



# **Sutter Basin Feasibility Study Floodplain Management Plan**

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Prepared for:

**Sutter Butte Flood Control Agency  
in conjunction with the  
United States Army Corps of Engineers**

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## **INTRODUCTION**

### **PURPOSE**

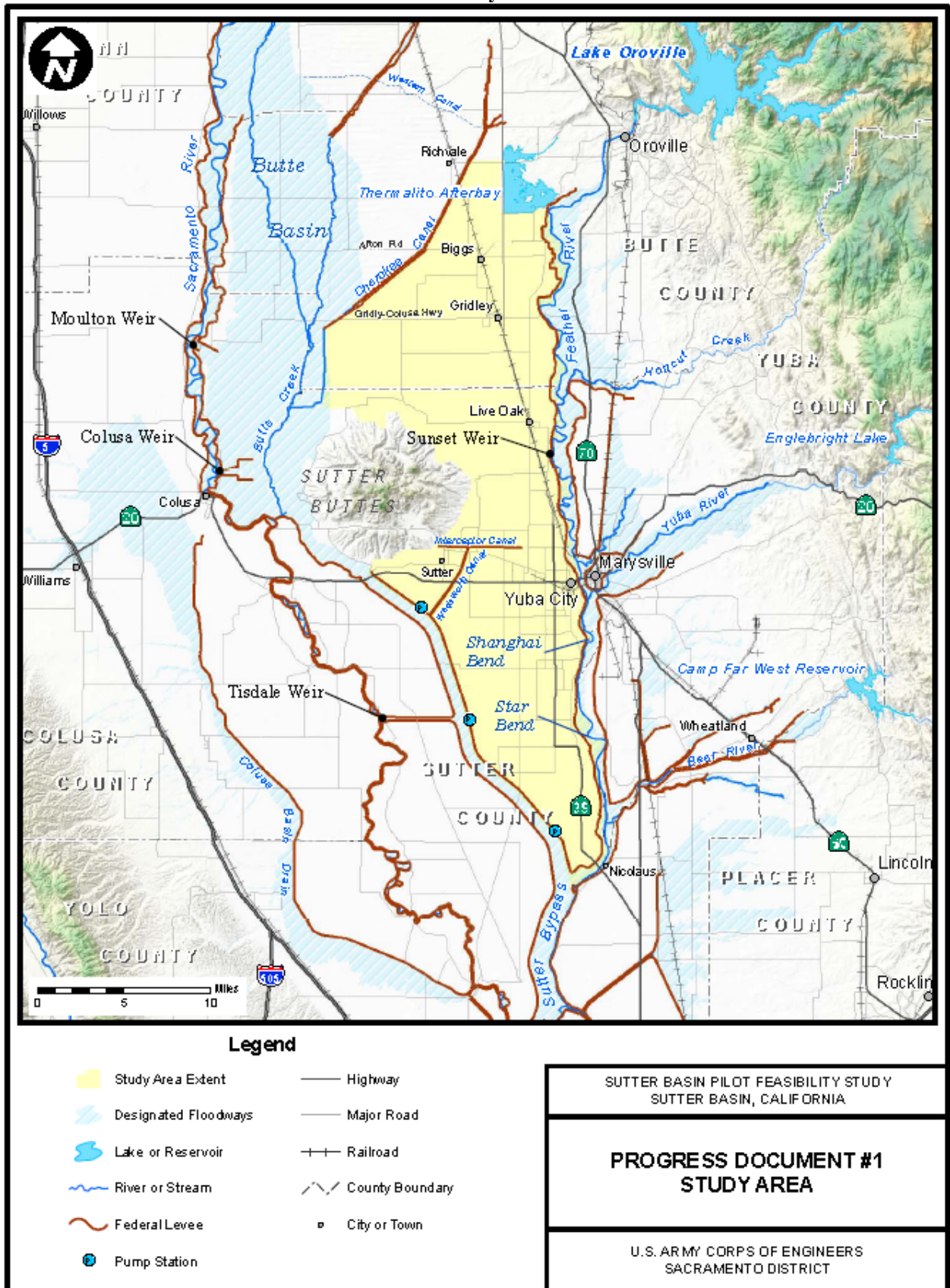
This Floodplain Management Plan (FMP) has been developed for the Sutter Butte Flood Control Agency (SBFCA) as an in-kind contribution to the US Army Corps of Engineers (USACE) Sutter Basin Pilot Feasibility Study (SBFS). The primary focus of this FMP is to identify potential measures, practices, and policies which will reduce the impact of future residual flooding, help preserve levels of protection provided by the SBFS project, and preserve and enhance natural floodplain values. SBFCA is the local sponsor, and is responsible for verifying implementation of this FMP by its member agencies.

### **STUDY AREA**

The study area is located in north-central California and encompasses a portion of Sutter County and Butte County. The study area is comprised of a region that is bordered by the Feather River, Sutter Bypass, Wadsworth Canal, Sutter Buttes, and Cherokee Canal. The study area has a population of approximately 95,000 and includes the communities of Yuba City, Live Oak, Gridley, Biggs, and numerous rural properties in the unincorporated areas of Sutter and Butte County. Flood waters with the potential to impact the study area originate from the Feather River watershed, the Sacramento River watershed, the Butte Basin, Cherokee Canal, Wadsworth Canal, and local interior drainage.

The study area is surrounded by project levees of the Sacramento River Flood Control Project (SRFCP) and high ground of the Sutter Buttes. In 1917, the Federal government authorized the Sacramento River Flood Control Project, which adopted a system of locally built levees as Federal levees, and constructed additional levees, bypasses, overflow weirs, and pumping facilities (USACE, 2012a). Figure 1 on the following page illustrates the study area and the Federal levees which provide flood protection in the region.

FIGURE 1 – Study Area



## PLAN DEVELOPMENT

### BACKGROUND

This FMP incorporates pertinent information contained in the SBFS, as well as flood hazard assessments and mitigation strategies from the most recent Multi-Hazard Mitigation Plans (MHMP's) prepared for Sutter and Butte County. Relevant information from Butte County's 2006 Flood Mitigation Plan is also included in this FMP.

Sutter County and Butte County prepared their respective MHMP's in 2007 pursuant to the requirements of the Disaster Mitigation Act of 2000, PL 106-390 and 44 CFR Part 201.6. Sutter County and Butte County are currently in the process of updating these plans, with anticipated completion in early 2013. These MHMP's are intended to provide a long-term framework to address various natural hazards, including flooding, which impact these counties.

Development and adoption of an MHMP enables a community to reduce long-term risk to people and property from natural hazards in the community. If an MHMP is accepted by the Federal Emergency Management Agency (FEMA), communities can gain Community Rating System (CRS) credits. The credit points a community receives from its MHMP, as well as other activities specified in CRS, provide a basis for reduced flood insurance rates.

Since this FMP is prepared as part of a USACE Feasibility Study, this FMP was prepared in accordance with the USACE Planning Guidance Letter 52 (PGL 52). PGL 52 provides guidance on the preparation of FMP's pursuant to Section 202 (c) of the Water Resources Development Act of 1996. In general, if an MHMP is accepted by FEMA, the floodplain management portion of the MHMP will meet PGL 52 requirements. Therefore, information contained in the previously prepared MHMP's was used as the basis for this FMP. The required plan components to meet PGL 52 and 44 CFR Part 201.6 are summarized in Table 1.

**TABLE 1 – Required Plan Components for PGL 52 FMP's and 44 CFR 201.6 MHMP's**

Required Plan Component	USACE PGL 52	FEMA 44 CFR 201.6
Identify non-Federal Planner or Committee	X	n/a
Set Goals & Objectives	X	X
Opportunity for Public Involvement	X	X
Opportunity for interagency involvement	X	X
Review & Incorporating Existing Studies/Plans etc.		X
Identify & describe hazards associated with flooding and other needs such as water quality, water supply, recreation, and environmental concerns	X	X
Describe Vulnerability and Risk from the natural hazard	X	X
Description of mitigation goals	X	X
Evaluation of a range of mitigation actions	X	X
Develop Action Plan to Implement FMP	X	X
Documentation of Process Used to Develop Plan	X	X
Documentation that the Plan has been formally adopted by governing body	X	X
Documentation of risk assessment & mitigation actions	X	X
Documentation of strategies and tools considered and reasons for inclusion/rejection	X	

In addition to the items in Table 1, SBFCA is required to maintain and provide public access to the most recent FEMA flood hazard maps to conform to PGL 52. Additionally, information needs to be provided to owners and residents of flood-prone property concerning residual risk and

availability of flood insurance on an annual basis. PGL 52 also requires this FMP to be implemented within 1-year of completing the SBFS.

### **INTERAGENCY COORDINATION AND PUBLIC OUTREACH**

Interagency coordination and public outreach has been performed for three closely related efforts – the SBFS, Sutter County MHMP, and Butte County MHMP. These efforts share the common goal of reducing flood risk and vulnerability within the study area. With permission from USACE, SBFCA has elected to adopt the interagency and public outreach efforts from these previous studies, rather than conduct a standalone effort for this FMP. A summary of the interagency coordination and public outreach from each of the referenced studies is included below.

#### SBFS

The USACE solicited public input on the SBFS via coordination with the sponsors (Central Valley Flood Protection Board (CVFPB) and SBFCA), and other agencies listed below, as well as through public workshops.

As part of the NEPA and CEQA process, USACE and the sponsors reached out to government agencies and the public to solicit input on the study. A Notice of Intent and a Notice of Preparation for the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) were published on May 20, 2011. Public scoping meetings were held in Yuba City and Gridley on June 27 and June 28, 2011.

In addition to public outreach efforts, the USACE has coordinated with agencies in and around Sutter and Butte County as part of the preparation of the SBFS. These agencies include:

- Sutter County
- Butte County
- Yuba City
- Levee District 1
- Levee District 9
- Central Valley Flood Protection Board
- Department of Water Resources Sutter Yard
- National Association of Flood and Storm Water Managers
- FEMA
- Sutter-Butte Flood Control Agency (SBFCA)
- California Central Valley Flood Control Association
- Association of State Flood Plain Managers
- Floodplain Management Association
- Sutter County Resource Conservation District
- Corps National Nonstructural/Flood Proofing Committee
- City of Biggs
- City of Gridley
- City of Live Oak
- Butte County Resource Conservation District
- Yuba County

SUTTER COUNTY MHMP

Public outreach activities as part of the Sutter County MHMP included press releases, website postings and collection of public comments on the draft plan. A public meeting was held during the early stages of the plan development process, and two public meetings were held prior to finalizing and adopting the MHMP.

The Sutter County MHMP Committee also invited neighboring communities and agencies to participate in the MHMP process. The list below identifies the key agencies which actively participated in Sutter County’s MHMP.

- Agricultural Department
- Assessor’s Office
- Community Services
- County OES
- Planning & Public Works Departments
- Sheriff
- City of Yuba City
- City of Live Oak
- ARES & ARC Radio Communications
- Bi-County Ambulance
- CA-OES
- Gilsizer County Drainage District
- Levee District One
- NWS Sacramento
- RD 70, 1001, 1500, 1660
- Red Cross
- Sutter County Resource Conservation District
- Yuba City School District
- Yuba-Sutter Salvation Army
- Yuba-Sutter Transit

Table 2 identifies the meetings the Sutter County MHMP Committee held during the preparation of the MHMP.

**TABLE 2 – Sutter County MHMP Development Meeting Summary**

<b>Meeting</b>	<b>Meeting Topic</b>	<b>Date</b>
1	Introduction to DMA 2000 and the Planning Process and Hazard Identification	July 18, 2006
2	Hazard Identification and Vulnerability Assessment Overview and Work Session	November 2, 2006
3	Risk Assessment Overview and Development of Mitigation Goals and Objectives	December 5, 2006
4	Developing and Prioritizing Mitigation Actions	December 6, 2006
5	Public Meeting Review & Plan Finalization	April 13, 2007

**BUTTE COUNTY MHMP**

Public input during the preparation of the Butte County MHMP was accomplished through website postings, newspaper announcements, a County Fair Kiosk, Fire Safe Council meetings, and general community meetings. The typical agenda for the information sharing and input gathering sessions with the public included:

- An overview of the MHMP purpose and process
- A broad overview of the MHMP Progress
- A detailed interactive discussion of each hazard
- Solicitation of comments
- An interactive discussion of the next steps

The Butte County MHMP Committee invited neighboring communities and agencies to participate in the MHMP process. The list below identifies the key agencies which actively participated in Butte County’s MHMP.

- County Office of Emergency Services
- County Department of Development Services
- County Department of Public Works, Land Development
- County GIS Division
- County Administrative Office
- County Sheriff’s Department
- CDF/Butte County Fire Department
- City of Chico Fire Department – Fire Chief
- City of Oroville Fire Department – Fire Chief
- City of Oroville Administrator
- City of Biggs Administrator - Finance Director
- City of Gridley Administrator
- Town of Paradise Fire Department – Fire Chief
- Mooretown Rancheria

Table 3 identifies the meetings the Butte County MHMP Committee held during the preparation of the MHMP.

**TABLE 3 – Butte County MHMP Development Public Meeting Summary**

<b>Meeting</b>	<b>Location</b>	<b>Date</b>
1	Thermalito Grange Community Open House – Informational Table Display	April 22, 2006
2	Upper Ridge Coordinating Council Meeting – OES Presentation	July 7, 2006
3	Butte County Board of Supervisors Chambers Public Meeting	July 26, 2006
4	Butte County Fair – Shared informational booth with CDF/Butte County Fire Department	August 22 – 26, 2006
5	Butte County Fire Safe Council – OES Presentation	September 6, 2006

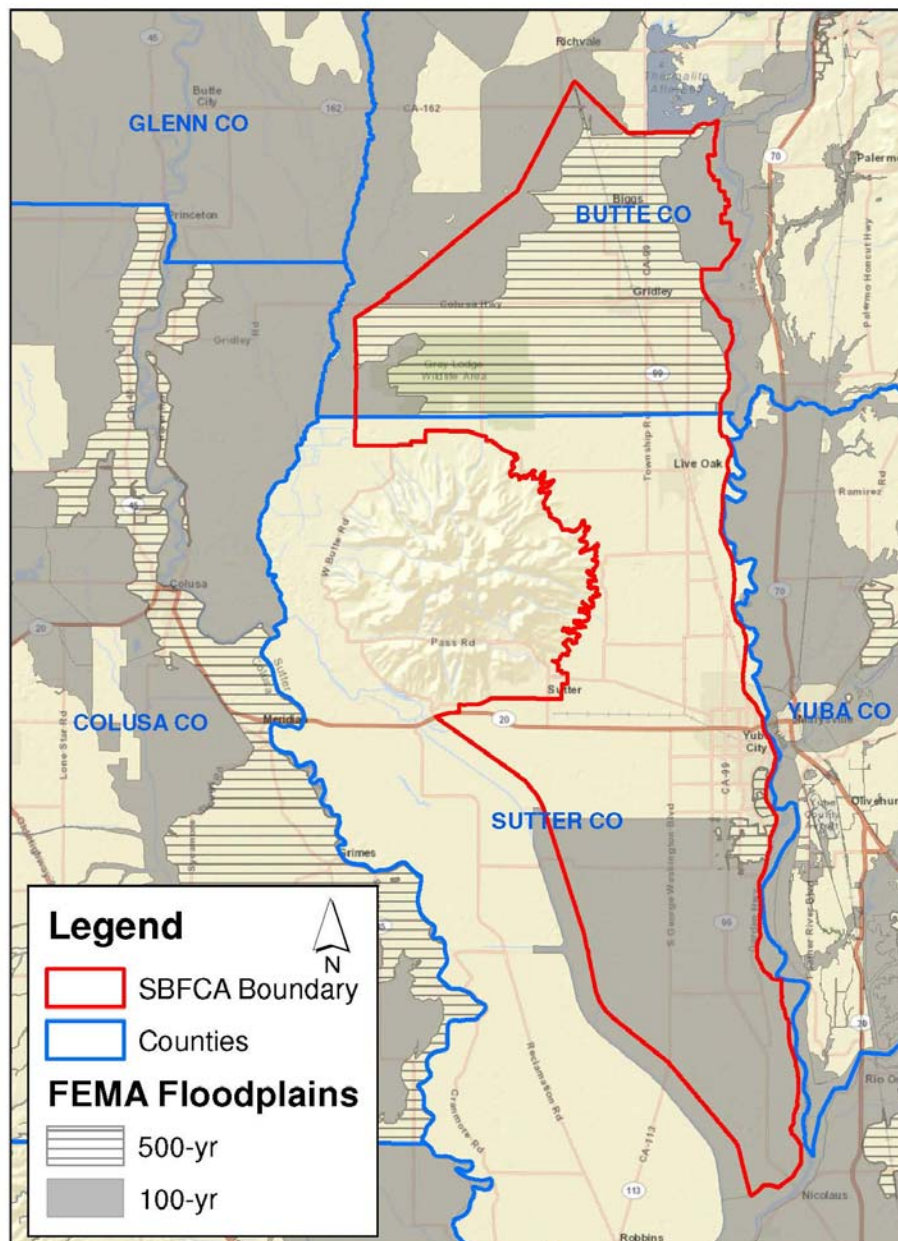
As of the date of this plan, Sutter County and Yuba City are the only communities which participate in the CRS in the Sutter Basin. They are both rated as Class 6 communities.

## FLOODING AND THE FLOODPLAIN

### HAZARD DESCRIPTION

Floods can cause widespread damage to structures, property, and utilities. Floods can also threaten the lives of residents in the floodplain, as well as people with special evacuation needs (i.e. hospitals, jails, nursing homes, etc.). Evacuation can be effective for natural riverine (slow rise) flooding. However, historical flooding in the region has been from levee failures due to underseepage. Levee and dam failure is difficult to predict, and can limit the effectiveness of evacuation measures. Furthermore, standing water and wet materials in structures can become a breeding ground for microorganisms such as bacteria, mold, and viruses. This can cause disease, trigger allergic reactions, and damage materials long after the flood (Sutter County, 2007). The 100-year (1% annual chance) and 500-year (0.2% annual chance) FEMA floodplains in the study area are shown in Figure 2.

FIGURE 2 – Floodplains in the Study Area



## **SOURCES OF FLOODING IN THE REGION**

Land and property within SBFCA's jurisdiction are vulnerable to four types of floods: localized flooding, natural riverine flooding, levee failure/overtopping, and dam failure floods. The primary sources of flooding within the study area are the Butte Basin, Sutter Bypass, Feather River, Cherokee Canal, Wadsworth Canal, and local interior drainage. The SBFS focuses on potential alternatives to mitigate flooding associated with the failure of existing Federal levees along the west bank of the Feather River, the east bank of the Sutter Bypass, and the east bank of the Wadsworth Canal. As previously mentioned, historical flooding in the region has been from levee failures due to underseepage.

## **DESCRIPTION OF THE NATURAL FLOODPLAIN AND STORAGE AREAS**

The SBFS describes the floodplain and natural storage areas within the study area in detail. The information in this section was adopted from the *SBFS Progress Document #1 – Without Project & Alternative Development* (USACE, 2012a).

The Butte Basin is a natural overflow and flood storage area northwest of the Sutter Buttes and east of the Sacramento River. The basin provides approximately 1 million acre-feet of transitory storage at flood stage. Excess floodwaters from the Sacramento River enter Butte Basin via overbank areas along the river and through the Moulton and Colusa weirs. Butte Creek and its tributaries, including Cherokee Canal, also flow into the Butte Basin. Outflow from the Butte Basin is regulated by hydraulic conditions of Butte Slough and floodplain topography at the upstream entrance to the Sutter Bypass.

The Sutter Bypass is a leveed flood control structure approximately three quarters of a mile wide, bordered by levees on each side. The bypass is an integral feature of the Sacramento River Flood Control Project's flood bypass system. The Sutter Bypass is described by four hydrologic reaches based on tributary inflows; Butte Slough to Wadsworth Canal, Wadsworth Canal to Tisdale Bypass, Tisdale Bypass to Feather River, and Feather River to Sacramento River. The Sutter Bypass conveys flood waters from the Butte Basin, Sacramento River, and Feather River to the Sacramento River at the entrance to the Yolo Bypass at Fremont Weir. Additional flood flows from the Sacramento River enter the Sutter Bypass through Tisdale Bypass. The Sutter Bypass also receives minor natural flow and agricultural return flow from Reclamation District 1660 to the west and from Wadsworth Canal and Department of Water Resources (DWR) pumping plants 1, 2, and 3 to the east. The lower portion of the Sutter Bypass also conveys the Feather River. Within this reach the Feather River is separated from the main conveyance of the bypass by a training levee. This design maintains higher velocities and sediment transport capacity within the Feather River during low flow events while utilizing the large conveyance of the Sutter Bypass during larger events.

The Feather River is a major tributary to the Sacramento River, merging with the Sutter Bypass upstream from the Sacramento River and Fremont Weir. The Feather River is described by four hydrologic reaches based on significant inflows; Thermalito to Honcut Creek, Honcut Creek to Yuba River, Yuba River to Bear River, and Bear River to Sutter Bypass. The Yuba and Bear Rivers are major tributaries to the Feather River. Two major flood management reservoirs are located within the Feather River watershed: Oroville on the Feather River and New Bullards Bar on the Yuba River.

The Cherokee Canal is a tributary to Butte Creek and the Butte Basin. The leveed canal was constructed between 1959 and 1960 by USACE. The drainage area is approximately 94 square miles and is bounded by the Feather River watershed to the east and southeast, Butte Creek and its tributaries to the north and west, and by Wadsworth Canal drainage to the south.

The Wadsworth Canal is a leveed tributary to the Sutter Bypass near the town of Sutter. The canal conveys flow from the East and West interceptor canals to the Sutter Bypass. The East and West interceptor canals collect runoff from canals and shallow floodplain runoff into the Wadsworth Canal.

**BENEFICIAL USES OF THE NATURAL FLOODPLAIN**

The Sutter National Wildlife Refuge is located within and along the Sutter Bypass and consists of about 3,000 acres along about 20 miles of riparian channels on both sides of the interior of the bypass (USACE, 2012a). Within the Sutter Bypass, riparian and emergent marsh vegetation is limited to narrow bands of woody vegetation near the low flow streams waterward of the project levees. Cottonwood and willow are the most common riparian tree species. During periods of high flow when the bypass is flooded, the bypass provides seasonal winter wetland habitat for migratory waterfowl. Segments of drainage ditches that are located landward of the Sutter Bypass and parallel the levee toe support areas of emergent marsh and the State and Federally-listed threatened Giant Garter Snake (GGS).

Fishing and boating are the major recreational activities on the Feather River. There are also several parks along the river. CDFG operates several areas within the Feather River Wildlife Area that are managed primarily for wildlife but offer recreation opportunities, including hunting, fishing, bird watching, and nature study. Use of levee top for hiking and biking is restricted because the public is not allowed to use most of the levee tops for recreation.

Some of the major water bodies in the study area also are sources of municipal, domestic, and agricultural water. These beneficial uses are at risk of being impacted by a significant flood event. Table 4 summarizes the beneficial uses of the major water bodies in the study area.

**TABLE 4 – Beneficial Uses of the Natural Floodplain and Water Bodies in the Study Area**

<b>Beneficial Uses</b>	<b>Sutter Bypass</b>	<b>Feather River (Fish barrier dam to Sacramento River)</b>	<b>Yuba River (Englebright Reservoir to the Feather River)</b>	<b>Bear River</b>
Municipal and Domestic Water Supply	X	X	X	X
Agriculture—Irrigation		X	X	X
Agriculture—Stock Watering			X	X
Hydropower			X	X
Rec-1—Contact	X	X	X	X
Rec 1—Canoeing & Rafting		X	X	X
Rec-2—Other Non—Contact		X	X	X
Freshwater Habitat—Warm	X	X	X	X
Freshwater Habitat—Cold		X	X	X
Fish Migration—Warm		X	X	X
Fish Migration—Cold	X	X	X	X
Fish Spawning—Warm		X	X	X
Fish Spawning—Cold	X	X	X	X
Wildlife Habitat	X	X	X	X
Navigation		X		

Source: SWRCB 2007

## INVENTORY & ASSETS IN THE SBFS STUDY AREA

The SBFS has estimated the number of existing structures and their respective values within the existing SBFS study area. Structures were determined to be within the study area by comparing the 500-year (0.2% annual chance) levee breach floodplain with spatially referenced assessor's parcel data in GIS. Additionally, land use information was used to group various land uses into four structural damage categories: commercial, industrial, public, and residential. The number of each type of structure within the 500-year levee breach floodplain is shown in Table 5.

**TABLE 5 – Structural Inventory in the 500-year Levee Breach Floodplain**

Area	Commercial	Industrial	Public	Residential	TOTAL
Biggs	18	1	0	586	605
Gridley	81	7	4	1,931	2,023
Live Oak	51	5	23	2,088	2,167
Yuba City	872	210	122	18,760	19,964
Rural Butte	10	16	0	1,242	1,268
Rural Sutter	10	29	8	1,162	1,209
<b>TOTAL</b>	<b>1,042</b>	<b>268</b>	<b>157</b>	<b>25,769</b>	<b>27,236</b>

The SBFS estimated the value of damageable structures based on depreciated replacement values. The value of damageable building contents was estimated as a percentage of the structure value. Table 6 presents the total value of damageable property (and contents) in the study area.

**TABLE 6A – Damageable Property (Structures) in the 500-year Levee Breach Floodplain**  
October 2011 Values (\$1,000's)

Area	Commercial Structures	Industrial Structures	Public Structures	Residential Structures	TOTAL STRUCTURES
Biggs	\$3,780	\$1,759	\$0	\$49,797	\$55,286
Gridley	\$37,534	\$36,953	\$2,175	\$191,168	\$267,830
Live Oak	\$14,621	\$1,389	\$31,064	\$213,262	\$260,335
Yuba City	\$585,935	\$234,644	\$239,100	\$2,395,719	\$3,455,399
Rural Butte	\$1,659	\$32,091	\$0	\$133,513	\$167,262
Rural Sutter	\$3,583	\$24,389	\$12,868	\$183,350	\$224,192
<b>TOTAL</b>	<b>\$647,114</b>	<b>\$331,225</b>	<b>\$285,207</b>	<b>\$3,166,758</b>	<b>\$4,430,304</b>

**TABLE 6B – Damageable Property (Contents) in the 500-year Levee Breach Floodplain**  
October 2011 Values (\$1,000's)

Area	Commercial Contents	Industrial Contents	Public Contents	Residential Contents	TOTAL CONTENTS
Biggs	\$2,829	\$601	\$0	\$24,873	<b>\$28,304</b>
Gridley	\$34,694	\$14,942	\$1,290	\$95,584	<b>\$146,509</b>
Live Oak	\$11,022	\$2,269	\$10,984	\$106,631	<b>\$130,906</b>
Yuba City	\$468,893	\$183,184	\$95,338	\$1,197,860	<b>\$1,945,276</b>
Rural Butte	\$2,261	\$13,571	\$0	\$66,736	<b>\$82,588</b>
Rural Sutter	\$5,436	\$15,246	\$5,661	\$91,675	<b>\$118,018</b>
<b>TOTAL</b>	<b>\$525,135</b>	<b>\$229,814</b>	<b>\$113,273</b>	<b>\$1,583,379</b>	<b>\$2,451,601</b>

**CRITICAL FACILITIES IN THE FLOODPLAIN**

In addition to the assets at risk in the floodplain, there are several critical facilities which could have life-safety and long-term economic impacts to the region if impacted by a flood event. Critical infrastructure includes life safety facilities and facilities of regional economic significance. Life safety facilities include the subcategories of police, fire, limited-mobility housing, hospitals, and emergency response facilities. Infrastructure of regional economic significance consists of airports, energy producers, major employers, and other high-value facilities.

The following critical facilities are within the current 100-year FEMA floodplain;

- The Montna Farms Processing Facility which contains more than \$10 million worth of rice;
- The Helena chemical plant which is a large manufacturer of insecticides, herbicides, and fertilizers. These products pose a threat if released during a flood and may require significant clean-up costs; and
- The Calpine Corporation energy facilities, which supply a significant amount of energy production and contain expensive infrastructure.

A list of critical facilities within the study area is shown below.

**TABLE 7 – Critical Facilities in the Study Area**

ID #	Description	Address	Category
1	California Highway Patrol	1619 Poole Boulevard, Yuba City, CA 95993	Life Safety
2	Gridley/Biggs Police Department	3019 8th, Biggs CA 95917	Life Safety
3	Yuba City Police Investigation	1545 Poole Boulevard, Yuba City, CA 95993	Life Safety
4	Gridley Police Department	685 Kentucky Street, Gridley, CA 95948	Life Safety
5	Biggs Fire Department	434 B St, Biggs, CA 95917	Life Safety
6	Feather River Surgery Center	370 Del Norte Ave # 101, Yuba City, CA 95991	Life Safety
7	Gridley Fire Department	47 East Gridley Road, Gridley CA 95948	Life Safety
8	Live Oak Fire Department	2745 Fir Street, Live Oak, CA 95953	Life Safety

<b>ID #</b>	<b>Description</b>	<b>Address</b>	<b>Category</b>
9	Oswald-Tudor Fire Department	1280 Barry Road, Yuba City, CA 95991	Life Safety
10	Sutter County LAFCO	1130 Civic Center Blvd #A, Yuba City, CA 95993	Life Safety
11	Sutter County Fire Department	2340 California Street, Sutter, CA 95982	Life Safety
12	Sutter County Fire Department	Live Oak, CA 95953	Life Safety
13	Walton Fire Department	824 Clark Avenue, Yuba City, CA 95991	Life Safety
14	Walton Fire Department	2855 Butte House Road, Yuba City, CA 95993	Life Safety
15	Yuba City Fire Department	824 Clark Avenue, Yuba City, CA 95991	Life Safety
16	Meridian Rural Fire Station	1160 Civic Center Blvd., Yuba City, CA	Life Safety
17	Ambulance Service Bi-County	1700 Poole Boulevard, Yuba City, CA 95993	Life Safety
18	American Red Cross of Northeastern California	2125 East Onstott Road, Yuba City, CA 95991	Life Safety
19	Biggs-Gridley Memorial Hospital: Artzner Thomas	240 Spruce St., Gridley, CA 95948	Life Safety
20	Families First Urgent Care and Weight Loss Center	466 Del Norte Ave, Yuba City, CA 95991	Life Safety
21	Fremont-Rideout Urgent Care Center	1531 Plumas Ct., Yuba City, CA 95991	Life Safety
22	Philips Lifeline Inc.	939 Live Oak Blvd. #A4, Yuba City, CA 95991	Life Safety
23	Sutter North Urgent Care	444 Plumas Blvd., Yuba City, CA 95991	Life Safety
24	Rideout Memorial Hospital	240 Spruce St., Gridley, CA 95948	Life Safety
25	Yuba Sutter Call Center	1700 Poole Boulevard, Yuba City, CA 95993	Life Safety
26	The Courtyard Assisted Living	1240 Williams Way, Yuba City, CA	Life Safety
27	Gardens Alzheimer's Care	840 Washington Ave., Yuba City, CA	Life Safety
28	River Valley Care Center	9000 Larkin Road, Live Oak, CA 95953	Life Safety
29	Yuba City Skilled Nursing Facility	521 Lorel Way, Yuba City, CA 95991	Life Safety
30	Yuba City Manor - Assisted Living	1880 Live Oak Blvd., Yuba City, CA 95991	Life Safety
31	North Valley Behavioral Health	1535 Plumas Ct., Yuba City, CA 95991	Life Safety
32	Sutter County Public Works	146 Garden Highway, Yuba City, CA 95991	Life Safety
33	Sutter County Public Works	1130 Civic Center Blvd #G, Yuba City, CA 95993	Life Safety
34	U.S. Social Security Administration	355 Percy Avenue, Yuba City, CA 95991	Regional Economic Significance
35	Helena Chemical Company	6788 Colusa Highway, Yuba City, CA 95993	Regional Economic Significance
36	Yuba City Water Treatment Plant	701 Northgate Drive, Yuba City, CA 95991	Life Safety
37	Yuba City Sewage Treatment Plant	302 Burns Drive, Yuba City, CA 95991	Life Safety
38	Leo Chesney Correctional Facility	2800 Apricot St., Live Oak, CA 95953	Life Safety
39	Sutter County Jail	1077 Civic Center Blvd., Yuba City, CA 95993	Life Safety

<b>ID #</b>	<b>Description</b>	<b>Address</b>	<b>Category</b>
40	Sutter County Airport	146 Garden Highway, Yuba City, CA 95991	Regional Economic Significance
41	Vanderford Ranch Company Airport	Yuba City, CA	Regional Economic Significance
42	Bowles Airport	Live Oak, CA 95953	Regional Economic Significance
43	Jones/Aviation Airport	Biggs, CA	Regional Economic Significance
44	Calpine Corporation	5029 South Township Road., Yuba City, CA	Regional Economic Significance
45	Yuba City Energy Center	875 North Walton Avenue., Yuba City, CA 95993	Regional Economic Significance
46	Green Leaf 1 Power Plant	5087 South Townshio Road, Yuba City, CA 95993	Regional Economic Significance
47	Sutter Energy Center	5029 South Township Road, Yuba City, CA 95993	Regional Economic Significance
48	Feather River Energy Center	202 Burns Drive, Yuba City, CA 95993	Regional Economic Significance
49	Green Leaf 2 Power Plant (Yuba City Energy Center)	875 North Walton Ave., Yuba City, CA 95993	Regional Economic Significance
50	Yuba City Cogen Partners	870 N Walton Ave, Yuba City, CA 95992	Regional Economic Significance
51	Boeger Bros Rice Dryer	501 Rudo Lane, Gridley, CA 95948	Regional Economic Significance
52	Rice Experiment Sta.	955 Butte City Highway, Biggs, CA 95917	Regional Economic Significance
53	Sutter Rice Co.	1421 Acacia Ave., Sutter, CA 95982	Regional Economic Significance
54	Feather River Packaging	663 Center Avenue., Gridley, CA 95948	Regional Economic Significance
55	Golden Valley Fruit Packing	2599 Reed Road, Yuba City, CA 95993	Regional Economic Significance
56	Gridley Packing, Inc.	1366 Larking Road, Gridley, CA 95948	Regional Economic Significance
57	Packing Shed LLC	95 Township Road, Gridley, CA 95948	Regional Economic Significance
58	Rio Pluma Co., LLC.	1900 California 99, Gridley, CA 95948	Regional Economic Significance
59	Sacramento Packing Inc.	833 Tudor Road, Yuba City, CA 95991	Regional Economic Significance
60	Sacramento Packing Inc.	1880 Lorraine Way, Yuba City, CA 95993	Regional Economic Significance
61	Sunrise Kiwi Packing	2165 Larkin Road, Biggs, CA 95917	Regional Economic Significance
62	Sunrise Kiwi Packing	1484 Larkin Road, Biggs, CA 95917	Regional Economic Significance
63	Sunsweet Growers Inc.	901 North Walton Ave., Yuba City, CA 95993	Regional Economic Significance
64	Valley View Packing Co.	7547 Sawtelle Ave., Yuba City, CA 95991	Regional Economic Significance
65	Wilbur Packing Co., Inc.	1500 Eager Road, Live Oak, CA 95953	Regional Economic Significance
66	Wil-Ker-Son Ranch & Packing Co.	661 East Evans Reimer Road, Gridley, CA 95948	Regional Economic Significance
67	Hi & Dry Warehouse	1551 Acacia Ave., Sutter, CA 95982	Regional Economic Significance

<b>ID #</b>	<b>Description</b>	<b>Address</b>	<b>Category</b>
68	Lomo Cold Storage	6005 California 99, Live Oak, CA 95953	Regional Economic Significance
69	Montna Farms/Dingville Driers	12755 Garden Highway, Yuba City, CA	Regional Economic Significance
70	Growers Ag. Services Inc.	2100 Everglade Rd., Yuba City, CA 95993	Regional Economic Significance
71	South Sutter Cold Storage	896 Obanion Road, Yuba City, CA 95991	Regional Economic Significance
72	Sierra Gold Nurseries	5320 Garden Highway, Yuba City, CA 95991	Regional Economic Significance
73	Bonanza Seeds	3818 Railroad Ave., Yuba City, CA 95991	Regional Economic Significance
74	Town Center Senior Manor	506 Plumas St. #14, Yuba City, CA 95991	Life Safety
75	Sunsweet Growers	960 Pease Rd, Yuba City, CA 95991	Regional Economic Significance
76	Dept. of Water Resources Maintenance Yard	6908 Colusa Highway, Sutter, CA 95982	Regional Economic Significance
77	Levee District 1 HQ	243 2nd Street, Yuba City, CA 95991	Life Safety
78	Levee District 9 HQ	1471 Coats Dr, Yuba City, CA	Life Safety
79	Yuba City City Hall	1201 Civic Center Blvd., Yuba City CA 95993	Life Safety
80	Live Oak City Hall	9955 Live Oak Blvd., Live Oak CA 95953	Life Safety
81	Gridley City Hall	995 Spruce St., Gridley, CA	Life Safety
82	Biggs City Hall	465 C St., Biggs CA 95917	Life Safety
83	Community Services Center	1130 Civic Center Blvd., Yuba City, CA 95993	Life Safety

## GOALS

As previously noted, the primary focus of this FMP is to identify potential measures, practices, and policies which will reduce the impact of flooding, help preserve levels of protection provided by the SBFS project, and preserve and enhance natural floodplain values. This is consistent with the SBFS and the respective flood mitigation goals and objectives in the previously prepared MHMPs for Sutter and Butte County, and the Butte County Flood Mitigation Plan. Therefore, SBFCA has elected to adopt the shared goals from these previous plans, rather than develop standalone goals for this FMP. Table 8 identifies the goals of this FMP, and identifies shared goals which are included in the SBFS, and the Sutter and Butte County MHMPs.

**TABLE 8 – FMP Goals**

<b>FMP Goal</b>	<b>Description</b>	<b>SBFS</b>	<b>Sutter MHMP</b>	<b>Butte MHMP/FMP</b>
1	Reduce the risk to life, health, public safety and hardship due to flooding	X	X	X
2	Reduce the risk of property damage due to flooding	X	X	X
3	Reduce the risk of damage to critical infrastructure due to flooding	X	X	X
4	Encourage wise use of the floodplain	X		
5	Restore floodplain connectivity and associated dynamic riverine processes	X		
6	Restore aquatic, wetland, riparian, and terrestrial habitats for special status and other native species	X		
7	Improve the public's access to and use of outdoor recreational opportunities in the study area	X		
8	Reduce the probability of flooding to urban and urbanizing areas to less than 1/200 annual exceedance probability	X		
9	Improve community awareness about hazards that threaten communities and identify appropriate actions to minimize their impacts upon people and property		X	
10	Reduce public expenditure for construction of additional flood damage reduction measures, emergency response actions, and post-disaster assistance	X		

## **HAZARD MITIGATION MEASURES**

In an effort to achieve the goals outlined in the previous section, mitigation measures were reviewed. Prior to summarizing the new potential mitigation measures considered by the SBFS and MHMPs, the current hazard mitigation measures employed within the study area are presented below.

### **CURRENT MITIGATION MEASURES**

Floodplain development is regulated at the local, state, and federal level. These regulations serve to discourage building structures in a floodplain by providing incentives (or disincentives) to developing in these areas. The various development restrictions in place at the local, state, and federal levels are summarized below (Shapiro, et. al., 2011).

#### ***Local-Level Development Restrictions***

Sutter and Butte County have General Plans and associated zoning ordinances which focus development to existing urban areas. Sutter County's General Plan states "A majority of the County has historically been set aside for agriculture and other resource uses, with rural development focused within the County's unincorporated communities. Urban growth has largely been directed to the incorporated cities, Yuba City and Live Oak." Similarly, Butte County's General Plan vision statement states, "Agriculture and open space will continue to dominate Butte County's landscape and be an important part of the County's culture and economy." The figures extracted from the respective General Plans on the following pages illustrate locations of planned urban and agricultural development. Additionally, Sutter and Butte County floodplain development ordinances require improved, repaired, or new buildings in designated floodzones to be elevated 1-foot above the FEMA 100-year Base Flood Elevation.

#### ***State-Level Development Restrictions***

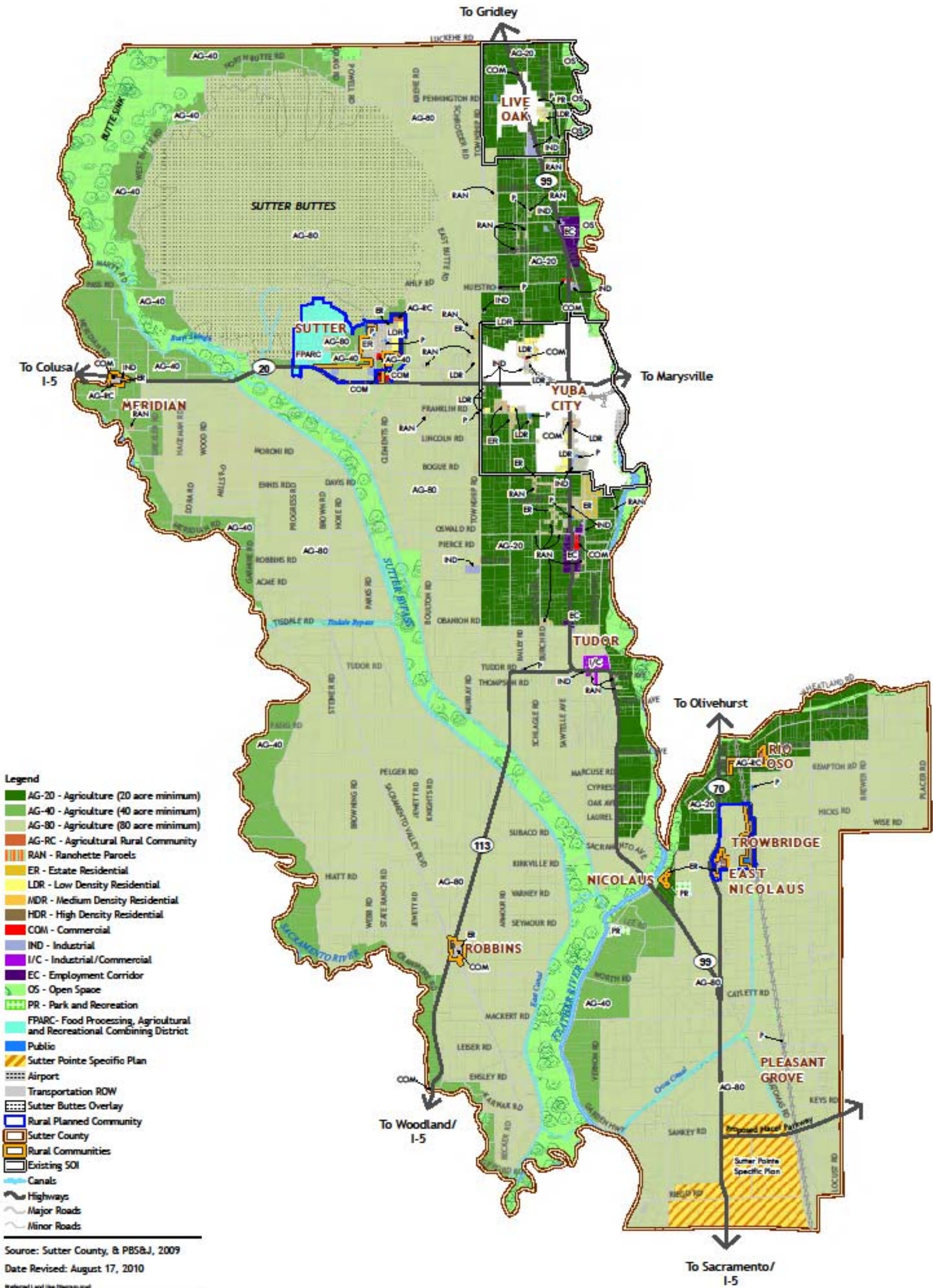
Land use in areas prone to flooding is highly regulated in California. The state's Cobey-Alquist Floodplain Management Act requires cities and counties to enact zoning regulations that generally prohibit permanent residential construction in land adjacent to watercourses that could be inundated by flooding (known as "floodways"). (Cal. Water Code §§ 8401, 8402.)

Additionally, recent legislative actions have imposed stricter regulation of flood-prone areas within the State of California. Senate Bill 5 (SB 5) requires the State to establish a Central Valley Flood Protection Plan by July 2012, and within two years (amended to three years by SB 1278) after the adoption of the Plan by the Central Valley Flood Protection Board (CVFPB), communities within the Central Valley must amend their general plans to include the data and analysis contained in the plan, identify goals and policies for the protection of lives and property from flooding, and include related feasible implementation measures.

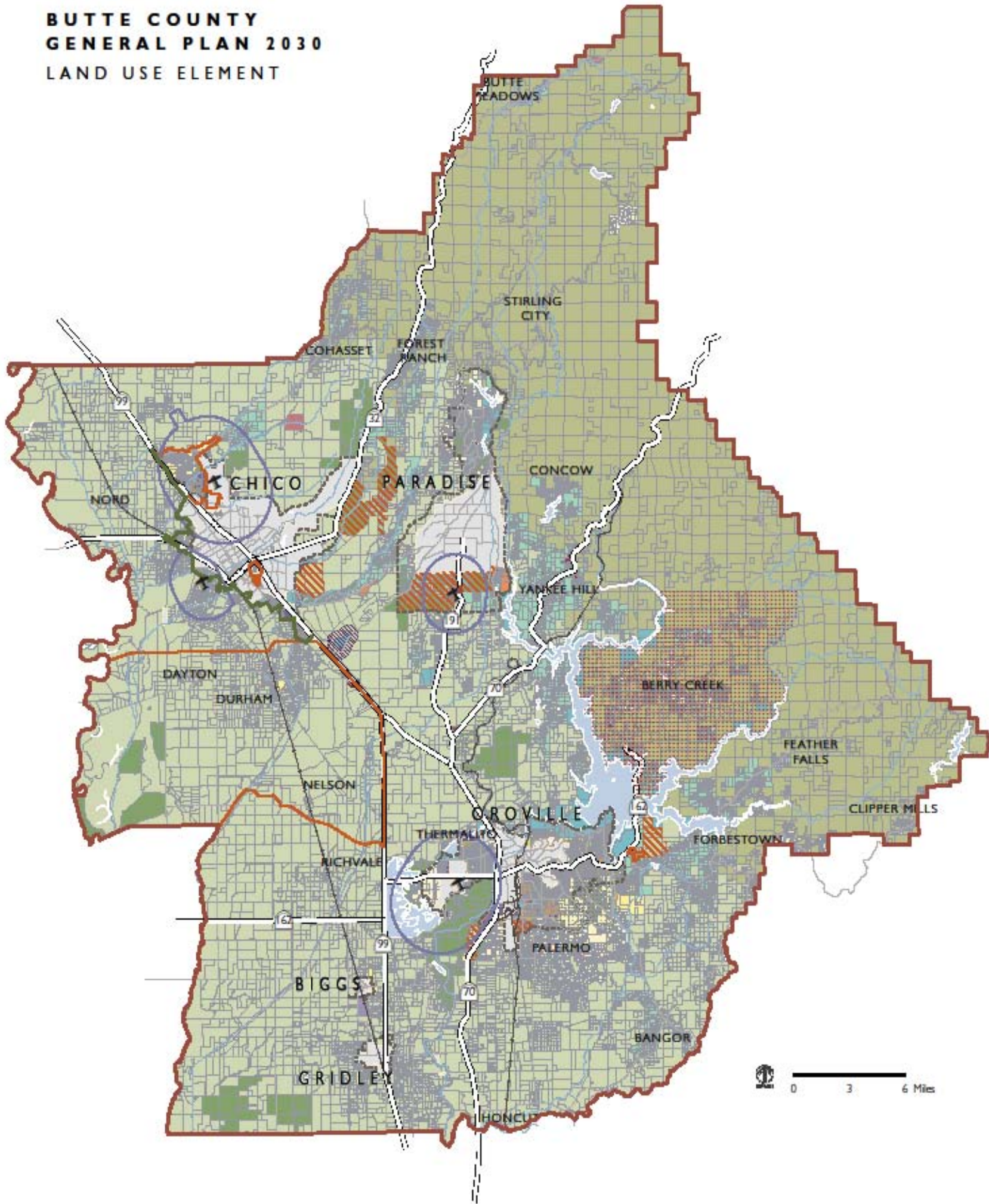
Development in a flood hazard zone would only be allowed if the city or county can find, based on substantial evidence in the record, that urban or urbanizing areas will be protected to a 200-year-flood level. Therefore, as of mid-2016, Central Valley cities and counties will be prevented from entering into development agreements, approving discretionary permits that would result in construction of a residence, and approving subdivision maps in urban or urbanizing areas without a finding of 200-year- flood-level protection.

#### ***Federal-Level Development Restrictions***

Cities and counties participating in the National Flood Insurance Program (NFIP) must conform to Federal Emergency Management Agency regulations regarding approval of development and/or the type of development that may occur. These regulations have severe growth limiting measures for areas that are mapped in the 100-year floodplain. FEMA also incentivizes cities and counties (through reduced NFIP insurance rates) to limit or regulate development in the floodplain. Sutter County and Butte County participate in the NFIP.



**BUTTE COUNTY  
GENERAL PLAN 2030  
LAND USE ELEMENT**



Source: Butte County GIS, 2009.

Note: The Deer Herd Migration Area Overlay and the Airport Land Use Compatibility Zones within the Airport Overlay are provided as separate maps.



**FIGURE LU-3  
GENERAL PLAN LAND USE DESIGNATIONS**

Source: Butte County, 2007

### ***Notifications***

Various local agencies provide information, notification, and outreach activities to residents in the study area in an effort to promote public awareness about flood risk. The State of California also provides information and outreach via DWR. A brief overview of the notification and outreach activities for these agencies is described below.

#### **Sutter Butte Flood Control Agency**

SBFCA maintains information regarding projects, flood insurance, and links to other flood control agency websites (i.e. Sutter & Butte County, Yuba City, FEMA, DWR, USACE, etc.)

#### **Sutter County**

Sutter County maintains a flood preparedness website that includes: evacuation preparation, sand bagging info, evacuation/flood stage information, recommended actions to take during flooding, and cleanup activity information. General flood information is also available in Spanish, Hmong, and Punjabi on the website. The website also includes links to active weather information, emergency planning documents, Flood Insurance Rate Maps, Flood Insurance Studies, information on the NFIP and CRS, and floodplain information. Sutter County also distributed a letter to Sutter County residents, which describes: the history of flooding in the region; the NFIP; local floodplain regulations; flood safety information; and links to other important contacts (i.e. FEMA, DWR, etc.). A copy of this letter is available on the Sutter County website.

#### **Butte County**

Butte County Office of Emergency Management maintains information on emergency preparation, links to disaster information, and evacuation maps. Links to Flood Insurance Rate Maps, and the latest Multi-Hazard Mitigation Plan are also available on the County's website.

#### **Yuba City**

Yuba City maintains a floodplain management website that provides information on flooding, flood insurance, preparation, sand bagging, evacuation/flood stage information, recommended actions to take during flooding, cleanup activity information, links to emergency planning documents, and floodplain ordinance information. Yuba City also distributed a letter, a copy of which is available on the website, to its residents. This letter summarizes the sources of flooding, flood insurance, floodplain ordinances, and provides additional agency contact information.

#### **Gridley**

The City of Gridley maintains an emergency planning pamphlet on its website which provides disaster preparation information to residents.

#### **DWR**

The Flood Risk Notification Program is part of the DWR's FloodSAFE California Initiative. The program's key goal is to increase flood risk awareness by effectively communicating that risk to individual property owners, the public, and local, state, and federal agencies. This includes encouraging people to understand the levee system that protects them; be prepared and aware of their flood risk; and take appropriate actions before, during, and after flooding to protect themselves, minimize damage to their property, and facilitate recovery.

Since September 2010, DWR has provided annual written notice of flood risks to each landowner whose property is protected by SPFC levees and is within an Levee Flood Protection Zone. The notice informs recipients of their property's potential flood risks and potential sources of flooding, and offers flood emergency planning and preparedness tips. It encourages recipients to take preventative actions such as purchasing flood insurance, elevating or "floodproofing" their buildings, and preventing blockage of channels, drains, and ditches.

## POTENTIAL MITIGATION MEASURES CONSIDERED

PGL 52 requires consideration of four strategies and related tools to meet the goals identified for the FMP. The components of the previously completed MHMP's, as well as considerations included in the SBFS have been cross referenced to each of these strategies and tools. Table 9 outlines the four strategies and related tools and identifies their inclusion in the reference documents. The strategies and tools included in Table 9 have also been provided to Sutter and Butte Counties for consideration and to facilitate discussion as part of their current MHMP development. Detailed documentation of the process used and mitigation actions reviewed in the SBFS and each MHMP is included in the respective reference documents.

**TABLE 9 – Hazard Mitigation Strategies and Tools Considered**

Strategy	Tool Description	SBFS	Sutter County MHMP	Butte County MHMP
Modify susceptibility to flood	Land use restrictions	X	X	
	Runoff & finished floor requirements	X	X	
	Flood warning & response plans	X	X	X
	Flood proofing & structure relocation	X	X	
Modify impact of flooding	Information & education	X	X	X
	Flood insurance	X	X	
	Tax adjustments	X		
	Emergency relief	X	X	X
	Post-flood recovery	X	X	
Preserve and restore natural resources	Wetlands protection	X	X	
	Erosion/sedimentation control	X	X	
	Water quality enhancement	X	X	
	Enhancement of recreational & educational opportunities	X		
	Preservation of cultural resources	X		
Structural modifications	Dams & reservoirs		X	
	Levees, dikes, floodwalls	X	X	X
	Channel diversions & bypasses	X	X	X
	Bridge modifications			X
	Pump stations	X		
	Onsite Detention		X	

The alternatives under consideration as part of the SBFS and the Action Plans in the Sutter County MHMP and Butte County MHMP share a common goal of reducing flood risk and vulnerability. This FMP considers these alternatives and action plans in the development of a composite action plan for SBFCA's FMP. A summary of the recommended mitigation measures in the SBFS and the action plans from each of the referenced MHMPs is included below.

### SBFS

The SBFS Progress Document #1 – Without Project & Alternative Development (USACE, 2012a) and Nonstructural Flood Risk Management Alternative Report (USACE, 2010) were reviewed to identify all mitigation actions considered. As shown in Table 9, the SBFS considered every strategy, and nearly every tool. The only tools which were not considered were dams,

bridge modifications, and onsite detention. These items were excluded since they are not feasible or applicable to effectively reduce flooding hazards in the study area. Furthermore, onsite detention is a local policy, and therefore is not included in the SBFS. Onsite detention was included in the local MHMP studies.

The SBFS has not been finalized, but an array of structural and nonstructural alternatives has been refined for further evaluation. Each of the refined alternatives are presented below.

### ***Nonstructural Measures***

The SBFS *Nonstructural Flood Risk Management Alternatives Report* (USACE, 2010) described, evaluated, and screened non-structural flood risk management measures, and developed alternatives for consideration as part of the SBFS. The nonstructural measures consist of the following measures:

- Enhance existing hazard mitigation plans in Sutter and Butte counties by formalizing coordination between the two counties. Vector control and post-flood clean up provisions are also recommended for these plans.
- Assess and improve early flood warning systems in Live Oak and Yuba City
- Develop a conjunctive use project at New Bullards Bar Reservoir and/or Oroville Reservoir to reduce flood risk in the region and minimize O&M requirements.
- Secure all large floatable objects in the study area.
- Construct ring levees around the following facilities:
  - Sunsweet Growers Facility
  - Howard Dryer Company
  - Biggs and Boeger Rice Dryers
  - Tri Valley Growers
  - Emergency Facilities
  - School Facilities
  - Live Oak WWTP, Yuba City WTP and WWTP, Biggs WWTP, and Gridley WWTP
  - Calpine Energy Plants
  - Wild Goose Storage, Inc.
  - Live Oak Manor Nursing Home
- Relocate the following structures/facilities:
  - Farm Labor Housing
  - Yuba City Treatment Plant effluent ponds
- Floodproof the following sites:
  - Gray Lodge Waterfowl Management Area
  - Church of the Nazarene
  - McConnell Chevrolet Pontiac
  - Kragen Auto #4140
  - Biggs and Gridley groundwater wells
- Elevate the following structures:
  - Gray Lodge Waterfowl Management Area

These nonstructural measures are not standalone alternatives to address flooding in the study area. These are measures which can supplement a structural alternative to reduce flood risk.

### ***Structural Alternatives***

The SBFS *Progress Document #1 – Without Project & Alternative Development* (USACE, 2012) described, evaluated, screened, and developed structural alternatives for consideration as part of the SBFS. Eight alternatives (SB-1 thru SB-8) were presented as the refined array of alternatives

for consideration as the Tentatively Selected Plan (TSP). Subsequent refinement by SBFCA and USACE resulted in three primary alternatives under consideration as the TSP: SB-6, SB-7, and SB-8. Each of these alternatives is described below.

Alternative SB-6: Fix-In-Place Feather River, Sutter Bypass & Wadsworth Canal

This alternative consists of fixing –in- place the Feather River levees from Thermalito to the confluence with the Sutter Bypass, and fixing-in-place the east levees of the Sutter Bypass. Levees along the south side of Wadsworth Canal would also be fixed-in-place. This alternative also includes non-structural measures of a flood warning system, evacuation plan, & flood fight pre-staging areas.

Options:

- Construct a new setback levee at the Sutter Bypass and Northern Feather River confluence.
- DFGWMA Re-contour Floodplain.
- Sunset Weir Modification.
- Improve Fish Passage- dependent on a Sutter Bypass setback.
- Construct a Southern Relief Structure.
- Construct a setback levee at Star Bend

Alternative SB-7: Minimal Fix-in-Place plus Non-Structural

This alternative consists of fixing-in-place the Feather River levees from Sunset Weir to approximately 2,200-feet south of Laurel Avenue. This alternative also includes non-structural measures of a flood warning system, evacuation plan, & flood fight pre-staging areas.

Options:

- Other non-structural measures include relocation of structures and critical infrastructure in the floodplain; flood proofing at isolated locations; elevating structures and transportation infrastructure; establishing flood-resistant housing, securing large floatable objects, constructing ring levees at isolated locations.
- Construct a Southern Relief Structure.
- Department of Fish and Game Wildlife Management Area (DFGWMA) Re-contour Floodplain.
- Sunset Weir Modification.
- Construct a setback levee at Star Bend

Alternative SB-8: Fix-In-Place Feather River, Thermalito to Star Bend

This alternative consists of fixing- in -place Feather River levees from Thermalito to approximately 2,200-feet south of Laurel Avenue. This alternative also includes non-structural measures of a flood warning system, evacuation plan, & flood fight pre-staging areas.

Options:

- Construct a Star Bend setback levee in lieu of a fix-in-place.
- Northern Feather River Setback.
- DFGWMA Re-contour Floodplain.
- Construct a Southern Relief Structure.
- Construct a setback levee at Star Bend

**SUTTER COUNTY MHMP**

The Sutter County MHMP focused on structural and nonstructural alternatives to address the goal of minimizing the risk and vulnerability to flood hazards. Bridge modifications and pump station modifications were not included for consideration in the worksheets the MHMP Committee distributed during the mitigation alternative evaluation process. Recreational opportunities and preservation of cultural resources were not explicitly identified, since these would likely be secondary considerations of any project planning effort initiated by the County. To facilitate additional mitigation alternatives discussion of the new Sutter County MHMP, a copy of the mitigation strategies and tools included in Table 6 was provided to Sutter County for considerations as part of the 2012 MHMP Update. As of the date of this FMP, the 2012 Sutter County MHMP Update had not yet held its first public meeting.

The adopted action plan for Sutter County consists of prioritized projects for each jurisdiction. Table 10 summarizes the adopted actions for the each jurisdiction in the study area.

**TABLE 10 – Sutter County MHMP Adopted Actions**

<b>Mitigation Action</b>	<b>Priority</b>	<b>Responsible Office</b>	<b>Status</b>
<b><i>Countywide Recommended Mitigation Actions</i></b>			
SBFS and Improvements	High	USACE – SPK, CVFPB, SBFCA	In progress
O’Banion Road DWR Pump Station	High	DWR	
<b><i>Unincorporated Sutter County</i></b>			
Live Oak Canal Constriction Removal	High	Sutter County Water Agency	
Bogue Road Flood Water Diversion Berm	High	Sutter County Water Agency	
Road Projects to Improve Right of Passage and Decrease Localized Flooding	Medium	Sutter County Dept. of Public Works	
Bypass Crossing @ Sacramento Avenue	Medium	Sutter County Dept. of Public Works	
<b><i>City of Yuba City</i></b>			
Flood Management Planning Outreach	High	Yuba City Department of Public Works	
Implementation of Additional CRS Activities	High	Yuba City Department of Public Works	
Comprehensive Flood Management Plan	High	Yuba City Department of Public Works	
Gilsizer Slough Weir at Bogue Road	High	Yuba City Department of Utilities	
East and West Feather River Bank Stabilization	High	Yuba City Department of Utilities	
Relocation of Wastewater Effluent Discharge Ponds	High	Yuba City Department of Utilities	
Low Lift Pump Access Road Improvements	Medium	Yuba City Department of Public Works	
Various Street Improvements to Decrease Localized Flooding	Medium	Yuba City Department of Public Works	
<b><i>City of Live Oak</i></b>			
Road Projects to Improve Right of Passage and Decrease Localized Flooding	Medium	Live Oak Department of Public Works	
Lift Pump Back Up Generator Improvements	Medium	Live Oak Department of Public Works	
<b><i>Gilsizer County Drainage District</i></b>			
Revetment of Slough Channel/Headwalls at Road Crossing	High	Gilsizer County Drainage District	

<i>Levee District One</i>			
Relief Well at N. Star Bend	High	Levee District One	
Star Bend Setback Levee	High	Levee District One	Completed
Bank Erosion Repairs to Levees	Med-High	Levee District One	

Some of the items in Sutter County’s Action Plan are addressed, or will likely be addressed by the SBFS. For example, the first action under the Countywide recommended mitigation actions is the SBFS. Additionally, Levee District One indicated a setback levee at Star Bend is a high priority. All three alternatives being considered as the TSP include an optional setback levee at Star Bend.

**BUTTE COUNTY MHMP**

The 2006 MHMP does not include a detailed discussion of mitigation alternatives reviewed as part of the plan preparation. The MHMP only identified those mitigation actions which were adopted for inclusion in the action plan. A copy of the mitigation strategies and tools included in Table 9 was provided to Butte County for considerations as part of the 2012 MHMP Update. As of the date of this FMP, the 2012 Butte County MHMP Update had not yet held its first public meeting.

The adopted action plan for Butte County consists of prioritized projects for each jurisdiction. The Butte County MHMP did not identify a responsible office for the adopted actions. Table 11 summarizes the adopted actions for the each jurisdiction in the study area.

**TABLE 11 – Butte County MHMP Adopted Actions**

Mitigation Action	Priority	Status
<i>Countywide Recommended Mitigation Actions</i>		
Increase Butte Creek, Cherokee Levee Levels for 100-yr flood Protection	High	
Rock Creek and Keefer Slough Flood Control Project	High	
3B’s Overflow Facility Construction	High	
Palermo Technical Assessment	High	
DWR Maintenance of Flood Control Channels	High	
Protect County Infrastructure (i.e. relocate EOC) and records	High	
<i>City of Biggs</i>		
Increase Butte Creek, Cherokee Levee Levels for 100-yr flood Protection	High	
Feather River Flood Control Project	High	May be addressed with SBFS
Flood Mitigation Strategy for Afterbay and Forebay	Medium	
<i>City of Gridley</i>		
Feather River Levee Reinforcement	High	May be addressed with SBFS
Reinforce Infrastructure Adjacent to Feather River (Sewer Plant / Facilities)	High	
Improve Drainage System	Medium	

Some of the items in Butte County’s Action Plan may be addressed by the SBFS. For example, the City of Biggs and Gridley adopted the Feather River Flood Control Project and Levee Reinforcement as high-priority items in the Butte County Action Plan. Alternatives SB-6 and SB-8 of the SBFS would remove these communities from 200-year floodplain.

## ACTION PLAN

This FMP considers the alternatives and action plans from the referenced studies in the development of a composite action plan for SBFCA's FMP. This action plan is intended to reduce the risk of future flood damages to structures within the post-project floodplain. Accordingly, it assumes the TSP has been selected and the SBFS is complete. The relevant recommended alternatives and actions from SBFS and the Sutter and Butte County MHMPs have been compiled into a composite Action Plan for SBFCA and its member agencies.

**TABLE 12 – SBFCA Action Plan**

Action	Priority
<b><i>Sutter Countywide Recommended Mitigation Actions</i></b>	
O'Banion Road DWR Pump Station	High
Secure all large floatable objects in the study area	Medium
Formalize MHMP coordination with Butte County	Medium
Include vector control and post-flood clean up provisions in the MHMP	Medium
Update FMP concurrently with Sutter County & Butte County MHMPs	Medium
<b><i>Unincorporated Sutter County</i></b>	
Live Oak Canal Constriction Removal	High
Bogue Road Flood Water Diversion Berm	High
Road Projects to Improve Right of Passage and Decrease Localized Flooding	Medium
Bypass Crossing @ Sacramento Avenue	Medium
<b><i>City of Yuba City</i></b>	
Assess and improve early flood warning systems	High
Flood Management Planning Outreach	High
Implementation of Additional CRS Activities	High
Comprehensive Flood Management Plan	High
Gilsizer Slough Weir at Bogue Road	High
East and West Feather River Bank Stabilization	High
Relocation of Wastewater Effluent Discharge Ponds	High
Low Lift Pump Access Road Improvements	Medium
Various Street Improvements to Decrease Localized Flooding	Medium
<b><i>City of Live Oak</i></b>	
Assess and improve early flood warning systems	High
Road Projects to Improve Right of Passage and Decrease Localized Flooding	Medium
Lift Pump Back Up Generator Improvements	Medium
<b><i>Gilsizer County Drainage District</i></b>	
Revetment of Slough Channel/Headwalls at Road Crossing	High
<b><i>Levee District One</i></b>	
Relief Well at N. Star Bend	High
Bank Erosion Repairs to Levees	Med-High
<b><i>Butte Countywide Recommended Mitigation Actions</i></b>	
Increase Butte Creek, Cherokee Levee Levels for 100-yr flood Protection	High
Rock Creek and Keefer Slough Flood Control Project	High
3B's Overflow Facility Construction	High
Palermo Technical Assessment	High
DWR Maintenance of Flood Control Channels	High
Protect County Infrastructure (i.e. relocate EOC) and records	High
Formalize MHMP coordination with Sutter County	Medium
Include vector control and post-flood clean up provisions in the MHMP	Medium
<b><i>City of Biggs</i></b>	
Increase Butte Creek, Cherokee Levee Levels for 100-yr flood Protection	High
Flood Mitigation Strategy for Afterbay and Forebay	Medium
<b><i>City of Gridley</i></b>	
Reinforce Infrastructure Adjacent to Feather River (Sewer Plant / Facilities)	High
Improve Drainage System	Medium

## **ADOPTION, IMPLEMENTATION, AND ADDITIONAL REQUIREMENTS**

PGL 52 requires this action plan be adopted by SBFCA and implemented within one year of completing the SBFS.

Furthermore, SBFCA is required to maintain and provide public access to the most recent FEMA flood hazard maps. The SBFCA website includes a link to the Sutter and Butte County webpages, which have links to the current FEMA maps. As long as these counties continue to provide the current maps on their websites, SBFCA will be compliant with this requirement. SBFCA will also need to assure that owners and residents of flood-prone property are provided information concerning residual risk and availability of flood insurance on an annual basis. Because DWR performs this function in cooperation with SBFCA, SBFCA is compliant with this requirement.

Finally, this FMP will need to be updated periodically. Once the next MHMP's are completed, (anticipated summer 2013) this FMP should be updated to reflect the most current information.

## REFERENCES

Butte County (2006). Flood Mitigation Plan.

Butte County (2007). Multi-Jurisdictional All Hazard Pre-Disaster Mitigation Plan.

Sutter County (2007). Yuba City-Sutter County, California, Multi-Hazard Mitigation Plan.

ICF International (2010a). Sutter Basin Feasibility Study—Recreation Opportunities, Measures, and Sponsors, report for USACE Sacramento District.

ICF International (2010b). Sutter Basin Feasibility Study—Restoration Opportunities, Measures, and Sponsors, draft report for USACE Sacramento District.

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Shapiro, Scott and Colli, Garrett (2011). Summary of Discretionary Approvals Requisite for Development in California

USACE (2010). Sutter Basin, California, Feasibility Study, Nonstructural Flood Risk Management Alternative Report, Sacramento District.

USACE (2012a). Sutter Basin, California, Pilot Feasibility Study, Progress Document #1, Without Project & Alternative Determination, Sacramento District.

USACE (2012b). Sutter Basin Pilot Feasibility Study, Draft Decision Point #2 Read Ahead, Flood Risk Management Project Appendix H - Economics, Sacramento District.

## QC COMMENTS & RESOLUTIONS

PROJECT: **SBFS WIK**

REVIEW DOCUMENT(S): **Sutter Basin Feasibility Study Floodplain Management Plan**

DATE: **1/25/2013**

SUBMITTED BY: **Jesse Patchett, P.E.**

REVIEWER: **Michael Bessette, P.E. (SBFCA); Barry O'Regan (ITR); Judy Soutiere (USACE)**

REFERENCE			COMMENT				RESPONSE				
			Comment Codes: <b>M</b> =Mandatory Response; <b>S</b> =Suggested Correction; <b>Q</b> =Question; <b>G</b> =General Comment;				Response Codes: <b>A</b> =Agree, will revise; <b>D</b> =Disagree, see explanation; <b>F</b> =Follow up required; <b>G</b> =General Response				
Comment No.	Dwg/Sec	Page/Sht	Code	Description	By	Date	Code	Explanation	By	Date	Backcheck By/Date
1	-	3	Q	Page 3, in the list of agencies coordinated with for the SBFS, should the bullet list include City of Live Oak?	SBFCA	10/18/12	G	Live Oak is now added to this list	JJP	10/22/12	SBFCA 1/22/13
2	-	18	Q	For the "Nonstructural Alternatives" list on page 18, did the SBFS actually recommend ring levees around all those structures as an alternative? If so, why is a ring levee considered a "non-structural" alternative?	SBFCA	10/18/12	G	Ring levees around individual properties are considered non-structural alternatives by FEMA and USACE. On page 6-14, the Non-Structural Alternatives Report recommended ring levees around the site listed in the FMP.	JJP	10/22/12	SBFCA 1/22/13
3	-	20	Q	On page 20, shouldn't it be noted that the LD-1 Star Bend Setback Levee project was completed?	SBFCA	10/18/12	G	Table 10 has been updated to indicate this project has been completed.	JJP	10/22/12	SBFCA 1/22/13
4	-	Varies	G	Clarify when natural floodplain or levee breach floodplains are referred to.	ITR	11/14/12	G	This has been clarified in the document	JJP	11/14/12	ITR 1/18/13
5	-	7	G	Update the SBFCA Boundary shown on Figure 2 to allow clear visibility of the FEMA floodplain	ITR	11/14/12	G	This change has been made to Figure 2	JJP	11/14/12	ITR 1/18/13
6	-	11	Q	Under Table 4, Beneficial Uses of the Floodplain and Water Bodies in the Study Area, does navigation apply to the Yuba River and Bear River.	ITR	11/14/12	G	The table was sourced from RWCQB; the navigation boxes for Yuba & Bear River were not checked.	JJP	11/14/12	ITR 1/18/13
7	-	26	G	The write up says annual notification is required. Should be expanded to include the outreach, notification that is done by each community and the state.	USACE	12/19/12	G	Additional information on notification and outreach has been added to page 19 of the FMP.	JJP	12/28/12	USACE 1/3/13
8	-	6	G	A statement of which communities participate in the Community Rating System with FEMA, and what their rank is.	USACE	12/19/12	G	Sutter County and Yuba City are currently the only two entities participating in the CRS, and both are Class 6 communities. This information has been added to page 6 of the FMP.	JJP	12/28/12	USACE 1/3/13
9	-	11	G	Need to say the document will be updated periodically and specifically when the Hazard Mitigations plans are completed	USACE	12/19/12	G	This statement has been added to page 26 of the FMP.	JJP	12/28/12	USACE 1/3/13