

level north of Cape Mendocino has been falling over the past ten decades while the level south of Cape Mendocino has been rising.

While the Sonoma Coast regularly experiences erosion, flooding, and significant storm events, sea level rise would exacerbate these natural processes, and lead to significant social, environmental, and economic impacts. The Fourth National Climate Assessment finds that the cost of doing nothing in response to sea level rise exceeds the costs associated with adapting to sea level rise by 4 to 10 times. Therefore, it is critically important that the Local Coastal Plan provide policies that prepare for and adapt to sea level rise to ensure public resources and coastal communities are resilient for present and future generations. Future Development considerations should include future vulnerabilities to sea level rise and corresponding habitat migration.

Table C-PS-1 below shows the projected sea level rise over time for the Sonoma Coast based on these studies:

Table C-PS-1. Sea Level Rise Projections Relative to 1983-2001 National Tidal Datum Epoch (Medium to High Risk Aversion Forecast – High GHG Emission Model)

Year	Projected Sea Level Rise	
	feet	meters
2030	0.8	0.25
2040	1.3	0.4
2050	2.0	0.6
2060	2.7	0.8
2070	3.5	1.0
2080	4.6	1.4
2090	5.6	1.7
2100	7.0	2.1

Sonoma County Planning staff examined the digital data from the Pacific Institute Report that was used to prepare **Figures C-PS-3a-k**. **Table C-PS-2** shows, by SubArea, the public roads, State facilities, and County facilities projected to be permanently inundated or temporarily flooded as a result of sea level rise and the 100-year storm event forecast for 2100. In addition to the public roads and facilities listed in **Table C-PS-2**, numerous private properties are projected to also be inundated or flooded.

Sea level rise inundation maps were prepared for Sonoma County using the Pacific Institute Report’s projected sea level rise, together with 100-year fluvial flood events for year 2100. **Figures C-PS-4a-c** illustrate the areas along the Sonoma County coast at risk from erosion, and **Figures C-PS-3a-k** illustrate the areas at risk from permanent inundation and temporary flooding as a result of a 7-foot sea level rise during a 100-year storm event by year 2100.

Sea Level Rise Vulnerability Assessment for the Sonoma Coast

In May 2017 Sonoma County completed a sea level rise adaptation planning effort for the Sonoma Coast. The County first conducted a general assessment of the coastal areas, communities, land uses, development, and public facilities most vulnerable to sea level rise impacts to prioritize development of community-specific focused vulnerability assessments. The *Sonoma County Coast General Vulnerability Assessment* was completed in June 2016. The *General Vulnerability Assessment* depicts

the inundation from sea-level rise in 1-foot increments up to 6 feet (2100 scenario). The results are those SubAreas with a relative vulnerability of “high” are Highcliffs/Muniz-Jenner (SubArea 6), Pacific View/Willow Creek (SubArea 8), and State Beach-Bodega Bay (SubArea 9).

Based on these results, the County identified the community of Bodega Bay as the subject for a focused vulnerability assessment. The *Bodega Bay Focused Vulnerability Assessment and Adaptation Strategies* (Vulnerability Assessment) and recommendations are located in **Appendix G**.

Table C-PS-2. Public Roads, Federal Facility, State Facilities, and County Facilities on the Sonoma County Coast Potentially Inundated or Flooded as a Result of 7-foot Sea Level Rise and the 100-Year Flood forecast for 2100.

SubArea	Public Roads	State Facilities	County Facilities
1 The Sea Ranch North	Highway 1	Del Mar Landing State Ecological Reserve	Gualala Point Regional Park & Beach The Sea Ranch Access Trails: Coastal bluff-Top; Salal; and Walk-on Beach
2 The Sea Ranch South			The Sea Ranch Access Trails: Shell Beach; Stengel Beach; Pebble Beach; and Black Point Beach
4 Salt Point		Salt Point State Park: Fisk Mill Cove; Gerstle Cove; Horseshoe Cove; Horseshoe Point; Salt Point; and Stump Beach	
5 Timber Cove/ Fort Ross	Highway 1	Fort Ross State Historic Park: Fort Ross Cove; Kohlmer Gulch; Sandy Cove; and Windermere Point	Stillwater Cove Regional Park: Stillwater Cove & Boat Launch; Stillwater Cove Expansion: Pocket Cove and Coastal Bluff Trail – Ocean Cove to Stillwater Cove
7 Duncans Mills	Highway 1 Hwy 116 B Street Freezeout Rd Main St Steelhead Blvd	Sonoma Coast State Park Access Trails: Duncans Mills River; Rancho del Paradiso - Freezeout River; Steelhead Boulevard River; and Willow Creek – Freezeout Jenner Visitors Center	
8 Pacific View/ Willow Creek	State Highway 1 Emery Rd Willow Creek Rd Wrights Beach Access Rd	Sonoma Coast State Park & Beach: Arched Rock; Duncans Cove, Point, & Landing; Penny Island; Blind Beach; Furlong Gulch Beach; Goat Rock Beach; Mann Beach; No Name Beach; North Portuguese Beach; Portuguese Beach; Wrights Beach; Monte Rio to Willow Creek Trail; and Willow Creek Campground & River Access Trail	Gleason Beach Accessway California Coastal Trail

Sonoma County Local Coastal Plan | Planning Commission Recommended
Public Safety Element

SubArea	Public Roads	State Facilities	County Facilities
9 State Beach/ Bodega Bay	Highway I Bay Flat Rd Bean Ave Brooke Rd Churchill St Doran Beach Rd Driftwood Rd Extension–Westshore to Whaleship Roads Maryana Dr Ocean View Ave Shaw Ct Smith Brothers Rd Westshore Rd	Bodega Dunes Campground North Salmon Creek Beach South Salmon Creek Beach U.C. Davis Bodega Marine Lab (access road) Bodega Head (access road) Federal: U.S. Coast Guard facility at Doran Beach	Birdwalk Loop Trail Doran Regional Park & Beach Doran Beach Jetty Day Use Area; Miwok Tent Campground; boat launch & parking; and visitor’s center/ operations Westside Regional Park: boat launch; RV & tent campsites; and parking Mason’s Marina Spud Point Marina Bodega Bay Sport Fishing Center Bodega Harbour Yacht Club (county owned)
10 Valley Ford	Highway I John’s St Middle Rd School St (Main St) Valley Ford – Estero Rd Valley Ford – Freestone Rd Valley Ford Rd		Gold Ridge Soil Conservation District Office

References:

- Global and Regional Sea Level Rise Scenarios for the United States* (NOAA 2022)
- Rising Seas in California: An Update on Sea-Level Rise Science* (Ocean Protection Council 2017)
- Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (National Academy of Sciences 2012)
- The Impacts of Sea-Level Rise on the California Coast* Pacific Institute Report (Heberger et al., 2009)

Note:

The County’s hazards maps and tables can be used as a resource for identification of potential hazard areas and vulnerable properties; however, absence of a hazard area on the maps cannot be considered absence of hazard, and local site conditions must be examined using the best available science.

Exposure to Inundation and Erosion

As part of the Sonoma County coast sea level rise adaptation planning effort funded by the Ocean Protection Council, the Center for Ocean Solutions analyzed the relative exposure of coastline areas to erosion and sedimentation caused by storms, and the role of natural habitat in reducing this exposure (Hartge et. al., 2016a).

The Center of Ocean Solutions (COS) and the National Capital Project (NCP) have conducted spatial analyses areas along the Sonoma County coastline at risk of erosion and inundation caused by storms. In addition, the analyses evaluated the role of natural habitat in reducing coastal exposure in Sonoma County. The information below summarizes the findings for the spatial analyses under a 2030 sea level rise scenario (National Academies of Science, 2012).

Figures C-PS-4a-c depict the findings of the analyses of coastal exposure for Sonoma County to erosion and inundation caused by storms under a 2030 sea level rise scenario. The coastal exposure values reflect the relative exposure of different coastline segments to erosion and inundation caused by coastal storms. The map is based on spatial data that includes the 2030 projection for sea level rise, coastal geomorphology, coastal topography and bathymetry, surge potential, wind and wave exposure, natural habitats, and human population. This mapping approach is qualitative and provides a broad overview of the spatial patterns of coastal exposure along the Sonoma County coastline to help prioritize future nature-based adaptation planning strategies for specific locations. **Policy C-PS-1d** requires review and updating of hazard maps every 3 years to assure that mapping reflects the best available science and most recent data.

Living Shorelines and Natural Infrastructure

The habitats fringing a coastline attenuate waves and thus reduce storm-related damage to shorelines from erosion and inundation. North of the Russian River mouth to the northern extent of Sonoma County, kelp forest habitat backed by rocky cliffs dominate the landscape and are generally low exposure. In contrast, south of the Russian River mouth, a greater diversity of habitats (e.g., wetlands, beaches, dune systems) are present and are habitats that are highly exposed to erosion and inundation during storms compared to north of the River mouth. As coastal development and rising sea levels alter or damage these habitats, coastlines and nearby infrastructure become increasingly vulnerable to storms.

Coastal habitats provide an ecosystem service by reducing the impacts of storms and by increasing resilience in coastal areas. However, with ever increasing stresses on ecosystems, it is important to identify where natural habitats provide the greatest benefits to prioritize adaptation planning efforts that protect or restore those critical natural habitats. The habitat types which provide the highest level of natural protection have been identified and mapped.

Figures C-PS-5a-c depict the areas along the Sonoma County coastline in which natural habitat plays a role in reducing exposure to erosion and inundation during storms. For example, the dark brown areas in Doran Beach and south of Salmon Creek indicate locations where habitats play the largest role in reducing exposure. The lighter tones in the map also indicate where habitat areas provide a protective coastal ecosystem service.

Adaptation Strategies

Much is at stake from sea level rise, and in order to minimize damage and losses, California's coastal communities must make adaptation to sea level rise a priority by conducting community sea level rise vulnerability and risk assessments and developing a Sea Level Rise Adaptation Plan. Developing a risk assessment involves considering the actual or future threats or hazards of concern, the economic importance or value of public facilities and infrastructure to the community, and the certainty of projected impacts to the degree that these are known or can be expected. Developing a Sea Level Rise Adaptation Plan involves setting goals, identifying objectives and adaptation measures, developing adaptation strategies for different types of land uses and facilities. The Adaptation Plan should consider public access, unique water dependent infrastructure, inundation caused by storm events, salt water intrusion, and consistency across any state and federal sea level rise projections.

In any coastal community there are three types of areas to be considered for adaptation planning: (1) undeveloped land that is considered or zoned to be developable; (2) existing unprotected development, including residential and commercial areas as well as infrastructure; and (3) existing development that has already been armored. The major armored area along the Sonoma County coast is a portion of the residential development above Gleason Beach. The Gleason Beach Highway 1 Realignment project proposed by Caltrans is an example of a "retreat" adaptation strategy. The proposal is to realign a 3,700 foot, two-lane section of Highway 1 about 400 feet inland of the current alignment at Gleason Beach. The purpose of the project is to provide a safe transportation facility that is no longer vulnerable to advancing coastal erosion.

Adaptation strategies for private property may be different or more difficult from those appropriate for and public property. Over a longer timescale, the cost of restricting or limiting new development in areas vulnerable to the hazards or impacts from sea level rise is far lower than the cost of addressing damaged or threatened development.

Based on the costs and benefits as well as the risks, adaptation strategies will identify the threshold at which the community should take action to prevent, reduce, or adapt to impacts from sea level rise. For example, a coastal park or parking lot can be used intermittently for a long time with periodic winter flooding, but a water or wastewater treatment plant at or near beach elevation must be retrofitted, relocated, or replaced well in advance of facility flooding or failure to ensure continued public services.

Sea Level Rise Forecast Standard

The Sonoma County Local Coastal Plan uses a **7-foot sea level rise forecast** as the basis for integrating sea level planning and resiliency into all elements of this plan. This is slightly higher than worst case scenario forecasts of 2 meters (6.56 feet) found in the recent studies *Rising Seas in California: An Update on Sea-Level Rise Science*, and *Global and Regional Sea Level Rise Scenarios for the United States* and consistent with the 2.1 meter (7 feet) medium-to-high risk forecast of the Ocean Protection Council's *State of California Sea-Level Rise Guidance 2018 Update*.

4.1 Goal, Objectives, and Policies

GOAL C-PS-4: Prevent unnecessary exposure of people, property, and coastal resources to risks of injury, damage, or loss from sea level rise. ~~(CCC REVISED)~~

Objective C-PS-4.1: Regulate new development to reduce the risks of human injury or property damage in areas subject to projected future sea level rise and other coastal hazards to an acceptable level, incorporating adaptive capacity in design and operation when hazard risk exceeds a project-specific threshold.

Objective C-PS-4.2: Minimize the risks of human health and safety, and property damage associated with existing development that may result from sea level rise consistent with LCP and Coastal Act policies regarding new shoreline protection structures or repair of existing shoreline protection structures. ~~(CCC REVISED)~~

Objective C-PS-4.3: Identify and assess risks to existing development, public facilities, infrastructure, and coastal resources that are vulnerable to projected future sea level rise inundation from seasonal storm events, and other coastal hazards. ~~(CCC REVISED)~~

Objective C-PS-4.4: Develop a plan for community adaptation to projected future sea level rise and other coastal hazards to reduce the risks and impacts to an acceptable level.

Policy C-PS-4a: Sea Level is defined as the locally corrected mean high water level referenced to the average of all the high water heights observed over the 1983-2001 National Tidal Datum Epoch at the National Oceanic and Atmospheric Administration Point Reyes Station Datum, Station ID 9415020. ~~(PC REVISED—CCC REVISED)~~

Policy C-PS-4b: Sea Level Rise is defined as a 7-foot increase in sea level relative to the locally corrected mean high water level referenced to the average of all the high water heights observed over the 1983-2001 National Tidal Datum Epoch at the National Oceanic and Atmospheric Administration Point Reyes Station Datum, Station ID 9415020. ~~(PC REVISED—CCC REVISED)~~

Policy C-PS-4c: For the purposes of vulnerability and risk assessments, mapping, land use planning, and adaptation planning, identify the areas projected to be inundated by sea level rise as defined in Policy C-4b, including under projected high tides, high water conditions in combination with high tides, storm wave run up and storm surge. ~~(CCC REVISED—NEW)~~

Policy C-PS-4d: Update hazard data every 3 years or at intervals recommended by responsible agencies, whichever is more frequent, using the best available scientific estimates, aligning with projections used by regional, state and federal agencies. ~~(CCC REVISED)~~

Policy C-PS-4e: Use the best available science and technical analyses available in combination with site-specific information when evaluating land use or development proposals in areas subject to sea level rise and other coastal hazards. ~~(NEW)~~

Policy C-PS-4f: Applications for Coastal Development Permits for development potentially subject to hazards from projected sea level rise, shall include a geologic/flood hazards report prepared by a licensed Geotechnical Engineer that evaluates the potential risk from inundation and/or coastal

erosion over the economic life of the development. The report shall evaluate hazards in the context of a 7-foot sea level rise and include recommendations on development location, design, and construction to reduce risk from coastal hazards and avoid impacts to coastal natural resources. ~~(CCC REVISED—NEW)~~

Policy C-PS-4g: Restrict rebuilding or coastal redevelopment of structures in vulnerable areas that have experienced repetitive damage from storms, flooding, landslides, or the impacts from sea level rise. ~~(CCC-REVISED)~~

Policy C-PS-4h: New development shall be set back a sufficient distance landward or otherwise sited and designed to avoid or minimize, to the maximum extent feasible, inundation and/or coastal erosion resulting from the extent of projected sea level rise, storm events, and other coastal hazards based on the best available science over the expected economic life of the development. Shoreline protection devices are prohibited for new development and shall not be considered when evaluating setback from coastal hazards. ~~(CCC REVISED—NEW)~~

Policy C-PS-4i: For development proposed where potential inundation, flooding, and/or coastal erosion resulting from projected sea level rise cannot be completely avoided, sea level rise adaptation measures, including requirement for future removal of development, shall be evaluated and incorporated into the development siting, design, construction, and operation. These measures shall not have an adverse impact on coastal natural resources, and risk disclosures and deed restrictions shall be required. ~~(CCC REVISED—NEW)~~

Policy C-PS-4j: New development shall be avoided on undeveloped land immediately adjacent to wetlands or other sensitive habitats that are at risk of inundation or flooding resulting from projected sea level rise so that these lands are available for wetland or other habitat restoration projects. ~~(NEW)~~

Policy C-PS-4k: Buffers to protect wetlands and riparian habitat shall be measured from the extent of a projected 7 foot sea level rise in tidally influenced areas based on the best available science. Consultation with California Department of Fish & Game, U.S. Fish & Wildlife Service, and U.S. Army Corps of Engineers is required to establish buffers in these areas. ~~(CCC REVISED—NEW)~~

Policy C-PS-4l: Development shall be removed and the disturbed area restored to a natural condition if:

- (1) Permit Sonoma declares the development unsafe for occupancy and/or use regardless of whether a new shoreline protective device would make the development safe for occupancy or use.
- (2) Development that encroaches onto current or future public trust land due to sea level rise and the State Lands Commission or other public trust land authority, denies a grant, lease, or other legal mechanism that would otherwise allow the development to remain in place. This does not apply to legally established development currently elevated above public trust lands on Bodega Bay.
- (3) Bluff top erosion reduces setback between the development and the bluff top below minimum setback required by **Policy C-PS-2d**. ~~(CCC Revised)~~

Policy C-PS-4m: The conditions of approval for any Coastal Development Permit on public or private property that is subject to hazards from projected sea level rise shall include the requirement that the owner shall record a deed with the following notice included: “The subject property is located in an area subject to inundation, flooding, or coastal erosion hazards as a result of projected sea level rise.”
(NEW)

4.2 Programs

Program C-PS-4-P1

Develop adoption plans for public infrastructure and local communities. For existing private development in vulnerable areas, develop the following strategies for addressing the impacts from sea level rise:

- (1) Incentives for planned retreat or relocation from vulnerable areas; establish mandatory rolling setbacks for future development or significant coastal redevelopment in areas that are likely to be affected by the impacts from sea level rise within the anticipated lifetime of the structures.
- (2) Identify funding for purchase or relocation of existing structures out of vulnerable areas.

For existing public infrastructure or community resources including ports, and public trust uses such as navigation and recreation in vulnerable areas, develop the following strategies for addressing the impacts from sea level rise:

- (1) Retreat or retrofit plans for existing infrastructure subject to future flooding, and remove and relocate or replace the infrastructure according to the plans.
- (2) Increasing adaptive capacity of shoreline roads, and determine the feasibility of relocating shoreline roads and increasing culvert and roadside ditch capacity. Work with entities such as Caltrans that plan, construct, or operate infrastructure.
- (3) Amendments to the Local Coastal Plan Public Access Element and Public Access Plan to ensure long- term protection of the function and connectivity of existing public access and recreation resources.
- (5) Reduce and eliminate dependence on shoreline protection structures. Identify critical structures where short term armoring is necessary until long-term solutions can be designed and implemented.

Based on the costs and benefits as well as the risks, the adaptation plan should then identify the threshold at which the community should take action to prevent, reduce, or adapt to impacts from sea level rise. For example, a coastal park or parking lot can be used intermittently for a long time with periodic winter flooding, but a water or wastewater treatment plant at or near beach elevation must be retrofitted, relocated, or replaced well in advance of facility flooding or failure to ensure continued public services. (CCC REVISED)

Program C-PS-4-P2: Prepare a Sea Level Rise Vulnerability and Risk Assessment, and Adaption Plan for the Sonoma County coast based on guidance from the California Coastal Commission’s Sea-Level Rise Policy Guidance (2018), the California Ocean Protection Council’s Sea-Level Rise Guidance (2018), and other applicable publications. Focus on those SubAreas of the Sonoma County coast at the

highest risk of inundation, flooding, or coastal erosion resulting from sea level rise, which include The Highcliffs/Muniz/Jenner (SubArea 6), Pacific View/Willow Creek (SubArea 8), Duncans Mills (SubArea 7), and State Beach/Bodega Bay (SubArea 9).

Preparation of the Sea Level Rise and Coastal Hazards Adaptation Plan shall involve collaboration with pertinent County of Sonoma departments and agencies, independent utility districts, and responsible federal and state agencies; and participation of the public.

The Sea Level Rise and Coastal Hazards Adaptation Plan shall focus on public and quasi-public facilities and infrastructure and include the following components:

- (1) Discussion of the following planning tools to help communities adapt to sea level rise and other coastal hazards: public purchase of private property for public uses, sale or transfer of public land to accommodate relocated roads and infrastructure, transfer of development rights, parcel reconfiguration, and zoning and land use designation amendments.
- (2) Requirements and standards for siting, design, and construction of new public facilities and infrastructure and private structures in areas subject to sea level rise and other coastal hazards as mapped in the Vulnerability Assessment.
- (3) Requirements and standards for maintenance and removal of abandoned structures.
- (4) Cost/benefit analyses of: a) adaptation measures versus no adaptation measures and b) carrying-out adaptation measures pre-inundation versus post-inundation (i.e., emergency conditions).
- (5) Plan for full disclosure of potential hazards to owners of property in areas subject to sea level rise and other coastal hazards as mapped in the Vulnerability Assessment.
- (6) Identify options and mechanisms to minimize or avoid County obligations to compensate for private property loss or damage resulting from sea level rise and other coastal hazards.

The County will continue to work with the National Oceanic and Atmospheric Administration, California Coastal Commission, Ocean Protection Council and other agencies and organizations to develop possible adaptation strategies for particular areas of the Sonoma County coast. (NEW)

Program C-PS-4-P3: Study, monitor, develop, and implement a plan to mitigate the impacts to groundwater from saltwater intrusion resulting from sea level rise and storm events based on the best available science. (NEW)

5. WILDLAND FIRE HAZARDS

The combination of highly flammable fuel, long dry summers and steep slopes creates a significant natural hazard of large wildland fires in many areas of Sonoma County. Wildland fire results in death, injury, economic losses, and a large public investment in firefighting efforts. Woodlands and other natural vegetation are destroyed resulting in the loss of timber, wildlife habitat, scenic quality and

recreation. Soil erosion, sedimentation of fisheries and reservoirs, and downstream flooding can also result.

Most damage results from a few large fires in the dry weather months. There were 21 wildland fires of 100 acres or more in the County between 1989 and 2000.

Fire hazard severity has been mapped by the CAL FIRE. Areas on the County coast with a high or very high fire risk are shown on **Figures C-PS-6a-c** and include Timber Cove and Sea Ranch. The highest fire hazard in Sonoma County is found in mountainous areas with dry summers, plenty of fuel, and steep slopes.

Residences have increased the number of fires in rural areas. Ninety-seven percent of the wildland fires over 50 acres in Sonoma County since 1989 were caused by human activities or facilities. Residences in rural areas cause fire suppression agencies to devote limited resources to structural protection while the wildfire spreads.

The probability of large damaging fires in developed areas is affected by weather conditions and the spread of fires in surrounding wildland areas. The type of construction, preventive measures, and the extent of fire suppression services are the chief factors which determine how far these fires spread.

The California Department of Forestry and Fire Protection (CAL FIRE) has lead responsibility for fighting wildland fires in designated State Responsibility Areas. The Sonoma County Fire and Emergency Services Department (County Fire) provides fire prevention, fire protection, rescue, emergency medical, code enforcement, and arson investigation services for the unincorporated areas of Sonoma County that are not included in an independent fire protection district. County Fire is responsible for enforcing the California Fire Code and other fire-related codes and ordinances. It enforces vegetation management, reviews building construction plans, and performs inspections of new construction for fire code compliance. In addition, three volunteer fire districts providing fire protection services to different portions of the Sonoma County Coastal Zone. See the Public Facilities and Services Element for a more detailed description of the fire protection services in the Coastal Zone.

The Sonoma County Fire Code is based on the National Fire Code, California Fire Code, Uniform Building Code, and California Subdivision and Development Code; constitutes the local adoption of the California Building Code; and is in Chapter 13 of the Sonoma County Code. It sets forth the requirements of the Sonoma County Fire Safety Ordinance, referred to as the Fire Safe Standards. The County Fire Code was adopted to establish minimum fire safe standards for development within the unincorporated area of the county. The County Fire Code requirements ensure that all new development within the unincorporated area of the county will provide a basic level of fire protection around itself making it easier and safer for fire fighters to fight wildland and structure fires.

The Fire Safety Standards include but are not limited to requirements for emergency access, road naming and addressing, minimum emergency water supply and sprinklers to ensure a supply of water to fight or defend property from a fire, fuel modification and defensible space to reduce the possibility and intensity of a wildfire, and other fire protection measures. Due to the severe fire risk in many areas of the County, the County's Fire Safe Standards which outline development standards

for emergency access, water supply, and vegetation management are more stringent than those required by the California Fire Code.

Hazards and Risk Assessment

Fire hazards shown on Figures C-PS-6a-c are only a general picture of the actual hazard because of the size of the areas and differences in vegetation and slope. The maps show the fire hazards only in unincorporated areas which are classified as wildlands and are therefore within the State Responsibility Area served by CAL FIRE.

Land Use Planning

In order to reduce the risks of property damage and human injury from wildland fires in rural areas, the types and intensities of land uses should be limited. Rural development should be most restricted where natural fire hazards are high, fire protection is limited, and road access prevents timely response by firefighting personnel and rapid evacuation by residents. Wildland fire hazards may be reduced by mitigation measures including removing vegetation and installing dependable water systems, but cannot be eliminated entirely.

The Sea Ranch Fuels Management

A landscape and fire management plan for The Sea Ranch was implemented in the 1990s to balance fire safety with the basic concept of preserving the natural landscape. In 2002 The Sea Ranch Association (TSRA) introduced a more aggressive Fuels Management Program to reduce fuel loads throughout The Sea Ranch. The Sea Ranch Association has continued to implement and expand the program. It incorporates the Sonoma County Fire Safe Standards (see Regulatory Environment below) and includes the following objectives and actions: create roadside fuel breaks to allow for safe evacuation and emergency access; reduce fuels on hillsides below homes to reduce fire intensity; enlarge the Highway 1 fuel break and reduce fuels on both sides of the highway; introduce sheep and goat grazing in the meadows on both sides of Highway 1; enhance riparian vegetation and remove conifers in drainages; and control new vegetation growth. TSRA also addresses fire safety around individual structures through its Defensible Space Fuel Management Resolution which requires the owners of developed property to maintain the fuel breaks around structures mandated by CAL FIRE; and its Design Manual Rules, which outline the permit process, procedure, and standards for fuels management on private lots and neighboring property.

Fire Safety Standards

Fire hazard regulations are intended to minimize on-site property damage and personal injury, avoid damage to adjacent properties, and reduce the cost of fire suppression services. Increasing built-in fire protection in those areas where new construction is allowed is the most cost effective way of achieving these objectives. All development must have adequate water available for fire suppression, whether from a hydrant and community system or from an on-site storage tank.

Where development is permitted near wildlands and natural vegetation, the fire hazard must be further mitigated by other measures. The locations of subdivision lots and building envelopes can maximize access by emergency vehicles and minimize construction in steep or wooded areas. Fire

retardant roof materials are now required in high fire hazard areas. Preventing the spread of wildland fires to and from structures also requires use of fire retardant materials and/or removal of surrounding vegetation and clearing of fuel breaks.

Differences in local, state, and federal fire safety standards and requirements and in staffing and training among local fire districts prompted the formation of the Sonoma County Department of Fire Services in 1985, now the Sonoma County Fire and Emergency Services Department. Improvements in standards for road design, water supply, and sprinkler systems have increased the effectiveness of local fire protection services. In February 2003 the County Board of Supervisors approved Ordinance Nos. 5402 and 5373 that amended the County Fire Code to require fire sprinklers for both residential and commercial development with some exceptions. In recent years, fire services have reorganized and consolidated in order to minimize administrative costs and to promote more efficient and consistent service response.

CalFire enforces requirements for firefighting and prevention, works with property owners on controlled burns, and advises rural residents on fire prevention methods. CalFire is currently preparing minimum fire safety standards for wildland areas. See “Regulatory Setting” below for more information about CalFire responsibilities and activities. [The following policies are intended to improve public safety and forest health consistent with the objectives of the Open Space and Resource Conservation Element.](#)

Another important component of fire safety is an improved system of street addresses throughout the county. Fire response time, particularly in rural areas, is occasionally affected by the ability of the responder to locate the affected address. Improved visibility and standardizing street addresses can result in reduced emergency response time.

Public Education

Increased public awareness of fire hazards and fire safe practices is an effective way to avoid or reduce future fire damages and loss of life. Emergency service providers typically provide educational programs that focus on fire prevention. In addition to continuing to promote these ongoing programs, fire prevention information can be provided directly to the general public and to prospective permit applicants for incorporation into the building design. Such a program can be further expanded to include fire hazard information by providing fire hazard warning signs along roadways in particularly vulnerable fire hazard areas.

5.1 Goal, Objectives, and Policies

GOAL C-PS-5: Prevent unnecessary exposure of people and property to risks of injury or damage from wildland and structural fires.

Objective C-PS-5.1: Work with other fire agencies to improve fire safety standards, carry-out fire prevention and protection programs, and educate the public about fire hazards and fire prevention.

Objective C-PS-5.2: Regulate new development to reduce the risks of human injury and property damage from known fire hazards to an acceptable level.

[Objective C-PS-5.3: Streamline vegetation management activities that balances protections for coastal resources and existing uses in order to reduce risk and improve the health of fire-adapted coastal lands. \(2023 Policy Option\)](#)

Policy C-PS-5a: Encourage continued operation of California Department of Forestry and Fire Protection programs for fuel breaks, brush management, controlled burns revegetation, and fire roads; however, brush clearing and controlled burns shall not take place in designated environmentally sensitive habitat areas or other sensitive habitats. ~~(EXISTING LCP REVISED)~~

Policy C-PS-5b: New development shall meet all applicable fire safety standards and shall be sited and designed to minimize required initial and future fuel modification and brush clearance in general, to the maximum feasible extent, and to avoid such activities within environmentally sensitive habitat areas and environmentally sensitive habitat areas buffers on site and on neighboring property, including parkland. All such requirements shall be applied as conditions of approval applicable for the life of the development. ~~(CCC REVISED)~~

Policy C-PS-5c: Removal of major vegetation adjacent to existing development for fire safety purposes shall be allowed upon a finding that fuel modification and brush clearance techniques are required in accordance with applicable fire safety regulations and are being carried out in a manner which reduces coastal resource impacts to the maximum feasible extent. In addition to the foregoing requirements, removal of environmentally sensitive habitat, or removal of materials in an environmentally sensitive habitat areas buffer shall only be allowed for fire safety purposes and must demonstrate that: ~~(CCC REVISED)~~

- (1) Removal does not conflict with prior conditions of approval
- (2) There are no other feasible alternatives for achieving compliance with required fire safety regulations
- (3) Impacts are mitigated in a manner that leads to no net loss of ESHA resource value.

Policy C-PS-5d: Controlled burns shall be allowed on agricultural land with a permit from the local fire agency and in consultation with the local Air Quality Management District and California Department of Forestry and Fire Protection. ~~(EXISTING LCP)~~

Policy C-PS-5e: The severity of natural fire hazards, potential damage from wildland and structural fires, adequacy of fire protection services, and mitigation measures consistent with the Public Safety Element shall be considered in the review of proposed development projects. ~~(GP2020)~~

Policy C-PS-5f: Fire management plans shall be required for subdivisions and new or expanded recreational facilities in non-urban areas, including development of California Department of Parks and Recreation and Sonoma County Regional Parks holdings. Such plans shall include, but not be limited to, adequate water storage, adequate ingress and egress for emergency vehicles and occupant evacuation, and building siting to minimize fire hazards. ~~(EXISTING LCP REVISED)~~

Policy C-PS-5g: Encourage and promote fire safe practices and the distribution of fire safe educational materials to the general public, permit applicants, and local planning agencies. ~~(GP2020)~~

Policy C-PS-5h: Provide fire hazard information signs in Areas of Very High or High Potential for Large Wildland Fires in a manner that is consistent with the Local Coastal Plan and does not degrade Scenic Highway Corridors or scenic views. ~~(GP2020)~~

Policy C-PS-5i: Encourage private individuals and communities on the Sonoma coast to construct small-scale water storage facilities for back-up use in the case of fire and for back-up non-potable water demand. ~~(EXISTING LCP REVISED)~~

Policy C-PS-5j: Exclude vegetation removal associated with defensible space activities consistent with state or local guidelines from the requirements of a Coastal Development Permit, when such activities are done in conjunction with an allowed or permitted use and will not result in type conversion of the existing vegetation community. (2023 Policy Option)

Policy C-PS-5j (ALT 1): Allow vegetation removal associated with defensible space activities consistent with state or local guidelines, when such activities are done in conjunction with an allowed or permitted use and will not result in type conversion of the existing vegetation community. Vegetation removal limited to the above defensible space activities shall not be considered major vegetation removal for the consideration of Coastal Development Permit requirements. (2023 Policy Option)

Policy C-PS-5k: Where other streamlining options are not available consider joint or programmatic Coastal Development Permit opportunities or similar tools to minimize the burden on individual properties for activities intended to reduce risk to existing resources, structures, or uses. (2023 Policy Option)

5.2 Programs

Program C-PS-5-P1: Develop Forest Health and Fire Resilience Public Works Plans for high fire risk areas in order to improve health of non-commercial forest lands, reduce wildfire hazards, and create vegetation management plans that will adapt to increase climate change-induced wildfire risk. Fire prevention projects in developed areas that cannot be designed to directly improve or restore ecosystems or ecosystem processes shall be limited to projects that are required to protect existing structures and/or infrastructure.

Projects approved under a Forest Health and Fire Resilience Public Works Plans shall be designed to:

- (1) Restore forest, health, improve ecosystem resiliency, and conserve forests by restoring native vegetation types and improving habitat for rare, threatened, and endangered plant and animal species.
- (2) Project water supply and quality with restoration projects across coastal watersheds.
- (3) Minimize the loss of forest-sequestered carbon from large, intense wildfires, through reduction of ladder fuels and brush in order to reduce fire severity.
- (4) Promote public safety, health, and welfare and protect public and private property through fuel reduction treatments and the creation of defensible space around structures in the wildland urban interface.

[Where an immediate need is identified for fire fuel reduction in residentially developed areas prior to approve of the Forest Health and Fire Resilience Public Works Plan, develop an interim fuel reduction program for these areas. \(2023 Policy Option\)](#)

[Program C-PS-5-P1 \(Alt 1\): Where necessary and where public funding is available, develop streamlined Forest Health and Fire Resilience Public Works Plans for high fire risk areas in order to reduce risk and improve the health of fire-adapted coastal lands. \(2023 Policy Option\)](#)

5.3 Initiatives

Initiative C-PS-5-I1: Work with the California Department of Forestry and Fire Protection to identify areas of high fire fuel loads and take advantage of opportunities to reduce those fuel loads, particularly in Areas with Very High or High Potential for Large Wildland Fires and in High Fire Hazard Severity Zones. ~~(GP2020)~~

Initiative C-PS-5-I2: The Sonoma County Department of Emergency Services shall offer assistance to local agencies in adopting and enforcing fire safety regulations and shall work with local agencies to develop proposed improvements to related County Codes and standards. ~~(GP2020)~~

Initiative C-PS-5-I3: Encourage the California Department of Parks and Recreation, and the Sonoma County Regional Parks Department to continue efforts to educate the public about fire hazards and fire prevention. ~~(EXISTING LCP REVISED)~~

6. HAZARDOUS MATERIALS

Many substances can be hazardous to human health and the environment, which includes air, soil, water, plants, and animals. The California Health & Safety Code defines a hazardous material as “any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and the environment if released into the workplace or the environment.” Common hazardous materials include oils, fuels, paints and varnishes, antifreeze, cleaning products, solvents, pesticides (includes herbicides, insecticides, fungicides, and rodenticides), and the associated hazardous waste. The increased use of hazardous materials has increased the potential hazards from hazardous materials and actual human injury and environmental damage, especially when they are used and disposed of near surface water. Public concerns have led to tighter controls on the production, transport, storage, sale, and use of hazardous materials, particularly on the handling and disposal of concentrated residues and wastes produced by power plants and other industrial operations.

Hazardous materials are found at many locations in Sonoma County. The electrical generating plants in The Geysers geothermal area use and produce hazardous materials hauled on winding mountain roads. Spills and releases of such materials have occurred. Petroleum fuels get into groundwater and surface water, particularly from underground storage tanks at gasoline stations and marinas. Preventing hazardous materials in the County’s solid waste landfills and transfer stations and industrial operations is important because these materials could affect water quality. Boat use, repair, and maintenance activities at Bodega Bay, Spud Point Marina, and Porto Bodega in the Coastal Zone

involve the storage, handling, use, and disposal of hazardous materials such as oils and fuels, paints and varnishes, solvents, and cleaning agents that may drain to surface water.

Pesticides are another hazardous material commonly used in Sonoma County by agricultural, residential, commercial, and recreational land uses. While state law preempts local regulation of pesticides, the County does have the authority to establish use restrictions applicable to its own operations. By doing so, the County can set an example that will encourage others to reduce reliance on pesticides.

Concerns about Outer Continental Shelf (OCS) oil and gas development led to the approval of Ordinance 3592R in the late 1980s, a countywide ballot initiative that requires voter approval of any proposed Local Coastal Plan Amendment to allow onshore facilities that would support OCS oil and gas development (see Outer Continental Shelf Development Policy in the Land Use Element). The issue of potential oil or other hazardous material spills from onshore support facilities would be addressed in the required environmental documents on the proposed projects.

The management of hazardous materials is included in this Public Safety Element because it has become a major public safety issue requiring attention significant personnel and financial resources and attention by local agencies. Different local, state, and federal agencies have different responsibilities in regulating hazardous materials, and are discussed below.

Federal Hazardous Materials and Waste Programs

The primary federal laws regulating hazardous materials, administered by the United States Environmental Protection Agency (U.S. EPA), are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). CERCLA, often referred to as the Superfund, was enacted to provide broad federal authority to clean up releases or threatened releases of hazardous substances at abandoned hazardous waste sites in the U.S. The hazardous materials waste program under RCRA establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal — in effect, from cradle to grave. In any given State, U.S. EPA or the State hazardous waste regulatory agency enforces hazardous waste laws. The U.S. EPA encourages States to assume primary responsibility for implementing a hazardous materials and waste program through State adoption, authorization, and implementation of the regulations.

State of California Hazardous Materials and Waste Programs

The State of California has assumed the primary responsibility for implementing the federal hazardous materials and waste program. California legislation in 1993 (Senate Bill 1082) established the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program). The Unified Program consolidates, coordinates, and makes consistent the California Environmental Protection Agency (Cal EPA) environmental programs which include:

- (1) Hazardous materials inventories and business plans
- (2) Permitting for generators of hazardous waste and operators of on-site hazardous waste treatment
- (3) Aboveground storage tanks

- (4) Underground storage tanks
- (5) Spill or accidental release prevention, control, and response
- (6) Fire code management plans

Under the Unified Program, Cal EPA certifies local agencies to implement the six state environmental programs listed above within their jurisdictions. The appointed local lead agencies are referred to as Certified Unified Program Agencies (CUPAs).

California Coastal Act

Section 30232 of the California Coastal Act requires that protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Sonoma County Hazardous Materials and Waste Lead Agencies and CUPAs

Hazardous Materials. The California Department of Toxic Substances Control (DTSC) is vested with the primary authority through the U.S. EPA to enforce federal and state laws pertaining to the regulation of hazardous materials and waste in California. The DTSC has authorized the Sonoma County Fire and Emergency Services Department as the lead agency and CUPA to enforce federal, state, and local laws pertaining to hazardous materials and hazardous waste management.

The Fire and Emergency Services Department enforces Chapter 29 of the Sonoma County Code regarding hazardous materials management, and for preparing a comprehensive hazardous materials and hazardous waste management plan. Chapter 29 regulates the storage, handling, and management of hazardous materials, whether in waste or non-waste form, unless specifically preempted by state or federal law. The Fire and Emergency Services Department is also responsible for emergency response to hazardous materials incidents throughout most of the County in coordination with local fire and police personnel, and enforces portions of the California Fire Code which address hazardous materials, including routine inspections.

Underground Storage Tanks. The State Water Resources Control Board (SWRCB) is vested with the primary authority through the U.S. EPA to enforce federal and state laws pertaining to leaking Underground Storage Tanks containing hazardous substances. The SWRCB has authorized the Sonoma County Department of Health Services as the lead agency and CUPA to enforce federal, state, and local laws pertaining to leaking underground storage tanks in the County.

Pesticides. The California Department of Pesticide Regulation (DPR) is vested with the primary authority through the U.S. EPA to enforce federal and state laws pertaining to the proper and safe use of pesticides in California. DPR's enforcement of pesticide use in the field is largely carried out in California's 58 counties by County Agricultural Commissioner Offices and their staffs. The DPR has authorized the Sonoma County Office of the Agricultural Commissioner as the lead agency and CUPA to enforce federal, state, and local laws pertaining to the use, storage, and sales of pesticides in the County. Additional pesticide restrictions on pesticide use within the Sonoma coastal zone are found in **Policy C-OSRC-7c**.

Oil Spills. The Oil Pollution Act of 1990 (OPA) improved the nation's ability to prevent and respond to oil spills by establishing provisions that expand the federal government's ability, and provide the money and resources necessary, to respond to oil spills. Under the OPA, the U.S. Coast Guard and U.S. EPA are the lead responsible agencies for preventing, preparing for, and responding to oil spills that occur in and around coastal waters and inland waters of the United States, respectively.

The Office of Spill Prevention and Response (OSPR), within the California Department of Fish and Wildlife, serves the responsibilities as public trustee and custodian for the protection, management, and restoration of the fish, wildlife, and plants across the State. As such, it is one of only a few agencies in the United States that both maintains major pollution response authority and public trustee authority for wildlife and habitat. In 2014, Governor Jerry Brown expanded the capabilities of the OSPR to include all state surface waters at risk of oil spills from any source, which more effectively captured possible spills from pipelines, production facilities, and railroad oil shipments (California features more than 7,000 rail crossings over water bodies).

Transport of Hazardous Waste. The California Department of Toxic Substances Control (DTSC) is vested with the primary authority through the U.S. EPA to enforce federal and state laws pertaining to the transport of hazardous waste in California. The DTSC has authorized the California Highway Patrol and Office of the State Fire Marshal to enforce some of the federal, state, and local laws pertaining to the transport of hazardous waste.

To operate in California, hazardous waste transporters must be registered with the DTSC. Unless specifically exempted, hazardous waste transporters must comply with the regulations of the U.S. Department of Transportation, DTSC, California Highway Patrol, and Office of the State Fire Marshal.

6.1 Goal, Objective, and Policies

GOAL C-PS-6: Prevent unnecessary exposure of people and property to risks of injury or property damage from hazardous materials.

Objective C-PS-6.1: Regulate the handling, storage, use, and disposal of hazardous materials in order to reduce the risks of injury or property damage from hazardous materials.

Policy C-PS-6a: Siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal shall be avoided in any area subject to inundation, flooding, coastal erosion hazards resulting from projected sea level rise and other coastal hazards, and in areas subject to heightened ground shaking during an earthquake event (Modified Mercalli Index (MMI) Ground shaking Intensity Level higher than Strong (VII) as identified on Figures C-PS-1a-c or within one quarter mile of schools. Siting shall be avoided in any area designated for urban residential or rural residential use; on agricultural lands; or near waterways, bays, or the ocean. (GP2020)

Policy C-PS-6b: A use permit shall be required for any commercial or industrial use involving hazardous materials in threshold planning quantities as determined by Federal and State laws. A hazardous materials management plan shall be required as a condition of approval for such permits. (GP2020)

6.2 Program

Program C-PS-6-P1: Create a new hazard combining zone to address impacts related to development and coastal redevelopment in hazard areas and on coastal bluffs in order to protect such development from the effects of costal bluff erosion. ~~(CCC REVISED—EXISTING LCP REVISED)~~

6.3 Initiatives

Initiative C-PS-6-I1: Continue to educate the general public about and promote the reduction in use of hazardous materials, proper disposal of hazardous materials, and the use of safe alternatives to hazardous materials in County operations and private businesses. ~~(GP2020 REVISED)~~

Initiative C-PS-6-I2: Work with applicable regulatory agencies to regulate the use, disposal, and transport of hazardous materials consistent with adopted County policies. ~~(GP2020 REVISED)~~

REFERENCES

- National Oceanic and Atmospheric Administration. 2022. Global and Regional Sea Level Rise Scenarios for the United States.
- California Coastal Commission. 2018. Sea Level Rise Policy Guidance. Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits. Adopted August 2015. Science Update adopted November 2018.
- California Natural Resources Agency. 2018. Safeguarding California Plan: 2018 Update. A report to the Governor of the State of California in response to Executive Order S-13-2008.200 p.244.
- California Ocean Protection Council. 2018. State of California Sea-Level Rise Guidance: 2018 Update.
- Hartge, E., L. Wedding, J. Reiblich, W. McEnery. April 21, 2016. *Initial General Vulnerability Assessment: Sonoma County*. Center for Ocean Solutions. Prepared for County of Sonoma Permit & Resource Management Department under Ocean Protection Council (OPC) Sea Level Rise Adaptation Planning Grant CO300500. 12 pp.
- Heberger, M., H. Cooley, P. Herrera, P., P.H. Gleick, and E. Moore. 2009. The impacts of sea-level rise on the California coast. Prepared by California Climate Change Center. 101 p.
- National Academies of Science. 2012. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future. Prepared by Committee on Sea Level Rise in California, Oregon, and Washington; Board on Earth Sciences and Resources; Ocean Studies Board, Division on Earth and Life Studies; and National Research Council. The National Academies Press, Washington, D.C. 250 p.
- National Research Council. 2010. Adapting to the impacts of climate change. The National Academies Press, Washington, D.C. 244 p.
- Russell, N. and G. Griggs. 2012. Adapting to sea level rise: a guide for California's coastal communities. University of California, Santa Cruz. Prepared for the California Energy Commission, Public Interest Environmental Research Program. 49 p.

