

14. SONOMA COUNTY AGRICULTURAL PRESERVATION & OPEN SPACE DISTRICT

14.1 LOCAL HAZARD MITIGATION PLANNING TEAM

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This annex was developed by the local hazard mitigation planning team, whose members are listed in Table 14-1.

Table 14-1. Local Mitigation Planning Team Members

Name	Title
Sheri Emerson	Stewardship Manager, Ag + Open Space
Allison Schichtel	Senior Conservation Planner, Ag + Open Space

14.2 JURISDICTION PROFILE

14.2.1 Overview

The Sonoma County Agricultural Preservation District (Ag + Open Space) is a special district of the County of Sonoma established in 1990 to permanently protect the diverse agricultural, natural resource, and scenic open space lands of Sonoma County for future generations. In 1990, Sonoma County voters approved Measures A and C to establish Ag + Open Space. Measure A established Ag + Open Space pursuant to California Public Resources Code sections 5500 et seq., which allows for the creation of an open space district, furthering California state policy on the preservation of open space. Measure C called for a quarter-cent sales tax over a 20-year period to fund protection of agricultural lands and open space in perpetuity. In 2006, voters extended the sales tax through 2031 by passing Measure F, which updated the Expenditure Plan directing how the collected tax revenue can be spent. As of June 2020, Ag + Open Space has protected over 122,000 acres in Sonoma County, primarily through acquisition of conservation easements over land owned and managed by others, and outright purchase of some land that Ag + Open Space owns and manages.

The climate of Sonoma County is generally Mediterranean, characterized by a summer dry season, winter rainy season, and cool nights and temperate days. Within Sonoma County there is an array of microclimates; areas

closer to the coast are cooler throughout the summer and receive more fog, while inland areas, including the Santa Rosa Plain, are typically hotter and drier. Rainfall varies throughout the County from 20 to 70 inches annually.

The Sonoma County Board of Supervisors serves as the Ag + Open Space Board of Directors, and the Board assumes responsibility for the adoption of this plan; the General Manager will oversee its implementation.

14.2.2 Service Area

The Sonoma County Agricultural Preservation and Open Space District was formed to serve all areas within Sonoma County.

Sonoma County is the northernmost of the nine San Francisco Bay Area counties. The current boundaries generally extend from about forty miles north of the Golden Gate Bridge, between Marin and Mendocino Counties, and from the Pacific coastline east to the Mayacamas Range bordering Napa County, encompassing an area of 1,576 square miles.

14.2.3 Assets

Table 14-2 summarizes the assets of the district and their value.

Asset	Value
Property	
4,178 acres of land (fee title)	\$39,326,263
113,203 acres of land (conservation easement)	\$391,309,458
Total:	\$430,635,721
Critical Facilities and Infrastructure	
Administrative Building—747 Mendocino Ave., Santa Rosa, CA 95401	\$2,300,000
Total:	\$2,300,000

14.3 CURRENT TRENDS

According to United States Census Bureau, the population of Sonoma County as of April 2010 was 483,878. Since 2010, the population has grown at an average annual rate of 2.2 percent.

14.4 CAPABILITY ASSESSMENT

This section describes an assessment of existing capabilities for implementing hazard mitigation strategies. The introduction at the beginning of this volume of the hazard mitigation plan describes the components included in the capability assessment and their significance for hazard mitigation planning.

Findings of the capability assessment were reviewed to identify opportunities to expand, initiate or integrate capabilities to further hazard mitigation goals and objectives. Where such opportunities were identified and determined to be feasible, they are included in the action plan. The “Analysis of Mitigation Actions” table in this annex identifies these as community capacity building mitigation actions. The findings of the assessment are presented as follows:

- An assessment of planning and regulatory capabilities is presented in Table 14-3.
- An assessment of fiscal capabilities is presented in Table 14-4.
- An assessment of administrative and technical capabilities is presented in Table 14-5.
- An assessment of education and outreach capabilities is presented in Table 14-6.
- Classifications under various community mitigation programs are presented in Table 14-7.
- The community's adaptive capacity for the impacts of climate change is presented in Table 14-8.

Table 14-3. Planning and Regulatory Capability

Plan, Study or Program	Date of Most Recent Update	Comment
Expenditure Plan	2006	Governs Ag + Open Space's expenditure of tax revenues; Exhibit "A" to Measure F, the legislation passed in 2006 to reauthorize Ag + Open Space through 2031. https://www.sonomaopenspace.org/wp-content/uploads/Measure-F_Expenditure-Plan-2006_Exhibit-A.pdf
Vital Lands Initiative	January 2021	Directs Ag + Open Space's conservation planning, acquisition, and stewardship efforts https://www.sonomaopenspace.org/wp-content/uploads/FINAL-VLI-FULL-REPORT-01.26.2021_-ADA.pdf
Fee Lands Strategy	February 2021	Guides the stewardship and conveyance of lands held in fee by Ag + Open Space https://www.sonomaopenspace.org/wp-content/uploads/Fee-Lands-Strategy_FINAL_20210301-REMEDIATED.pdf
Initial Public Access, Operation & Maintenance Policy	February 2016	Policy for budgeting and administering funds under Paragraph 6 of the Expenditure Plan https://www.sonomaopenspace.org/wp-content/uploads/IPAOM_Reso_20160203.pdf
Stewardship Policy	February 2021	Establishes guidelines for staff implementation of stewardship responsibilities https://www.sonomaopenspace.org/wp-content/uploads/Stewardship-Policy_FINAL_20210301-REMEDIATED.pdf
Mitigation Policy	July 2017	Describes Ag + Open Space's role with respect to environmental mitigation and process for evaluating environmental mitigation proposals https://www.sonomaopenspace.org/wp-content/uploads/Final-District-Mitigation-Policy_20170718.pdf

Table 14-4. Fiscal Capability

Financial Resource	Accessible or Eligible to Use?
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	No
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	No
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Federal Grant Programs	Yes

Table 14-5. Administrative and Technical Capability

Staff/Personnel Resource	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Yes	Acquisition Manager, Conservation Planning Manager, Stewardship Manager, Stewardship Coordinator, Acquisition Specialists, Stewardship Specialists, Senior Conservation Planner
Engineers or professionals trained in building or infrastructure construction practices	Yes	Provided through contract support
Planners or engineers with an understanding of natural hazards	Yes	Acquisition Manager, Conservation Planning Manager, Stewardship Manager, Stewardship Coordinator, Acquisition Specialists, Stewardship Specialists, Senior Conservation Planner
Staff with training in benefit/cost analysis	Yes	Provided through contract support
Surveyors	Yes	Provided through contract support
Personnel skilled or trained in GIS applications	Yes	Conservation GIS Coordinator, Senior Conservation Planner, Acquisition Assistant, Stewardship Specialists, Stewardship Technicians
Scientist familiar with natural hazards in local area	Yes	Provided through contract support
Emergency manager	No	
Grant writers	Yes	Acquisition Specialists, Stewardship Specialists, Senior Conservation Planner; also provided through contract support
Other	Yes	All staff trained to fill ICS operations positions

Table 14-6. Education and Outreach

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	No Through contract support only
Do you have hazard mitigation information available on your website? <i>If yes, please briefly describe</i>	Yes Blog posts about Ag + Open Space activities related to hazard mitigation and studies on benefits and economic values of open space (including for hazard mitigation)
Do you use social media for hazard mitigation education and outreach? <i>If yes, please briefly describe</i>	Yes Social media (Facebook, Instagram) and e-newsletters to notify the public of Ag + Open Space activities related to hazard mitigation
Do you have any citizen boards or commissions that address issues related to hazard mitigation? <i>If yes, please briefly specify</i>	Yes Ag + Open Space Board of Directors, Fiscal Oversight Commission, and Citizens Advisory Committee provide direction and input on Ag + Open Space projects related to hazard mitigation
Do you have any other programs already in place that could be used to communicate hazard-related information? <i>If yes, please briefly describe</i>	Yes Outreach and education program; volunteer program
Do you have any established warning systems for hazard events? <i>If yes, please briefly describe</i>	No

Table 14-7. Community Classifications

	Participating?	Classification	Date Classified
FIPS Code	No		
DUNS#	Yes	143290547	
Community Rating System	No		
Building Code Effectiveness Grading Schedule	No		
Public Protection	No		
Storm Ready	No		
Firewise	No		
Tsunami Ready	No		

Table 14-8. Adaptive Capacity for Climate Change

Criterion	Jurisdiction Rating ^a
Technical Capacity	
Jurisdiction-level understanding of potential climate change impacts <i>Comment:</i> Ag + Open Space maintains a library of GIS, remote sensing, technical reports, and studies related to local documented and projected impacts from climate change, including impacts to water quality and supply, sensitive habitats and species, ecosystem health/stability, agricultural productivity and viability, and threats to communities from fires, floods, sea level rise, and other hazards	Medium
Jurisdiction-level monitoring of climate change impacts <i>Comment:</i> Ag + Open Space maintains fine-scale maps of vegetation and other land cover types in Sonoma County and intends to monitor changes in vegetation over time. In addition, the organization maintains a library of GIS, remote sensing, technical reports, and studies related to local documented and projected impacts from climate change	Medium
Technical resources to assess proposed strategies for feasibility and externalities <i>Comment:</i> Ag + Open Space may conduct assessments using expertise of internal staff and/or through technical consultant support	Medium
Jurisdiction-level capacity for development of greenhouse gas emissions inventory <i>Comment:</i> Ag + Open Space does not have internal capacity to develop a greenhouse gas emissions inventory and relies on inventories prepared by the Sonoma County Regional Climate Protection Authority and other regional and state entities	Low
Capital planning and land use decisions informed by potential climate impacts <i>Comment:</i> Ag + Open Space evaluates potential climate impacts when designing conservation easements, land management or improvement projects, and in developing countywide priorities for land conservation	Medium
Participation in regional groups addressing climate risks <i>Comment:</i> Ag + Open Space participates in climate change-related planning, education, and community engagement efforts led by the Sonoma County Regional Climate Protection Authority, North Bay Climate Adaptation Initiative, Sonoma County Office of Recovery & Resiliency, and local, regional, and state organizations	Medium
Implementation Capacity	
Clear authority/mandate to consider climate change impacts during public decision-making processes <i>Comment:</i> Climate change is not explicitly addressed in Ag + Open Space’s Expenditure Plan and authorizing legislation, though the Ag + Open Space Board of Directors strongly supports decisions that limit or mitigate environmental impacts from climate change, and has declared a Climate Emergency (resolution 19-0367)	Medium
Identified strategies for greenhouse gas mitigation efforts <i>Comment:</i> Through guiding policy documents, Ag + Open Space prioritizes conservation of open space areas and implements stewardship projects that promote carbon sequestration and avoided emissions	Medium
Identified strategies for adaptation to impacts <i>Comment:</i> Ag + Open Space has conducted case studies to evaluate the role of land conservation in mitigating impacts from climate change and extreme events, and is the process of developing targeted strategies to mitigate risks to community safety and ecosystem health from fire, flood, sea level rise, and drought	Medium

Criterion	Jurisdiction Rating ^a
Champions for climate action in local government departments <i>Comment:</i> Ag + Open Space staff have been active in developing County goals and strategies for climate adaptation and mitigation and providing data for climate action planning	High
Political support for implementing climate change adaptation strategies <i>Comment:</i> The Ag + Open Space Board of Directors, partners, and stakeholders strongly support decisions that limit or mitigate environmental impacts from climate change	High
Financial resources devoted to climate change adaptation <i>Comment:</i> Ag + Open Space’s core function of conserving and stewarding land supports climate change adaptation, but the organization does not have dedicated funding specifically for climate change projects	Medium
Local authority over sectors likely to be negatively impacted <i>Comment:</i> Ag + Open Space does not have local authority over sectors likely to be negatively impacted	Low
Public Capacity	
Local residents knowledge of and understanding of climate risk <i>Comment:</i> Unsure of residents’ knowledge and understanding	Low
Local residents support of adaptation efforts <i>Comment:</i> According to a 2016 poll conducted by Ag + Open Space, a majority of residents thought that climate change adaptation is an important benefit of Ag + Open Space’s work	Medium
Local residents’ capacity to adapt to climate impacts <i>Comment:</i>	Low
Local economy current capacity to adapt to climate impacts <i>Comment:</i>	Low
Local ecosystems capacity to adapt to climate impacts <i>Comment:</i>	Low

a. High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement; Low = Capacity does not exist or could use substantial improvement; Unsure= Not enough information is known to assign a rating.

14.5 INTEGRATION REVIEW

For hazard mitigation planning, “integration” means that hazard mitigation information is used in other relevant planning mechanisms, such as capital facilities planning, and that relevant information from those sources is used in hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future. Resources listed at the end of this annex were used to provide information on integration. The progress reporting process described in Volume 1 of the hazard mitigation plan will document the progress of hazard mitigation actions related to integration and identify new opportunities for integration.

14.5.1 Existing Integration

Some level of integration has already been established between local hazard mitigation planning and the following other local plans and programs:

- **County’s Emergency Operation Plan**—Ag + Open Space participates and supports the County’s Emergency Operation Plan.
- **Sonoma County’s General Plan**—Ag + Open Space was established as a result of the 1990 General Plan, and the agency implements and complements several key elements of the current General Plan.

- **Ag + Open Space’s Emergency Operation and Response Plan**—Ag + Open Space has developed and continues to implement its own Emergency Operation and Response Plan.
- **Ag + Open Space Comprehensive Plan**—Ag + Open Space developed a long-term comprehensive plan, the Vital Lands Initiative. The Vital Lands Initiative identifies objectives and strategies for integrating climate change and extreme event mitigation and adaptation into all aspects of Ag + Open Space’s work
- **Fee Lands Strategy**—Ag + Open space updated its Fee Lands Strategy, which highlights the natural resources management practices (including understory thinning and prescribed burning) implemented by the organization to enhance ecosystem health and support hazard mitigation.

14.5.2 Opportunities for Future Integration

The capability assessment presented in this annex identified the following plans and programs that do not currently integrate hazard mitigation information but provide opportunities to do so in the future:

- The Sonoma County Community Wildfire Protection Plan (CWPP) which was being updated as of this plan update.
- Future General Plan updates
- County Capital Facilities Planning
- Sonoma County Five-Year Strategic Plan
- Local Coastal Plan

14.6 RISK ASSESSMENT

14.6.1 Jurisdiction-Specific Natural Hazard Event History

Table 14-9 lists past occurrences of natural hazards for which specific damage was recorded in County of Sonoma. Other hazard events that broadly affected the entire planning area, including County of Sonoma, are listed in the risk assessments in Volume 1 of this hazard mitigation plan.

Table 14-9. Past Natural Hazard Events

Type of Event	Date
Historical CA Droughts	1841, 1864, 1924, 1928-35, 1947-50, 1959-60, 1976-77, 1986-92, 2007-09
Heavy Rains and Flooding	December 24, 1964
Severe Storms, Flooding	January 26, 1969
Severe Storms, Flood, Mudslides, High Tide	December 19, 1981 – January 8, 1982
Coastal Storms, Floods, Slides, Tornadoes	January 21 – March 30, 1983
Severe Storms, Flooding	February 12 – March 10, 1986
Freeze of '91	1990 – 1991
Flood of '93	1993
Fishing Emergency	May – September 1994
Flood of '95, Part 1	January 8 – 31, 1995
Flood of '95, Part 2	March 7 – 15, 1995
December Winter Storm	1995
Cavedale Fire	1996

Type of Event	Date
Jenner Sandbarrier	1996
Porter Creek Fire	October 27-28, 1996
New Year's Flood	December 30, 96–January 4, 97
Superbowl Flood	January 25, 1997
Flood of '98/ Rio Nido Debris Flow	February 2, 1998–January 4, 2000
February Winter Storm	February 8-10, 1999
December Winter Storms	December 17, 02–April 8, 03
Geysers Fire	September 3-8, 2004
New Year's Floods	December 31, 2005–January 3, 2006
Late Spring Storms	March 29-April 16, 2006
SF Oil Spill	November 7, 2007
H1N1 Influenza Pandemic	April – May, 2009
Great Tohoku Tsunami	March 11, 2011
Holiday Decoration Flood	December 2, 2012
Drought	2014 – 2016
South Napa Earthquake	August 24, 2014
December Winter Storm	August 24, 2014
Valley Fire	September 12-25, 2015
Severe Winter Storms, Flooding, and Mudslides	January 3-12, 2017
Severe Winter Storms, Flooding, and Mudslides	February 1-23, 2017
LNU Complex Fires	October, 2017
Wildfires	October 8-31, 2017
PG&E Power Shutoff	October, 2018
Severe Winter Storms, Flooding, Landslides, Mudslides	February 24 – March 1, 2019
PG&E Power Shutoff	October 2019
Kincade Fire	October 23 – November 7, 2019
COVID-19 Pandemic	January 2020 – present
Wildfires	August 14 – September 26, 2020
Wildfires—various ones	September 4 – November 17, 2020
Green Valley Road Flood	2000-2019
Drought	2021
Valley Ford Freestone Road Flooding	2000-2019

14.6.2 Hazard Risk Ranking

Table 14-10 presents a local ranking of all hazards of concern for which this hazard mitigation plan provides complete risk assessments. As described in detail in Volume 1, the ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property and the economy. Mitigation actions target hazards with high and medium rankings. Ag + Open Space completed a qualitative ranking of potential hazards, resulting in an overall significance ranking of High, Moderate, or Low for each hazard.

Table 14-10. Hazard Risk Ranking

Rank	Hazard Type	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance Rank
1	Wildfire	Extensive	Highly Likely	Catastrophic	High
2	Flood	Significant	Likely	Catastrophic	High
3	Drought	Extensive	Likely	Critical	High
4	Earthquake	Significant	Occasional	Catastrophic	High
5	Severe Weather	Extensive	Likely	Critical	Medium
6	Soil Hazards, including Erosion and Landslide	Significant	Likely	Limited	Low
7	Sea Level Rise	Limited	Likely	Limited	Low
8	Dam Failure	Limited	Occasional	Catastrophic	Low
9	Tsunami	Limited	Occasional	Critical	Low

Note that the column headings are defined as follows (definitions are based on an example annex from Sierra Resource Conservation District in Fresno County, California):

- *Geographic Extent:* Limited (less than 10% of the service area); Significant (10-50% of the service area); Extensive (50-100% of the service area).
- *Probability of Future Occurrence:* Highly Likely (happens almost every year); Likely (Has a recurrence interval of every 10 years or less); Occasional (Has a recurrence interval of every 11 to 100 years); Unlikely (Has a recurrence interval of greater than every 100 years).
- *Magnitude/Severity:* Catastrophic (more than 50 percent of property severely damaged, shutdown of facilities for more than 30 days, and /or multiple deaths); Critical (25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and /or injuries and /or illnesses result in permanent disability); Limited (10-25 percent of property severely damaged; shutdown of facilities for more than a week; and /or injuries/illnesses treatable do not result in permanent disability); Negligible (Less than 10 percent of property severely damaged, shutdowns of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid).
- *Significance Rank:* Low (minimal potential impact); Medium (moderate potential impact); High (widespread and/or extensive potential impact).

14.6.3 Jurisdiction-Specific Vulnerabilities

Volume 1 of this hazard mitigation plan provides complete risk assessments for each identified hazard of concern. The following jurisdiction-specific issues have been identified based on a review of the results of the risk assessment, public involvement strategy, and other available resources.

Assets at risk from the hazards identified in this plan include approximately 122,000 acres in conservation easements and land. These properties include agricultural areas, wilderness areas, riparian corridors, mountaintops, wetlands, woodlands, and coastline, regional park land and trail systems, urban parks, and greenbelts between urban areas. These real property assets support key conservation and monetary values, providing a variety of services and benefits to our communities. Sonoma County's natural capital, including lands currently protected by Ag + Open Space, has the potential to adapt in the face of climate change, to reduce hazard risk for communities, and provide a high quality of life. Critical working and natural lands at risk include:

- Agricultural lands and rangeland
 - Farms, ranches, dairies, vineyards, and orchards are important contributors to Sonoma County’s economy, providing local food and fiber, jobs, and revenue. In addition, working lands provide ecosystem services such as soil retention and formation, above- and below-ground carbon sequestration, reduced fuel loading, regulation of water flow and water quality, habitat for pollinators and threatened and endangered species, scenic benefits, and tourism opportunities
 - Agricultural lands and rangelands are subject to wildfires, severe weather (e.g., freeze), drought, and floods; risks include destruction of crops, livestock, and associated structures and reduction in jobs
- Wetlands, floodplains, and riparian corridors
 - Wetland and stream ecosystems are biologically rich areas that also provide numerous ecosystem services to human communities, including moderation of extreme events (e.g. flood attenuation), carbon sequestration, soil retention, assimilation of pollutants, reduction in stream temperature, support for the commercial and recreational fishery, habitat for threatened and endangered species, and recreational benefits. Tidal wetlands reduce wave action and provide flood protection and are critical for reducing impacts of sea level rise on human communities
 - Wetlands, floodplains, and riparian corridors are subject to wildfire and drought; risks include reduced water quality for people and natural communities (including from toxins in runoff, sedimentation, and increase in water temperatures), destruction of aquatic habitat for fish and amphibians, and mortality of vegetation
- Forests
 - Conifer and hardwood forests of Sonoma County are important for wood and fiber production, and also provide various ecosystem services, including carbon sequestration, avoided sedimentation, flood mitigation, habitat for threatened and endangered species, and scenic, spiritual, and recreation benefits
 - Forestlands are subject to devastating wildfires, drought, and floods. In some cases, high intensity fires may destroy this critical resource, resulting in a loss of jobs and the provision of ecosystem services
- Other wildland ecosystems, including grasslands and shrublands
 - Wildland ecosystems, including forestlands described above, grassland, and shrubland communities, are undeveloped areas that are important for maintaining high native biodiversity and providing community benefits such as clean drinking water, groundwater supply, flood control, carbon sequestration, and scenic and recreational benefits
 - Wildland ecosystems are subject to unnatural fire events which may result in vegetation mortality, species compositional shifts, erosion (from loss of tree canopy as well as fire suppression efforts), and loss of habitat. In addition, these systems are susceptible to drought, landslides, and floods which may reduce the ecosystem services provided by these areas
- Urban open space and parklands
 - Urban open spaces and parklands, including urban forests, parks, and trails, are important places for exercise and recreation and also provide community benefits such as enhancing air quality, reducing the urban heat island effect and providing areas of shade during high heat events, reducing transport of pollutants from developed areas to waterways, and helping to manage storm water (e.g., through green infrastructure projects)
 - Urban open spaces and parklands are subject to fires and floods which may destroy park infrastructure, inhibit public access, and negatively impact natural systems and ecosystem services provided within these areas

In 2015 Ag + Open Space led a study to evaluate and quantify the ecosystem services provided by Sonoma County's natural capital, and found that working and natural landscapes of Sonoma County yield \$2.2 to \$6.6 billion per year in economic value. The ecosystem services provided and the associated annual values are described in Table 14-11.

Table 14-11. Economic Value of Ecosystem Services in Sonoma County

Ecosystem Service	\$ Millions Per Year Countywide (Low Estimate)	\$ Millions Per Year Countywide (High Estimate)
Water Supply	\$9M	\$180M
Wastewater Treatment	\$35M	\$117M
Moderation of Extreme Events	\$82M	\$220M
Urban Stormwater Management	\$0.2M	\$8M
Soil Retention and Formation	\$4M	\$620M
Carbon Sequestration	\$58M	\$197M
Air Quality	\$19M	\$22M
Pollination	\$218M	\$367M
Habitat and Nursery	\$4M	\$43M
Biological Control	\$8M	\$23M
Natural Beauty	\$1,214M	\$4,182M
Recreation and Tourism	\$500M	\$596M
Grand Total	\$2.2 Billion	\$6.6 Billion

An additional asset is the Ag + Open Space administration building, currently occupied by Ag + Open Space staff pursuant to a lease agreement. This property, as well as the staff and the public who are present during working hours, are vulnerable to the identified hazards as well.

Mitigation actions addressing these issues were prioritized for consideration in the action plan in this annex.

14.7 HAZARD MITIGATION ACTION PLAN

Table 14-12 lists the actions that make up the hazard mitigation action plan for this jurisdiction. Table 14-13 identifies the priority for each action. Table 14-14 summarizes the mitigation actions by hazard of concern and mitigation type.

Table 14-12. Hazard Mitigation Action Plan Matrix

Benefits New or Existing Assets	Objectives Met	Lead Agency	Support Agency	Estimated Cost	Sources of Funding	Timeline ^a
Action SAO-1 —Participate in and support the County’s Continuity of Operations Planning (COOP) efforts, Watershed Task Force, and other emergency response/recover efforts.						
<i>Hazards Mitigated:</i> Wildfire, flood, drought, earthquake, public safety power shutoff, severe weather, soil hazards, sea level rise, dam failure, tsunami						
New & Existing	2, 4, 5, 6, 8, 9, 10	County of Sonoma	Ag + Open Space, Sonoma	Low	Staff Time, General Funds	Ongoing
Action SAO-2 —Actively participate in the plan maintenance protocols outlined in Volume 1 of this hazard mitigation plan.						
<i>Hazards Mitigated:</i> Wildfire, flood, drought, earthquake, public safety power shutoff, severe weather, soil hazards, sea level rise, dam failure, tsunami						
New & Existing	1, 4, 8, 12	County of Sonoma	Any Supporting Departments	Low	Staff Time, General Funds	Short-term
Action SAO-3 —Coordinate vegetation management grant awards using funds from PG&E settlement						
<i>Hazards Mitigated:</i> Wildfire, severe weather, soil hazards						
New & Existing	2, 4, 9	Ag + Open Space	County of Sonoma	Low	PG&E Settlement Funds	Short-term
Action SAO-4 —Partner with County departments and other organizations to acquire countywide LiDAR and update land use/land cover, hydrology, topography, and vegetation structure (including fuel load) datasets						
<i>Hazards Mitigated:</i> Wildfire, flood, drought, earthquake, public safety power shutoff, severe weather, soil hazards, sea level rise, dam failure, tsunami						
New & Existing	2, 6, 8	County of Sonoma	Ag + Open Space, County of Sonoma, Sonoma Water, USGS, NGOs	High	BRIC, USGS, General Funds, Private Foundations	Short-term
Action SAO-5 —Develop and implement a public outreach and education campaign about the role of land conservation and stewardship in mitigating flood, drought, and wildfire risks and impacts from climate change						
<i>Hazards Mitigated:</i> Wildfire, flood, drought, severe weather, soil hazards, sea level rise						
New & Existing	4, 8	Ag + Open Space		Low	General Funds	Short-term
Action SAO-6 —Map potential riparian (and shoreline) buffers of adequate width, length, hydrology, soils, and vegetation to provide effective fuel breaks, flood conveyance, and groundwater recharge.						
<i>Hazards Mitigated:</i> Wildfire, flood, drought						
New & Existing	4, 8, 10	Ag + Open Space	Sonoma Water, County of Sonoma, CA Department of Conservation	Medium	Staff Time, General Funds, BRIC, CA Department of Conservation	Short-term
Action SAO-7 —Identify priority areas and acquire conservation easements over multi-benefit natural and working lands in hazard-prone areas to ensure fewer people and structures are at risk and to allow first responders to stage suppression and response operations						
<i>Hazards Mitigated:</i> Wildfire, flood, drought, earthquake, soil hazards, sea level rise, dam failure, tsunami						
New & Existing	4, 7, 9, 10	Ag + Open Space	Sonoma Land Trust, County of Sonoma, NGOs	Medium	General Funds, BRIC, HMGP, PDM, FMA, USDA-NRCS, State Coastal Conservancy, CA Department of Conservation, CA Natural Resources Agency, Strategic Growth Council/ Sustainable Agricultural Lands Conservation, CAL FIRE, Private Foundations	Long-term

Benefits New or Existing Assets	Objectives Met	Lead Agency	Support Agency	Estimated Cost	Sources of Funding	Timeline ^a
Action SAO-8 —Partner with public agencies, non-profit organizations, and private landowners to establish strategically placed fuel buffer zones between wildlands and at-risk communities						
<i>Hazards Mitigated:</i> Wildfire, severe weather, soil hazards						
New & Existing	4, 7, 9	Ag + Open Space	County of Sonoma, NGOs, CAL FIRE	Medium	General Funds, HMGP, PDM, BRIC, CAL FIRE, USDA-NRCS, State Coastal Conservancy, CA Department of Conservation, CA Natural Resources Agency, Strategic Growth Council/ Sustainable Agricultural Lands Conservation, Private Foundations	Long-term
Action SAO-9 —Identify priority areas and acquire conservation easements over natural and working lands which provide drought, flood, and climate change resiliency benefits, including lands with high recharge potential; wetlands, floodplains, and headwater streams; and coastal areas (including coastal wetlands)						
<i>Hazards Mitigated:</i> Wildfire, flood, drought, soil hazards, sea level rise, tsunami						
New & Existing	4, 7, 9, 10	Ag + Open Space	Sonoma Land Trust, County of Sonoma, Sonoma Water, CA Department of Fish & Wildlife, Coastal Conservancy	Medium	General Funds, BRIC, HMGP, PDM, FMA, USDA-NRCS, State Coastal Conservancy, CA Department of Conservation, CA Natural Resources Agency, Strategic Growth Council/ Sustainable Agricultural Lands Conservation, Private Foundations	Ongoing
Action SAO-10 —Partner with public agencies and non-profit organizations to expand, create, or connect new parks and open space preserves and trails and to implement open space projects in or near incorporated cities and other communities in Sonoma County, including acquisition projects and improvement projects (restoration, public access, agriculture, recreation development)						
<i>Hazards Mitigated:</i> Wildfire, flood, public safety power shutoff, severe weather, sea level rise						
New & Existing	4, 7, 9, 10	Ag + Open Space	Incorporated cities, County of Sonoma, NGOs, California State Parks	Medium	General Funds, BRIC, State Coastal Conservancy, CA Department of Conservation, CA Natural Resources Agency, USDA, Private Foundations	Ongoing
Action SAO-11 —Conduct and encourage forest and grassland management activities, including ecologically appropriate thinning, prescribed burning, and livestock grazing, to improve forest health and resiliency to wildfire, disease, and drought; to reduce wildfire hazards; enhance wildlife habitat; and increase carbon sequestration.						
<i>Hazards Mitigated:</i> Wildfire, severe weather, soil hazards						
New & Existing	2, 4, 9	County of Sonoma	Ag + Open Space, RCDs, CAL FIRE, California Conservation Corps, NGOs	Medium	HMGP, PDM, General Funds, CAL FIRE	Ongoing
Action SAO-12 —Stabilize burned slopes and remove hazard trees to reduce risk of debris flows and other damage to structures, roads, and waterways following a fire						
<i>Hazards Mitigated:</i> Severe weather, soil hazards						
New & Existing	9, 10	County of Sonoma	Ag + Open Space, Sonoma Water, CAL FIRE, NGOs	Medium	HMGP, PDM, FMA, USDA-NRCS EWP	Ongoing

Benefits New or Existing Assets	Objectives Met	Lead Agency	Support Agency	Estimated Cost	Sources of Funding	Timeline ^a
Action SAO-13 —Monitor and assess vegetation response, carbon loss, erosion and sedimentation risks, stream channel response, and invasive/noxious species establishment on burned lands to prioritize and implement remedial efforts as needed to minimize hazards.						
<i>Hazards Mitigated:</i> Wildfire, flood, severe weather, soil hazards						
New & Existing	4, 8, 9, 10	County of Sonoma	Ag + Open Space, Sonoma Water, CA State Parks, Regional Water Board, USGS, USFS, NGOs	Medium	Staff Time, General Funds, Private Foundations	Ongoing
Action SAO-14 —Partner with RCDs and other organizations on technical assistance and outreach efforts to landowners regarding best practices and mitigation measures for wildfire, flood, and drought hazards.						
<i>Hazards Mitigated:</i> Wildfire, flood, drought						
New & Existing	2, 4, 6, 8, 10	RCDs	Ag + Open Space, Sonoma Water, UC Cooperative Extension, County of Sonoma, NGOs, Fire Safe Sonoma, local fire districts	Medium	HMGP, PDM, FMA, BRIC, USDA-NRCS, State Coastal Conservancy, CA Department of Food & Agriculture, CA Wildlife Conservation Board, CAL FIRE	Ongoing
Action SAO-15 —Partner with RCDs and other organizations to implement habitat restoration projects to reduce flood risk and/or risk of post-fire landslide or debris flows.						
<i>Hazards Mitigated:</i> Flood, soil hazards						
New & Existing	2, 4, 6, 10	RCDs	Ag + Open Space, Sonoma Water, UC Cooperative Extension, NGOs	Medium	HMGP, PDM, FMA, BRIC, USDA-NRCS, State Coastal Conservancy, State Water Resources Control Board	Ongoing
Action SAO-16 —Partner with RCDs and other organizations to improve soil health, including organic matter content, aggregate stability, water holding capacity, and carbon sequestration						
<i>Hazards Mitigated:</i> Drought, severe weather, soil hazards						
Existing	2, 4, 6, 10	RCDs	Ag + Open Space, Regional Climate Protection Authority, Zero Waste Sonoma, Carbon Cycle Institute, North Coast Soil Health Hub, NGOs	Medium	CA Department of Food & Agriculture, USDA-NRCS, Restore CA, CA Wildlife Conservation Board	Ongoing

a. Short-term = Completion within 5 years; Long-term = Completion within 10 years; Ongoing= Continuing new or existing program with no completion date

See the introduction to this volume for list of acronyms used here.

Table 14-13. Mitigation Action Priority

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Cost?	Is Project Grant-Eligible?	Can Project Be Funded Under Existing Programs/ Budgets?	Implementation Priority ^a	Grant Pursuit Priority ^a
SAO-1	7	Low	Low	Yes	No	Yes	High	Low
SAO-2	4	Low	Low	Yes	No	Yes	High	Low
SAO-3	3	High	Low	Yes	No	Yes	High	Low
SAO-4	3	Low	High	No	No	No	Low	Low
SAO-5	2	Low	Low	Yes	No	Yes	Medium	Low
SAO-6	3	Low	Low	Yes	No	Yes	Medium	Low
SAO-7	4	Medium	Medium	Yes	Yes	Yes	High	High
SAO-8	3	Medium	Medium	Yes	Yes	Yes	High	High
SAO-9	4	Medium	Medium	Yes	Yes	Yes	High	High
SAO-10	4	Medium	Medium	Yes	Yes	Yes	Medium	Medium
SAO-11	3	High	Medium	Yes	Yes	Yes	High	High
SAO-12	2	High	Medium	Yes	Yes	Yes	High	High
SAO-13	4	Medium	Medium	Yes	No	Yes	Medium	Low
SAO-14	5	High	Medium	Yes	Yes	Yes	High	High
SAO-15	4	High	Medium	Yes	Yes	Yes	High	High
SAO-16	4	High	Medium	Yes	No	Yes	Medium	Low

a. See the introduction to this volume for explanation of priorities.

Table 14-14. Analysis of Mitigation Actions

Hazard Type	Action Addressing Hazard, by Mitigation Type ^a							
	Prevention	Property Protection	Public Education & Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
High-Risk Hazards								
Wildfire	SAO-3, 7, 8, 9, 10	SAO-14	SAO-1, 5, 14	SAO-3, 6, 7, 8, 9, 10, 11, 14	SAO-1	SAO-14	SAO-5, 6, 8, 9, 10, 11, 14	SAO-1, 2, 4, 6, 13
Flood	SAO-7, 9, 10	SAO-14	SAO-1, 5, 14	SAO-6, 7, 9, 10, 14, 15	SAO-1	SAO-14	SAO-5, 6, 9, 10, 14, 15	SAO-1, 2, 4, 6, 13
Drought	SAO-7, 9	SAO-14	SAO-1, 5, 14	SAO-6, 7, 9, 11, 14, 16	SAO-1	SAO-14	SAO-5, 6, 9, 11, 14, 16	SAO-1, 2, 4, 6,
Earthquake	SAO-7		SAO-1	SAO-7	SAO-1			SAO-1, 2, 4
Medium-Risk Hazards								
Severe Weather	SAO-3, 8, 9, 10		SAO-1, 5	SAO-3, 8, 9, 10, 12, 16	SAO-1		SAO-5, 8, 9, 10, 16	SAO-1, 2, 4, 13
Low-Risk Hazards								
Soil Hazards	SAO-3, 7, 8, 9, 10		SAO-1, 5	SAO-3, 7, 8, 9, 10, 11, 12, 15, 16	SAO-1		SAO-5, 8, 9, 10, 11, 15, 16	SAO-1, 2, 4, 13
Sea Level Rise	SAO-7, 9		SAO-1, 5	SAO-7, 9	SAO-1		SAO-5, 9	SAO-1, 2, 4
Dam Failure	SAO-7		SAO-1	SAO-7	SAO-1			SAO-1, 2, 4
Tsunami	SAO-7, 9		SAO-1	SAO-7, 9	SAO-1		SAO-9	SAO-1, 2, 4

a. See the introduction to this volume for explanation of mitigation types.

14.8 INFORMATION SOURCES USED FOR THIS ANNEX

The following technical reports, plans, and regulatory mechanisms were reviewed for this annex.

- FY 2019-2020 Schedule of Interests in Land for valuation of assets held by Ag + Open Space
- Ag + Open Space Expenditure Plan—2006. https://www.sonomaopenspace.org/wp-content/uploads/Measure-F_Expenditure-Plan-2006_Exhibit-A.pdf
- Ag + Open Space Vital Lands Initiative—2021. https://www.sonomaopenspace.org/wp-content/uploads/FINAL-VLI-FULL-REPORT-01.26.2021_-ADA.pdf
- Ag + Open Space Fee Lands Strategy—2021. https://www.sonomaopenspace.org/wp-content/uploads/Fee-Lands-Strategy_FINAL_20210301-REMEDIATED.pdf
- Abt Associates (2015). The Economic Value of Natural Capital on the Sonoma Coast Prepared for: Sonoma County Agricultural Preservation and Open Space District <https://www.sonomaopenspace.org/wp-content/uploads/HLHE-Case-Study-Ag-Open-Space-Technical-Report-Sonoma-Coast.pdf>
- Sonoma County Ag + Open Space. (2018). Healthy Lands & Healthy Economies: The Multiple Benefits of Sonoma County Working and Natural Lands. Santa Rosa, CA <https://www.sonomaopenspace.org/projects/healthy-lands-healthy-economies/>
- Sonoma County Ag + Open Space and The Nature Conservancy. (2016). The Climate Action Through Conservation Project. https://www.sonomaopenspace.org/wp-content/uploads/CATC_Final_lowres.pdf

The following outside resources and references were reviewed:

- Hazard Mitigation Plan Annex Development Toolkit—The toolkit was used to support the identification of past hazard events and noted vulnerabilities, the risk ranking, and the development of the mitigation action plan.
- Sonoma County Regional Climate Protection Authority. 2016. Climate Action 2020 and Beyond
- Climate Ready North Bay: Key Vulnerability Assessment Findings for the North Bay Region

14.9 FUTURE NEEDS TO BETTER UNDERSTAND RISK/VULNERABILITY

Sonoma County acquired LiDAR data in 2013, which has been applied in support of public safety, climate change action, open space conservation, wildfire risk mitigation, flood planning, and wetland protection, among others. Since 2013, Sonoma County has experienced numerous fire and flood events and so updated LiDAR data are needed that reflect current conditions. These data may be used to update land use/land cover maps for the evaluation of ecosystem services, hazard exposure and risk mapping, and to identify areas where green infrastructure/nature-based solutions (including open space conservation) could have the most impact for the least amount of money. This information may also support the design and implementation of built infrastructure.

In relation, Ag + Open Space could benefit from additional studies about the value of ecosystem services provided by working and natural lands and the value of ecosystem services lost due to fire, flood, drought, and other impacts from climate change. Green infrastructure provides important benefits to human communities, including the reduction of risks and exposure to hazards like fires and floods. Having a better understanding of the ecosystem services provided by these landscapes may support the prioritization and implementation of this type of hazard mitigation solution.