7 Higgins/Penn Valley Forecast Zone

7.1 Forecast Zone Description

Higgins/Penn Valley Forecast Zone (FZ) is located in the southwest end of Nevada County. This area is also commonly referred to as "South County." The FZ is dominated by rangelands and oak woodlands and is comparatively much flatter than the rest of the County. Within the FZ is the western half of the Deer Creek Canyon and Bridgeport Crossing on the South Yuba River. These areas are very popular recreation sites for locals and tourists/visitors.

Commercial area in the Higgins/Penn Valley FZ

7.1.1 Location

The Higgins/Penn Valley Forecast Zone (FZ) covers 143,715 acres, making it the second-largest FZ. It is bound on the west by Yuba County, on the east by the Grass Valley/Nevada City FZ, on the north by the South Yuba River, and on the south by the Bear River and Placer County. The FZ is below the 2,000-foot elevation line.

7.1.2 Land Ownership

The Higgins/Penn Valley FZ is largely comprised of privately owned land, accounting for 133,983 acres or roughly 93% of the FZ. The second largest landowner is the California Department of Fish and Wildlife who own the Spenceville Wildlife Area. Land ownership in the Higgins/Penn Valley FZ is presented in Table 27.

Table 27. Land Ownership in the Higgins/Penn Valley Forecast Zone

Land Ownership	Total Acreage	Percent
Private Ownership	133,983	93%
California Department of Fish and Wildlife	3,992	3%
United States Bureau of Land Management	2,918	2%
Nevada Irrigation District	1,547	1%
Bear Yuba Land Trust	1,265	1%
California Department of Parks and Recreation	1,097	1%
Placer Land Trust	142	<1%

Table 27. Land Ownership in the Higgins/Penn Valley Forecast Zone

Land Ownership	Total Acreage	Percent
Western Gateway Recreation and Park District	86	<1%
United States Army Corps of Engineers	16	<1%
South Sutter Water District	6	<1%
University of California	4	<1%

Source: CAL FIRE 2024d.

7.2 Fire Hazard

7.2.1 Climate

The temperature in the Higgins/Penn Valley Forecast Zone (FZ) is influenced by being at relatively lower elevation in comparison to the other FZs in Nevada County. Warmer temperatures are more likely, as is consequential early season drying of vegetation. Temperatures in this area during the summer months and early fall (June through September) range from 66°F to 91°F. Average winter temperatures, from November through March, average below 60°F. Rainfall is minimal in the summer months of June through September, if any, ranging from 0.0 inches to 0.4 inches. Average monthly precipitation, from October through May, ranges from 0.50 inches to 5.6 inches. The dominant wind direction is typically from the south February through September, and from September through February, the wind direction is most often from the east. The average hourly wind speed in this FZ averages around 6 mph throughout the year (Weather Spark 2024a).

7.2.2 Terrain

The terrain in the Higgins/Penn Valley FZ is relatively gently sloped when compared to the terrain of the other FZs within Nevada County. Most of the FZ has slopes ranging from 0% to 46% slopes The areas that contain slopes at 46% to 70% and above are the areas approaching the South Yuba River, which crosses the northernmost part of the Higgins/Penn Valley FZ border, and then San Juan Ridge, which is north of the South Yuba River and located just outside of the northernmost Higgins/Penn Valley FZ border. The Bear River follows the southern border of the FZ. Dry Creek runs through the middle portion of the FZ, while Deer Creek runs west and east of Lake Wildwood. These rivers serve as drainages within the FZ.

7.2.3 Vegetation and Fuels

The predominant vegetation community in the Higgins/Penn Valley FZ is hardwood woodland/forest and this is where the majority of the County's Oak Woodlands are located. Common oak species are canyon live oak (*Quercus chrysolepis*), interior live oak (*Quercus wislizenii*), and California black oak (*Quercus kelloggii*). A total of 24% of the vegetation within the FZ are Mixed Conifer/Hardwood. Common conifer species include ponderosa pine (*Pinus ponderosa*) and gray pine (*Pinus sabiniana*). Other common hardwood species include white alder (*Alnus rhombifolia*), Fremont cottonwood (*Populus fremontii*), California buckeye (*Aesculus californica*), and willow (Salix spp.). Grass/Herbaceous vegetation makes up 17% of the vegetation which is higher than any other FZ. Table 28 displays all vegetation communities

and their acreages, while Figure 5, Vegetation Communities, provides a visual display of these communities within the Higgins/Penn Valley FZ and comparatively to the rest of Nevada County.

Table 28. Higgins/Penn Valley Forecast Zone Vegetation Communities

Vegetation Community	Total Acreage	Percent
Hardwood Forest/Woodland	71,588	50%
Mixed Conifer/Hardwood	33,893	24%
Herbaceous	24,757	17%
Urban	4,596	3%
Shrub	2,886	2%
Agricultural	3,006	2%
Water	1,424	1%
Conifer Forest/Woodland	1,202	1%
Barren/Other	364	<1%

Source: USFS 2019a, 2019b.

7.2.4 Fire and Ignition History

From 1950 through 2022, the Higgins/Penn Valley FZ has experienced 47 fires according to the fire history record. These fires burned approximately 42,477 acres within the FZ, with the north and northwest portion of the FZ accounting for most of this acreage due to the 1988 49er Fire, which burned 36,343 total acres (Figure 14, Fire History – Higgins/Penn Valley). Most of this fire occurred in the Higgins/Penn Valley FZ, with some of the acreage in the Grass Valley/Nevada City FZ. The next largest fires that have occurred in this FZ are the 2021 River Fire (1,294 acres in the FZ), the 1961 Bilderback Fire (921 acres in the FZ), and the 1953 Camp Beale #5 Fire (881 acres in the FZ). The most recent fires that have occurred in this FZ of notable size are the 2021 River Fire (1,294 acres in the FZ), 2020 Jones Fire (698 acres in the FZ), and the 2017 Lobo Fire (820 acres in the FZ). While the average fire return interval within the Higgins/Penn Valley FZ was calculated to be approximately every 2 years, 19 of these 47 fires occurred within the past 10 years. Table 29 summarizes the Higgins/Penn Valley FZ fire history per decade, with recorded history dating back to 1950. Fire History for the Plan Area is presented in Figure 14, Fire History – Higgins/Penn Valley.

Table 29. Higgins/Penn Valley Forecast Zone Fire History by Decade

Years	Total Acreage in FZ	Number of Fires
<1980	5,991	12
1980–1990	31,987	4
1991–2000	542	2
2001–2010	669	9
2011–2020	1,871	14
2021–2023	1,418	6
Total:	**42,478**	**47**

Source: CAL FIRE 2024c.
Note: FZ = Forecast Zone

Ignition History

While the largest areas of wildfire appear to have occurred along the northern and eastern portions of Higgins/Penn Valley FZ, the highest concentration of fire ignitions appears to be alongside State Highway 49, State Route 20, and in the areas of the Nevada County WUI (Figure 15, Ignition History – Higgins/Penn Valley FZ). The WUI area is presented in Figure 16 (Wildland-Urban Interface – Higgins/Penn Valley FZ) and the Defensible Space Area is presented in Figure 17 (Defensible Space – Higgins/Penn Valley FZ). Similarly, Figure 14 also shows that the west part of the FZ contains the least number of ignitions, due to possible lack of road access and reduced human influence in those areas. The areas where fire ignitions have the highest concentration also overlap with the locations of the most urbanized areas within the FZ: around Lake of the Pines and Lake Wildwood; and around the communities of Penn Valley, Rough and Ready, and Alta Sierra.

7.3 High-Value Resources and Assets at Risk

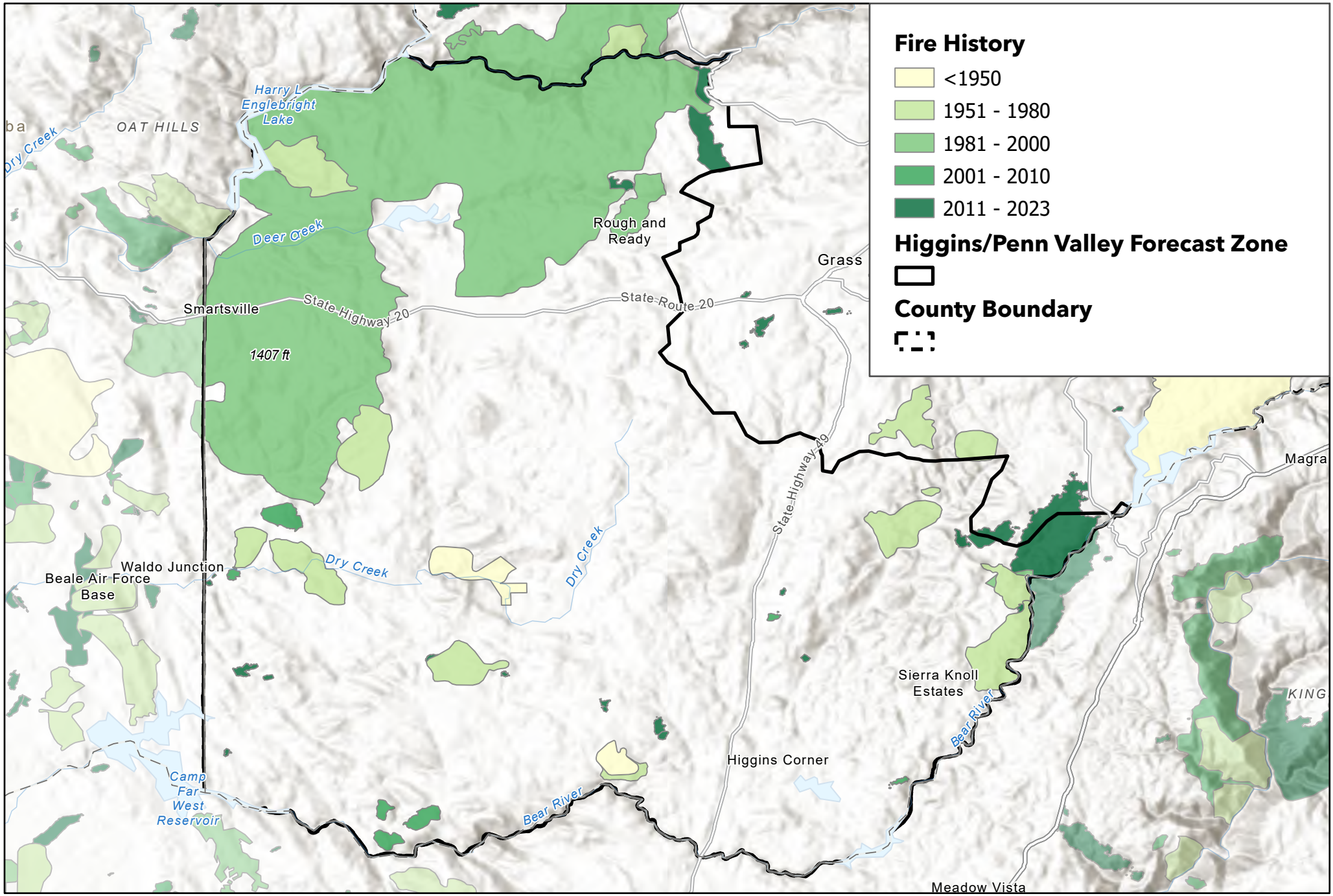
7.3.1 Community Lifelines

Community Lifelines are critical assets to a community and are the fundamental services of a community that enable all other aspects of society. Community Lifelines include:

- **Communities** include populated areas (e.g., Grass Valley, Truckee, North San Juan, Lake of the Pines, Washington) and assets within them (e.g., fire stations, schools, post offices, gas stations, and grocery stores).
- **Vulnerable Populations** include nursing homes, mobile home parks, homeless shelters, and low-income or disadvantaged communities.
- **Critical Water Infrastructure** includes canals, dams, public and private water storage, water or wastewater treatment sites, and areas likely on well or septic systems.
- **Critical Transportation Infrastructure** includes airports, bridges, highways, railroads, major County roads, and yearlong USFS roads.
- **Critical Power and Communication Infrastructure** includes communications sites, power plants, and major powerlines.

The HVRA list for Nevada County and an explanation of each HVRA is documented in Appendix E of the WRA (Appendix B, Wildfire Risk Assessment).

Figure14 - Higgins/Penn Valley Forecast Zone - Fire History



NEVADA COUNTY CALIFORNIA DUDEK

0 1 2 4 Miles

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Figure 15 - Higgins/Penn Valley Forecast Zone - Ignition History

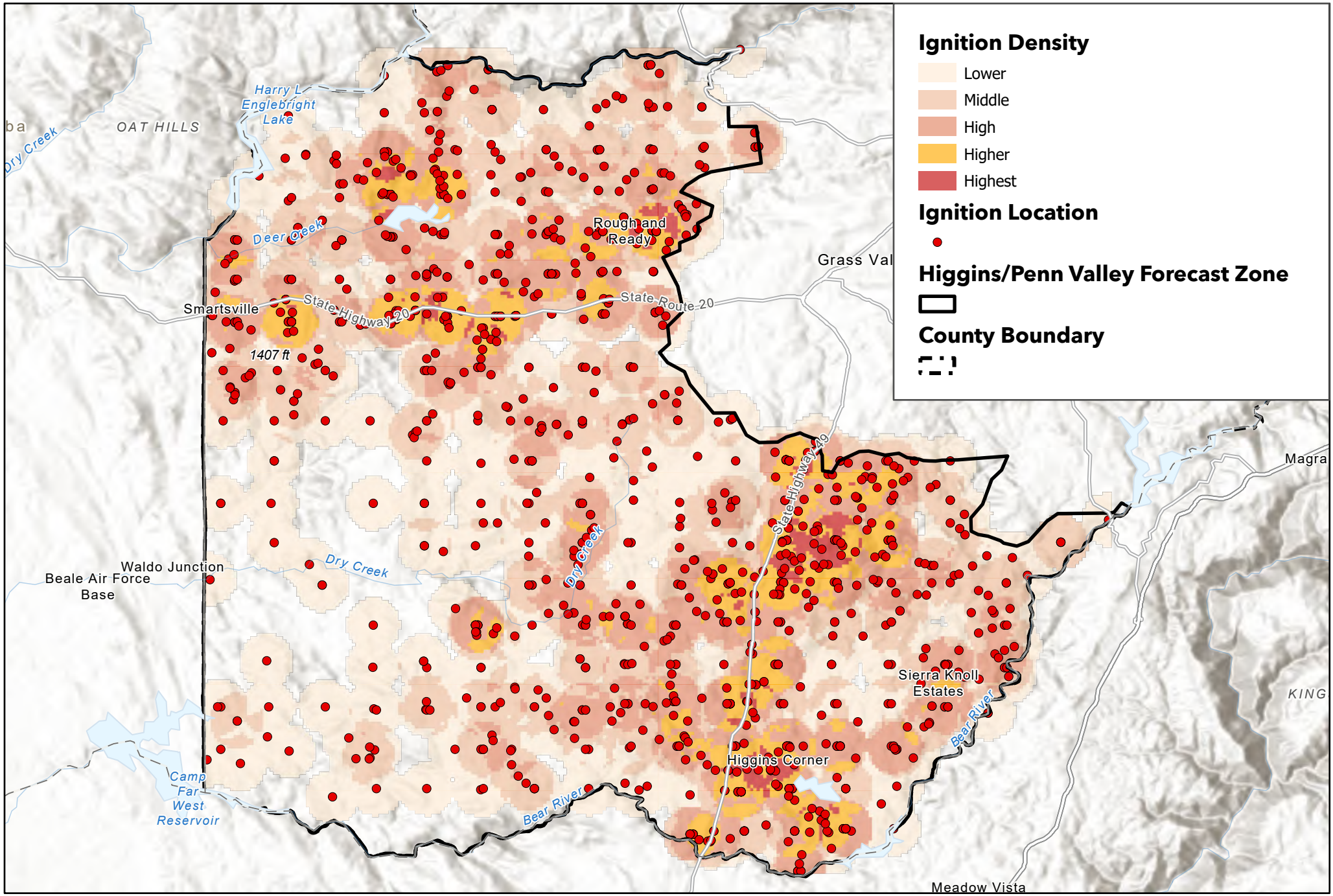

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Figure 16 - Higgins/Penn Valley Forecast Zone - Wildland-Urban Interface

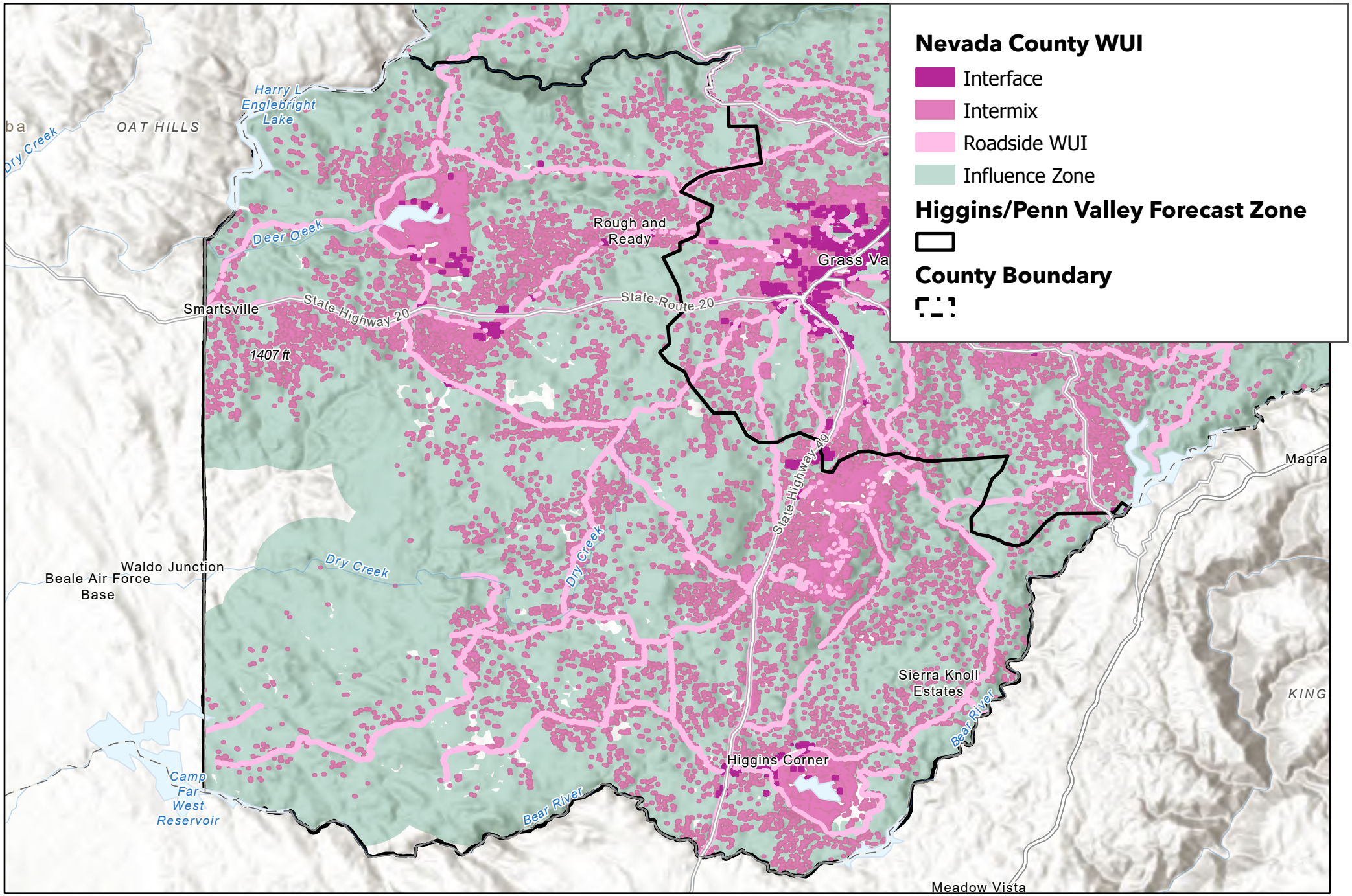

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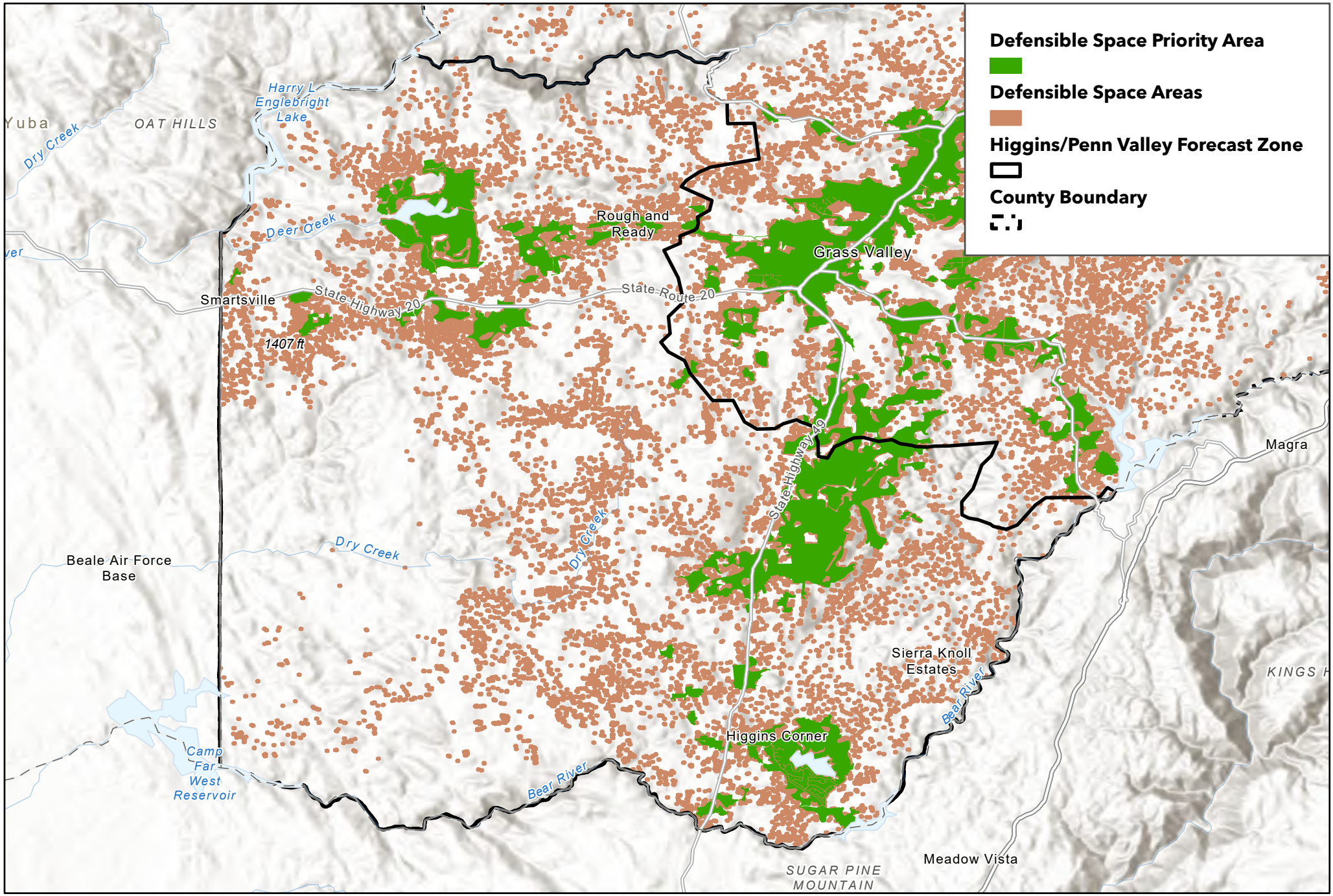
Figure 17 - Higgins/Penn Valley - Defensible Space Areas



NEVADA COUNTY CALIFORNIA DUDEK

0 1.25 2.5 5 Miles

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7.3.1.1 Communities

The Higgins/Penn Valley FZ does not include incorporated cities, and all of the communities are located in unincorporated Nevada County. The community makeup varies across the FZ and includes working landscape, rural lifestyle, subdivision, and high-amenity high-resource communities. Some of the major communities within the FZ are Lake of the Pines, Alta Sierra, Higgins Corner, Rough and Ready, Penn Valley, and Lake Wildwood.

Residential areas in the Higgins/Penn Valley FZ

Communities in the Higgins/Penn Valley FZ are distributed across the FZ at varying densities, except for the central- and south-western portions of the FZ along Dry Creek, Little Dry Creek, and Austin Ravine. The building density (Jaffee et al. 2024) within the FZ is variable, with notable concentrations of high density (approximately 500-1,000 buildings/km^2) in and near Alta Sierra, Lake Wildwood, Lake of the Pines, and portions of Penn Valley. The building density in the FZ is moderate (approximately 100-500 buildings/km^2) in and near Rough and Ready, portions of Penn Valley, Piper Hill, Higgins Corner, McCarty Flat, Wolf Creek, Lakewood, Bear River Ranch, and the Sierra Hills Road area. Building density is low (approximately 5-100 buildings/km^2) in and near Golden Oaks, Sierra Knolls, Darkhorse, Bella Oaks, Mustang Valley, and Vineyard Lakes, Bitney Springs, John Born, Jones Bar, and the Wolf Mountain Road area. Structure age in this FZ is predominantly older, with approximately 95% of construction occurring prior to 2007 (after which current California Building Code ignition-resistant construction requirements went into effect) (County of Nevada 2024c). Buildings are typically wood frame construction with wood siding. Numerous outbuildings (barns, stables, utility buildings) are located on parcels throughout the FZ, especially in low-density areas where parcel sizes are greater.

Within the FZ there are also communities defined as at risk from wildfire by the Office of the State Fire Marshal and CAL FIRE Nevada-Yuba-Placer Unit. See Table 30.

Table 30. Office of the State Fire Marshal and CAL FIRE At Risk Communities in the Higgins/Penn Valley Forecast Zone

Community Name	Incorporated Community
Alta Sierra	No

Table 30. Office of the State Fire Marshal and CAL FIRE At Risk Communities in the Higgins/Penn Valley Forecast Zone

Community Name	Incorporated Community
Brewer Canyon	No
Cherry Creek Acres	No
Higgins Corner (Wolf)	No
Jones Bar	No
Lake of the Pines	No
Lake Wildwood	No
Lone Valley	No
Mooney Flat	No
Penn Valley	No
Pleasant Valley	No
Rex Reservoir Road	No
Rough and Ready (Bitney Corner)	No
Stardust Drive	No
Willaura Estates	No

Source: OSFM 2024, CAL FIRE 2024e.

The FZ includes essential community services such as post offices, gas stations, grocery stores, schools, and fire stations. There are two post offices, one in Penn Valley and the other in Rough and Ready. There are seven gas stations in the FZ and four grocery stores. Schools are an important community resource and service. Within the FZ there are ten schools. See Table 31.

Table 31. Higgins/Penn Valley Forecast Zone Schools

Name	Address
Arete Charter Academy	16229 Duggans Road
Forest Lake Christian School	12515 Combie Road
Nevada City School of the Arts	13032 Bitney Springs Road
Bear River High School	11130 Magnolia Road
Vantage Point Charter School	10862 Spenceville Road
Williams Ranch Elementary School	14804 Pleasant Valley Road
Ready Springs Elementary School	10862 Spenceville Road
Alta Sierra Elementary School	16607 Annie Drive
Cottage Hill Elementary School	22600 Kingston Lane
Christen Encounter High School	17183 Retrac Way

There are seven fire stations in the FZ. This includes local fire districts and CAL FIRE. Currently, Penn Valley and Rough and Ready Fire Protection District are in discussion with Nevada County Consolidated (NCC) Fire Protection District to consolidate under NCC Fire. Fire stations in the Higgins/Penn Valley FZ are presented in Table 32.

Table 32. Higgins/Penn Valley Forecast Zone County Fire Stations

Name	Address
Higgins Station 21 (CAL FIRE Station)	10106 Combie Road
Higgins Station 22	20223 Morning Sun Lane
Higgins Station 23	20604 McCourtney Road
NCC Station 89	11833 Tammy Way
Penn Valley Station 43	10513 Spenceville Road
Penn Valley Station 44	18989 Lake Forest Drive
Rough and Ready Station 59	14506 Rough and Ready Highway

Note: NCC = Nevada County Consolidated.

7.3.1.2 Vulnerable Populations

Vulnerable populations are important to consider in wildfire planning as they are more likely to have less access to wildfire risk reduction resources and/or a harder time recovering from wildfires. Within the Higgins Penn Valley FZ are mobile home communities including the recognized Firewise Community of Ponderosa Pines. These communities face challenges with wildfire due to the ignitable nature of their structures, limited home hardening resources, limited ability to complete defensible space, and evacuation challenges. There are also communities within the FZ that have been identified as low-income and/or disadvantaged by the State or Federal government.

7.3.1.3 Critical Water Infrastructure

Lake Wildwood

Critical water infrastructure includes canals, dams, public and private water storage, water or wastewater treatment sites, and areas likely on well or septic systems all of which exist in the Higgins/Penn Valley FZ. Canals exist all across the FZs providing communities, businesses, and landowners with water. The canals also support local, agriculture and rangelands. There are four dams in the FZ (1) Anthony House Dam in Lake Wildwood, (2) Swan Dam on Dry Creek, (3) Magnolia Dam in Lake of the Pines, and (4) a dam at the Penn Valley wastewater facility. There are also over 1,000 public or private water storage resources within the FZ which range from water retention ponds to reservoirs. Water treatment is an important part of the water infrastructure system. There are four facilities in the FZ that treat residential water or residential wastewater. They are located in Lake Wildwood, Penn Valley, Higgins Corner, and Lake of the Pines. Finally, within Higgins/Penn Valley there

are communities that are more likely to only be on a well or septic system and have no access or potential access to public water systems.

7.3.1.4 Critical Transportation Infrastructure

Transportation is a key component of communities. Transportation is important for ignition prevention, evacuations, and community recovery. In Nevada County, this includes airports, bridges, highways, railroads, major County roads, and yearlong USFS roads. In Higgins/Penn Valley FZ there are important critical transportation infrastructures both for the FZ but also for the County as a whole. There are 96 bridges in the FZ some of which provide critical crossings over rivers for vehicles such as the Bridgeport Bridge over the South Yuba River. Within the FZ are two major highways for Nevada County, Highway 20 and Highway 49. These are major evacuation corridors and are the two main roads that lead in and out of the County. Highway 20 crosses into Yuba County and Highway 49 leads south into Placer County. These roads are also very important for the transportation of goods and resources. There are major local roadways in the FZ such as Pleasant Valley Road, Rough and Ready Highway, McCourtney Road, Dog Bar Road, and Magnolia Road. Roads such as Pleasant Valley Road, Mooney Flat Road, and Dog Bar Road have been identified as priorities for evacuation improvement by communities in the 2024 Evacuation Study Appendix A.

7.3.1.5 Critical Power and Communication Infrastructure

Power and communication infrastructure play important roles in wildfires. Power infrastructure can be an ignition risk but is also a critical component of community recovery. Communication infrastructure is crucial for wildfire response allowing first responders to communicate in wildfire events, emergency alerts to be disseminated, and more. Powerlines exist all across the FZ providing electricity to residents and businesses. There are major high-voltage powerline transmission corridors in the FZ as well, one of which bisects the lower southeast corner. Additionally, there are two powerplants in the Higgins/Penn Valley FZ one located at Englebright Lake and the other located at Lake Combie. Finally, there are over 100 communication sites within the FZ.

7.3.2 Community Health

Community health focuses on factors that impact the overall health of a community and potentially could result in secondary impacts from a wildfire that impede community recovery. Community Health includes the following:

- **Wildfire Smoke Emission Potential** are areas identified by the U.S. Forest Service as having a high potential for emitting harmful levels of PM 2.5 if burned.
- **Soil Vulnerability** refers to soils in the County that are more likely to be subject to post-fire mass wasting events such as hydraulic mine scars.
- **Listed Hazardous Waste** are sites that are currently listed hazardous waste sites.
- **Hospitals and Sheltering Facilities** which include local hospitals, schools, community centers, veteran halls etc.
- **Solid Waste Management Facilities**

The HVRA list for Nevada County and an explanation of each HVRA is documented in Appendix E of the WRA (Appendix B, Wildfire Risk Assessment).

7.3.2.1 Wildfire Smoke Emission Potential

Wildfire Smoke Emission Potential refers to areas that were identified the U.S. Forest Service as having A High potential for emitting harmful levels of PM 2.5 if burned in a wildfire. PM 2.5 is one of the air pollutants in wildfire smoke that can be harmful to communities. If these areas burn they not only have the potential to negatively impact the Higgins/Penn Valley FZ but also adjacent communities and areas outside the County. Within the FZ there are 87,247 acres classified as having a high potential for emitting harmful levels of wildfire smoke.

7.3.2.2 Soil Vulnerability

Soil Vulnerability refers to soils in Nevada County that are more likely to be subject to post-fire erosion due to either their natural composition or human activities (i.e., hydraulic mining). Mass wasting events after a wildfire can be devastating. They can affect the community that burned or the community that is located downslope of the burn scar. Fire scars are regularly monitored for these types of events because of the potential impacts on communities. In Higgins/Penn Valley FZ there are 1,250 acres of historic hydraulic mine sites which are more vulnerable to erosion and mass wasting events. They are located adjacent to water waterways and river canyons. There are several areas in Rough and Ready around Ruffle Box and Rex Ditch, along Deer Creek south of Lake Wildwood, adjacent to Dry Creek in the Spenceville Wildlife Area, and along South Wolf Creek. Compared to the other FZ Higgins/Penn Valley has some of the least areas naturally or likely to experience significant erosion. There are 2,461 acres within the FZ naturally more vulnerable to landslide events and they are concentrated at the South Yuba River which is one of the steepest areas in the FZ.

7.3.2.3 Listed Hazardous Waste Sites

Hazardous waste sites can present challenges to community health if burned. They can emit toxic fumes and impede recovery efforts by requiring more stringent clean-up processes due to site contamination. Currently, there are twelve known hazardous waste clean-up sites in the Higgins/Penn Valley FZ.

7.3.2.4 Hospital and Sheltering Facilities

Hospital and sheltering facilities are included in Community Lifelines as components of communities. However, they also serve to support Community Health. They support secondary impacts from fire such as smoke impacts, sheltering sites, recovery centers, resource support, and more. These sites are often already within the community service as other functions such as schools, libraries, community centers, or churches. As previously mentioned, there are ten schools in the Higgins/Penn Valley FZ and two public libraries, Penn Valley Library and Bear River Public Library. There are no hospitals in the FZ.

7.3.2.5 Solid Waste Management Facilities

As with the other HVRAs in Community Health Solid Waste Management facilities are important to consider from a prevention and recovery perspective. Like hazardous waste sites, these facilities can

present complications related to contamination if burned. They are also important for community recovery. Loss in solid waste infrastructure can cause community residents to have to drive long distances to dispose of their garbage. In the Higgins/Penn Valley FZ there is the McCourtney Transfer Station which is the main solid waste facility for Western County. Additionally, there are three previously existing dump/solid waste sites in the FZ.

7.3.3 Natural Resources

In Nevada County, natural resources are both high-value resources that can be impacted by a wildfire and a wildfire hazard. The majority of vegetation has adapted in one way or another to exist in a fire-prone environment. However, historical management decisions and fire suppression have resulted in many of the natural resources in Nevada County being overloaded with fuel and presenting a fire hazard. Nevada County is also home to an abundance of natural resources that offer recreational amenities, significant species habitat, and support for watersheds. Further, the community has a very strong identity tied to many of these natural resources, such as the South Yuba River. The Natural Resources Primary-HVRA includes the following:

- **Outdoor Recreation Resources** which include recreation areas such as public parks, trails, campsites, seasonal roads, ski resorts, and the Tahoe National Forest.
- **Watersheds**
- **Significant Species**
- **Oak Woodlands**
- **Areas of High Climate Change Resilience** are areas identified by the State as being more likely to survive the impacts of climate change (Thorne et al. 2016).

The HVRA list for Nevada County and an explanation of each HVRA is documented in Appendix E of the WRA (Appendix B, Wildfire Risk Assessment).

7.3.3.1 Outdoor Recreation Resources

Outdoor Recreation Resources are important to Nevada County from multiple perspectives especially considering their often-hazardous fuel conditions and community value. They include things like public parks, trails, and campsites. There are several outdoor recreation resources in the Higgins/Penn Valley FZ. Trails exist across the FZ and are very popular with community members and visitors. These include Western Gateway Park, Alta Sierra Trail, Overland Emigrant Trail, South Yuba River trails, and Independence Trail to name a few. There are ten parks in the FZ some of which are located within communities such as the parks in Lake Wildwood and others are publicly owned by local, state, and federal governments. The most popular park in the FZ is the South Yuba River State Park. This includes Bridgeport, land adjacent to the river, the area around the excelsior Ditch, and the 49 Crossing.

7.3.3.2 Watersheds

Watersheds include public water bodies, wetlands, Clean Water Act 303(d) listed water bodies, and rivers/streams/creeks. These resources are critical in supporting our environment and the community. There are 67 public water bodies in the Higgins/Penn Valley FZ this includes reservoirs such as Rex

Reservoir and Lake Combie. There are 275 acres of wetlands in the FZ most of them in the southern half. Five waterbodies in the FZ are on the Clean Water Act 303(d) list, meaning their water quality is impaired for one or more constituents such as mercury, a relic of legacy mining activities. They include Zayak Lake, Camp Far West Reservoir, Combie Lake, Lake Wildwood, and Englebright Lake. Finally, there are 457 miles of rivers, streams, and creeks in the Higgins/Penn Valley FZ.

7.3.3.3 Significant Species

At the time of this CWPP there is no known critical habitat identified in the Higgins/Penn Valley FZ. However, critical habitat and the presence of significant species regularly change. Further, critical habitat data is only publicly available for animal species and does not include botanical species. This means that biological and botanical surveys are very likely to still be required for risk reduction activities.

7.3.3.4 Oak Woodlands

Oak Woodlands are one of the dominant vegetation communities in Higgins/Penn Valley FZ. There are over 70,000 acres of Oak Woodlands and common species include canyon live oak (*Quercus chrysolepis*), interior live oak (*Quercus wislizenii*), blue oak (*Quercus douglasii*), and California black oak (*Quercus kelloggii*). Higgins/Penn Valley has more Oak Woodlands that any other FZ in the County.

7.3.3.5 Areas of High Climate Change Resilience

There are no Areas of High Climate Change Resilience (Thorne et al. 2016) in the Higgins/Penn Valley FZ.

7.3.4 Economic Resources

An important component of wildfire resilience is economic resources. Communities not only need to be able to physically survive a wildfire, but they also need to be able to have their economic infrastructure in place so that the community can recover after a wildfire. In California, wildfire has significantly impacted economic resources, impairing the community's ability to recover. This is seen in Paradise, after the Camp Fire, and in rural communities, such as Greenville, after the Dixie Fire. Therefore, it is important to include Economic Resources as a Primary-HVRA in the WRA. In Nevada County, many economic resources also double as natural resources, as the economy is tourist-driven and focused on outdoor recreation. The Economic Resources Primary-HVRA includes the following Sub-HVRAs:

- **Recreation**
- **Historic and Cultural Districts**
- **Government Buildings**

It is important to note that the main driver of the economy in Nevada County is tourism, especially recreation-based tourism directly tied to the natural environment. This means that the County's main economic resource is the environment itself. Therefore, it is not possible to separate Economic Resources in a meaningful way, as they are components of all the HVRAs. Further, as a result, Economic Resources HVRA is very vulnerable to wildfire given that any impact on the other identified HVRAs also has the potential to impact the Economic Resources in Nevada County. For these reasons, the results

from the Economic Resources risk assessments are not further analyzed in the WRA beyond the County-scale discussion of the risk assessments. The information below is provided for community context.

The HVRA list for Nevada County and an explanation of each HVRA is documented in Appendix E of the WRA (Appendix B, Wildfire Risk Assessment).

7.3.4.1 Recreation

Recreation resources include the previously described Outdoor Recreation Resources in Section 7.3.3.1. Of which there are many in Higgins/Penn Valley FZ and provide economic income for the area and the County.

7.3.4.2 Historic and Cultural Districts

There are no federally identified Historic Districts nor state-identified Cultural Districts in Higgins/Penn Valley FZ.

7.3.4.3 Government Buildings

While government facilities were included in the Community Lifelines HVRA they were specified in Economic Resource HVRA since the largest employer in the County is government (local, state, and federal). In Higgins/Penn Valley FZ there are 22 government buildings which include CAL FIRE facilities, CA State Park-owned buildings, and locally owned buildings.

7.4 Risk Assessment Summary

As discussed in Section 3.2 a Quantitative Wildfire Risk Assessment (QWRA) was completed for High Value Resources and Assets at Risk (HVRA) within each Forecast Zone (FZ). The following is a summary of the results from the QWRAs completed in the Higgins/Penn Valley FZ. It is important to note this is not the final component of the Wildfire Risk Assessment (WRA). More detailed information on the QWRA results can be found in Appendix A Wildfire Risk Assessment.

Across each HVRA, in all fire scenarios, 9% of the land (12,280 acres) is classified as Non-Burnable[8], and 1-2% (2,884 acres, 2,656 acres, and 1,886 acres respectively) is classified as Burnable but Not Burned[9]. Land area (pixels) classified as No Impact[10] range from 11% to 87% for the three scenarios as well, with Community Lifelines having the least number of pixels classified as No Impact and Economic Resources having the most.

In the Higgins/Penn Valley FZ, the results for the Community Lifelines HVRA classified over 70% of the burnable pixels as either High Priority or Very High Priority Risk from wildfire and these are adjacent to

[8] Non-burnable indicates an area mapped with a non-combustible fuel/vegetation type classification (e.g., rock, water, pavement).

[9] Burnable but Not Burned indicates an area that did not burn in the fire behavior modeling component but is mapped as a combustible fuel/vegetation type (e.g., grass, brush) and has the capacity to burn. This classification does not mean such areas cannot burn, but rather modeled fires did not reach these areas.

[10] No Impact classifications indicate areas that are not classified as an HVRA but did burn in the wildfire behavior modeling component.

communities such as Lake Wildwood and Alta Sierra. For the Community Health risk assessments over 50% of the burnable pixels are classified as either High or Very High Priority Risk from wildfire. There is an overlap in where these locations occur between the Community Lifelines results and the Community Health results and they generally are found around communities.

Within the Higgins/Penn Valley FZ, the Natural Resources risk assessment does indicate the potential for burnable pixels to have a potential benefit from exposure to wildfire. Generally, the results indicate a potentially High or Very High Priority Benefit. This is largely due to the presence of Oak Woodlands within this FZ. Areas considered to have a potential benefit from wildfire will still benefit from wildfire risk reduction activities. Wildfire risk reduction activities can potentially mimic the disturbance of a wildfire, or it can mean that that area will be more conducive to prescribed fire treatments. Between 30 and over 60% of the pixels in the Natural Resources risk assessment are classified as High or Very High Priority Risk.

7.5 Project Priority Areas

As described in Section 4 the main goal of the Wildfire Risk Assessment (WRA) is to identify the Project Priority Areas. The Project Priority Areas are the final result of the WRA as they identify and prioritize areas on the landscape for multi-beneficial wildfire risk reduction activities. These areas represent the overlap between wildfire risk and assets and resources the community values in protecting from wildfire. The Project Priority Areas are organized into High and Highest Priority. High Priority is where there is overlap between Community Lifelines and Community Health at high risk from wildfire and Highest is where there is overlap between Community Lifelines, Community Health, and Natural Resources at high risk from wildfire. This prioritization was determined based on the results from the WRA, stakeholder outreach, and community outreach.

In the Higgins/Penn Valley Forecast Zone (FZ), 77,085 acres are classified as Project Priority Areas, accounting for 54% of the FZ's total area. These 77,085 acres are classified as High Priority. Of these, 52,661 acres are also classified as Highest Priority. Project Priority Areas in the Higgins/Penn Valley FZ are presented in Table 33 and shown graphically in Figure 18. The risk reduction approaches identified in Section 7.8 would be prioritized in these areas.

Table 33. Higgins/Penn Valley Forecast Zone Priority Project Areas

Name	Acres
Highest Priority (Community Lifelines, Community Health, and Natural Resources)	52,661*
High Priority (Community Lifelines and Community Health)	77,085

Note:
* Areas designated as highest priority are also considered high priority areas.

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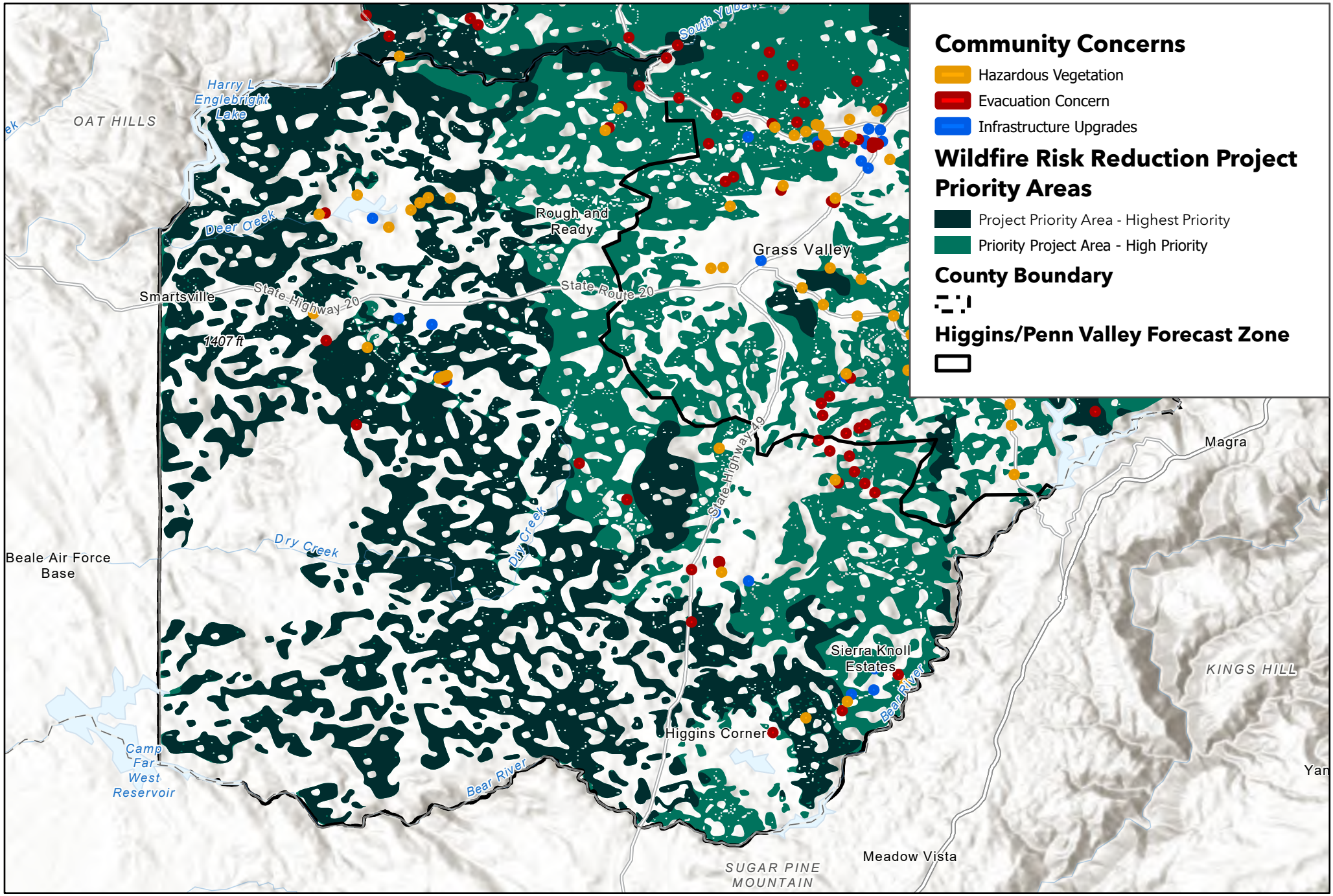
Figure 18 - Higgins/Penn Valley - Community Concerns



NEVADA COUNTY CALIFORNIA DUDEK

0 1.25 2.5 5 Miles

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7.6 Community Engagement Results

7.6.1 Community Wildfire Protection Plan Survey

As described in Section 5.1.1. the Community Wildfire Protection Plan (CWPP) process was initiated by a CWPP Public Survey. The survey was used to understand community priorities, wildfire risk reduction priorities, wildfire risk perception, and evacuation behavior. Of the 2,267 survey responses, 812 were from the Higgins/Penn Valley FZ.

Survey respondents viewed the County's Risk from wildfire as Very High and felt that the most important risk reduction actions for the County to address were (1) Evacuation Route Improvement, (2) Defensible Space Assistance, and (3) Roadside Vegetation Removal. In the FZ the highest priority to protect from wildfire was Community Lifelines, followed by Community Health, Natural Resources, and Economic Resources.

When asked about their personal wildfire risk the majority of respondents felt that their risk was moderate. They also on average rated their defensible space as a score of 4.4/5. Even so, respondents felt that the main challenges in reducing their wildfire risk were (1) fuel on neighboring properties, (2) cost of home hardening, and (3) cost of defensible space/fuel reduction.

In terms of evacuation, the majority of respondents had never been evacuated in Nevada County before and felt that they would leave as early as possible if they needed to evacuate in the future. The three primary evacuation concerns for respondents in the Higgins/Penn Valley FZ were (1) getting trapped on the road, (2) getting out early, and (3) losing their home or property.

A full report on the survey results for Higgins/Penn Valley FZ is available in Appendix C.

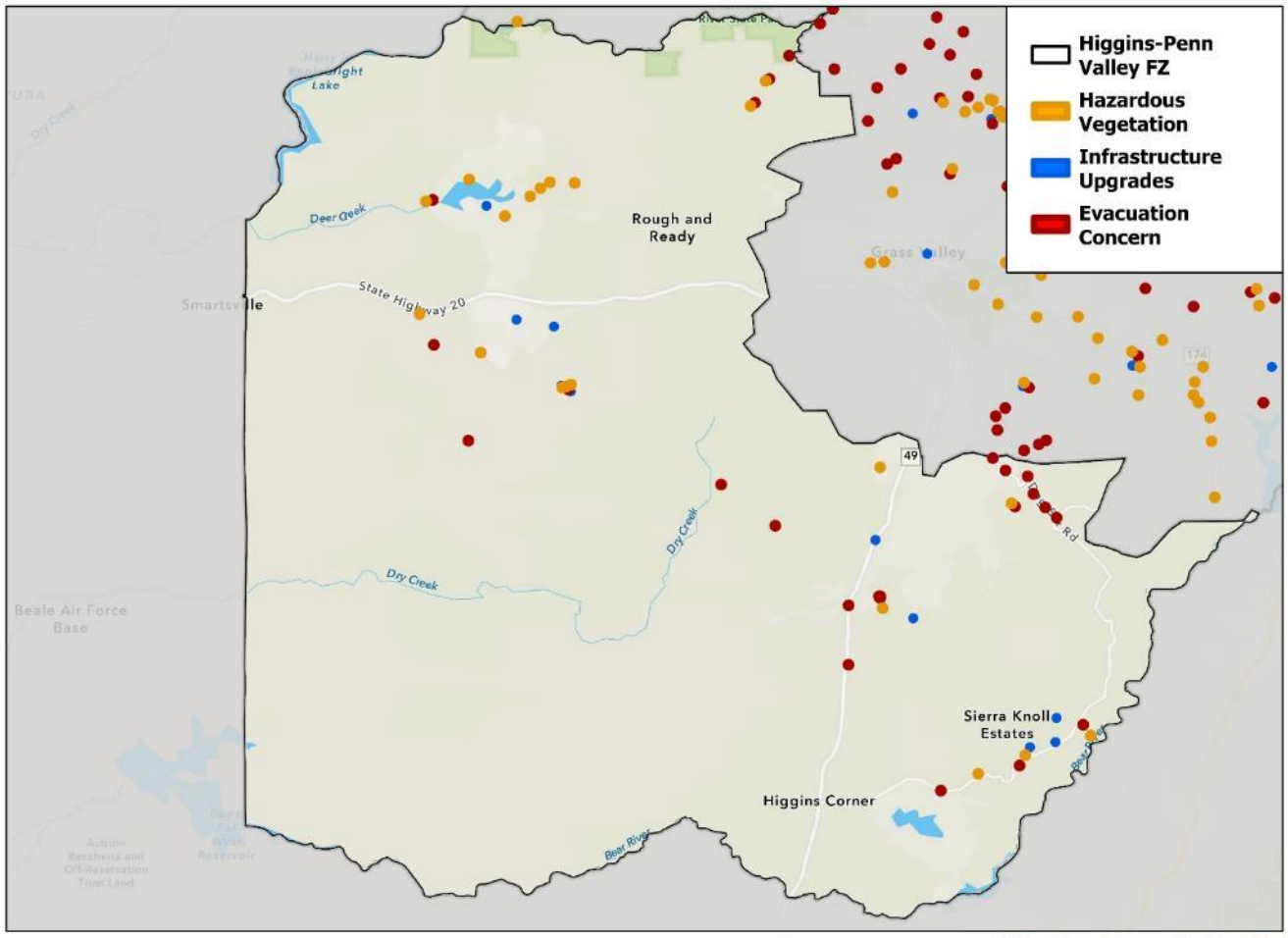
7.6.2 Community Workshop Results

The workshops for the Higgins/Penn Valley FZ took place on January 17 and 23, 2024 and included 22 total attendees. The workshops included a brief overview of the project followed by self-guided and active engagement activities aimed at facilitating discussion and gaining input from community members. A summary of the activities and community input received is provided in the following sections.

7.6.2.1 Self-Guided Activities

The self-guided activities included a map activity where community members could identify areas of concern using pins on a map, including limited evacuation routes, hazardous vegetation, and areas where structural hardening is needed. Areas pinned by community members are shown in Exhibit 5. Many of the pins were placed in areas that participants lived in or were familiar with including around Sierra Knoll Estates, Highway 49, Dog Bar Road, Lake Wildwood, and along Highway 20.

Exhibit 5. Community-identified areas of concern for the Higgins/Penn Valley Forecast Zone



The self-guided activities also included a bead activity which allowed residents to prioritize wildfire risk reduction methods for the community and to identify which vegetation management techniques they wanted to see in the community. Exhibit 6 presents community preferences for wildfire risk reduction activities.

Exhibit 6. Preferred wildfire risk reduction methods for the Higgins/Penn Valley Forecast Zone

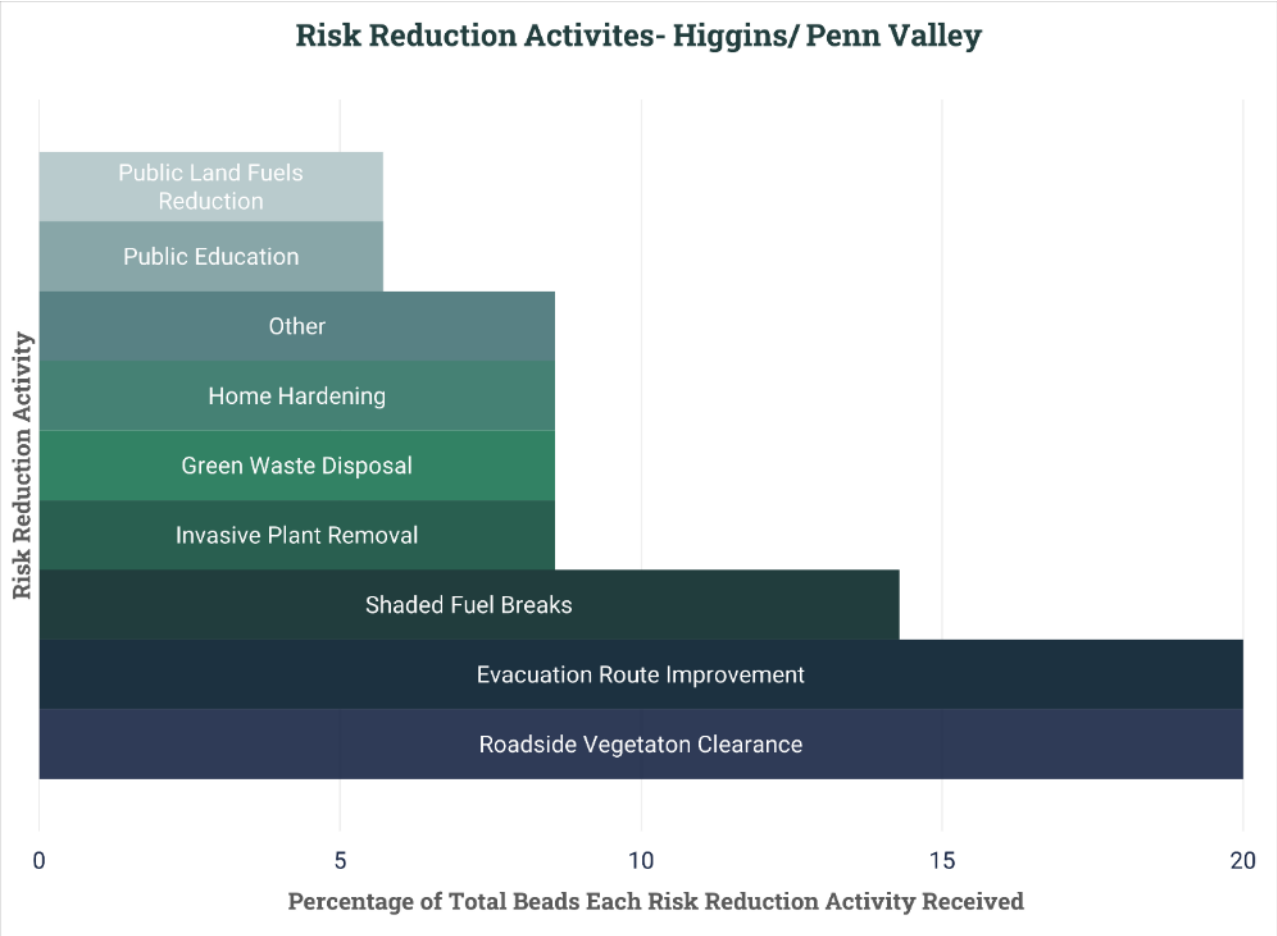
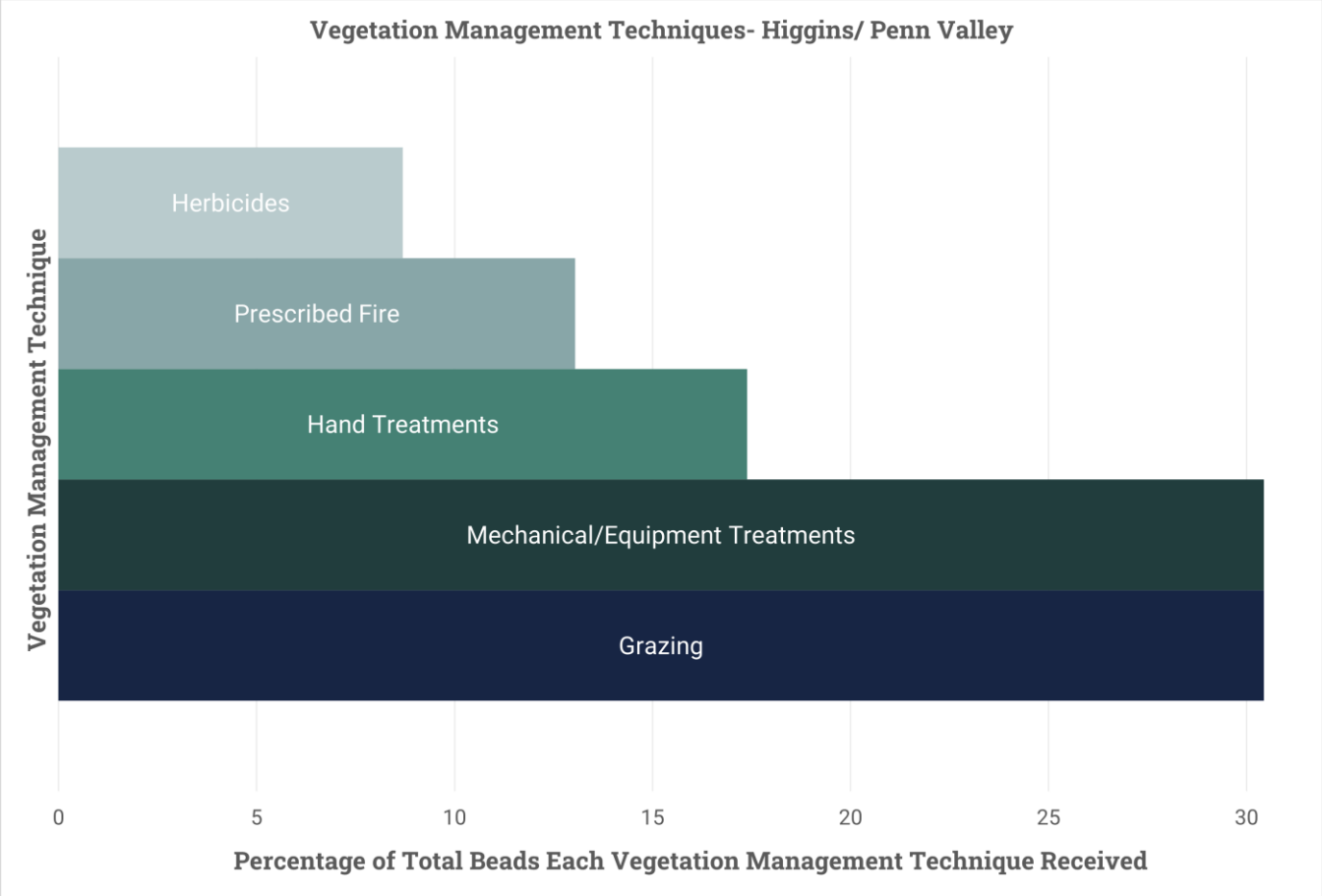


Exhibit 7 presents community preferences for vegetation management techniques.

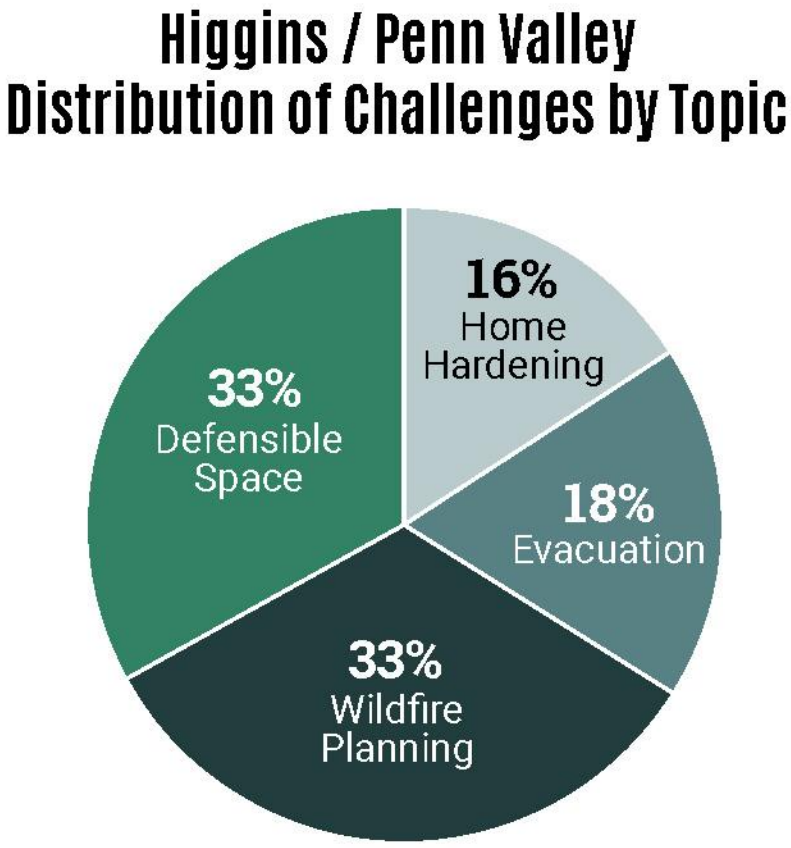
Exhibit 7. Preferred vegetation management techniques for the Higgins/Penn Valley Forecast Zone



7.6.2.2 Community Discussions

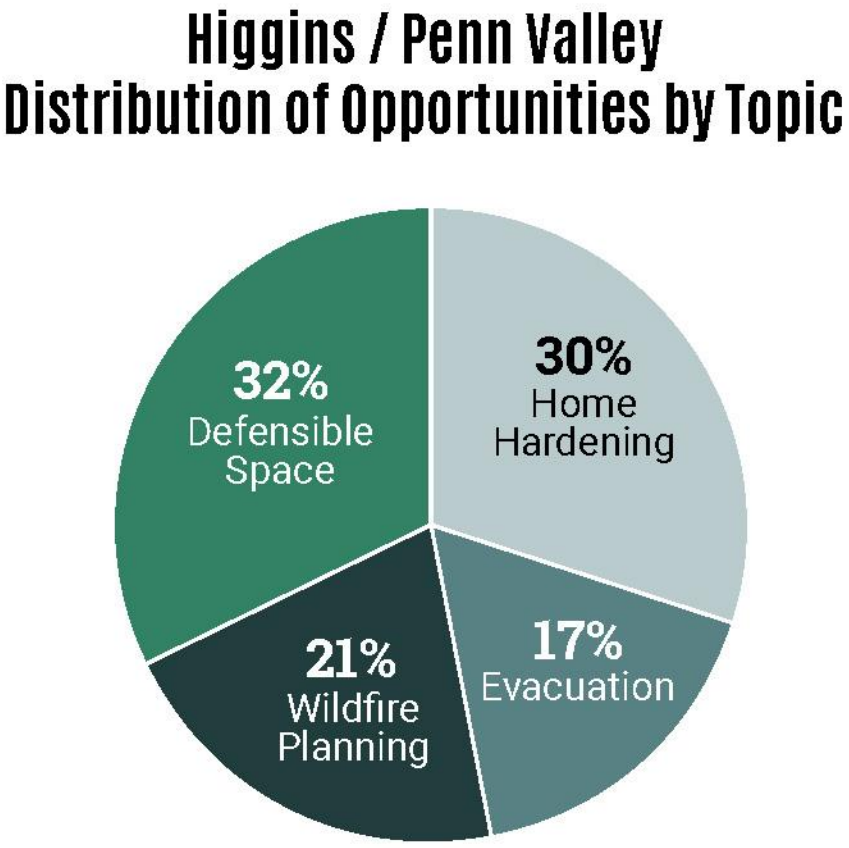
To analyze the community groups discussions, two methods were taken. The data was first categorized by challenges and opportunities. As further described in Section 5.1.2, this data was categorized by the four discussion topics to help show the distribution of issues for each FZ. Exhibit 8 shows the distribution of challenges by topic for the Higgins/Penn Valley FZ. This shows how the majority of the written comments refer to Defensible Space and Wildfire Planning, with fewer comments regarding Home Hardening and Evacuation.

Exhibit 8. Community-identified challenges for the Higgins/Penn Valley Forecast Zone



Additionally, as shown in Exhibit 9, when looking at opportunities, community members in the Higgins/Penn Valley FZ were focused primarily on Defensible Space and Home Hardening. The proportions of challenges did not always translate to the proportion of opportunities. For example, although Wildfire Planning had 33% of the comments regarding challenges, it only represented 21% of the comments regarding opportunities.

Exhibit 9. Community-identified opportunities for the Higgins/Penn Valley Forecast Zone



The data was also categorized by issue topic. Exhibit 10 shows the distribution of overall challenges by issue category.

Exhibit 10. Community-identified challenges by issue category for the Higgins/Penn Valley Forecast Zone

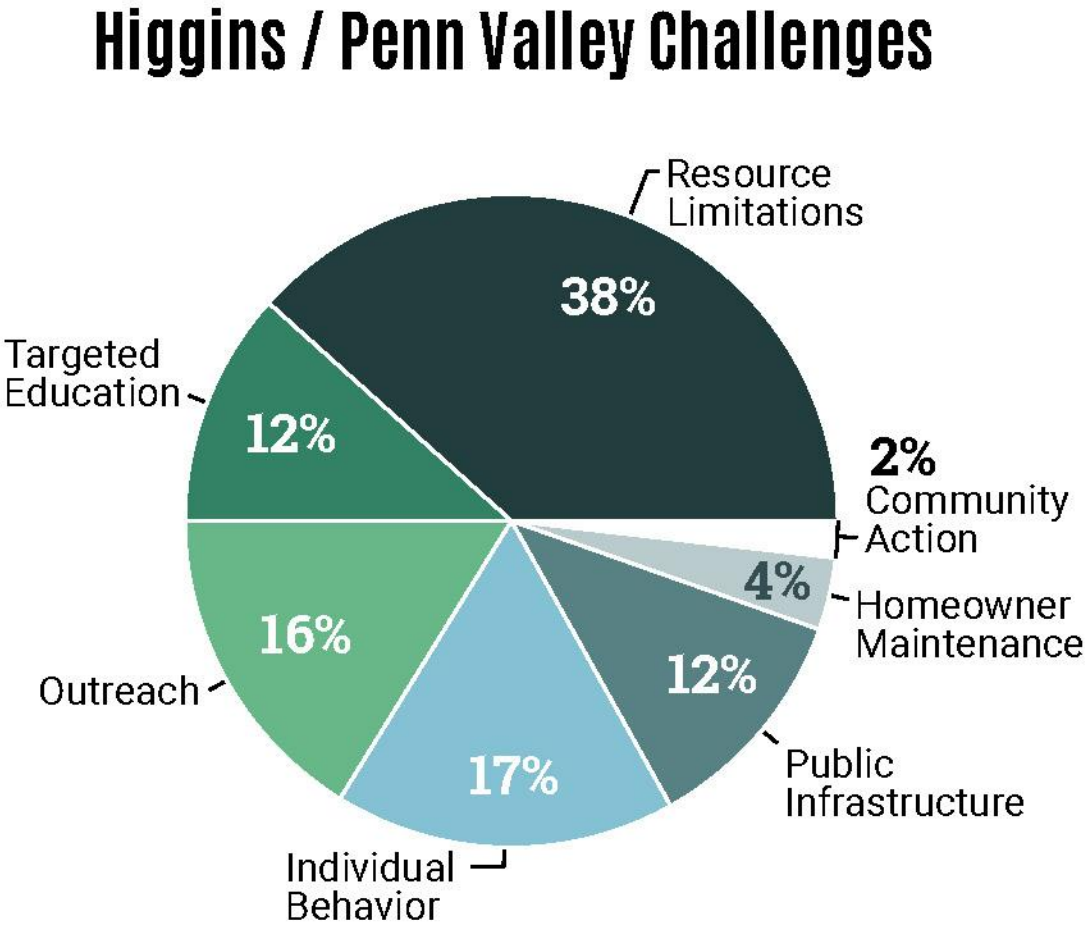
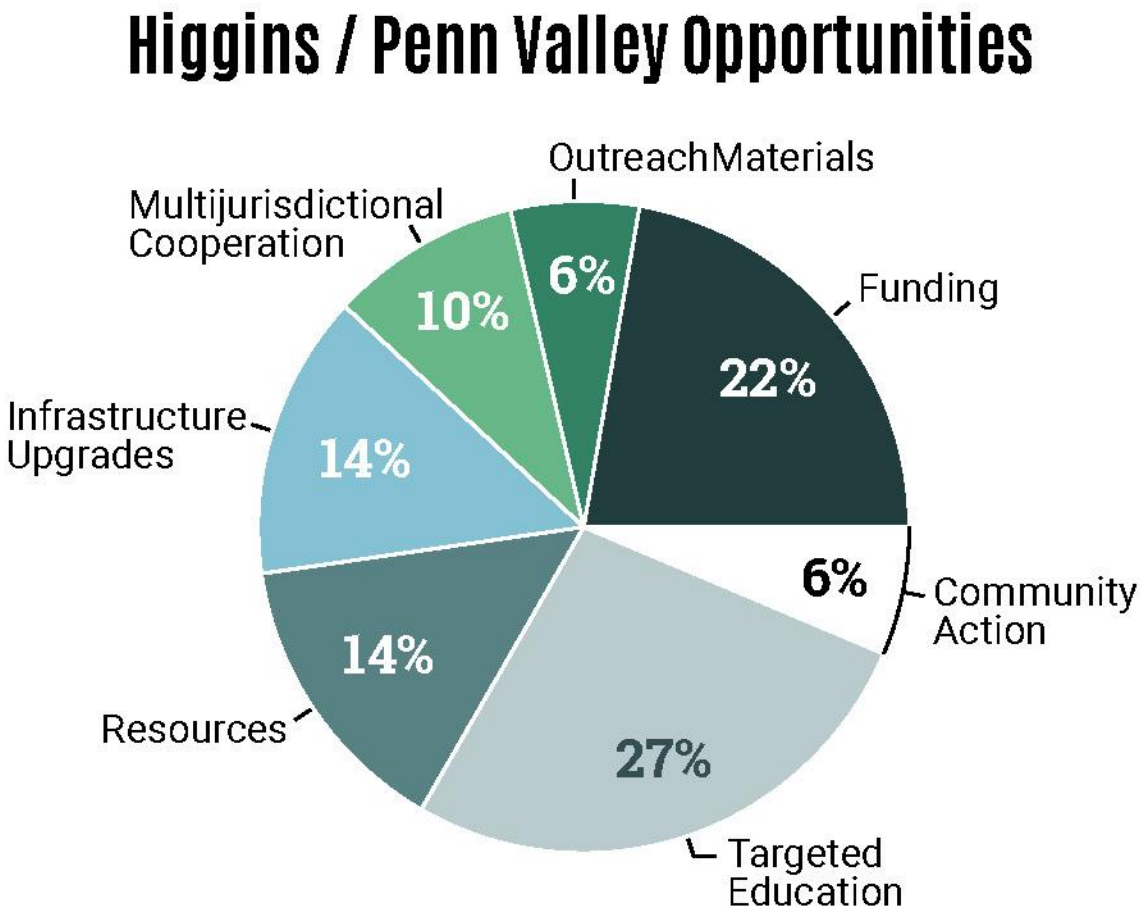


Exhibit 10 emphasizes how community members in the Higgins/Penn Valley FZ are very concerned about resources limitations that prevent people and communities from preparing for wildfire. This includes the costs associated with hardening their homes or implementing defensible space, not having the time or physical ability to implement improvements, or not having enough contractors to do the work. Other main concerns include needing more targeted education for full time and seasonal residents, outreach, and influencing individual behavior.

As shown in Exhibit 11, community members in the Higgins/Penn Valley FZ primarily focused their discussions on opportunities regarding funding and targeted education. Specifically, discussions were focused on exploring grants, tax incentives, and access and functional needs assistance.

Exhibit 11. Community-identified opportunities by issue category for the Higgins/Penn Valley Forecast Zone



For Targeted Education, community members in the Higgins/Penn Valley FZ wanted more education regarding evacuation, local ordinances that involve vegetation management, education on how fire behaves in this environment, and the importance on implementing Zone 0 within defensible space areas. Community members in this FZ also wanted to explore how infrastructure can be upgraded to increase communication during wildfires (including more towers to improve cell service) and increased evacuation signage. **For full results of each discussion topic and the full community workshop analysis, please see Appendix D.**

7.7 Issues Specific to the Higgins/Penn Valley Forecast Zone

The following list summarizes the major issues present within the Higgins/Penn Valley Forecast Zone (FZ). These issues were obtained from community member input, collaboration with interested parties, field visits, and a review of wildfire-related spatial data.

Wildfire Hazard

- Many areas within the FZ have not experienced wildfire according to the historic wildfire record, suggesting fuel accumulation is high and hazardous fuel conditions are widespread.
- The extreme southeast region of the FZ within the Bear River drainage east of Alta Sierra has experienced the most wildfires, with some areas in this region having burned four times historically.
- This FZ exhibits a greater distribution of grassland and chaparral vegetation when compared to the other FZs. The fire dynamics of these vegetation types may require alternative vegetation approaches compared to those conducted in other FZs.
- Areas of High and Very High wildfire hazard are present throughout this FZ. Wildfire Hazard in this FZ was modeled to be highest in the central region of the FZ's eastern boundary, in addition to the northern edge of the FZ within the South Yuba River drainage.

Community Participation and Education

- This FZ is largely comprised of private land, emphasizing the need for community member participation to achieve wildfire risk reduction goals.

Evacuation and Access Challenges

- Higher-density communities present in Lake Wildwood and Alta Sierra present the potential for road congestion and delayed evacuation during a wildfire event.

Wildfire Ignitions

- Similar to the Grass Valley/Nevada City FZ, the number of vegetation fire ignitions per acre is roughly twice as high compared to the Tahoe National Forest (TNF) Area and Truckee/Donner FZs.
- A review of vegetation fire ignition history shows that ignitions are more common in the areas of Alta Sierra, Higgins Corner, Rough and Ready, Lake Wildwood, and along Highway 49 and Highway 20.

Jurisdiction and Land Ownership

- The high degree of private land ownership in this FZ requires the need for collaboration between private landowners to achieve community and landscape level wildfire risk reduction efforts.

7.8 Action Plan

7.8.1 Risk Reduction Approaches

Wildfire often impacts a wide range of assets. Risks to identified assets can be mitigated through the implementation of a variety of risk reduction approaches**.** The following sections identify wildfire risk reduction approaches that may be considered within Project Priority Areas

7.8.1.1 Reducing Structural Ignitability

Terrain, vegetation, and climatic conditions in the Plan Area combine to create a unique situation capable of supporting large-scale, high-intensity, and sometimes damaging wildfires. There are two main components to reducing structural ignitability: structural hardening and defensible space. The following sections identify actions that can be implemented by homeowners on private properties to reduce the potential for structure ignitions caused by wildfires.

7.8.1.1.1 Structural Hardening

Although fire-resistant construction standards are mandatory for new buildings, hardening of existing structures is voluntary. Hardening of the homes and other structures to enhance survivability during a wildfire would include retrofitting the most vulnerable home features, including roofs, vents, eaves and soffits, windows, walls, decks, rain gutters, patio covers, chimneys, garages, and fences. Adopting mandatory home hardening provisions through building and fire codes is problematic because existing, nonconforming structures were typically approved and built to the codes in effect at the time of construction. A burning structure contributes to wildfire spread via radiant heat generation (to nearby structures) and ember generation (to downwind structures). Retrofits to existing structures can reduce fire risk, and some cost-sharing and grant programs are available to offset costs. Resources for hardening structures can be found on the following websites:

- Wildfire Home Retrofit Guide
- Protect Your Property from Wildfire
- Prepare for Wildfire
- Low-Cost Retrofit List
- Preparing Your Home

Structural Hardening recommendations for the Higgins/Penn Valley FZ are described in Table 34.

Table 34. Higgins/Penn Valley Forecast Zone Recommendations for Reducing Structural Ignitability

Action/Recommendation	Issue	Scale
Encourage structural retrofits through inspections, community education, and grant funding opportunities.	Structure Exposure Community Participation and Education Financial Barriers	Community
Target contiguous community areas to provide maximum benefit towards reducing structure-to-structure ignitions.	Structure Exposure Financial Barriers	Community
Evaluate opportunities for engaging residents and landowners in structural retrofit programs.	Structure Exposure Community Participation and Education Financial Barriers	Community
Work to encourage home hardening self-assessments through community education.	Structure Exposure Community Participation and Education	Community Individual
Prioritize the most cost-effective structural hardening actions in community education and outreach materials and campaigns. Prioritize this outreach in financially challenged communities.	Structure Exposure Community Participation and Education Financial Barriers	Community
Encourage structure inspections in tandem with existing defensible space inspection programs.	Structure Exposure	Community
Educate residents of working landscapes on the importance of hardening accessory structures (e.g., barns, paddocks, livestock pens etc.) against wildfire.	Structure Exposure	Community Individual
Educate residents on structure hardening options for mobile homes and prefabricated homes especially in mobile home communities.	Structure Exposure	Community Individual

7.8.1.1.2 Defensible Space

Reducing structure exposure to wildfire is also achieved via vegetation management/fuel reduction in defensible space areas. Five zones are identified for defensible space areas. Recommendations for management actions that can be taken by homeowners in each of these zones can be found on Nevada

County's website at https://nevadacountyca.gov/3004/Defensible-Space. Recommendations for Higgin/Penn Valley FZ are described in Table 35.

Table 35. Higgins/Penn Valley Forecast Zone Nevada County Defensible Space Recommendations

Action/Recommendation	Issue	Scale
Encourage local government, fire agencies, and NGOs to identify staffing needs in order to facilitate a high level of annual defensible space inspections.	Structure Exposure Wildfire Hazard	Community
Focus efforts to increase defensible space inspection rates, education, and compliance levels in communities with higher wildfire risk exposure. Focus these efforts on disadvantaged communities with high wildfire risk exposure.	Structure Exposure Wildfire Hazard	Community
Increase defensible space education and resource deployment in vulnerable populations with high wildfire risk exposure.	Structure Exposure Wildfire Hazard Community Participation and Education	Community
In areas outside of Nevada County jurisdiction where creating 100 feet of defensible space is not possible for a single property due to property size, develop a process for property owners to partake in collaborative vegetation management. Provide residents with information on alternative methods and materials that can be implemented to increase fire safety when 100 feet of defensible space is not feasible (e.g., fire wall, enhanced structural hardening measures). Most applicable in medium to higher-density communities where parcel sizes are smaller.	Structure Exposure Wildfire Hazard Community Participation and Education	Community Individual
Promote community-scale defensible space projects within the County Defensible Space Home Hardening Zone.	Structure Exposure Wildfire Hazard	Community
Develop a training course for landscape contractors on defensible space standards, common issues, and best practices. Maintain a list of contractors who have completed the training course.	Structure Exposure Community Participation and Education	Community
Emphasize the importance of creating an Ember Resistant Zone (Zone 0) around all structures.	Structure Exposure Wildfire Hazard Wildfire Ignitions	Community Individual

Table 35. Higgins/Penn Valley Forecast Zone Nevada County Defensible Space Recommendations

Action/Recommendation	Issue	Scale
	Community Participation and Education	
Emphasize the importance of storing firewood away from structures during fire season.	Structure Exposure Community Participation and Education	Community Individual
Develop Community-based volunteer programs where community members can assist one another with defensible space creation.	Structure Exposure Community Participation and Education	Community Individual
Emphasize the relationship between winter storm debris and defensible space. Promote defensible space as a year-round activity.	Structure Exposure Wildfire Hazard Community Participation and Education	Community Individual
Encourage residents to address defensible space around accessory structures.	Structure Exposure Wildfire Hazard Community Participation and Education	Community Individual
Educate residents on the impact of noxious species on defensible space and the importance of removing these species from defensible space zones.	Structure Exposure Wildfire Hazard Community Participation and Education	Community Individual
Educate residents and encourage the use of prescribed grazing for maintaining defensible space in appropriate landscapes.	Structure Exposure Wildfire Hazard Community Participation and Education	Community Individual

7.8.1.2 Vegetation Management/Fuel Reduction

Vegetation management/fuel reduction actions outside of defensible space/fuel modification areas (see Section G-IV 7.3 of County Hazardous Vegetation Abatement Ordinance) may be conducted by fire and land management agencies, organizations, or private landowners for the purposes of wildfire risk reduction. Vegetation Management/Fuel Reduction recommendations for Higgins/Penn Valley FZ are described in Table 36.

Table 36. Higgins/Penn Valley Forecast Zone Vegetation Management/Fuel Reduction Recommendations

Action/Recommendation	Issue	Scale
Promote partnership between federal agencies, state agencies, and private landowners to collaborate in cross-ownership vegetation management/fuel reduction projects.	Wildfire Hazard Jurisdiction and Land Ownership	Community Individual
Provide community education focused on the post-fire benefits of active vegetation management/fuel reduction on watershed function, slope stability, and forest health/vegetation community resilience.	Community Participation and Education	Community
Conduct roadside vegetation management/fuel reduction along major evacuation routes and where roadside ignitions are common.	Wildfire Ignitions Evacuation and Access Challenges	Community Individual
Create or maintain fuel breaks/hazardous fuel reduction areas along strategic ridgelines.	Wildfire Hazard	Landscape
Identify and address obstacles to implementing prescribed fire on public and private land.	Wildfire Hazard	Community
Conduct vegetation management/fuel reduction around critical infrastructure and critical resources.	Wildfire Hazard Wildfire Ignitions	Community
Conduct vegetation management/fuel reduction projects around high-use recreation facilities to decrease the potential for ignitions.	Wildfire Ignitions Evacuation and Access Challenges Wildfire Hazard	Community
Encourage the development of wildfire risk reduction projects that also promote climate resilience.	Wildfire Hazard	Community
Encourage development of wildfire risk reduction projects that also address tree mortality.	Wildfire Hazard	Community
Educate residents on the nexus between wildfire resilience and agriculture. Promote wildfire risk reduction actions that also support agriculture practices.	Wildfire Hazard Community Participation and Education	Community
Encourage the development of wildfire risk reduction projects that promote the resilience of Oak Woodlands.	Wildfire Hazard	Community

Vegetation Management/Fuel Reduction Monitoring and Evaluation Strategies

Vegetation management/fuel reduction activities may occur over long periods of time and require substantial investment and resources. In addition, these activities often require adaptive management due to changing conditions and subsequent treatments to ensure their effectiveness and longevity. Therefore, it is necessary to have a strategy to measure, both quantitatively and qualitatively, whether the goals and objectives of vegetation management/fuel reduction activities are being met as expected.

The 2024 Truckee Community Wildfire Protection Plan (CWPP) identified monitoring strategies that may be employed during vegetation management/fuel reduction projects throughout the County. Monitoring strategies aid in reaching management objectives and ensure that treatments address prior goals. Additionally, effective monitoring of vegetation management/fuel reduction projects addresses environmental damages that can be caused by vegetation removal such as soil erosion and invasive species recruitment. Post-treatment monitoring of treated areas also assists in the identification of appropriate treatment intervals based on the regrowth of vegetation following treatments.

Monitoring for each vegetation management/fuel reduction project will be tailored to the specific site and vegetation management/fuel reduction goals. The monitoring activities listed below serve different objectives, require varying amounts of time, and are suitable for different groups. These include:

Minimum- Level 1: Pre-and Post-Project Photographs

This monitoring strategy is considered a minimum standard and assists in comparing pre- and post-treatment vegetation conditions. This strategy captures vegetation conditions soon after treatment and therefore does not address vegetation regrowth over time.

Targeted Group: Homeowners conducting fuel reduction projects on private property.

Moderate – Level 2: Multiple Permanent Photo Points

Permanent photo points allow vegetation conditions to be assessed over time at set locations. This ensures consistency and ensures photo monitoring remains consistent. This monitoring strategy is best utilized over multiple years.

Targeted Group: Enthusiastic homeowners or agencies conducting small-scale projects.

High – Level 3: Basic Vegetation Plots

Vegetation plots are utilized to assess vegetation conditions including species, canopy cover, and vegetation frequency, in addition to environmental conditions including slope, aspect, soil type, and elevation. Using pre-established measurement protocols, vegetation conditions can be assessed pre- and post-treatment. Plot locations can be recorded, allowing continual monitoring over time to assess vegetation regrowth and identify treatment frequency standards.

Targeted Group: Agencies conducting fuel treatments in forestlands.

Intense – Level 4: Basic Vegetation Plots Plus Dead and Downed Fuels Inventory

In addition to the basic vegetation pots described above, conducting an inventory of dead and down fuels at each plot provides additional insights into fuel loading. This would include an assessment of dead and down fuels that may contribute to increased wildfire severity. Over time, these fuels build up in forested areas and may decrease the level of fuel treatment effectiveness if not maintained over time.

Targeted Group: Agencies tracking detailed changes in vegetation following fuel treatments in forestlands.

7.8.1.3 Community Outreach and Education

Community outreach and education is an important component in community wildfire hazard reduction efforts. Such efforts increase the community's knowledge and awareness of wildland fire, can assist in prevention and preparedness efforts, and are an important component in planning and implementing vegetation management/fuel reduction projects. Given the size of the County, it is important that the outreach messages around wildfire preparedness are consistent amongst communities. Information on existing County programs can be found in Section 6.2.4. The actions presented in Table 37 are recommended to address community outreach and education in the Higgins/Penn Valley FZ.

Table 37. Higgins/Penn Valley Forecast Zone Community Outreach and Education Recommendations

Action/Recommendation	Issue	Scale
Continue to distribute wildfire education and awareness materials at community events. Partner with nonprofits and other agencies to engage with the public about wildfire-related issues.	Community Participation and Education	Community
Continue to prioritize in-person wildfire education and awareness events that meet the community where they are at.	Community Participation and Education	Community
Support the development of fire planning efforts in incorporated cities through information and data sharing.	Jurisdiction and Land Ownership	Community
Identify key locations and coordinate with appropriate agencies to install signage to notify the public of an area's high fire hazard, including in recreational areas and within neighborhoods.	Community Participation and Education	Community
Develop outreach strategies to engage with seasonal residents, absentee landowners, and visitors.	Community Participation and Education	Community
Develop wildfire awareness materials (e.g., handouts, signage, QR codes) for display and/or distribution at high-use recreation areas (campgrounds, trailheads, day-use	Community Participation and Education	Community

Table 37. Higgins/Penn Valley Forecast Zone Community Outreach and Education Recommendations

Action/Recommendation	Issue	Scale
areas) to increase awareness of wildfire hazards.		
Work with camps, recreational facilities, and other guest-oriented businesses to develop evacuation plans and enhance wildfire preparedness.	Jurisdiction and Land Ownership	Community
Conduct outreach specific to addressing wildfire hazards, emergency communications, and evacuation procedures with vulnerable populations.	Community Participation and Education	Community
Support the development of new Firewise Communities in areas where they are needed and encourage the creation of Community Focus Groups intended to engage community members and identify local priority projects.	Community Participation and Education	Community
Develop outreach and education strategies that promote all-hazard disaster preparedness.	Community Participation and Education	Community
Develop outreach and education to support land management and land management planning for public and private landowners.	Community Participation and Education	Community
Develop outreach and education to engage with stakeholders and communities around climate and wildfire resilience.	Community Participation and Education	Community

7.8.1.4 Evacuation

The Plan Area presents unique challenges for evacuation, including narrow and windy roads, single access communities, rural communities located far from major evacuation routes, steep and variable terrain, and hazardous vegetation near roadways. In the Plan Area, the Nevada County Sheriff's Office (NCSO) is responsible for coordinating emergency notifications and evacuations in their jurisdiction within the County's operational area in addition to the County's unincorporated areas. This includes alerting and warning the public, coordinating evacuations, enforcing laws and emergency orders, establishing safe traffic routes, ensuring that security is provided at incident facilities, ensuring access control to damaged areas, ordering, and coordinating appropriate mutual aid resources, and assuming responsibility for the coroner function. NCSO communicates the need for evacuation to the public using various communication methods as described further in Section 2.6 and Section 6.2.5.

The actions presented in Table 38 are recommended to address evacuation in the Plan Area.

Table 38. Higgins/Penn Valley Forecast Zone Evacuation Recommendations

Action/Recommendation	Issue	Scale
Leverage and extend the 2024 Evacuation Study by identifying key ingress/egress routes that should be prioritized for improvements to facilitate emergency egress (e.g., widening, road surface improvements, bridge improvements, vegetation management/fuel reduction, signage, and refuge sites). Prioritize roadways that function as the sole evacuation route for communities.	Evacuation and Access Challenges Wildfire Ignitions	Community
Leverage Appendix A of the 2024 Evacuation Study to support the implementation of community-identified evacuation priorities.	Evacuation and Access Challenges	Community
Coordinate with private landowners to implement roadside vegetation removal along private roadways.	Wildfire Ignitions Jurisdiction and Land Ownership	Community Individual
Prioritize efforts to address community evacuation priorities as identified in the Nevada County Evacuation Study.	Evacuation and Access Challenges	Community
Evaluate opportunities for installing and maintaining fireboxes at entry gates to communities and large ranches with road networks. Fire boxes could include hard copy maps, pertinent community/site information, and/or scannable QR codes for access to digital maps and community/site information. Boxes should be secured with a Knox Key.	Evacuation and Access Challenges Jurisdiction and Land Ownership	Community
Where secondary evacuation routes exist, seek opportunities to improve road conditions to conditions suitable for low-clearance vehicles.	Evacuation and Access Challenges	Community
Coordinate with relevant agencies to manage access to areas with large expanses of open space during Red Flag Warnings, or other high fire hazard periods, to minimize ignition potential.	Evacuation and Access Challenges Jurisdiction and Land Ownership Wildfire Ignition	Community
Identify high-use roadways and parking areas where parking restrictions during fire season or Red Flag warnings are needed to improve emergency ingress and evacuation.	Evacuation and Access Challenges	Community
Encourage community-wide evacuation drills to prepare community members for emergency situations.	Evacuation and Access Challenges	Community

Table 38. Higgins/Penn Valley Forecast Zone Evacuation Recommendations

Action/Recommendation	Issue	Scale
	Community Participation and Education	
In communities lacking secondary access, install reflective road signs to direct those to primary egress routes.	Evacuation and Access Challenges Community Participation and Education	Community
Educate residents on the importance of developing individualized evacuation plans.	Evacuation and Access Challenges Community Participation and Education	Individual
Continue to educate residents about Evacuation Zones and nexus with emergency alerts.	Evacuation and Access Challenges Community Participation and Education	Community Individual
In communities with gated access encourage residents to leave early when possible and work at a community scale to plan for different scenarios using different gates.	Evacuation and Access Challenges Community Participation and Education	Community
Educate residents with livestock on how to prepare livestock for wildfire, evacuation procedures, and when it is best to leave.	Evacuation and Access Challenges Community Participation and Education	Community Individual
Educate residents on evacuation procedures for towing trailers, fifth wheel, RVs etc., and emphasize the importance of leaving early.	Evacuation and Access Challenges Community Participation and Education	Community Individual
Encourage residents whose primary egress route is a major roadway prone to congestion to leave early.	Evacuation and Access Challenges Community Participation and Education	Community Individual

7.8.1.5 Emergency Communication Alerts

Emergency Communication Alerts are a critical way to communicate relevant emergency information to residents in the Plan Area. With the Plan Area having a diverse population including in age, race, ethnicity, native language, and access to technology it is crucial that emergency notifications accommodate that. This includes a diversity of media sources, languages, and methods of delivery of these notifications to

reach most residents in the Plan area. The actions presented in Table 39 are recommended to address emergency communication alerts for the Higgins/Penn Valley FZ.

Table 39. Higgins/Penn Valley Forecast Zone Emergency Communication Alerts Recommendations

Action/Recommendation	Issue	Scale
Pursue methods for disseminating evacuation information at high-use recreation areas where cell phone reception is limited.	Evacuation and Access Challenges Community Participation and Education	Community
Identify areas with limited telecommunications facilities and capabilities and explore opportunities for enhancing communications to residents and visitors prior to, during, and following wildfire events.	Evacuation and Access Challenges Community Participation and Education	Community
Improve early warning systems and emergency communications to reach everyone, including non-English speakers, and develop materials or tools to facilitate emergency communications in appropriate languages.	Evacuation and Access Challenges Community Participation and Education	Community
Install remote-operated electronic emergency signs in communication-limited areas to inform community members of emergency alerts including evacuation information and active wildfire information	Evacuation and Access Challenges Community Participation and Education	Community
Pursue strategies to increase community familiarity with Hi-Lo Sirens used during evacuations.	Evacuation and Access Challenges Community Participation and Education	Community

7.8.1.6 Post-Fire Recovery

The Higgins/Penn Valley FZ has been subject to wildfires that have necessitated evacuations, impacted road systems, reduced soil stability, and damaged infrastructure and natural resources. Post-fire runoff, flooding, and debris flows are possible and can cause further damage and impacts downstream of the burn area. Issues associated with post-fire recovery include repair and re-opening of access roads, repairs to utilities and other infrastructure, instability of slopes, proliferation of invasive species, and the need to rebuild damaged or destroyed structures, amongst others. Post-fire recovery actions are difficult to complete in advance because the location and extent of a burn area are unknown, and the level of burn severity drives much of the required actions. The Cal OES provides resources for post-fire recovery at https://wildfirerecovery.caloes.ca.gov/. Additionally, the Natural Resources Conservation Service provides information about post-fire assistance and recovery at: https://www.nrcs.usda.gov/wps/portal/nrcs/main/ca/newsroom/features/.

The actions presented in Table 40 are recommended to address post-fire recovery in the Higgins/Penn Valley FZ.

Table 40. Higgins/Penn Valley Forecast Zone Post-Fire Recovery Recommendations

Action/Recommendation	Issue	Scale
Develop post-fire rehabilitation guidelines for property owners and landowners in cooperation with appropriate federal, state, and local agencies that address post-fire effects of flooding and soil erosion. Prioritize reducing the importation of invasive species and restoring native habitats where applicable.	Community Participation and Education	Community
Develop post-fire rehabilitation guidelines for property owners and landowners in cooperation with appropriate federal, state, and local agencies that address post-fire effects on potable water, wastewater, hazardous materials, and the clean-up process.	Community Participation and Education	Community
Continue to aid those affected by wildfire through post-fire recovery guidance including insurance recommendations, how to apply for federal assistance, and guidance for post-fire cleanup, property reassessment, and rebuilding. https://nevadacountyca.gov/1241/Disaster-Recovery	Community Participation and Education Financial Barriers	Individual
Identify opportunities for post-fire social resilience, including, but not limited to, support for housing and employment access, health resource access, and access to mental and emotional support services.	Community Participation and Education Financial Barriers	Community Individual
Support the community by providing post-fire educational resources related to physical recovery, monetary support, and social services.	Community Participation and Education	Community
Encourage residents and property owners to participate in wildfire insurance reduction programs.	Community Participation and Education	Community Individual

7.8.1.7 Additional Approaches

In addition to those discussed in the previous sections, other wildfire risk reduction approaches can be effective on a case-by-case basis depending on assets at risk and resource availability. The following identifies additional wildfire risk mitigation approaches that may be considered within Project Priority Areas:

- **Fire Road Maintenance:** Activities, including minor grading or natural material resurfacing, to ensure that existing roads are drivable by fire agency apparatus.

- **Ignition and Spread Prevention:** Modifications to areas prone to wildfire ignitions (e.g., roadsides) including flashy fuel treatment, restoration, installation of ignition-resistant materials, and use modifications/restrictions.
- **Utility Hardening/Undergrounding:** Undergrounding of power lines/utilities, or retrofitting overhead power line networks to minimize arcing, conductor contact, etc.
- **Inspection/Monitoring:** Staff time allocated to conducting defensible space or structural hardening inspections or monitoring open space areas for trespass or fire activity.
- **Chipper Programs:** Services where a chipper is provided for residential areas to incentivize defensible space and fuel modification area maintenance work on residential properties.
- **Equipment Acquisition:** Purchase of tools, vehicles, or other equipment used in vegetation management/fuel reduction, restoration, firefighting, data collection, mapping, and public education related to wildfire hazard reduction.
- **Infrastructure:** Purchase, installation, permitting, and maintenance of equipment intended to alert the community about wildfires (e.g., fire detection cameras), or provide data to fire managers (e.g., remote automated weather stations).
- **Staffing:** Funds for permanent or seasonal/temporary personnel focused on firefighting or fire prevention activities.
- **Patrols:** Funding for permanent or seasonal/temporary personnel to patrol large open space areas during periods of high fire hazard to detect and report fire starts.