

Annex I North Yuba Water District

I.1 Introduction

This Annex details the hazard mitigation planning elements specific to North Yuba Water District (NYWD or District), a new participating jurisdiction to the 2014 Butte 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 NYWD with a focus on providing additional details on the risk assessment and mitigation strategy for the District.

I.2 Planning Process

As described above, the NYWD followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Butte 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 I-1. Additional details on plan participation and District representatives are included in Appendix A.

Table I-1 North Yuba Water District Planning Team

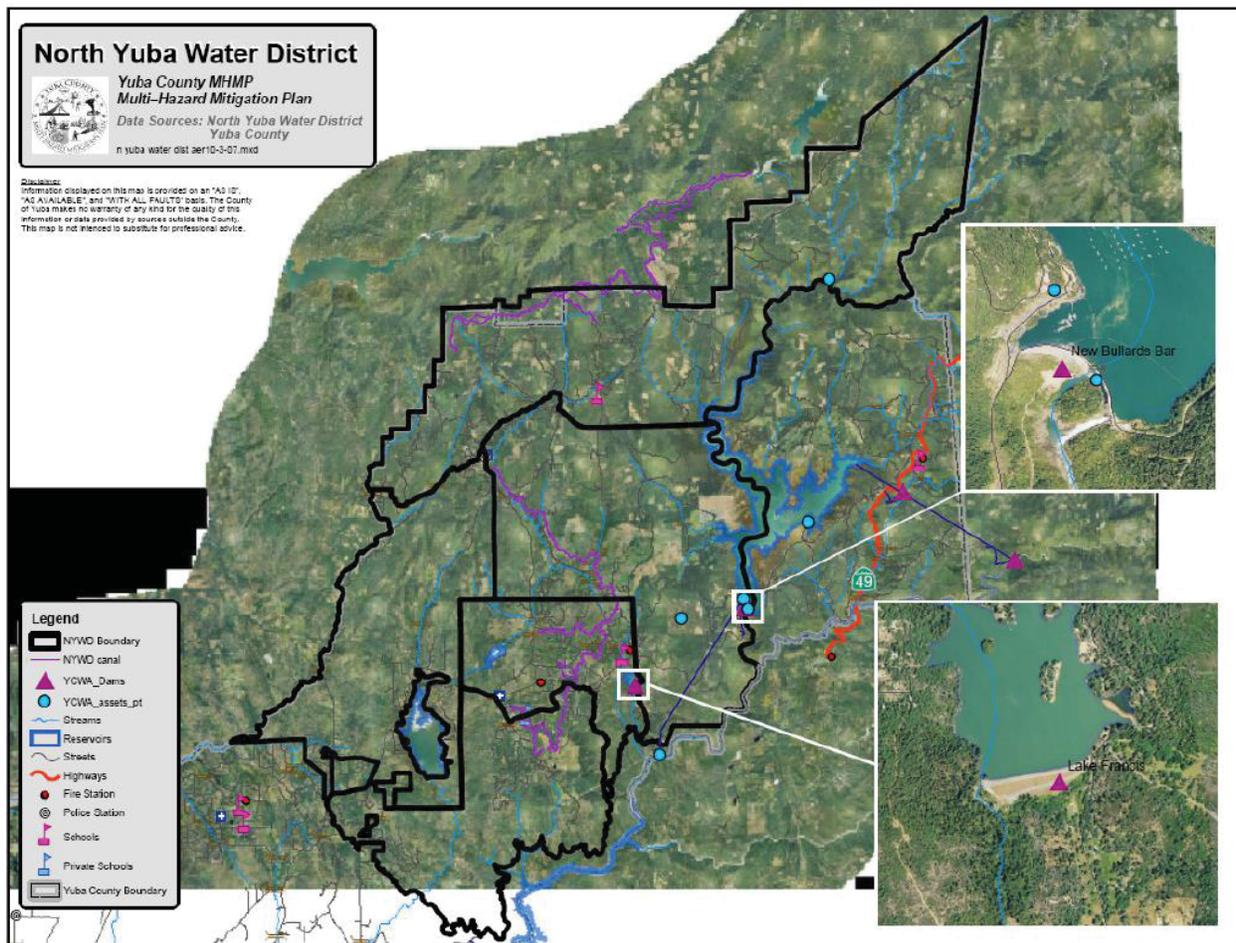
Name	Position/Title	How Participated
Kristin McKillop	Engineering Consultant	Attended meetings, Completed Worksheets, Reviewed Drafts
Richard Guevarra, P.E.	Engineering Consultant/Associate Engineer	Completed Worksheets

Source: NYWD

I.3 District Profile

The community profile for the NYWD is detailed in the following sections. Figure I-1 displays a map and the location of the District within Butte County.

Figure I-1 North Yuba Water District Map



Source: NYWD

I.3.1. Overview and Background

The North Yuba Water District (formally the Yuba County Water District) was formed June 30, 1952 pursuant to water district law. An application was filed in 1958 by the District for a permit to appropriate 23,000 acre-feet per annum from Fall River, tributary to Middle Fork Feather River, and Rock Creek, tributary to South Fork Feather River. The water was to be diverted to off stream storage for irrigation and domestic use within the District.

The District serves the communities of Challenge, Brownsville, Rackerby, and Forbestown. The communities of Rackerby and Forbestown, lie partially in Butte County. These local communities got their start during the gold rush days, becoming important sources of lumber from the forests surrounding them. I. E. Brown built a lumber mill in 1851, at the site of present-day Brownsville, hence the town was named Brownsville Challenge had a lumber mill shortly thereafter in 1856. These two communities are so close together that they share services and have become a census-designated place (CDP). According to the Census Bureau, census of 2000, the CDP has a total area of 9.7 square miles, with 1,069 people, 491 households, and 322 families residing in the area.

The North Yuba Water District receives its water through the South Feather Water and Power Agency (formally Oroville-Wyandotte Irrigation District). This joint water venture began in 1852 when a small ditch company was organized to construct a ditch from the South Fork of the Feather River to the mining sites at Forbestown, Wyandotte, Honcut, and Bangor. These communities all lie along the shared Yuba-Butte County line. The District shares a power generator with SFWPA and water conduction facilities. As a result of the concern for an adequate water supply and for a revenue source to fund South Feather Water and Power Agency's expanding infrastructure, the District's Board of Directors proposed the construction of the South Fork Project. The South Fork Project, covering 82 square miles in three counties, consisted of 8 dams, 17 tunnels, 21 miles of canals and conduits, 3 hydroelectric power plants and 21 miles of roads. The project was completed in 1963 at a cost of \$62 million and was financed through the sale of revenue bonds secured by the projected revenues from power generation.

The current North Yuba Water District stills lies on the border of Yuba-Butte counties and provides treated drinking water to about 190 square miles including 25 square miles that is built upon and protected by a fire hydrant system. The District's source of water is the Little Grass Valley Reservoir, in La Porte. Water is released from the reservoir into the South Fork of the Feather River, then diverted by tunnel into Sly Creek Reservoir. From Sly Creek the water passes through a water power generator and is stored in Lost Creek Reservoir. From Lost Creek the water enters another tunnel to Woodleaf where it is released into a 9-mile section of open canal to the Water Treatment Plant in Forbestown. After the treatment process, the water is pumped into a 500,000-gallon storage tank. From the tank the water is gravity fed to the Challenge (100,000 gal.), Brownsville (300,000 gal.) and Rackerby (100,000 gal.) tanks. Water is also pumped into the Forbestown tank (100,000 gal.), then gravity fed to Forbestown.

I.4 Hazard Identification

NYWD's planning team identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to the District (see Table I-2).

Table I-2 North Yuba Water District – Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Climate Change	Extensive	Likely	Limited	Low	–
Dam Failure	Significant	Occasional	Critical	Low	Medium
Drought & Water shortage	Extensive	Likely	Significant	High	High
Earthquake	Extensive	Occasional	Catastrophic	High	Low
Floods: 100/200/500 year	Limited	Occasional	Limited	Low	Medium
Floods: Localized Stormwater	Limited	Occasional	Limited	Medium	Medium
Hazardous Materials Transportation	Limited	Unlikely	Limited	Low	Low
Invasive Species: Aquatic	Limited	Occasional	Limited	Low	Low
Invasive Species: Pests/Plants	Limited	Occasional	Limited	Low	Low
Landslide, Mudslide, and Debris Flow	Significant	Likely	Critical	High	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Low	High
Severe Weather: Freeze and Winter Storm	Significant	High Likely	Critical	High	Medium
Severe Weather: Heavy Rain and Storms (Hail, Lightning)	Extensive	Highly Likely	Critical	Low	Medium
Severe Weather: Wind and Tornado	Limited	Occasional	Limited	Low	Low
Stream Bank Erosion	Limited	Occasional	Limited	Low	Low
Volcano	Extensive	Unlikely	Critical	Low	Low
Wildfire	Extensive	Highly Likely	Catastrophic	Medium	High
<p>Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area</p> <p>Probability 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.</p> <p>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</p> <p>Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> <p>Climate Change Impact: Low: Not likely to increase the probability of this hazard. Medium: Is likely to increase the probability of this hazard. High: Is very likely to increase the probability of this hazard.</p>					

I.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the NYWD’s hazards and assess the District’s vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 Hazard Profiles and 4.3 Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the NYWD is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

I.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section I.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the District and includes information on past hazard occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

I.5.2. Vulnerability Assessment and Assets at Risk

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

Assets at Risk and Critical Facilities

This section considers the NYWD’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 I-3 lists critical facilities and other District assets identified by the NYWD planning team as important to protect in the event of a disaster. NYWD’s physical assets, valued at over \$57 million, consist of the buildings and infrastructure to support NYWD’s operations.

Table I-3 North Yuba Water District Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Hazard Info
Water Treatment Plant	Micro Membrane System	\$6,000,000	Earthquake, Wildfires
Office and Maintenance Yard	Office and equipment storage/repair	\$1,500,000	Earthquake, Wildfires
Water Treatment Pond	Treatment Pond	\$3,000,000	Earthquake, Wildfires
Forbestown Tank (500,000 gal)	Storage Tank	\$4,500,000	Earthquake, Wildfires
Forbestown Tank (100,000 gal)	Storage Tank	\$1,500,000	Earthquake, Wildfires
Forbestown Ditch	Water conveyance system	\$10,000,000	Heavy Rain, Landslide and Wildfires
Costa Creek	Water conveyance system	\$7,000,000	Heavy Rain, Landslide wildfires
Dry Creek	Water conveyance system	\$5,000,000	Heavy Rain, Landslide wildfires
Oroleve Creek	Water conveyance system	\$4,000,000	Heavy Rain, Landslide wildfires
Dobbins Oregon House Canal	Water conveyance system	\$15,000,000	Heavy Rain, Landslide wildfires
Total		\$57,500,000	

Source: NYWD

Natural Resources

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

Historic and Cultural Resources

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

Growth and Development Trends

Growth in the District parallels that of the County as a whole. Information can be found in Section 4.3.1 of the Base Plan. Since most of NYWD’s facilities were constructed in the 1800s, the District plans to update and repair the facilities such as the conveyance system to provide a more efficient system for the customer’s current needs. An increase in long-range planning will be needed to account for any population growth, increased water demands, infrastructure replacement and improvements.

Future Development

The District has no control over future development in areas serviced by the District. Future development in these areas parallels that of the County as a whole. More general information on growth and development in Butte County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 of the Base Plan.

I.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment for those hazards identified above in Table I-2 as high or medium significance hazards. Impacts of past events and vulnerability of the NYWD to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Butte County Planning Area).

An estimate of the vulnerability of the NYWD to each identified priority 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.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or wildfires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends. Water districts normally require at least a 10-year planning horizon to implement a multiagency improvement project to mitigate the effects of a drought and water supply shortage.

Location and Extent

As discussed in the Base Plan, drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the NYWD, is at risk. 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. Should a drought last for a long period of time, water shortage becomes a larger issue.

Past Occurrences

Since drought is a regional phenomenon, past occurrences of drought for the NYWD are the similar to those for the County. Those past occurrences can be found in Section 4.2.8 of the Base Plan.

Vulnerability and Impacts to Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including in 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 is often 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 the NYWD to drought is District-wide, but impacts may vary and include reduction in water quality and supply as well as an increase in dry fuels. The increased dry fuels result in an increased fire danger.

NYWD's increased vulnerability to drought is due in part to farming on marginally arable lands and the pumping of ground water to the point of depletion. The most significant qualitative impacts associated with drought in the planning area are those related to water intensive activities such as wildfire protection, municipal usage, commerce, tourism, and recreation. Voluntary conservation measures are typically implemented during extended droughts. Drought conditions can also cause water quality deterioration and soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Assets at Risk

NYWD assets that are at risk includes the Water Treatment Plant, Office and Maintenance Yard, Water Pond, and Forbestown Ditch.

Future Development

NYWD receives surface water diverted from the South fork of the Feather River and conveyed to the surrounding communities of Challenge, Brownville, Rackerby and Forbestown. An increase in long-range planning will be needed to account for any population growth, increased water demands, infrastructure replacement and improvements.

Earthquake and Liquefaction

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

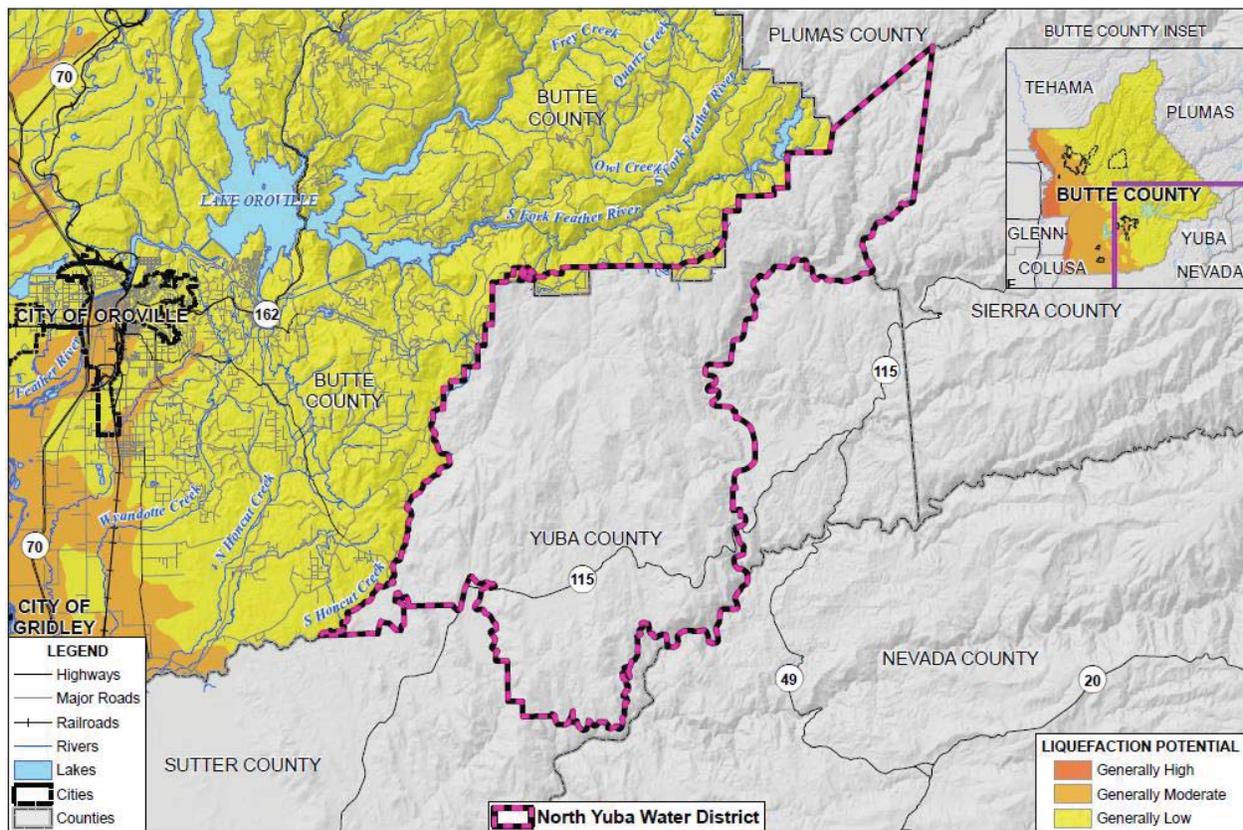
The State of California has identified five areas of critical seismic concern including surface ruptures, ground shaking, ground failure, tsunamis, and seiches. Each of these is caused by earthquake activity thereby creating hazards for life and property, which has the potential anywhere in California. The District is not at risk for tsunamis or seiches due to its inland location and the absence of nearby large bodies of water. Due to the proximity of the District to the Cleveland Hills Fault, the District can expect low to

medium intensity shocks from time to time. These earthquakes can cause liquefaction within the District. Liquefaction is a process whereby soil is temporarily transformed to a fluid formed during intense and prolonged ground shaking.

Location and Extent

Since earthquakes are regional events, the whole of the District is at risk to earthquake. NYWD and the surrounding area is located in a region of relatively low to moderate risk of earthquake occurrence. The only known active fault in Butte County is the Cleveland Hills fault, the site of the August 1975 5.7 Richter magnitude Oroville earthquake. Since earthquakes are regional events, the whole of the District is at risk to earthquake. NYWD and the surrounding area are relatively free from significant seismic and geologic hazards. Additionally, the District is potentially at risk to liquefaction from earthquake shaking should an earthquake occur. A map of liquefaction potential and District locations is shown on Figure I-2.

Figure I-2 North Yuba Water District – Liquefaction Areas



Foster Morrison
 Data Source: Butte County General Plan 2030, Butte County GIS, Cal-Atlas; Map Date: 8/27/2019.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake’s magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.2.10 of the Base Plan. Earthquake and liquefaction both have a short onset period, and the duration of shaking and liquefaction is short as well.

Past Occurrences

As shown in the Base Plan, only the 1975 federal disaster declarations have occurred in the County due to earthquake. The HMPC noted no other past occurrences of earthquakes or liquefaction that affected the District in any meaningful way.

Vulnerability and Impacts to Earthquake

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage.

Ground shaking is the primary earthquake hazard. Many factors affect the survivability of structures and systems from earthquake-caused ground motions. These factors include proximity to the fault, direction of rupture, epicentral location and depth, magnitude, local geologic and soils conditions, types and quality of construction, building configurations and heights, and comparable factors that relate to utility, transportation, and other network systems.

Impacts to the District included damage to facilities conveyance system and distribution lines. Any ground movement along the district's conveyance system, such as Forbestown Ditch, may cause portion of the ditch to fail and disrupt the water service to its communities.

Assets at Risk

NYWD assets that are at risk includes Forbestown Ditch, Costa Creek, Dry Creek and Oroleve Creek.

Future Development

NYWD is in a design process of replacing the existing Forbestown ditch with HDPE pipe that will be installed above ground and anchored by concrete blocks and straps. This type of installation will allow minor sagging and deformation and be repaired prior to any major failure.

Floods: Localized Stormwater

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

Localized flooding and other issues caused by severe weather events, primarily heavy rains and severe storms, are an annual occurrence in the District. 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 overwhelm the drainage system. Primary concerns include impacts to NYWD facilities and infrastructure that may affect District operations and possibly causing disruption in service. Other localized flooding concerns include impacts to the roadways and bridges that provides a means of ingress and egress throughout the community.

Location and Extent

Areas in and around the District are subject to localized flooding portion of the Forbestown Ditch and Forbestown Treatment Plant, the main office and yard. The extent of localized flooding can be measured in volumes, velocity, 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

The most recent event was during a major storm in 2017 during an extended and intense rainfall periods. The storm caused sections of Forbestown Ditch to fail and interrupted service to its communities.

Vulnerability and Impacts to Localized Flood

Localized flooding occurs throughout the District primarily during the winter and spring months during periods of heavy rains. Localize flooding can cause road closures, pavement deterioration, washouts, landslides/mudslides, debris areas, and downed trees. The amount and type of damage or flooding that occurs varies from year to year and storm to storm, depending on the quantity of runoff. Heavy rains may produce ponding around storm drains and in low lying areas, but these events are short in duration and do not typically cause property damage. Impacts to the District can include damages to facilities and infrastructure. Localized flooding can also affect transportation routes that District personnel must take to get to District facilities.

Assets at Risk

NYWD assets that are at risk includes Forbestown Water Treatment, Forbestown Ditch, District's office and maintenance yard.

Future Development

An increase long-range planning will be needed to assure that the effect of flooding to NYWD's infrastructure will be very minimal.

Landslide and Debris Flow

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading,

debris avalanche, earth flow, and soil creep. Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

Location and Extent

The legend on the figure in the Location and Extent in Section 4.2.15 of the Base Plan shows the measurement system that the California Geological Survey uses to show the possible magnitude of landslides. It is a combination of slope class and rock strength. The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time. NYWD's Forbestown ditch is one area that is susceptible to this type of hazard event.

Past Occurrences

The most recent failure occurred during the 2017 rain event during extended or intense rainfall periods which created a completely saturated state in the soil underneath the ditch causing portions of the hill to slide down. This resulted to damages to the ditch at two different locations and affected the overall operations of the District.

Vulnerability and Impacts to Landslide

Impacts in the District from landslide include damage to facilities and infrastructure. Impacts from landslide include loss of life, property damage, and damage to critical facilities and infrastructure.

Assets at Risk

NYWD assets that are at risk includes the Forbestown Ditch. Portions of this system was built along the side of the hill as an open channel that meanders parallel to the natural topographic contours.

Future Development

NYWD is in a design process of replacing the existing ditch with HDPE pipe that will be installed above ground and anchored by concrete blocks and straps. This type of installation will allow minor sagging and deformation to the system that will any repairs prior to and major failure.

Severe Weather: Freeze and Winter Storm

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

Hazard Profile and Problem Description

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Winter storms in the District, while

not typical, can include freezing temperatures, snow, and ice. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and winter storms are regional issues, meaning the entire District is at risk to freeze and winter storm. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, temperature data from the County from the WRCC indicates that there are 21.8 days that fall below 32°F in western Butte County, with no days falling below 0°F. Freeze and snow have a slow onset and can be generally be predicted in advance in the County and District. Freeze events can last for hours (in a cold overnight), or for days at a time. Snowfall is measured in amount of snowfall and snow depths. It is rare for snow to fall, and even rarer that snow accumulates in the District.

Past Occurrences

The Planning Team note that since freeze and winter storm is a regional phenomenon, events that affected the lower elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.2.3.

Vulnerability and Impacts to Freeze and Storm

The District experiences temperatures below 32 degrees during the winter months. The temperature moves to the teens in rather extreme situations. Winter storms with snow and ice, though rare, can occur in the District. Freeze normally does not impact structures but can be a life safety issue. Secondary impacts of extreme cold can affect the supporting mechanisms or systems of a community's infrastructure. These winter conditions can cause downed trees and power lines, power outages, accidents, and road closures. District facilities can be affected by loss of electricity that is required in the daily operation of the district.

Assets at Risk

NYWD assets that are at risk includes Forbestown Water Treatment, District's office and maintenance yard.

Future Development

NYWD does not have any future development in place that directly mitigate the issue caused by this type of hazard. The District, however, maintains its facilities and equipment to prevent any major damage that may occur due to winter storm.

Wildfire

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

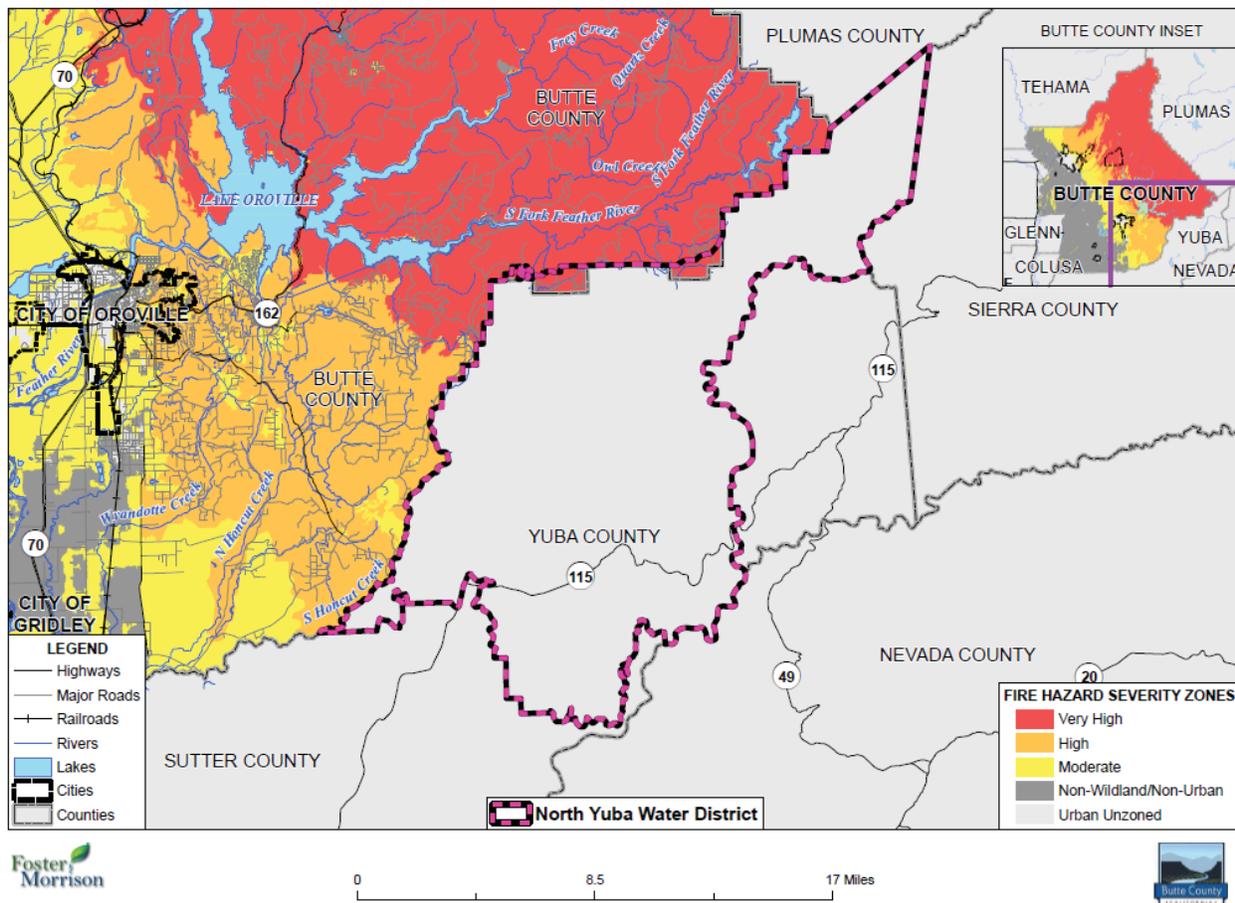
Hazard Profile and Problem Description

Wildland fire is an ongoing concern for the District. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire suppression practices have affected the natural cycle of the ecosystem. While the fire season was considered to be predominantly May through October, it has now become a year around concern. Complicating the issue, PG&E shutdowns can occur during red flag days, which affects the District.

Location and Extent

The District lies in the Moderate to Very High Fire Hazard Severity Zones. District locations and FHSZ are shown on Figure I-3.

Figure I-3 North Yuba Water District – Fire Hazard Severity Zones



Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time or may have durations lasting for a week or more.

Past Occurrences

There are no known past occurrences in areas near NYWD's facilities that were damaged by wildfires.

Vulnerability and Impacts to Wildfire

Risk and vulnerability to the Butte County Planning Area and the District from wildfire is of significant concern, with some areas of the planning area being at greater risk than others. High fuel loads in the planning area, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to November fire season, the dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the Planning Area, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

The District is not immune to numerous types of grass and brush fires and any one of them may accelerate into a large urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures and rangeland. The natural fuels available in or near the District vary in the rate and intensity of burning. Much of the land surrounding the District is farmland, which lowers the risk to District facilities.

Wildfires can cause short-term and long-term disruption to the County and District, as evidenced by the Camp Fire in Paradise and the resultant increase in the population in nearby Oroville. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the County by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires may result in casualties and can destroy buildings and infrastructure.

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. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. 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. Fires can also cause major damage to power plants and power lines needed to distribute electricity to operate facilities. Again, complicating the issue, PG&E shutdowns can occur during red flag days, which affects the District.

Assets at Risk

NYWD assets that are at risk includes the Water Treatment Plant, District's office and maintenance yard, Water Pond, storage tank, and Forbestown Ditch. These facilities are in areas that are susceptible to wildfire.

Future Development

An increase long-range planning will be needed to assure that the effect of wildfire to NYWD's infrastructure will be very minimal.

I.6 Capability Assessment

Capabilities are the programs and policies currently in place 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, and mitigation education, outreach, and partnerships.

I.6.1. Regulatory Mitigation Capabilities

Table I-4 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 District.

Table I-4 North Yuba Water District – Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	N/A	
Capital Improvements Plan	N/A	
Economic Development Plan	N/A	
Local Emergency Operations Plan	N/A	
Continuity of Operations Plan	N/A	
Transportation Plan	N/A	
Stormwater Management Plan/Program	N/A	
Engineering Studies for Streams	N/A	
Community Wildfire Protection Plan	N/A	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		Most regulatory issues would be handled by Yuba County and Butte County
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N/A	
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	
Fire department ISO rating:	N/A	
Site plan review requirements	N/A	

Land Use Planning and Ordinances	
Zoning ordinance	N/A
Subdivision ordinance	N/A
Floodplain ordinance	N/A
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A
Flood insurance rate maps	N/A
Elevation Certificates	N/A
Acquisition of land for open space and public recreation uses	N/A
Erosion or sediment control program	N/A
Other	N/A
How can these capabilities be expanded and improved to reduce risk?	
Long term planning by the regulatory agencies can include programs specific to NYWD and surrounding areas	
Source: NYWD	

I.6.2. Administrative/Technical Mitigation Capabilities

Table I-5 identifies the District staff/roles responsible for activities related to mitigation and loss prevention in the District.

Table I-5 North Yuba Water District – Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	
Mutual aid agreements	N	
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	
Floodplain Administrator	N	
Emergency Manager	Y	DISTRICT MANAGER
Community Planner	N	
Civil Engineer	Y	
GIS Coordinator	N	
Other		

Technical	
Warning systems/services (Reverse 911, outdoor warning signals)	N
Hazard data and information	N
Grant writing	Y
Hazus analysis	N
Other	
How can these capabilities be expanded and improved to reduce risk?	
Expanding the staff with clear roles and goals for the District will allow everyone to effectively work toward achieving those goals.	

Source: NYWD

I.6.3. Fiscal Mitigation Capabilities

Table I-6 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table I-6 North Yuba Water District – Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	N	
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	Y	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Identify other funding resources to assist in improving and updating existing NYWD facilities.		

Source: NYWD

I.6.4. Mitigation Education, Outreach, and Partnerships

Table I-7 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. More information can be found below the table.

Table I-7 North Yuba Water District – Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N	
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continuous educational and outreach programs specific to environmental protection, emergency preparedness should be included in NYWD's long term planning.		

Source: NYWD

I.7 Mitigation Strategy

I.7.1. Mitigation Goals and Objectives

North Yuba Water District adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

I.7.2. Mitigation Actions

The planning team for the NYWD 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:

➤ Drought and Water Shortage

- Earthquake and Liquefaction
- Floods: Localized Stormwater
- Landslide and Debris Flows
- Severe Weather: Freeze and Winter Storm
- Wildfire

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.

Mitigation Actions

Action 1. Ditch to Pipe Replacement Project

Hazards Addressed: Drought & Water Supply and Landslide

Goals Addressed: 1, 2, 3, 4, 7, 9

Issue/Background: The goal of this project is to improve the existing Forbestown conveyance system and increase its efficiency by reducing raw water losses and minimizing the opportunity for contaminants to enter the conveyed water. The project will also mitigate system issues caused by soil creep. A portion of the ditch is extremely vulnerable to slope instability and overtopping during severe storm events. Through the years, several failures and areas of distress have occurred along the Forbestown ditch that have caused water conveyance to be disrupted or stopped completely.

Project Description: Forbestown Ditch is located in Butte and Yuba Counties and begins near the community of Woodleaf. The project includes replacing the existing ditch with 42-inch HDPE ADS N-12 to improve the existing conveyance system and increase its efficiency by reducing raw water loss and minimize water contamination. The ditch extends approximately 10 miles that begins at Woodleaf Penstock South Fork gauging station 14 (SF 14) and ends at Forbestown Water Treatment Plant.

Other Alternatives: Other alternatives considered for the project includes soil stabilization to stop slope creep and shallow slope failures

Existing Planning Mechanisms through which Action will be Implemented: None

Responsible Office: Northstar Inc.

Priority (H, M, L): High Priority

Cost Estimate: 10,000,000

Potential Funding: Yuba Water Agency

Benefits (avoided Losses): Reduced risk to conveyance system and the customers who rely on it for water.

Schedule: Within 5 years as funding is available

Action 2. Public Education and Outreach Information Program

Hazards Addressed: Multi- Hazard (Drought and Water Shortage, Earthquake and Liquefaction, Floods: Localized Stormwater, Landslide and Debris Flows, Severe Weather: Freeze and Winter Storm, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 7, 9

Issue/Background: The goal is to provide public education program providing information on the different hazards that could affect the residents of the district and measures that can be taken to mitigate those hazards and reduced any of the hazards affect to the district.

Project Description: Proving an ongoing program and outreach meeting to the public.

Other Alternatives: None

Existing Planning Mechanisms through which Action will be Implemented: None

Responsible Office: NYWD

Priority (H, M, L): High Priority

Cost Estimate: \$2,000,000

Potential Funding: DHS - FEMA

Benefits (avoided Losses): The local residents will be educated and prepared for any disaster, minimizing potential affect and cost of the hazards that may occur.

Schedule: This will be an ongoing event for the District

Action 3. Update to the NYWD Flood Plan

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 7, 9

Issue/Background: The goal is to update and enhanced the existing NYWD flood plan to include the district facilities.

Project Description: Update NYWD's flood plan to reflect the existing conditions of the district's facilities and surrounding areas.

Other Alternatives: None

Existing Planning Mechanisms through which Action will be Implemented: None

Responsible Office: NYWD

Priority (H, M, L): Medium

Cost Estimate: \$1,000,000

Potential Funding: DHS - FEMA

Benefits (avoided Losses): Updated flood plan will allow the District to be better prepared shall flooding occur.

Schedule: This will be an ongoing event for the District