SB 552 – Napa County Drought Resilience Plan

For State Small Water Systems and Domestic Wells

October 2024

Mission

Napa County is dedicated to sustaining agriculture and the environment and to providing leadership and services to advance the health, safety, and economic well-being of current and future generations.

Acknowledgment

The Napa County Drought Resilience Plan was developed with technical assistance from the California Department of Water Resources (DWR) and Stantec Consulting Services Inc. (Stantec).

Financial support for this planning effort was provided through DWR's County Drought Resilience Planning Assistance Program, which was legislated by Senate Bill 552 (SB552), Hertzberg. SB552 was passed on the California Senate Floor on September 9, 2021, and approved by California Governor on September 23, 2021. SB 522 provides guidance and financial assistance where counties can request up to $125,000 in financial assistance or direct technical assistance to support their planning efforts. Napa County was approved on July 20, 2023, to receive direct technical assistance to meet the requirements of SB 552.

DWR contracted with Stantec to deliver direct technical services to Napa County. The County coordinated closely with the Stantec team throughout the development of this plan.

Napa County expresses its gratitude to DWR for the technical resources provided through this assistance program. The County also thanks the team at Stantec for their technical expertise in guiding this planning process.

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Abbreviations and Acronyms

AB	Assembly Bill
BOS	Board of Supervisors
CA-DOF	California Department of Finance
County	Napa County
CWC	California Water Code
DRP	County Drought Resilience Plan
DWSTF	Drought Water Shortage Task Force
DWR	California Department of Water Resources
EHD	Napa County Environmental Health Division
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HSC	Health and Safety Code
LTMS/A	long-term mitigation strategies and actions
MST	Milliken-Sarco-Tulucay
NCGSA	Napa County Groundwater Sustainability Agency
NENMA	Northeast Napa Management Area
OES	Napa County Office of Emergency Services
PBES	Napa County Planning, Building, and Environmental Services Department
PLSS	Public Land Survey System
Risk Assessment	Drought and Water Shortage Vulnerability Assessment
SB	Senate Bill
SSWS	state small water system
State	State of California
SWP	State Water Project
Task Force	Drought and Water Shortage Task Force
WICC	Watershed Information and Conservation Council

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1.0 Introduction

The purpose of the Napa County Drought Resilience Plan (DRP) is to aid Napa County (County), and the Drought and Water Shortage Task Force (Task Force), in preparing for and identifying drought and water shortage risks and proposed short-term response actions and long-term mitigation strategies and actions (LTMS/A) for two types of water systems within the County's jurisdiction: state small water systems (SSWS) and domestic wells. The need to prepare the plan was established by Senate Bill (SB) 552 (Hertzberg) which is explained in more detail in the next section. The County DRP encompasses the two aforementioned water systems; other types of water systems are covered by provisions of the 2018 Legislation on Water Conservation and Drought Planning, namely SB 606 (Hertzberg) and Assembly Bill (AB) 1668 (Friedman).

1.1 Legislative Requirements

SB 552 was signed into law in September 2021 by Governor Gavin Newsom as *Drought Planning for Small Water Suppliers, State Small Water Systems, and Domestic Well Communities*. Chaptered in 2022 to Division 6 – Conservation, Development, and Utilization of State Water Resources Part 2.56 (California Water Code (CWC) §10609.50-10609.80), SB 552 establishes new responsibilities and requirements for State of California (State) and local agencies to improve water resilience for small water suppliers and rural communities. The bill also implements SB 606 and AB 1668, State legislation originally passed in 2018 on Water Conservation and Drought Planning (collectively referred to as "2018 Legislation"). Amended for consistency with SB552, the 2018 Legislation provides a new framework for urban water use efficiency, directives for eliminating water waste, additional requirements for strengthening local drought resilience for urban areas and for vulnerable small water suppliers and rural communities, and recommendations for improving agricultural water use efficiency and drought planning.

Water users protected under SB 552 include small water suppliers and non-transient non-community water systems (§10609.60); and State small water systems and domestic wells (§10609.70). These water users are defined as follows:

- Small Water Supplier: A community water system serving 15 to 2,999 service connections, inclusive, and that provides less than 3,000 acre-feet of water annually (§10609.51(k)).
- Community Water System: A public water system that serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents of the area served by the system, as defined in Health and Safety Code (HSC) §116275(i) and §10609.51(a).
- State Small Water System: A system for the provision of piped water to the public for human consumption that serves at least five, but not more than 14, service connections and does not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year, as defined in HSC §116275(n) and §10609.51(m).
- Domestic Well: A groundwater well used to supply water for the domestic needs of an individual residence or a water system that is not a public water system and that has no more than four service connections, as defined in HSC §116275(n) and §10609.51(d).

- Non-Transient Non-Community Water System: A public water system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year, as defined in HSC §116275(k) and §10609.51(f).

1.1.1 County Agency

This plan fulfills County requirements as defined in State Small Water Systems and Domestic Wells (§10609.70). While measures to protect small water suppliers and non-transient non-community water systems are not within the scope of this document, this plan considers integration opportunities consistent with the intent of SB 552. Applicable County requirements are:

- Establish a standing County Drought and Water Shortage Task Force (§10609.70(a))
- Develop a plan that considers, at a minimum, each of the following (§10609.70(b)):
    1. Consolidations for existing water systems and domestic wells
    2. Domestic well drinking water mitigation programs
    3. Provision of emergency and interim drinking water solutions
    4. An analysis of the steps necessary to implement the plan
    5. An analysis of local, State, and federal funding sources available to implement the plan

1.1.2 State Agency Involvement and Implementation

SB 552 defined a series of requirements for the State Water Resources Control Board and the California Department of Water Resources. These include the following:

State Water Resources Control Board: §10609.70(c)

The state board shall work with counties, groundwater sustainability agencies, technical assistance providers, nonprofit organizations, community-based organizations, and the public to address state small water system and domestic well community drought and emergency water shortage resiliency needs, including both of the following:

> *(1) Proactive communication to domestic well communities before a drought occurs, such as information on local bottled water and water tank providers.*
>
> *(2) Funding for installation of basic drought and emergency water shortage resiliency infrastructure, such as well monitoring devices.*

California Department of Water Resources: 10609.80(a)

The department shall take both of the following actions to support implementation of the recommendations of its County Drought Advisory Group:

> *(1) Maintain, in partnership with the state board and other relevant state agencies, the risk vulnerability tool developed as part of the County Drought Advisory Group process and continue to refine existing data and gather new data for the tool, including, but not limited to, data on all of the following:*
>
> > *(A) Small water suppliers and nontransient noncommunity water systems serving a school.*

(B) State small water systems and rural communities.

(C) Domestic wells and other self-supplied residents.

(2) Update the risk vulnerability tool for small water suppliers and rural communities periodically, by doing all of the following:

(A) Revise the indicators and construction of the scoring as more data becomes readily available.

(B) Make existing and new data publicly available on the California Open Data internet web portal.

(C) In consultation with other relevant state agencies, identify deficits in data quality and availability and develop recommendations to address these gaps.

(b) (1) The department, in collaboration with the state board and relevant state agencies, shall establish a standing interagency drought and water shortage task force to facilitate proactive state planning and coordination, both for predrought planning and post-drought emergency response, to develop strategies to enhance collaboration between various fields, and to consider all types of water users.

(2) The interagency drought and water shortage task force shall include representatives from local governments, community-based organizations, nonprofit technical assistance providers, the public, and experts in land use planning, water resiliency, and water infrastructure.

1.2 Purpose of the County DRP

The County DRP is a stand-alone document that provides a singular, comprehensive, and accessible document for reference and ease of future updates. The development of this plan was led by the Napa County Planning, Building, and Environmental Services Department. The short-term response actions and LTMS/A outlined in this plan will guide future drought response efforts and help improve the resilience of domestic wells and SSWS against drought and water shortage. The DRP was developed to meet legislative requirements set forth by the State. However, the plan will not set, rescind, or modify existing or future drought planning and water conservation requirements set by the County prior to this plan.

1.3 Document Organization

This document is organized as follows:

- **Chapter 1 Introduction** provides an overview of the legislation relating to SB 552 and the development of the County DRP. This chapter also includes background on County demographics and geography, as well as an overview of State small water systems and domestic wells within the County's jurisdiction.
- **Chapter 2 County Drought and Water Shortage Task Force** provides an overview of the Task Force, including its development process and charter, membership, roles, purpose, and meeting frequency.
- **Chapter 3: Drought and Water Shortage Risk Assessment** characterizes the vulnerability of domestic wells and SSWSs within the County to drought and water shortage. This chapter also presents the approach and data used to assess vulnerability. It highlights areas within the

County that have a higher risk of drought and water shortage where domestic wells and SSWSs are present. Additionally, data gaps are identified to help inform potential long-term strategies.

- **Chapter 4: Short-Term Response Actions** details the proposed short-term response actions for emergency and interim drought solutions, including specific actions, local response triggers, and public engagement.
- **Chapter 5: Long-Term Mitigation Strategies and Actions** details the proposed long-term mitigation strategies and actions for improving the water supply resilience of domestic wells and SSWSs.
- **Chapter 6: Implementation Considerations** presents a roadmap for implementing the identified short-term actions and long-term strategies. This includes the actions required for implementation, responsible entities, implementation barriers, and timeline. This section also summarizes funding opportunities available to support implementation.
- **Chapter 7: References** summarizes references used in developing this plan

1.4 County Overview

The County lies in Northern California on the ancestral land of the Wappo, Lake Miwok, and Patwin people and is located north of San Francisco and San Pablo Bay. It was formed in 1850 as one of the original 27 California counties when the State was admitted to the Union. It is abutted by Sonoma County to the west, Lake County to the northwest, Yolo County to the northeast, and Solano County to the east and south. The County is known as a premiere grape-growing and winemaking region with a robust agricultural industry and has adopted various policies to protect its agricultural industry and maintain its rural character. It promotes agricultural preservation, resource conservation, and urban-centered growth (LAFCO-NC 2020). Previous efforts to address climate-change-induced water shortages and droughts on water supplies within the County focused on municipalities. Prior and ongoing drought- and water-related planning efforts include the Napa Valley Drought Contingency Plan (Napa County 2022), The Napa County Emergency Operations Plan-Drought Annex (Napa County 2024), the Napa Countywide Water and Wastewater Municipal Service Review (Napa County 2020), the Napa Valley Subbasin Groundwater Sustainability Plan (Napa County 2022), and the Napa County General Plan (Napa County 2008). These plans above do not explicitly address water shortage and drought for domestic wells and SSWS. Based on the most recent data available to the County, there are approximately 5,746 domestic wells and six SSWS. Chapter 3 of this document identifies the systems that reside in higher vulnerability areas.

1.4.1 County Demographics

Based on the most recent data obtained by the State, the population of the County is 135,029 (California Department of Finance [CA-DOF] 2024). The County remains sparsely populated outside of the incorporated cities, towns, and a small number of unincorporated communities. The population within the County has exhibited a fairly constant rate of population growth over time that is slow compared to other counties in the Bay Area (Metropolitan Transportation Commission and Association of Bay Area Governments 2021, 2020 Census and CA-DOF 2024). Collectively, the County has seen about 2.2% population decline between the 2020 census and January 1, 2024.

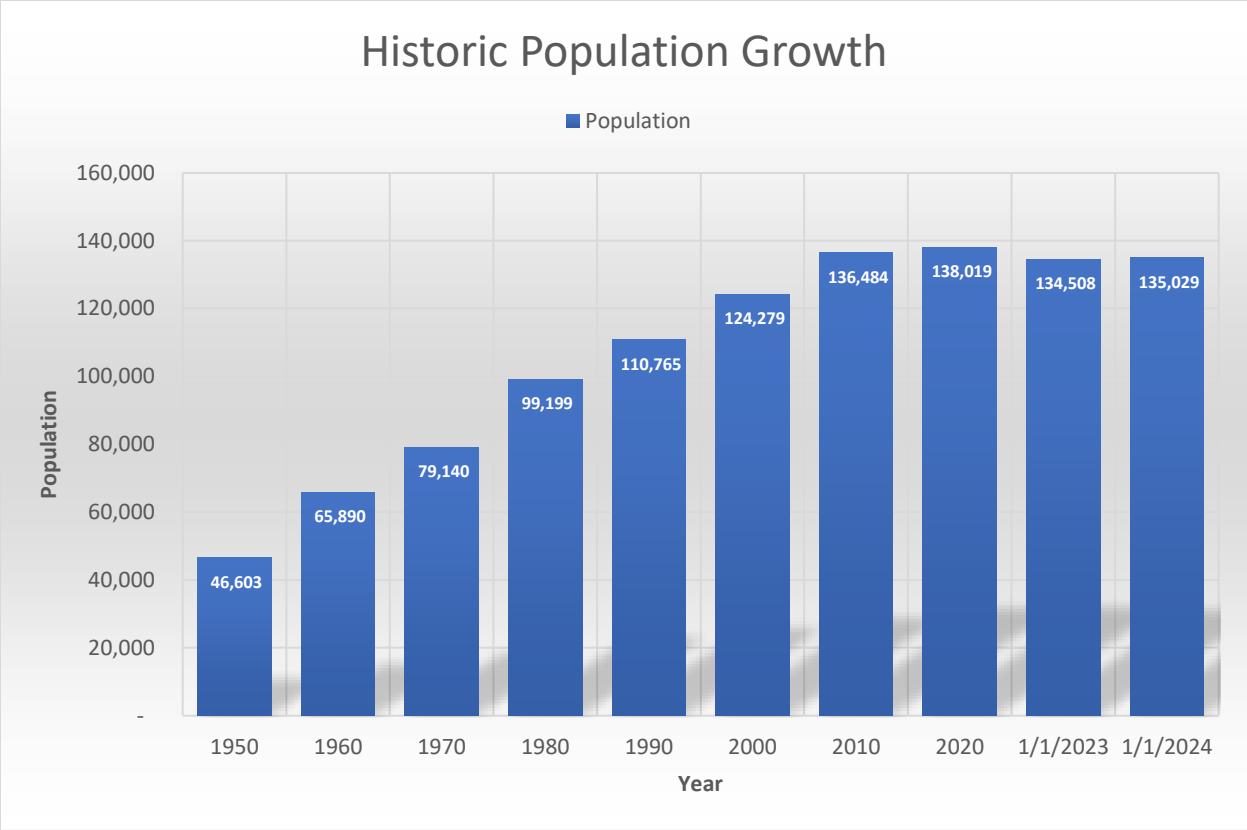

Figure 1-1. Historic Population Growth of Napa County

Most of the County's population – about 83% of the population - lives within the Napa River watershed and the five incorporated municipalities of American Canyon, Calistoga, Napa, St. Helena, and Town of Yountville; most of the land area outside of these municipalities supports agricultural uses and open space.

Table 1-1. Population in Cities of Napa County

County/City	1/1/2023	1/1/2024	Change
Napa County	134,508	135,029	0.4%
American Canyon	21,379	21,758	1.8%
Calistoga	5,127	5,142	0.3%
Napa	77,074	77,174	0.1%
St. Helena	5,284	5,314	0.6%
Yountville	2,766	2,781	0.5%
Balance of County	22,878	22,860	-0.1%

Demographics of the County are derived from the 2020 U.S. Census. Population estimates by race identify 83 percent as White, 9.4 percent as Asian, 2.4 percent as Black or African American alone, 1.3

percent are American Indian and Alaska Native alone, 0.4 percent as Native Hawaiian and other Pacific Islander, and the remaining 3.5 percent as two or more races. The County is approximately 49.9 percent female and 50.1 percent male.

1.4.2 County Economy

As mentioned previously, the County is renowned as a premiere grape-growing and winemaking region and the local agricultural economy is dominated by high-value vineyards and wineries. The local wine industry and related businesses provide an annual economic impact of more than $9.4 billion locally and nearly $34 billion in the United States. The industry directly and indirectly provides 46,000 full-time-equivalent jobs in the County and nearly 190,000 such jobs nationwide (Napa Valley Vintners 2021). The economy depends on a robust agricultural industry, which supports tourism, the second largest industry in the county (Brown and Caldwell 2022). The tourism industry supports an estimated 15,900 full-time-equivalent jobs.

1.4.3 County Hydrology

The County is located in between the Mayacamas and Vaca Mountain Ranges. A majority of the County's water supply comes in the form of precipitation that feeds groundwater aquifers and the Napa River and its tributaries, local reservoirs, and imported water from the State Water Project.

Napa County encompasses several groundwater basins and subbasins, each playing a crucial role in the region's water supply and renowned wine industry. Here's a breakdown of the main basins:

- **Napa Valley Subbasin:**
  - The most significant basin in the County
  - Classified by DWR as a high priority groundwater basin and managed by the Napa County Groundwater Sustainability Agency under the Sustainable Groundwater Management Act according to an DWR-approved Groundwater Sustainability Plan (GSP)
  - Stretches from north of Calistoga to the southern end of the City of Napa
  - Runs the length of the Napa Valley floor
  - Primary source of groundwater for agricultural and rural residences
  - The City of St. Helena relies on a small amount of groundwater to supplement surface water supplies
  - Coincides with the area where the largest portion of the County's population resides
- **Napa-Sonoma Lowlands Subbasin:**
  - Located in the southwestern part of the County
  - Extends into neighboring Sonoma County
  - Encompasses portions of southwestern Napa and parts of the Carneros region
  - Known for its cooler climate, influencing the distinctive wines produced in this area
  - Classified by DWR as a very low priority groundwater basin

- **Pope Valley Basin:**
  - Located in the Putah Creek watershed to the northeast of Napa Valley
  - Primarily supports local agriculture
  - Smaller basin compared to the Napa Valley Subbasin
  - Classified by DWR as a very low priority groundwater basin
- **Berryessa Valley Basin:**
  - Runs along the northeastern shore of Lake Berryessa
  - Much of its original extent is now submerged beneath Lake Berryessa
  - Classified by DWR as a very low priority groundwater basin
- **Suisun-Fairfield Valley Subbasin** (partial):
  - A small portion extends from Solano County into Napa County
  - Located along the southeastern border between the counties
  - Classified by DWR as a very low priority groundwater basin

These basins are crucial for the County's water supply, supporting agriculture (especially viticulture), domestic use, and ecosystems. The Napa County Groundwater Sustainability Agency monitors and manages the Napa Valley Subbasin, the only high priority basin in the County to ensure its long-term sustainability.

Additionally, Napa County receives imported surface water from the State Water Project (SWP) through the North Bay Aqueduct through an agreement with the Napa County Flood Control and Water Conservation District. The City of Napa receives this surface water, which it treats and distributes to customers within its service region. Calistoga receives its SWP allotted water through the City of Napa. The City of Napa also distributes treated water wholesale to the City of St. Helena and Town of Yountville and exports water to the City of American Canyon, and the California Veterans Home, as well as other irrigation customers.

There are seven reservoirs and lakes within the County. These are:

- Lake Berryessa: owned by the Bureau of Reclamation and supplies water to Solano County Water Agency, Solano Irrigation District and few water connections around the lake.
- Kimball Reservoir: provides water to the City of Calistoga.
- Bell Canyon Reservoir: provides water to the City of St. Helena.
- Lake Hennessey: provides water to the City of Napa.
- Rector Reservoir: provides water to Town of Yountville.
- Milliken Reservoir: provides water to the City of Napa.

- Lake Curry: located within Napa County, Lake Curry provides water to Solano County as part of their water supply storage.

Figure 1-2 shows a map of the groundwater basins, lakes, rivers, and streams located in the County.

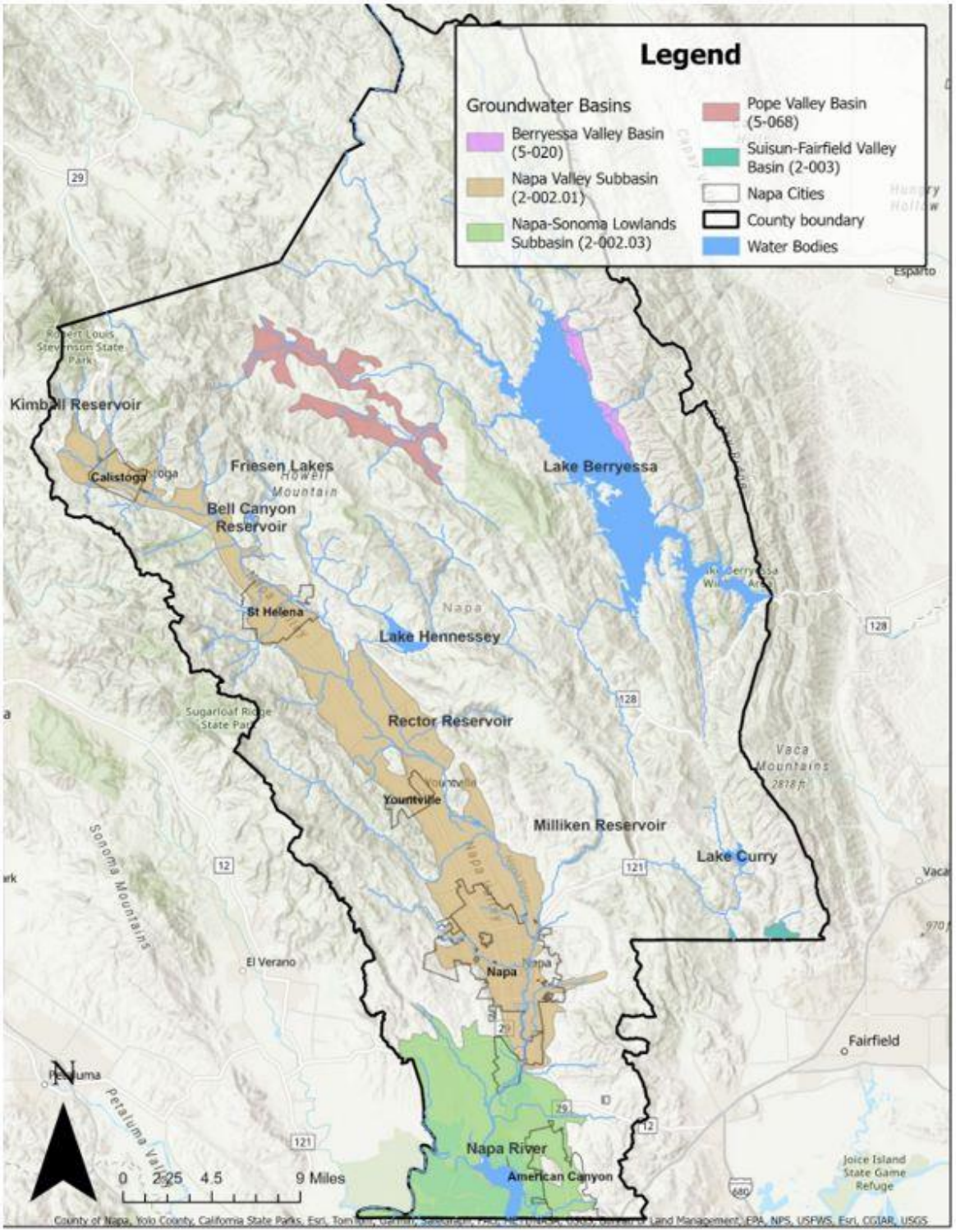

Figure 1-2. Map of Hydrologic Features of Napa County

1.4.4 Water Management

Napa County's population distribution and water supply systems are closely intertwined, reflecting the diverse landscape and needs of the region. Approximately 22,800 residents live in the unincorporated parts of the County, representing a significant portion of the population outside the main municipalities. The unincorporated regions primarily rely on a combination of groundwater, surface water diversions, and various local water management entities. These include improvement districts, water districts, and community water systems. Among these are the Circle Oaks Water District, Congress Valley Water District, Lake Berryessa Resort Improvement District, Napa Berryessa Resort Improvement District, and Spanish Flat Water District. There are approximately twenty-three community water systems, excluding the Cities and Town, that serve approximately 10,948 customers across the county, ensuring water access in areas not covered by municipal systems (Napa-LAFCO 2020). Figure 1-3 shows the water systems boundaries in Napa County

Water users outside of municipalities across the County are predominantly vineyards, wineries, residential and some industrial users. The unincorporated areas of the County rely principally on groundwater and surface water diversions, while the incorporated areas rely on local reservoirs and regional water providers. Principal exceptions include the County's airport industrial area, which relies on municipal water from the cities of Napa and American Canyon; portions of the Silverado area, which rely on municipal water from the City of Napa; several small communities around Lake Berryessa, which rely on the reservoir; and other developed areas such as Angwin, which relies on private water suppliers. Approximately 4,339 residents live outside of community water systems who are dependent on domestic wells. This highlights the importance of groundwater resources in supporting both residential needs and the agricultural industry that defines the region. It is important to note that many residences within municipal service boundaries are also served by a private domestic well.

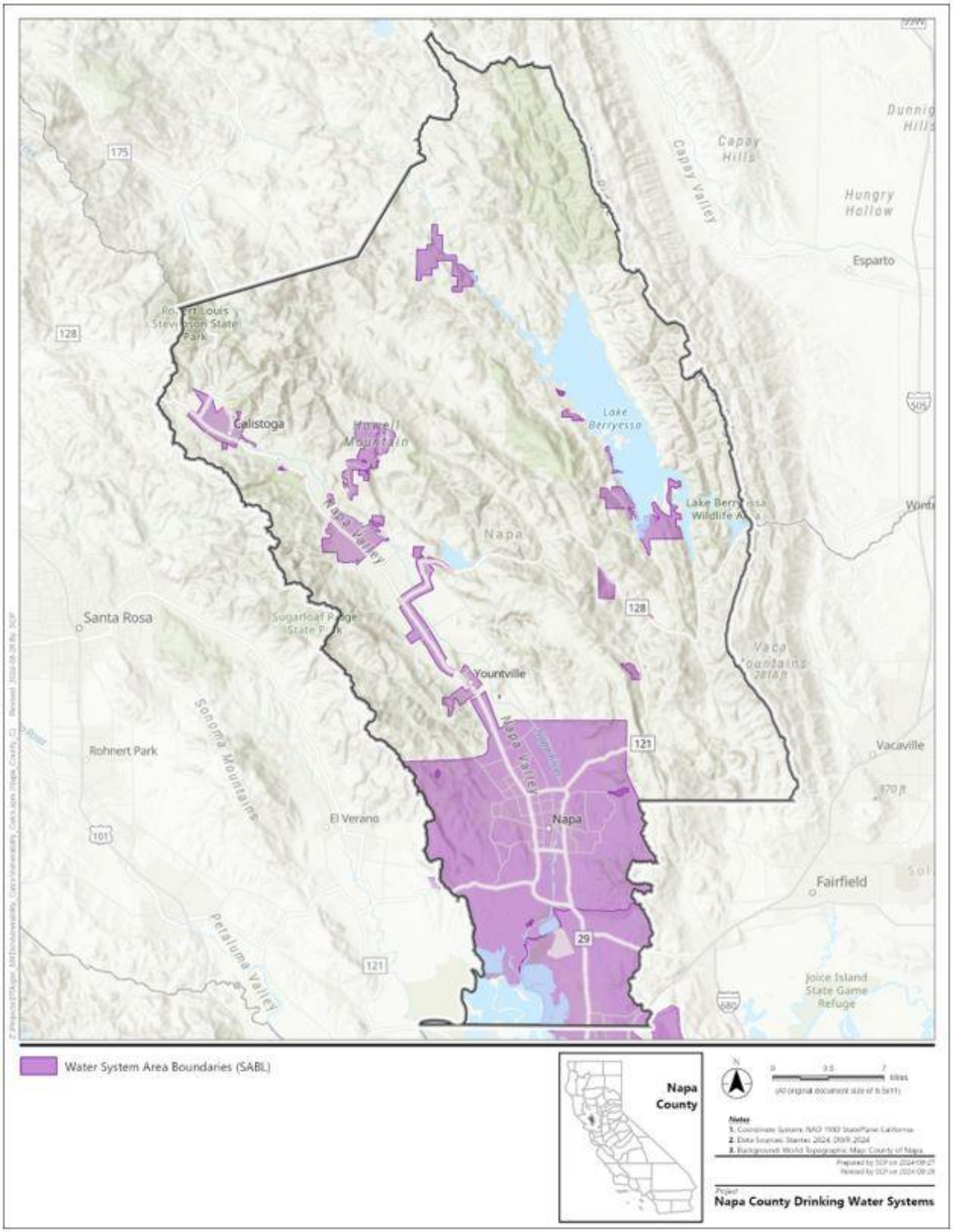

Figure 1-3. Map of Water Systems Boundaries in Napa County

1.4.4.1 Topography

The County has a diverse and varied landscape and is segmented by portions of the California Inner Coast Ranges. The Mayacamas Mountains stretch north to south along the County's western boundary with Sonoma County. The Vaca Mountains border the eastern side of Napa Valley and extend through the County's eastern portions. The Napa Valley is a long alluvial river valley that is approximately 30 miles long and 5 miles across at its widest point. The valley is segmented by small tributaries and the Napa River, which flows north to south down its length.

The highest elevation is Mount St. Helena, located in the northwestern corner of the County, which reaches an elevation of 4,343 feet. Principal ridgelines have maximum elevations that vary between 1,800 and 2,500 feet. The southern end of the Napa Valley meets San Pablo Bay in the Napa-Sonoma Marshes, the lowest elevation in the County. On the eastern side of Napa Valley, the Vaca Range extends north to south. Beyond Napa Valley, this range creates a series of rolling hills and valleys in the northeastern and eastern portions of the County.

The County is segmented into three watersheds: the Napa River, Putah Creek, and Suisun Creek. The Napa River watershed covers an area of 430 square miles and contains the Napa River and the five incorporated areas within the County. This region contains a mixture of urban and residential areas, extensive vineyards and agriculture, wineries, some industry, and unincorporated areas. It is estimated that more than 90 percent of the County's population resides in the Napa River watershed. The Putah Creek watershed is characterized by Lake Berryessa, which is a large reservoir on Putah Creek formed by the construction of Monticello Dam in the 1950s. The Suisun Creek watershed in the southeast portion of the County is separated from Napa Valley by Mt. George in the west and bounded by the Vaca Mountains in the east and the upper portions of Suisun Creek before it exits Napa and enters Solano County. Lake Curry is a human-made reservoir that provides the municipal water supply to the City of Vallejo (Brown and Caldwell 2022). The topography is heavily influenced by the volcanic geology that formed the Inner Coast Ranges. As a result, there are numerous unique microclimates that exist within the County. Figure 1-4 shows the general topography in Napa County.

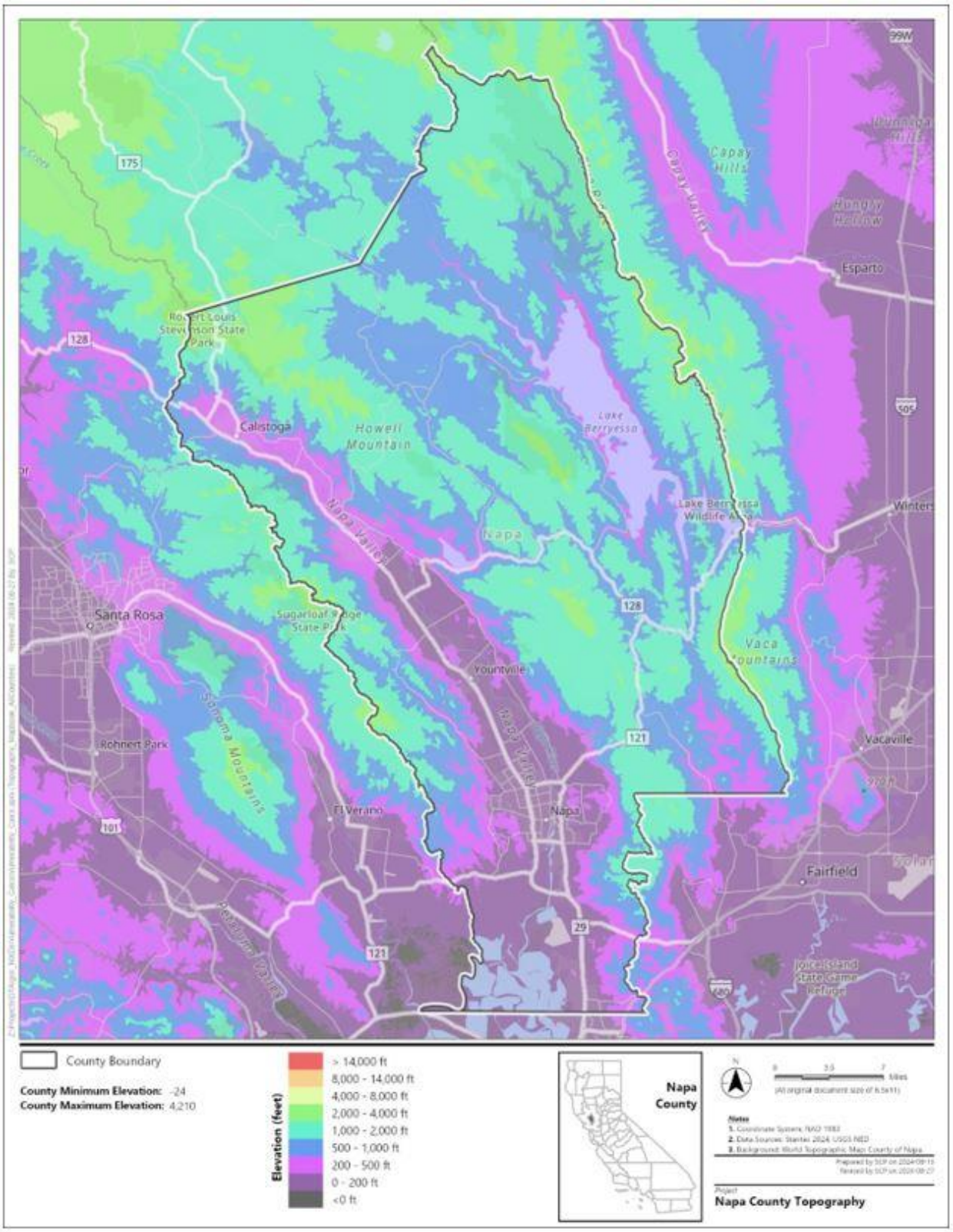

Figure 1-4. Topographic Map of Napa County

1.4.4.2 Precipitation

The County is located within the Mediterranean climate zone and experiences a characteristic pattern of precipitation that plays a crucial role in shaping its environment and agricultural productivity. Historically, the County has typically received most of its rainfall between November and March, with peak precipitation occurring in December and January. This seasonal distribution aligns with the region's Mediterranean climate that is characterized by mild, wet winters and warm, dry summers. Annual precipitation totals in the County vary depending on location and elevation, with higher elevations often receiving more precipitation than lower-lying areas. The western slopes of the Mayacamas Mountains in the northwestern portions of the county tend to receive higher average amounts of rainfall. In contrast, the eastern slopes of the Vaca Range experience a rain-shadow effect, resulting in drier conditions and lower precipitation. However, microclimatic variations exist within the County, influenced by factors such as proximity to bodies of water, elevation, and terrain. This creates localized differences in rainfall distribution.

The average minimum and maximum rainfall in the County can vary depending on the specific location within the county and the source of the data. However, as a general overview from the period between 2012 and 2021, the County typically experiences an annual rainfall ranging between 20 inches and 40 inches with very few exceptions outside this range. In terms of the minimum rainfall, some areas of the County, particularly those in rain-shadow regions or lower-lying areas, may receive less than 20 inches of rainfall per year on average. These areas often include parts of the eastern slopes of the Vaca Range, which experience drier conditions due to the rain-shadow effect as well as the southeastern portion of the County in the American Canyon area. The maximum rainfall in the County tends to occur in regions influenced by orographic lifting, such as the western slopes of the Mayacamas Mountains. In these areas, average annual rainfall can exceed 40 inches, with some localized areas receiving even higher amounts of precipitation, particularly in the higher elevations. These figures are averages and annual rainfall totals can vary from year to year due to factors such as climate variability, atmospheric circulation patterns, and the occurrence of extreme weather events like atmospheric rivers or droughts. Local climate data from weather stations or regional climate assessments may provide more precise and localized information on average rainfall in the County. Figure 1-5 below shows a visual display of the rainfall averages throughout the County and approximately how many inches of rainfall they receive.

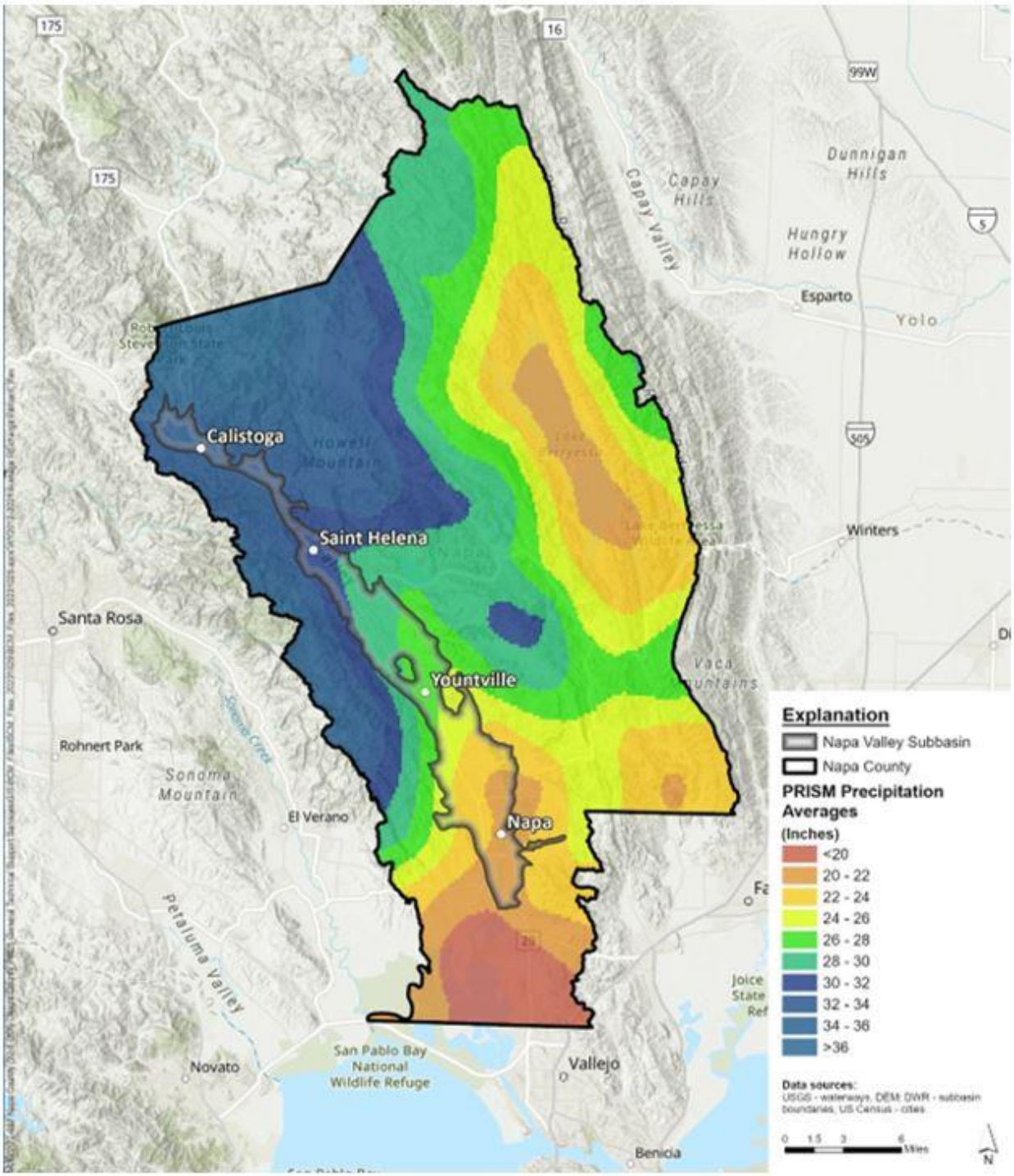

Figure 1-5. PRISM 10-Year Rainfall Average (2012 to 2021)

1.4.4.3 Land Use

The County has sought to intentionally preserve its agricultural lands and character. On April 9, 1968, the County created the first agricultural preserve in the United States. This statute launched a succession of progressive land-use policies to prevent the urbanization of agricultural and open-space lands in the fertile Napa Valley and foothill areas of the County. The Napa Valley Agricultural Preserve

district is a zoning designation in the County General Plan that sets a minimum parcel size of 40 acres. The agricultural preserve district classification is intended to be applied in the valley floor areas of the County in which agriculture is and should continue to be the predominant land use, where uses incompatible to agriculture should be precluded, and where the development of urban type uses would be detrimental to the continuance of agriculture and the maintenance of open space which are economic and aesthetic attributes and assets of the County. No land has ever been removed from the agricultural preserve. The County has managed to retain its prime vineyard lands in production. Figure 1-6 shows the distribution of the land use across the County.

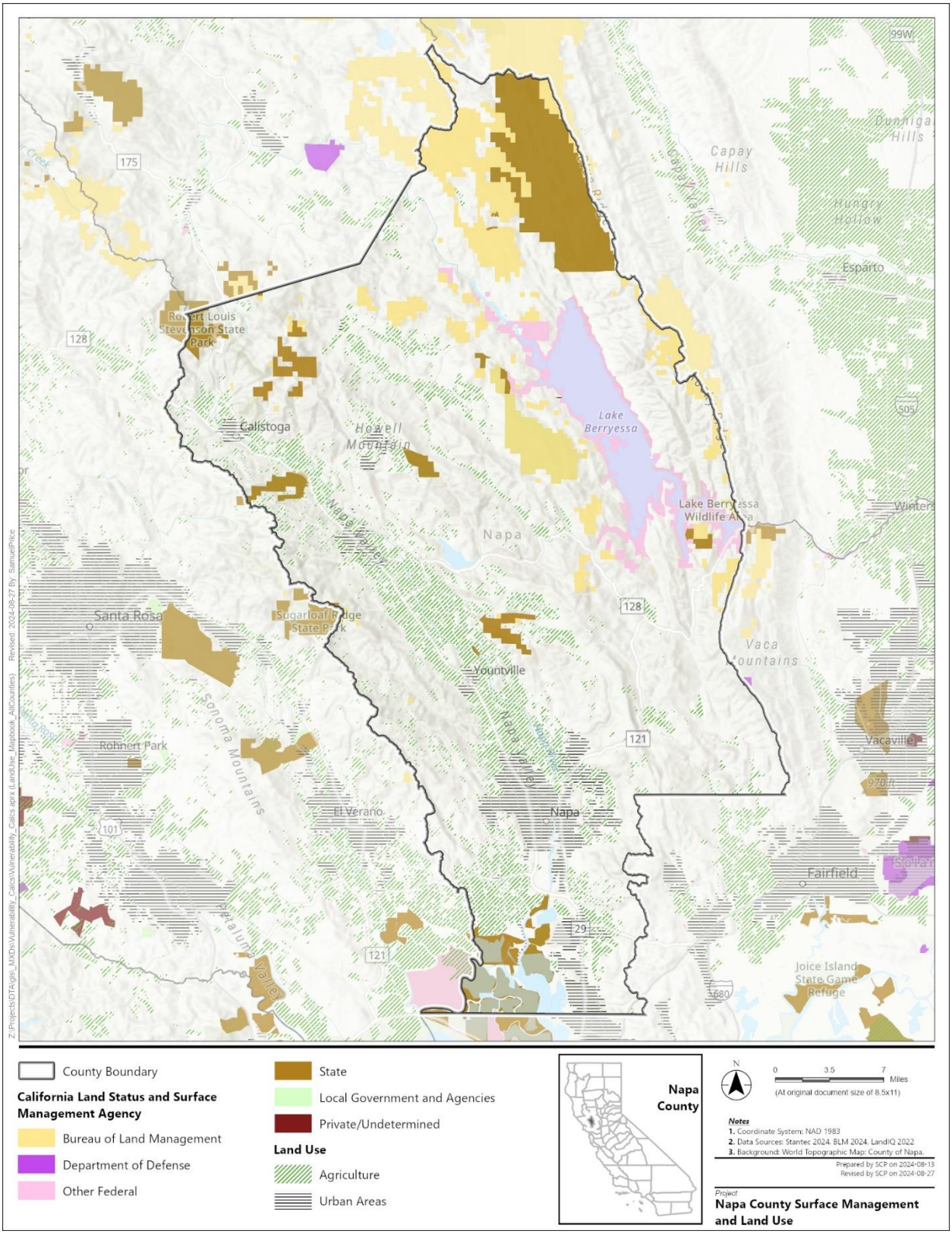

Figure 1-6. Land Use in Napa County

1.4.4.4 Soils

The County is known for its fertile soils, which have continued to support its renowned wine grape vineyards. Below is a list of soil types that occur within the County.

Bale Cole Yolo: This unit is found mainly in Napa Valley on flood plains and alluvial fans along the Napa River, Dry Creek, Conn Creek, and Napa Creek. Smaller areas are on the flats around Carneros south of State Route 12. This unit makes up about 6 percent of the County and contains some of the County's most productive soils. They are used for many kinds of wine grape vineyards and orchards.

Maymen-Lodo Felton: This unit is located in the Dry Creek-Oakville Grade area near Zim-Zim Creek west of Knoxville-Berryessa Road, and in the area due west of Spanish Flat around Lake Berryessa. It makes up 10 percent of the County. These soils are used for timber, wildlife habitat, recreation, and watershed maintenance. Some small grassy areas are used for cattle browse on a very limited basis.

Forward-Boomer-Felton: This unit is located on the uplands bordering Sonoma County, between Spring Mountain and Petrified Forest Road. It makes up about 8 percent of the County. These soils are used for timber, wildlife habitat, recreation, and watershed maintenance.

Bressa-Dibble-Subrante: This unit is located east, north, and northwest of Lake Berryessa. It also is found near Wooden Valley and south of Browns Valley. It makes up 29 percent of the County. These soils are used mostly for livestock grazing. Small areas of the more gently sloping soils are used for varietal vineyards and orchards.

Forward-Aken: This unit is found in the Angwin-Los Posadas Forest area. It makes up about 5 percent of the County. These soils are used mainly for timber. At lower elevations, some small areas are used for vineyards or orchards.

Rock Outcrop-Kidd-Hambright: This unit is found around Blue Ridge bordering Yolo County, in the Oat Hill-Palisade Ridge area in the northwestern part of the County, and in the Soda Canyon-Atlas Peak area. It makes up 9 percent of the County.

Tehama: This unit is mainly found in Pope Valley and on flats bordering the east side of Lake Berryessa. It makes up about 3 percent of the County. These soils are used mainly for pasture, some vineyards, and irrigated pasture.

Henneke-Montara: This unit is found in Butts Canyon south of Snell Valley around Cedar Valley and Adams Ridge west of Knoxville-Berryessa Road, and in Soda Valley. It makes up about 18 percent of the County. These soils are used for watershed maintenance, wildlife habitat, and recreation.

1.4.4.5 Bedrock Recharge and Hydraulic Conductivity

The County's complex geology can be grouped into three general geologic units based on the time and environment of deposition. The earliest geological units, with the greatest potential for groundwater recharge, include all the Quaternary alluvial deposits located primarily in the low-lying valley areas. The Tertiary units consist of volcanic and sedimentary deposits with a range of recharge potential less than alluvial deposits. Last are the Mesozoic units that are highly deformed with limited potential for groundwater recharge. Recharge throughout the County is in part controlled by the hydraulic conductivity of bedrocks. Using the Basin Characterization Model that was modified based on local geologic mapping, recharge estimates were determined on a sub-watershed basis across the County.

The following sections describe the generalized geologic units across the County and the approximate vertical hydraulic conductivity.

Quaternary Geologic Units

Quaternary alluvial deposits throughout the County consist of unconsolidated sediments transported by rivers and streams over the last 2.5 million years. These deposits include gravel, sand, silt, and clay which have been laid down in the alluvial basins across the County including Napa Valley, Pope Valley, Capell Valley, and the Berryessa Valley. The composition and distribution of these deposits are influenced by geology, climate, and hydrology, resulting in varied sediment layers that reflect changes in water flow over time. The deposits have been divided into recent Holocene deposits (last 100,000 years) and Pleistocene deposits (2.5 million years to 100,000 years). Holocene deposits include active stream channels, terraces, floodplains and alluvial fans. Pleistocene deposits include older terraces, alluvial fans, and older alluvium (Napa County GSP 2022) (Napa County 2024). Alluvial deposits are very porous and have greater potential for groundwater recharge compared to other bedrock types. Vertical hydraulic conductivities for the Quaternary units ranged from 0.7 to 1.6 feet per day.

Tertiary Geologic Units

Sonoma Volcanics are Tertiary-aged units range from 63 million years to 2.5 million years and consist of volcanic and sedimentary rocks. The most significant Tertiary rocks in the County are the Sonoma Volcanics which were deposited during the Pliocene, 5 to 2.5 million years. The Sonoma Volcanics consists of interbedded volcanic and sedimentary rocks. The volcanic rocks consist of lava flows, ash, and flow tuffs. These are exposed at the surface over large areas in the upper valley including groundwater management areas such as the Milliken-Sarco-Tulucay (MST) subarea. The Sonoma Volcanics have less potential for recharge compared to the alluvial deposits with a vertical hydraulic conductivity ranging from 0.0007 to 0.12 feet per day.

Other Tertiary rocks include the sedimentary deposits that have been divided into later Tertiary assemblages and early Tertiary assemblages. The late assemblages include sedimentary rocks in the Carneros, Conn Valley, and MST areas. These rocks have more limited surface exposure compared to the Sonoma Volcanics. Vertical hydraulic conductivity is approximately 0.05 feet per day. The early Tertiary assemblages consist of sedimentary rocks with some volcanics. Notable units include the Domingene and Markley Sandstones. Vertical hydraulic conductivity ranges from 0.001 to 0.02 feet per day.

Mesozoic Geologic Units

The oldest bedrock in the County is of Mesozoic age deposited during the Cretaceous and Jurassic Periods (>63 million years); it consists of well lithified and highly deformed rocks. These rocks are categorized as the Franciscan and Great Valley Complex. The Franciscan complex includes mélange, graywacke, and greenstone. It has limited surface exposure and is located outside Napa Valley in the high valley area north of Yountville. The Great Valley Complex, which consists of sandstones, shales, and serpentinite makes up most of the eastern portion of the County around Lake Berryessa. Both the Franciscan and Great Valley Complex have limited groundwater and have a vertical hydraulic conductivity of less than 0.007 feet per day.

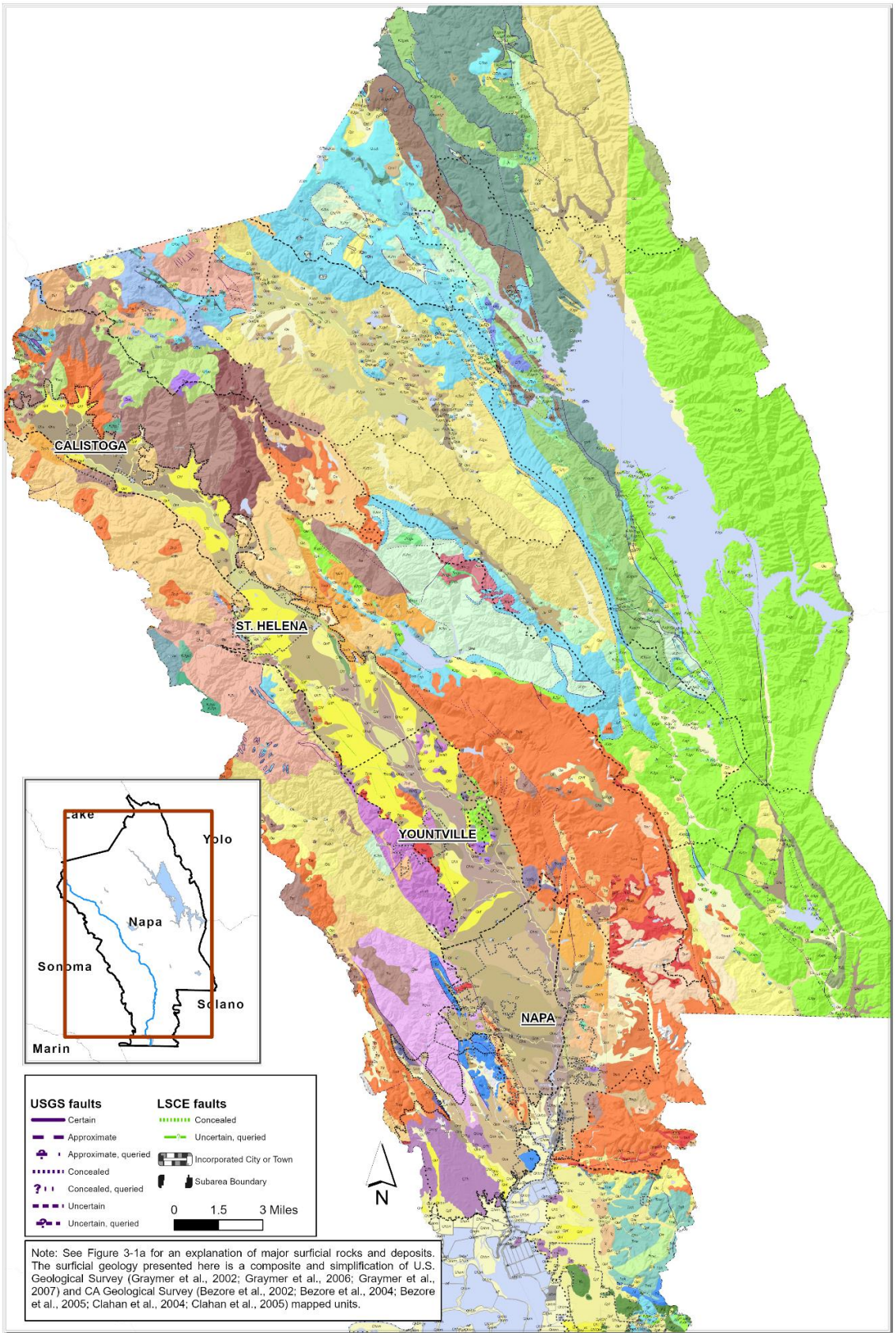

Figure 1-7. Regional Geology Based on Hydraulic Conductivity

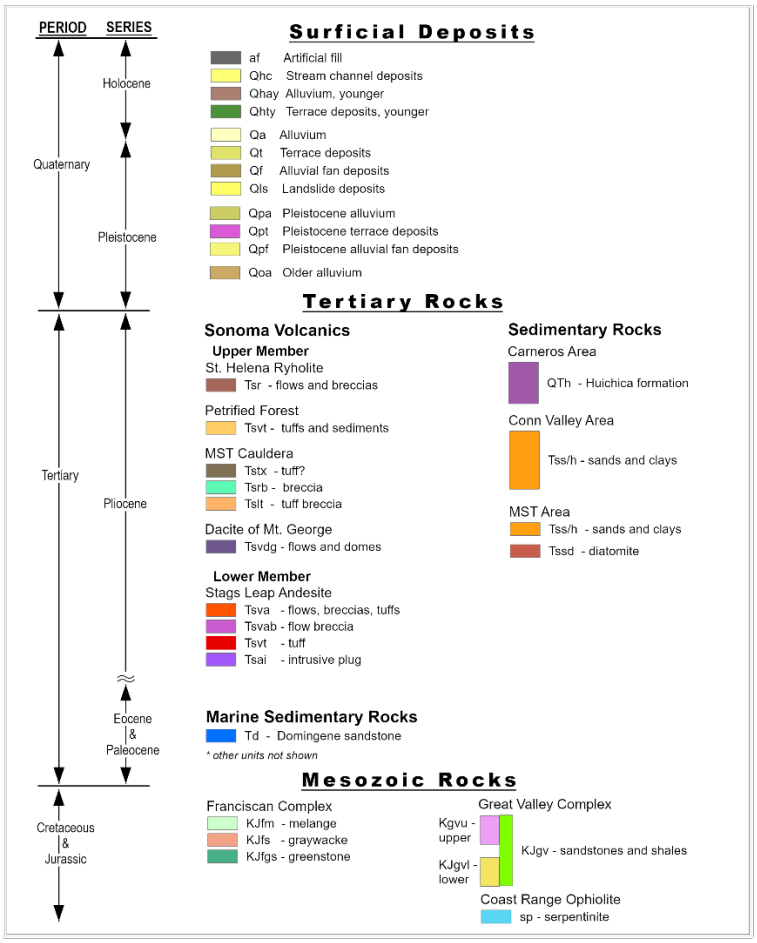

Figure 1-8. Napa County Rock and Deposits (Legend for Figure 1-7)

1.4.5 State Small Water Systems and Domestic Wells

Per the State legislation definition and according to the most current data available to the County, there are six SSWSs and 5,746 domestic wells in the County. One of the SSWSs is a winery, which opted for this water system designation, but does not serve any residential water users. For the purposes of this report, it will be disregarded.

County staff employed land-use data sets to interpolate parcels that are expected to have domestic groundwater wells. It was determined that, if a parcel within the County was designated to have residential or agricultural use outside of a municipal water service boundary, the parcel was assumed to rely on groundwater and to have at least one well on the parcel. County Geographic Information System (GIS) staff then attempted to verify and confirm these interpolated wells using County records to search for well permits at existing parcels and physical addresses. Where possible, County GIS staff used exact coordinates from the well completion reports, well permits or other relevant information from existing databases. Aerial photography was also used to map locations where possible. The count of the domestic wells includes wells permit pre/post 1977.

The five SSWS and the vast majority of domestic wells are located within the Napa River watershed. Approximately 5,156 of the domestic wells exist within the Napa River watershed where a majority of the population is concentrated. Figure 1-9 displays the locations of the three watersheds, SSWSs, and all known domestic wells. Figure 1-10 provides a further breakdown of the SSWS and their locations.

The five SSWSs are located in the northern to northwest region of the County. As previously mentioned, the domestic wells are scattered throughout the County and are primarily concentrated in the Napa Valley. Fewer domestic wells are located in the eastern foothills and mountain range. Table 1-1 provides the estimated wells located within each of the three watersheds. Table 1-2 provides details of the SSWSs in the County.

Table 1-2. Total Number of Domestic Wells by Watershed Within Napa County

Watershed	Domestic Wells
Napa River Watershed	5,156
Putah Creek Watershed	468
Suisun Creek Watershed	122
Total Wells	**5,746**

Table 1-3. State Small Water System Information

Public Water System ID	System Name	Population Served	Total Service Connections	Proximity to Public Water Systems
CA2800570	Palisades Ridge (Formerly 4410 Lake County Water System)	10	5	2.5 miles from the City of Calistoga water system.
CA2800724	Mapes Heights Mutual Water Co	10	5	0.2 miles from the City of Calistoga water system.
CA2802715	Jackson Family Investments Water System	24	6	0.45 miles from the Vailima Estates Mutual Water District
CA2803137	Mucho Dinero Aqua Cia Water	10	5	Within the service boundary of City of St. Helena
CA2803657	Woodland Ridge Mutual Water Co	18	14	Within the service boundary of City of St. Helena
CA2800078*	Seven Apart Winery	0	1	*

* Excluded from this report because they do not serve a residential population.

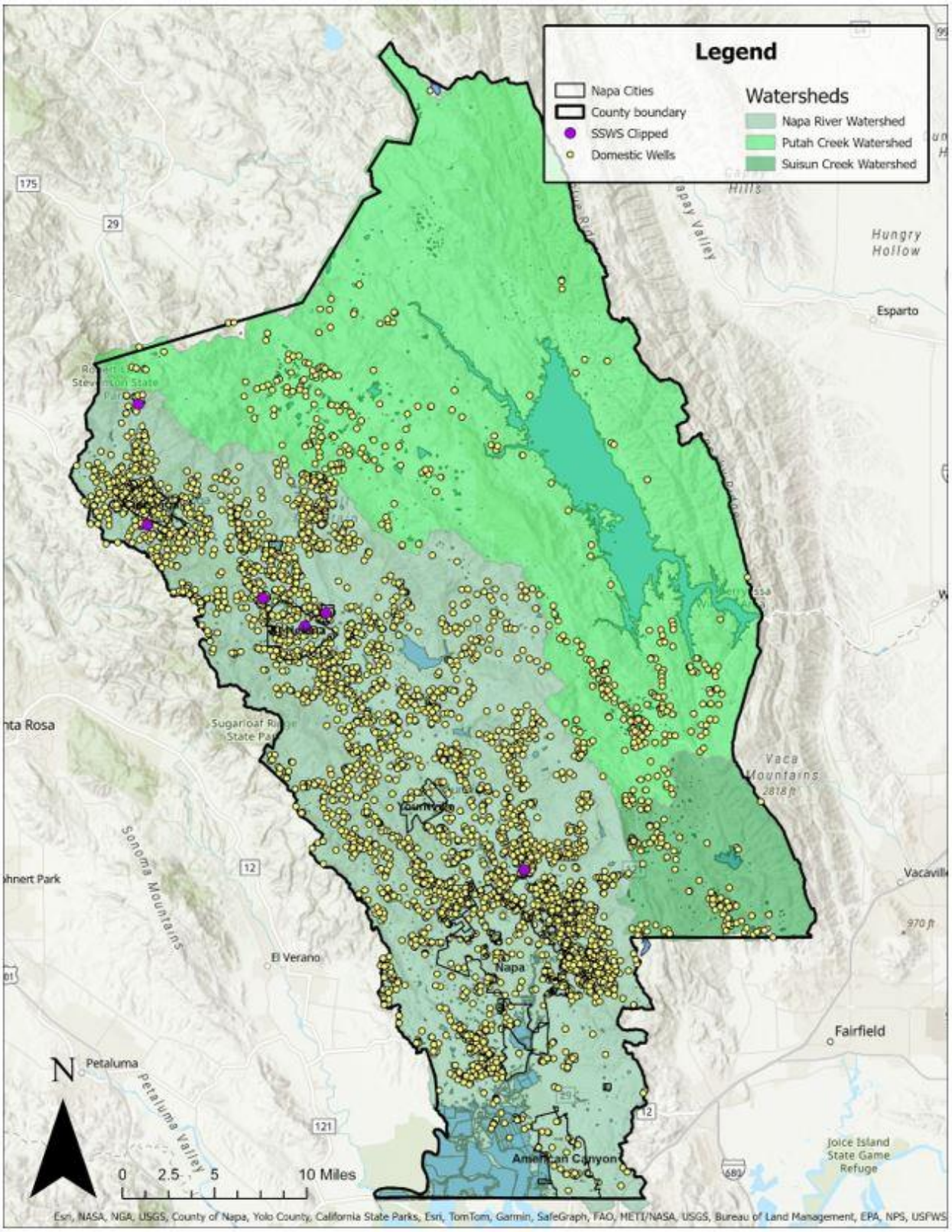

Figure 1-9. Napa County State Small Water Systems and Domestic Wells

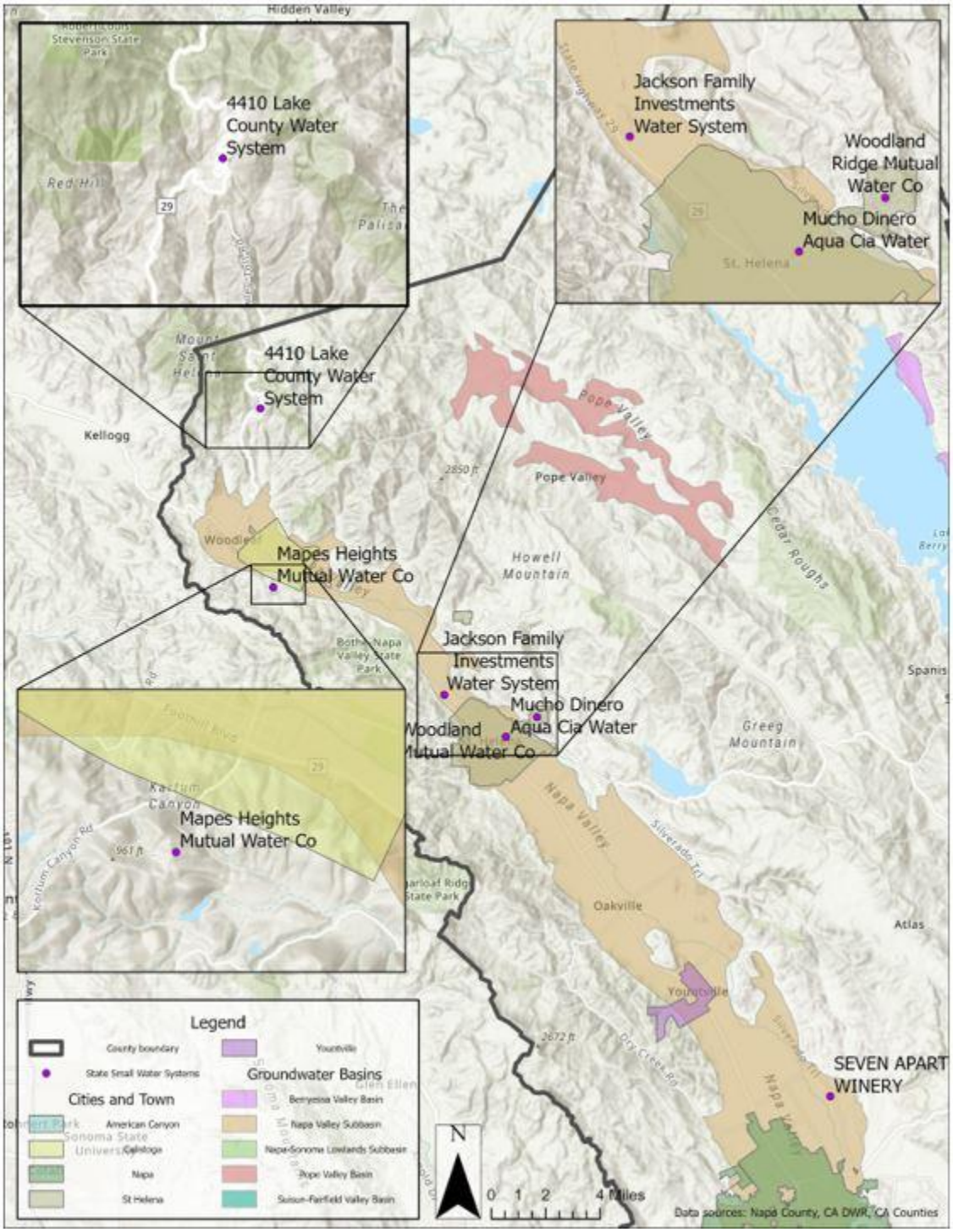

Figure 1-10. State Small Water Systems Locations

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2.0 County Drought and Water Shortage Task Force

In accordance with SB 552 requirements (CWC Section 10609.70), the County chose to establish a drought and water shortage task force:

> *a) (1) A county shall establish a standing county drought and water shortage task force to facilitate drought and water shortage preparedness for state small water systems and domestic wells within the county's jurisdiction, and shall invite representatives from the state and other local governments, including groundwater sustainability agencies, and community-based organizations, local water suppliers, and local residents, to participate in the task force.*

The County established a standing the Drought Water Shortage Task Force (DWSTF), referred to as Task Force, that facilitates drought and water shortage preparedness for SSWSs and domestic wells within its jurisdiction.

The Task Force was established, and bylaws were adopted by the Board of Supervisors (BOS) on December 13, 2021, by resolution 2021-147. Conducted in compliance with the Ralph M. Brown Act (California Government Code Section 54950), the Task Force is comprised of members of the pre-existing Watershed Information and Conservation Council (WICC) plus six additional members appointed by the BOS. The six additional members include representatives of the Napa County Flood Control and Water Conservation District, the California Department of Water Resources (DWR), the Napa County Planning, Building, and Environmental Services Department's Division of Environmental Health, and three public-at-large members representing local water suppliers and/or residents who rely on individual wells for drinking water. Though not an official Task Force member, a representative of the Napa County Office of Emergency Services also participates in Task Force meetings. The WICC is a long-standing committee established by the BOS in 2002. Their purpose is to provide watershed information and education, and to guide and support community efforts to maintain and improve the health of the County's watershed lands by coordinating and facilitating partnerships among the individuals, agencies, and organizations involved in improving watershed health and restoration. Task Force meetings and meeting notifications are staffed and facilitated by staff of the Napa County Department of Planning, Building and Environmental Services (PBES).

The first meeting of Task Force was held on April 28, 2022. During their second meeting on May 20, 2022, the first action taken was to form an Ad Hoc Subcommittee to deliberate and guide the development of the plan. Meetings are held in the chambers of the County BOS and are open to the public. Agendas are posted no less than 72 hours in advance of each session meeting through a public email listserv that is subscribed by approximately 850 individuals and organizations. The Ad Hoc Subcommittee held eight meetings to develop the County DRP.

Table 2-1 below shows the name and affiliation of each of the DWSTF members and the selected Ad Hoc Subcommittee members.

Table 2-1. Drought and Water Shortage Task Force and Ad Hoc Subcommittee

Organization	Representative	DWSTF	Ad Hoc Subcommittee
Napa County BOS, WICC	Anne Cottrell	X	X
Napa County BOS, WICC	Alfredo Pedroza	X	
Napa County OES	Angel Hernandez	-	Reviewer Only
Napa County Parks and Open Space District, WICC	Barry Christian	X	
City of Napa Councilmember, WICC	Bernie Narvaez	X	
WICC	Bill Pramuk	X	
Napa County Groundwater Sustainability Agency	Brendan McGovern	Staff	
Napa County PBES	Brittany Urquhart	X	X
California DWR	Chelsea Spier/designee	X	X
WICC	David Graves	X	X
City of American Canyon Councilmember, WICC	David Oro	X	
Public At Large	Delia Viader	X	X
Town of Yountville Vice Mayor, WICC	Eric Knight	X	
Natural Resource Conservation Service, WICC	Evelyn Denzin	X	
Planning Commission, WICC	Heather Phillips	X	
Napa County Groundwater Sustainability Agency	Jamison Crosby	Staff	
WICC	Jason Lauritsen	X	
WICC	Kimberly Richard	X	
City of Calistoga Councilmember, WICC	Lisa Gift	X	
Public At Large	Mark Perkins	X	X
Winegrowers of Napa County, WICC	Michelle Benvenuto	X	
WICC	Pamela Smithers	X	
City of St. Helena Councilmember, WICC	Pat Kenealy	X	
Napa County Flood Control and Water Conservation District	Richard Thomasser	X	X
Napa County BOS, WICC	Ryan Gregory	X	
Public At Large, Howell Mountain Mutual Water Company	Tanner Hiers	X	X
Napa Land Trust, WICC	Tosha Comendant	X	X

Key:
BOS = Napa County Board of Supervisors
DWR = California Department of Water Resources
OES = Napa County Office of Emergency Services
PBES = Napa County Planning, Building, and Environmental Services Department
WICC = Watershed Information and Conservation Council

Development of the County DRP and the activities of the Ad Hoc Subcommittee were led by County staff from the Napa County PBES in collaboration with a team from Stantec Consulting Services Inc. whose services were provided to the County through a grant of direct technical assistance provided by DWR. Following the acknowledgment from the Napa County BOS of the County DRP, the Task Force will remain a standing task force as required by the SB 552. The Task Force will meet at a minimum, annually or as necessary to implement the plan or if the County or State of California declares a drought emergency.

The draft and final versions of the County DRP were distributed along with the agendas and meeting materials for the Task Force and Ad Hoc Subcommittee meetings. This included the Napa County BOS

meeting when the County DRP was brought forward to the board for acknowledgement and acceptance on the BOS board meeting on December 17th 2024. Napa County will decide to adopt the DRP at a later time to facilitate any potential funding that requires an adopted plan. The final County DRP will be posted on the Napa County website and disseminated to the public email listserv.

County PBES will continue to work with the BOS, State and County representatives, and other interested parties, as necessary, to implement the County DRP. This coordination will include coordination with the Napa County Office of Emergency Services (OES) and the California OES.

3.0 Drought and Water Shortage Risk Vulnerability Assessment

To develop a drought resilience plan as directed in CWC Section 10609.70(b), a Drought and Water Shortage Vulnerability Assessment (Risk Assessment) is a crucial component of the County DRP. A risk assessment evaluates how potential hazards intersect with the County's vulnerabilities to impact community assets that create a water supply shortage. By assessing the potential vulnerabilities, the County identified short-term response actions and long-term mitigations strategies and actions that mitigate these vulnerabilities to improve the overall water supply reliability and sustainability. This chapter presents the vulnerability assessment results for the County. The risk assessment within the DRP do not replace the regulatory requirements of the Federal Emergency Management Agency (FEMA). The DRP will improve the County's eligibility for FEMA's Pre-Disaster Mitigation and Hazard Mitigation Grant programs. However, if a jurisdiction also seeks approval of the drought and water shortage risk assessment within their local hazard mitigation plan, it will follow the requirements outlined in the FEMA Local Mitigation Planning Handbook (LMPH) (FEMA 2013) At the time of development, California DWR opted to structure the County Drought Resilience Plan Guidebook on the terminology and concepts identified in the 2013 version of the FEMA LMPH. Although the County is aware of the updated 2023 version of FEMA's LMPH, the new version's concepts and terminology are not fully compatible with the focus areas addressed in this County DRP.

3.1 Concepts and Terminology

The risk and vulnerability assessment adapted the following definitions from the FEMA LMPH (FEMA 2013) within the context of drought and water shortage planning:

Hazard: Source of harm or difficulty created by a meteorological, environmental, geological, other event, or hydrological and/or other environmental conditions. In the context of SB 552, hazards are the natural, human-made, and social processes that can lead to water shortages in the County.

Community Assets: The people, structures, facilities, and systems that have value to the community. The minimum assets considered as part of the SB 552 DRP must include SSWSs and domestic wells and populations reliant on these water supplies.

Vulnerability: Characteristics of community assets or population that make them susceptible to damage from a given hazard. It includes both physical vulnerability and social vulnerability.

Impact: The consequences or effects of a hazard related to drought and water shortages on the community and its assets.

Risk: The potential for damage, loss, or other impacts (e.g., fire risk) created by the interaction of natural hazards (i.e., climate change) with community assets and their physical and social vulnerabilities.

Vulnerability Assessment: Product or process that collects information and assigns values to vulnerability indicators for the purpose of informing priorities, developing, or comparing courses of action, and informing decision-making.

3.2 Risk and Vulnerability Assessment Approach

The nature and severity of drought and water shortage hazards differ widely both on a regional basis and within a county due to variations in precipitation patterns, the hydrogeologic setting, infrastructure, and regulatory frameworks. Communities are impacted unequally, with those lacking access to reliable water sources facing the brunt of the consequences. A drought risk and water shortage vulnerability

assessment that considers environmental (including geologic conditions), hydrological, and social factors is essential for developing effective mitigation strategies and ensuring equitable water distribution during periods of scarcity. Identifying major hazards in the County and the level of imposed drought risk associated with each hazard is important for preparedness and community resilience against drought. A water shortage vulnerability scoring method and tool are used for this analysis to determine the relative physical and social vulnerabilities to drought in the County.

3.2.1 Scope

Domestic wells and SSWSs are vulnerable to drought and water shortage events due to a combination of physical environmental and socioeconomic factors. For this reason, SB 552 requirements specifically encompass domestic wells and SSWSs. As such, the scope of the DRP water shortage vulnerability assessment is, at a minimum, to determine the vulnerability of these wells to various hazards and help the County plan to protect those reliant on SSWSs and domestic wells. The methodology used in the vulnerability assessment includes all areas within the County, but the assessment focuses on domestic wells and SSWSs locations (Figure 1-4). In total, there are 5,746 identified domestic wells and six SSWSs within the County.

3.2.2 Methodology

The Ad Hoc Subcommittee led by Napa County PBES used a GIS-based approach to identify areas of physical and social vulnerability throughout the County. This approach was presented and discussed with the Task Force for their input. To begin the discovery process, County GIS staff mapped all known wells within the County and cross-referenced them with DWR's well completion report database to match well locations with parcels and addresses. County staff employed land-use data sets to interpolate parcels that are expected to have water wells. It was determined that, if a parcel within the County was designated to have residential or agricultural use outside of a municipal water service boundary, the parcel was assumed to rely on groundwater and to have at least one well on the parcel. County GIS staff then attempted to verify and confirm these interpolated wells using County records to search for well permits at existing parcels and physical addresses. Where possible, County GIS staff used exact coordinates from the well completion reports, well permits or other relevant information from existing databases. Aerial photography was also used to map locations where possible. With this newly created domestic well layer, the County used a GIS-based approach to conduct its vulnerability assessment.

DWR had also developed the Water Shortage Vulnerability Tool platform[1], which is an interactive GIS-based tool to assess groundwater vulnerability across numerous physical and social characteristics. The tool uses data collected from a variety of sources that are available to planners to apply within the tool or to download for use in their own GIS. The tool allows users to download each individual vulnerability layer and manipulate it as needed. In addition to numerous useful reference layers containing data of known well completion depths, water system boundaries, and other groundwater related data, there are 16 physical vulnerability characteristic layers. These layers vary in physical vulnerability type that were compiled by DWR. The physical vulnerability scores and contributing information were reviewed and updated based on County-specific information. Specific data applied by the County to the DWR model included additional groundwater elevation data, review of geologic setting, and assessing 10-year normal rainfall averages as opposed to 30-year normal. Each physical vulnerability type assigns a

[1] https://dwr.maps.arcgis.com/apps/webappviewer/index.html?id=b20d1b8b751c42f9a067a915544e512c&extent=-13907991.0652%2C4418196.9081%2C-13092866.5956%2C4811388.9816%2C102100

vulnerability score to an individual Public Land Survey System (PLSS) section, which represents a single square mile. Such modifications are shown in Table 3-1.

Table 3-1. Physical Vulnerability Indicators and County-Specific Modifications

Indicator Name	Indicator Description	County-Specific Modification
Climate Change		
Temperature Shift (RC1a)	Projected change in max temperatures by midcentury	No change
Saline Intrusion Projected (RC1b)	Spatial extent of projected 1 meter sea level rise by 2040 into coastal aquifers	No change
Wildfire Risk (RC1c)	Projected area burned by 2035–2064	No change
Current Environmental Conditions and Events		
Current Dry Year, 2022 (RC2a)	If 2022 precipitation was less than 70 % of normal	Use of 10-year normal to better assess conditions. Use of precipitation in the alluvial valleys, use recharge estimates in fractured-rock area.
Consecutive Dry Years (RC2aa)	Count of dry years within the last five years	Modified to three-year timeframe to better account for how quickly Napa County responds to drought conditions.
Wildfire Risk (RC2b)	CalFire Hazard Score	No change
Geology (RC2c)	Fractured-rock basin within the PLSS	Removed areas with less than 50 feet of alluvium as well as shallower alluvial basins.
Water Quality Aquifer Risk (RC2i)	SAFER Needs Assessment 2022 water quality composite score	No change
Subsidence (RC2d)	Amount of subsidence as measured by remote sensing	Amount of recorded subsidence is within the accuracy of InSAR and there is no geologic evidence of groundwater pumping based subsidence, set to zero.
Basin Salt (RC2e)	Presence of saltwater intrusion into coastal aquifer	No change
Overdrafted Basin (RC2f)	SGMA critically overdrafted groundwater basin	No change
Chronic Declining Water Levels (RC2g)	Amount of declining groundwater levels between 2019–2022	Updated to use Fall 2019 to Fall 2022 groundwater elevation raster.
Surrounding Land Use (RC2j)	Proportion of irrigated agriculture in PLSS	No change
Infrastructure Susceptibility		
Dry Domestic Well Susceptibility in basins (RC3a)	Dry well susceptibility	Updated based on updated well layer and updates to RC2g.
Domestic Well Density in Fractured-Rock Areas (RC3c)	Density of Well Completion Reports	Updated based on updated well layer and count of wells within 500 feet of another well.
Record of Shortage		
Reported Household Outage on Domestic Well	Presence of one or more households with reported outages in PLSS	No change

Key:
CalFire = California Department of Forestry and Fire Prevention
PLSS = Public Land Survey System
SAFER = Safe and Affordable Funding for Equity and Resilience
SGMA = Sustainable Groundwater Management Act

The County-modified physical vulnerability characteristics are combined into a single layer, which proves useful for conducting the vulnerability assessment. This combined physical vulnerability layer uses a weighting factor to each of the vulnerability indicators. This weighting factor was developed by DWR through an ad hoc group comprised of State and local agency staff (DWR 2023). The indicators and the weighting factor varied slightly based on whether a groundwater basin exists within a fractured-rock area or an alluvial basin. The weighting factor for the two types of physical characteristics can be seen in Figure 3-1. It is important to note that the DWR ad hoc group weighted the physical indicator perceived to be particularly important to domestic well owners and SSWSs reliant on groundwater.

The equation for the alluvial basin score is:

[rRC1a_Temperature_Change] + [rRC1b_Sea_Level_Rise] +
[rRC1c_Wildfire_Projections] + 2*[RC2a_Current_Dry_Year]+
2*[rRC2aa_Multiple_Dry_Years]+ 3*[rRC2b_calfire]+3*[
rRC2i_SWRCB_Water_Quality_Ris] + 3*[rRC2e_Saltwater_Intrusion] + 3*[
rRC2j_Percent_Farmed_Score]+ 2*[rRC2f_Critically_Overdrafted]+ 2*[
rRC2d_Subsidence] + 3*[rRC2g_Groundwater_Decline]+
5*[rRC3a_Well_Susceptibility]+ 5*[rRC5a_Household_Water_Outage]

The equation for the fractured rock area score is:

[rRC1a_Temperature_Change] + [rRC1b_Sea_Level_Rise] +
[rRC1c_Wildfire_Projections] + 2*[RC2a_Current_Dry_Year]+
2*[rRC2aa_Multiple_Dry_Years] + 3*[rRC2b_calfire]+3*[RC2c_Fractured_Rock_Area]+
3*[rRC2i_SWRCB_Water_Quality_Ris] + 3*[rRC2e_Saltwater_Intrusion] + 3*[
rRC2j_Percent_Farmed_Score]+ 5*[rRC3c_FRA_Dry_Wells]+
5*[rRC5a_Household_Water_Outage]

Source: DWR 2023

Figure 3-1. Physical Vulnerability Weighting Factor Applied to Alluvial Basin and Fractured-Rock Area

Similar to the physical vulnerability characteristics, the DWR tool contains social vulnerability layers. These layers can also be selected individually or combined into a single layer containing the 11 social vulnerability indicators aggregated to the U.S. Census-block level in a single layer. To ensure that no single social vulnerability factor is treated more importantly than another, the combined social vulnerability layer applies an equal weight to each social vulnerability factor. This leads to a single layer at the U.S. Census-block level that contains a score between 0 and 100. The social vulnerability factors included in the combined layer with their sources can be found in Table 3-2. Social vulnerability indicators were not modified from the DWR Water Shortage Vulnerability Tool.

Table 3-2. Social Vulnerability Indicators

Indicator Name	Indicator Description
Per Capita Income	Average per capita income
Median Household Income	Average Median Household Income
Percent of Population Living in Poverty	Percentage of population living under 2x the federal poverty level
Percent Persons 65 Years of Age or Older	Percentage of population of 65 and older
Percent Persons 5 Years of Age or Younger	Percentage of population of under 5 years of age
Percent of Mobile Homes	Percentage of mobile households out of total households
No Vehicles Available	Percentage of households with no vehicles out of total households
Percent Persons without High School Diploma	Percentage of population over 25 years of age with no high school diploma out of total population over 25 years
Percent of Population with Single Parent	Percentage of population with single parents with children under 18
Percent of Population Unemployed	Percentage of population of civilian unemployed
Percent of Population Who Speak English Less than Well	Percentage of population who speak English less than well

The results of the physical vulnerabilities are shown in Figure 3-2 where warm-colored shades (oranges and reds) indicate areas with higher physical vulnerability. This figure informed the County where short-term response actions and long-term mitigation strategies/actions are most likely to be considered. The figure also shows the PLSS sections ranked from least to most vulnerable according to their physical vulnerabilities.

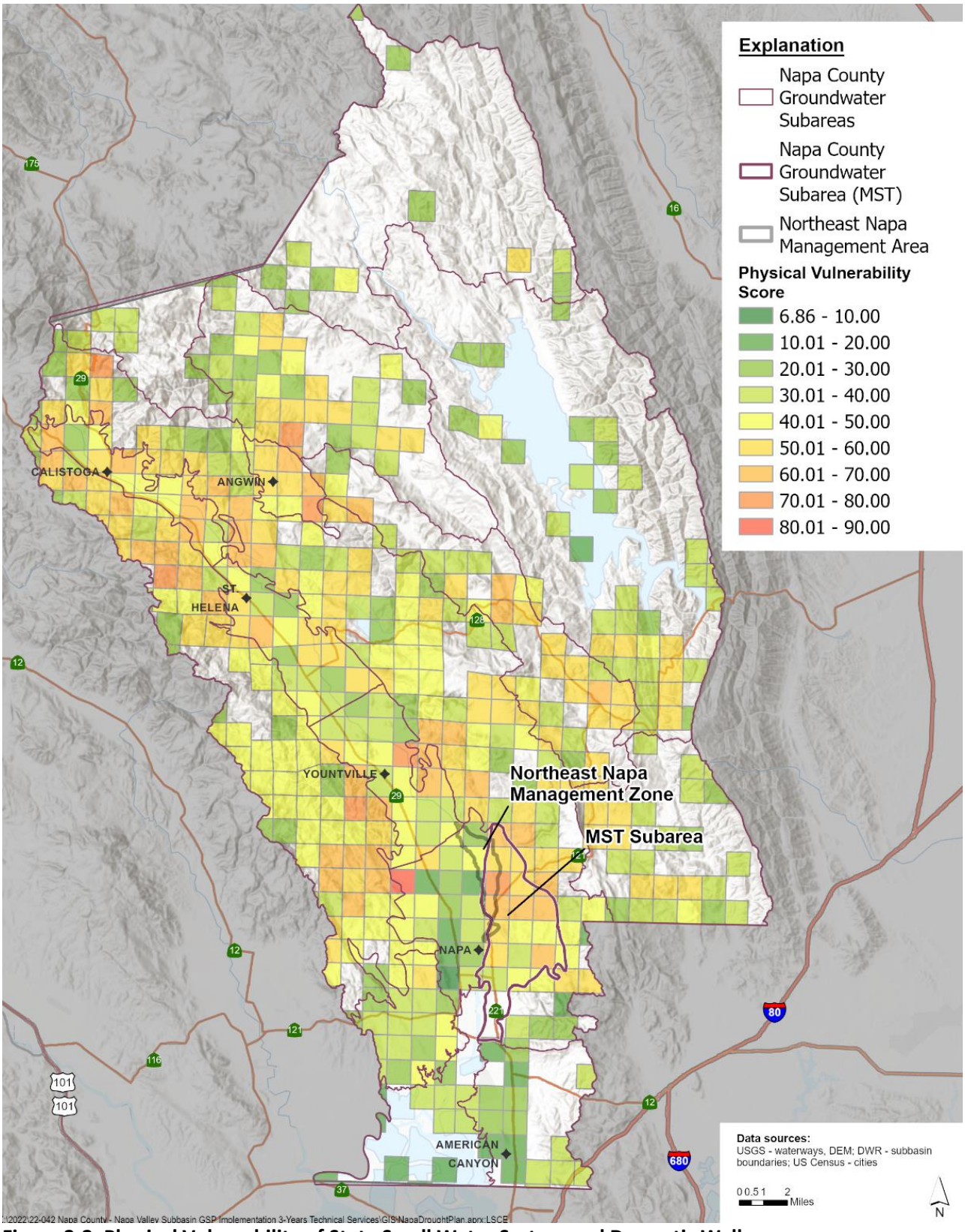

Figure 3-2. Physical Vulnerability of State Small Water System and Domestic Wells

Understanding social vulnerability is crucial for managing water shortage risks in SSWSs and domestic wells. Social vulnerability encompasses socioeconomic, demographic, and community factors that affect a population's ability to cope with environmental hazards like water shortages. The County assessed the social vulnerabilities to accurately identify water shortage risks and develop effective mitigation strategies.

By considering social vulnerabilities, the County will better protect at-risk populations from water shortages. Figure 3-3 illustrates this concept, showing social vulnerabilities scores in areas containing SSWSs and domestic wells. On this map, warmer colors indicate higher vulnerability.

The social vulnerability layer already contained an overall social vulnerability score ranked between 0 and 1. County staff converted the polygon layer to a raster layer and assigned the social vulnerability score to the raster layer.

Next, to bring in knowledge of the domestic wells within the County, County staff filtered the wells that contain the term “domestic” in the well category or well-use column. It is important to note that numerous parcels across the County could have multiple water-use types assigned to them (i.e., a vineyard with a residence might have both an irrigation and domestic-use designation). A density calculation was performed on the well layer assuming that wells within 500 feet of each other could have an impact on one another. The layer was summed to the PLSS to have the total number of wells that were located within 500 feet of another well. This density was used to estimate the well density within the vulnerability assessment. See Figure 3-4 below.

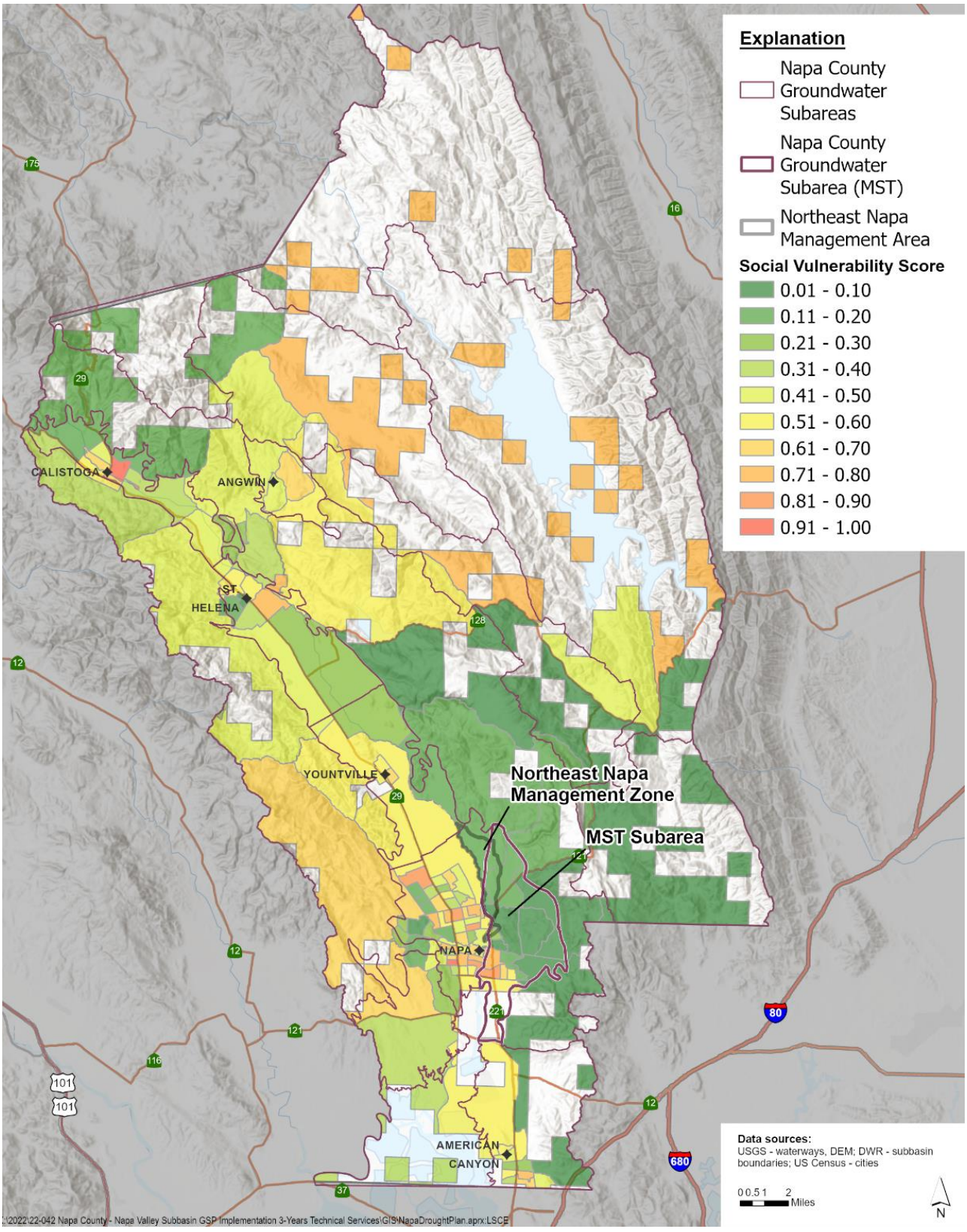

Figure 3-3. Social Vulnerabilities in Areas Containing State Small Water Systems and Domestic Wells

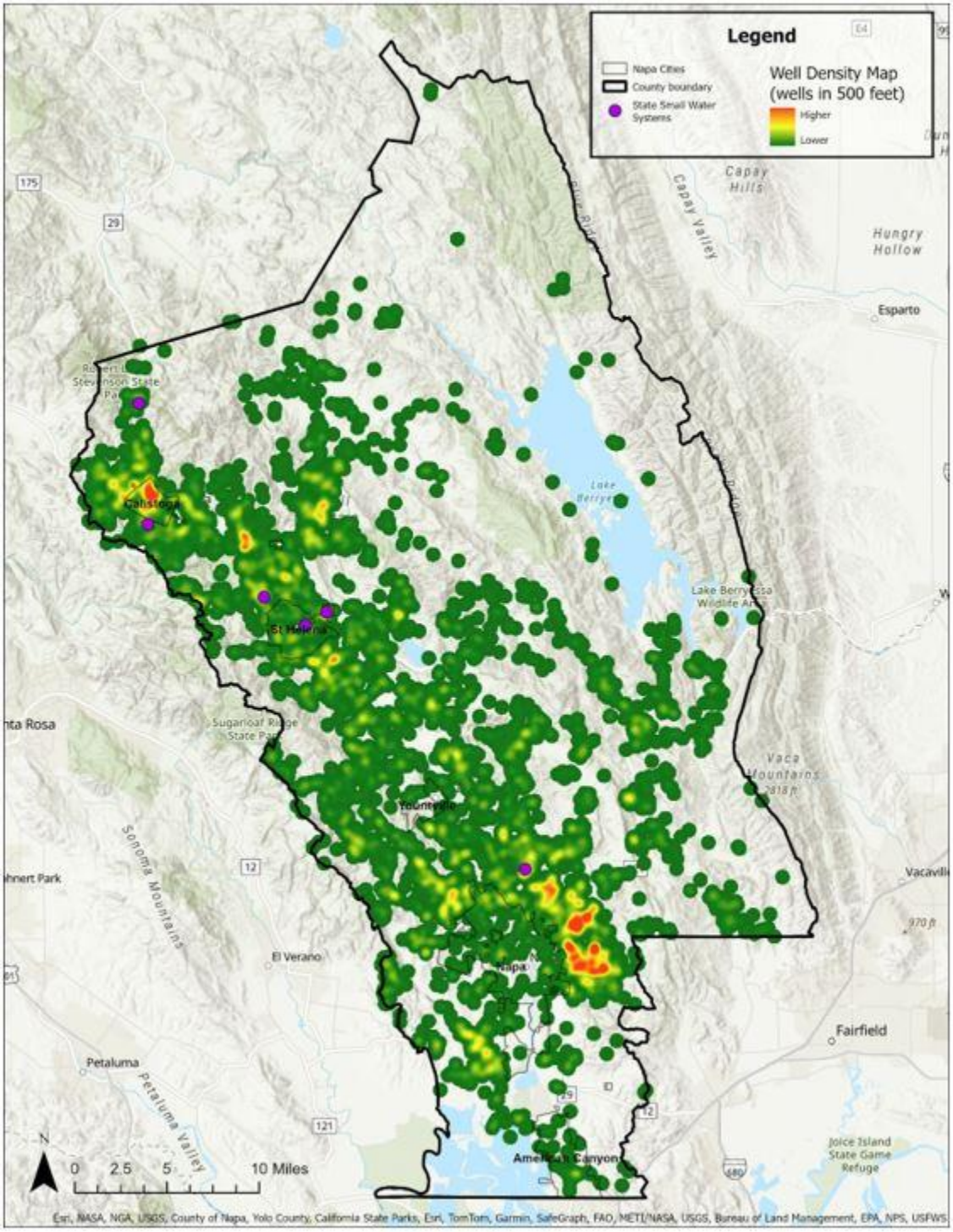

Figure 3-4. Domestic Wells Density

3.2.3 Areas with Vulnerabilities Within Napa County

The Risk Assessment summarized where water shortages affecting domestic wells and SSWSs will be more likely to occur. This section evaluates in more detail the physical vulnerabilities driving water shortage vulnerability. Identifying and characterizing these drivers of physical vulnerability will help the County understand the most effective short-term response actions and long-term mitigation

strategies/actions and their associated implementation. Table 3-1 summarizes the physical vulnerability indicators within the County.

The vulnerability assessment identified several regions of concern that warranted careful consideration by County staff. The areas highlighted as most vulnerable include:

- The MST Subarea region east of the City of Napa
- Northwest – City of Napa
- Northeast Napa Management Area (NENMA)
- City of Calistoga, City of St. Helena, and Angwin Area
- Putah Creek Watershed
- Mountaintop areas outside the alluvial basin
- Southern parts of the County, including the Carneros and American Canyon areas

Figure 3-5 shows these regions in detail. Each of these areas is discussed in detail below, highlighting their specific vulnerabilities and characteristics.

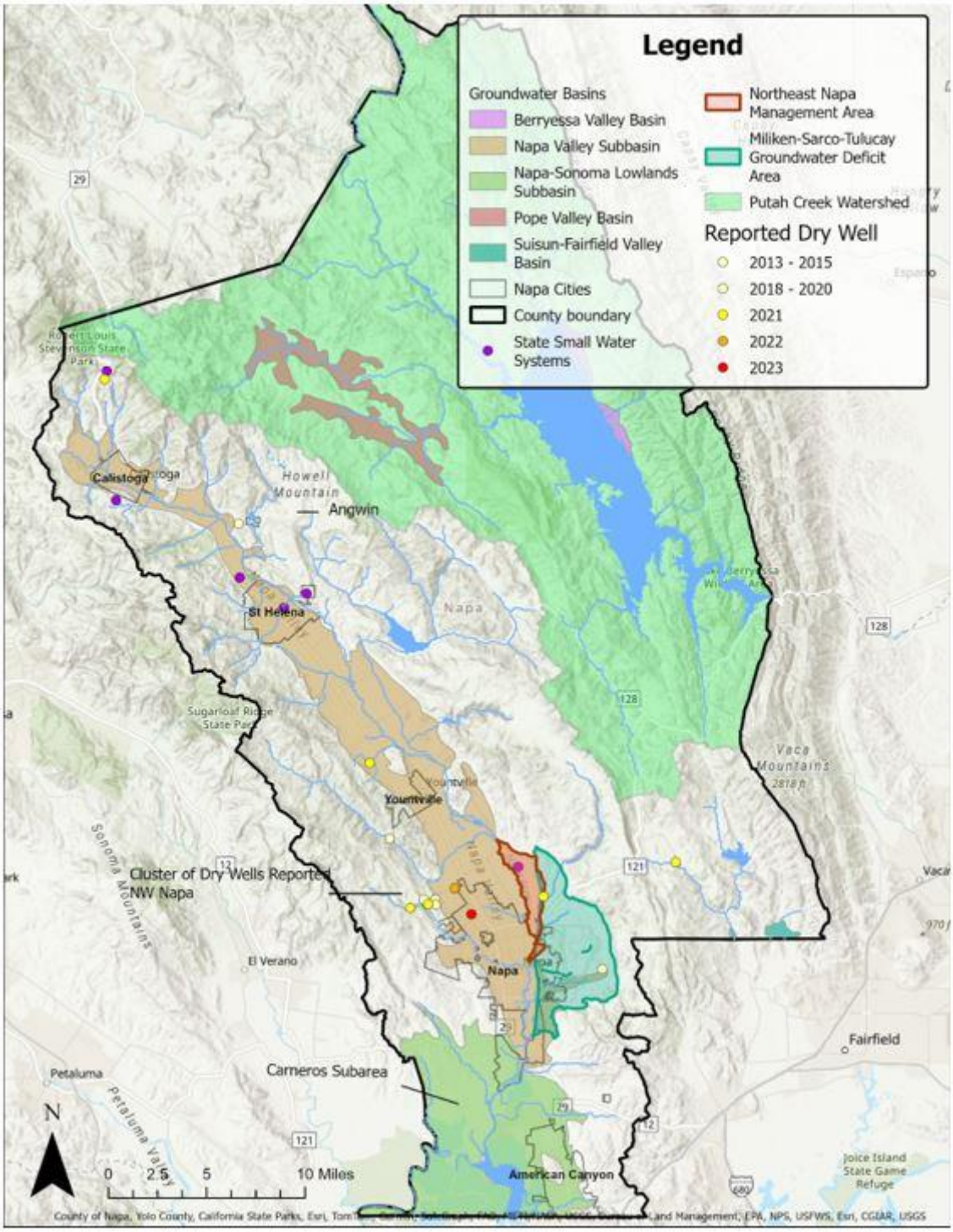

Figure 3-5 Regions of Concern for Future Vulnerability.

3.2.3.1 Milliken-Sarco-Tulucay Subarea Area

The MST subarea exists on the eastern side of the City of Napa east of the Napa River predominantly outside the Napa Valley Subbasin with approximately 2,000 of the total 11,000 acres falling within the Subbasin, and contains numerous homes, vineyards, wineries, and golf courses. This subarea has been designated as a groundwater-deficient area by the County. Therefore, the County requires additional regulations and review requirements for groundwater permit applications to avoid further impacts to

groundwater uses and groundwater levels in the subarea. The approach for groundwater permits has been "no net increase" for existing uses and "fair share" for new uses. In the MST, the aquifer system is composed primarily of Sonoma Volcanics and the associated Tertiary sedimentary deposits. The presence of these geologic formations combined with numerous faults limit the connection of the MST to the alluvial aquifer basin that runs the length of the Napa Valley floor, known as the Napa Valley Subbasin. This combination of geologic factors and development pressure have led to groundwater level declines, which have been observed in the MST as early as the 1960s and 1970s but stabilized around 2009. Following a dry period from 2012 to 2014, water levels were again in decline until spring 2023 (LSCE 2024). Groundwater level responses differ within the north, central, and southern sections of the subarea, indicating localized conditions. Groundwater levels correlate with precipitation and groundwater management practices. In 1999, the County adopted Groundwater Conservation Ordinance 1162 to limit pumping in the subarea. In 2016, the Napa Sanitation District constructed a 5-mile recycled water pipeline to provide access to recycled water for irrigation. Business, residents, and irrigators along the pipeline can purchase recycled water to reduce groundwater extraction and provide additional water reliability. Recycled water is used to irrigate golf courses, vineyards, landscaping, pastureland, parks, playing fields, and a cemetery. The 5-mile MST recycled water pipeline was constructed to provide up to 700-acre feet of water annually. In 2023, which is characterized as a wet year, recycled water usage totaled 208 AF and depends on water year type (Napa Sanitation District, 2024).

3.2.3.2 Northwest of City of Napa

This region just outside the northwest limits of the City of Napa has numerous domestic wells and large vineyards. Eight wells were reported to this region's dry well reporting system between July 2013 and September 2023. Three of the dry well reports overlay the alluvial subbasin and five reports are in fractured rock areas. The water issues reported through this system include a reduction in water pressure; lower flows; intermittent availability of creek, stream, spring or other surface water source; and well is dry (no longer producing water). The hillside residents have reported trucking in water, installation of additional water tanks, and using water sparingly or living without. Valley floor residents reported trucking in water, getting water via hose from neighbors, and a lack of financial resources to resolve the issue. The most recent dry well reported to DWR occurred on September 15, 2023. The residents reported a reduction in water pressure beginning approximately May 24, 2023, and cited financial constraints to resolving the issue. DWR notified PBES staff and staff members subsequently contacted the resident to provide resources to potentially address issues with their well.

3.2.3.3 Northeast Napa Management Area

The NENMA is a small area northeast of the City of Napa. This region is characterized by agriculture, wineries, and rural residential housing. It is situated along 6 miles of the east bank of the Napa River and is adjacent to the MST. The NENMA area covers approximately 1,968 acres within the Napa Valley Subbasin. In 2017, NENMA was designated as a management area in the Napa Valley Subbasin to better implement projects and management actions pursuant to the Sustainable Groundwater Management Act and to further study local groundwater conditions (LSCE 2017, 2018). Two tributaries to the Napa River cross the NENMA: Milliken Creek and Soda Creek. There are two main faults: East Napa Fault Zone and the Soda Creek Fault (LSCE and MBK 2013). Similar to the MST, the presence of numerous faults and fractured rocks limit the capacity of the groundwater basin, leaving this region vulnerable to groundwater depletion.

Several domestic wells within the NENMA exist along Soda Creek, which crosses the Soda Creek Fault. Residential homes along Petra Drive between the Napa River and Silverado Trail have seen water level declines. The County monitors two domestic wells for static water level along Petra Drive. Water levels are measured once per month at one well and twice per year (mid-October and mid-March) at the other. These voluntary residential wells have been in the County Monitoring Program for over a decade. To monitor groundwater levels and assess fluctuations, the NCGSA installed a dedicated dual completion groundwater monitoring well on Petra Drive in Fall 2023. The dual completion monitoring well collects hourly data on groundwater levels in both the shallow subsurface and deeper water table intended to assess how surface water conditions affect groundwater infiltration and recharge. This monitoring effort is intended to study how groundwater levels fluctuate in this region given the presence of numerous faults and the complex hydrogeology.

3.2.3.4 City of Calistoga, City of St. Helena, and Angwin Area

According to the vulnerability assessment performed by County GIS staff, there are numerous wells that exist within the municipal limits of the City of Calistoga and the eastern portion of the City of St. Helena, and atop Howell Mountain in Angwin that are at risk due to physical vulnerability. Domestic wells along the hillsides east of the Napa Valley floor and within the hills and mountains of Angwin lie on semi-fractured rock formations that are susceptible to drying out and lower water quality. These regions show high vulnerabilities through both physical and social vulnerabilities, and well density. Many of the domestic wells in these regions fall within or near the municipal water system limits of the City of Calistoga, City of Helena and Howell Mountain Mutual Water Company. If a domestic well falls within the public water distribution area, a parcel serving a domestic well may be able to tie into the water system for that city or water company service area. In numerous instances across the County, a parcel may be serviced by a water district, but maintains a private domestic well on the parcel to serve outdoor irrigation needs. In these instances, it would be easy to supplement water demand from a dry domestic well used for outdoor irrigation with water supplied by a municipal water system, if the municipal water system can handle this demand.

3.2.3.5 Putah Creek Watershed

The Putah Creek watershed is a sparsely populated portion of the County compared to Napa Valley. The watershed is characterized by the presence of Lake Berryessa. There is a relatively small population living within this region outside of several public water systems, which include the Berryessa Highlands Water District, Spanish Flat Water District, Lake Berryessa Improvement District (Berryessa Estates), the Napa Berryessa Resort Improvement District and Circle Oaks County Water District. Domestic wells in the Putah Creek Watershed are likely reliant on springs, small tributaries or reliant on groundwater. While there is relatively low physical vulnerability due to the fractured rock formation, the area ranks high in social vulnerability due to the median per capita income, which could indicate that homeowners lack the resources to mitigate a dry well or other issue impacting the proper functioning of their well. The County monitors two wells in this region, one in the Pope Valley Subbasin and one along Chiles Pope Valley Road. It would be beneficial for the County to expand the groundwater monitoring program to wells throughout this region.

3.2.3.6 Mountaintop Areas Outside the Alluvial Basin

These includes area along Mt. Veeder Road, Atlas Peak, and much of the Putah Creek watershed region. Much of the high vulnerability in these areas and especially the Berryessa watershed region are driven by a high social vulnerability of lower median per capita income for the domestic wells' users.

3.2.3.7 Southern Parts of Napa County

In the southern part of the County, sea level rise and potential for salinity intrusion threaten the quality of groundwater for shallow domestic well users in the Carneros and American Canyon areas, and along the southern end of the Napa River. As sea level rise allows saltwater to intrude further up the Napa River, shallow wells adjacent to the Napa River could experience degraded water quality. This area has wells as shallow as 100 meters and facing degraded water quality. In the Carneros region, recycled water through Napa Sanitation District can provide up to 450 AF per year. In 2023, 383 AF of recycled water was delivered to the Carneros region (Napa Sanitation District, 2024).

3.2.4 Risk and Vulnerability Assessment Summary

The Drought and Water Shortage Risk Vulnerability Assessment results are summarized in Table 3-4 below. The table includes the physical indicators, along with social vulnerability scores to provide a comprehensive view of the regions discussed above.

Table 3-1. Summary of Risk Assessment Findings in Napa County

Area with Water Shortage Vulnerability and Domestic Wells/SSWSs	Physical Vulnerability Indicator	Social Vulnerability Score
The MST Subarea region east of the City of Napa	• Higher domestic well density in fractured rock areas • Consecutive dry years • Reported groundwater decline of about between -16 feet (Spring 2019-2022) • Declined water quality	Between .01 and .20
Northwest – City of Napa	• Cluster of dry wells reported • Reported groundwater decline ranges between -16 to -66 feet (Spring 2019-2022) • Consecutive Dry Years • Basin transitions between alluvial to fractured rocks • Declined water quality	Between .21 and .60
Northeast Napa Management Area	• Reported groundwater decline ranges between -16 to -66 feet (Spring 2019-2022) • Declined water quality	Between .01 and .20
City of Calistoga, City of St. Helena, and Angwin Area	• Higher domestic well density • Angwin Area falls in a semi fractured rock areas and susceptible to drying wells • Cities of Calistoga and St. Helena has reported groundwater decline of about between -16 feet (Spring 2019-2022) • Declined water quality	Between .21 and .60
Putah Creek Watershed	• Primarily lies in fractured rock areas	Between .61 and .80
Mountaintop areas outside the alluvial basin	• Primarily lies in fractured rock areas	Between .61 and .80
Southern parts of the County, including the Carneros and American Canyon areas	• Potential for salinity intrusion • Declined water quality	Between .41 and .80

Overall, this approach provides a systematic method to analyze the risks and concerns to domestic well owners and SSWS within the County. While it is difficult to accurately identify all wells across the County, this approach allowed the County to evaluate multiple data sources that cover both physical and social vulnerability while including some analysis of well density. The weighting of the physical vulnerability layer by the Ad Hoc Subcommittee provides thoughtful considerations to properly weight various types of physical vulnerabilities. The social vulnerability layer is helpful because it captures the numerous social vulnerabilities across the County.

While the risk assessment approach provides valuable insights, it is important to understand it relies on verified and interpolated data has its limitations. These limitations are summarized in Table 3-3 below. Understanding these limitations helps in using the assessment responsibly and shows where more information will enhance future updates.

Table 3-3. Risk Assessment Limitations

Limitation	Description of Limitations
Well Data Accuracy	The assessment uses both verified and estimated data for domestic wells from the Couty records and the State database. The exact total number of wells might slightly vary.
Physical Vulnerability Data	It is aggregated to a Public Land Survey System section (one-square-mile areas) that might not present enough granularity for the various physical vulnerabilities within the Napa County.
Social Data Scale	Social vulnerability is based on U.S. Census blocks. These might not perfectly match where wells are located.
Well Density Calculation	The assessment assumes wells within 500 feet of each other might affect one another. This might not always reflect cumulative impacts of numerous wells accurately.
Groundwater Areas	The approach does not distinguish between different types of groundwater areas (like valley floors vs. hillsides) except for alluvial vs fractured basins. These areas can behave differently during droughts.
Well Depth Comparison	The assessment does not compare known and estimated well depths to water table depths. This means it might miss identifying some areas where wells could go dry during long droughts.
Age and Accuracy of Well Records	Older well records might be less accurate or missing information.

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4.0 Short-Term Response Actions

Based on the results of the County drought risk and water shortage vulnerability assessment and feedback from the County PBES team, Ad Hoc Subcommittee and the Task Force, short-term response actions were developed to address water shortage and drought-related water emergencies in areas within the County identified to have a higher vulnerability. Short-term response actions are an important factor for allowing SSWS communities and domestic well owners to receive assistance during a water shortage and drought period. The short-term response actions in this section were designed to be carried out in the event of drought conditions or a water emergency event. Some actions would remain in effect until the water shortage is alleviated or the County secures an alternative for the impacted area or community. Coordination between multiple County agencies would continue to occur as outlined in the Napa County Emergency Operations Plan – Drought Annex (Napa County 2024).

4.1 Methodology

Short-term response actions for the County DRP were developed through a collaborative effort involving the County PBES staff and the Ad Hoc Subcommittee. Stantec developed an initial list of short-term response actions that would address water shortages for domestic wells and SSWSs. Short-term response actions were identified to support all domestic wells and SSWSs within the County as well as those areas with a high vulnerability to water shortage, as shown in Figure 3-2.

The Ad Hoc Subcommittee was surveyed on the initial list of short-term response actions to gather which short-term response actions they felt will most effectively address water shortages and identify the lead entity for implementing each action. County PBES discussed survey outcomes with the Ad Hoc Subcommittee and reached a consensus on selected short-term response actions. When reaching this consensus, the County PBES and the Ad Hoc Subcommittee considered if short-term response actions could be implemented with available resources and applied experience from recent droughts.

Through this collaborative process of consultation, feedback, and consensus-building, the final short-term response actions list was developed. By involving all relevant parties, the County aligned the short-term actions with its goals and objectives for addressing water shortages.

4.2 Short-Term Response Actions Evaluated

The primary short-term response action evaluated is providing emergency and interim drinking water supplies during a water shortage event. In this action, the County would work to identify the quantity of water needed for distribution to the affected community or domestic well owner(s) and the frequency of distributions, assess emergency drinking water needs and parameters by estimating:

- The duration of system outage, drought, or water shortage
- The affected parcel(s) or geographic area
- The size and demographics of the affected population

Once the County can identify the affected areas and direct needs, it will determine the preferred method of emergency drinking water distribution. The distribution method may include delivery of water to identified critical facilities and forms of packaging (e.g., bottled, bulk). To ensure the effectiveness of distribution, the County will work with vendors and stakeholders to map out water distribution points and share details with communities. These details will include clear directions on where, when, and how to get water supplies to community members.

For these short-term actions to be implemented and effective, the County will identify staff resources and equipment needed to facilitate water distribution or supportive efforts. Staff would continue to monitor the emergency drinking water distribution process and coordinate with stakeholders as needed. Coordination would continue until the impacted water system(s) is/are restored to normal operations.

4.3 Selected Short-Term Response Actions

Table 4-1 shows the selected short-term response actions to address water shortages for domestic wells and SSWSs. The table lists the lead entity in charge of implementing each short-term response action in the event of a water shortage. In addition, the short-term response actions in this table are grouped into three categories: Emergency Potable Water Supply, Water Conservation, and Planning and Assistance.

The short-term response actions were grouped into two tiers based on their priority in a water shortage event. Tier 1 actions focus on emergency and interim drinking water solutions. Tier 1 actions include the provision of packaged or bottled water transportation, a water-hauling contact list, and support to expedite well replacement permits. Tier 2 includes actions that would be implemented after the immediate, short-term need is satisfied. Tier 2 actions include proactive measures, such as monitoring water levels in domestic wells and the creation of a network of vendors and County contacts. Community outreach initiatives are also emphasized to distribute educational materials and engage with the public through various channels such as public meetings, emails, and website updates. Additionally, the implementation of the Napa County Water Conservation and Groundwater Pumping Reduction Workplans (LSCE 2024ab) are prioritized for the County to promote water-saving practices among growers, domestic well owners, and others.

Careful pre-planning, including identifying responsible departments or programs, and clear steps to execute the actions are necessary for their effective implementation and timely response to an emergency or short-term water supply needs.

Table 4-1. Napa County Drought Response Short-Term Response Actions

ID	Action	Category	Action Descriptions and Possible Steps to Implement	Potential Barriers to Implementation	Lead Entity
Tier 1					
ST-01	Packaged or Bottled Water	Emergency and interim drinking water solutions	Short-term transportation of packaged or bottled water will be provided to vulnerable communities that rely on domestic wells and SSWS. The County will coordinate the procurement and delivery of packaged water to identified drop off areas. This can be achieved by continuing to evaluate this action and outline the steps necessary to support the SSWSs and domestic wells impacted. This action would be subject to funding and availability.	Lead entity ownership and action.	Napa County, OES and PBES
ST-02	Water Hauling	Emergency and interim drinking water solutions	The County will establish a list of vendor contacts that domestic well owners or SSWS communities can contact to provide hauled-water services. This hauled water may be used to fill available storage tanks in vulnerable communities that rely on domestic wells and SSWS. The City of Napa has a list of approved water-hauling vendors. The County would provide this list to affected users who need water-hauling services.	None; Napa County to make the water hauling vendor list available.	Napa County, PBES
ST-03	Expedite Well Replacement Permits	Planning and Engagement	When a drought emergency is declared, the County will continue to expedite the permitting to replace wells that have run dry. The County would assess the drought situation and determine if well permits should be expedited.	None; however, if there are large number of permits requests this could delay processing of these permits.	Napa County, PBES
Tier 2					
ST-04	Water Conservation Workplan and Program	Water mitigation programs	The County will implement the Napa County Water Conservation Workplan: A Guide for Vineyards, Wineries and Other Water Users (LSCE and ERA 2024). This includes issuing guidelines and working with domestic well owners and SSWS users to promote and conserve water around their households (including reducing indoor and outdoor water uses where practical and feasible). This can be achieved by continuing to implement the *Napa County Water Conservation Workplan: A Guide for Vineyards, Wineries and Other Water Users*.	Staff resources to implement an expanded water conservation education and outreach.	Napa County, PBES

ID	Action	Category	Action Descriptions and Possible Steps to Implement	Potential Barriers to Implementation	Lead Entity
			Napa County could expand the program to other parts of the County and expand water conservation efforts.		
ST-05	Well Sounding (water level meter)	Planning and Engagement	The County will continue to encourage the domestic well owners to measure the depth-to-water during a drought or water emergency. The County developed the Well Owner's Guide, which includes a section about keeping valuable records of the domestic wells and SSWS. Data such as pump test results and water quality measurements can provide an early indicator if a well is at risk of drying up. The Well Owner's Guide is available on the County's website. This can be achieved by continuing to loan out their water level meter device to impacted domestic well owners.	None; however, if there are large number of requests this could delay processing of these requests.	Napa County, PBES
ST-06	Vendors Contact Information	Planning and Engagement	The County will provide domestic well owners and SSWS with contact information for vendors who can supply personnel, equipment, materials, and/or associated services to restore dry wells. This can be achieved by providing this information on the County's website.	None	Napa County, PBES
ST-07	Community Outreach	Planning and Engagement	The County will work with the Task Force and local entities to distribute educational materials and to hold public meetings as necessary. The County will also send out informational emails, mailers, and update its websites. This information will include possible resources to domestic well and SSWS.	None	Napa County, PBES and PIO

Key:
LSCE = Luhdorff & Scalmanini Consulting Engineers
OES = Napa County Office of Emergency Services
PBES = Napa County Planning, Building, and Environmental Services Department
PIO = Public Information Office
SSWS = state small water system

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5.0 Long-Term Mitigation Strategies and Actions

In addition to the short-term response actions in Chapter 4, the County developed a list of Long-term mitigation strategies and action (LTMS/A) that mitigate the vulnerability of domestic wells and SSWSs to water shortages. LTMS/A would address preparation and capacity-building actions before a drought or water shortage event to reduce potential impacts, with the intent to improve water supply resilience and reduce reliance on short-term response actions.

5.1 Methodology

The LTMS/A were developed in parallel with the short-term response actions using the same methodology described in Section 4.1.

The County and its Task Force considered a wide variety of long-term mitigation strategies and actions that could potentially assist vulnerable domestic wells and SSWSs. Examples of strategies considered for the County included water conservation and drought-related educational information, tools to assess water shortage vulnerability areas and planning and land-use considerations, incentives to increase awareness of water use and to track local groundwater conditions, permit streamlining and coordination, encouragement for public reporting of water shortages or dry well conditions, and coordination with DWR to improve DWR's online Water Shortage Vulnerability tool.

5.2 Long-Term Mitigation Strategies and Actions Evaluated

Water system consolidations and drinking water mitigation programs were initially considered for this plan but ultimately not incorporated because the Ad Hoc Subcommittee determined that these actions were already examined in existing plans such as the Napa Valley Drought Contingency Plan. As appropriate, the County will incorporate these actions into future planning documents and countywide coordination when funding is made available.

In addition to the long-term mitigation strategies and actions, the County and Task Force agreed to use existing County-developed resources such as, *Well Owner's Guide: A Guide for Private Well Owners in Napa County* (Napa 2017). This guide is available to the public on the County's website (https://www.countyofnapa.org/3210/Resources-for-Well-Owners). The guide's purpose is to educate domestic well owners about the potential for well contamination; the value of water quality testing for understanding more about the quality of groundwater produced from their well; the basics of well construction, destruction, and maintenance; and owner responsibilities. Similar to the long-term actions selected by the County, the guide provides a menu of potential recommendations. Not all recommendations will be suitable for every circumstance; other strategies and actions are likely to be identified in the future.

5.3 Selected Long-Term Strategies

Table 5-1 summarizes the long-term mitigation strategies and actions identified and considered by the County and Task Force. The table lists the lead entity in charge of implementing each long-term response action to address water shortage. In addition, the long-term response actions in this table are grouped into five categories: General, Water Quality, Education, Water Infrastructure, and Planning.

Table 5-1. Napa County Drought Response for Long-Term Mitigation Strategies and Actions

ID	Action	Category	Action Descriptions and Possible Steps to Implement	Potential Barriers to Implementation	Lead Entity
LT-01	Education	Planning and Engagement	The County will promote water conservation and other drought-related topics through outreach and educational materials. Topics would be directed toward domestic wells and SSWSs. This can be achieved by collaboration with local agencies to create relative material and distribute the material through various communication channels.	County staffing to provide outreach activities.	Napa County, PBES, OES, PIO, and Public Works
LT-02	Treatment of Water from Alternate Sources	Drinking water solutions	The County will provide technical assistance to SSWSs, upon request, to explore short-term treatment options that would allow for an emergency source of supply during disruptions. An alternate source includes a nearby well that has water but does not meet the desired water quality. Approval of the water source and/or treatment unit by the Environmental Health Division will be required to ensure that the treatment is sufficient for addressing the source water contamination. The County will consult SSWS operators, facilitate regulatory communication, provide technical assistance, and stress proper approval for addressing contamination.	EHD will need to provide staff to provide technical assistance.	Napa County, EHD
LT-03	Website and Online Educational Materials	Planning and Engagement	The County will maintain a web portal with County information, permits, and forms in one place. It will also provide a map depicting water shortage vulnerability areas. Educational information will include well maintenance (see *Well Owner's Guide: A Guide for Private Well Owners in Napa County* at https://www.countyofnapa.org/3210/Resources-for-Well-Owners). The County will ensure that portals and tools are simple, accessible, and easy to navigate to remove avoidable associated barriers. This can be achieved by maintaining the website for groundwater related information.	County resources.	Napa County, PBES

ID	Action	Category	Action Descriptions and Possible Steps to Implement	Potential Barriers to Implementation	Lead Entity
LT-04	Improve Water Efficiency	Drinking water solutions	The County will encourage individuals to improve the efficiency of existing irrigation systems for vineyards, landscape and/or small agriculture plots to decrease demand and reduce water use. This can be achieved by public education campaigns and potentially working with local hardware stores and landscaping companies to offer workshops on irrigation efficiency.	County has the information and needs staff to prepare a presentable material in their website.	Napa County, PBES
LT-05	Installation of Water Measuring Devices	Water mitigation programs	The County will explore expanding its current well-monitoring networks. It will also offer guidance to private well owners on how to accurately measure their water usage, with some information already available in the *Well Owner's Guide: A Guide for Private Well Owners in Napa County*. The County will provide technical assistance to encourage well users to install flow meters and voluntarily record groundwater levels. The County will assess and expand its well-monitoring networks while developing guides on accurate water usage measurement for domestic well owners and SSWS. An outreach program will be created to encourage flow meter installation and voluntary groundwater level recording, offering technical assistance and information through various channels. The County will also compile a list of potential grants for flow meter installation and create a user-friendly guide for the grant application process, making all resources easily accessible online and through local offices.	The County need staff resources who can track the types of potential funding programs and provide technical assistance.	Napa County, PBES
LT-06	Connect SSWS to Larger Systems	Consolidation Consideration	Infrastructure upgrades will improve the reliability of the SSWS and increase the likelihood that a close-by public water agency would consolidate with a well maintained SSWS. Another approach is to provide an intertie of a SSWS within close proximity to public water systems. SSWS shall perform needed infrastructure upgrades to improve their service reliability and reduce system losses. Some efforts include managing system water pressure, repairing aging pipelines, and replacing outdated meters, etc. The County and public water agency(s) will provide technical assistance to facilitate consolidation, where applicable. The County can guide SSWS owners on system improvements, including pressure management, pipeline repairs, and meter upgrades. It will offer advice on best practices and funding sources, while facilitating communication with public water agencies for potential consolidations.	SSWS does not have the resources to engage with the County and nearby public water agencies.	SSWS

ID	Action	Category	Action Descriptions and Possible Steps to Implement	Potential Barriers to Implementation	Lead Entity
LT-07	Water Service Area Boundaries	Planning and Engagement	The County will make available the water service area boundaries of all water suppliers. This information is also available on the DWR Water Shortage Vulnerability tool. The information will be valuable for SSWSs and domestic well users to consider future consolidation based on their proximity to larger water supplier agencies. This can be achieved by establishing a standardized format for the water service area boundaries of all the water suppliers. This information could be made accessible on the County's website	The information exists and County will need to dedicate staffing resources to implement this action.	Napa County, PBES
LT-08	Dry Well Reporting System	Planning and Engagement	The County will continue to send reports to the State's Dry Well Reporting System during drought or water emergency events. The County will encourage SSWS and domestic well users to report water shortages and dry well conditions to the State's Dry Well Reporting System. This can be achieved by establishing a protocol for consistent reporting to the State's Dry Well Reporting System throughout the year.	Well users might not provide timely reports or lack of reporting.	Napa County, PBES
LT-09	Water Shortage Planning	Planning and Engagement	The County will supplement DWR data with additional available local data to improve the applicability of DWR's online Water Shortage Vulnerability tool. This includes wells data, dry wells reports, etc. The County will periodically update its local risk assessment as new data refine the understanding of local conditions. The County will use an adaptive management approach to update this County DRP as needed. This can be achieved by establishing a process to regularly collect and integrate local ground water data with the DWR's Water Shortage Vulnerability tool by designating resources as new data becomes available.	Availability of County staff to do risk assessments.	Napa County, PBES
LT-10	Funding Opportunities	Planning and Engagement	The County will provide assistance to domestic well owners and SSWSs by identifying funding opportunities available at the local, State and federal levels for infrastructure repairs, improvements, and other necessary measures. This can be achieved by developing a database of local, State, and federal funding opportunities and posting it on the County website.	Availability of trained staff that tracks the potential funding programs.	Napa County, PBES

ID	Action	Category	Action Descriptions and Possible Steps to Implement	Potential Barriers to Implementation	Lead Entity
LT-11	Encouraging Water Tank Installation	Planning and Engagement	The County will educate SSWSs and domestic well owners about any potential water shortage risks and vulnerabilities affecting their wells. This information will help SSWSs and domestic well owners consider installing water storage tanks connected to their wells. These tanks will allow for supplemental water supply during times when a well yield is diminishing. By implementing this strategy, well owners could reduce or eliminate their reliance for water filling stations, bottled water, or hauled water during shortage periods. This will help well owners better prepare for and manage potential water scarcity situations, enhancing their self-reliance and resilience to drought conditions. This can be achieved by creating informative materials about water shortage risks and vulnerabilities and making it available on the County website. Material could include the benefits of installing water storage tanks, providing practical guidance on installation, maintenance, and use.	Availability of staff to develop, update and communicate with impacted users.	Napa County

Key:
DWR = California Department of Water Resources
EHD = Napa County Environmental Health Division
PBES = Napa County Planning, Building, and Environmental Services Department
SAFER = Safe and Affordable Funding for Equity and Resilience
SSWS = state small water systems

6.0 Implementation Considerations

The County DRP identifies short-term actions and long-term strategies and actions that, together, will improve the reliability of water supply for domestic wells and SSWSs. This section describes how the selected actions will be implemented through a collective effort among different departments and units within the county in coordination with other State and local agencies.

6.1 Legislative Direction

The California Water Code Section 10609.70 considers, at a minimum, each of the following,

- Consolidations for existing water systems and domestic wells.
- Domestic well drinking water mitigation programs.
- Provision of emergency and interim drinking water solutions.
- An analysis of the steps necessary to implement the plan.
- An analysis of local, state, and federal funding sources available to implement the plan.

6.2 Funding Opportunities and Assistance Programs

Due to the limitations of outside funding and available resources for the County to work with its SSWSs and domestic well owner communities, the actions identified in the prior Chapters will be led by the County and their departments and offices. Coordination and implementation could require participation or leadership of other local, State, or federal agencies to provide guidance and funding. To coordinate and seek funding sources for the identified actions, the County will discuss funding strategies during the standing Task Force meetings and consider coordinating with regional entities and the GSA to maximize funding opportunities.

6.2.1 Local Assistance Programs

Napa County will explore the available local assistance programs to provide technical or financial support for SSWSs and domestic well owners. If the programs are not currently available to support the actions identified in this plan, the County will discuss current grant applications, funding sources, or programs that will support implementation with the Task Force during meetings.

6.2.2 State Assistance Programs

The county does not have control or influence on the budget allocations, conditions, or other directives from the State. However, the County would continue to seek out opportunities provided by State agencies to provide technical assistance or financial assistance that could assist with the implementation of the short-term response actions and LTMS/A to alleviate the water shortage risk. The County will monitor the following agencies for State funding:

- DWR: Grants and Loans
- State Water Board:
    - Countywide and Regional Funding Program
    - Emergency financial assistance programs
    - Funding incentives for consolidation and regionalization projects

    - Emergency drought funding
    - Direct technical assistance
- Integrated Climate Adaption and Resiliency Program Grant Programs

In addition to the agencies listed above, the County will continue to utilize the California Grants Portal to investigate available funding for water shortage risk.

Napa County will continue to directly support the SSWS communities and domestic well owners that are impacted by drought with actions identified in previous chapters. All actions are subject to funding and availability.

6.2.3 Federal Assistance Programs

The bulk of the resources at the Federal level would exist in the form of grants and loans. In the cases where assistance programs or technical assistance are made available to reduce water shortage risk, they could include the following.

- Rural Development Program of the U.S. Department of Agriculture
- WaterSMART Program
- National Integrated Drought Information System

Due to the continually evolving conditions for grant availability and associated eligibility and requirements, the county will register with GRANTS.GOV to receive updated information regarding active grants and their specifications.

6.3 County DRP Updates and Future Plan Development

The County will review and update its DRP at least every five years, allowing for progress assessment and action improvement. More frequent updates may occur if new data or approaches to drought-risk management emerge. This DRP serves as the foundation for future drought planning, with updates triggered by changing drought conditions or risk assessments. Updates will refine the community engagement roadmap, detailing information distribution methods, emergency water supply locations, and decision trees for anticipated water shortage triggers.

Designated County departments will lead both short-term and long-term action implementation, identifying specific triggers and steps to mitigate drought and water shortage vulnerabilities, especially for domestic well owners and SSWSs. During water shortages, communication will occur through multiple channels, including the County websites, mailed notices, local media, public meetings, newsletters, and email lists.

Future updates to the DRP and Emergency Water Shortage Response Plan will incorporate lessons learned and address community feedback received during water shortage emergencies. This approach ensures continuous improvement in the drought preparedness and response efforts, building on the existing plan to enhance the County's resilience to water scarcity challenges.

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