



Annex D Cortina Community Services District

D.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Cortina Community Services District (CCSD 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 CCSD, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this District.

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

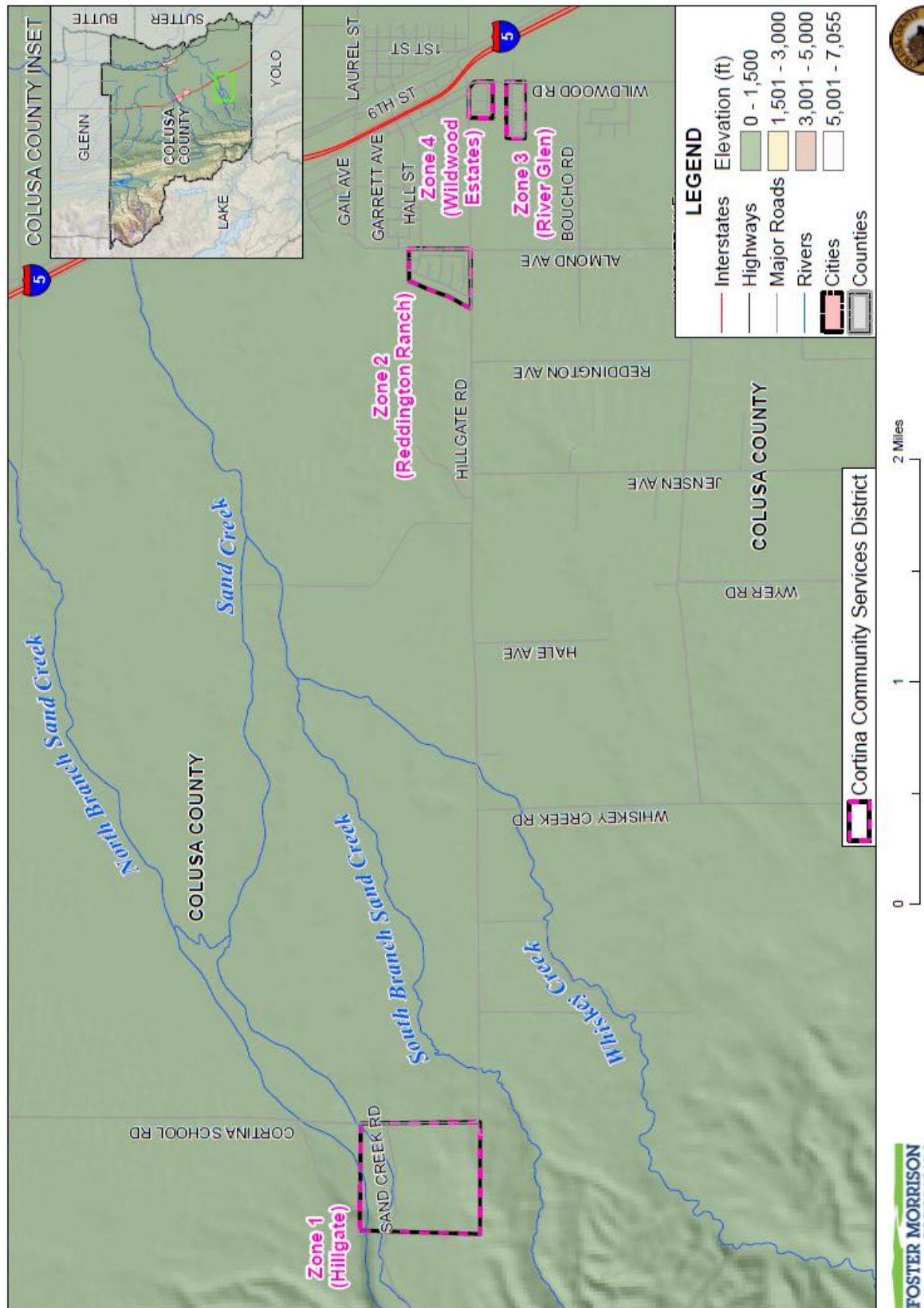
Table D-1 CCSD – Planning Team

Name	Position/Title	How Participated
Karl Drexel	General Manager	Provided data on hazards, facilities, capabilities, and mitigation actions. Attended HMPC meetings.

D.3 District Profile

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

Figure D-1 CCSD



Data Source: Colusa County GIS, Cal-Atlas; Map Date: 3/20/2024.

D.3.1. Overview and Background

The Colusa County Board of Supervisors passed Resolution 2005-40 for the formation of Cortina CSD and establishment of a Sphere of Influence coterminous with its boundaries. The establishment of the Cortina CSD in 2006 allowed the provision of necessary services for the four previously approved subdivision applications (totaling 225.53 acres) shown below:

- Hillgate (formerly Rancho Cortina) APNs: 018-250-018, (tax rate area 067-052) 018-250-019, 018-250-020, 018-250-017 (USA) Located at the northwest corner of Cortina School Road and Hillgate Road, west of Arbuckle.
- Reddington Ranch (now called Honey Grove) APNs: 018-280-010, 018-280-011, 018-280-013 Located at the northwest corner of Almond Avenue and Hillgate Road, west of Arbuckle. Annexed to Arbuckle PUD June 1, 2006 (Colusa LAFCO No. 2005-05, Tim Lewis).
- River Glen APNs: 020-200-01 through 41-- tax rate area 067-054 Located on the west side of Wildwood Road, north of Boucho Road, west of Arbuckle. Annexed to Arbuckle PUD 1992 (Colusa LAFCO No. 91-06, Arbuckle Land Company).
- Wildwood Estates (five lots are developed) APN: 021-300-018 Located and the southwest corner of Wildwood Road and Hillgate Road, west of Arbuckle. Annexed to Arbuckle PUD July 15, 2005 (Colusa LAFCO No. 2004-01, Tomlinson).

The development of these parcels into residential subdivisions created the need for the following services as authorized in Colusa LAFCO Resolution 2006-0002:

- Street light maintenance,
- Road/Street maintenance
- Pedestrian and/or bicycle trail maintenance
- Landscape maintenance
- Open space maintenance
- Collection, treatment and disposal of storm water
- Maintenance of drainage and floodway facilities
- Water not within the Arbuckle PUD or its Sphere
- Wastewater not within the Arbuckle PUD or its Sphere
- Police and Fire Infrastructure financing

The Cortina Community Services District is located west of Arbuckle. Arbuckle is a census-designated place (CDP) which means that census data is available for the community. The population was 3,424 at the 2020 census, 3,028 at the 2010 census, and 2,332 at the 2000 census. The area has seen consistent growth. The area is characterized by single-family residences, multiple-family units, some mobile homes, and commercial activities. Land surrounding Arbuckle is mostly agricultural including cultivated annual crops, and both active and unmaintained orchards (primarily almonds). Regional access is provided by the north-south running Interstate 5.

D.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 CCSD 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:

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

D.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 D.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 D.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 780-800 people in approximately 208 residences. The day-to-day activities of the Cortina CSD are administered by a part time general manager, who is responsible for the work of independent contractors performing landscape and other maintenance services. The CCSD does not have any regular employees.

Special Populations and Disadvantaged Communities

The District noted that its special populations and disadvantaged communities mirror that of Arbuckle, CA as a whole. The CCSD serves a population with a median household income of \$79,312. The District Planning Team noted that there are disadvantaged communities in the District – namely those who are Hispanic or Latino, as well as the elderly. The District also parallels Colusa County as a whole. Those populations and communities can be found in more detail in Section 4.2.1 of the Base Plan.

Structures and Critical Facilities

This section considers the CCSD'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.

Table D-2 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. CCSD's physical assets, valued at over \$2 million, consist of the buildings and infrastructure to support the District's operations.

Table D-2 CCSD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Reddington Ranch Greenway	Community Parkway/Greenway	\$1,000,000	Floods: 1%,0.5%,0.2% Floods: Local Storm Water, Landslide Debris Flow, Stream Bank Erosion
River Glen Roads and Storm drains	Streets and Roads, Stormwater Retention	\$1,000,000	Floods: 1%,0.5%,0.2% Floods: Local Storm Water, Landslide Debris Flow,
Total		\$2,000,000	

Source: CCSD

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

CCSD has a variety of natural resources of value to the District. In 2006, the three residential developments went through a screening for natural resources of significance. Nothing unique to the District was found. It was noted that the District's natural resources parallels that of Colusa County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Historic and Cultural Resources

CCSD has a variety of historic and cultural resources of value to the District. In 2006, the three residential developments went through a screening for cultural and historical significance. Nothing unique to the District was found. It was noted that 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 CCSD 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

The District noted there has been limited past growth since surrounding agricultural land is developed by the County and it is rarely developed. The District has 208 houses it serves.

Future Development Areas

It is important to review future development plans for the District. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards. The District has noted that there is no growth anticipated or future developments at this time.

D.4.2. Hazard Identification

CCSD 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 D-3).

Table D-3 CCSD—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)	–	–	–	–	Medium
Climate Change	–	–	–	–	–
Dam Failure	–	–	–	–	Medium
Drought & Water shortage	–	–	–	–	High
Earthquake	–	–	–	–	Low
Floods: 1%/0.2% annual chance	Significant	Likely	Critical	High	Medium
Floods: Localized Stormwater	Significant	Likely	Critical	High	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 Tornadoes	–	–	–	–	Low
Stream Bank Erosion	Significant	Likely	Critical	High	Medium
Subsidence	–	–	–	–	Low
Wildfire	–	–	–	–	Medium
Geographic Extent <i>Limited:</i> Less than 10% of planning area <i>Significant:</i> 10-50% of planning area <i>Extensive:</i> 50-100% of planning area Likelihood of Future Occurrences <i>Highly Likely:</i> Near 100% chance of occurrence in next year or happens every year. <i>Likely:</i> Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. <i>Occasional:</i> Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. <i>Unlikely:</i> Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years. Magnitude/Severity <i>Catastrophic:</i> More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths <i>Critical:</i> 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 <i>Limited:</i> 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 <i>Negligible:</i> 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 <i>Low:</i> Minimal potential impact <i>Medium:</i> Moderate potential impact <i>High:</i> Widespread potential impact Climate Change Influence <i>Low:</i> Minimal potential impact <i>Medium:</i> Moderate potential impact <i>High:</i> Widespread potential impact					

D.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 D-3) 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 D.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 recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California’s three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme weather fire 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

The District noted that PSPSs have not been of concern. The irrigation system does run using electrical power but has not been defined as key infrastructure.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Likely

Vulnerability–High

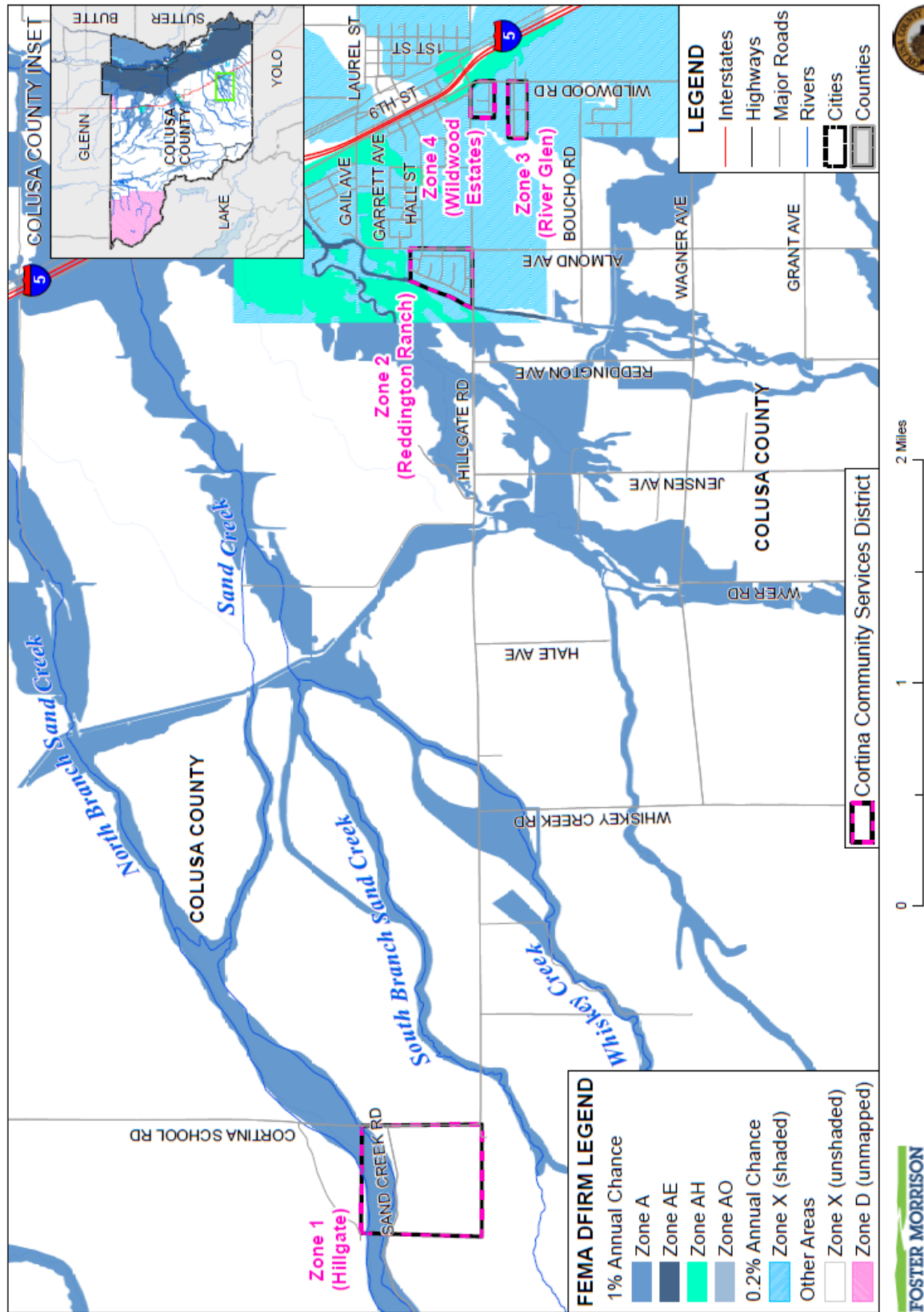
Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the District and may have caused damage in the past. Flooding can be a significant problem in the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the District swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas.

Location and Extent

The CCSD has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure D-2.

Figure D-2 CCSD – FEMA DFIRM Flood Zones



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

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Colusa County from flooding is shown on Table D-4. These events also likely affected the District to some degree.

Table D-4 Colusa County – State and Federal Disaster Declarations from Flood 1950-2024

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rain and storms)	17	1955, 1958, 1963 (twice), 1970, 1983, 1986, 1995 (twice), 1997, 1998, 2005/2006, 2017, 2019 (twice), 2023 (twice)	19	1950, 1955, 1958 (twice), 1963 (twice), 1973, 1978, 1983, 1986, 1995 (twice), 1997, 1998, 2005/2006, 2008, 2017, 2019 (twice)

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Colusa County has seen 14 events. These events most likely had some impact on the District.

CCSD Events

The District noted multiple recent storms.

2019 Flooding

In 2019 there were storms that affected the District. Heavy rains caused flooding in the District. Images from Barbara Way in the River Glen neighborhood are shown on Figure D-3 and Figure D-4.

Figure D-3 CCSD – 2019 Flooding on a Flood Retention Pond at Barbara Way in River Glen Neighborhood



Source: CCSD

Figure D-4 CCSD – 2019 Street Flooding at Barbara Way and Wildwood



Source: CCSD

2021 Floods

Heavy rains caused flooding in the District. Images from flooding are shown on Figure D-5 and Figure D-6.

Figure D-5 CCSD – Flooding at Flood Retention Pond at Hall Road in Reddington Ranch



Source: CCSD

Figure D-6 CCSD – Flooding at Barbara Way and Wildwood (across from High School)



Source: CCSD

2023 Floods

Heavy rains and storms from atmospheric river events caused flooding in the District. This caused flooding on Salt Creek. This can be seen on Figure D-7. This caused streambank erosion in the District. More information on that erosion can be found in the Past Occurrences of the Stream Bank Erosion section below.

Figure D-7 CCSD – Flood Waters on Salt Creek in 2023



Source: CCSD

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. 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 in California and the Colusa County Planning Area, including the District. 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. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the District.

The whole of the District is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. 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 has specific concerns and unique vulnerabilities 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.

Within the District, the flooding and bank erosion during high rain events has been eroding the property next to the resident's greenway and walking path and potential park property. There are numerous residences adjacent to the walking path that over the years may be vulnerable to flooding if the bank continues to be wiped out by flood waters. The District's only infrastructure is the irrigation system that will also need to be replaced if the erosion continues. The Creek bank needs to be armored, while also considering the best environmentally sound way to eliminate future erosion. Removal of the built-up silt in the river bed to get the river flow directed back to the way it was, down the middle of the creek rather than directed toward the bank is also a priority for the District.

Assets at Risk

Assets at risk from 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

All people and populations located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

District residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. The District has only one employee who would be at risk during a flood event.

Structures and Critical Facilities

Certain structures in the District are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. The District noted that the properties and assets listed in Table D-2 are at risk to flooding.

Flooding presents a threat to both critical facilities and infrastructure, as well as community lifelines. Critical infrastructure plays an immensely important role in our communities. Communities rely on roads, rail corridors, and related biking and pedestrian routes for transportation, and on water infrastructure for drinking water, wastewater service, and draining streets of rainwater. Damage to any one of these systems can threaten public safety, wreak havoc on daily life, impact properties far from flood zones, and result in economic impacts that cascade throughout California.

Community Lifelines

1% and 0.2% annual chance flooding 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. This was discussed in greater detail in Section 4.3.11 of the Base Plan. Generally, even major flood events are temporary events with flood waters receding back to pre-storm levels at the conclusion of the storm. However, depending on the location, duration, and magnitude and severity of any given flood event, some of these community lifelines may be overwhelmed in the short term.

Natural, Historic, and Cultural Resources

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 that fall in the flood zones shown on Figure D-2 would be vulnerable. This is especially true if a 0.2% annual chance flood event occurs.

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 4.3.11 of the Base Plan.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

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

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 (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Changes in population patterns and land use, and the extent to which they affect this hazard, are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time. While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the CCSD. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services. It is unknown how changes in land use and development will affect streambank erosion in the District's service territory. Building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions.

One of the most effective ways to reduce vulnerability to potential flood damage is through careful land use planning that fully considers applicable flood management information and practices. Master planning will also be necessary to assure that open channel flood flow conveyances serving the smaller internal streams and drainage areas are adequately prepared to accommodate the flows. Preservation and maintenance of natural and riparian areas should also be an ongoing priority to realize the flood control benefits of the natural and beneficial functions of these areas.

Future development in the District may be built in the floodplain, in conformance to the standards of the floodplain ordinance. The District enforces the floodplain ordinance on new development in CCSD.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence—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 CCSD is subject to localized flooding throughout the District. This is discussed in Table D-5 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.

CCSD Events

Past events of flooding (where localized flood occurred) are discussed in the CCSD Events under Past Occurrences in the Flood: 1%/0.2% Annual Chance section.

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 has specific concerns and unique vulnerabilities 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 tracks localized flooding areas. Affected localized flood areas identified by the CCSD are summarized in Table D-5. The District noted that there is a lack of bank stabilization in Salt Creek, as well as a lack of a storm drain system on County Road Wildwood for the River Glen neighborhood.

Table D-5 CCSD – List of Localized Flooding Problem Areas

Road/Area Name	Flooding	Pavement Deterioration	Washouts	High Water/Creek Crossing	Landslides/Mudslides	Debris	Downed Trees
Salt Creek	yes	yes	yes	yes	Bank Erosion	yes	no
Wildwood at Barbara	yes	yes	no	High water	Mud and debris	yes	no
Wildwood at Kleeman	yes	yes	no	High water	some	some	no

Source: CCSD

Within the District, the flooding and bank erosion during high rain events has been eroding the property next to the resident’s greenway and walking path and potential park property. There are numerous residences adjacent to the walking path that over the years may be vulnerable to flooding if the bank continues to be wiped out by flood waters. The District’s only infrastructure is the irrigation system that will also need to be replaced if the erosion continues. The Creek bank needs to be armored, while also considering the best environmentally sound way to eliminate future erosion. Removal of the built-up silt in the river bed to get the river flow directed back to the way it was, down the middle of the creek rather than directed toward the bank is also a priority for the District.

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. The District has only one employee who would be at risk during a flood event.

Structures and Critical Facilities

Structures and critical facilities in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damages.

Localized flooding, while often more of a nuisance, can cause damage to critical facilities and infrastructure during a heavy rain and storm event. Any facility that experiences localized flooding can be impacted. Utilities and other critical infrastructure can all be affected, causing interruptions in service until repairs can be made. For example, water and wastewater systems can be vulnerable to heavy rains and flood events. Rainfall creates a high water table, surging streams and creeks, and saturates soil. Infiltration of stormwater into water and wastewater systems may occur and presents a threat to public health and safety, when the infrastructure is no longer able to meet operational needs and local demands. Other critical facilities such as roads, bridges and other transportation facilities can also experience localized flooding causing road closures and other impacts until storm waters recede. This can result in extended road closures requiring alternate routes.

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 (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Changes in population patterns and land use, and the extent to which they affect this hazard, are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time. While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the CCSD. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services. It is unknown how changes in land use and development will affect streambank erosion in the District's service territory. Building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions.

Future development in the District will add more impervious surfaces causing an increase in stormwater runoff and the continued need to drain these waters. The District will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Stream Bank Erosion

Likelihood of Future Occurrence—Likely
Vulnerability—High

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. 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.

CCSD Events

The District noted that in 2022/2023, 1,600 lineal feet of bank erosion occurred on Salt Creek along the Community parkway/greenway. This is typically an annual occurrence which the District noted high levels of concern. These events were confirmed to have occurred in 2019, 2021, 2023, and 2024. There have been multiple events before 2006, however exact dates are not available. This can be seen on the images on Figure D-8 and Figure D-9. Continued erosion without mitigation could erode all the way to houses adjacent to the Creek.

Figure D-8 CCSD – Streambank Erosion on Salt Creek



Source: CCSD

Figure D-9 CCSD – Streambank Erosion on Salt Creek



Source: CCSD

Other past events of flooding (where stream bank erosion likely occurred) are discussed in the CCSD Events under Past Occurrences in the Flood: 1%/0.2% Annual Chance section.

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 which contributes to 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 has specific concerns and unique vulnerabilities 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 that in 2022/2023, 1,600 lineal feet of bank erosion occurred on Salt Creek along the Community parkway/greenway. The District has concerns that continued erosion without mitigation could erode all the way to houses adjacent to the Creek. There is concern that longer and heavier storms due to climate change could worsen the problem.

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. The District has only one employee who would be at risk during a flood or streambank erosion event.

Structures and Critical Facilities

Structures and critical facilities near rivers are at some risk from the effects of streambank erosion. Streambank erosion can undercut structure foundations causing instability and other issues. Structures that are in areas protected by levees are at greater risk of streambank erosion. Should levees erode quickly, their risk of failure increases. Those structures behind the levees would be at risk. This is discussed in greater detail in Levee Failure section above. Damage to any one of these systems can threaten public safety, wreak havoc on daily life, impact properties far from flood zones, and result in economic impacts that cascade throughout California. The District noted that the properties and assets listed in Table D-2 are at risk to streambank erosion.

Community Lifelines

Streambank erosion that causes significant impacts such as 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 unlikely to overwhelm 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.

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 (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Changes in population patterns and land use, and the extent to which they affect this hazard, are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time. While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the CCSD. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services. It is unknown how changes in land use and development will affect streambank erosion in the District's service territory. Building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions.

Determining the cause of accelerated streambank erosion is the first step in solving the problem. When a stream is straightened or widened, streambank erosion increases. Accelerated streambank erosion is part of the process as the stream seeks to re-establish a stable size and pattern. Damaging or removing streamside vegetation to the point where it no longer provides for bank stability can cause a dramatic increase in bank erosion. A degrading streambed results in higher and often unstable, eroding banks. When land use changes occur in a watershed, such as clearing land for agriculture or development, runoff increases. With this increase in runoff the stream channel will adjust to accommodate the additional flow, increasing streambank erosion. Addressing the problem of streambank erosion requires an understanding of both stream dynamics and the management of streamside vegetation.

Planned developments should take erosion risk areas into account during the construction of new homes and commercial properties

D.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.

D.5.1. Regulatory Mitigation Capabilities

Table D-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 CCSD.

Table D-6 CCSD'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	
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	N	
Comprehensive/Master Plan	N	
Continuity of Operations Plan	N	
Economic Development Plan	N	
Land Use Plan	N	
Local Emergency Operations Plan	N	
Stormwater Management Plan	N	
Transportation Plan	N	
Other (describe)		
		Is the ordinance an effective way to reduce hazard impacts?
Land Use Planning and Ordinances	Y/N	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		
How can these capabilities be expanded and improved to reduce risk?		
The Cortina CSD is fully built out with no commercial property and no economic development. The District also has limited ability to regulate this development. The District will continue to work with Arbuckle and the County on any planning or regulatory issues that arise.		

Source: CCSD

D.5.2. Administrative/Technical Mitigation Capabilities

Table D-7 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the District.

Table D-7 CCSD'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	No District Staff
Civil Engineer, including dam and levee safety	N	No District Staff
Community Planner	N	No District Staff – Community built out
Emergency Manager	N	GM Assumes
Floodplain Administrator	N	GM Assumes
GIS Coordinator	N	County is GIS Coordinator
Planning Commission	N	District is built out
Other		
Technical	Y/N	Has capability been used to assess/mitigate risk in the past?
Grant writing	Y	GM Assumes
Hazard data and information	N	
GIS analysis	N	
Mutual aid agreements	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District has limited staffing. Only one employee is currently with the District, and serves in a part time capacity. Capabilities could be expanded by converting that employee to full time status. This would cause an impact to District finances.		

Source: CCSD

D.5.3. Fiscal Mitigation Capabilities

Table D-8 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table D-8 CCSD'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	
Community Development Block Grant	N	

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?
Federal funding programs (non-FEMA)	N	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
State funding programs	N	
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
District Funding is through property assessments for street and road maintenance and street lights cannot be used for mitigation.		

Source: CCSD

D.5.4. Mitigation Education, Outreach, and Partnerships

Table D-9 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 D-9 CCSD's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	Occasional letter goes out to all community members
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	N	
Local news	N	
Organizations that interact with underserved and vulnerable communities	N	
Social media	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Nextdoor would be a good local news media. This will be researched and possibly used to expand these capabilities.		

Source: CCSD

D.5.5. Other Mitigation Efforts

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

- The District attempted to mitigate stream bank erosion and flood repairs after the 2022-2023 Winter Storm and were rejected. Joining the 2024 Colusa County LHMP should help the District secure possible funding streams in the future.

D.6 Mitigation Strategy

D.6.1. Mitigation Goals and Objectives

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

D.6.2. Mitigation Actions

The planning team for the CCSD 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:

- Flood: 1%/0.2% Annual Chance
- Flood: Localized Flood
- Stream Bank Erosion

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. Armor the Salt Creek Bank

Hazards Addressed: Flooding, Localized Flooding, Bank Erosion

Goals Addressed: 1, 3, 4, 5

Issue/Background: Salt Creek, running adjacent to the Reddington Ranch residential development and greenway, has flooded during high rain events and erodes the bank and the District's property and causes

localized flooding. The property next to the creek has been identified as a possible park site and further erosion would be devastating.

Project Description: To armor 1,600 feet of creek bank with rip rap or other environmentally acceptable armoring acceptable to California Department of Fish and Wildlife to prevent further erosion and flooding.

Other Alternatives: Continue to have flooding and erosion during high rain events

Existing Planning Mechanism(s) through which Action Will Be Implemented: Unknown

Responsible Office/Partners: Cortina Community Services District, Colusa County, Dept of Fish and Wildlife

Benefits (Losses Avoided): To protect further erosion an encroachment into District property and nearby residential area.

Potential Funding: Cal OES, FEMA HMGP

Timeline: Within 1 year if funding is available.

Project Priority (H, M, L): High