X		Zone C		Total	
Property Type	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Pcls**	**Improved Value**	**Parcels**	**Improved Value**
Residential	73	$ 3,272,115	471	$ 72,111,505	1,246	$ 102,438,075	1,790	$ 177,821,695
Commercial	11	$ 1,416,696	-	$ -	50	$ 12,449,850	61	$ 13,866,546
Industrial	1	$ 34,795	-	$ -	8	$ 7,026,525	9	$ 7,061,320
Institutional	3	$ 188,301	1	$ 12,300	25	$ 5,377,211	29	$ 5,577,812
Agricultural	-		8	$ 611,203	8	$ 632,068	16	$ 1,243,271
Other	-		3	$ 371,331	10	$ 841,295	13	$ 1,212,626
Total	**88**	**$ 4,911,907**	**483**	**$ 73,106,339**	**1,347**	**$ 128,765,024**	**1,918**	**$ 206,783,270**

Base on this analysis, the City of Live Oak has substantial assets at risk to the 100-year and greater floods. Looking at the A Zone which indicates a risk to the 100-year flood results in 88 improved parcels for a total of $4,911,907 located within the 100-year floodplain. There are no parcels identified within the 500-year floodplain.

Comparing these numbers to the insurance data, of the 88 total parcels at risk to the 100-year flood, 20 of these parcel owners maintain flood insurance. This equates to 22.7% of people subject to the 100-year flood event as having insurance.

Further, application of the 20% damage factor to the above values at risk for improved parcels of $4,911,907, results in $982,381 at risk of damage to the 100-year flood.

DFIRM Floodplain Analysis

The above analysis focused on evaluating impacts to the City of Live Oak based on the current FEMA Q3 floodplain mapping for the City. DFIRMs will be eventually developed

based on the results of the Upper Feather River Study that will replace the existing Q3 data. This analysis assumes that the new DFIRMs will be similar in outcome to the DFIRMS generated from the Lower Feather River Study, which covered portions of unincorporated Sutter County and the City of Yuba City. As previously stated, the major change associated with these new maps is that the DFIRMs do not recognize the existing levee system as being certified. As a result, most of the properties designated as Zone X or Zone C (outside the floodplain) in the paper maps (and Q3 data) are being re-categorized into 100-year and 500-year flood zones.

Assuming that new DFIRM maps apply to the City of Live Oak, county parcel and assessor data were used to provide a worst-case scenario of assets at risk to a 100-year or greater flood. The table below summarizes total assets at risk within the City. Until the new study and maps are complete, the actual number and types of parcels falling within the 100-year and 500-year flood zones cannot be determined. As a result, it can only be assumed that the entire city is potentially at risk to flooding without the benefit of the levees providing 100 year or more protection.

City of Live Oak
Total Assets at Risk to the 100-year or Greater Flood
(Based on proposed DFRIM mapping)

CITY OF LIVE OAK 2006 Roll Values							
	Units	Total Improved	Total Improved	Units	Total Unimproved	Grand Totals	
Property Type	Improved	Value	Land Value	Unimproved	Land Value	Units	$$
Residential	1,790	$ 177,821,695	$ 65,617,918	-	$ -	1,790	$ 243,439,613
Commercial	61	$ 13,866,546	$ 3,362,066	21	$ 734,075	82	$ 17,962,687
Industrial	9	$ 7,061,320	$ 1,172,035	1	$ 14,353	10	$ 8,247,708
Agricultural	16	$ 1,243,271	$ 894,090	15	$ 9,027,369	31	$ 11,164,730
Institutional	29	$ 5,577,812	$ 748,192	46	$ 341,800	75	$ 6,667,804
Other	13	$ 1,212,626	$ 607,593	719	$ 9,188,362	732	$ 11,008,581
Total	**1,918**	**$ 206,783,270**	**$ 72,401,894**	**802**	**$ 19,305,959**	**2,720**	**$ 298,491,123**

Critical Facilities

Critical facilities are those community components that are most needed to withstand the impacts of disaster. Included in this classification are police and fire stations, hospitals, schools that serve as emergency shelters, and lifeline utilities; power, water and sewer system components. A map of the critical facilities within the City of Live Oak is located on page 226. Within the Planning Area many critical facilities are protected by the extensive flood control system. To additionally protect them individually from the potential failure of the structural flood control systems may be very difficult to justify on a benefit/cost ratio analysis. Still, the impact to the community, should the statistically unlikely catastrophic flood event occur, would be astonishing if also these critical facilities are damaged or destroyed.

Cultural and Natural Resources at Risk

The City of Live Oak has significant cultural and natural resources located throughout its boundaries as previously described. Risk analysis of these resources was not possible due to data

limitations. However, natural areas within the floodplain often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters.

Development Trends

The development trend in the Sutter County Planning Area is steady, significant growth, especially within the existing urban areas.

The Housing Element of the Sutter County General Plan expects the population in the City of Live Oak to grow to 8,180 by 2015. This is an additional 2,640 people from the 2000 census estimate of 5,540. Such growth will consume acres of previously undeveloped areas and the impacts may overwhelm existing drainage and flood control facilities.

Master planning for stormwater runoff and adherence to floodplain management regulations for new development should help both new and existing development from the impacts of the 100-year flood.

Vulnerability to Wildfire

Wildfire is of limited concern to Live Oak. There is no history of large, damaging fires in or around the city in recent history. According to the fire threat map included on page 164. areas near the city are of moderate to somewhat high threat to wildfire. The topography of the city is nearly level and fuels are comprised of agriculture, grasslands, and the built environment. In addition, most fuels are discontinuous, broken by numerous roads and fuel type changes. According to the Safety Element Background Report to the General Plan for the city, the lack of topography and complex fuels leads to very little severe fire behavior. Most fires are characterized by smaller events lasting short periods of time.

As previously discussed, the nearby Sutter Buttes are the primary concern with respect to a wildfire hazard near the city. Of lesser concern are the areas within the levees that are left in a natural state allowing fuels to accumulate over a period of time. However, the Background Report concludes that neither the Sutter Buttes nor the river bottoms pose unreasonable fire risk to any urbanized area. As such, the wildfire hazard is not considered a significant concern to the City of Live Oak and is not discussed further.

Other Identified Hazards: Agricultural Hazards, Dam Failure, Drought, Earthquakes, Severe Weather, and West Nile Virus.

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the Sutter County Planning Area. Thus, the risk assessment for the planning area also includes and directly corresponds to the unincorporated portions of the County and all incorporated jurisdictions, including the City of Live Oak.

SUTTER COUNTY DISTRICTS

DMA 2000 includes "Districts" in its definition of local governments subject to the requirements of multi-hazard mitigation planning. Types of Districts vary in both form and function. The Districts participating in this Multi-Hazard Mitigation Plan include:

- Gilsizer County Drainage District
- Levee District One
- Reclamation District 1001 (RD1001)
- Reclamation District 1500 (RD1500)
- Reclamation Districts 70 & 1660 (RD70 & RD1660): Meridian Basin

These Districts, some who have never received any damage from a natural hazard, disaster assistance from state or federal programs, or mitigation assistance from FEMA chose to participate in the development of this Multi-Hazard Mitigation Plan nonetheless, in order to preserve and maintain their eligibility for future mitigation assistance should the need and the opportunity arise. Thus, not every District has an individual Action Item recommended, while others have several. Each District, however, now recognizes the overall risk and vulnerability of the Sutter County Planning Area and their role in minimizing future damage and facilitating recovery. In that light, each District will participate in the overall countywide public education recommendation presented in Section 5.0, the Mitigation Strategy portion of this plan. The Districts, as all local governments, reserve their right to revise their input to this plan to reflect new threats and to propose new mitigation activities as the need and the concepts arise.

The risk assessment for this plan, as previously described, covers the entire geographical extent of the Sutter County Planning Area. Thus, the risk assessment for the Planning Area also includes and directly corresponds to the participating Districts. The following sections detailing District-specific information supplements the risk assessment for the Sutter County Planning Area and provides additional detail where the risk varies across the Planning Area.

Gilsizer County Drainage District

Gilsizer County Drainage District was formed in 1963 to improve storm drainage service to the Yuba City area and to maintain Gilsizer Slough and other district drainage facilities. The District comprises 6005 acres including most of the City of Yuba City (See map that follows). The District's major facilities are Gilsizer Slough and a pumping station near the Feather River levee north of the Tenth Street Bridge. The pumping station collects storm drainage from approximately 2500 acres of the northeasterly part of Yuba City and discharges directly into the Feather River. Most of the City and surrounding area drain to Gilsizer Slough.

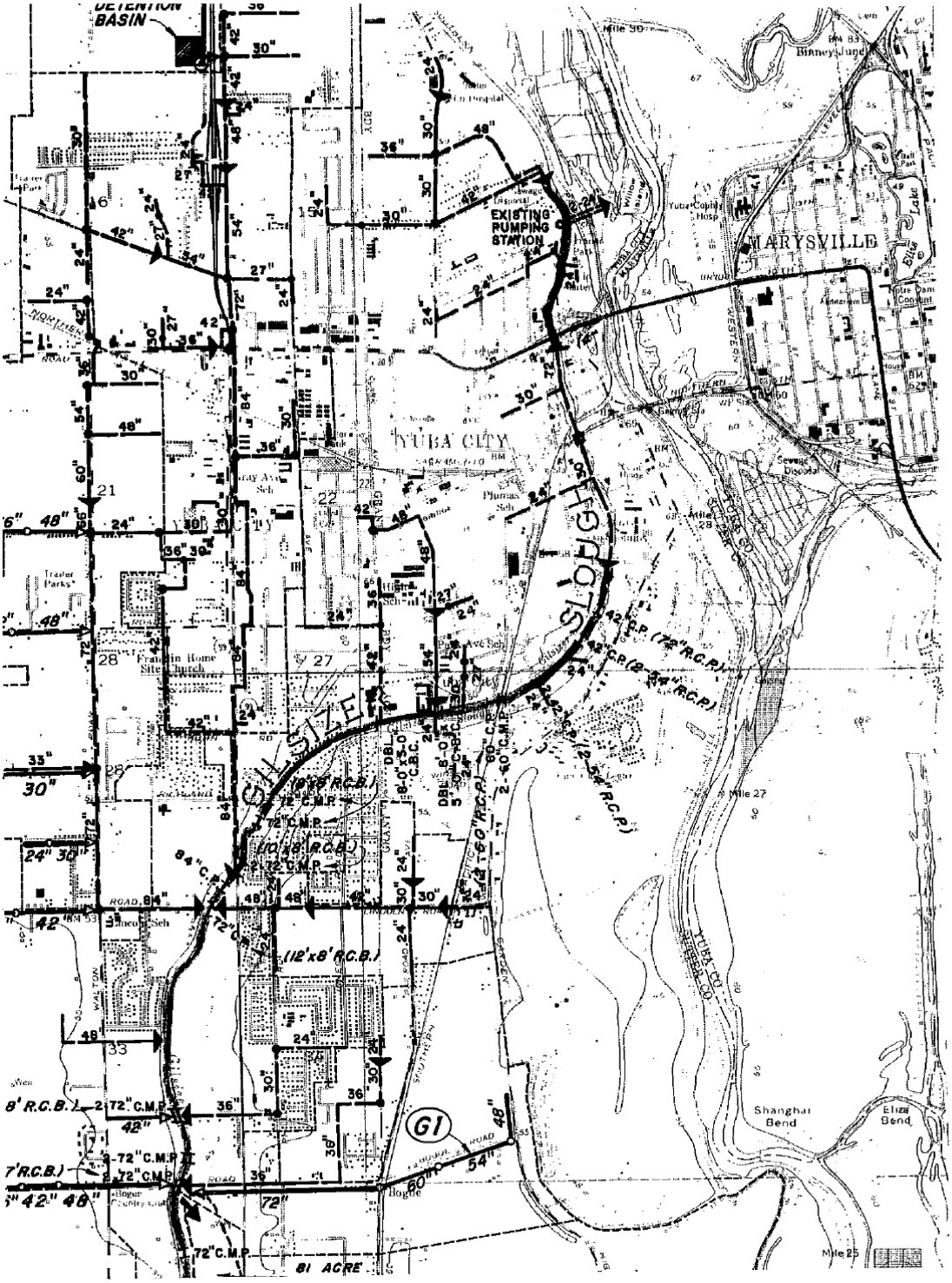
The Gilsizer County Drainage District is responsible for the operation and maintenance of drainage ditches that direct storm water runoff away from developed and improved properties in the low-lying Yuba City area of Sutter County. The ditches have been cut and channeled through native soils and backfill, with each drainage ditch having sloped banks.

According to the District, while some improvements to the system have been made to increase capacity with the expansion of the Yuba City Urban Area, some areas still need further improvements. Flooding still occurs in parts of Yuba City caused by old pipelines designed for small flows. The District will continue to make improvements to the Slough, increasing capacity as required by expanding areas of development.

Risk Analysis

The two significant hazards facing the drainage district are winter storms and flooding. Typically, during large winter storm events, excessive rainwater runoff collects in and flows through the drainage ditches in the Gilsizer County Drainage District. These large volumes of high-velocity water erodes the banks of the drainage ditches and along the toes of the banks where they intercept the bottom of the ditches. Storm water runoff onto the banks of the ditches creates gullies and irregular depressions and undermine the integrity of the ditches. Damages associated with past hazard events include those detailed below:

December 17, 2005 to January 3, 2006: Severe storms and flooding caused excessive amounts of rainwater runoff to collect in and flow through the Gilsizer drainage ditch. Ditch slope and toe erosion to 21 areas of the ditches resulted in excess of $313,749 in damages.



Gilsizer County Drainage District

(Source: Gilsizer County Drainage District)

Levee District One

Levee District One of Sutter County was the first Levee District formed in the State of California in 1868. The District is one of two Levee Districts within the county responsible for levee maintenance. Levee District One has responsibility for 17 miles of levees along the Feather River from the north end of Yuba City (Pease Road) down river to Markuse Road.

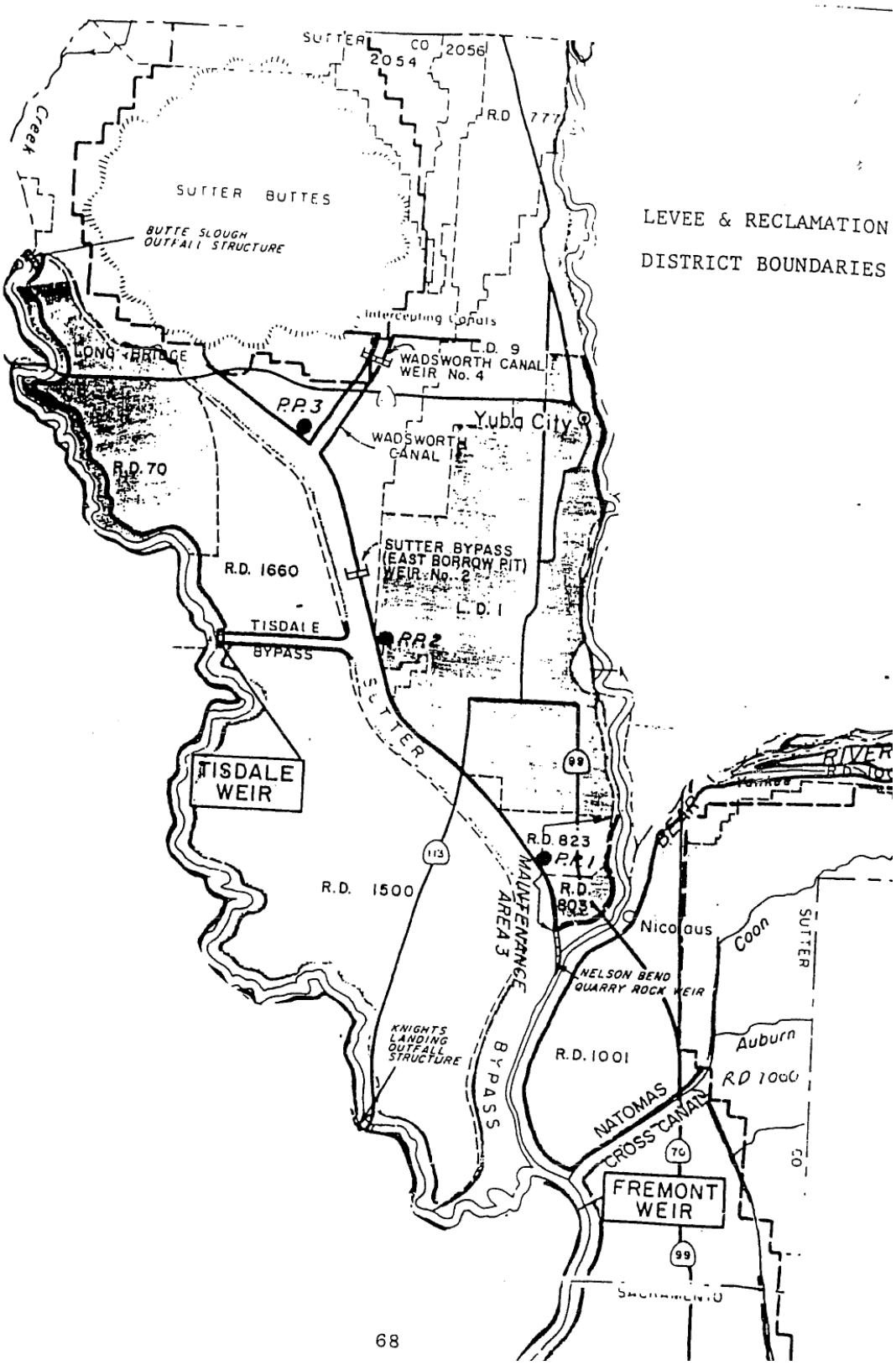
Risk Analysis
The two significant hazards facing the drainage district are winter storms and flooding. Over the years the Feather River has been eroding into the levee causing significant concern in some areas.

District assets include levees within the jurisdictional boundaries and associated support facilities.

Reclamation Districts

There are 12 Reclamation Districts that are active within the boundaries of the Sutter County Planning Area. The map on the following page illustrates the boundaries for participating reclamation districts. Of these 12, the following participated in the plan development process and information specific to their districts are provided in the following sections:

- RD1001
- RD1500
- RD70 & 1660



(Source: Sutter County General Plan Background Report)

Reclamation District 1001

RD1001 provides flood and drainage control, reclamation, and levee maintenance services within its district boundaries. RD1001 is located in the south eastern portion of the county; boundaries include: south of Bear River, east of Feather River, east of Sacramento River from end of Feather River, north of Natomas Cross Canal, and west of East Side Canal. The district services approximately 52 square miles within District boundaries (See map that follows). The District has jurisdiction over several waterways including: interior drains and levees along Bear River, Yankee Slough, Feather River, and the Sacramento River.

The levees within the district boundaries were built between 1912 and 1914. Recent repairs to the levees include stone protection completed on the waterside in 1997-1998 and repairs to the North Cross Canal and Bear River after the 1997 floods. Current project includes the Mid Valley Levee Rehab project for levee repairs along the Feather and Sacramento Rivers. Levees are maintained to USACE maintenance standards and inspected by DWR twice a year. The District is currently formulating a master management plan for levee maintenance and improvements. The USACE, DWR and the District's Board of Trustees are the parties responsible for levee improvements.

Other assets of RD1001 include lateral drains and a pumping facility. The pumps function to remove excess water from the District with a capacity of pumping approximately 300,000 gallons per minute. The drains are repaired on an as-needed basis. Recent repairs to the pumping facility include rebuilding two pumps (150 & 250 hsp) in 2005 and replacement of a 52 inch elbow and replacement and/or rebuild of intake and discharge pipes within the pump facility.

The District continues to work with state, federal, and local agencies to ensure levee stability. In accordance with Public Law 84-99, Standard Operating Procedures for Responding to Flood Emergencies, the District has an adopted "Slow Rise Emergency Plan".

Risk Analysis

The two significant hazards facing the drainage district are winter storms and flooding.

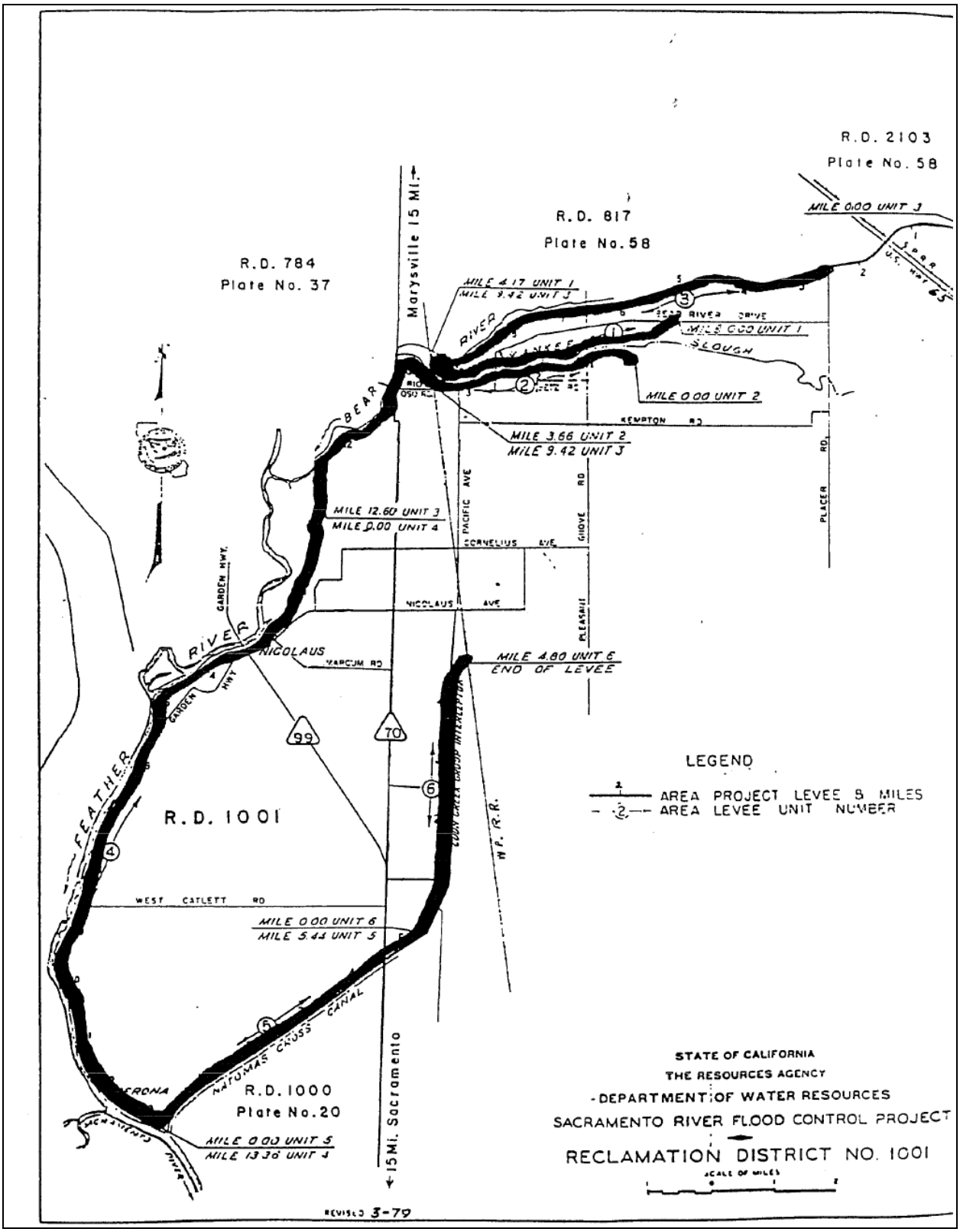
District assets include the following:

- Levees within the jurisdictional boundaries
- 140 miles of drain laterals of various sizes and ages
- Pumping facility built in 1914/1915

All assets identified above are considered critical to the operations of the District and in providing adequate flood and drainage control within its boundaries. Should any of these identified assets fail, excessive flooding will occur within the District. Depending on the location of the failure, flooding could cause a small number of residents and property to be inundated to a very large area of the District. Flood water elevations could be anywhere from one to twenty feet in depth for an undetermined amount of time.

Flooding of this magnitude would cause major loss to property owners, close two major state highways used as commuter routes to jobs in the Sacramento, destroy historical landmarks, impact local transportation, agricultural crops and public utilities.

All drainage water in the District flows mostly by gravity into drain laterals that all flow to Reclamation District 1001 Main Pumping Plant in the southern portion of the District. This pump facility pumps water into the Natomas Cross Canal one mile east of the Sacramento River. Should there be a major levee break, this facility could not handle the volume of water pouring into the District thus backing up flood water for miles.



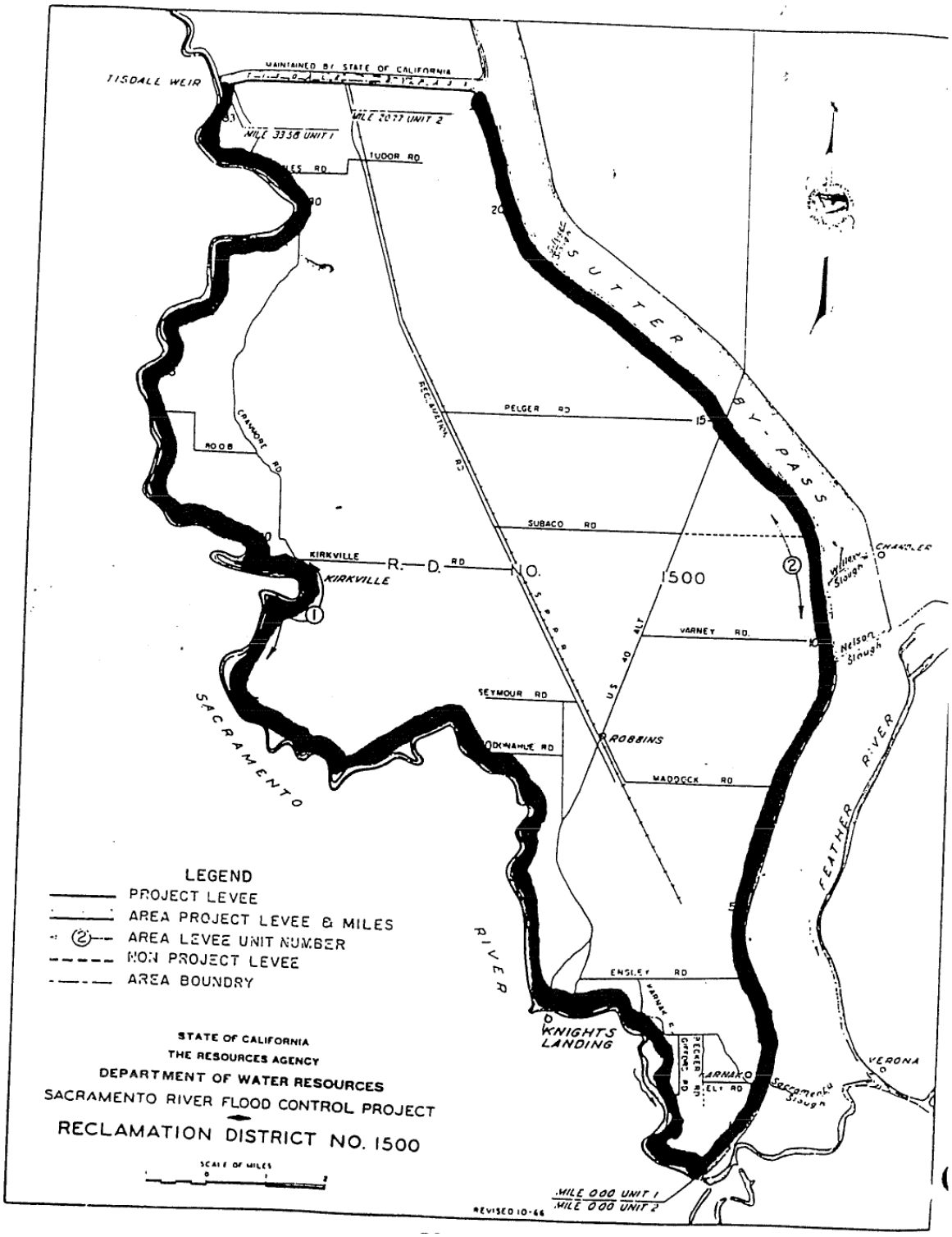
(Source: Sutter County General Plan Background Report)

Development Trends

Currently, the District is located within a rural area with very little growth. Development within the district boundaries is estimated at an additional five homes per year. Although, given the growth in the county, development trends could be significant five to ten years down the road. A couple of factors influence the development trend within the district. First the rural setting of the area is attractive to new development coming from urban areas. But, secondly, the flood potential of the area acts to discourage new development.

Reclamation District 1500

RD1500 provides flood and drainage control, reclamation, and levee maintenance services within its district boundaries. RD1500 is located in the south western portion of the county; boundaries include: south of Tisdale Bypass, east and north of the Sacramento River, and west of Sutter Bypass. The district services approximately 52 square miles within District boundaries (See map that follows).



(Source: Sutter County General Plan Background Report)

Risk Analysis
The two significant hazards facing the drainage district are winter storms and flooding.

The drainage facilities under the ownership and control of the district are at risk to damage from excessive rainfall, stormwater runoff and flooding. Of greatest concern to RD1500 is excessive flooding that could occur should the Karnak Pumping Facility Fail. Sutter Basin is surrounded by levees maintained and monitored by Reclamation District 1500. All water coming into this Basin must be pumped or gravity feed out. During high water, the release of water at Oroville Dam and high Feather River water flows will not allow for gravity feed so that all water must be pumped out of the basin. If the pumps at Karnak fail, then flooding in the south end of the District will start immediately; and within 4 to 6 hours water will be in the Sutter Basin Growers Co-Op and the town of Robbins. The Co-Op's approximate annual revenue to its growers is 22 million dollars with assets valued at about 15 million dollars. Flooding the town of Robbins would cause considerable damage to its 100 residents, school and businesses. If flooding occurs in the Basin, then Hwy 113 a major north-south transportation route from Yuba City south, with a bridge over the Sutter Bypass, could close, which in the 1997 storm and flood events was one of the few emergency routes out of Yuba City that remained opened. The following photo is of the Karnak Pump Plant.

Reclamation Districts 70 & 1660: Meridian Basin

RD70 & RD1660 provide flood and drainage control, reclamation, and levee maintenance services within its districts' boundaries. RD70 & RD1660 are located in the north western portion of the county; boundaries include: north of Tisdale Bypass, east of the Sacramento River, and west of Sutter Bypass. (See maps that follows).

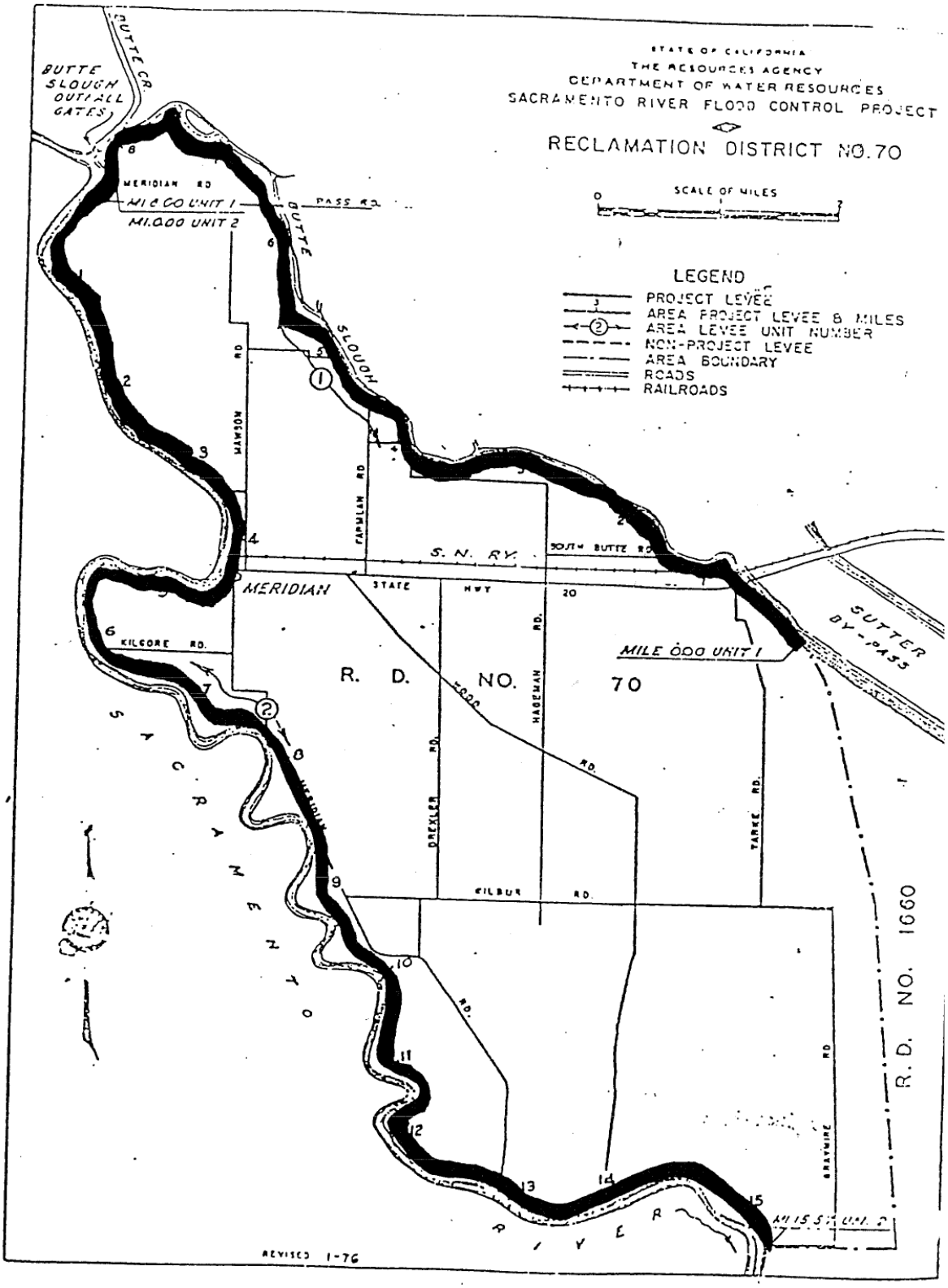
Risk Analysis

The two significant hazards facing the drainage districts are winter storms and flooding. The representative for the Districts describes the potential affects of flooding within the boundaries as extensive and potentially catastrophic. Significant hazard events occurring within District boundaries include the following:

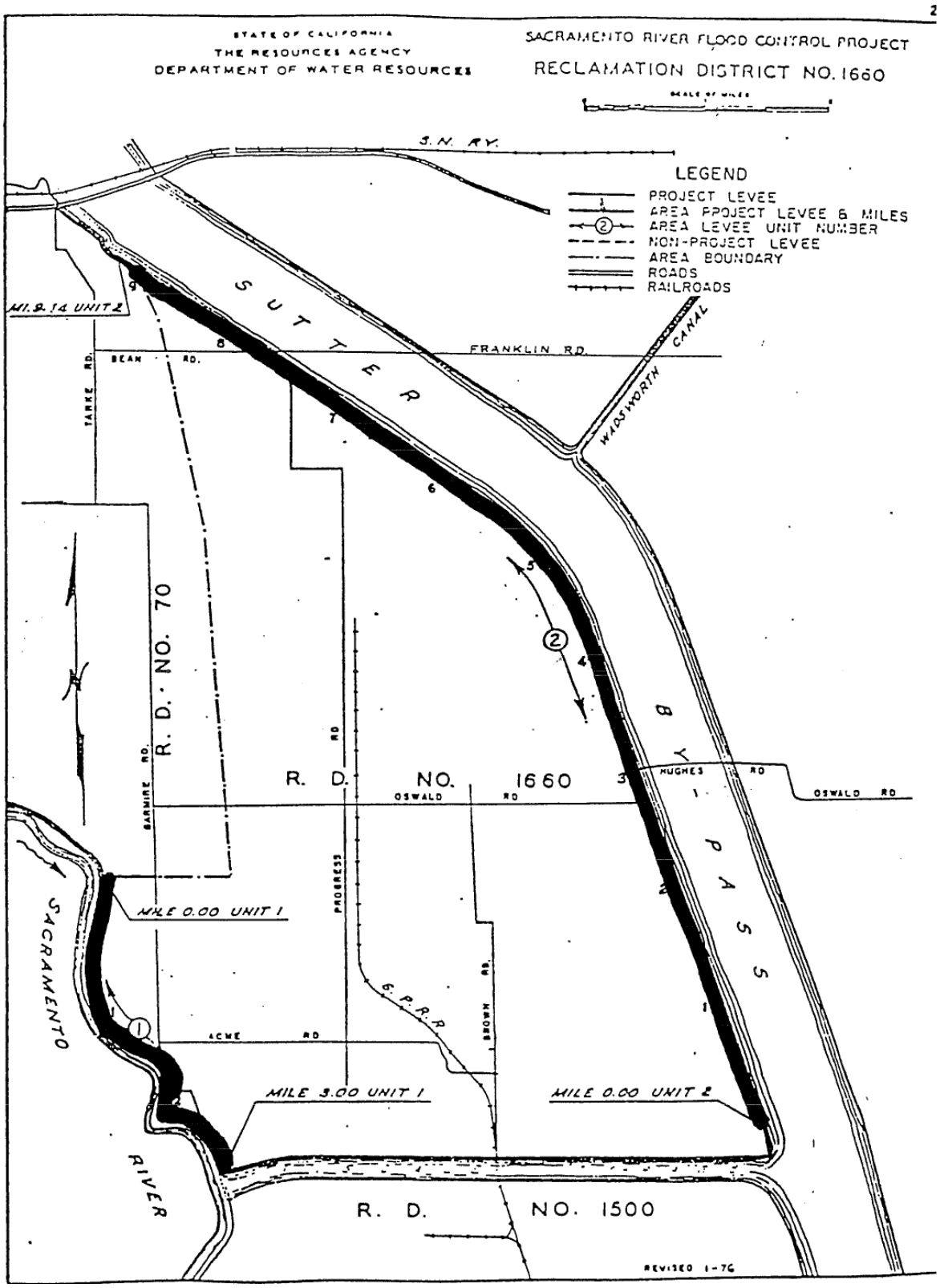
- March 1940 – Flooding occurred; no details available
- January 1997 – Levee breach on the Sutter Bypass caused flooding to approximately 75% of the Meridian Basin. Damage to property and infrastructure was I the millions. Highway 20 and county roads were closed for weeks.
- Winterstorms periodically occur that overwhelm the drainage system and pumping plants and cause local flooding.

Within the Meridian Basis, assets at risk include:

- Population of approximately 500 people
- State Highway 20
- County Roads
- District Pumping Plants
- Natural gas wells



(Source: Sutter County General Plan Background Report)



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