A SAFE ENVIRONMENT

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9. SAFETY + HAZARDS

9.1 PURPOSE OF THE CHAPTER

Yountville is vulnerable to a range of public safety threats including both natural and human-made hazards. Earthquakes, flooding, fire, and extreme heat events pose serious and real threats to the Town. Planning is critical to identify potential hazards and provide policies and regulatory actions to reduce the community's risk of death, illness, injury, property damage, and economic and social disruption.

This chapter presents a framework for governing future decisions about how the Town will provide a safe community and protect the community from natural and man-made hazards. The chapter addresses the requirements of the State-mandated safety element and partially addresses the requirements of the land use element of the general plan.

The Safety and Hazards chapter includes the following sections.

9.2 Geologic and Seismic Hazards. Describes environmental and man-made hazards including earthquakes and soil stability.

9.3 Flooding Hazards. Describes flood hazards and flood control measures to protect the community form flooding.

9.4 Fire Hazards. Discusses fire risks, fire hazard zones, and fire protection measures and service.

9.5 Climate Change Adaptation and Resilience. Describes the impacts of a warming climate on Yountville, including increased risk of extreme heat events, more frequent and intense storms, sea level rise, and wildfire.

9.6 Public Safety. Provides an overview of crime in Yountville and police protection services.

9.7 Goals, Policies, and Programs. Identifies goals, policies and programs minimize hazards and risks to life and property.

This chapter describes how the Town will protect the community from natural and man-made hazards. Photo of Napa County fires, October 11, 2017. Source: San Francisco Examiner.

9.2 GEOLOGIC AND SEISMIC HAZARDS

Yountville is located in the seismically active San Francisco Bay region, an area with a long history of tectonic movements. The region sits on the boundary between two of the Earth's major tectonic plates—the Pacific and North American Plates—which move inexorably past each other at a rate of about two inches per year. Much of this motion is accommodated from time to time by sudden slips on faults, producing an earthquake. Although the San Andreas fault is the main origin of slip, other faults splay out from the plate boundary throughout most of California.

The San Andreas fault, located about 32 miles southwest of Yountville, was the source of the magnitude 7.9 earthquake in 1906. The most recent large earthquake on the San Andreas fault was the magnitude 6.9 Loma Prieta earthquake in 1989. The Loma Prieta earthquake caused intense seismic activity throughout the Bay Area, collapsing a double-decked freeway in West Oakland and destroying buildings in San Francisco's fill-based Marina District.

Active and potentially active faults in the Yountville area include the West Napa Fault, which traverses the planning area, and the Soda Creek Fault, which is located approximately three miles to the northeast of the Town limits, as shown in Figure SH-1. An active fault is defined as one which has had surface displacement within Holocene time, approximately over the past 11,000 years. The southern section of the West Napa fault is active while the northern section is not active. Other inactive and unnamed faults also traverse the Town limits.

The West Napa Fault has been identified to have the potential to generate a 6.8 to 7.1 magnitude earthquake. Earthquakes of this magnitude can kill and injure many people and cause extensive damage to buildings, roads, bridges, and utilities.

The Alquist-Priolo Earthquake Zoning Act (1972) and the Seismic Hazards Mapping Act (1990) directs the State Geologist to delineate regulatory zones of required investigation, including Alquist-Priolo earthquake fault zones and areas that are potentially at high-risk for liquefaction and/or landslides. Cities and counties affected by the zones must regulate certain development projects within them. The Acts also require sellers of real property and their agents within a mapped hazard zone to disclose at the time of sale that the property lies within such a zone. There are no zones of required investigation within the Town. However, Alquist-Priolo earthquake fault zones are located in Napa County from the City of American Canyon to the City of Napa, as shown in Figure SH-2. These earthquake fault zones were identified after an earthquake struck south Napa in 2014.

A magnitude 6.0 earthquake occurred in south Napa, northwest of American Canyon, on the West Napa fault in 2014. The earthquake injured nearly 200 people, mostly in Napa County, while touching off fires that destroyed at least six homes, buckled local roads, and damaged dozens of buildings in Napa and across the region. The ground shaking was very strong along the fault in in the Napa Valley, and many historical masonry buildings and older residences in the City of Napa were damaged. Buildings in Yountville were also damaged.

The Town of Yountville was subject to a magnitude 5.2 earthquake on the West Napa fault in 2000. More recently, a magnitude 4.1 earthquake occurred in Yountville in May 2015. According to the US Geological Survey, the epicenter was about nine miles north of Napa and six miles northeast of Yountville, at a depth of 9.3 miles.

Significant earthquakes documented in the regional vicinity are shown in Table SH-1.

Figure SH-1

EARTHQUAKE FAULTS

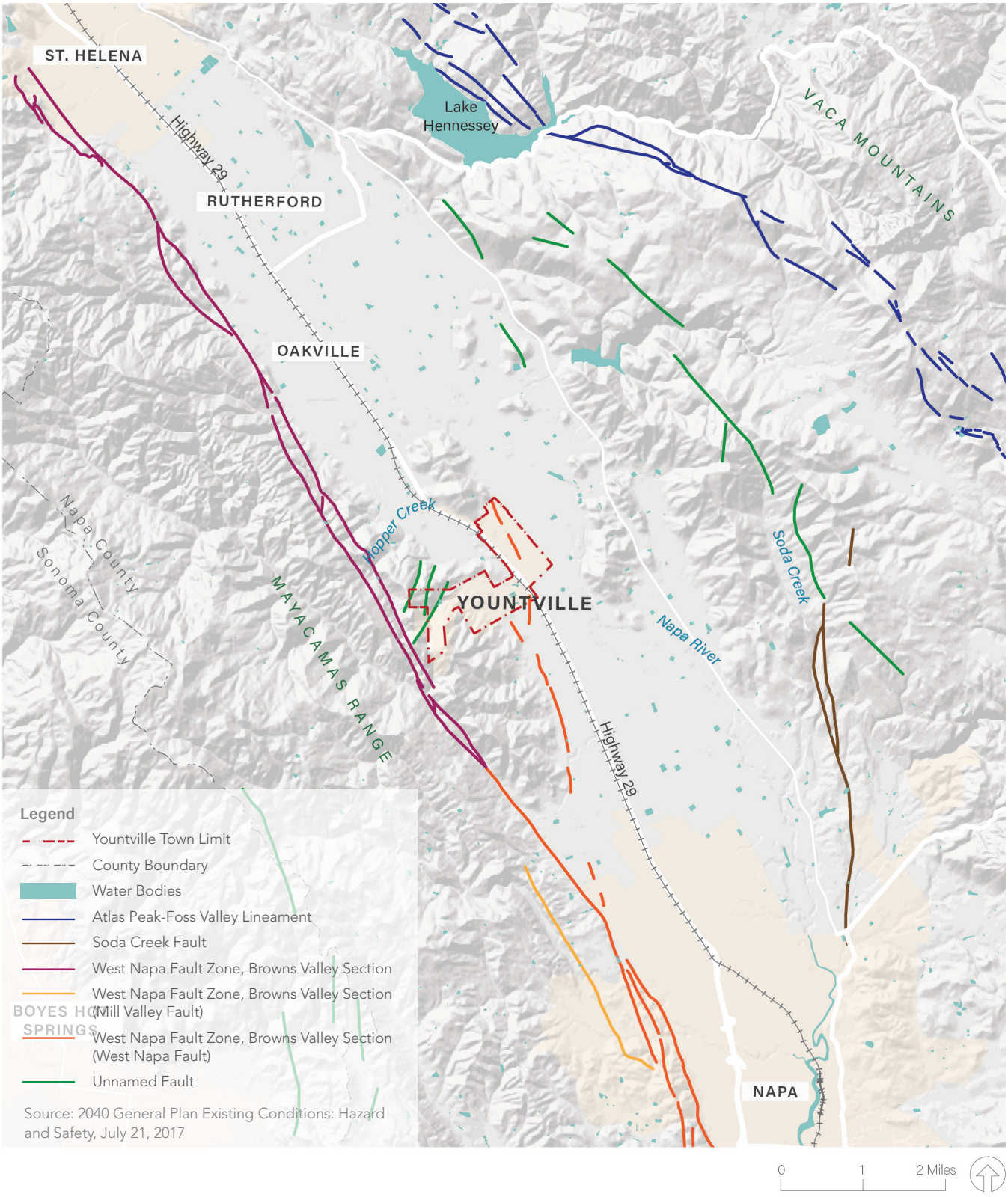


Figure SH-2

EARTHQUAKE ZONES OF REQUIRED INVESTIGATION

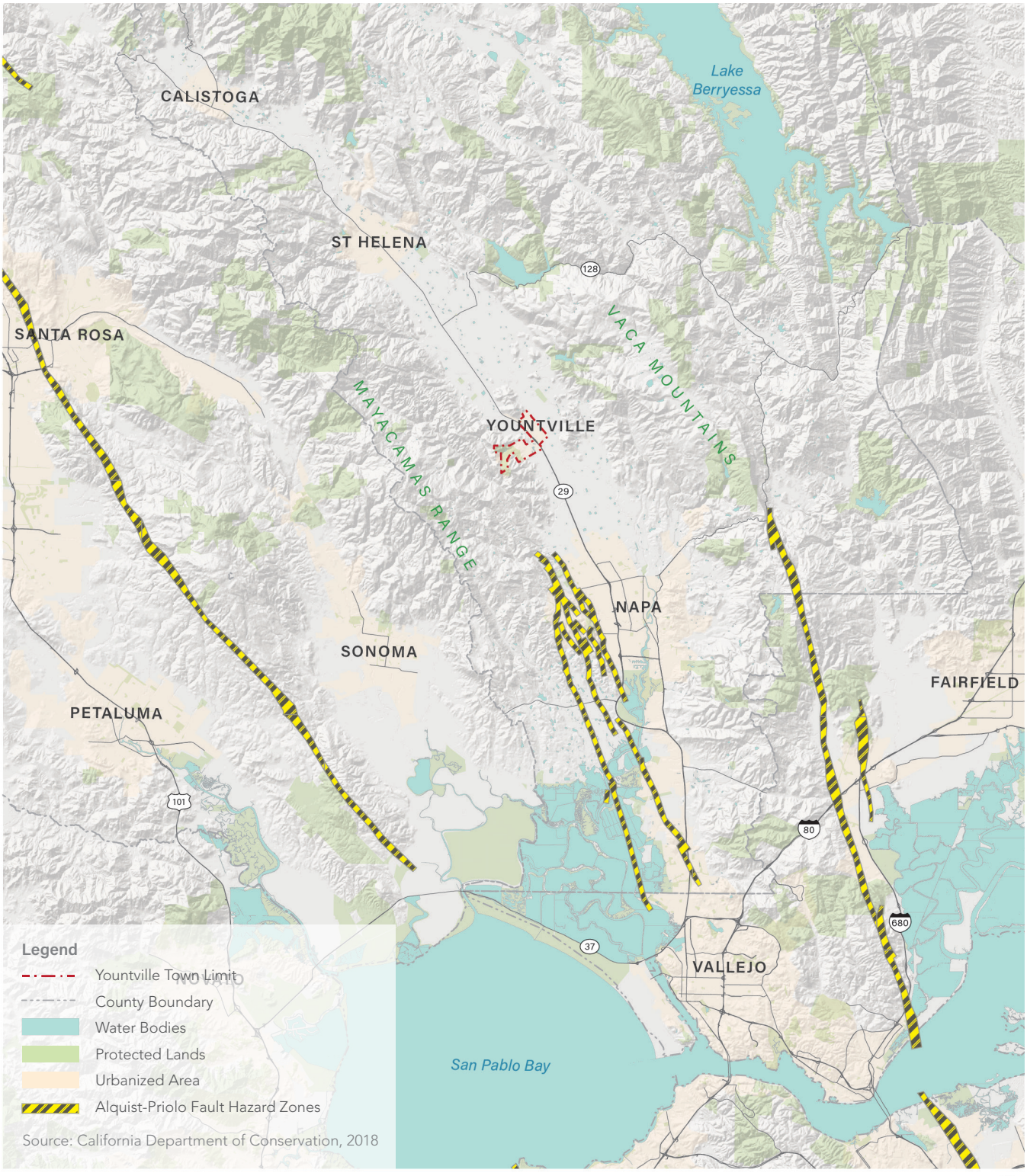


Table SH-1
SIGNIFICANT EARTHQUAKES IN THE REGION

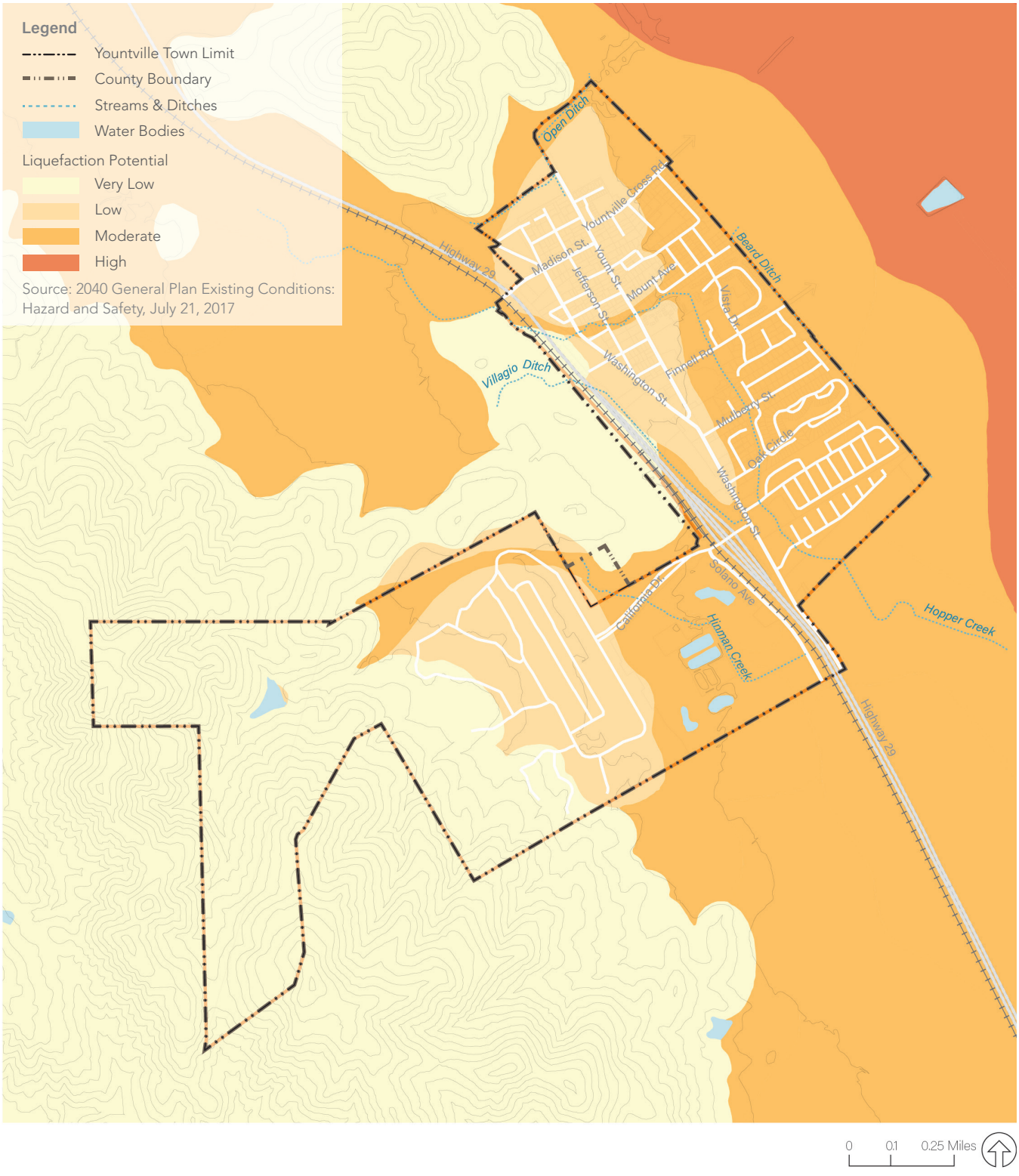
AGNITUDE	LOCATION	YEAR
4.1	Yountville	2015
6.0	South Napa	2014
4.5	Napa - Vacaville	2006
4.1	Napa - Vavaville	2005
5.2	Yountville	2000
6.9	Loma Prieta (San Andreas)	1989
5.6	Santa Rosa (Rodgers Creek)	1969
5.7	Santa Rosa (Rodgers Creek)	1969
7.9	San Francisco (San Andreas)	1906
4.0 - 5.0	Santa Rosa	1899
6.8	Mendocino (San Andreas?)	1898
6.2	Mare Island	1898
5.1	Santa Rosa	1893
6.2	Winters	1892
6.4	Vacaville	1892
5.5	Napa - Sonoma	1891
4.0 - 5.0	Petaluma	1888
6.8	East San Francisco Bay (Hayward)	1868
6.5	Santa Cruz Mountains	1865
4.0 - 5.0	Santa Rosa	1865
6.8	San Francisco Peninsula	1838

Source: USGS, 2009; USGS, 2017

Damage resulting from earthquakes is mainly from shaking. The intensity of shaking that a structure will experience during an earthquake depends upon the magnitude of the earthquake, the proximity to the epicenter, and the type of ground materials beneath the structure. Soft soils amplify the shaking, while hard bedrock does not.

All buildings located in Yountville are vulnerable to earthquake damage, but depending upon construction, some buildings are expected to perform better than others. One and two-story wood-frame buildings generally perform well, but they may shift if not bolted to the foundation or partially collapse if cripple walls (short walls between the foundation and first floor that create a crawl space) are not braced. Homes with rooms built over garages are also vulnerable to collapse if walls are not reinforced or braced. While current building codes address seismic safety, they are designed to protect occupant lives during an earthquake. Newly constructed buildings can still be significantly damaged during a major earthquake.

Figure SH-3
LIQUEFACTION POTENTIAL



Unreinforced masonry buildings (including materials such as brick, concrete and stone), pre-1940 wood-frame houses, and pre-1973 concrete buildings are very likely to be damaged during earthquakes. In most cases, these older buildings require retrofit, or they risk significant structural damage during an earthquake.

The Town of Yountville has six unreinforced masonry buildings, three of which have undergone a partial retrofit, including V Marketplace, Maison Fleurie, and Gates Estates. In the 2014 earthquake in Yountville, one unreinforced masonry building was red-tagged and underwent a partial retrofit at that time. Another historic building in the Town lost its brick chimney as a result of the 2014 earthquake.

Structures built in areas of water-saturated granular sediment or fill material are susceptible to liquefaction. The ground shaking from an earthquake transforms the material from a solid state to a temporarily liquid state. Liquefaction is a serious hazard because buildings in areas that experience liquefaction may sink or suffer major structural damage. Most single and multifamily homes under ten stories are unlikely to have foundations stable enough to withstand liquefaction even if they can withstand ground shaking.

Liquefaction potential in the planning area includes designation of "Very Low" to "Moderate" as shown in Figure SH-3. Areas in Yountville designated with moderate potential for liquefaction are generally located on the Vintners Golf Club near California Drive, as well as in the residential areas east of Yount Street and Washington Street. The remainder of the planning area is designated "Very Low" and "Low" potential for liquefaction.

Although an earthquake on the Hayward and Rodgers Creek fault complex, which runs beneath San Pablo Bay, could create a tsunami, there is believed to be little potential for a tsunami to affect Yountville.

LANDSLIDE

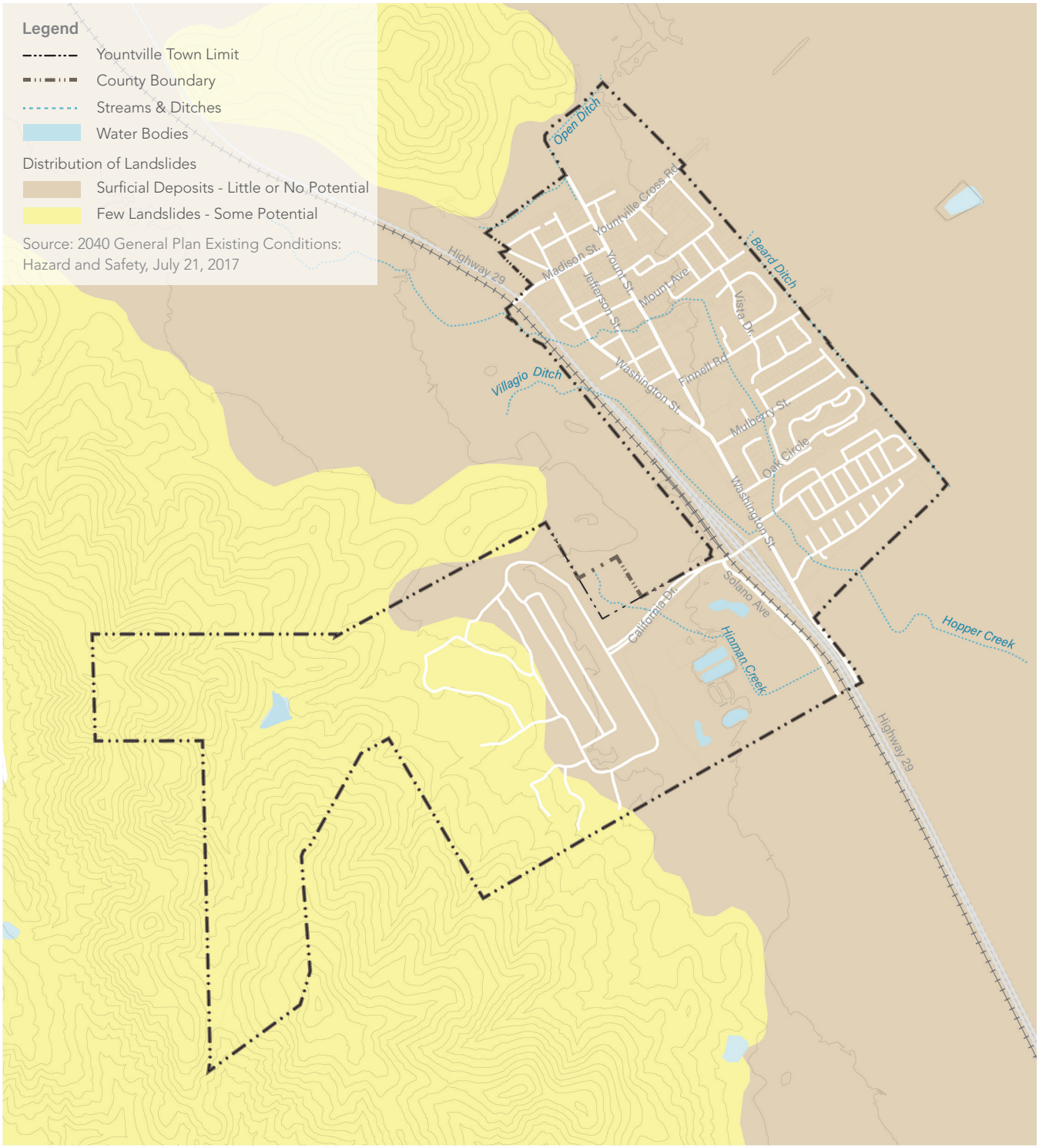
Landslides are a potential hazard to structures, roads, and utilities on hillsides in Napa County. Landslides can move slowly, as in hillside creep, or can move quickly and disastrously, as is the case with debris flows.

Almost every landslide has multiple causes. Landslides can be initiated in slopes already on the verge of movement by rainfall, erosion, earthquake, and disturbance by human activities. Factors that indicate the probable formation and relative risk of landslide and slope instability include:

- Slope Steepness: Most landslides occur on moderate to steep slopes.
- Slope Material: Loose, unconsolidated soils and soft, weak rocks are more hazardous than are firm, consolidated soils or hard bedrock.
- Water Content: Increased water content increases landslide hazard by decreasing resistance to sliding and adding weight to the materials on a slope.
- Vegetation Coverage: Abundant vegetation with deep roots increases slope stability.
- Proximity to Areas of Erosion or Man-Made Cuts: Undercutting slopes may greatly increase landslide potential.
- Earthquake Ground Motions: Strong ground shaking may trigger landslides in marginally stable slopes or loosen slope materials and thus increase the risk of future landslides.

Hillsides in Napa County have a medium to high susceptibility for landslides, while the valley has a low susceptibility. Figure SH-4 illustrates the landslide potential in the vicinity of the planning area. Given the relatively level slope throughout the Town, the landslide potential is very low. The landslide potential increases in the foothills to the north and west of the planning area.

Figure SH-4
LANDSLIDE POTENTIAL



9.3 FLOODING HAZARDS

Yountville is subject to flooding problems along the natural creeks and drainages that traverse the area, particularly as a result of excessive overflow of the Napa River and Hopper Creek. Land adjacent to the Napa River is subject to flooding, with numerous damaging floods recorded since 1862 when settlers began keeping track of such events. Since that time, 21 serious floods have been recorded. The 1986 flood is considered to be the worst flood experienced in Napa County since 1900. A series of tropical Pacific storms dumped between 12 and 28 inches of rain throughout Napa Valley, causing the Napa River to crest at 30 feet, five feet above flood stage in Napa. The flood resulted in in three people dead, 27 injured, 5,000 evacuations, 250 homes destroyed, 2,500 residences damaged, and $100 million in damages. Major floods since 1940 are shown in Figure SH-5.

The Town experiences localized flooding with heavy rain events. Impacted areas typically include:

- Oak Circle adjacent to Vineyard Park
- Oak Circle at Heather Street
- Yount Mill Road at the cemetery
- Solano Avenue near Hinman Creek
- Finnell Road neighborhood
- Washington Street at California Street
- Yountville Bike Path
- Paths at Heather Street, behind mobile home parks, and behind the Yountville Elementary School.

Congress passed the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 to address the increasing cost of flood-related disaster relief. The intent of the National Flood Insurance Program, which was established by the 1968 Act, is to reduce the need for large, publicly-funded flood control structures and disaster relief by restricting development on floodplains.

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations and limit development on floodplains. FEMA issues Flood Insurance Rate Maps (FIRM) for communities participating in the flood insurance program. The FIRM maps delineate flood hazard zones in the community.

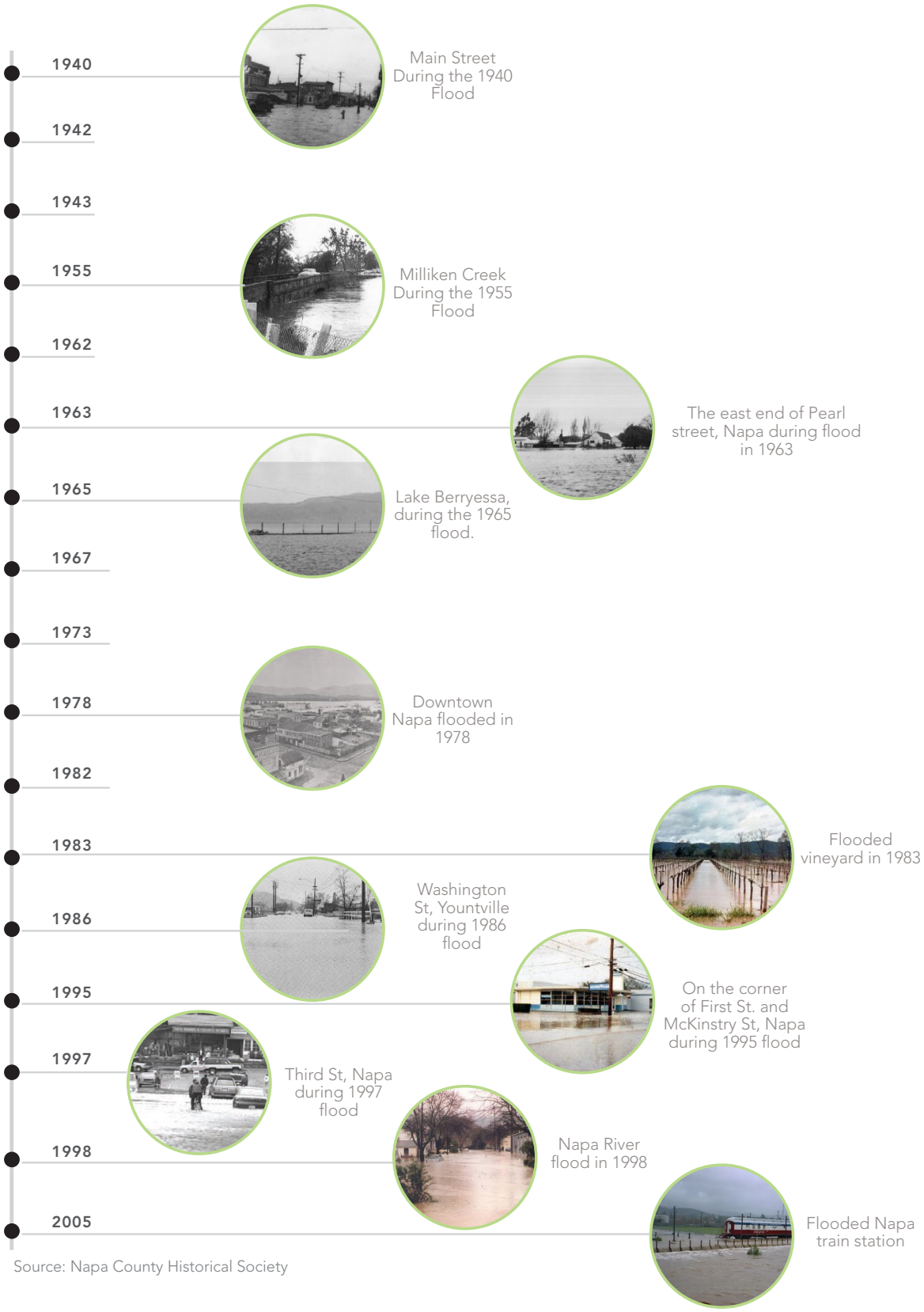
The FIRM maps play several critical roles. First, the maps are used by local and county agencies to identify and plan for local or area flood protection. Second, the maps are used by the banking and insurance industries to determine if flood insurance is mandated for a specific property or area. Lands located within the Special Flood Hazard Areas (areas subject to 1 percent chance of flooding in any given year) require that flood protection insurance be secured for federally-regulated or insured loans. Lastly, the maps are used at the federal and State level to plan for waterway projects that are administered by the US Army Corps of Engineers. The most current FIRM maps for Yountville were last updated and published in 2008.

Improvements, construction, and developments within Special Flood Hazard Areas are generally subject to the following standards:

- All new construction and substantial improvements of residential building must have the lowest floor (including basement) elevated to or above the base flood elevation (BFE).
- All new construction and substantial improvements of non-residential buildings must either have the lowest floor (including basement) elevated to or above the BFE or dry-floodproofed to the BFE.
- Buildings can be elevated to or above the BFE using fill, or they can be elevated on extended foundation walls or other enclosure walls, on piles, or on columns.

Figure SH-5

FLOOD EVENTS IN NAPA COUNTY



Source: Napa County Historical Society

- Extended foundation or other enclosure walls must be designed and constructed to withstand hydrostatic pressure and be constructed with flood-resistant materials and contain openings that will permit the automatic entry and exit of floodwaters. Any enclosed area below the BFE can only be used for the parking of vehicles, building access, or storage.

The Town's Floodplain Management Regulations are contained in Title 15, Division 2 of the Yountville Municipal Code. These regulations implement the FEMA standards for construction and development within Special Hazard Zones in Yountville.

Figure SH-6 shows the areas of Yountville that are prone to flooding, as identified by FEMA. Areas in the 100-year flood zone have a 1 percent chance of flooding in any given year, while areas in the 500-year flood zone have a 0.2 percent chance of flooding. Buildings with habitable living space or critical building equipment below grade are likely to be significantly damaged by flooding.

The 100-year floodplain is located mainly in the eastern area of Town, as well as a small area near Hinman Creek, west of Highway 29. These areas are considered high flood hazards. Areas in the 500-year floodplain include the Town's mobile home parks, which are protected by a flood wall that was completed in 2006. These areas are considered low to moderate flood hazards. The remaining areas outside the 500-year flood zone are minimal flood hazards.

In addition to the flood wall project, the Town has completed several projects to reduce flooding risks. Most recently, the Town completed the Hopper Creek flood control project in 2016. This project included installation of three 36-inch pipes that drain to Beard ditch, three sedimentation basins, and curb, gutter, and sidewalk improvements on Finnell Road. Ongoing projects are planned to install drainage inlets on Washington Street, underground the open ditch on Monroe Street, and install full trash capture devices at all drainage inlets. The Town also provides funding annually to address localized flooding and drainage issues in Town.

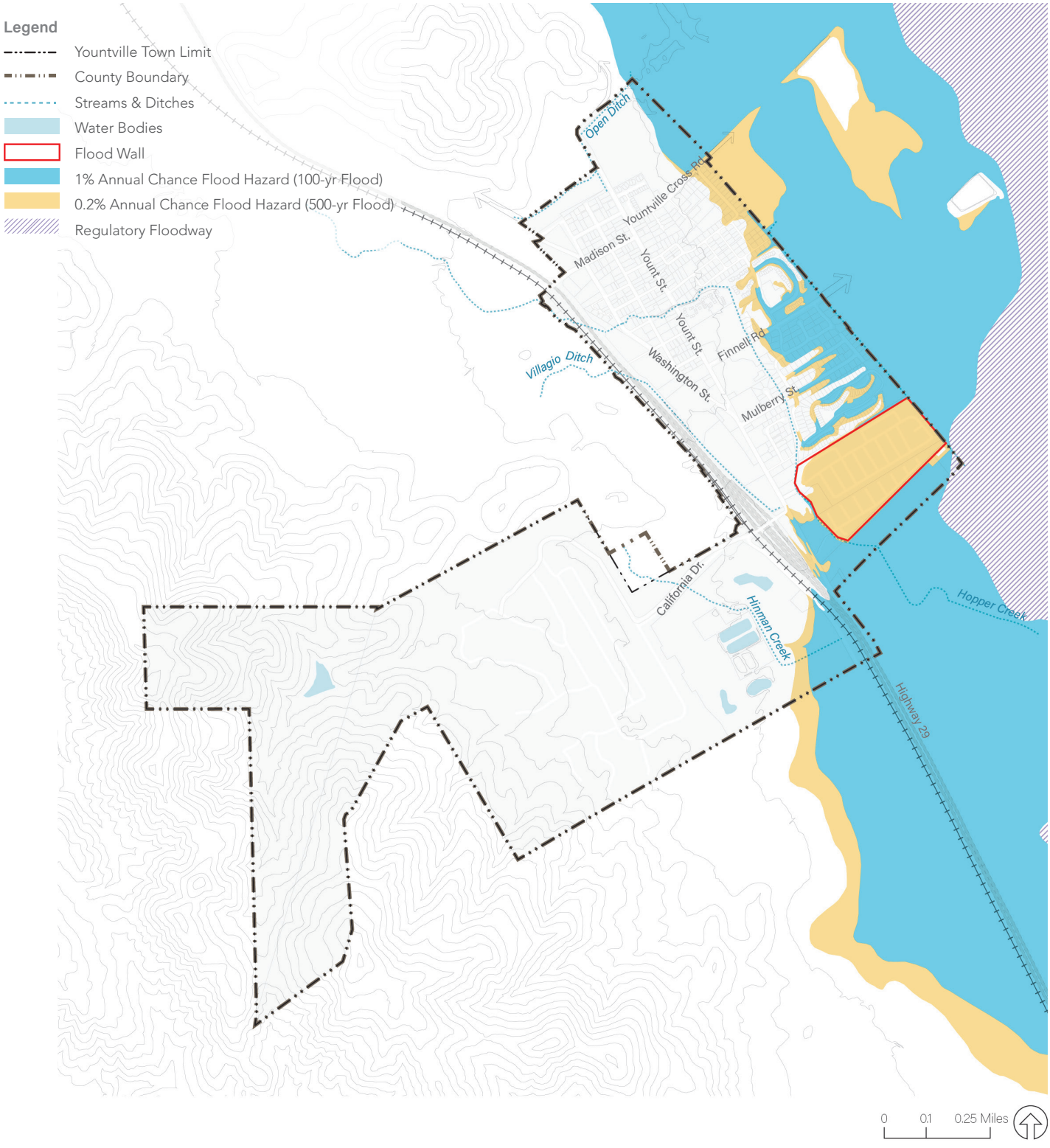
Despite the many improvements, Yountville will experience local flooding in future years. During the winter months, Napa County experiences "atmospheric river" storms that can deliver over one-inch of rain per hour over extended time frames, causing localized and Napa River flooding. Scientists warn that climate change could increase the frequency and intensity of atmospheric river storms in California, mostly in the form of occasional years with more extreme storms. These tendencies could produce more frequent and severe flooding.

The Town works closely with other Napa County jurisdictions to manage and reduce the impacts of flooding from the Napa River. The Town is a member of the Napa County Flood Control and Water Conservation District, which is a separate government entity responsible for developing and managing domestic water supplies and managing flood and storm water in Napa County. The District coordinates projects intended to protect local communities from inundation by maintaining and clearing tributary channels and sponsoring capital improvements. This includes serving as the local sponsor of the Napa River/Napa Creek Flood Protection Project.

Yountville has completed several projects to reduce flooding risks, and works on an ongoing basis to address flooding and drainage issues.

Figure SH-6

FEMA FLOOD HAZARD ZONES

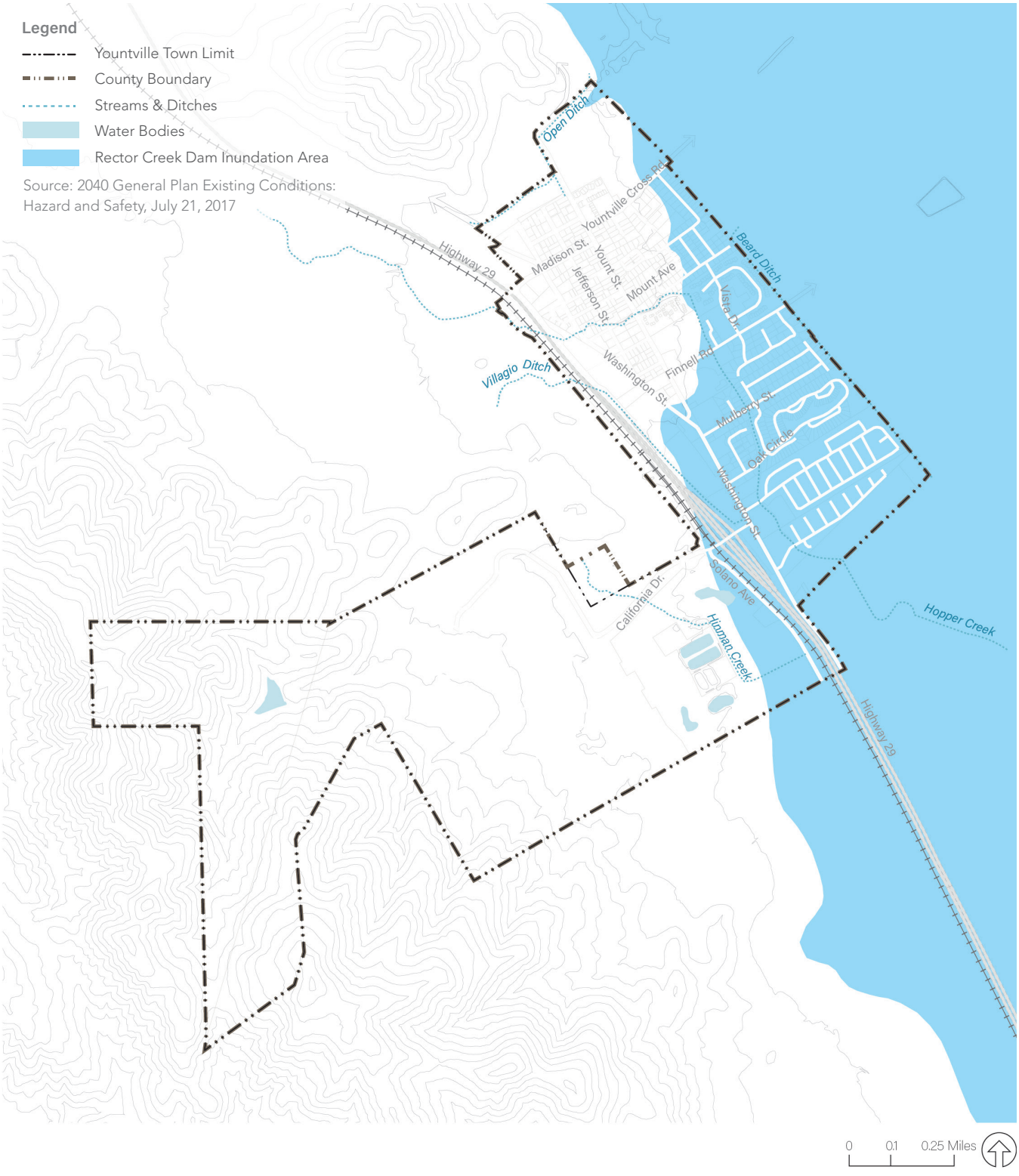


DAM INUNDATION

Yountville is subject to potential flooding resulting from the failure of Rector Creek Dam. The earthen embankment dam, built in 1946, stores about 4,600 acre-feet of water and the crest height is 164 feet. Earthquakes centered close to a dam are typically the most likely cause for failure. The area that would be inundated in the event of a sudden failure of the dam is shown in Figure SH-7. The California Department of Water Resources considers downstream hazards of the dam to be extremely high, with considerable loss of life and major impacts to critical infrastructure or property should the dam fail when operating with a full reservoir.

Rector Creek Dam is owned and maintained by the California Department of Veteran Affairs. According to the Department of Water Resources, the dam is certified and may safely impound water. It is also in satisfactory condition, with no existing or potential dam safety deficiencies.

Figure SH-7
DAM INUNDATION AREAS



9.4 FIRE HAZARDS

The California Department of Forestry and Fire Protection (CAL FIRE) identifies fire hazard severity zones based on the severity of the fire hazard expected to prevail there. These areas are based on factors such as fuel type (vegetation that is fire prone), slope, aspect, and fire weather. There are three zones, based on increasing fire hazard: moderate, high, and very high.

Areas under State jurisdiction are referred to as State Responsibility Areas (SRAs). Within the vicinity of the Town, these SRAs are primarily found to the north and west of the Town limits. As shown in Figure SH-8, areas adjacent to the north of Town are categorized as a moderate fire hazard severity zone, while areas to the west of Town are categorized as moderate, high, or very high. The very high zone extends to the Sonoma County line, which is approximately 4.65 miles to the west of Town.

Areas under the jurisdiction of local entities are referred to as Local Responsibility Areas. CAL FIRE identifies very high fire zones within Local Responsibility Areas. The majority of Town is not categorized as a fire hazard severity zone. However, a small area in the southwestern corner of the Town limits is categorized as a very high fire hazard severity zone. This zone is in a remote, undeveloped area within the Veterans Home property, which is owned and maintained by the California Department of Veterans Affairs.

Historically, fires in the Yountville area have occurred mainly to the east and west of the Town in the hillside areas. The devastating wildfires of October 2017 largely conformed to this historic pattern, with the Nuns Fire located in the hills to the west of Town and the Atlas Fire to the east of Town, as shown in Figure SH-9.

The Atlas Fire started on October 8, 2017. By the time it was fully contained on October 27th, the fire had burned 51,624 acres in Napa and Solano counties and destroyed 783 structures. There were six civilian fatalities. CAL FIRE determined the fire started in two locations from a large tree limb and a tree that fell on PG&E power lines.

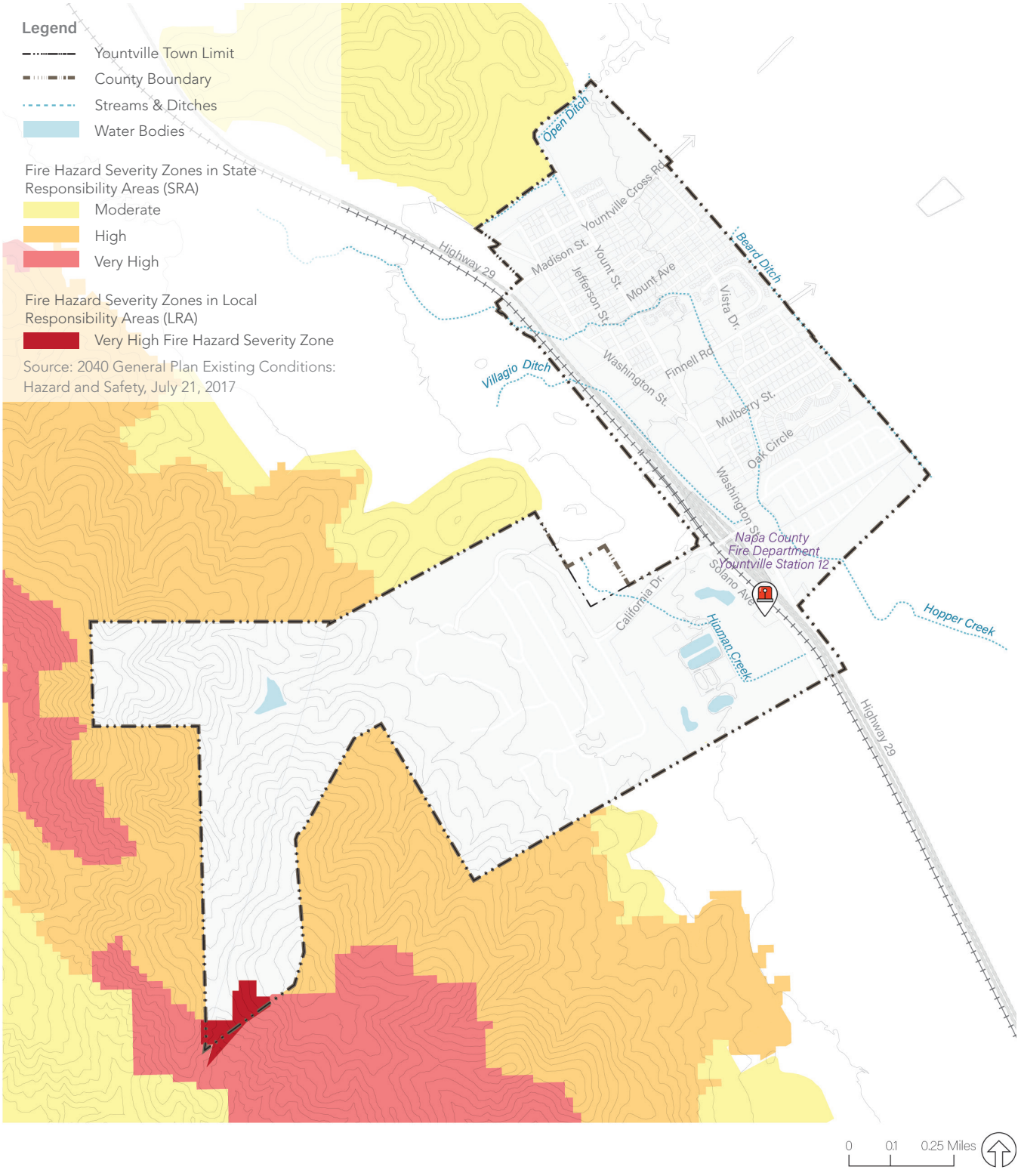
The Atlas Fire encompassed a north-south trending ridge that is roughly bounded by Napa Valley to the west, Highway 128 to the north, Capell Valley Road to the northeast, Wooden Valley Road to the southeast, and Highway 12 and Green Valley road to the South. The closest the Atlas Fire got to Yountville was at the Silverado Trail, about 1.5 miles to the east of the Town limits. The burn area ranged from about 200 feet above mean sea level west of Napa to Atlas Peak at 2,663 feet and comprised grassland, chaparral, and oak woodland. The area within the Atlas Fire perimeter had an active fire history, with approximately 58 percent of the area having been previously burned since 1980.

The Nuns Fire also started on October 8, 2017, and, according to CAL FIRE, was caused by a broken top of a tree coming in contact with a PG&E power line. The Nuns Fire was part of series of fires that merged in Napa and Sonoma counties. These fires burned a total of 56,556 acres, destroyed 1,355 buildings, and resulted in three civilian fatalities. The fire was fully contained on October 31, 2017. The fire area was located on the western and eastern flanks of the Mayacamas Mountains and extended into Sonoma County's Highway 12 Corridor and Bennet Valley. In the Yountville vicinity, the fire reached Dry Creek Road, about one-half mile to the west of the Town limits. The burn area ranged in elevation from about 200 feet along Sonoma Creek to 2,730 feet at Hood Mountain. Vegetation was largely comprised of oak woodland, chaparral, mixed hardwood/conifer forest, grassland, and vineyards. Approximately 27 percent of the area had been previously burned since 1951.

Defensive positions and significant fire resources deployed at Mt. Veeder Road and Dry Creek Road to the west of Town and at the Silverado Trail to the east of Town spared Yountville from the most devastating

Figure SH-8

FIRE HAZARD SEVERITY ZONES



impacts of the fires. The Town was never under a mandatory evacuation order, although the Veterans Home opted to move their skilled nursing facility residents on the second day of the fire. Heavy smoke resulted in poor air quality in Town, and residents with respiratory concerns were encouraged to leave the area. Although the Town was initially hampered by compromised internet and cell phone service, by October 11th the Town was providing regular email updates on fire conditions and available resources. Information was also provided through the Town's emergency alert system, NIXLE, and the Town's social media outlets. The Town kept the Yountville Community Center open daily and distributed breathing masks to community members.

FIRE PROTECTION SERVICES

The Town of Yountville contracts for fire protection services with the Napa County Fire Department (County Fire). The Veterans Home has a separate contract with County Fire. County Fire, in turn, contracts with the California Department of Forestry and Fire Protection (CAL FIRE). Countywide, CAL FIRE provides administrative support and coordination with five full-time paid stations and nine volunteer fire companies operating under a County Fire Plan, which is approved by the Napa County Board of Supervisors. The Napa County Fire Chief is responsible for the direction and coordination of fire protection services by these organizations on a countywide basis.

A three-way cost sharing arrangement between Napa County, the Town, and the Veterans Home funds operation of Fire Station 12 located at 7401 Solano Avenue in Yountville, shown in Figure SH-8. County Fire/CAL FIRE services in Yountville include staffing the fire station and providing structure fire protection, wildland fire protection, emergency medical response, technical rescue/extrication, hazardous materials, water supply, dispatch, training, fire safety education, fire (arson) investigation, fire prevention, vegetation management, and Fire Marshal (code enforcement) services. Additionally, County Fire offers domestic preparedness planning and response.

Yountville is assured a minimum level of staffing of four persons 24 hours a day, seven days per week. Service levels are evaluated on a regular basis by County Fire.

The Town's municipal fire hydrant system has a fire hydrant strategically placed within 1,000 feet of all locations throughout the Town limits. The hydrant capacity/rating is sufficient at more than 1,000 gallons per minute. There are seven water tenders in the Napa County Fire Department that can be utilized in addition to or in place of the hydrant system.

County Fire/CAL FIRE's average response time is three minutes. The goal is to be at the scene within four minutes, 90 percent of the time. The response time includes the 911 call, dispatching, turnout time, and response time to the scene.

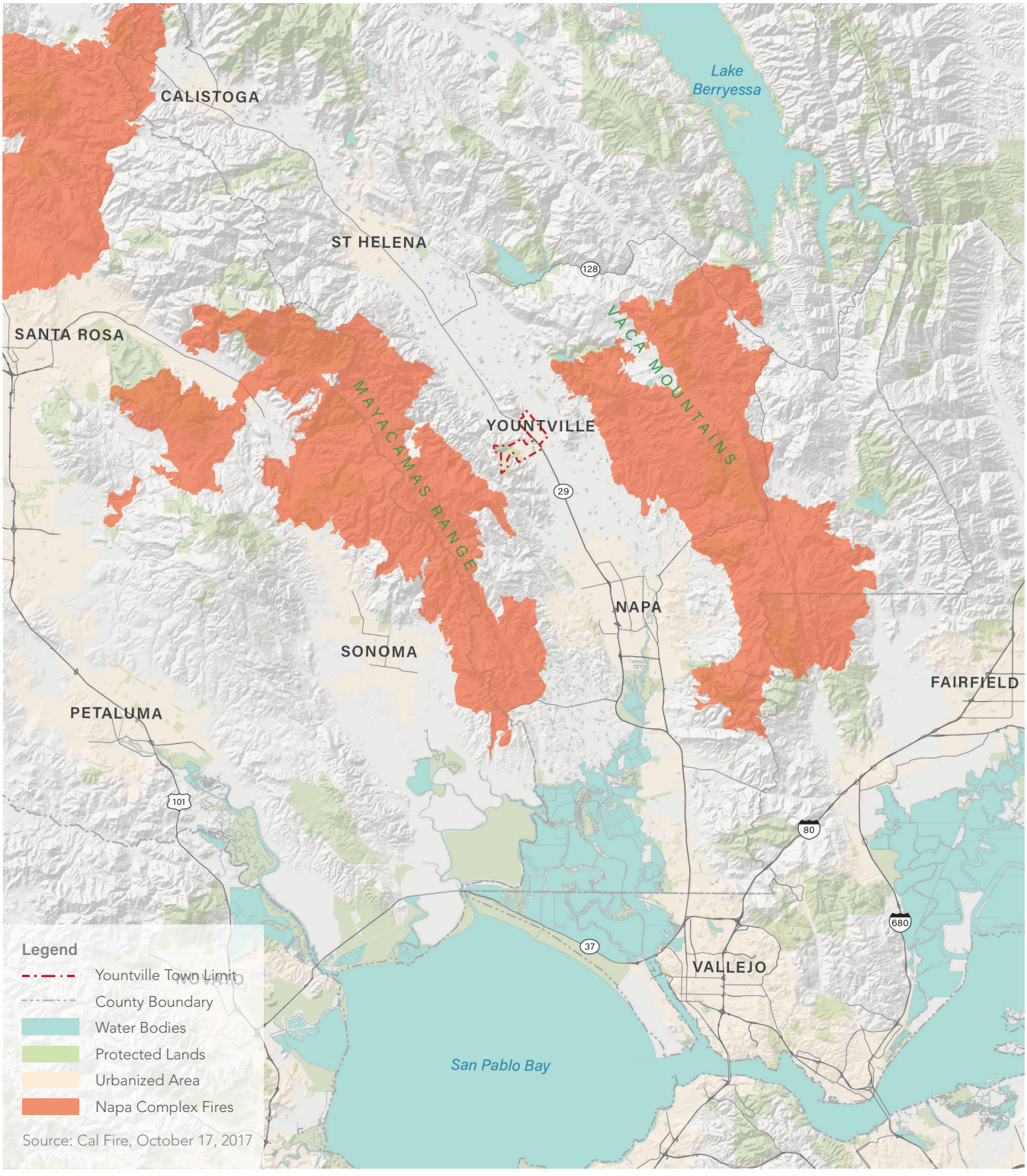
Through a series of automatic aid and contractual agreements with the other five fire agencies in Napa County, County Fire augments its level of service by providing closest resource response to those areas of the County that are immediately adjacent to these jurisdictions. These agreements also include a reciprocal response of County Fire resources when requested.

The Yountville Fire Station 12 responded to 1,716 calls during 2016, of which 17 percent were incidents within the Town limits. A large majority of these calls were for medical aid response.

The Napa County Fire Marshal's Office is a division within the Napa County Fire Department. Personnel assigned to this office are CAL FIRE employees under contract by the County of Napa to provide fire prevention and code enforcement duties in the unincorporated areas of Napa County and the Town of Yountville. The Fire Marshal provides plan review and inspection for use permits, new construction, and special events. The Fire Marshal's Office enforces the California Fire Code and locally adopted amendments, including residential and commercial development standards, address signage and sprinkler requirements, defensible space requirements for structures and roadways, and road and street standards.

Figure SH-9

NAPA COMPLEX FIRES OF OCTOBER 2017



9.5 CLIMATE CHANGE ADAPTATION AND RESILIENCE

The Earth's climate is warming, mostly due to human activities such as changes in land cover and emissions of certain pollutants. Greenhouse gases are the major human-induced drivers of climate change. These gases warm the Earth's surface by trapping heat in the atmosphere.

The evidence that the climate is warming is unequivocal. Global surface temperatures have increased 0.9 °C (1.6 °F) relative to the 1951-1980 average temperatures. Seventeen of the 18 warmest years in the 136-year record have occurred since 2001, and the year 2016 ranks as the warmest on record (NASA/GISS, 2018). Consistent with global observations, annual average air temperatures have increased by about 1.8 °F in California, with temperatures rising at a faster rate beginning in the 1980s.

As temperatures continue to rise, California faces serious climate impacts, including:

- More intense and frequent heat waves
- More intense and frequent drought
- More severe and frequent wildfires
- More severe storms and extreme weather events
- Greater riverine flows
- Shrinking snowpack and less overall precipitation
- Accelerating sea level rise
- Ocean acidification, hypoxia, and warming

The Cal-Adapt.org web portal provides resources to help communities understand how climate change will raise temperatures and exacerbate extreme heat events, drought, wildfire, and coastal flooding in their area. The Cal-Adapt tool shows projections for two possible climate futures, one in which greenhouse gas emissions peak around 2040 and then decline (RCP 4.5) and another in which emissions continue to rise strongly through 2050 and plateau around 2100 (RCP 8.5). Both futures are considered possible depending on how successful the world is at reducing emissions and atmospheric carbon dioxide.

Emissions scenarios used in the General Plan are the same as those used by the Intergovernmental Panel on Climate Change's Fifth Assessment Report and are called Representative Concentration Pathways, or RCPs. There are four RCPs: 2.6, 4.5, 6.0, and 8.5. Each represents a set of possible underlying socioeconomic conditions, policy options, and technological considerations, spanning from a low-end scenario that requires significant emissions reductions resulting in zero global emissions by 2080 (RCP 2.6) to a high-end, "business-as-usual," fossil fuel-intensive emissions scenario (RCP 8.5). The low-end scenario is most closely aligned with California's ambitious greenhouse gas reduction targets and the aspirational goals of the United Nations Framework Convention on Climate Change 2015 Paris Agreement. Thus far, global emissions continue to follow the business-as-usual trajectory.

AVERAGE MAXIMUM TEMPERATURES

Overall temperatures are projected to rise substantially throughout this century. The historical (1990-2005) annual maximum mean temperature for Yountville is 72.0°F. Under the low emissions (RCP 4.5) scenario, the maximum mean temperature in Yountville is expected to rise about 3°F by 2050 and 5°F by 2100 (see Table SH-2). Under the high emissions (RCP 8.5) scenario, the maximum mean temperature is projected to rise 9°F to about 81°F by 2100.

Warmer temperatures will increase the demand for air conditioning and cooling systems. A common proxy used to understand the demand for energy needed to cool buildings is Cooling Degree Days (CDD). A Cooling Degree Day is defined as the number of degrees by which a daily average temperature exceeds a reference temperature, in this case 65°F, which loosely represents the average daily temperature above which space cooling is needed. According to the Cal-Adapt modeling tool, the average number of Cooling Degree Days will increase from an historical average of 609 CDD in Yountville to 991 CDD by 2050 and will double to 1,271 CDD by 2100 under the RCP 4.5 scenario. Under the high emissions scenario, that average more than triples to 2,117 CDD.

AVERAGE MINIMUM TEMPERATURES

The historical annual minimum mean temperature for Yountville is 45.9°F. Under the low emissions scenario (RCP 4.5), the minimum mean temperature is expected to rise about 2°F by 2050 and 3°F by 2100. Under the high emissions scenario (RCP 8.5), the maximum mean temperature is projected to rise 7°F by the end of the century.

Warmer temperatures should reduce the demand for energy for space heating, and the Cal-Adapt tool shows a decrease in the projected number of Heating Degree Days (HDD). A Heating Degree Day is defined as the number of degrees by which a daily average temperature is below the reference temperature of 65°F. The historical annual number of Heating Degree Days in Yountville is 2,821 HDD. That number is projected to decrease about 14 percent by 2050 and 27 percent by 2100 under the low emissions scenario (RCP 4.5). Under the high emissions scenario (RCP 8.5), the number of Heating Degree Days declines by 50 percent by the end of the century.

Overall, the models project an increase of about 380 Cooling Degree Days and a decrease of about 400 Heating Degree Days by mid-century under a low emissions scenario. Considering that most heating systems use natural gas and most cooling systems

Table SH-2

AVERAGE TEMPERATURES AND WARMING IMPACTS IN YOUNTVILLE

MAGNITUDE	HISTORICAL AVERAGE (1990-2005)	LOW EMISSIONS SCENARIO (RCP 4.5)		HIGH EMISSIONS SCENARIO (RCP 8.5)	
		2040-2050 AVERAGE	2090-2099 AVERAGE	2040-2050 AVERAGE	2090-2099 AVERAGE
Annual Average Maximum Temperature	72.0°F	75.2°F	76.8°F	75.6°F	80.7°F
Annual Average Minimum Temperature	45.9°F	47.5°F	48.7°F	47.9°F	53.3°F
Annual Cooling Degree Days	609 CDD	991 CDD	1,271 CDD	1,078 CDD	2,117 CDD
Annual Heating Degree Days	2,821HDD	2,418 HDD	2,053 HDD	2,459 HDD	1,402 HDD
Annual Extreme Heat Days	2.7 days	11 days	13 days	12 days	33 days

use electricity, which is a cleaner energy source in Yountville, this may be somewhat positive news for future mitigation of greenhouse gas emissions.

EXTREME HEAT DAYS

As the climate changes, some of the more serious threats to public health will stem from more frequent and intense extreme heat days and longer heat waves. Extreme heat events are likely to increase the risk of mortality and morbidity due to heat-related illness, such as heat stroke and dehydration, and exacerbation of existing chronic health conditions.

An extreme heat day is defined as a day in April through October where the maximum temperature exceeds the 98th historical percentile of maximum temperatures based on daily temperature data between 1961-1990. In Yountville, the extreme heat threshold is 100.2°F.

Cal-Adapt projects a significant increase in the number of extreme heat days for Yountville, as detailed in Table SH-2. Between 1990-2005, there was an average of 2.7 days above 100.2°F. That average is projected to increase to 11 days by 2050 under the low emissions scenario (RCP 4.5). By the end of the century, the average number of extreme heat days is expected to increase to 13 days and could be as many as 33 days under the high emissions scenario (RCP 8.5).

Those most at risk and vulnerable to heat-related illness are the elderly, infants, the socially or economically disadvantaged, those who work outdoors, and individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses. In Yountville, where there is already a large senior population that is expected to grow by nearly 60% by 2040, heat-related illness is of significant concern. Currently, nearly half of Yountville's population are 65 and older and 25 percent are over 80 years old. There are also many individuals with disabilities and chronic illnesses at the Veterans Home.

RAINFALL

The historical annual mean rainfall for Yountville is 37.5 inches. Under the low emissions scenario (RCP 4.5), annual mean rainfall is expected to rise about 3 inches by 2050 and 4 inches by 2090, as shown in Table SH-3. Under the high emissions scenario (RCP 8.5), annual mean precipitation is projected to increase about 9 inches by 2090. As discussed in the section on flooding, climate scientists warn that climate change could increase the frequency and intensity of atmospheric river storms in northern California, potentially producing more frequent and severe flooding. While the expected increase in rainfall may exacerbate local flooding, the projections also mean that local water resources may not be negatively impacted by climate change.

Table SH-3
AVERAGE ANNUAL RAINFALL IN YOUNTVILLE

HISTORICAL AVERAGE (1990-2005)	LOW EMISSIONS SCENARIO (RCP 4.5)		HIGH EMISSIONS SCENARIO (RCP 8.5)	
	2040-2050	2080-2090	2040-2050	2080-2090
37.5"	41.0"	41.3"	39.6"	46.1"

SEA LEVEL RISE

The San Francisco Bay is vulnerable to a range of natural hazards, including storms, extreme high tides, and rising sea levels resulting from global climate change. Flooding already poses a threat to communities along the Bay and there is compelling evidence that these risks will increase in the future. As temperatures rise globally, sea levels are rising mainly because ocean water expands as it warms, and water from the melting of major stores of land ice and glaciers flow into the ocean. In the past century, average global sea level has increased by 7 to 8 inches. Sea level at the San Francisco tide gauge has risen by about 7 inches since 1900.

Rising seas put new areas at risk of flooding and increase the likelihood and intensity of floods in areas that are already at risk. The State's Sea Level Rise Guidance Document projects a "likely" (66% probability) increase in sea level at the San Francisco tide gauge of 10 inches by 2040 and 13 inches by 2050. By the end of the century, sea levels are likely to rise by 2.4 feet under a low emissions scenario (RCP 2.6) and 3.4 feet under a high emissions scenario (RCP 8.5). Flooding will be more severe when combined with storm events.

Although Yountville is located far enough away from the coastline to avoid direct impacts of sea level rise, flooding could impact travel to and from Yountville. State Route 37, for example, passes through the marshes of North San Francisco Bay, providing commuters, tourists, and trucks with access to Napa County from Interstate 80 and US Highway 101. Models show that stretches of the highway are inundated at 1.6 feet of sea level rise. Thus, sea level rise could impact Yountville's tourist economy, as well as the transport of goods and services to the Town.

WILDFIRE

Wildfire is a serious hazard in California. Several studies have indicated that the risk of wildfire will increase with climate change. According to Cal-Adapt, the historical annual average area burned by wildfire in Napa County is 3,343 acres. As shown in Table SH-4, that average is expected to increase under both low and high emissions scenarios throughout the century. By 2090, the models predict an increase in burned areas of about 26 to 28 percent.

Prolonged and more severe drought may exacerbate conditions for wildfires to ignite and spread. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts, vegetation conversions, and habitat fragmentation.

Table SH-4
ANNUAL AVERAGE AREA BURNED IN NAPA COUNTY

HISTORICAL AVERAGE (1990-2005)	LOW EMISSIONS SCENARIO (RCP 4.5)			HIGH EMISSIONS SCENARIO (RCP 8.5)		
	2020-2030	2040-2050	2080-2090	2020-2030	2040-2050	2080-2090
3,343 acres	3,998 acres	3,836 acres	4,214 acres	3,904 acres	4,045 acres	4,293 acres

ADAPTIVE CAPACITY

Adaptive capacity is the current ability of a community to address the potential impacts of climate change. Yountville has existing policies, plans, programs, resources, and institutions that are already in place to adapt to climate change and reduce potential impacts. Resources to address flooding and storm events are described in Section 9.3 of the Safety + Hazards Chapter, and resources for fire prevention and protection are covered in Section 9.4. In addition, the Town has an emergency operations plan which can be activated for a variety of emergency situations, including flooding, wildfire, and extreme heat events. The Town's Community Center operates as a cooling center during extreme heat days and heat waves.

The Town's local hazard mitigation plan, described in Section 9.6 of this chapter, was adopted in 2013. The next update of the plan will include an analysis of climate change impacts and adaptation and resiliency strategies.

9.6 PUBLIC SAFETY

The Town contracts with the Napa County Sheriff's Department to provide law enforcement and police protection services throughout Yountville. County Sheriff is responsible for enforcing all State statutes, local codes, and ordinances, including traffic enforcement within the Town limits. The current contract obligates the County Sheriff to provide a minimum of 160 hours of patrol services in Yountville weekly and provides for a full spectrum of municipal law enforcement services, including:

- Personnel management (recruitment, hiring, training, etc.)
- Vehicles and equipment, including maintenance
- Dispatch services
- Records management
- Crime scene and lab processing
- Property/evidence management and storage
- Investigative services (major crimes and major traffic collisions)
- Supplemental patrol services
- Canine services
- Animal control services
- Hazardous device mitigation
- SWAT and hostage negotiation
- Disaster response management and training
- Special event services
- Participation in DARE program
- Attendance at Town Council, board and commission, and other Town meetings as requested

The Napa County Sheriff's Office is located near the Napa County Airport at 1535 Airport Blvd. There are several substations in locations throughout the county. The Town of Yountville Police Station is located at 1950 Mulberry Street and is shown in Figure LU-4. The Town is responsible for providing and maintaining the substation.

The Sheriff's Department has approximately 135 employees. There are three dedicated deputies assigned to the Town as well as one sergeant who acts as the Chief of Police for the Town. The sergeant attends Town Council meetings, and supervises any deputies working in the Town. County Sheriff evaluates and makes recommendations regarding Yountville's service levels at least once per quarter.

As shown in Table SH-5, the majority of crimes committed in Yountville consist of non-violent property crimes, primarily theft of personal property without the use of force. The table shows crime statistics through 2016, the latest year for which data is available. An active shooter incident in March of 2018 at the Veterans Home resulted in the deaths of three hostages. The gunman, a veteran suffering from post-traumatic stress disorder who was formerly housed at a residential program within the Veterans Home, also died during the standoff with police.

Yountville contracts with the Napa County Sheriff's Department to provide law enforcement and police protection services.

Table SH-5
CRIMES BY CATEGORY

CATEGORY	2012	2013	2014	2015	2016
VIOLENT CRIMES	7	1	7	7	4
• Homicide	0	0	0	0	0
• Rape	0	1	0	0	0
• Robbery	1	0	0	0	0
• Aggravated Assault	6	0	7	7	4
PROPERTY CRIMES	56	57	40	46	47
• Burglary	16	17	14	7	16
• Larceny-Theft	38	34	24	36	28
• Vehicle Theft	2	6	2	3	3
ARSON	1	0	0	0	0

Source: Federal Bureau of Investigation, Criminal Justice Information Services Division, Offenses Known to Law Enforcement Tables (2012 through 2016).

EMERGENCY OPERATIONS AND HAZARD MITIGATION

The Town works with the Napa County Office of Emergency Services to develop and implement emergency and hazard mitigation plans.

In 2013, the County of Napa adopted the Napa County Operational Area Hazard Mitigation Plan, prepared in cooperation with the Town of Yountville, the Cities of American Canyon, St. Helena, and Calistoga, the Napa County Flood Control and Water Conservation District, Napa Valley College, and the Napa County Office of Education. The Hazard Mitigation Plan addresses a wide variety of disasters that could affect Napa County and provides measures for reducing or mitigating these threats. Major threats addressed in the plan include flooding, earthquake, and wildland urban interface fires. The plan is prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 and is updated periodically. The Hazard Mitigation Plan analyzes the risk of each of these hazards and includes a detailed assessment of how critical facilities (public buildings, hospitals, day care centers, etc.) would be affected by fire, earthquake, and other disasters.

The Town maintains an Emergency Operations Center at Town Hall. The Center facilitates a coordinated response during a major emergency or disaster. The Town's Emergency Operations Plan guides the planned response to emergency situations as well as coordination with other governmental agencies when required.

The Town prepares evacuation routes in cooperation with Napa County OES which are intended for use by first responders. Actual evacuation routes may need to be modified in the field during emergencies. Evacuation policies and procedures are addressed in Section 3 of the Town's All Hazards Emergency Operations Plan.

9.7 GOALS, POLICIES AND PROGRAMS

Goal SH-1: Maintain high levels of public safety and emergency preparedness.

SH-1.1 S**eismic and Geologic Hazards**. Reduce the risk of loss of life, personal injury and property damage resulting from seismic and geologic hazards including ground shaking, land sliding, liquefaction and slope failure.

SH-1.1a **Seismic and Geologic Safety**. *Require new subdivision and development proposals and infrastructure projects and additions and remodels, as applicable, to address potential seismic and geologic hazards and to conform to seismic requirements of the California Building Code and, when applicable, the California Environmental Quality Act.*

SH-1.1b **Unreinforced Masonry Buildings**. *Encourage property owners to retrofit existing unreinforced masonry buildings.*

SH-1.2 **Flood Hazards**. Reduce the risk of loss of life, personal injury and property damage resulting from flooding by maintaining storm drainage systems, natural flood control channels and waterways, and regulating runoff from new construction and development projects. Encourage flood control measures that retain the natural features and conditions of watercourses to the maximum feasible extent.

SH-1.2a **Mesa-Tallent Lane Storm Drainage Benefit District**. *Require all development within the Mesa-Tallent Lane Storm Drainage Benefit District to participate and fund improvements which address the drainage problems of the area.*

SH-1.2b **Hopper Creek**. *Maintain Hopper Creek as a natural creek. Preserve and enhance the riparian habitat and flood control attributes of the creek by requiring development setbacks and regulating the planting and removal of creekside vegetation.*

SH-1.2c **Flood Insurance Rate Maps**. *Use the most recent Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps to identify 100-Year Flood Events and calculate flow rates within identified stream channels. Monitor FEMA's efforts to map the 200-year flood plain and address new requirements as appropriate.*

SH-1.2d **Development within the 100-Year Flood Zone**. *Require development within the 100-year flood zone to comply with the floodplain management regulations of the Yountville Municipal Code.*

SH-1.2e **Maintain Flood Wall**. *Maintain the flood wall surrounding the mobile home parks to reduce damage from flooding.*

SH-1.2f **Extension of Flood Wall.** *Evaluate whether to extend the flood wall to the church-owned property at the far southeast corner of town.*

SH-1.2g **Storm Drainage System**. *Maintain unobstructed water flow in the storm drainage system to the maximum extent feasible. Continue to carry out inspections and maintenance of drainage systems.*

SH-1.2h **Flood Protection Easements**. *Ensure the retention of flood protection easements held by public agencies on private property to prevent development in these areas.*

SH-1.2i **Beard Ditch**. *Work with Napa County to support its efforts to perform annual maintenance of Beard Ditch for drainage purposes.*

SH-1.2j **Rector Creek Dam**. *Work with Napa County, the State, and federal agencies to encourage measures to ensure the safety of Rector Creek Dam and to prepare for and respond to potential flooding events.*

SH-1.2k **Coordination with Napa County**. *Work with Napa County officials in urging the State and federal governments to make flood control improvements to the Napa River which will reduce or eliminate the danger of flooding caused by overflow of the Napa River.*

SH-1.2l **Napa County Stormwater Pollution Prevention Program.** *Work with the Napa County Flood Control District to implement the Stormwater Pollution Prevention Program to minimize negative impacts of storm runoff.*

SH-1.2m **Napa County Flood Control District**. *Participate in the Napa County Flood Control and Water Conservation District to manage flood and storm waters to protect life and property, and to maintain the Napa River, its tributaries, and watershed.*

SH-1.3 **Fire Hazards**. Reduce the risk of loss of life, personal injury, and property damage resulting from wildland and urban fire hazards through code enforcement and coordination with the Napa County Fire Department.

SH-1.3a **Napa County Fire Department Agreement**. *Maintain agreement with Napa County Fire Department for fire protection and to maintain adequate level of service.*

SH-1.3b **Risk and Response Time**. *Coordinate with Napa County Fire Department to meet accepted levels of risk and response time.*

SH-1.3c **Inspections and Site Plan Review**. *Maintain programs with Napa County Fire Department for inspections and site plan review.*

SH-1.3d **Weed Abatement and Defensible Space.** *Develop weed abatement and defensible space programs which reduce risk of fire while maintaining native vegetation and wildlife habitat.*

SH-1.3e **Heather Street and Heritage Court Emergency Access.** *Maintain the existing one-lane emergency access connection at Heather Street and Heritage Court.*

SH-1.3f **Fire Risk in New Development**.

1. *Review all development proposals for fire risk and require mitigation measures to reduce the probability of fire. Encourage attractive native and drought-tolerant, low-maintenance landscaping responsive to fire hazards. Require all new development to meet the adopted State and local fire codes.*
2. *Require adequate access for emergency vehicles, adequate street width and vertical clearance, driveway access and parking restrictions for new development.*
3. *Require sprinkler systems for new commercial and residential development and substantial remodels and additions.*

SH-1.3g **Water Supply for Fire Fighting**. *Maintain an adequate water supply, fire hydrant system, and water pressure to effectively suppress fires.*

SH-1.3h **Education and Code Enforcement**. *Increase fire prevention effectiveness through education and code enforcement, including requirements for defensible space around structures and removal of flammable vegetation near roadways.*

SH-1.4 **Police and Community Safety.** Provide a high level of service to the community by working to ensure order and improve the safety of the community.

SH-1.4a **Napa County Agreement.** *Maintain agreement with Napa County for police protection and to maintain adequate level of service.*

SH-1.4b **Risk and Response Time.** *Coordinate with Napa County to meet accepted levels of risk and response time.*

SH-1.5 **Building Hazards**. Reduce the risk of loss of life, personal injury and property damage resulting from structural, electrical or fire damage to structures through code enforcement and public education.

SH-1.5a **Building Code Enforcement**. *Review and inspect new development, building additions and remodels, enforcing the California Building Code and local amendments.*

SH-1.5b **Code Updates**. *Continue to update the Town's building and fire codes and provide information to the public on new code provisions.*

SH-1.6 **Erosion and Runoff Control.** Implement measures to reduce soil erosion and surface runoff during and after construction.

SH-1.6a **Soil Stabilization Measures**. *Encourage soil stabilization measures that prevent soil erosion.*

SH-1.6b **Soils Reports**. *Require soils reports for subdivisions and new development proposals. Building materials and construction procedures must adhere to specifications of soils engineer.*

SH-1.7 **Soil Quality**. Protect and preserve soil as a natural resource.

SH-1.7a **Toxic Chemicals**. *Ensure the proper use, storage, and disposal of toxic chemicals to prevent soil contamination.*

SH-1.7b **Soils Analysis**. *Require soils analysis for all new residential developments and other sensitive receptors when there is a history of agricultural or industrial use.*

SH-1.8 **Hazardous Materials**. Minimize risks and health impacts from environmental and human-induced disasters.

SH-1.8a **Measures to Reduce Hazards**. *Require measures to protect the public health from the hazards associated with the transportation, storage, and disposal of hazardous wastes and materials.*

SH-1.9 **Emergency Management**. Minimize exposure to all hazards through emergency management, planning and training.

SH-1.9a **Hazard Mitigation Plan**. *Implement the Napa County Operational Area Hazard Mitigation Plan 2013 Update approved by the Federal Emergency Management Agency in 2014.*

SH-1.9b **Hazard Mitigation Plan Update**. *Work with Napa County Office of Emergency Services to periodically evaluate and update the Napa County Operational Area Hazard Mitigation Plan, including addressing climate change impacts.*

SH-1.9c **Emergency Response Plans**. *Maintain and update the Town's emergency response plans on a regular basis, designating emergency shelters and evacuation routes.*

SH-1.9d **Emergency Shelter**. *Evaluate adding support systems at the Community Center to enhance its use as an emergency shelter during extended power outages.*

SH-1.9e **Interagency Cooperation**. *Continue to cooperate with the appropriate federal, State, and local agencies to practice and implement effective emergency plans and provide public safety training programs, where feasible.*

SH-1.9f **Emergency Preparedness and Response**. *Provide timely information to the public on public safety emergencies, health advisories, and evacuation warnings, orders, procedures and routes, and encourage community members to prepare emergency supplies and plans and sign up for the Town's public safety alert system.*

SH-1.9g **Disaster Recovery**. *Develop a disaster recovery plan that provides for efficient and effective coordination, recovery assessment, resource utilization, and policy guidance during the disaster recovery process.*

SH-1.10 **Essential Facilities**. Ensure essential public facilities/critical facilities, including utilities and water and wastewater facilities, are accessible and operational during flooding, seismic events, fires, extreme heat events, and other emergencies and, if such facilities are new development, that they are located outside of high risk areas, to the extent feasible.

SH-1.11 **Climate Change Adaptation and Resiliency**. Prepare for and respond to the expected impacts of climate change.

SH-1.11a **All-Hazard Mitigation Plan**. *Incorporate the projected impacts of climate change, including sea level rise, extreme heat and storm events, and increased risk of wildfire, in the Town's Local Hazard Mitigation Plan.*

SH-1.11b **Emergency Planning**. *Incorporate the likelihood of climate change impacts into Town emergency planning and training.*

SH-1.11c **Inter-Agency Coordination**. *Coordinate with Napa County Flood Control and Water Conservation District, Napa County Fire Department, Napa County Office of Emergency Services, Napa County Resource Conservation District, and other relevant organizations to address climate change impacts and develop adaptation strategies. Address fire prevention and protection, flooding and severe storms, extreme heat events, public health, and the health and adaptability of natural systems, including water resources and biological resources.*

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