Annex C Colusa County Resource Conservation District

C.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Colusa County Resource Conservation District (CCRCD or District), a new participating jurisdiction to the 2024 Colusa County Local Hazard Mitigation Plan (LHMP) Update. 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 the District, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this District.

C.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 Colusa 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 C-1. Additional details on Plan participation and District representatives are included in Appendix A.

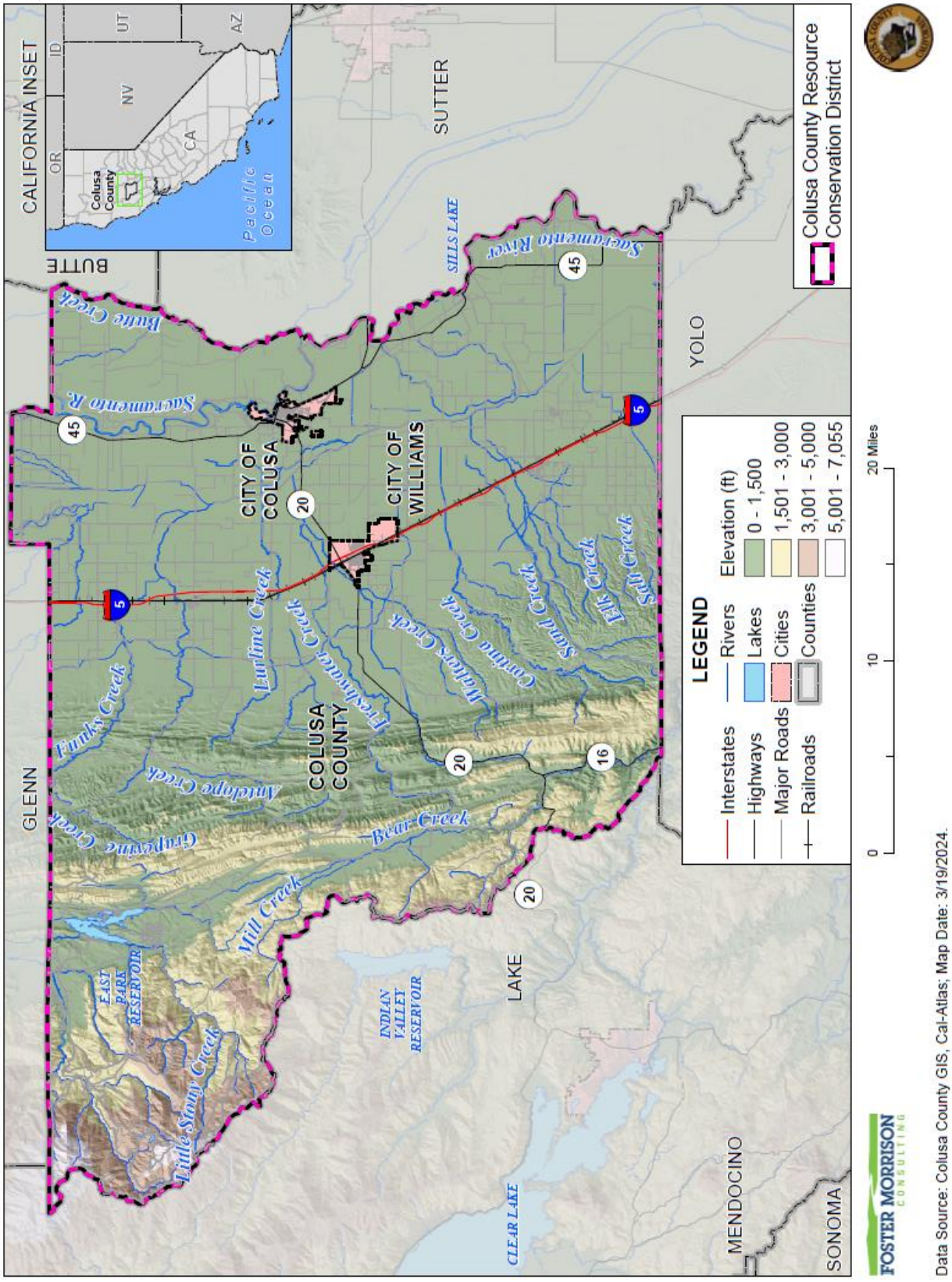
Table C-1 CCRCD – Planning Team

Name	Position/Title	How Participated
Liz Harper	Executive Director	Attended Meetings And Developed Plan
Margot Flynn	Sacramento Valley Climate And Agriculture Hub Coordinator	Attended Meetings And Developed Plan
Eduardo Blancas-Alcantara	Conservation Program Coordinator	Attended Meetings And Developed Plan

C.3 District Profile

The District profile for the CCRCD is detailed in the following sections. Figure C-1 displays a map and the location of the District within Colusa County.

Figure C-1 CCRCD



C.3.1. Overview and Background

Soil Conservation Districts, now known as Resource Conservation Districts or RCD's, were formed in the 1930's after the unparalleled ecological disaster known as the Dust Bowl. At the present time every county in the United States has a conservation district.

Originally Colusa County had two Districts, voluntarily organized by landowners, under the provisions of Division 9 of the Public Resource Code of the State of California. The Stonyford Resource Conservation District (Western portion of Colusa County) was formed in 1956 and the Colusa County Resource Conservation District (Eastern Colusa County) was organized in 1959. In 1996 the two separate districts merged to better serve the needs of Colusa County in its entirety. This united district became known as the "Colusa County Resource Conservation District."

The mission of the CCRCD is to protect, conserve, and restore natural resources through locally led education and implementation activities that support a healthy environment and provide economic sustainability through wise land use.

C.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The CCRCD risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the District's potential risk to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Overview and Background above, a risk assessment was performed for the District. This includes the following sections:

- C.4.1 District Assets Inventory and Growth and Development Trends
- C.4.2 Hazard Identification
- C.4.3 Hazard Profiles and Vulnerability to Specific Hazards

C.4.1. District Assets Inventory and Growth and Development Trends

This section provides an inventory of the District's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the District's total assets, including the people and populations: structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section C.4.3 Hazard Profiles and Vulnerability to Specific Hazards.

- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

- People and Populations (Populations Served)
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section C.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the District. The District provides services to all landowners within the whole of Colusa County. People and populations in the County can be seen in 4.2.1 of the Base Plan.

Special Populations and Disadvantaged Communities

The District provides services to the whole of Colusa County. Special populations in the County can be seen in 4.2.1 of the Base Plan.

Structures and Critical Facilities

This section considers the CCRCD'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:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

CCRCD owns no facilities or properties.

Community Lifelines

Assessing the vulnerability of the District to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential

to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the District as a partnership between the District, local cities, and Colusa County. Due to its rural nature, there is an interplay in community lifelines between all jurisdictions in the County. In fact, most of the District's community lifelines overlap the County's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP. Due to this fact, specific information on these community lifelines in the District and how they may be affected by a hazard event or disaster are discussed in each hazard section; however, many of these sections refer back to the detailed lists that are captured in the Section 4.2.1 of the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the District to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The CCRCD has the same boundaries as Colusa County. As such, the natural resources of the RCD parallel that of Colusa County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Historic and Cultural Resources

The CCRCD has the same boundaries as Colusa County. As such, the historic and cultural resources parallels that of Colusa County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the CCRCD to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair. Community Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time.

Population Trends and Projections

General growth in the District parallels that of the Colusa County Planning Area as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Future Development Areas

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Colusa County Planning Area. More general information on growth and development in Colusa County as a whole can be found in "Growth and Development Trends" in Section 4.2.2 of the Base Plan.

C.4.2. Hazard Identification

CCRCD identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to the District (see Table C-2).

Table C-2 CCRCD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Invasive Species (Pests and Weeds)	Extensive	Highly Likely	Critical	High	Medium
Climate Change	Extensive	Likely	Critical	High	–
Dam Failure	–	–	–	–	Medium
Drought & Water shortage	Extensive	Likely	Critical	High	High
Earthquake	–	–	–	–	Low
Floods: 1%/0.2% annual chance	–	–	–	–	Medium
Floods: Localized Stormwater	Limited	Highly Likely	Negligible	Medium	Medium
Landslide, Mudslide, and Debris Flow	–	–	–	–	Medium
Levee Failure	–	–	–	–	Medium
Severe Weather: Extreme Cold and Freeze	–	–	–	–	Medium
Severe Weather: Extreme Heat	–	–	–	–	High
Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)	–	–	–	–	Medium
Severe Weather: High Winds and Tornados	–	–	–	–	Low
Stream Bank Erosion	Limited	Highly Likely	Limited	Medium	Medium
Subsidence	Significant	Likely	Limited	High	Low
Wildfire	Significant	Likely	Limited	High	Medium

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

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.

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
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

C.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the District (as identified in the Significance column of Table C-2) and also includes a hazard profile and vulnerability assessment to the four primary hazards to the State of California: dam failure, earthquake, flood, and wildfire, regardless of the significance ranking by the District. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Colusa County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment Format

Each hazard is profiled in the following format:

- **Hazard Profile**—A hazard profile is included for each hazard. This includes information on:
  - ✓ A general discussion of the hazard and related issues.
  - ✓ **Location** and **Extent**—Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences**—Past occurrences are discussed for each hazard. NCDC events are also discussed. A discussion of disaster declarations is included in each hazard section. Other past occurrence data specific to the District follows the disaster declarations for each hazard.
  - ✓ **Climate Change**—This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **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.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same format as in Section C.4.1 above. This includes sections on: People and Populations Served; Structures and Critical Facilities, Community Lifelines; Natural, Historic, and Cultural Resources; and Economic Assets and Community Activities of Value. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset. Impacts are also affected by the community's ability to mitigate, prepare for, respond to, and recover from an event.
- **Future Conditions/Development** – A discussion of how future development will be affected by the hazard is also included.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage 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 U.S. 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 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has been recently occurring 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 (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other hazards from starting a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires are much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

Local concerns of the District are the same as that of Colusa County as a whole. Those are found in Section 4.3 of the Base Plan

Ag Hazards: Severe Weather/Invasive Species

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

The County is highly agrarian. Farming and related agricultural industries are not only the backbone of Colusa County's economy, but they also play a central role in the way of life of County residents and help define the character of the County. Agriculture has always been an integral part of Colusa County and has continually grown and changed along with the County. Agriculture in the County can be affected by severe weather, as well as invasive species (pests and weeds).

According to the HMPC, agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, heat, and drought. The 2023 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.

Invasive species are organisms that are introduced into an area beyond their natural range and become a pest in the new environment. This hazard addresses the issues related to invasive pests including those that pose a significant threat to the agricultural industry and are therefore a concern in the Colusa County Planning Area. This hazard does not address pest and plants that cause impacts to human health, as those issues are addressed in other planning mechanisms in the County.

Location and Extent

Agricultural hazards, including issues associated with severe weather as well as insects and pests, occur throughout the County where lands are used for farming and grazing. The larger County has large swaths of agricultural lands. Areas not as greatly affected by insects and pests are the cities in the County, as well as the upper portions of elevation of the County which all contain fewer agricultural acres. However, while the cities may not be directly affected, they are indirectly affected economically when agricultural losses occur.

There is no scale that measures agricultural hazards. Agriculture in the County is at risk to many hazards: severe weather, as well as invasive species. Each of these has a different duration and speed of onset. Some, such as freeze, can have a short onset and a short duration. Drought can have a long onset and long duration. Invasive species like insect pests and weeds can have short or long onset, and short or long durations. All agricultural losses can have a significant impact on affected communities.

Past Occurrences

Disaster Declaration History

There are no state or federal disaster declarations issued by Cal OES or FEMA. There have been 19 USDA Secretarial Disaster Declarations for the County since 2012 (as shown in the Past Occurrences in Section 4.3.12 of the Base Plan). 14 were from drought, 3 were from freeze, and 2 were from severe weather.

NCDC Events

The NCDC does not track agricultural events.

CCRCD Events

The CCRD noted the following events:

In **2021-2022**- Almond crop was severely damaged during the frost event.

In **2022**, walnut and other crops were damaged from an extreme heat wave, making their value drop in the market due to quality.

During the **2022** drought surface water supplies were significantly reduced. Colusa County planted 82,256 less acres of rice in 2022 and groundwater extractions resulted in a significant overdraft for the year and for the cumulative overdraft dating back to the previous drought.

Climate Change and Agricultural Hazards

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with agricultural hazards. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the CAS, addressing climate change in agriculture will encompass reducing vulnerability through adapting to the ongoing and predicted impacts of climate. Agriculture in California is vulnerable to predicted impacts of climate change, including less reliable water supplies, increased temperatures, and increased pests.

The 2023 California State Hazard Mitigation Plan noted that California farmers contend with a wide range of crop-damaging pests and pathogens. Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. It also noted that change in climate can directly impact crop growth through new temperature patterns and northward shifts of pests and disease. Additionally, longer growing seasons may enable pest species to complete more reproductive cycles, which can increase severity of infestations.

Finally, the 2023 State Plan noted that temperature is not the only climatic influence on pests. For example, some insects are unable to cope in extreme drought, while others cannot survive in extremely wet conditions. Furthermore, while warming speeds up the life cycles of many insects, suggesting that pest

problems could increase, some insects may grow more slowly as elevated carbon dioxide levels decrease the protein content of the leaves on which they feed.

Vulnerability to Invasive Species: Plants and Pests

According to historical hazard data, both severe weather affecting agriculture and invasive species (insect pests and weeds) are an annual occurrence in the District. If left unchecked, invasive species can threaten native species, biodiversity, ecosystem services, recreation, water resources, agricultural and forest production, cultural resources, economies and property values, public safety, and infrastructure.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to the CCRCD. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect the entire District. These sections include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns

The District and unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

Permanent crops such as almonds and pistachios that rely on Bureau of Reclamation water allocations are a very significant economic asset. The orchards that rely on Tehama – Colusa Canal for conveyance are very dependent on Bureau of Reclamation surface water allocations because of limited groundwater conjunctive capacity. Rice acreage is also very dependent on surface water allocations.

Wildfire and fuel loads in high-risk areas for fire severity: Colusa County is two-thirds unirrigated land. These rain-fed systems are vulnerable to wildfires. The forest and rangeland in the district provide important habitat for wildlife and also important food sources for livestock.

Assets at Risk

Assets at risk from ag hazards include people and populations served; structures and critical facilities; community lifelines; natural, historic, and cultural resources; economic assets; and community activities of value. These are discussed in the following sections.

People and Populations Served

Agricultural hazards have a minimal effect on people and populations in the District. However, damage to crops from invasive and nuisance species can cause significant increases in food prices and food insecurity among low-income communities.

Structures and Critical Facilities

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Community Lifelines

Community lifelines will be minimally affected by agricultural hazards. This was discussed in greater detail in Section 4.3.12 of the Base Plan.

Natural, Historic, and Cultural Resources

Natural can be affected by agricultural hazards. Negative impacts of weeds to natural resources include the following:

- Loss of wildlife habitat and reduced wildlife numbers;
- Loss of native plant species;
- Reduced livestock grazing capacity;
- Increased soil erosion and topsoil loss;
- Diminished water quality and fish habitat.

Historic and cultural resources have a more limited risk from agricultural hazards.

Economic Assets and Community Activities of Value

Economic assets and community activities of value for the District are similar or the same as those for the County as a whole. Those assets and activities were discussed in greater detail in Section 4.3.12 of the Base Plan.

Impacts from Severe Weather/Invasive Species

According to the HMPC, the consequences of agricultural disasters to the District and larger Colusa County include ruined plant crops, dead livestock, ruined feed and agricultural equipment, monetary loss, job loss, and possible multi-year effects (i.e., trees might not produce if damaged, loss of markets, food shortages, increased prices, possible spread of disease to people, and loss or contamination of animal products). When these hazards cause a mass die-off of livestock, other issues occur that include the disposal of animals, depopulation of affected herds, decontamination, and resource problems. Those disasters related to severe weather may also require the evacuation and sheltering of animal populations. Overall, any type of severe agricultural disaster can have significant economic impacts on both the agricultural community, the CCRCD, and the entire Colusa County Planning Area.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. A discussion on these items can be found in Section 4.3.12 of the Base Plan.

Future Conditions/Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District will not be at future risk to this hazard.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted 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.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The District falls in the North Central Valley Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the CCRCD, the Colusa County Planning Area, surrounding counties, 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

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

CCRCD Events

The District Planning Team noted that all weather-based events correlate to the changing climate, most noteably climate change exacerbates the impacts of the weather event. No past events provided evidence solely linked to Climate Change.

Vulnerability to Climate Change

The whole of the District is at some measure of vulnerability to climate change. The District Planning Team has concerns that the vulnerability of the District will grow to be greater in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District and unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

The CCRCD's is concerned about the vulnerabilities of farms, ranches and wildland areas. These working and natural landscapes use, protect, conserve, and provide natural resources for the District.

Assets at Risk

Assets at risk from climate change include people and populations served; structures and critical facilities; community lifelines; natural, historic, and cultural resources; economic assets; and community activities of value. These are discussed in the following sections.

People and Populations Served

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other socially vulnerable or underserved populations (as shown in the Special Populations discussion in Section C.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures and Critical Facilities

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Community Lifelines

Due to the slow onset of climate change, community lifelines in the District are expected to adapt over time to new climate normal. It is thought that community lifelines in the District would not be overwhelmed by climate change. This was discussed in greater detail in Section 4.3.7 of the Base Plan.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the District supports rich biodiversity, including many special-status species. These are all at risk from the effects of climate change. In addition, if heat contributes to changes in wildfire patterns, all areas (on land) of the District are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the drought hazard, areas of wetlands in the City may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Economic Assets and Community Activities of Value

Economic assets and community activities of value for the District are similar or the same as those for the County as a whole. Those assets and activities were discussed in greater detail in Section 4.3.7 of the Base Plan.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Central Valley region in which the District is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7° F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by changes in population patterns (migration, density, or the makeup of socially vulnerable

populations), and changes in land use and development. A discussion on these items can be found in Section 4.3.7 of the Base Plan.

Future Conditions/Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District will not be at future risk to this hazard.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Drought and water shortages are a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the District and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District are shown in Section 4.3.9 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been one federal and three state disaster declarations from drought. This can be seen in Table C-3.

Table C-3 Colusa County – Federal and State Drought Disaster Declarations 1950-2024

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Drought	1	1977	3	1976, 2014, 2021

Source: Cal OES, FEMA

NCDC Events

There have been 58 NCDC drought events in Colusa County. These most likely had some impact on the District.

CCRCD Events

In 2022, 82,256 less acres of rice were planted due to water restrictions. Over 15,000 acre feet of groundwater were extracted in or near the area of subsidence impact for conveyance in the TC Canal under the Warren Act. Other portions of the groundwater aquifer were heavily extracted. Migratory bird and other wildlife habitat were drastically reduced due to the extensive fallowing of rice acreage.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.9 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of CCRCD to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

Tree Mortality and Drought

One of the specific impacts of drought in the District and Colusa County is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the District.

The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the City that provides relief during extreme heat days.

The whole of the City is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The District and unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

The implementation of the proposed Bay-Delta Plan is a significant risk to the environment and economy of Colusa County. Regulatory drought imposed by Bay Delta curtailments is probably more detrimental than physical drought because surface water supplies will likely be curtailed even in years that in the past would not have had curtailments.

CCRCD has seen extensive losses in the riparian forest north of Colusa due to fire and drought. Many large trees on Sycamore slough have died.

Assets at Risk

Assets at risk from drought and water shortage include people and populations served; structures and critical facilities; community lifelines; natural, historic, and cultural resources; economic assets; and community activities of value. These are discussed in the following sections.

People and Populations Served

The people and populations of the District are not directly affected by drought; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the District may be vulnerability to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations. Drought and water shortage can lead to an increase in wildfires threatening District residents. Water shortages can have an effect on all of the population in the District, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access clean drinking water during shortages. During periods of drought as the costs of water usage may increase, especially during mandated conservation times, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures and Critical Facilities

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Community Lifelines

While limited, community lifelines can have a vulnerability to drought and water shortage. Many of the District's community lifelines are the same as or similar to Colusa County's. Drought will most likely not overwhelm these community lifelines. This was discussed in greater detail in Section 4.3.9 of the Base Plan.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the District are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to District residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the District.

Economic Assets and Community Activities of Value

Economic assets and community activities of value for the District are similar or the same as those for the County as a whole. Those assets and activities were discussed in greater detail in Section 4.3.9 of the Base Plan.

Impacts from Drought and Water Shortage

The vulnerability of the District to drought is Districtwide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels and fuel loads associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts.

Other qualitative impacts associated with drought in the District are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought. Drought can also lead to turf losses and cause tree die off within the District and County.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. A discussion on these items can be found in Section 4.3.9 of the Base Plan.

Future Conditions/Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District will not be at future risk to this hazard.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

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 District 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 CCRCD is subject to localized flooding throughout the District. This is discussed in Table C-4 below. 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.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations from localized floods.

NCDC Events

The past occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above.

CCRCD Events

The District noted the following past occurrences of localized flooding:

Flooding in winter **2022- 2023**- Impacted farmland and county infrastructure due to flash flood conditions. Water quality and quantity, flooding, and streambank erosion issues occurred.

The District also noted that in general, drought followed by heavy rain events impact the watersheds within the District.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with localized flood. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the District during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the District. However, while flooding can cause significant impacts depending on the duration and volume of precipitation and the

drainage in any given area, many of the floods in the District are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the District are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District and unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

Historically, the District has been affected by flooding of streams and creeks occurring during heavy rain and storm events. Additional development in the District and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the District.

The District noted there are areas of inadequate drainage conveyance. Lack of dredging of sandbar, gravel, and sand in the Colusa Basin Drain north of College City south of Davis Weir Dam cause localized flooding. The District tracks localized flooding areas. Affected localized flood areas identified by the CCRCD are summarized in Table C-4.

Table C-4 CCRCD – List of Localized Flooding Problem Areas

Road/Area Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
Bailey Road	Yes	Yes	Yes			Yes	
Hahn Road	Yes	Yes				Yes	
Grime Arbuckle Rd	Yes					Yes	

Source: CCRCD

Assets at Risk

Assets at risk from localized flood include people and populations served; structures and critical facilities; community lifelines; natural, historic, and cultural resources; economic assets; and community activities of value. These are discussed in the following sections.

People and Populations Served

People and populations are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the District.

Structures and Critical Facilities

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Community Lifelines

Due to the relatively minor nature of localized flooding, community lifelines are unlikely to be overwhelmed. Many of the District's community lifelines are the same as or similar to Colusa County's. This was discussed in greater detail in Section 4.3.12 of the Base Plan.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the District actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Economic Assets and Community Activities of Value

Economic assets and community activities of value for the District are similar or the same as those for the County as a whole. Those assets and activities were discussed in greater detail in Section 4.3.12 of the Base Plan.

Impacts from Localized Flood

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.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff. Localized flooding impacts may be exacerbated in the future due to the effects of climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change, changes in population patterns (migration, density, or the makeup of

socially vulnerable populations), and changes in land use and development. A discussion on these items can be found in Section 4.3.12 of the Base Plan.

Future Conditions/Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District will not be at future risk to this hazard.

Stream Bank Erosion

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Erosion is the general process whereby rocks and soils are broken down, removed by weathering, or fragmented and then deposited in other places by water or air. Stream bank erosion poses problems for the District. The rate of erosion depends on many variables, including the soil or rock texture and composition, soil permeability, slope, extent of vegetative cover, and precipitation amounts and patterns. Erosion increases with increasing slope and precipitation and with decreasing vegetative cover, which includes areas where protective vegetation has been removed by fire, construction, or cultivation. The District is traversed by many waterways, including leveed areas. These locations are all subject to bank erosion. Stream bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects.

Location and Extent

Stream bank erosion occurs on rivers, streams, and other moving waterways, including leveed areas, in the District. Erosion and deposition are occurring continually at varying rates over the Planning Area. Swiftly moving floodwaters cause rapid local erosion as the water carries away earth materials. This is especially problematic in leveed areas. Severe erosion removes the earth from beneath bridges, roads and foundations of structures adjacent to streams. By undercutting it can lead to increased rockfall and landslide hazard. The deposition of material can block culverts, aggravate flooding, destroy crops and lawns by burying them, and reduce the capacity of water reservoirs as the deposited materials displace water.

The speed of onset of stream bank erosion is slow, as the erosion takes place over periods of years. Duration of erosion is extended. Greater erosion occurs during periods of high stream flow and during storm and wind events when wave action contributes to the extent and speed of streambank erosion.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations related to erosion.

NCDC

The NCDC does not track stream bank erosion.

CCRCD Events

The CCRD noted that stream bank erosion is constantly occurring at various levels throughout the County. During every heavy rain, some measure of streambank erosion occurs.

Climate Change and Stream Bank Erosion

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with streambank erosion. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the CAS, climate change may affect flooding and thereby erosion in Colusa County. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Future precipitation projections were shown in Section 4.3.4 of the Base Plan. Also, according to the National Center for Atmospheric Research in Boulder, Colorado, atmospheric rivers are likely to grow more intense in coming decades, as climate changes warms the atmosphere enabling it to hold more water. All of the events above could exacerbate stream bank erosion in the County.

Vulnerability to Stream Bank Erosion

Parts of the District located along streambanks are at some measure of vulnerability to streambank erosion. An assessment of a community's vulnerability begins with an understanding of local exposure to streambank erosion. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District and unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

Certain developed areas that abut creeks and rivers in the County are at risk to continued bank erosion. Levees are at risk to erosion as well, due to the channelization due to narrow river channels. Significant erosion can cause degradation and loss of levee stability. This is the main concern regarding erosion in Colusa County. This is the case in many locations, but a few examples are included here:

- Lack of shoulder for road on Road 1 at Yolo County Border from Tehama Colusa Canal west to the intersection of Road 1 and Road 84. There has been substantial erosion on both sides of Road 1 which could result in a falling power pole or a car overturning in the steep ditch.
- Deterioration of the east side of the Levee on the Colusa Basin Drain east of the Colusa National Refuge at MA12 7.0 – this has been deteriorating for over a year. There are markers which might indicate the site will be repaired. This levee is under the control of CA DWR out of its Hwy 20 office.

Assets at Risk

Assets at risk from streambank erosion include people and populations served; structures and critical facilities; community lifelines; natural, historic, and cultural resources; economic assets; and community activities of value. These are discussed in the following sections.

People and Populations

Streambank erosion will have a minimal direct effect on District staff, people, and populations in the District. Indirect effects on people and populations include damages to roads or bridges from streambank erosion, causing transportation issues. Streambank erosion can also cause high sediment loads. While rare, this can cause water quality impacts. Water quality can be impacted causing health problems, especially to vulnerable populations where access to clean water supplies can be more challenging.

Structures and Critical Facilities

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Community Lifelines

Streambank erosion that causes levee failures presents a threat to life and property, including community lifelines in the District. Many of the District's community lifelines are the same as or similar to Colusa County's. Streambank erosion is not likely to overwhelm the community lifelines. These were discussed in greater detail in Section 4.3.15 of the Base Plan.

Natural, Historic, and Cultural Resources

Streambank erosion could cause levee failure flooding. Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these resources that fall in the flood zones would be vulnerable.

Economic Assets and Community Activities of Value

Economic assets and community activities of value for the District are similar or the same as those for the County as a whole. Those assets and activities were discussed in greater detail in Section 4.3.15 of the Base Plan.

Impacts from Streambank Erosion

Stream bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. Stream bank erosion processes, although complex, are driven by two major components: stream bank characteristics (erodibility) and hydraulic/gravitational forces. Many land use activities can affect both of these components and lead to accelerated bank erosion. The vegetation rooting characteristics can protect banks from fluvial entrainment and collapse, and also provide internal bank strength. When riparian vegetation is changed from woody species to annual grasses and/or forbs, the internal strength is weakened, causing acceleration of mass wasting processes. Stream bank aggradation or degradation is often a response to stream channel instability. Since bank erosion is often a symptom of a larger, more complex problem, the long-term solutions often involve much more than just bank stabilization. Numerous studies have demonstrated that stream bank erosion contributes a large portion of the annual sediment yield.

These impacts may be exacerbated by the effects of climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. A discussion on these items can be found in Section 4.3.15 of the Base Plan.

Future Conditions/Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District will not be at future risk to this hazard.

Subsidence

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Land subsidence is defined as the sinking of the land over man-made or natural underground voids. Subsidence can result in serious structural damage to buildings, roads, irrigation ditches, underground utilities, and pipelines. It can disrupt and alter the flow of surface or underground water. Weight, including surface developments such as roads, reservoirs, and buildings and manmade vibrations from such activities as blasting or heavy truck or train traffic can accelerate the natural processes of subsidence. In Colusa County, there are generally two types of subsidence of concern: subsidence from groundwater pumping and the settling of the ground over abandoned mine workings (i.e., the creation of sinkholes).

Location and Extent

Subsidence has been documented in some areas of the Sacramento Valley. In the Sacramento/San Joaquin Delta, subsidence has been associated with the drainage of organic soils and sediment compaction, which has been exacerbated by biological oxidation and extreme desiccation. Minimal subsidence locations in the District have been reported. According to the HMPC, any groundwater pumping areas in the eastern portion of the County may be at risk to subsidence. The HMPC noted that the Arbuckle area of the County is an area subject to subsidence associated with the drawdown of the water table. This is also where 5 wells went dry during the most recent drought.

There is no scientific scale or measurement system of subsidence. Changing elevations and groundwater tables can be measured over time, if areas are suspected of being affected by subsidence. The speed of onset of subsidence is slow, making it hard to determine with certainty that subsidence has occurred. According to the HMPC, subsidence in the District and County is caused by groundwater pumping, which affects the areas near the groundwater pumping area.

No known and mapped mining areas fall inside the District. However, it should be noted that not all mining locations in the District or County have been mapped and accounted for.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations from subsidence.

NCDC Events

The NCDC does not track subsidence.

CCRCD Events

The District noted that subsidence occurs, but could recall no instances where damages in the County occurred.

Climate Change and Subsidence

It is possible that climate change will increase the chance of future occurrence as well as future impacts associated with subsidence. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate change may cause additional subsidence in the County during times of drought and additional groundwater pumping. Data is showing that the groundwater table is lowering causing subsidence in California which can be compounded by the changes in precipitation and periods of drought.

Vulnerability to Subsidence

Portions of the District are at some measure of vulnerability to subsidence. An assessment of a community's vulnerability begins with an understanding of local exposure to subsidence. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District and unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

The District noted there is significant subsidence near Arbuckle. The operational conveyance of the Tehama-Colusa Canal, I-5, and potentially the railroad tracts east of I-5 are all at risk.

OTHER SPECIFIC VULNERABILITY CONCERNS? WHICH AREAS ARE MOST LIKELY AFFECTED? WHICH AREAS WILL MITIGATION EFFORTS FOCUS ON?

Assets at Risk

Assets at risk from subsidence include people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; economic assets; and community activities of value. These are discussed in the following sections.

People and Populations Served

Since subsidence generally happens over a long period of time, there is only a minimal risk to people and populations, including vulnerable populations. Areas in the eastern portion of the Colusa County Planning Area around the District have had groundwater levels lowered due to pumping; and subsidence has occurred. Since subsidence from groundwater pumping is a slowly occurring phenomenon, it is unlikely to affect populations in the short term. Given the lack of data on mines in the District and County, it is unknown whether people or populations will have any measurable risk to mine-related subsidence.

Structures and Critical Facilities

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Community Lifelines

Community lifelines are unlikely to be affected by subsidence due to its slow onset. Many of the District's community lifelines are the same as or similar to Colusa County's. Subsidence is not likely to overwhelm the community lifelines. These were discussed in greater detail in Section 4.3.16 of the Base Plan.

Natural, Historic, and Cultural Resources

All natural, historic, and cultural resources in the District bear some measure of risk to subsidence. Gradual sinking could cause foundation damages. A sinkhole from an abandoned mine location could affect a

structure. Historic structures built when building codes were less restrictive may be at greater risk should a sinkhole occur. The likelihood of this is low.

Economic Assets and Community Activities of Value

Economic assets and community activities of value for the District are similar or the same as those for the County as a whole. Those assets and activities were discussed in greater detail in Section 4.3.16 of the Base Plan.

Impacts from Subsidence

Effects of land subsidence in California include increased flood risk in low-lying areas, damage to buildings and infrastructure, loss of groundwater aquifers, and damage to aquatic ecosystems. As the land sinks, it can experience increased flooding and adverse impacts on sewer lines, stormwater drainage systems, and other impacts to critical facilities and infrastructure. As subsidence progresses, areas protected by levees can be impacted. Compaction of the aquifer system due to subsidence may permanently decrease its capacity to store water

These impacts may be exacerbated by the effects of climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. A discussion on these items can be found in Section 4.3.16 of the Base Plan.

Future Conditions/Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District will not be at future risk to this hazard.

Wildfire

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

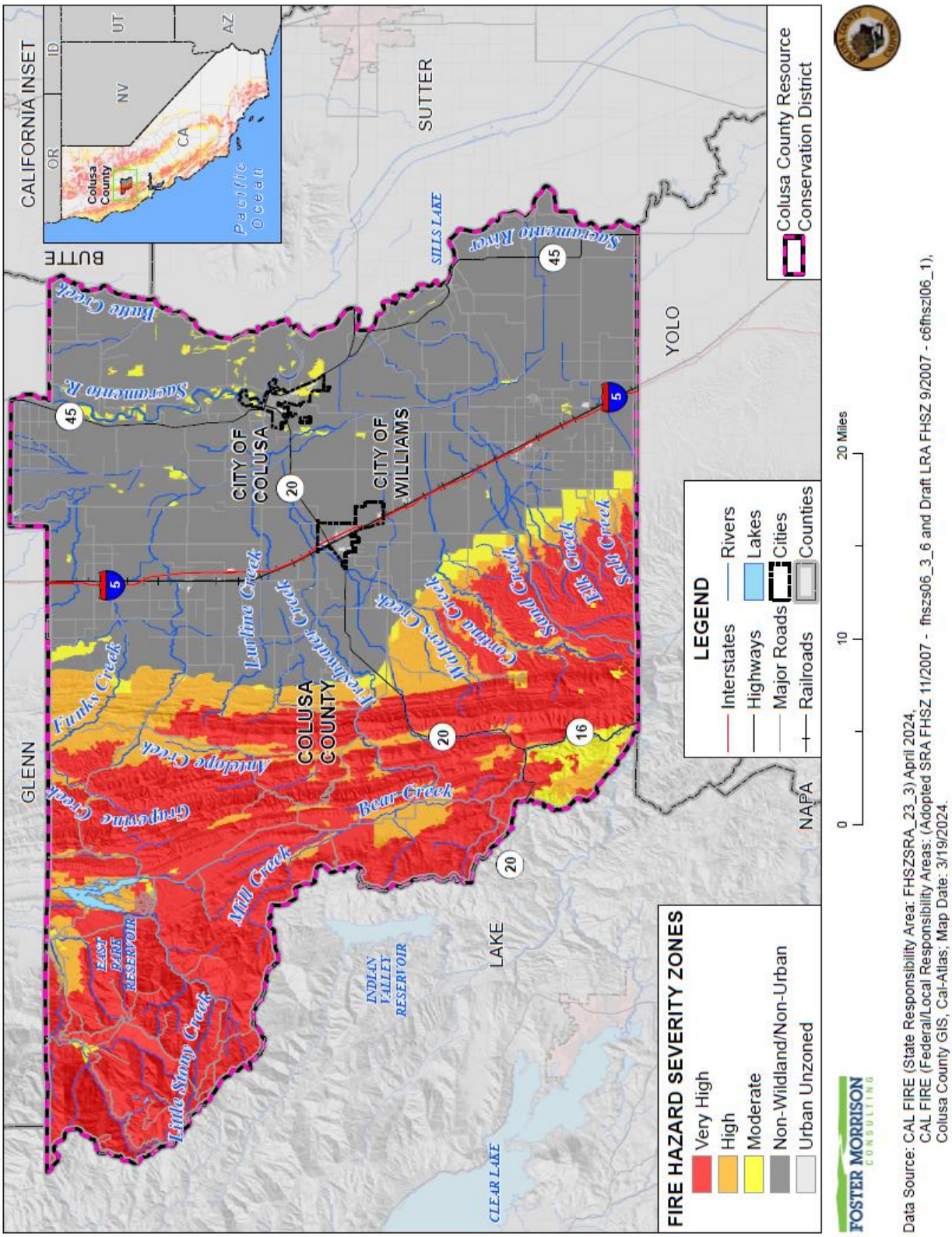
Wildland fire and the risk of a conflagration is an ongoing concern for the CCRCD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the District. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas. There is also the concern of wildfires occurring in

these more remote, forested areas that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.17 of the Base Plan, wildfire maps for the CCRCD were created. Figure C-2 shows the CAL FIRE Fire Hazard Severity Zone (FHSZ) in the District. As shown on the maps, FHSZs within the District range from Urban Unzoned to Very High.

Figure C-2 CCRCD – CAL FIRE Fire Hazard Severity Zones



Past Occurrences

Disaster Declaration History

There has been one federal and two state disaster declaration due to fire, as shown in Table C-5.

Table C-5 Colusa County – Federal and State Wildfire Disaster Declarations 1950-2024

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Wildfire	1	2018	2	1987, 2018

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 13 wildfire events in the County dating back to 1993.

CCRCD Events

The District noted the following events:

Ranch Fire **2018**- Mendocino National Forest was burned significantly impacting the watershed above Stonyford.

Colusa River Fire **2021**- burned in wildlands along river threatening the town of Colusa. There remains dead standing trees with risk to those who recreate along the river and public park.

Princeton Fire **2022**- wildfire burned along river impacting wildlife and threatening the town.

Although it was not a major fire in acreage, there was a fire that destroyed the riparian forest on the Sacramento River north of Colusa in **2022**.

Sites Fire **2024**- destroyed rangeland and foothill habitat and ranching infrastructure with some structures destroyed, over 10,000 acres impacted.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with wildfire. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.17 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Colusa County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters

used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Colusa County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of concern. Wildfires that occur in the District occur from a variety of both natural and manmade causes. The District can be affected both by fires that start on or near District lands as well as those that start elsewhere and move into the District. In addition to burning large areas of land, air quality can be affected in the District by fires occurring inside the District as well as those from many miles away. As growth continues and populations increase in the District, the potential for wildfires will also increase.

The whole of the District is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The District and unincorporated County has certain specific concerns regarding this hazard. The District concerns are the same as the County, which can be seen in Section 4.3.17 of the Base Plan.

Wildfire Smoke and Air Quality

Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both the County and nearby northern California communities since the 2018 LHMP Update have created significant air pollution affecting area residents. This was the case during the 2020 North Complex Fire, as well as others that affected the nearby areas. This also occurred to some measure during every event listed in the Past Occurrences section above.

Assets at Risk

Assets at risk from wildfire include people and populations served; structures and critical facilities; community lifelines; natural, historic, and cultural resources; economic assets; and community activities of value. These are discussed in the following sections.

People and Populations Served

All populations are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise or recreate outdoors
- Individuals who work outdoors
- Individuals with impaired mobility

Structures and Critical Facilities

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Community Lifelines

Wildfire presents a threat to life and property, including to community lifelines in the District. Many of the District's community lifelines are the same as or similar to Colusa County's. These were discussed in greater detail in Section 4.3.17 of the Base Plan. A large wildfire in the County could overwhelm community lifelines.

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the District, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Historic and cultural resources can be affected and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Economic Assets and Community Activities of Value

Economic assets and community activities of value for the District are similar or the same as those for the County as a whole. Those assets and activities were discussed in greater detail in Section 4.3.17 of the Base Plan.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures (commercial, industrial, and residential) and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the

District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the District, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

These impacts may be exacerbated by the effects of climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. A discussion on these items can be found in Section 4.3.17 of the Base Plan.

Future Conditions/Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District will not be at future risk to this hazard.

C.5 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.

It should be noted (for all of the tables in the sections below) that these tables were designed to display capability information for a county or city. The District has very few of these capabilities, due to their lack of size, lack of complexity, as well as their lack of statutory ability to regulate. The District depends on other jurisdictions for many of these capabilities, and partners with them on case-by-case issues that affect the District.

C.5.1. Regulatory Mitigation Capabilities

Table C-6 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 CCRCD.

Table C-6 CCRCD's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	N	NA
Climate Change Adaptation Plan	N	Has not been created and reliant on county
Community Wildfire Protection Plan	Y	Project, Risk Assessment, Hazards Identified, Yes, updated 2021
Comprehensive/Master Plan	N	NA
Continuity of Operations Plan	N	NA
Economic Development Plan	N	NA
Land Use Plan	N	NA
Local Emergency Operations Plan	N	NA
Stormwater Management Plan	N	NA
Transportation Plan	N	NA
Other (describe)	Y	Long Range Plan (2023-2028)
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N	
Building code	N	
Flood insurance rate maps	N	
Floodplain ordinance	N	
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	
Subdivision ordinance	N	
Zoning ordinance	N	
Other	N	

How can these capabilities be expanded and improved to reduce risk?
The District will assist with planning and providing input on natural resource protection, management practices, and mitigation projects within any plan or ordinance. The CCRCD should be represented at plan development meetings especially the Climate Change Adaptation Plan

Source: CCRCD

CCRCD 5 Year Plan (2023-2028)

The CCRCD 5-Year Plan has multiple mitigation related planning mechanisms. These are shown in Table C-7.

Table C-7 CCRCD 5-Year Plan Mitigation Related Items

Funder/ Grant Agency	Project Name	Start Date	End Date	Award	Project Description	Potential Hazard Mitigation	Location in Colusa County
Natural Resource Conservation Service (NRCS)	Cooperative Agreement-Soil Health Technical Assistance	9/30/2021	7/31/2025	$180,000	Providing Technical Assistance to Private Landowners (Farmers/Ranchers) for soil health and management practices	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Cropland and Rangeland and post-fire forestland
Colusa Glenn Subwatershed Program (CGSP)	Program Support	1/1/2022	12/31/2024	$90,000	Provides reporting assistance and education/outreach to members that have irrigated cropland to adhere to water quality regulations	Subsidence, Drought and water shortages, Climate change, Water Quality	Cropland Colusa County
California Department of Fire and Forestry (CAL Fire)	2019 Forest Health Grant-Upper Little Stony Post Ranch Fire Watershed Restoration Project	4/22/2020	3/31/2024	$1,882,529	Post-fire watershed scale restoration and reforestation effort across 13 private innholders within the Goat Mt. area of the Mendocino National Forest.	Wildfire, Invasive Species, Climate Change, Landslide/Mudslide/Debris Flow	Mendocino National Forest
California Department of Fire and Forestry (CAL Fire)	2021 Forest Health Grant-Goat Mountain Forest Infrastructure Improvements for Fire Resilience	9/20/2021	3/31/2025	$1,619,686	Pest management and fuel break infrastructure improvements along private and public roadways.	Wildfire, Invasive Species, Climate Change, Landslide/Mudslide/Debris Flow	Mendocino National Forest

Funder/ Grant Agency	Project Name	Start Date	End Date	Award	Project Description	Potential Hazard Mitigation	Location in Colusa County
Department of Conservation (DOC)	Regional Fire and Fuel Capacity Program (RFFC)- Inter-Coastal Range	11/15/2021	3/31/2028	$1,187,120	Supports development and implementation of projects and plans to improve forest health and fire resiliency.	Wildfire, Invasive Species, Climate Change, Landslide/Mudslide/Debris Flow	All fuel types in Colusa County including forests, chaparral, oak woodland, grasslands, and riparian areas.
Napa County Resource Conservation District and Conservation Works	Regional Conservation Partnership Program- Building Fire Resiliency in California's Coast Range Forests and Grasslands)	9/21/2022	3/31/2026	$117,086	Provide technical and project financial assistance to grassland and forest landowners for wildfire prevention and/or recovery and overall forest/grassland health/resilience	Wildfire, Invasive Species, Climate Change, Landslide/Mudslide/Debris Flow	Private Rangeland and Forestland in Colusa County
California Department of Food and Agriculture (CDFA)	Climate Smart Agriculture Practices: Healthy Soils Incentive Program Technical Assistance	9/12/2021	3/31/2024	$58,799	Assist local landowners and managers with planning, implementing and applying for financial assistance for soil health management practices	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Private Lands in Colusa County, Ag Land
California Department of Food and Agriculture (CDFA)	Climate Smart Agriculture Practices: State Water Efficiency and Enhancement Program Technical Assistance	9/12/2021	3/31/2024	$58,086	Assist local landowners and managers with planning, implementing and applying for financial assistance for Irrigation water management practices	Climate Change, Ag Hazards (Dust Bowl), Erosion, Drought, Water Availability	Private Lands in Colusa County, Ag Land

Funder/ Grant Agency	Project Name	Start Date	End Date	Award	Project Description	Potential Hazard Mitigation	Location in Colusa County
California Department of Food and Agriculture (CDFA)	Continued-Climate Smart Agriculture Practices: State Water Efficiency and Enhancement Program Technical Assistance	11/1/2023	10/31/2026	$150,000	Assist local landowners and managers with planning, implementing and applying for financial assistance for Irrigation water management practices	Climate Change, Ag Hazards (Dust Bowl), Erosion, Drought, Water Availability	Private Lands in Colusa County, Ag Land
California Department of Food and Agriculture (CDFA)	Pollinator Habitat Program-Colusa County's Integrating Pollinator Habitat on Working Lands	5/1/2023	4/30/2026	$299,248	The grant funds will be used to incentivize conservation practices on working lands that create, enhance, or sustain pollinator habitat.	Loss of critical habitat, climate change, ecosystem health	Private Lands in Colusa County, Ag Land
County of Colusa	County Coordinator-Fire Mitigation Planning	4/18/2023	12/31/2024	$100,000	Development of county-wide education and collaboration among fire mitigation groups and stakeholders to organize and identify fire mitigation projects and efforts.	Wildfire, Invasive Species, Climate Change, Landslide/Mudslide/Debris Flow	All fuel types in Colusa County including forests, chaparral, oak woodland, grasslands, and riparian areas.
California Association of Resource Conservation Districts (CARCD) and Wildlife Conservation Board (WCB)	Climate Resilience Through Habitat Restoration	2/14/2023	2/28/2027	$250,000	Establishing and enhancing, Planting native plant species to support pollinating species (native bees, monarchs, flies, birds)	Loss of critical habitat, climate change, ecosystem health	Private Lands in Colusa County, Ag Land

Funder/ Grant Agency	Project Name	Start Date	End Date	Award	Project Description	Potential Hazard Mitigation	Location in Colusa County
Yolo County Resource Conservation District (YCRCD)	Agriculture Conservation Planning	6/15/2023	6/14/2025	$60,500	Creating conservation plans for private landowners who are interested in implementing conservation practices into their farm or ranch. These plans include Carbon Farm Plans, Habitat Restoration Plans, and Soil Health Plans	Climate Change, Ag Hazards (Dust Bowl), Erosion, Habitat, Stormwater Flooding	Private Lands in Colusa County, Ag Land
Carbon Cycle Institute (CCI)	Sacramento Valley Climate and Agriculture Regional Coordinator	7/1/2023	7/31/2026	$360,000	Funds a regional coordinator for the Sacramento Valley to promote and scale climate smart agriculture practices, develop regional partnerships and programs and advocate for funding to farms and ranches that employ natural resource conservation practices	Climate Change, Ag Hazards (Dust Bowl), Erosion, Habitat, Stormwater Flooding	Private Lands in Colusa County, Ag Land
Colusa Indian Community (CIC)	Healthy Soils Block Grant-Technical Assistance	pending	pending	$100,000	Assist local landowners and managers with planning, implementing and applying for financial assistance for soil health management practices	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Private Lands in Colusa County, Ag Land
Colusa Indian Community (CIC)	State Water Efficiency and Enhancement Program BLOCK Technical Grant Assistance	pending	pending	$100,000	Assist local landowners and managers with planning, implementing and applying for financial assistance for Irrigation water management practices	Climate Change, Ag Hazards (Dust Bowl), Erosion, Drought, Water Availability	Private Lands in Colusa County, Ag Land

Funder/ Grant Agency	Project Name	Start Date	End Date	Award	Project Description	Potential Hazard Mitigation	Location in Colusa County
Total Funds				$6,613,054			

Source: CCRCD 5-Year Plan

Additionally, the CCRCD has spearheaded or participated in multiple planning efforts. These are included below:

Colusa Basin Watershed Assessment (Colusa Basin – December 15th, 2008)

The Colusa County RCD was granted funding through the Department of Water Resources (DWR) as an implementing agency for the CALFED Bay Delta Watershed Program grant under Water Security, Clean Drinking Waters, Coastal and Beach Protection Act of 2002 (Proposition 50) for developing and implementing the Colusa Basin Watershed Assessment. The Colusa Basin Watershed (Basin) envelopes the upper portion of Yolo County, the majority of Colusa County, and the southern part of Glenn County with all the major tributaries draining into the Bay Delta in one way or another. The Colusa Basin Watershed Assessment can be characterized as a "current conditions report" and will help to illustrate where there are information gaps, what changes have occurred in the basin, why these changes happened, if they were good changes or bad changes, land use patterns, social characteristics, and more. The consulting firm H.T. Harvey and Associates worked on the information gathering process for the Assessment. The idea was not to reinvent the wheel, but to make it more functional. Our hope is that this working document will assist local stakeholders in making informed land management decisions that will improve the holistic health of the watershed.

Colusa Basin Watershed Management Plan (Colusa Basin – December 2016)

The health of our communities and natural resources is dependent upon the overall health of our watershed. Similarly, the health of our watershed is dependent upon the actions of those living within its boundaries. The Colusa County Resource Conservation District (CCRCD) Watershed Coordinator has created the Colusa Basin Watershed Management Plan (Plan) to function as a road map to watershed health by addressing the issues and concerns of stakeholders in the watershed and providing guidance in watershed stewardship through cooperative planning.

Bear Creek Watershed Assessment (Bear Creek – June 7th, 2010)

Bear Creek watershed encompasses 103 square miles (266 km2) at the interface of the North Coast Range on the west side of the Sacramento River Valley in Colusa County. The watershed has varied in terrain, from the nearly flat Bear Valley to steep, highly dissected canyons at the northwest, west, and southeast edges of the watershed. A series of rolling hills of blue oak woodland form the east boundary. Although the watershed is sparsely populated today, people over the past 150 years have transformed large portions of the landscape, particularly in Bear Valley and in Sulphur Creek sub watershed. Mercury mining, cattle ranching, and hot springs resorts have been the mainstays of the economic life of the watershed. The purpose/goals of this project are to improve water quality, restore hydrologic function, conserve topsoil and stabilize erosion-prone areas, protect and enhance biological diversity, and much more.

Colusa Basin Streambank Analysis (County of Colusa Streambanks – February 25th, 2010)

Following the completion of the Colusa Basin Watershed Assessment, a Streambank Analysis study was completed on 36 foothill streams in the watershed. These streams were mapped for erosion potential, riparian habitat quality and invasive species infestation. Next, 24 critical management reaches were selected that showed potential for restoration projects. The purpose of the Streambank Analysis study is to fill in some of the data gaps from the Watershed Assessment by defining areas along streams in the Colusa Basin Watershed that would benefit most from restoration projects. These projects will ultimately improve the overall health of the Watershed and quality of water flowing into the Bay Delta from the Colusa County streams.

Community Wildfire Protection Plan 2021 (Colusa County – January 2021)

In 2019, the CCRCD received funding through the California Fire Safe Council and from Colusa County to develop a Community Wildfire Protection Plan. This plan covers all wildland within the county addressing potential risks to wildfire and identifying projects that would protect the people and property of our county. These projects range from organizational projects such as developing a locally-led fire safe council and homeowner education to on-the-ground projects such as fuel management and prescribed fire.

Oak Woodland Management Plan (Colusa County's Rangeland and Oak Woodlands)

The Colusa County Resource Conservation District (CCRCD), along with local landowners worked over a long period of time to create an Oak Woodlands Management Plan (OWMP) for Colusa County. The OWMP was a non-regulatory, voluntary plan that will give landowners a tool to utilize in knowing how to practice better stewardship among the Oak Woodlands on their land. On May 18th, 2008, the CCRCD attended a board meeting of the Colusa County Board of Supervisors to answer questions that they might have about the proposed plan. There was minimal discussion to be had, and the plan was passed and adopted by the Board of Supervisors without reservation.

C.5.2. Administrative/Technical Mitigation Capabilities

Table C-8 identifies the District department(s) responsible for activities related to mitigation and loss prevention in CCRCD.

Table C-8 CCRCD's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N	Non-regulatory agency
Civil Engineer, including dam and levee safety	N	Non-regulatory agency

Community Planner	N	Non-regulatory agency
Emergency Manager	N	Non-regulatory agency
Floodplain Administrator	N	Non-regulatory agency
GIS Coordinator	Y	Capable of mapping on GIS software
Planning Commission	N	Non-regulatory agency
Other	N	Non-regulatory agency
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	We are grant funded so all projects, including those to mitigate risk are a result of successful grant writing
Hazard data and information	Y	Yes Wildfire
GIS analysis	Y	Yes Wildfire
Mutual aid agreements	N	We don't provide services that would require mutual aid agreements
Other	Y	Project identified and developed with private landowners impacted
How can these capabilities be expanded and improved to reduce risk?		
Seeking grant funds for a Climate Change Adaptation Plan will enhance the roadmap to hazard mitigation through climate change mitigation and adaptation in our natural and working lands. Adding remote sensing to existing GIS projects can help scale up the impact of our forestry and agricultural work through remote sensing		

Source: CCRCD

C.5.3. Fiscal Mitigation Capabilities

Table C-9 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table C-9 CCRCD's Fiscal Mitigation Capabilities

Funding Resource	In Place 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	NA
Community Development Block Grant	N	NA
Federal funding programs (non-FEMA)	Y	Natural Resource Conservation Service
Fees for water, sewer, gas, or electric services	N	NA
Impact fees for new development	N	NA
State funding programs	Y	Calfiornia Dept of Food and Ag, Wildlife Conservation Board, Department of Conservation, Department of Water Resource, CalFire
Stormwater utility fee	N	NA

Funding Resource	In Place 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?
Other	Y	Non-governmental agencies such as The Nature Conservancy, Carbon Cycle Institute, Zero Foodprint
How can these capabilities be expanded and improved to reduce risk?		
Diverse funding streams from both state and federal sources will ensure that programming at the district can continue to serve the community consistently and dependably. Building more non-agency partnerships open up opportunities to build capacity and grow district programming within our county. Adding a full-time grant writer to our district staff will also ensure continual funds are available for district operations and programming.		

Source: CCRCD

C.5.4. Mitigation Education, Outreach, and Partnerships

Table C-10 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 C-10 CCRCD's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	200 Subscribers
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	Farm Show, Community Meetings
Local news	Y	Articles and Press Release in local paper
Organizations that interact with underserved and vulnerable communities	Y	CCRCD staff is fluent in Spanish to serve local landowners that are non-native English speakers
Social media	Y	400 Followers
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
The District provides programs and project funding for local landowners and partners to address and mitigate a natural resource concern. Campaigns to add to community newsletters and social media followers will be engaged and expanded.		

Source: CCRCD

C.5.5. Other Mitigation Efforts

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

Some of the previous 5-Year Plans had hazard mitigation components. Those are shown on Figure C-3.

Figure C-3 CCRCD – Past 5-Year Plan Mitigation Related Items

Funder/ Grant Agency	Project Name	End Date	Award	Project Description	Natural Resource Concern	Hazards	Location in Colusa County
Resource Conservation District of Tehama County	Firescape Mendocino (member)	6/30/2021	$1,000	Regional partnership building for agencies and other stakeholders that work within the Mendocino Nation Forest. Monthly meetings to share projects, develop partnership charter, and plan regional efforts	Forest Health, Watershed Health	Wildfire, Invasive Species, Climate Change, Landslide/Mudslide/Debris Flow	USFS and Private Lands within Colusa County and the MNF
California Fire Safe Council	Listos-Emergency Preparedness Program	5/14/2021	$3,000	Disperse marketing materials for emergency preparedness in Spanish and English throughout the County through online social platforms and in-person events	Wildfire, vegetation and watershed health	flood, wildfire, etc	Countywide
Community Alliance of Family Farms	Specialty Crop Hub Technical Assistance	12/31/2021	$4,500	A series of outreach events were planned to highlight conservation practices within orchard systems in Colusa, Glenn, Yolo, Solano counties	Soil-Farmland	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Private Lands in Colusa County, Ag Land
Yolo County Resource Conservation District (YCRCD)	Regional Carbon Hub Development to scale Carbon Farm Planning in the Sacramento Valley	2020	$3,250	This was a planning grant to solidify partners and assess potential climate impacts of agriculture in the Sacramento Valley and how to support farms and ranches adapt to climate change through conservation practice implementation	Soil, Sustainable Ag, Watershed Health, Habitat	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Private Lands in Colusa County, Ag Land

Funder/ Grant Agency	Project Name	End Date	Award	Project Description	Natural Resource Concern	Hazards	Location in Colusa County
Zero Food Print	Technical Assistance to a farm implementing soil health practice- compost application	6/1/2022	$1,200	CCRCD supported a farm plan, apply and verify a soil health practice. Often the CCRCD acts as a third-party to ensure funding is being used properly and practice is being implemented properly	Soil-Farmland	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Private Lands in Colusa County, Ag Land
One Tree Planted	Funds to purchase seedlings and plant in burn scare	10/31/2022	$45,643	Grant that funded the purchased of 400,000 trees to be planted in the Mendocino National Forest after a wildfire.	Forest Health, Watershed Health	Wildfire, Invasive Species, Climate Change, Landslide/Mudslide/Debris Flow	Private Lands within Colusa County and the MNF
County of Colusa	Community Wildfire Protection Plan	6/19/2020	$10,000	CCRCD planned and published a Community Wildfire Protection Plan through holding stakeholder meetings, identifying areas that are under threat of wildfire, and projects that mitigate the risk of wildfire damage to private property, human life, community assets and the environment	Forest Health, Watershed Health	Wildfire, Invasive Species, Climate Change, Landslide/Mudslide/Debris Flow	Countywide
California Fire Safe Council	Community Wildfire Protection Plan	6/19/2020	$10,000				
California Department of Food and Agriculture (CDFA)	2018 Healthy Soil Incentive Program Technical Assistance	6/30/2020	$44,000	Assist local landowners and managers with planning, implementing and applying for financial assistance for soil health management practices	Soil-Farmland	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Private Lands in Colusa County, Ag Land

Funder/ Grant Agency	Project Name	End Date	Award	Project Description	Natural Resource Concern	Hazards	Location in Colusa County
Carbon Cycle Institute (CCI) and California Association of RCDs (CARCD)	Carbon Farm Plan Development	6/30/2020	$15,000	The CCRCD created a Carbon Farm Plan for Davis Ranches in Colusa, County. The plan consisted of a series of recommended conservation practices that addressed the farm's natural resource concerns. The plan also provided the climate benefit if the conservation practice were implemented. The benefits quantified by calculating the metric tons of carbon or equivalent that is offset and/or captured from practice implementation.	Soil, Sustainable Ag, Watershed Health, Habitat	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Private Lands in Colusa County, Ag Land
Sutter County Resource Conservation District (SCRCD)	National Air Quality Initiative Program Technical Assistance	7/31/2021	$20,000	This program provides financial assistance to farmers that need to replace old tractors with new more efficient farming equipment. The technical assistant reviews contracts and plans then verifies the new tractor and the destruction of the old tractor.	Air Quality	Climate Change, Air Pollution	Private lands in Sutter County, Farmers replacing equipment

Funder/ Grant Agency	Project Name	End Date	Award	Project Description	Natural Resource Concern	Hazards	Location in Colusa County
The Nature Conservancy (TNC)	Outreach	9/31/2021	$5,400	Provided Outreach to private landowners to gauge interest in groundwater recharge and bird habitat return programs, which entailed flooding fields after harvest	Habitat, Groundwater Quantity, Watershed Health	Loss of critical habitat, climate change, ecosystem health, Drought, Groundwater Depletion	Private Lands in Colusa County, Ag Land
California Association of RCDs	Monarch Habitat Conservation Planning Grant	12/31/2022	$33,369	This was a planning grant to create habitat conservation plans on private lands within working lands. The habitat conservation plans suggested best management practices to provide and protect habitat for pollinators and the monarch butterfly. The RCD produced 4 plans.	Habitat, CA Native Species (plant and pollinating insects)	Loss of critical habitat, climate change, ecosystem health	Private Lands in Colusa County, Ag Land
Colusa Glenn Subwatershed Program (CGSP)	Program Support	12/31/2021	$53,280	Provides reporting assistance and education/outreach to members that have irrigated cropland to adhere to water quality regulation	Water Quality	Subsidence, Drought and water shortage, Climate change, Water Quality	Cropland Colusa County
University of California Cooperative Extension	Healthy Soils Demonstration Site	3/31/2023	$18,856	Assist local landowners and managers with planning, implementing and applying for financial assistance for soil health management practices	Soil-Farmland	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Private Lands in Colusa County, Ag Land

Funder/ Grant Agency	Project Name	End Date	Award	Project Description	Natural Resource Concern	Hazards	Location in Colusa County
Natural Resource Conservation Service (NRCS)	Cooperative Agreement-Soil Health Technical Assistance	7/31/2021	$180,000	Providing Technical Assistance to Private Landowners (Farmers/Ranchers) for soil health and management practices	Soil-Farmland	Climate Change, Ag Hazards (Dust Bowl), Erosion, Stormwater Flooding	Cropland and Rangeland and post-fire forestland

Source: CCRCD

C.6 Mitigation Strategy

C.6.1. Mitigation Goals and Objectives

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

C.6.2. Mitigation Actions

The planning team for the CCRCD 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:

- Ag Hazards: Severe Weather/Invasive Species
- Climate Change
- Drought & Water shortage
- Floods: Localized Stormwater
- Stream Bank Erosion
- Subsidence
- Wildfire

Low priority hazards not considered for mitigation planning include

- Dam Failure
- Earthquake
- Floods: 1%/0.5%/0.2% annual chance
- Landslide, Mudslide, and Debris Flow
- Levee Failure
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Severe Weather: High Winds and Tornados

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.

Mitigation Actions

Action 1. Abandoned Agricultural Lands Pest Management

Hazards Addressed: Agriculture Hazards

Goals Addressed: 1, 3, 4, 6

Issue/Background: Colusa County has abandoned croplands that pose a threat to nearby productive land. A high number of invertebrate and vertebrate pests that live on unmanaged, abandoned land can cause crop damage to adjacent fields.

Project Description: Orchard removal, mulching to improve soil health, and reestablishing beneficial insect habitat.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Wildlife Conservation Board (WCB), CDFA, Colusa County Wildfire Mitigation Action Plan (2024)

Responsible Office/Partners: CCRCD, Colusa Agricultural Commissioner Office

Benefits (Losses Avoided): Pest management, crop damage mitigation

Potential Funding: CDFA, WCB

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 2. Beetle-killed Tree Removal

Hazards Addressed: Wildfire, Drought and Water Shortage, Climate Change, Ag Hazards

Goals Addressed: 1, 3, 4, 6

Issue/Background: Colusa County has a high number of bark-beetle infested trees that are now dead and require removal to minimize fire risk. Beetle populations increase over time and threaten infestation of healthy nearby trees.

Project Description: CCRCD will work with US Forest Service and local landowners to remove beetle infested trees.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Colusa County Community Wildfire Protection Plans, Colusa County Fire Mitigation Project (2024)

Responsible Office/Partners: CCRCD, US Forest Service

Benefits (Losses Avoided): Pest management, wildfire protection

Potential Funding: Cal Fire

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 3. Climate Action Plan

Hazards Addressed: Climate change

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

Issue/Background: Climate change threatens the wellbeing of Colusa County residents, landowners, and natural resources. Drought, fire, flood, and severe weather are all poised to intensify as climate change continues to impact California. Greenhouse gas emissions contribute to the problem and must be identified and mitigated to make progress towards a more climate-resilient future.

Project Description: Typically led by the County, climate action plans have taken shape across the state and identify plans to mitigate greenhouse gas emissions. Climate action planning will require input from all major jurisdictions in the area. Colusa County RCD will support the writing of a climate action plan for the county and contribute to the natural and working lands section of the publication.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Governor's Office 30x30 – Working Lands Solutions

Responsible Office/Partners: Colusa County, CCRCD, Colusa Dept of Agriculture, Colusa County Air Resources Board, any additional County departments

Benefits (Losses Avoided): Damage and stress from climate change, minimizing pollution, improving air quality and quality of life for County residents and landowners

Potential Funding: State and federal grants.

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 4. Climate-smart Agricultural Planning

Hazards Addressed: Climate change, air quality

Goals Addressed: 1, 3, 4, 6

Issue/Background: Climate change threatens the food security and economic viability of agriculture in Colusa County. Drought, flood, and severe weather are all poised to intensify as climate change continues to impact California. Agricultural practices need updating to become resilient and can be part of the solution to climate change in our region.

Project Description: CCRCD will incorporate conservation agriculture practices to conserve resources and limit the exacerbation of climate change, while also reaching farmers to aid in climate change adaptation and resiliency on farms.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Regional Climate and Agriculture Hub, CDFA programming

Responsible Office/Partners: CCRCD, USDA-NRCS

Benefits (Losses Avoided): Climate change adaptation and resiliency, carbon sequestration, mitigation of greenhouse gas emissions

Potential Funding: State ag grants, USDA grants.

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 5. Update and Implement Community Wildfire Protection Plan

Hazards Addressed: Fire mitigation

Goals Addressed: 1, 3, 4, 6

Issue/Background: Wildfire threatens the hills of Western Colusa County and poses a risk to structures and valuable natural resources in the area. CCRCD has been forming a Community Wildfire Protection Plan to gain stakeholder input and develop a collective understanding of the risks and solutions associated with wildfire in the region.

Project Description: CCRCD will update the CWPP and work to implement project ideas in the county.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP development, Fire Safe Council, Colusa County Coordinator Fire Mitigation Plan (2024)

Responsible Office/Partners: CCRCD, Cal Fire, County of Colusa Community Development, local fire authorities

Benefits (Losses Avoided): Decreased wildfire risk, high community input on climate solutions, conservation of natural resources (timber and natural lands)

Potential Funding: CAL FIRE grants.

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 6. Colusa County Fire Mitigation Plan of 2024 Implementation

Hazards Addressed: Fire mitigation

Goals Addressed: 1, 3, 4,6

Issue/Background: Wildfire threatens the hills of Western Colusa County and poses a risk to structures and valuable natural resources in the area.

Project Description: CCRCD will implement projects outlined in the fire mitigation plan. This plan identifies new projects to be added to the community wildfire protection plan (CWPP) and reestablishes stakeholder engagement that began with the CWPP. New projects have been prioritized and identified through this effort between CCRCD and the County of Colusa Community Development Department. Projects include fuel breaks, prescribed burning on private lands, and community programs to increase defensible space in neighborhoods.

Other Alternatives: Deal with fires after the start.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP, Fire Safe Council, Colusa County Coordinator Fire Mitigation Plan (2024)

Responsible Office/Partners: CCRCD, Cal Fire, County of Colusa Community Development, local fire authorities, US Forest Service

Benefits (Losses Avoided): Decreased wildfire risk, community input on climate solutions, conservation of natural resources

Potential Funding: CAL FIRE grants.

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 7. Colusa County Fire Safe Council

Hazards Addressed: Fire mitigation

Goals Addressed: 1, 3, 4, 6

Issue/Background: Wildfire threatens the hills of Western Colusa County and poses a risk to structures and valuable natural resources in the area.

Project Description: CCRCD will support the development and oversight of a Fire Safe Council, which is a group of stakeholders that meet regularly to prioritize and implement projects outlined in wildfire mitigation plans.

Other Alternatives: Status quo.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP, Fire Safe Council, Colusa County Coordinator Fire Mitigation Plan (2024)

Responsible Office/Partners: CCRCD, Cal Fire, County of Colusa Community Development, local fire authorities, US Forest Service

Benefits (Losses Avoided): Decreased wildfire risk, high community input on climate solutions, conservation of natural resources

Potential Funding: CAL FIRE grants.

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 8. Groundwater Recharge

Hazards Addressed: Drought and water shortage, agriculture, subsidence

Goals Addressed: 1, 3, 4, 6

Issue/Background: Climate instability has led to increased extreme precipitation events. Due to the prevalence of extreme precipitation events and drought, it may prove beneficial to harness the surface runoff in wet years by recharging the aquifer.

Project Description: CCRCD will support farmers and landowners interested in installing groundwater recharge projects on their land.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: DWR Programming, USDA-NRCS Conservation Innovation, CDFA

Responsible Office/Partners: CCRCD, DWR, USDA-NRCS Conservation Innovation, CDFA, various NGOs

Benefits (Losses Avoided): Food security, long-term water storage for dry years, aquifer recharge/maintenance

Potential Funding: CA DWR, CDFA, USDA grants.

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 9. Invasive Species Removal from Waterways

Hazards Addressed: Drought and water storage, agriculture

Goals Addressed: 1, 3, 4, 6

Issue/Background: California Invasive Plant Council (Cal IPC) mapped arundo and tamarisk throughout Colusa County watersheds and identified these species as an invasive species due to being high water demand plants, spreading vigorously, displacing native species and a fire hazard.

Project Description: CCRCD will work with a neighboring RCD and the Colusa Agriculture Department to continue removing arundo in upper Stony Creek and other water ways throughout the county.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Cal IPC report, Glenn County and Colusa County Community Wildfire Protection Plans

Responsible Office/Partners: CCRCD, Colusa County Dept of Agriculture, Glenn County RCD

Benefits (Losses Avoided): Invasive plant control, water security, streambank stability, wildfire protection

Potential Funding: Cal Fire, CDFA

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 10. Irrigation Efficiency Technical Assistance

Hazards Addressed: Drought and water shortage, agriculture

Goals Addressed: 1, 3, 4, 6

Issue/Background: Drought has worsened in the Sacramento Valley and water prices have risen, making agriculture less feasible for farmers in Colusa County and destabilizing our local food system.

Project Description: CCRCD will provide planning and financial assistance to farms to increase water use efficiency on farms. CCRCD will help farmers upgrade water and pumping infrastructure, introduce farmers to climate-smart agriculture, irrigation management, increase uptake of soil health practices, land management technical assistance for water quantity and quality.

Other Alternatives: No action, which may keep water prices higher for longer.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CDFA SWEEP, Regional Mobile Irrigation Lab

Responsible Office/Partners: CCRCD, USDA-NRCS, Yolo RCD, Glenn RCD

Benefits (Losses Avoided): Increased water use efficiency on farmland/farm adaptation to drought, food security, economic benefits for farmers

Potential Funding: CA DWR, CAL FIRE grants.

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 11. Localized Stormwater Management and Streambank Erosion Mitigation

Hazards Addressed: Flooding, severe weather, stream bank erosion

Goals Addressed: 1, 3, 4, 5

Issue/Background: Climate instability has led to increased extreme precipitation events. Due to the prevalence of extreme precipitation events, Colusa County needs to adapt natural lands to be more resilient to flooding and waterway erosion.

Project Description: CCRCD will update our streambank erosion plan, update the Colusa Basin Watershed Assessment, restore floodplain/wetland habitat, do rangeland and upper watershed management

to mitigate erosion, instream restoration of stream beds, implement conservation practices along streambanks and ditches (grassed waterways, low water crossings)

Other Alternatives: Allow erosion to occur and fix on a case by case basis.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Colusa Basin Watershed Assessment, Streambank Erosion Plan, SGMA Action Plan

Responsible Office/Partners: CCRCD, DWR

Benefits (Losses Avoided): Reduced runoff, reduced soil erosion/loss, increased water quality

Potential Funding: CA DWR grants.

Timeline: 2025 – 2030

Project Priority (H, M, L): High

Action 12. On-farm Water Storage Projects

Hazards Addressed: Drought and water shortage, agriculture

Goals Addressed: 1, 3, 4, 6

Issue/Background: Drought has worsened in the Sacramento Valley and water prices have risen, making agriculture less feasible for farmers in Colusa County and destabilizing our local food system. Water storage provides a localized way to address this issue and improve the economic viability of farms and ranches.

Project Description: CCRCD will improve or install water storage on farms and ranches in Colusa County based on NRCS conservation practice recommendations. Rangeland planting for upper watershed management may also be included in this project.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CDFA SWEEP, DWR Programming

Responsible Office/Partners: CCRCD, USDA-NRCS

Benefits (Losses Avoided): Farm adaptation to drought, food security, long-term water storage for dry years, economic benefit for farmers, habitat establishment in upper watershed

Potential Funding: CDFA, CA DWR grants.

Timeline: 2025 – 2030

Project Priority (H, M, L): High