

Annex E Reclamation District 10

E.1 Introduction

This Annex details the hazard mitigation planning elements specific to Reclamation District 10 (RD 10 or District), a new participating jurisdiction to the 2021 Yuba County Local Hazard Mitigation Plan (LHMP) Update. **Note:** RD 10 participated in the original 2007 Yuba County LHMP. Staff turnover in the past 14 years has reduced institutional memory of that 2007 Plan. Actions from the 2007 Plan were:

- Update local flood ordinances to agree to national standards.
 - ✓ No complete – this is a County action. The District cannot enforce a floodplain ordinance.
- Flood Control – Stabilize Levee.
 - ✓ RD 10 has not implemented large scale flood control projects to stabilize the levees since the 2007 LHMP Plan.
- Internal Drainage Improvements.
 - ✓ RD 10 partnered with CA Department of Water Resources (DWR) to evaluate internal drainage features under the CA DWR – Deferred Maintenance Program (DMP).
- Operating Procedures – Flood Guide.
 - ✓ RD 10 has not updated the operating procedures.
- Flood Preparedness Training.
 - ✓ RD 10 Staff has participated in the Flood Preparedness Training and Flood Fight Methods Training presented by CA DWR.
- Levee system improvement.
 - ✓ RD 10 has completed a Limited Geotechnical Problem Identification Report (2019) which has identified and prioritized levee system improvements throughout the district.
- Elevate Communications and IT equipment.
 - ✓ RD 10 has identified new communications and IT equipment but has yet to upgrade current equipment due to funding availability

It can be assumed that the 2007 Plan was not incorporated into any RD 10 planning mechanisms. Development in the District since 2007 was described by RD 10 as minimal. As such, it can be assumed that the vulnerability has not changed.

This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to RD 10, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

E.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Yuba County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning

process are shown in Table E-1. Additional details on plan participation and District representatives are included in Appendix A.

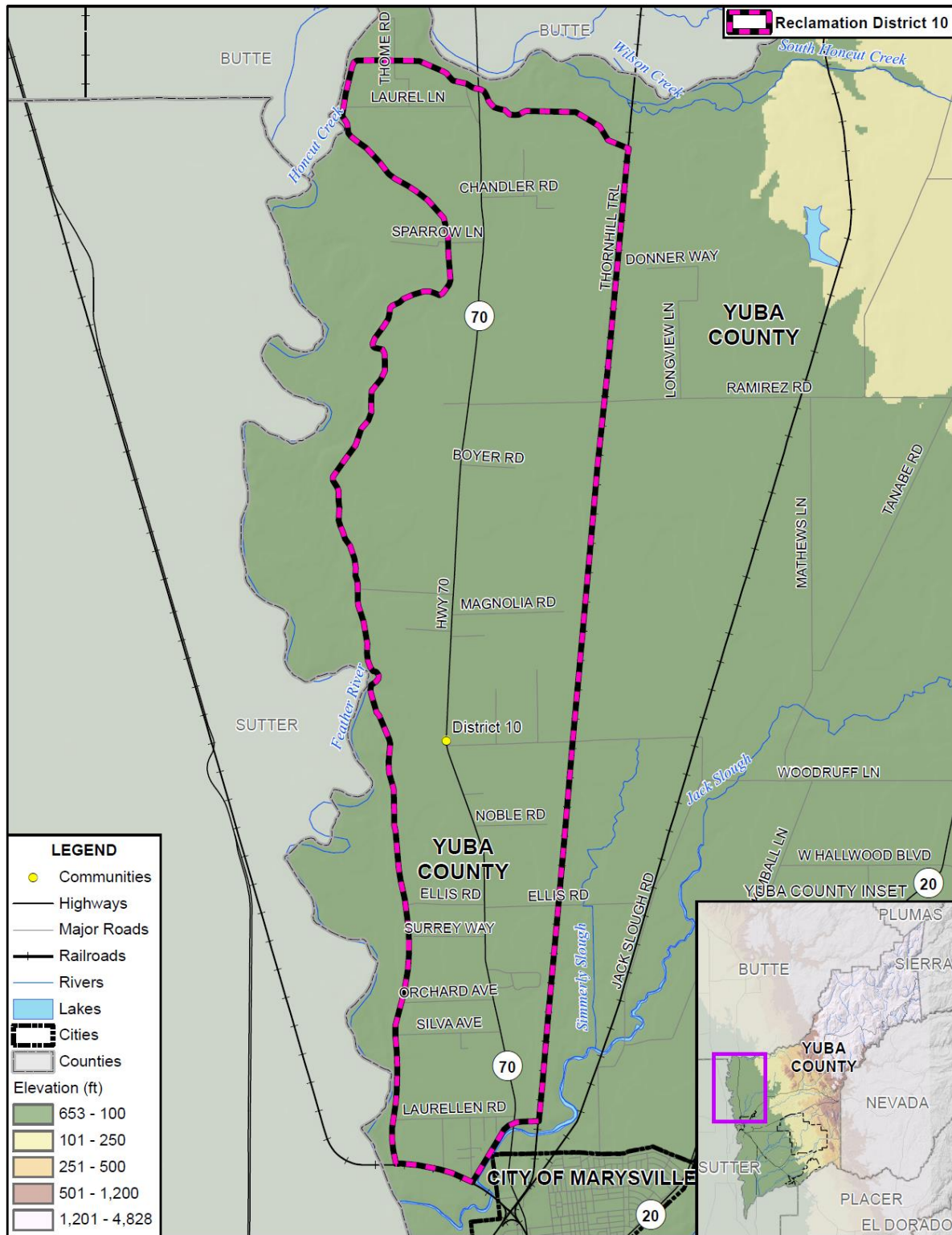
Table E-1 RD 10 – Planning Team

Name	Position/Title	How Participated
Sarb Johl	District President	HMPC Meeting participation and document review.
Tom Engler	District Engineer	HMPC Meeting participation and document review.
Tony Deus	Support Staff	HMPC Meeting participation and document review.

E.3 District Profile

The District profile for the RD 10 is detailed in the following sections. Figure E-1 displays a map and the location of the District within Yuba County.

Figure E-1 RD 10



0 2 4 Miles

Data Source: Yuba County GIS, Cal-Atlas; Map Date: 1/15/2021.



E.3.1. Overview and Background

Reclamation District 10 was established by special legislation in 1913, and operates under the authority of the State of California’s Reclamation Board and the Department of Water Resources (DWR). The District encompasses approximately 12,000 acres and includes 23 miles of levees. The boundaries are Honcut Creek to the north, the Marysville Levee to the south, the Feather River to the west, and the Union Pacific Railroad Tracks to the east. The District includes approximately 50 businesses including 31 farms, 13 ag-related businesses, and numerous other small businesses scattered along State Highway 70 which runs north-south through the center of the District from Marysville to Honcut Creek on the Butte County line.

RD 10 is responsible for the maintenance of levees along the south bank of Honcut Creek, east bank of the Feather River, north bank of Jack and Simmerly Slough, and the east side back levee along the UPRR railroad embankment. Maintenance includes the control of vegetation, erosion, rodents, and maintenance of access roads for levee patrols and emergency access as well as maintenance and operation of a small pump station to evacuate internal drainage flows. Maintenance is performed by a part-time paid maintenance superintendent with support from the local farmers and community volunteers who are not compensated. Maintenance of the levees is accomplished in accordance with Federal and State regulations. During periods of high water the levees are patrolled by volunteers who monitor the levees for early detection of possible weakness, damage or erosion.

Many of the farmers and community members have a long history in the area; and as such are concerned that the levees are being weakened by beavers, rodents, soil erosion, storms, and high water events. The levees are also being further eroded and undermined by trees, brush, debris, and refuse piled on or near the levees, and illegal driving on the levees.

Reclamation Districts in Yuba County began as farmers mounded soil to protect farmland from flooding by nearby rivers. The State Legislature enacted law so Reclamation Districts could be formed as a way to pay the costs to “reclaim” the land. “This law (Water Code 50000 et seq.) provides a means for counties to finance the reclamation of land that has been made unusable by overflow or flooding. Services and facilities that can be financed by a Reclamation District include all things “necessary and convenient” to reclaim the land. Items commonly financed include facilities and services for sewage and waste removal and facilities to be used for the irrigation of lands inside or outside the district.”

Reclamation Districts in Yuba County provide protection through a system of levees on the Yuba, Bear, and Feather Rivers. Local Reclamation Districts are responsible for the maintenance and operation of levees and pumps. Maintenance is generally provided by volunteers. There are five levee maintenance districts in Yuba County. As in most cases, the needs and resources vary from district to district. Three of the districts include at least some urbanized area, while two are predominately agricultural.

The levee systems are under the jurisdiction of each Reclamation District in which the levee or portion of the levee is located. Any improvements to the levee systems or other types of improvements to remove areas from the floodplain are the responsibility of the Reclamation Districts and will require an adequate comprehensive financing system to provide system maintenance to FEMA required standards.

RD 10 is a volunteer agency and has 1 employee. All levee repair work is undertaken by the Board of Directors, maintenance superintendent, and supported by a consulting district engineer. District administrative services are covered by a local accounting firm and an outside legal counsel on an as needed basis.

E.4 Hazard Identification

RD 10 identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table E-2).

Table E-2 RD 10—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Climate Change	Extensive	Highly Likely	Limited	Medium	–
Dam Failure	Extensive	Likely	Limited	High	Medium
Drought & Water Shortage	Extensive	Occasional	Catastrophic	Low	High
Earthquake	Extensive	Unlikely	Limited	Medium	Low
Floods: 1%/0.5%/0.2% annual chance	Extensive	Occasional	Critical	High	Medium
Floods: Localized Stormwater	Significant	Highly Likely	Limited	Medium	Medium
Levee Failure	Significant	Highly Likely	Limited	High	Medium
Pandemic	Extensive	Likely	Critical	Low	Medium
Severe Weather: Extreme Cold and Freeze	Extensive	Highly Likely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Low	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Low
Wildfire	Significant	Highly Likely	Critical	Low	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

E.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Yuba County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Yuba County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

E.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section E.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table E-2) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Yuba County Planning Area.

E.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the RD 10’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Critical Infrastructure describes the physical and cyber systems and assets that are so vital to the County of Yuba that their incapacity or destruction would have a debilitating impact on our physical or economic security or public health or safety. Critical infrastructure includes any location, facility, or infrastructure that are necessary to maintain normalcy in daily life, and that are essential for the delivery of vital services and for the protection of the community. Critical Facilities are further broken out into three Categories: 1) Essential Services Facilities, 2) Large Group and Vulnerable Populations Facilities, and 3) Infrastructure Facilities.

Table E-3 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. RD 10’s physical assets, valued at over \$232.8 million, consist of the buildings and infrastructure to support the District’s operations.

Table E-3 RD 10 Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
D-10 Main Pumping Plant	Pumping Plant	\$2,000,000 (estimate)	Aquatic Invasive Species, Climate Change, Dam Failure, Earthquake, Floods, and Levee Failure
District Owned Land	Land – (2 acres)	\$100,000	Dam Failure, Earthquake, Floods, and Levee Failure
Maintenance Equipment	Equipment (Vehicles, Maintenance)	\$159,000	Dam Failure, Earthquake, Floods, and Levee Failure
Levees	Flood Control Structures	\$230,000,000	Dam Failure, Earthquake, Floods, Levee Failure, and Severe Weather
Doc Adams (Privately Operated) – Pump	Pumping Plants (single engine)	\$500,000 (estimate)	Dam Failure, Earthquake, Floods, Levee Failure, and Severe Weather
Total		\$ 232.8M	

Source: RD 10

Natural Resources

RD 10 has a variety of natural resources of value to the District. These natural resources parallels that of Yuba County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

RD 10 has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallels that of Yuba County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. RD 10 provides services to approximately 1,350 residents.

- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Power Outage/Power Failure

An impact of almost all hazards below relates to power outage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.3 of the Base Plan.

The District may be affected by power shutoffs in that the main pumping plant does not currently have a redundant power supply. In the event of a shutoff during a flood emergency, the District may not have sufficient pumping capacity to remove internal drainage flows leading to localized flooding.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power outage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.3 of the Base Plan.

The District has experienced PSPS shutoffs but they did not affect the District's ability to perform its operation and maintain responsibilities. Concerns for residents of the district from both a health and safety standpoint and agricultural processing standpoint may be considered.

Climate Change

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Yuba County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Yuba County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter.

Vulnerability to and Impacts from Climate Change

The 2014 California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California’s APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Yuba County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region’s economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Yuba County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Yuba County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Risks to the District include the precipitation variability and potential for more extreme precipitation events that could lead to flooding or flood events that exceed the levee system design.

Assets at Risk

Assets include levees, buildings, and pumping systems that could be overwhelmed by extreme precipitation events.

Dam Failure

Likelihood of Future Occurrence—Occasional

Vulnerability—Extremely High

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

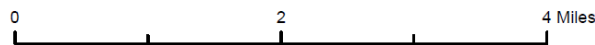
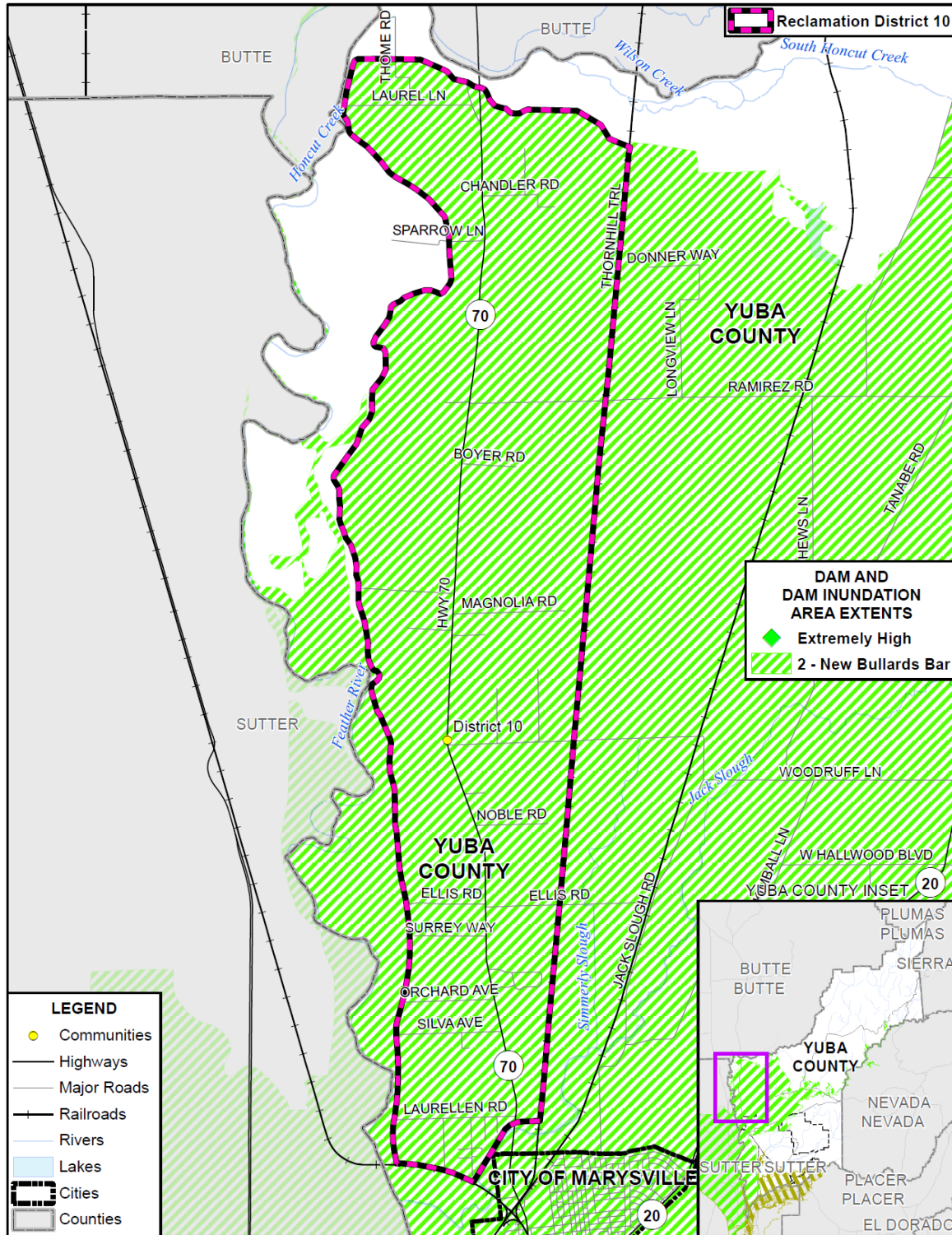
Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.7 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

Extremely High Hazard Dams inside the County that can affect the District can be seen on Figure E-2. No High Hazard Dams inside the County affect the District. Extremely High Hazard Dams outside the County that can affect the District can be seen on Figure E-3. No high hazard dams outside the County have mapped inundation areas that intersect RD 10.

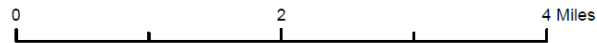
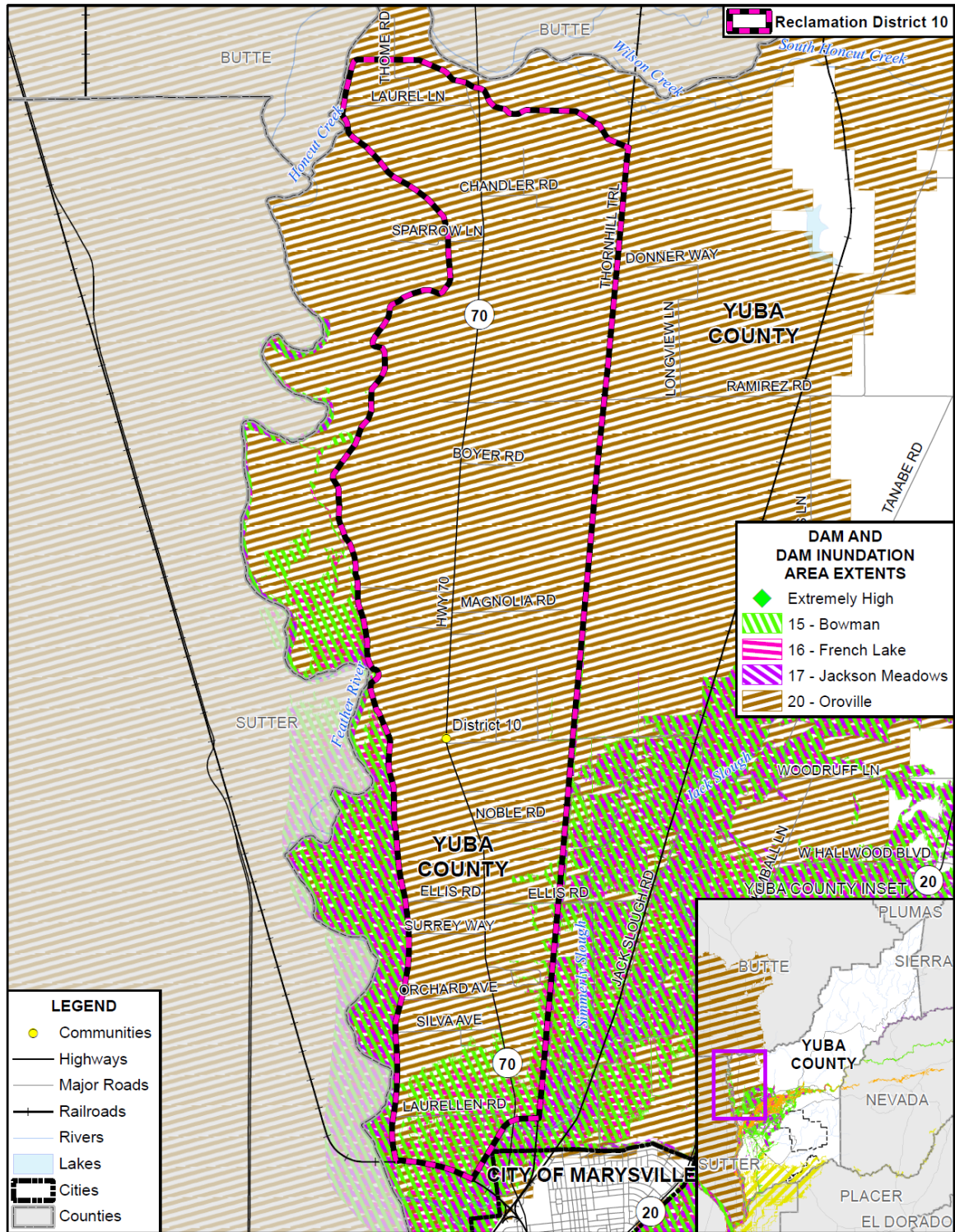
Figure E-2 RD 10 – Dam Inundation Areas from Extremely High Hazard Dams Inside the County



Data Source: DWR DSOD Data 2021, Yuba County GIS, Cal-Atlas; Map Date: 1/15/2021.



Figure E-3 RD 10 – Dam Inundation Areas from Extremely High Hazard Dams Outside the County



Data Source: DWR DSOD Data 2021, Yuba County GIS, Cal-Atlas; Map Date: 1/15/2021.



Past Occurrences

There has been on federal or state disaster declarations for dam failure in the County, as shown on Table E-4. This was associated with the Oroville spillway incidence in Butte County. While the dam did not fail, mass evacuations were ordered resulting in significant economic and other impacts to Butte and neighboring counties.

Table E-4 Yuba County – State and Federal Disaster Declarations from Dam Failure 1950-2021

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Dam Failure	0	–	1	2017

Source: Cal OES, FEMA

The 2017 Oroville Spillway Incident caused additional seepage which resulted in levee instability and localized agricultural crop damages. The levee issues were repaired through DWR flood fighting direct assistance and Federal PL 84-99 repairs. Property damages are being considered through legal proceedings by the property owners.

Vulnerability to and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Impacts to the District from a dam failure flood could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

Oroville Dam and New Bullards Bar Reservoir are of significant concern to the district. Dam failures could also cause increased stress and/or overtopping of District levees that would greatly increase the potential for levee breaches.

Assets at Risk

As seen on Figure E-2 and Figure E-3 above, all District assets would be at risk to this hazard.

Earthquake

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth’s outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth’s crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas,

communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Yuba County is located within an area of relatively low seismic activity and is not located within a highly active fault zone. No Alquist-Priolo Earthquake Fault Zones are located in the County. Faults include primarily inactive faults of the Foothills Fault System, running south-southeastward near Loma Rica, Browns Valley, and Smartville. Faults include the Prairie Creek Fault Zone, the Spenceville Fault, and the Swain Ravine Fault. More information on earthquake extent can be found in Section 4.3.9 of the Base Plan

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where few earthquakes of significant magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Seismic shaking maps for the area show Yuba County and the District fall within a low to moderate shake risk, with most of the moderate risk in the Delta area of the County.

Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are within and near the County, seismic hazard mapping indicates that the County has low seismic hazard potential. Additionally, the County is not located within a delineated Alquist-Priolo Earthquake Fault Zone. The risks associated with earthquakes, such as surface fault rupture, within the County are considered low.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those

constructed of unreinforced masonry (URM) and soft story buildings. None of these buildings are owned by the District.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The RD 10 is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

In the event of an earthquake, district pumping facilities may be impacted and affect pumping capacity if a concurrent flood and earthquake event were to occur. The District has not conducted any seismic studies. CA DWR may have compiled seismic vulnerability assessments and liquefaction probability assessments for the District levees under the Non-Urban Levee Evaluation Program.

Assets at Risk

The D-10 main pumping facility is at risk of this hazard; retrofitting is not needed.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—High

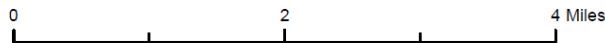
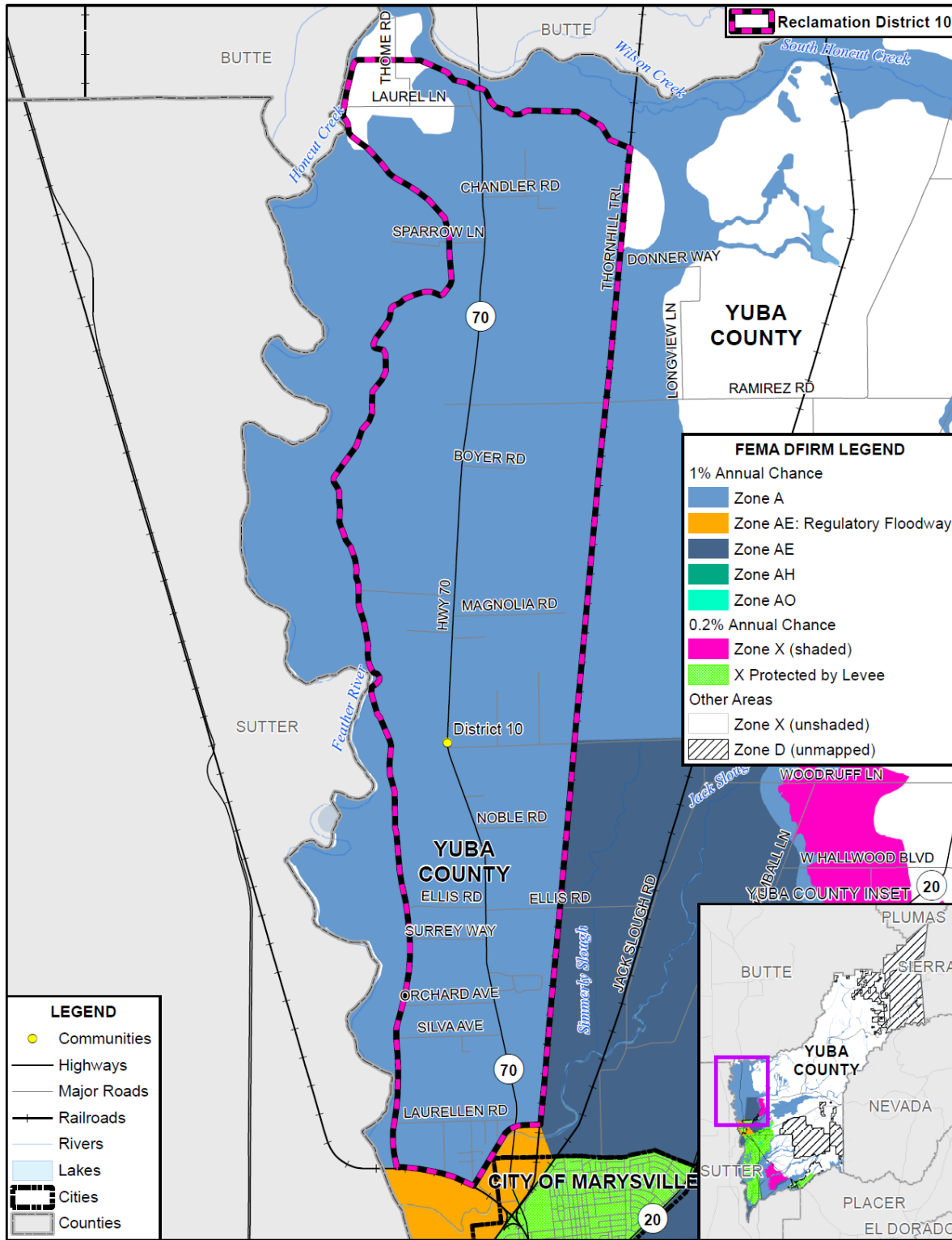
Hazard Profile and Problem Description

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Yuba County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. As previously described in Section 4.3.10 of the Base Plan, the Yuba County Planning Area and the RD 10 have been subject to historical flooding.

Location and Extent

The RD 10 has areas located in the 1% annual chance floodplain. This is seen in Figure E-4.

Figure E-4 RD 10 – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 2/18/2011, Yuba County GIS, Cal-Atlas; Map Date: 1/15/2021.



Table E-5 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table E-5 RD 10– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	
AO	1% annual chance flooding: sheet flow areas. BFEs derived from detailed hydraulic analyses are shown in this zone.	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone.	
X (unshaded)	No flood hazard	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Yuba County from flooding is shown on Table E-6. These events also likely affected the District to some degree.

Table E-6 Yuba County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958, 1962, 1963 (twice), 1969, 1973, 1982, 1983, 1986, 1995 (twice), 1997, 2008, 2017	15	1955, 1962, 1963, 1964, 1969, 1970, 1983, 1986, 1995 (twice), 1997, 1998, 2006, 2017 (twice)

Source: Cal OES, FEMA

Vulnerability to and Impacts from Flood

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

The District is responsible for operations and maintenance of the flood control system including levees and drainage facilities. Flood events result in significant effort to manage flood waters, both internally and behind levees, to prevent flooding to its residents. The levee system and facilities are aged and in need of repair, but the costs far exceed what can be accomplished by the District. As a result, large flood events result in evacuation of residents and significant flood fighting, drainage pumping, and emergency repairs.

Assets at Risk

The two significant hazards facing the drainage district are winter storms and flooding. District assets are shown in Table E-3. All assets identified in Table E-3 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 one major state highway used as commuter routes to jobs in the Sacramento, destroy historical landmarks, impact local transportation, agricultural crops and public utilities.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County 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.

Location and Extent

The RD 10 is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

The District tracks localized flooding areas. The main flooding areas occur at the District pumping facilities and are managed by pumping operations. The District is not responsible for roads or railway crossings, but does monitor internal drainage canal water levels and addresses issues as they arise. These localized flood areas identified by the RD 10 are summarized in Table E-7.

Table E-7 RD 10 – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Doc Adams – Residential Development (Southeast Portion of the District)	X	X		X		X	
Drainage Culverts: -Feather River -Simmerly Slough RD 10 monitors these locations during high water events	X		X	X		X	

Source: RD 10

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. Localized flooding has occurred in numerous past events either when electrical service is interrupted to the pumping facilities or the magnitude of precipitation exceeds pumping capacity. Additionally this has occurred when

existing non-district maintain/own pumping facilities were not functioning properly. In these areas, there a number of residences and private commercial businesses which may be impacted.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Impacts due to localized flood may be associated with agricultural production, and property damage.

Assets at Risk

The D-10 Pump Station may be at risk to damages due to inoperability and inundation

Levee Failure

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower steam channel, levees can also increase the speed of the water. Levees can be natural or man-made.

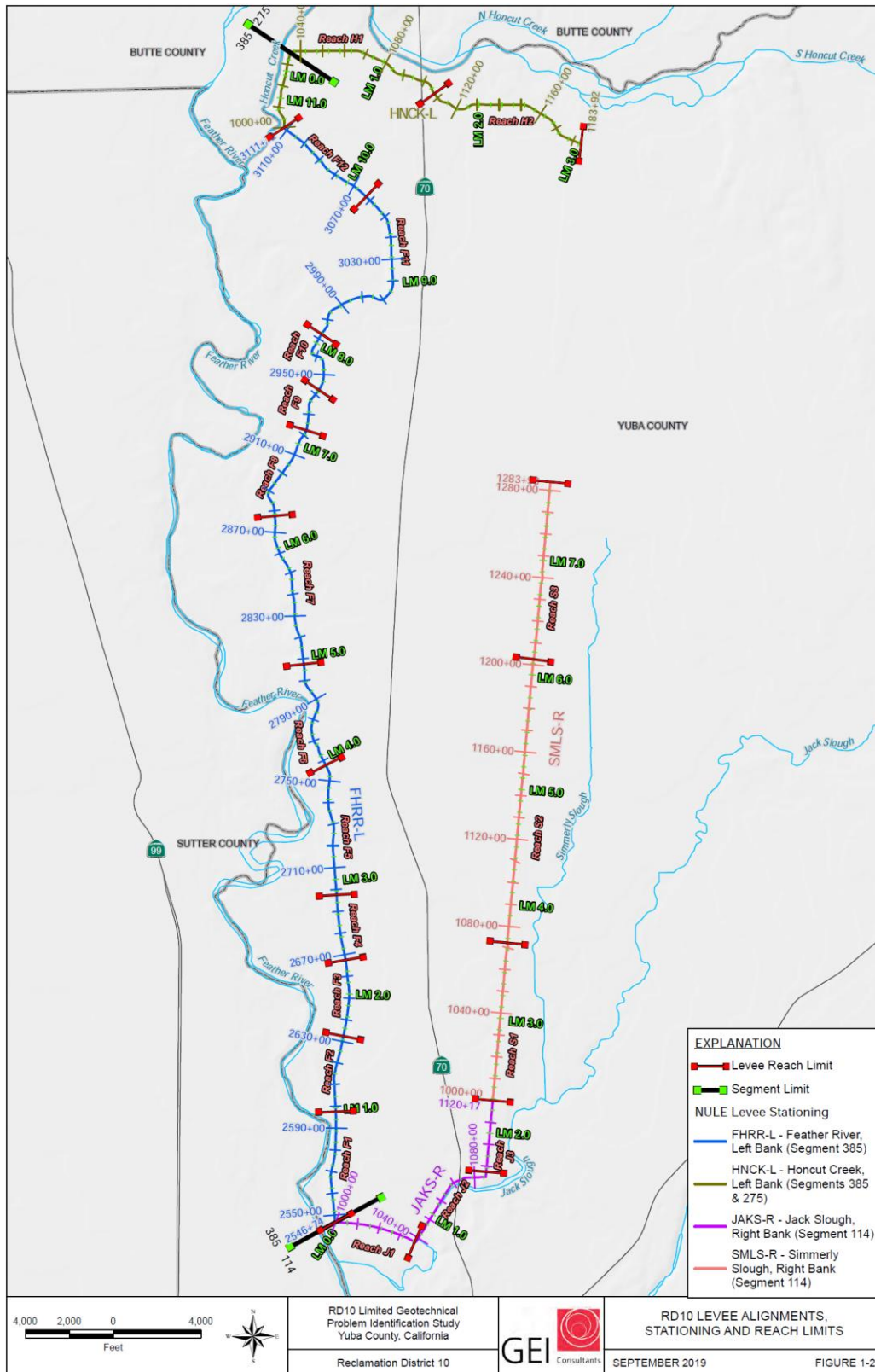
Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. For example, levees can be certified to provide protection against the 1% annual chance flood. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high water velocities. Levee failure can occur through overtopping or from seepage issues resulting from burrowing rodents, general erosion, excessive vegetation and root systems and other factors that compromise the integrity of the levee. No levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

Location and Extent

There is not a scientific scale or measurement system in place for levee failure. Expected flood depths from a levee failure in the District vary by event and location. The speed of onset is slow as the river rises, but if a levee fails the warning times are generally short for those in the inundation area. The duration of levee failure risk times can be hours to weeks, depending on the river flows that the levee holds back. When northern California dams and reservoirs are nearing maximum capacity, they release water through the river systems, causing additional burdens on County levees. The RD 10 levee system consists of approximately 22 miles of levees and protects approximately 12,000 acres of rural residential, farmland, and agricultural-related businesses. The boundaries of the District are all leveed areas. District boundaries were shown on Figure E-1.

Levees in the District are shown on Figure E-5.

Figure E-5 RD 10 – Levees



Source: RD 10

Past Occurrences

A few residents remember the levee failure of 1937 when huge storms hit the north state and water was up to the roof tops in the south end of RD 10. In 1955 when a levee failed in Sutter County, water was to the top of the RD 10 levee. When communities south of Marysville were inundated with flood waters in 1986 and 1997, additional pumps were again placed at the south end of the District to pump water over the levee to relieve pressure and prevent flooding from internal storm water.

Severe Winter Storms, as in 2005-2006, multiplies the stress already on the weakened levee system in RD 10. Severe storms increase the amount of water in the river, widening the channel and causing further erosion along the banks. With increased, heightened flows of water the levees become more saturated, increasing the possibly of failure. During the Dec. 2005 - Jan. 2006 Severe Winter Storm event, the levees were patrolled by RD 10 Board members and local residents, and requests for assistance were coordinated through the County. The Yuba County Sheriff's Department aided in clearing two gate valves to close the valves and stop the water from flowing through the levee. Repairs were completed to the levee near Simmerly Slough in RD 10.

No levee failures have occurred since 1937. Highwater was experienced during the 2017 Oroville Spillway event as well as during the 2017-2018 flood season.

Vulnerability to and Impacts from Levee Failure

A levee failure can range from a small, uncontrolled release to a catastrophic failure. Levee failure flooding can occur as the result of prolonged rainfall and flooding. The primary danger associated with levee failure is the high velocity flooding of those properties outside and downstream of the breach.

Should a levee fail, some or all of the area protected by the levees would be at risk to flooding. Impacts from a levee failure include property damage, critical facility damage, and life safety issues. Business and economic losses could be large as facilities could be flooded and services interrupted. School and road closures could occur. Road closures would impede both evacuation routes and ability of first responders to quickly respond to calls for aid. Other problems connected with levee failure flooding include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

RD 10 is a volunteer organization which has one employee, a maintenance superintendent, that operates on an annual budget of approximately \$100,000, making large repair projects and routine maintenance difficult to undertake.

RD 10 is responsible for the maintenance of levees along the east bank of the Feather River. Maintenance includes the control of vegetation, erosion, rodents, and maintenance of access roads for levee patrols and emergency access. Maintenance is performed by the local farmers and community volunteers who are not compensated. Maintenance of the levees is accomplished in accordance with Federal and State regulations. During periods of high water the levees are patrolled by volunteers who monitor the levees for early detection of possible weakness, damage or erosion.

Many of the farmers and community members have a long history in the area; and as such are concerned that the levees are being weakened by beavers, rodents, soil erosion, storms, and high water events. The

levees are also being further eroded and undermined by trees, brush, debris, and refuse piled on or near the levees, and illegal driving on the levees.

Assets at Risk

All assets identified in Table E-3 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 five feet in depth for an undetermined amount of time.

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

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Yuba County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are one of the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding. More information on power outage and failure can be found in the discussion at the beginning of Section E.5.3, as well as in Section 4.3.3 of the Base Plan.

Assets at Risk

District facilities including pumping facilities, buildings, and equipment are at risk during storms.

Severe Weather: High Winds and Tornadoes

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds can also lead to PSPS events.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, are another severe weather hazard that can affect areas of the Yuba County Planning Area, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration

of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the County and District. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

There has been no federal and one state disaster declarations in the County for winds and tornadoes. This can be seen on Table E-8. The District noted that since high winds is a regional phenomenon, events that affected the lower elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.5.

Table E-8 Yuba County – State and Federal Disaster Declarations from High Winds 1950-2021

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
High Winds	1	1983	0	–

Source: Cal OES, FEMA

Vulnerability to and Impacts from Severe Weather: Wind and Tornado

High winds are common occurrences in the District throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. High winds can impact critical facilities and infrastructure and can lead to power outages. Wind can also drive wildfire flames, spreading wildfires quickly. During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County.

Impacts from high winds in the District will vary. Future losses from straight line winds include:

- Downed trees
- Power line impacts and economic losses from power outages
- Increased PSPS events
- Occasional building damage, primarily to roofs

Assets at Risk

District facilities including pumping facilities, buildings, and equipment are at risk of damage during high winds.

E.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

E.6.1. Regulatory Mitigation Capabilities

Table E-9 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the RD 10.

Table E-9 RD 10 Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N	RD 10 coordinates with Yuba County for consistency with the Yuba County 2030 General Plan.
Capital Improvements Plan	N	
Economic Development Plan	N	
Local Emergency Operations Plan	N	
Continuity of Operations Plan	N	
Transportation Plan	N	
Stormwater Management Plan/Program	N	
Engineering Studies for Streams	Y	The RD 10 – Limited Geotechnical Problem Identification Report (2019) identified projects to mitigate levee seepage and stability vulnerabilities at critical locations in the District. This would include addressing flood hazards and levee failures. The PIR also provides mitigations measures which can be implemented to reduce risks.
Community Wildfire Protection Plan	N	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	Feather River Toe Access Corridor Project
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N/A	Version/Year:

Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	Score:
Fire department ISO rating:	N/A	Rating:
Site plan review requirements	N/A	
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	N/A	
Subdivision ordinance	N/A	
Floodplain ordinance	N/A	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A	
Flood insurance rate maps	N/A	
Elevation Certificates	N/A	
Acquisition of land for open space and public recreation uses	N/A	
Erosion or sediment control program	N/A	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District has no regulatory authority, and depends on the County to regulate. The District will seek to assist regulating agencies. Examples include: local flood operations plans should be coordinated with neighboring agencies including Yuba and Sutter Counties to allow for coordinated evacuations and flood operations to avoid evacuation chaos as was experienced in the Oroville Spillway Incident. At this time there is no planned expansion; funding would have to be available to RD 10 to work collaboratively with policy makers to expand capabilities. Likely this would include improvements to development or modifications to the floodplain ordinance, flood insurance rate mapping, elevation certificate, and erosion control or sediment controls spaces. It is also inconsistent with State regulations against development within the 200-year floodplain		

Source: RD 10

Southern Toe Access Corridor Project (Initial Study/Proposed Mitigated Negative Declarations – May 2020)

The project would improve levee accessibility for patrol and maintenance purposes by constructing approximately 2 miles of an all-weather elevated landside toe access corridor (TAC) along the Feather River east levee, in the southwestern portion of RD 10. The approximately 24-foot-wide TAC would include 3 feet of fill at the landside levee toe and would be topped with a 20-foot-wide corridor of aggregate base. The Feather River East Levee – Southern Toe Access Corridor Project (project) site is located approximately 1 mile north of Marysville in Yuba County, California. The project site can be accessed via Laurellen Road or Silva Avenue from State Route 70.

E.6.2. Administrative/Technical Mitigation Capabilities

Table E-10 identifies the District department(s) responsible for activities related to mitigation and loss prevention in RD 10.

Table E-10 RD 10's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	District maintains levees to the best of its abilities.
Mutual aid agreements	N	
Other	Y	District works collaboratively with State and Federal agencies to evaluate funding opportunities to support mitigation projects. These include applications for implementation funding from Yuba Water Agency, CA DWR, and various Federal agencies. These actions have resulted in the district receiving funds to implement various flood risk reduction projects and perform operations and maintenance activities. The district plans to continue evaluating these opportunities and funding programs.
Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?		
Staff	Y/N FT/PT	
Chief Building Official	N/A	
Floodplain Administrator	N/A	
Emergency Manager	N/A	
Community Planner	N/A	
Civil Engineer	N/A	
GIS Coordinator	N/A	
Other	PT	The District maintenance superintendent would be involved in inspections and coordination with authorities and agencies regarding enforcement actions. District consulting engineer staff would also be involved to provide technical oversight and guidance on an as-needed basis.
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	N/A	The District coordinates and utilizes the existing Be Prepared Yuba framework and relies on existing public safety officials/capabilities for outreach. No staff specifically supports these tasks.
Hazard data and information	N/A	
Grant writing	PT	The district would coordinate with YWA staff and consulting engineer staff to develop grant applications.
Hazus analysis	N/A	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District has only one employee. This employee is tasked with levee maintenance and upkeep. With additional revenue, more employees could be added if the need arose. Employees could be contract or hired employees. This would help expand capabilities and reduce risk		

Source: RD 10

E.6.3. Fiscal Mitigation Capabilities

Table E-11 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table E-11 RD 10's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	Y	USACE Civil Works Program, FEMA PDM, HMGP, and or BRIC programs
State funding programs	Y	DWR and CDFW grants for flood control and restoration work. Grants previously used include FSRP, CVT, YFFPP. And SCFRR
Other	Y	The District has an O&M assessment district that collects assessments through the County property tax bills for operations and maintenance activities.
How can these capabilities be expanded and improved to reduce risk?		
Outside funding is necessary for the District to be capable of completing costly mitigation projects. The District will seek funding opportunities as they become available and known to the District. This would help expand capabilities and reduce risk		

Source: RD 10

E.6.4. Mitigation Education, Outreach, and Partnerships

Table E-12 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table E-12 RD 10's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N	
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other	Y	Outreach coordinated by the district is project specific and occurs on an as-needed basis. For broader public safety concerns, the district coordinates as needed with Yuba County OES as well as state and federal agencies for outreach. This includes the BePreparedYuba framework.
How can these capabilities be expanded and improved to reduce risk?		
The District relies on County, State, and Federal risk notification programs for public education. Without additional revenue, it is unlikely that these capabilities could be expanded. The District will look for ways to partner with these entities to increase public education. This would help expand capabilities and reduce risk		

Source: RD 10

E.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- USACE System-Wide Improvement Framework Plan to maintain Federal Rehabilitation assistance Eligibility after flood events while addressing deficiencies noted in Federal Inspections.

E.7 Mitigation Strategy

E.7.1. Mitigation Goals and Objectives

The RD 10 adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

E.7.2. Mitigation Actions

The planning team for the RD 10 identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and

administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Dam Failure
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Levee Failure
- Severe Weather: Heavy Rains and Storms
- Severe Weather: Wind and Tornado

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Implement Feather River Levee Improvement Projects - Seepage and Stability Mitigation (Feather River Levee Improvement Projects) – (To consider combination of seepage/stability berms and/or cutoff walls) Implementation of the RD 10 Toe Access Corridor Project for Flood Fight Access, Monitoring, and Operations and Maintenance

Hazards Addressed: Climate Change, Dam Failure, Floods 1%/0.2%, Localized Flooding, Levee Failure, Severe Weather: Heavy Rains and Storms, Earthquake, High Winds and Tornadoes

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Historically, the RD 10 levees along the Feather River are susceptible to seepage and landside slope stability issues during prolonged high water events. To evaluate repairs, RD 10 completed a limited geotechnical problem identification report in 2019 which identified critical reaches of levees from a seepage and stability perspective. The report also proposed mitigation measures to meet a 100yr a design criteria. The report identified 4 reaches along the Feather River East Levee and evaluated potential design alternatives which included combination seepage and stability berms, and cutoff walls.

Project Description: The improvements will address climate change by considering the best available hydrology and variability due to climate change. Additionally, the improvements will add a sense of robustness and resiliency to the project reaches and reduce the likelihood of a levee breach due to an

upstream dam failure. The levee improvements will be designed to address liquefaction potential during a seismic event. The levees will also be protected from flooding from heavy rains and storms, dam failures, 1%/0.2% annual chance and localized flooding, as well as from erosion from waves caused by high winds and storms during high water events.

Other Alternatives: N/A

Existing Planning Mechanisms through which Action will be Implemented: RD 10 does not have an Emergency Operations Plan or a 5-year Plan. RD 10 will continue to evaluate and pursue funding opportunities to implement the proposed mitigation actions. In an emergency, RD 10 will follow the protocols and procedures within the Yuba County Emergency Response plan as detailed in the BePreparedYuba community emergency planning documents.

Responsible Office: RD 10

Priority (H, M, L): H

Cost Estimate: \$40-100M in total dependent on alternative selected

Potential Funding: Funding source not yet identified. RD 10 to consider FEMA HMGP, BRIC, CA DWR FSRP, Prop 1E, Prop 68 Grant

Benefits (avoided Losses): Large scale property damage/interruptions to residences, agricultural operations, and general commerce.

Schedule: 5-15 years funding dependent

Action 2. Implementation of the RD 10 Toe Access Corridor Project for Flood Fight Access, Monitoring, and Operations and Maintenance

Hazards Addressed: Climate Change, Dam Failure, Floods 1%/0.2%, Levee Failure, Localized Flooding, Severe Weather: Heavy Rains and Storms, High Winds and Tornadoes.

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: RD 10 has completed design for a 2 mile reach of Toe Access Corridor (TAC) along the Feather River East Levee. The TAC will allow flood fight activities and monitoring to occur more easily during high water events. These high water events can be from heavy rains and storms, flooding, localized flooding, and dam failure flooding. Climate change is thought to make heavy rains more intense. During periods of high water, high winds can cause erosion on levees.

Project Description: This will include visual inspection to identify developing seepage and/or stability concerns along the landside of the levee embankment. Construction is planned in the next 1-3 years. Additionally, RD 10 plans to consider expanding the TAC project throughout the entirety of the district.

Other Alternatives: N/A

Existing Planning Mechanisms through which Action will be Implemented: RD 10 does not have an Emergency Operations Plan or a 5-year Plan. RD 10 will continue to evaluate and pursue funding opportunities to implement the proposed mitigation actions. In an emergency, RD 10 will follow the protocols and procedures within the Yuba County Emergency Response plan as detailed in the BePreparedYuba community emergency planning documents.

Responsible Office: RD 10

Priority (H, M, L): H

Cost Estimate: \$1.8M

Potential Funding: Funding secured through a grant from Yuba Water Agency.

Benefits (avoided Losses): Potential to reduce the likelihood of large scale property damage/interruptions to residences, agricultural operations, and general commerce due to a levee failure which may be identified via levee patrols using the Toe Access Corridor.

Schedule: 1-3 years

Action 3. Implement: Pipe Replacement Projects and Pump Improvement Projects

Hazards Addressed: Floods – Localized Stormwater

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: RD 10 has work collaboratively with CA DWR and Caltrans to identify repairs to existing internal drainage features such as pipes and pump stations. Many of the facilities are past their useful life and are in need of repair. This includes design and construction of the Doc Adams Pump Station.

Project Description: This will be accomplished by full replacement of pipes, in place repairs such as CIPP liners, or adding additional capacity to existing pump stations or constructing new pump facilities.

Other Alternatives: N/A

Existing Planning Mechanisms through which Action will be Implemented: RD 10 does not have an Emergency Operations Plan or a 5-year Plan. RD 10 will continue to evaluate and pursue funding opportunities to implement the proposed mitigation actions. In an emergency, RD 10 will follow the protocols and procedures within the Yuba County Emergency Response plan as detailed in the BePreparedYuba community emergency planning documents.

Responsible Office: RD 10

Priority (H, M, L): H

Cost Estimate: \$1-10M; Doc Adams Pump Station - \$750,000

Potential Funding: Funding sources will consider funding through CA DWR – Deferred Maintenance Program (DMP), HMGP, BRIC, Prop 1E, and Prop 68.

Benefits (avoided Losses): Potential to reduce the likelihood of medium scale property damage/interruptions to residences, agricultural operations, and general commerce due to a shallow nuisance type flooding caused by insufficient pumping/drainage capacity.

Schedule: 1-10 years