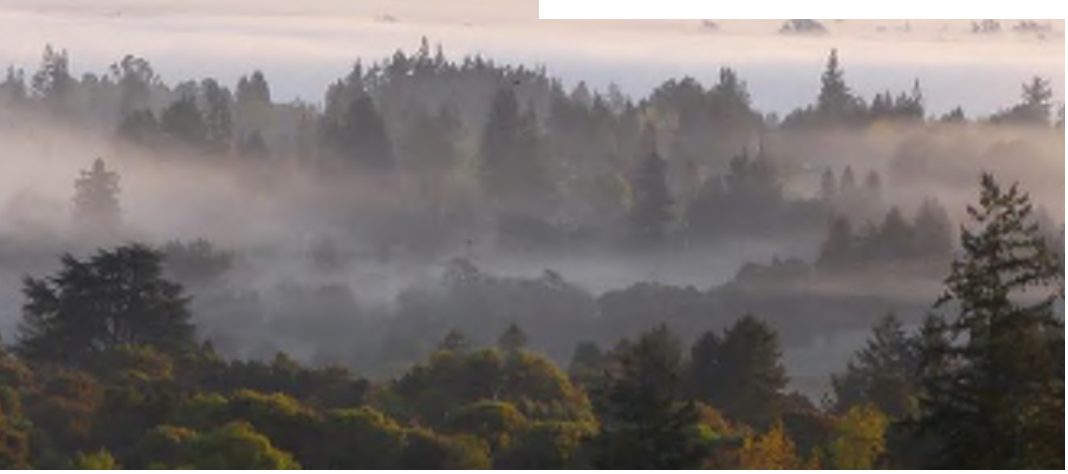
City of Sebastopol Local Hazard Mitigation Plan

Public Review Draft Plan | October 2021











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Executive Summary

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. The City of Sebastopol (City) developed this Local Hazard Mitigation Plan (LHMP) update to make the City and its residents less vulnerable and more resilient to future hazard events. This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 so that Sebastopol would be eligible for the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation and Hazard Mitigation Grant programs.

The City followed a planning process prescribed by FEMA, which began with the formation of a hazard mitigation planning committee (HMPC) comprised of key City representatives, and other regional stakeholders. The HMPC conducted a risk assessment that identified and profiled hazards that pose a risk to the City of Sebastopol, assessed the City's vulnerability to these hazards, and examined the capabilities in place to mitigate them. The City is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Floods, wildfires, severe weather, and earthquake hazards are among the hazards that can have a significant impact on the City.

Based on the risk assessment review and goal setting process, the HMPC identified the following four goals, which provide the direction for reducing future hazard-related losses within the City's Planning Area:

- **Goal 1:** Minimize new development in hazard-prone areas.
- **Goal 2:** Minimize hazard impacts on existing development.
- **Goal 3:** Build resiliency in the community and build capacity against hazards in the City.
- **Goal 4:** Improve infrastructure and lifeline resiliency and redundancy against disruption and interruption.

To meet identified goals, the plan recommends 30 mitigation actions, which are summarized in the table that follows. This plan has been formally adopted by the City and will be updated every five years.

Table ES-1: Mitigation Action Summary Table

Action ID	Action Title	New Action/2010 Action	Address Existing or Future Development	Priority	Related Goal
	Earthquake				
E-1	Inventory soft-story structures in the City and provide notification to property owners of the findings of those inspections	2010 Action	Both	High	1, 2, 3
E-2	Inventory all non-ductile concrete, concrete tilt-up, and other suspicious building in the City	2010 Action	Both	High	1, 2, 3
E-3	Use both the non-ductile concrete and concrete tilt-up inventory and the soft-story inventory to recommend private owners to inform existing tenants (and prospective tenants prior to signing a lease agreement) that they live in this building type	2010 Action	Both	Low	1, 2, 3
E-4	Adopt incentives to encourage retrofitting of privately-owned seismically vulnerable residential buildings	2010 Action	Both	Medium	1, 2, 3
E-5	Hillside Slope Stabilization Project at Burbank Farm	New	Both	Low	1, 2, 3, 4

Action ID	Action Title	New Action/2010 Action	Address Existing or Future Development	Priority	Related Goal
Flood					
F-1	Temporary Flood Protection for the Sebastopol Community Cultural Center Main Hall	New	Both	High	1, 2, 3, 4
F-2	Housing Replacement and Recreation Easement Project at the Park Village Property	New	Both	High	1, 2, 3, 4
F-3	Repetitive Loss Area Analysis	New	Both	Medium	1, 2, 3, 4
F-4	Consider joining Community Rating System Program	New	Both	Low	1, 2, 3, 4
F-5	Participation in the FEMA Sea Level Rise Study	New	Both	High	1, 2, 3, 4
F-6	Sebastopol Community Cultural Center Main Hall Flood Mitigation Alternative Implementation	New	Both	High	1, 2, 3, 4
F-7	Ives Park Calder Creek Daylighting and Stormwater Improvement and Green Infrastructure Project	New	Both	Medium	1, 2, 3
Wildfire					
W-1	Promote Wildfire-Resistant Construction Materials for New Construction in the City	New	Both	High	1, 2, 3, 4
W-2	Develop a Tree Ordinance that requires defensible space maintenance and promotes healthy landscapes	New	Both	High	1, 2, 3, 4
W-3	Develop a Sebastopol Community Wildfire Protection Plan	New	Both	High	1, 2, 3, 4
Drought					
D-1	Continue participation in the Groundwater Sustainability Agency and support future project-specific groundwater management projects related to the City's water system	New	Both	Medium	1, 2, 3, 4
D-2	Build resiliency in the City's water conveyance system by upgrading and replacing water line infrastructure	New	Existing	High	1, 2, 3, 4
D-3	Enhance the City's local drought contingency plan to focus on additional water conservation measures	New	Existing	Low	1, 2, 3, 4
D-4	Conduct a City-wide Facility Energy and Water Audit	New	Existing	Medium	3, 4
Dam Incidents					
DI-1	Participate in the Emergency Action Plan for Warm Springs Dam	New	Both	Medium	1, 2, 3, 4
Extreme Heat					
EH-1	Identify locations for Sebastopol Designated Cooling Centers and including the locations in updated outreach information	New	Existing	Medium	1, 2, 3, 4
Severe Weather: Heavy Rain/Thunderstorms/Lightning/Dense Fog					
SW-1	Upgrade emergency back-up power generation for essential areas of the public safety building	New	Both	Low	1, 2, 3, 4
Severe Weather: High Wind					

Action ID	Action Title	New Action/2010 Action	Address Existing or Future Development	Priority	Related Goal
HW-1	PSPS Readiness & Community Outreach Preparedness Program	New	Both	Low	1, 3, 4, 5
HW-2	Inspect City-owned critical facilities and create a plan that corrects deficiencies and addresses infrastructure hardening and utility undergrounding to ensure resiliency to high winds and severe weather	New	Existing	Low	1, 2, 3
Public Health Hazards					
PH-1	Pandemic Preparedness and Response Plan	New	Both	Medium	1, 2, 3, 4
Multi-Hazard					
M-1	Ensure that the Police and Fire Departments have adequate and interoperable radio communication systems and equipment to meet current technology requirements and to support first responders during response and recovery operations	2010 Action	Both	High	1, 2, 3
MH-2	Ensure that emergency operational plans meet SEMS and NIMS compliance and are adequate for federal and state response and recovery	New	Existing	High	1, 2, 3, 4
MH-3	Develop plans and procedures for Para-Transit system response and recovery from disasters that utilizes the Sonoma County Mutual Aid Program	2010 Action	Both	High	1, 2, 3, 4
MH-4	Update the City Emergency Operations Plan	New	Both	High	1, 2, 3, 4
MH-5	Evacuation Route Plan	New	Both	High	1, 2, 3, 4

Table of Contents

Executive Summary i

1 Introduction 1-1
- 1.1 Background and Scope 1-1
- 1.2 Previous Plan 1-1
- 1.3 Regulatory Authority 1-3
  - 1.3.1 Federal 1-3
  - 1.3.2 State and Local 1-3
- 1.4 Plan Organization 1-4

2 Community Profile 2-1
- 2.1 Location and Geography 2-1
- 2.2 Land Use Distribution 2-1
- 2.3 History 2-5
- 2.4 Demographics 2-5
  - 2.4.1 Population and Growth Projections 2-5
  - 2.4.2 Age 2-6
  - 2.4.3 Housing 2-7
  - 2.4.4 Race and Ethnicity 2-8
  - 2.4.5 Income and Poverty 2-8
- 2.5 Social Vulnerability 2-9
  - 2.5.1 Environmental Justice 2-13
  - 2.5.2 Disadvantaged Communities 2-14
- 2.6 Economy and Employment 2-17
- 2.7 Commuter Population 2-18
- 2.8 Growth and Development Trends 2-18
- 2.9 Mitigation Capability Assessment 2-20
  - 2.9.1 City of Sebastopol's Regulatory Mitigation Capabilities 2-20
  - 2.9.2 City of Sebastopol Administrative/Technical Mitigation Capabilities 2-26
  - 2.9.3 City of Sebastopol Fiscal Mitigation Capabilities 2-28
  - 2.9.4 Mitigation Outreach and Partnership Capabilities 2-29
  - 2.9.5 Opportunities for Enhancement 2-31

3 Planning Process 3-1
- 3.1 Background on Mitigation Planning in the City of Sebastopol 3-1
- 3.2 Local Government Participation 3-2
- 3.3 The 10-Step Planning Process 3-3
  - 3.3.1 Phase 1: Organize Resources 3-4
  - 3.3.2 Phase 2: Assess Risks 3-22
  - 3.3.3 Phase 3: Develop the Mitigation Plan 3-22
  - 3.3.4 Phase 4: Implement the Plan and Monitor Progress 3-23

4 Risk Assessment 4-1
- 4.1 Hazard Identification: Natural and Human-Caused Hazards 4-2
  - 4.1.1 Methodology and Results 4-2
  - 4.1.2 Overall Hazard Significance Summary 4-7
  - 4.1.3 Disaster Declaration History 4-8
  - 4.1.4 Climate Change Considerations Summary 4-10
- 4.2 Asset Summary 4-12

4.2.1 Total Assets at Risk 4-12
4.3 Hazard Profiles and Risk Assessment 4-21
4.3.1 Earthquake 4-23
4.3.2 Flooding 4-50
4.3.3 Wildfire 4-70
4.3.4 Drought 4-91
4.3.5 Dam Incidents 4-103
4.3.6 Severe Weather 4-109
4.3.7 Severe Weather: Extreme Heat 4-110
4.3.8 Severe Weather: Heavy Rain/ Thunderstorm/ Hail/ Lightning/ Dense Fog 4-116
4.3.9 Severe Weather: High Winds 4-129
4.4 Human-Health and Human-Caused Hazard Profiles and Risk Assessment 4-133
4.4.1 Public Health Hazards 4-134
4.4.2 Hazardous Material Releases 4-141
4.5 Hazard Summary 4-147
5 Mitigation Strategy 5-1
5.1 Goals and Objectives 5-1
5.1.1 Goals Development Process 5-1
5.1.2 Objectives Development Process 5-2
5.1.3 Incorporation into Existing Planning Mechanisms 5-2
5.2 Identification and Analysis of Mitigation Actions 5-3
5.2.1 Prioritization Process 5-4
5.3 Mitigation Action Plan 5-6
5.3.1 Progress on 2010 City of Sebastopol LHMP Annex Mitigation Actions 5-6
5.3.2 Continued Compliance with National Flood Insurance Program 5-6
5.3.3 Mitigation Action Plan 5-7
6 Plan Adoption 6-1
7 Plan Implementation and Maintenance 7-1
7.1 Implementation 7-1
7.1.1 Role of Hazard Mitigation Planning Committee in Implementation and Maintenance 7-2
7.2 Maintenance 7-2
7.2.1 Maintenance Schedule 7-2
7.2.2 Maintenance Evaluation Process 7-3
7.2.3 Incorporation into Existing Planning Mechanisms 7-5
7.2.4 Process for Plan Integration 7-5
7.2.5 Continued Public Involvement 7-6

Tables

Table ES-1: Mitigation Action Summary Table i
Table 2-1: City of Sebastopol Land Uses by Acreage 2-2
Table 2-2: City of Sebastopol Populations Changes (counts), 2010-2020 2-6
Table 2-3: City of Sebastopol's Demographic and Social Characteristics, 2014-2018 2-6
Table 2-4: City of Sebastopol Housing Tenure, 2015 2-7
Table 2-5: City of Sebastopol Race and Ethnicity, 2014-2018 2-8

Table 2-6: City of Sebastopol's Comparative Economic Characteristics: 2014 and 2018 2-9
Table 2-7: City of Sebastopol's Employment by Industry, 2014-2018 2-17
Table 2-8: City of Sebastopol's Major Employers 2-17
Table 2-9: City of Sebastopol Land Use Acreages at Plan Buildout 2-19
Table 2-10: City of Sebastopol's Regulatory Mitigation Capabilities 2-20
Table 2-11: City of Sebastopol Safety Element Goals 2-24
Table 2-12: City of Sebastopol Open Space and Conservation Goals 2-24
Table 2-13: City of Sebastopol Community Services and Facilities Element Goals 2-25
Table 2-14: City of Sebastopol's Administrative and Technical Mitigation Capabilities 2-26
Table 2-15: City of Sebastopol's Fiscal Mitigation Capabilities 2-28
Table 3-1: Mitigation Planning Processes Used to Develop the City of Sebastopol's LHMP Update 3-4
Table 3-2: Local Hazard Mitigation Plan Schedule of Planning Activities 3-4
Table 3-3: Schedule of Planning Meetings 3-6
Table 3-4: Public Workshops 3-10
Table 3-5: Incorporated Planning Mechanisms 3-17
Table 4-1: Crosswalk with Other Hazard Mitigation Plans 4-3
Table 4-2: City of Sebastopol Hazard Significance Summary 4-7
Table 4-3: Sebastopol and Sonoma County State and Federal Disaster Declarations, 1950-2020 4-9
Table 4-4: City of Sebastopol Total Improved Parcel Exposure by Parcel Type 4-13
Table 4-5: Sebastopol Critical Facilities by FEMA Community Lifeline and Type Counts 4-14
Table 4-6: City NRHP Historical Resources and Sonoma County District 5 Historic Landmarks 4-17
Table 4-7: Threatened and Endangered Species in Sonoma County and the Planning Area 4-18
Table 4-8: Magnitude and Mercalli Intensity Scale Measurements and Associated Characteristics 4-32
Table 4-9: Expected Building Damage by Building Type (All Building Design Levels) 4-39
Table 4-10: Casualty and Injury Estimates from Hazus Results 4-41
Table 4-11: Building-Related Economic Loss Estimates (Millions of dollars) 4-42
Table 4-12: Transportation System Economic Losses (Millions of Dollars) 4-43
Table 4-13: Utility System Economic Losses (Millions of Dollars) 4-44
Table 4-14: Expected Damage to the Transportation Systems 4-45
Table 4-15: Expected Utility System Facility Damage 4-46
Table 4-16: Expected Utility System Pipeline Damage (Site Specific) 4-46
Table 4-17: Hazus 4.2 Deterministic M7.2 Earthquake Scenario Loss Estimations for Sebastopol's Census Tracts 4-48
Table 4-18: FEMA's Special Flood Hazard Area Zone Descriptions 4-58

Table 4-19: NFIP Claims in City of Sebastopol by Building Type (Residential versus Non-Residential) 4-61
Table 4-20: City of Sebastopol Repetitive Losses in Floodplains 4-61
Table 4-21: City of Sebastopol Combined Hazus Level 2 & FEMA Flood Loss Estimates 4-62
Table 4-22: City of Sebastopol Parcels in 0.2 Percent Annual Chance Floodplains by Property Type 4-64
Table 4-23: Sebastopol's Critical Facilities in the 100-Year Floodplain and Hazus Level 2 Depth Grid 4-69
Table 4-24: Summary of Fire History within 10 miles of the City of Sebastopol 4-75
Table 4-25: Parcels in FHSZs within LRAs in Sebastopol 4-83
Table 4-26: Parcels in Wildland Fire Threat Areas in Sebastopol 4-83
Table 4-27: The City of Sebastopol's Critical Facilities at Risk to Wildfire based on FHSZs in LRAs 4-87
Table 4-28: City of Sebastopol's Critical Facilities at Risk to Wildfire based on Wildfire Threat 4-87
Table 4-29: Sebastopol's Current Water Supply Sources and Projected Availability for 2025 4-92
Table 4-30: Disaster Declarations and Proclamations Related to Drought in Sonoma County 4-98
Table 4-31: Characteristics of the Dams of Concern Upstream of the City of Sebastopol 4-104
Table 4-32: NCEI Hazard Event Reports for the Sonoma County: 1950-2020 4-109
Table 4-33: Hail Measurements 4-120
Table 4-34: Lightning Activity Level Scale 4-120
Table 4-35: Atmospheric River Categories 4-121
Table 4-36: Severe Weather Events recorded in Sonoma County (1950-2020) 4-123
Table 4-37: Beaufort Wind Scale 4-130
Table 4-38: Annual Cases of Communicable Diseases in Sonoma County: 2015 – 2019 4-137
Table 4-39: Hazard Identification and Determination of Priority Hazard 4-147
Table 5-1: Mitigation Action Summary Table 5-8

Figures

Figure 2-1: City of Sebastopol Planning Area 2-3
Figure 2-2: City of Sebastopol Land Use Distribution 2-4
Figure 2-3: City of Sebastopol Current and Projected Age Distribution, 2010 – 2023 2-7
Figure 2-4: City of Sebastopol Age Distribution vs. Sonoma County Percentage of Population, 2019 2-7
Figure 2-5: Comparable Median Home Sales Price in Sonoma County, 2017 2-8
Figure 2-6: Disadvantaged Communities based on CDC ATSDR SVI Tool 2-11
Figure 2-7: Overall Social Vulnerability in the City of Sebastopol Planning Area based on SVI Data 2-12
Figure 2-8: Disadvantaged Communities based on California DWR DAC Mapping Tool 2-14
Figure 2-9: Sebastopol Census Tract Scores based on OEHHA CalEnviroScreen Tool 2-15
Figure 2-10: SCTA-Defined Disadvantaged Communities in Sebastopol 2-16

Figure 4-1: Risk Graphic 4-1
Figure 4-2: Critical and FEMA Community Lifeline Facilities in Sebastopol by Overall Category 4-15
Figure 4-3: Potential Ground Shaking Probability in the City of Sebastopol 4-24
Figure 4-4: Liquefaction Susceptibility in the City of Sebastopol 4-26
Figure 4-5: Landslide Susceptibility in the City of Sebastopol and Its Planning Area 4-28
Figure 4-6: Earthquake Faults near the Planning Area 4-30
Figure 4-7: Hazus 2,500 Year Probabilistic Earthquake Scenario with Liquefaction Susceptibility – Total Losses by Census Tract 4-36
Figure 4-8: Estimated Building Damage by General Occupancy Type and Damage Category 4-38
Figure 4-9: Displaced Households and Persons Seeking Shelter Estimates 4-40
Figure 4-10: Economic Loss Estimates by Loss Type and Occupancy Type 4-42
Figure 4-11: USGS Generated ShakeMap Earthquake Scenario for Hayward-Rodgers Creek Faults 4-47
Figure 4-12: Watersheds in the City of Sebastopol Planning Area 4-53
Figure 4-13: FEMA Special Flood Hazard Areas for the 1% and 0.2% Annual Chance Flood Events in the City of Sebastopol 4-57
Figure 4-14: City of Sebastopol Parcels in the FEMA and Hazus One Percent Annual Chance Depth Grid Floodplain 4-63
Figure 4-15: City of Sebastopol Parcels in the 1% and 0.2% Annual Chance Floodplains 4-65
Figure 4-16: City of Sebastopol Critical Facilities and Infrastructure in the 1% and 0.2% Annual Chance Floodplains 4-67
Figure 4-17: City of Sebastopol Critical Facilities and Infrastructure in the Hazus One-Percent Annual Chance Depth Grid Floodplain 4-68
Figure 4-18: FHSZs in State Responsibility Areas (SRAs) and Local Responsibility Areas (LRAs) 4-72
Figure 4-19: Fire Threat Zones in and Near the City of Sebastopol 4-73
Figure 4-20: Fire History and Burn Perimeters near the City of Sebastopol 1944 to 2020 4-77
Figure 4-21: Annual Fire Probability in the City of Sebastopol for the Years 2026-2050 4-79
Figure 4-22: Future Annual Averages of Acres Burned in Sebastopol under Low and High Emission Scenarios 4-81
Figure 4-23: Fire Hazard Severity Zones in Local Responsibility Areas - City of Sebastopol 4-84
Figure 4-24: Wildland Fire Threat Areas within and around the City of Sebastopol 4-85
Figure 4-25: Critical Facilities and Infrastructure within Local Responsibility Hazard Areas in the City of Sebastopol 4-88
Figure 4-26: Critical Facilities and Infrastructure within Fire Threat Zones in the City of Sebastopol 4-89
Figure 4-27: U.S. Drought Monitor Conditions for California, January 5, 2021 4-95
Figure 4-28: U.S. Drought Monitor Conditions for California, November 29, 2018 4-96
Figure 4-29: U.S. Drought Monitor for California: August 4, 2015 4-97

Figure 4-30: Drought Conditions in California – 2000 – 2019 4-97
Figure 4-31: Drought Impact Reporter Impacts at the County Level in Sonoma County, 1950-2020 4-99
Figure 4-32: Dams of Interest in the Vicinity of the City of Sebastopol 4-105
Figure 4-33: Dam Failure Inundation in Sonoma County 4-107
Figure 4-34: National Weather Service Heat Index 4-110
Figure 4-35: The City of Santa Rosa's Daily Temperature Averages and Extremes 4-112
Figure 4-36: California's Statewide Mean Temperature Departure, 1900-2014 4-112
Figure 4-37: City of Sebastopol – Future Extreme Heat Days in High and Low Emission Scenarios 4-113
Figure 4-38: Cloud to Ground Lightning 4-119
Figure 4-39: Atmospheric River Strength and Land Distribution, February 2018 vs. February 2019 4-122
Figure 4-40:City of Santa Rosa's Monthly Average Total Precipitation 4-125
Figure 4-41: City of Santa Rosa's Daily Average and Extreme Precipitation 4-125
Figure 4-42: City of Sebastopol Future Precipitation Estimates in High and Low Emission Scenarios 4-126
Figure 4-43: Sonoma County New Cases by Date 4-137
Figure 4-44: Hazardous Materials Incidents in Sebastopol Reported to Cal OES: 2010-2020 4-145

Appendices

Appendix A: Planning Process

Appendix B: References

Appendix C: Mitigation Strategy

Appendix D: Adoption Resolution

Appendix E: Annual Progress Meeting Agenda and Report Template

Acronyms

ABAG	Association of Bay Area Governments
APG	Adaptation Planning Guide
ASCE	American Society of Civil Engineers
AWIA	America Water Infrastructure Act
BAAQMD	Bay Area Air Quality Management District
BCM	Basin Characterization Model
BFE	Base Flood Elevation
CAC	Climate Action Commission
CalARP	California Accidental Release Prevention Program
Cal FIRE	California Department of Forestry and Fire Protection
Cal OES	California Office of Emergency Services
CAP	Climate Action Plan
CBC	California Building Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CERT	Community Emergency Response Team
CIS	Community Information System
COPE	Citizens Organized to Prepare for Emergencies
CRHR	California Registry of Historic Resources
CUPA	Certified Unified Program Agency
CWD	Climate Water Deficit
CWPP	Community Wildfire Protection Plan
DHS	Department of Health Services
DOF	Department of Finance
DOT	Department of Transportation
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EAP	Emergency Action Plan
EIR	Environmental Impact Report
EOC	Emergency Operations Center

EOP	Emergency Operations Plan
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FHSZ	Fire Hazard Severity Zone
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMP	Floodplain Management Plan
FRAP	Fire and Resource Assessment Program
GCM	Global Climate Model
GIS	Geographic Information Systems
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HMBP	Hazardous Materials Business Plan
HMPC	Hazard Mitigation Planning Committee
HSC	Health and Safety Code
IBC	International Building Council
ICC	International Code Council
IPCC	Intergovernmental Panel on Climate Change
IVT	Integrated Water Vapor Transport
IZO	Implementing Zoning Ordinance
LAL	Lightning Activity Level
LHMP	Local Hazard Mitigation Plan
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
LRA	Local Responsibility Area
MDD	Maximum Daily Demand
NBRP	North Bay Reuse Program
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NFHL	National Flood Hazard Layer
NOAA	National Oceanic Atmospheric Association
NPMS	National Pipeline Mapping System
NRC	National Response Center

NRHP	National Registry of Historic Places
NWS	National Weather Service
OSHA	Occupational Safety and Health Administration
PG&E	Pacific Gas and Electric
PRC	Public Resources Code
PSPS	Public Safety Power Shutoff
RCPA	Regional Climate Protection Authority
RCRA	Resource Conservation and Recovery Act
RGMS	Residential Growth Management System
RMP	Risk Management Plan
RTK NET	Right-to-Know Network
SBA	Small Business Administration
SCAPOSD	Sonoma County Agricultural Preservation and Open Space District
SFHA	Special Flood Hazard Area
SGMA	Sustainable Groundwater Management Agency
SHMP	State Hazard Mitigation Plan
SLR	Sea Level Rise
SRA	State Responsibility Area
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, Environmental
UGB	Urban Growth Boundary
URM	Unreinforced Masonry
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
WERC	Western Ecological Research Center
WRCC	Western Regional Climate Center
WRFP	Water Recycling Funding Program
WSCP	Water Shortage Contingency Plan
WUI	Wildland Urban Interface

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1 Introduction

The City of Sebastopol prepared this Local Hazard Mitigation Plan (LHMP) update to guide efforts to better protect the people and property of the City from the effects of hazardous events. It serves as a tool to help decision makers direct mitigation activities, to coordinate City resources, and to be eligible for State and Federal mitigation funding. This plan updates the City's previous hazard mitigation plan that was developed as part of a regional effort. This plan also demonstrates the City's commitment to reducing risks from hazards to the community and serves as a tool to implement and achieve mitigation goals.

1.1 Background and Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated.



Emergency Management Cycle

Hazard mitigation is defined by the Federal Emergency Management Agency (FEMA) as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." Mitigation activities can be planned and implemented before a disaster occurs. After the disasters, reconstruction is completed to restore the damaged property to pre-disaster conditions. While such efforts repair and reconstruct the property, the pre-disaster conditions may result in a repetitive cycle of damage and reconstruction. The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on hazard mitigation saves society an average of $6 in avoided future disaster costs (National Institute of Building Sciences 2018).

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented. Hazard mitigation planning in the City of Sebastopol can break this repetitive cycle by reducing vulnerability to hazards through thoughtful planning and smart construction. This plan documents the City of Sebastopol's hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the City will use to decrease vulnerability and increase resiliency and sustainability in Sebastopol.

1.2 Previous Plan

The Association of Bay Area Governments (ABAG) prepared a regional multi-jurisdictional LHMP for the San Francisco Bay Area in 2005 referred to as *Taming Natural Disasters*. The plan was updated in 2010 and covered numerous jurisdictions in the Bay Area consisting of seven counties, 76 cities including the City of Sebastopol, five school districts, 12 transit agencies, 13 water districts, and five special-purpose districts. The goal of the regional multi-jurisdictional LHMP was to maintain and enhance a disaster-resistant

region by reducing the potential loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery from those disasters. The City participated in the original plan and update by preparing an annex that was approved by FEMA and adopted by resolution in 2011 by the Sebastopol City Council as the City of Sebastopol 2010 LHMP Annex. Today ABAG is no longer managing the update of the multi-jurisdictional LHMP and the 2010 *Taming Natural Disasters* plan has expired.

The City's 2021 LHMP update supersedes the 2010 LHMP Annex prepared by ABAG. This new and updated LHMP is a single jurisdictional stand-alone plan for the City of Sebastopol that geographically covers everything within the City of Sebastopol's jurisdictional boundaries and its Sphere of Influence (SOI) (hereinafter referred to as the Planning Area). The single jurisdictional and stand-alone plan is tailored to better suit the needs and capabilities of the City and their planning partners. The updated 2021 LHMP differs from the 2010 ABAG plan as follows:

- The single jurisdictional and stand-alone plan focuses only on the City of Sebastopol rather than being a subset of a larger regional and multi-jurisdictional planning effort.
- The risk assessment addresses natural, human-caused, and human-health hazards specific to the City and includes a vulnerability assessment that evaluated risks to people and property within the City's Planning Area, critical facilities and infrastructure, and City-owned facilities and infrastructure, specifically municipal buildings, community lifelines, and water and wastewater systems.
- The plan integrates best available data and tools, including information on climate change impacts in a detailed risk and vulnerability assessment.
- The planning process was aligned with FEMA's National Flood Insurance Program (NFIP) Community Rating System (CRS) in order to maximize credits if the City participates in the CRS program in the future to reduce flood insurance premiums.
- A City and planning committee (referred to as the Hazard Mitigation Planning Committee [HMPC]) was formed that collaborated to develop the plan and involve the public through a coordinated outreach strategy targeted for both socially vulnerable, such as the City's senior population, as well as disadvantaged communities.
- The HMPC consisted of the City and local government and non-profit organization planning partners, such as Sonoma County, a neighboring jurisdiction (City of Petaluma), a local fire district, and senior center who worked together to develop goals and objectives, and mitigation strategies and implementation methods to reduce natural hazard risks in the Planning Area.
- The planning process involved the circulation of one online public survey to better understand the community's perception of natural, human-caused, and health hazard risks and to engage and solicit input on risk reduction through mitigation actions for the whole community.
- The planning process involved review of mitigation activities and strategies identified in City planning documents, such as the 2016 Sebastopol General Plan and 2010 LHMP Annex.
- The plan includes a more detailed and tailored mitigation action strategy than the previous 2010 ABAG plan; the mitigation strategy included additional flood mitigation projects.
- The City and planning committee identified specific mitigation actions that are best suited for the City of Sebastopol and can be funded under Hazard Mitigation Assistance (HMA) program and Building Resilient Infrastructure and Communities (BRIC) grants and state funding programs in order to meet multiple objectives.

- It provides access to FEMA grant funding to conduct hazard mitigation activities and provides resources to City residents wishing to conduct hazard mitigation efforts by providing financial and technical resources.

1.3 Regulatory Authority

1.3.1 Federal

This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act or DMA of 2000.) The DMA of 2000, also commonly known as "The 2000 Stafford Act Amendments," constitutes an effort by the Federal government to reduce the rising cost of disasters. The Act stresses the importance of coordinated mitigation planning and disaster preparedness prior to an event and emphasizes the need for mitigation planning.

Section 322 of the regulations established the requirements that LHMPs must meet in order for a local jurisdiction to be eligible for certain Federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). To facilitate implementation of the DMA 2000 and the Stafford Act Amendments, FEMA created an Interim Final Rule (the Rule), published in the Federal Register in February of 2002 in Section 201 of 44 CFR (44 CFR §201.6). The Rule spells out the mitigation planning criteria for States and local communities.

In March 2013 FEMA released *The Local Mitigation Planning Handbook* (Handbook) as the official guide for local governments to develop, update and implement local mitigation plans. The Handbook complements and references the October 2011, *FEMA Local Mitigation Plan Review Guide* (Guide) in order to help "Federal and State officials assess Local Mitigation Plans in a fair and consistent manner." Local jurisdictions must demonstrate that proposed mitigation actions are based upon a sound planning process that accounts for the inherent risk and capabilities of the individual communities as stated in Section 201.5 of the Rule. The Handbook and Guide were routinely reviewed during the development of the City's 2021 LHMP update for the purpose of ensuring thoroughness, diligence, and compliance with the DMA of 2000 planning requirements. The City also reviewed the California Adaptation Planning Guide (APG) among other state-focused planning guides to inform the climate vulnerability assessment and development of climate-specific adaptation goals and strategies.

This plan was also developed so the City can be eligible for certain federal disaster assistance, specifically, the FEMA HMA grants including the Hazard Mitigation Grant Program (HMGP), BRIC program, and the Flood Mitigation Assistance (FMA) program. Additional FEMA mitigation funds include the HMGP-Post Fire funding associated with Fire Management Assistance Grant (FMAG) declarations).

1.3.2 State and Local

During the development of the City's LHMP update, City staff initiated a review of the Sebastopol General Plan Safety Element to ensure consistency with hazards and mutually reinforcing policies. Following approval of the City's LHMP update, the City intends to formally update the Sebastopol General Plan Safety Element. In addition to following the DMA requirements the development of the 2021 LHMP addressed and exceeded the requirements of California Government Code Section 65302 (g) and the following State of California legislation that relate to the General Plan and LHMP:

- Senate Bill (SB) 379 requires inclusion of climate adaptation strategies in the General Plan Safety Element and encourages a climate change discussion in LHMP updates. Climate change considerations are addressed in a subsection within each hazard profile in the risk assessment.
- SB 1000, the Planning for Healthy Communities Act requires environmental justice and social equity considerations in the General Plan update upon the next revision of two or more elements concurrently on or after January 1, 2018 or the next revision of a LHMP; these considerations were addressed in the social vulnerability and disadvantaged communities summary of the community profile in Chapter 2 and again in the mitigation action prioritization criteria detailed in Chapter 5.
- Assembly Bill (AB) 2140 requires adoption by reference or incorporation of the LHMP into the Safety Element of the General Plan, following LHMP approval, to be eligible for a larger share of California Disaster Relief Act (CDAA) funding, should a disaster be declared. The sample adoption resolution is included in Appendix D.

Information in this plan will be used to guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. All residents and businesses in the City will benefit from the implementation of the LHMP, as the plan reduces risk for those who live in or work in the City, and the mitigation strategy sets the foundation for the development of collaborative partnerships in the region and the implementation of local mitigation activities.

The City of Sebastopol's Planning Area has been affected by hazards in the past and the City is committed to reducing future impacts from hazard events, building community resilience to future disasters, and becoming eligible for mitigation-related federal funding.

1.4 Plan Organization

The City of Sebastopol's LHMP is organized as follows:

- Chapter 2: Community Profile
- Chapter 3: Planning Process
- Chapter 4: Risk Assessment
- Chapter 5: Mitigation Strategy
- Chapter 6: Plan Adoption
- Chapter 7: Plan Implementation and Maintenance
- Appendices

2 Community Profile

The City of Sebastopol is located approximately 55 miles north of San Francisco. Sebastopol is a vibrant and unique community, geographically situated on the edge of the Laguna de Santa Rosa River and defined by the surrounding hillsides and vineyards, and pedestrian-friendly Main Street and "small town" atmosphere.

Today the City's proximity to the San Francisco Bay Area and the growing food, wine, and art scene continues to make it an attractive place for home buyers and visitors. Sebastopol has experienced modest growth since suburbanization in the 1950s and the adoption of the Urban Growth Boundary (UGB) in 2016. In 2020, the City's population was 7,745 compared to 7,370 in 2010, representing a slower growth rate of four percent when compared to the rest of Sonoma County's nine major cities over the same period (DOF 2020).

2.1 Location and Geography

The City of Sebastopol is located at the western end of Sonoma County. The City is comprised of 1.9 square miles. State Route (SR-) 12 and SR 116 bisect the City, approximately 9 miles west of U.S. Highway 101 easily connecting locals and visitors to the surrounding Bay Area region.

Sebastopol's boundaries have been defined mostly by the surrounding natural landscape. The City is situated along the edge of the Laguna de Santa Rosa River and wetland preserve to the east, which is fed by Santa Rosa Creek, and other tributaries including Zimpher Creek, Calder Creek, and Witter Creek. The City also sits within the Santa Rosa Plain between the Mayacamas Mountains to the east and the Coastal Range to the west along the Pacific Ocean. The City is surrounded by the unincorporated community of Graton to the north and the City of Santa Rosa to the east.

2.2 Land Use Distribution

The City of Sebastopol's land use pattern has been defined by historical growth and land use regulations (City of Sebastopol 2016c). In 1996, Sebastopol voters approved a 25-year UGB as part of Measure O, which amended the General Plan to establish the UGB and amend land use policies in the City's General Plan. This UGB was reaffirmed in 2016 with minor modifications when the City Council adopted Ordinance 1090, which defines and establishes standards for the administration of the UGB. The City may also amend the UGB and approve annexation in order to accommodate lands to be designated for residential uses (City of Sebastopol 2016c). No more than three acres of land may be brought within the UGB for this purpose in any calendar year, and no more than a total of ten acres may be brought within the UGB for this purpose during the term of the initiative if certain findings related to land use consistency, scenic impacts, critical habitat protection, affordable housing, safe access, and the provision of services are made. The Hazard Mitigation Planning Committee (HMPC) selected the City's Sphere of Influence (SOI) as the Planning Area for this plan because it represents the probable physical boundary and service area of the City that could potentially be developed after annexation. This Planning Area is shown in Figure 2-1.

It should be noted that the "planning area" defined in the Local Hazard Mitigation Plan (LHMP) is different than the "planning area" defined in the Sebastopol General Plan, which consists of the City, SOI, and the UGB (see Figure 2-1). State law allows cities to identify a planning area during their General Plan process. This is typically an area outside of city boundaries and generally outside the UGB. It is designed to act as a signal to the County and other nearby local authorities that Sebastopol recognizes that development may occur within these areas.

The most common land use classification in the City of Sebastopol is residential with more than 52 percent of parcels being designated as residential single-family homes, medium-density residences, and high-density residences. The remaining land uses include primarily open space and park land (11 percent), community facilities (8 percent), right-of-way (15 percent), general commercial (6 percent), mixed-use use (1 percent), light industrial (3 percent), and office (3 percent) (City of Sebastopol 2016a). A detailed breakdown of land use in the City is summarized in Table 2-1. These land uses are shown in Figure 2-2.

Table 2-1: City of Sebastopol Land Uses by Acreage

Land Use Description	Acres	Percentage of Total
Open Space	90.7	7.6%
Parkland	34.4	2.9%
Downtown Core	44.8	3.8%
General Commercial	66.4	5.6%
Light Industrial	32.7	2.8%
Office	35.8	3.0%
Office/Light Industrial	13.3	1.1%
Very Low Density Residential	7.4	0.62%
Low Density Residential	89.9	7.6%
Medium Density Residential	369.7	31.1%
High Density Residential	134.5	11.3%
Community Facilities	96.3	8.1%
Right-of-Way	172.5	14.5%
No Label	0	0%
Total	1,188.4	100%

Source: City of Sebastopol 2016a

Figure 2-1: City of Sebastopol Planning Area

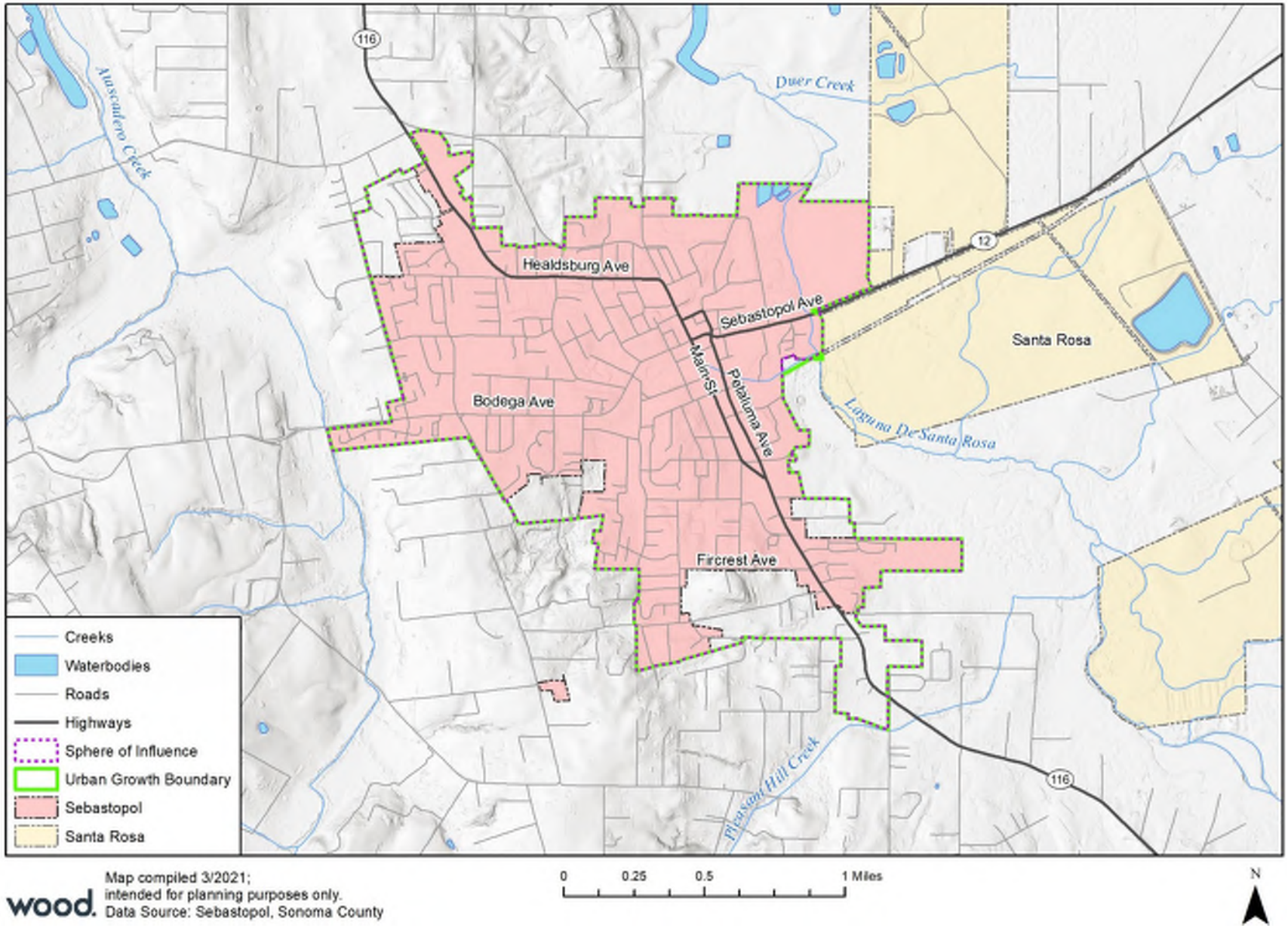
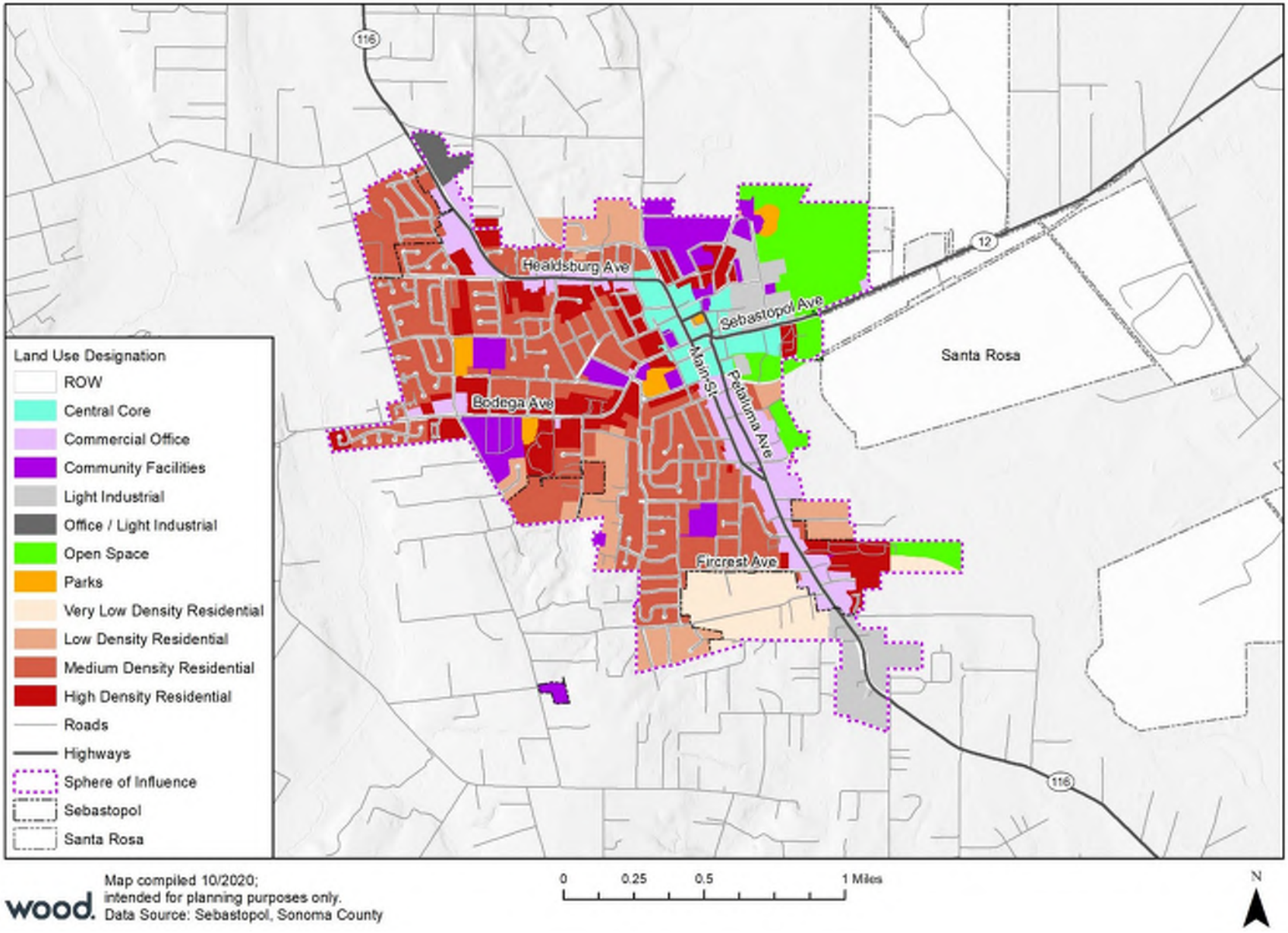


Figure 2-2: City of Sebastopol Land Use Distribution



2.3 History

The native Miwok and Pomo originally inhabited the area of modern-day Sebastopol. The town of Sebastopol later formed in the 1850s when a U.S. Post Office was established as a small trade center for the farmers in the surrounding agricultural region. As California's population grew after the Gold Rush of the 1850s, settlers moved into the fertile California valleys north of San Francisco.

The apple industry brought steady rural prosperity to the town and Sebastopol was incorporated in 1902 (City of Sebastopol 2020). With incorporation, the City grew and was soon developed with schools, churches, hotels, canneries, mills, wineries, and an opera house. The 1906 earthquake reduced much of this early development, but much of the town was soon rebuilt.

In the second half of the 20th century, the apple industry struggled to compete with other apple-producing regions and gradually declined. With greater mobility and the rise of shopping centers in other Sonoma County communities, the City changed from a full-service town to one with more limited range of goods and services. Today, Sebastopol is a vibrant, unique, and creative community with a thriving and growing food and wine and arts hub. The City is a known leader in environmental and conservation efforts and sustainable farming. Sebastopol's geographical setting, proximity to wineries and the Sonoma Coast, and new commercial and industrial businesses and healthy living also support a strong local economy.

2.4 Demographics

Comprehensive data on the City of Sebastopol's demographics was obtained from the U.S. Census Bureau's American Community Survey (ACS) five-year estimates (2014-2018) and the California Department of Finance (DOF) population estimates.

2.4.1 Population and Growth Projections

Between 2010 and 2020 the population of Sebastopol steadily increased by 366 persons (4.8 percent) (DOF 2020) as shown by Table 2-2 reported by the California DOF Population Estimates. During the same time period, the state of California population increased by two percent, but Sonoma County's population slightly decreased by 1.6 percent. This growth trend demonstrates that the City of Sebastopol has experienced growth compared to the State and the surrounding region; however, this growth is relatively small given the small size of the City (US Census 2010; DOF 2020). The County's population increased between 2010 through 2017 and then gradually decreased (Sonoma County 2019). The City's General Plan Housing Element also estimates an additional 455 residents in the City by 2030, resulting in another 5.5 percent increase over the next decade. Although Sonoma County's growth has decreased slightly in the last several years and estimates by the Sonoma County Economic Development Board show a slight decrease in population in Sebastopol in the short-term (next 4-5 years), the County population is projected to grow at a similar rate as Sebastopol, or by roughly 7 percent over the next decade (Sonoma County EDB 2019, City of Sebastopol 2015).

The key land use changes noted in the City's General Plan buildout are increases in residential and mixed-uses within the City limits. The City estimated the buildout will result in approximately 750 new residential units, 341,159 square feet of new commercial space, 59,959 square feet of new industrial space, and 137,375 square feet of new office space (City of Sebastopol 2016a). Cumulatively, maximum buildout projections (beyond the General Plan buildout scenarios) within the City limits and the SOI and UGB could yield up to 1,185 new residential units, 341,159 square feet of new commercial space, 684,889 square feet of new industrial space, and 137,375 square feet of new office space (City of Sebastopol 2016a). In summary, the population and growth projections over the next 5 to 10 years could be lower or higher depending on a range of economic and environmental factors in the region.

Table 2-2: City of Sebastopol Populations Changes (counts), 2010-2020

Year	Total Population
2020	7,745
2015	7,440
2010	7,379

Sources: U.S. Census ACS 2010-2015, DOF 2020, City of Sebastopol 2016a

Table 2-3 breaks down Sebastopol's demographics for select social characteristics.

Table 2-3: City of Sebastopol's Demographic and Social Characteristics, 2014-2018

Characteristic	
Gender/Age	
Median Age	48.5
Male, percentage	45.8%
Female, percentage	54.2%
Under 5 Years, percentage	2.9%
Under 18 Years, percentage	17.6%
65 Years and Over, percentage	22.5%
Race/Ethnicity	**Percentage**
White	77.3%
Hispanic or Latino (Any Race)	9.3%
Asian	2.7%
Some Other Race	7.4%
Black or African American	2.0%
American Indian/Alaska Native	0.2%
Native Hawaiian and Other Pacific Islander	1.1%
Education**	**Percentage**
High School Graduate or Higher	95.7%
Bachelor's Degree or Higher	43.8%

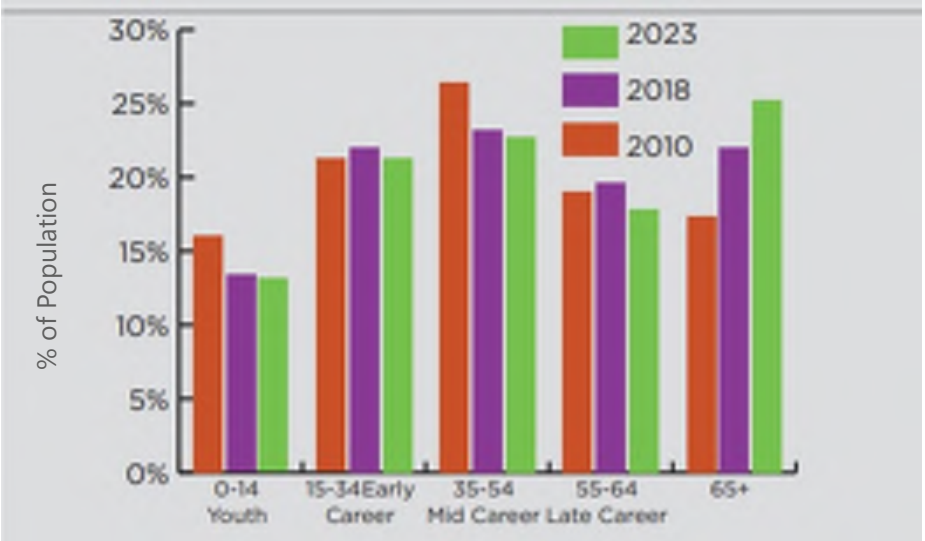
Source: U.S. Census Bureau American Community Survey, 2014-2018, www.census.gov/ ; DOF 2020

**California DOF estimates

2.4.2 Age

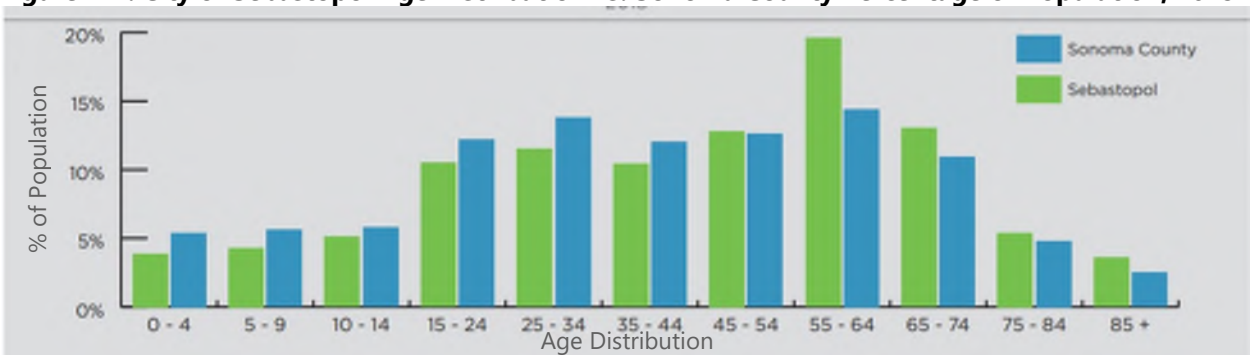
As noted in Table 2-3, the median age of Sebastopol residents was 48.5 years old in 2017. According to the 2019 Sebastopol City Profile Report from the Sonoma County Economic Development Board, Sebastopol is ranked second-highest among the County's nine incorporated cities in terms of age, and older than the median age of Sonoma County (41) and above California (36). The City's labor force is older than the state but younger than the county overall. The City is projected to continue to age with the greatest increase by 2022 being individuals 65 years and older. A low unemployment rate paired with a relatively lower labor force rate also indicates an aging population. Figure 2-3 and Figure 2-4 show the age distribution as of 2019 and projected for 2023.

Figure 2-3: City of Sebastopol Current and Projected Age Distribution, 2010 – 2023



Source: Sebastopol City Profile Report, Sonoma County Economic Development Board 2019

Figure 2-4: City of Sebastopol Age Distribution vs. Sonoma County Percentage of Population, 2019



Source: Sebastopol City Profile Report, Sonoma County Economic Development Board 2019

2.4.3 Housing

Housing tenure for City of Sebastopol was obtained through the U.S. Census Bureau ACS and shows the majority of residents live in a home they own. Table 2-4 breaks down the differences in housing tenure.

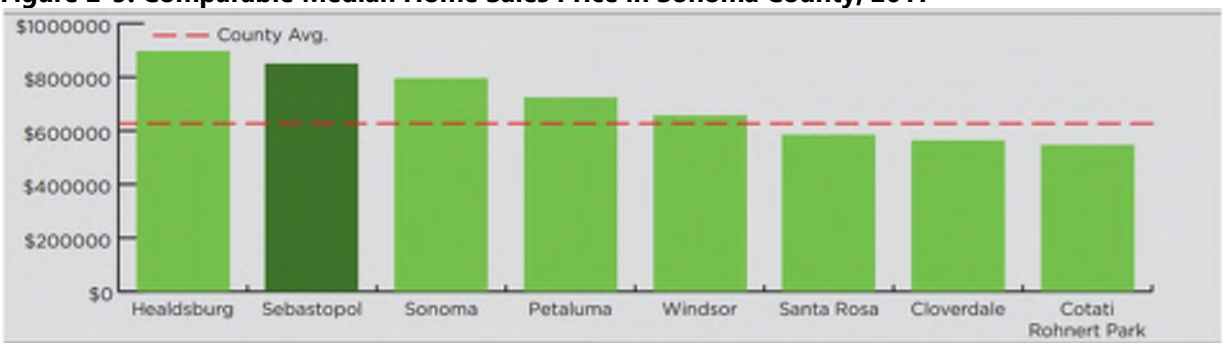
Table 2-4: City of Sebastopol Housing Tenure, 2015

Characteristic	Estimates
Total Households	3,482
Owner Occupied	1,762 (51%)
Renter Occupied	1,720 (49%)

Source: U.S. Census Bureau American Community Survey, 2014-2018, www.census.gov/; City of Sebastopol General Plan Housing Element 2015

Median home prices in the City of Sebastopol as of 2019 was $849,750, which is the second highest among Sonoma County's nine cities. In the past five years, Sebastopol's median home sales prices have risen by 9 percent annually, which is the slowest in the County (Sonoma County 2019). Figure 2-5 compares Sebastopol's median home sale prices to the other incorporated communities in Sonoma County.

Figure 2-5: Comparable Median Home Sales Price in Sonoma County, 2017



Source: 2019 Sebastopol City Profile Report, Sonoma County Economic Development Board 2019

The City of Sebastopol has made a strong commitment to affordable housing and a diversity of housing types over the last decade. This commitment is demonstrated by its support for a number of affordable housing developments, such as the Hollyhock, Sequoia Village, and Petaluma Avenue Homes projects. According to the City's Housing Element, there was 402 affordable housing units in 2014 out of the 537 subsidized and restricted affordable housing units developed in the City. The City has also maintained an inclusionary housing ordinance, requiring projects to provide deed-restricted affordable units.

2.4.4 Race and Ethnicity

Table 2-5 shows the comparative demographic estimates between 2014 and 2018. The racial and ethnicity makeup of the City is somewhat similar to the County. Sebastopol is less diverse in terms of race and ethnicity compared to the County and state and has a smaller Hispanic population.

Table 2-5: City of Sebastopol Race and Ethnicity, 2014-2018

Race/Ethnicity	2008-2012		
	Sebastopol	County	California
White	77.3%	66.5%	37.5%
Black	2.0%	1.4%	5.5%
American Indian and Alaska Native	0.2%	0.4%	0.4%
Asian	2.7%	3.9%	14.1%
Native Hawaiian and Other Pacific	1.1%	0.3%	0.4%
Other	0%	0.5%	0.2%
Hispanic	9.3%	26.5%	38.9%
Two races, excluding other race	7.6%	0.5%	2.8%

Source: U.S. Census Bureau American Community Survey, Comparative Demographic Estimates, 2008-2012 and 2014-2018 estimates,www.census.gov/

2.4.5 Income and Poverty

Individual households are commonly expected to use private resources and funds to prepare for, respond to and recover from disasters. This means that households living in poverty are disadvantaged when confronting natural and human-caused hazards. Households living in poverty may also occupy poorly built or inadequately maintained housing. These housing types may be more susceptible to damage in earthquakes or flood events than other types of housing. In semi-urban areas, such as the City of Sebastopol, households living in poverty may also live in older houses and multi-family housing that is constructed of un-reinforced masonry, a building type that is susceptible to damage during earthquakes. Further, residents living below the poverty level are less likely to have insurance to compensate for the losses incurred from natural disasters.

Persons under 18 years old in Sebastopol can also be disproportionately affected by poverty. According to the 2014-2018 ACS data, 9.6 percent of the City's total residents under the age of 18 were living in

poverty and 11.6 percent of the City's total residents under the age of 18 were living in poverty based on the 2018 ACS data (see Table 2-5 below), compared to the 8 percent of all families in the City, respectively. As shown in Table 2-6, the percentage of residents in poverty in Sebastopol has decreased between 2014 and 2018. The income brackets of $50,000 to $75,000 is estimated to shrink by 2.2 percent while the income bracket of $200,000 and more is estimated to grow by 2.1 percent by 2022 (Sonoma County 2018).

Table 2-6: City of Sebastopol's Comparative Economic Characteristics: 2014 and 2018

	City of Sebastopol	
Characteristic	**2014**	**2018**
Families below Poverty Level	9.6%	8.0%
All People below Poverty Level (under 18 years)	10.8%	11.6%
All People below Poverty Level (18 years and over)	13.1%	9.7%
Median Household Income	$67,782	$77,204
Per Capita Income	$35,094	$40,125
Population in Labor Force	66.7%	65.7%
Population Employed*	61.1%	60.0%
Unemployment	5.6%	5.7%**

Source: U.S. Census Bureau American Community Survey, 2014-2018, obtained by California Office of Finance. 2018 ACS data added in July 2020.
*Excludes active duty armed forces

**Unemployment rate is based on 2018: ACS 5-Year Estimate data.

The City of Sebastopol also had the fifth-highest median household income in the County's nine incorporated cities as the average household income in 2014 was $67,782 and in 2018 increased to $77,204 according to the U.S. Census Bureau ACS data. During 2018, the median household income in Sonoma County was at $76,753 while household incomes in nearby counties ranged higher from $84,753 to $110,217 (Napa and Marin counties). The median household income for the State in 2018 was $71,228 and the 10.4 percent of families were living below the poverty line (U.S. Census Bureau ACS 2018). Based on this comparison, while the City of Sebastopol has a slightly higher median household income than the County and State, there are small segments of the City's population that are low income and disadvantaged, and in turn socially vulnerable and expected to be more susceptible to natural disasters and less likely to recover at the same pace as the rest of the community. The City of Sebastopol recently approved the Elderberry Commons projects, a remodeled 31-room hotel to provide permanent and supportive housing for vulnerable housing individuals, and a workforce and affordable housing project is proposed along Bodega Avenue (City of Sebastopol 2021).

Additional demographic data and information on income, social vulnerability, and disadvantaged communities in the Sebastopol Planning Area are summarized below in Section 2.5 Social Vulnerability. Information on population growth is summarized in Section 2.8 Growth and Development Trends.

2.5 Social Vulnerability

Social vulnerability considerations were included in the development of this plan to identify populations across the City's Planning Area that might be more vulnerable to hazard impacts based on a number of factors. Hazard events can have very different impacts for different segments of a community, even if the hazard effects the entire City. The combination of socioeconomic status, household composition, physical disabilities, age, race and ethnicity, education level, primary language, housing, and transportation barriers can alter the way communities prepare for and respond to hazard events. For example, as stated in the previous section, families with lower household incomes may not be able to renovate their home to be more resilient to flooding and earthquakes, and as a result these households may be disproportionately

affected by a flood or earthquake event. The elderly population may have limited mobility due to age and physical disabilities, which could lead to less accessibility during hazard events. It may also be more time-intensive for this population to receive hazard information and respond in the event of a hazard. Similarly, for those segments of the population where English is not their native language, it may take these individuals and families more time to prepare and respond during a hazard event.

The social vulnerability considerations in this plan cover household income, ethnicity, English proficiency, senior population, disabled population, single-parent households metrics. The considerations in this plan are broad in scope and are based on best available data and mapping information from the following source:

- Center for Disease Control's (CDC) Agency for Toxic Substances and Disease Registry (ATSDR) Social Vulnerability Index (SVI).

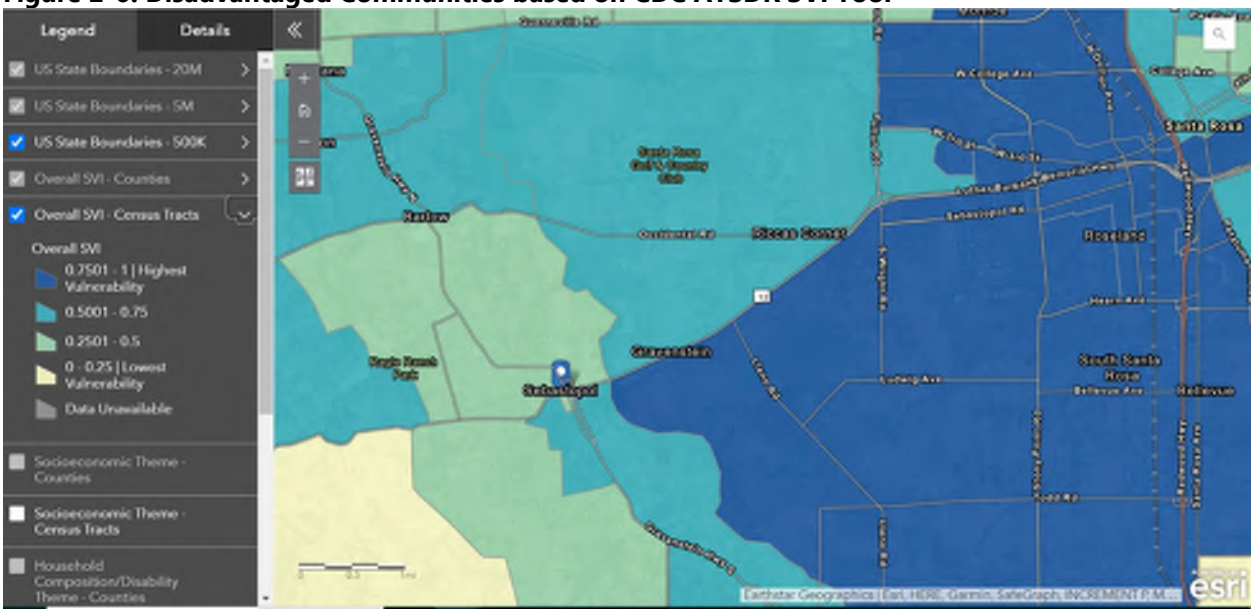
CDC Agency for Toxic Substances and Disease Registry Social Vulnerability Index

A social vulnerability index (SVI) was developed by the Center for Disease Control's (CDC) Agency for Toxic Substances and Disease Registry (ATSDR) and their Geospatial Research, Analysis & Services Program, as a way to portray communities' capacities to prepare for and respond to natural and man-made disasters. The SVI provides information on vulnerable populations to assist emergency response planners and public health officials in the identification of communities more likely to require additional support before, during, and after a hazardous event. The CDC's SVI includes county- and state-level maps that show relative vulnerability, provide key socially and spatially relevant information on communities' populations, and the maps compare the SVI based on Census Tracts. This SVI index combines four main themes of vulnerability: socioeconomic status; household composition and disability; minority status and language; and housing and transportation. The information from the SVI data informs the vulnerability of people, as qualitatively discussed in the vulnerability assessment for each hazard in Chapter 4.

An overview of social vulnerability for the City's Planning Area is shown in Figure 2-6 based on CDC SVI data aggregated to Census Tracts. The SVI map depicts that within the City there is one census tract in the eastern portion with population with a higher vulnerability to disasters (in navy blue) and a portion of two other census tracts to the northwest and south with population with high vulnerability. The census tracts shaded in green and yellow have moderate to low vulnerability to disasters. The overall social vulnerability in the surrounding unincorporated portion of Sonoma County based on the SVI data is shown in Figure 2-7. Additional maps using the four main vulnerability themes of the SVI, including socioeconomic vulnerability, household composition and disability, minority status, language vulnerability, and housing and transportation are provided on the CDC's SVI online materials and maps at https://svi.cdc.gov/.

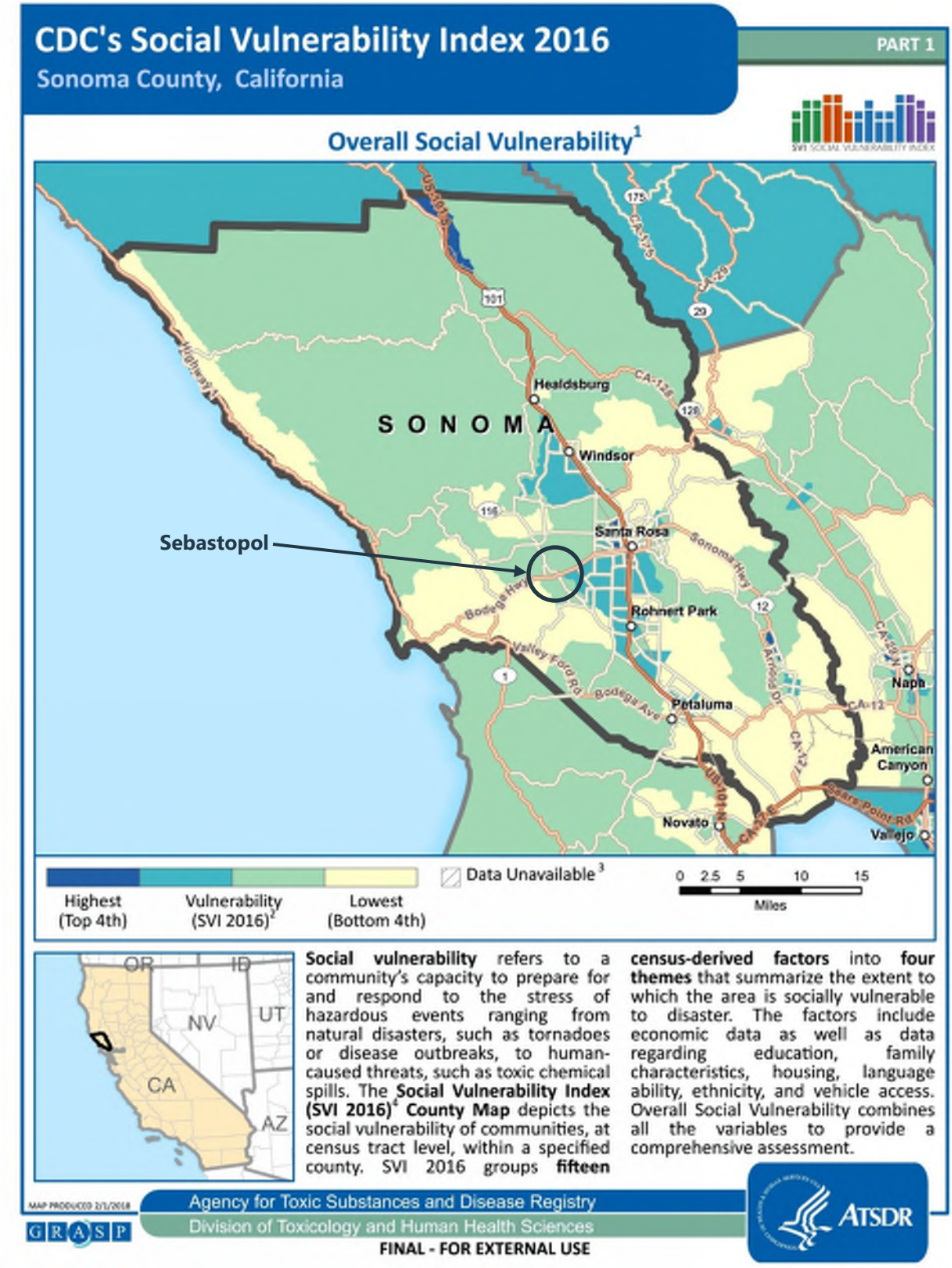
Additional data and mapping sources on defining and identifying vulnerable communities in the context of climate change and other natural hazards will soon be available in California but was not yet developed to be incorporated into this plan. Therefore, the CDC's SVI data was used to quantitatively summarize potential socially vulnerable communities in the City.

Figure 2-6: Disadvantaged Communities based on CDC ATSDR SVI Tool



Source: CDC ATSDR 2016

Figure 2-7: Overall Social Vulnerability in the City of Sebastopol Planning Area based on SVI Data



2.5.1 Environmental Justice

Certain low-income residents, communities of color, and immigrant communities in California have disproportionately experienced greater environmental burdens and related health problems than other communities. The inequity is a result of many factors, including, but not limited to inappropriate zoning, discriminatory housing, limited political and economic power among certain demographics, and development patterns that tend to concentrate pollution in in certain communities (CEJA 2018). When combined with a lack of economic resources and unjust policy making, these residents and communities, also known as disadvantaged communities (DACs) or environmental justice (EJ) groups can face significant barriers to their overall health, livelihood, and resiliency to hazard events. With the support of community-based organizations (CBOs), planners, local governments, and public health advocacy groups, recent legislation in California was developed to create healthier cities and counties and prioritize the needs of DACs.

SB 1000 Requirements §65302(h)(1)
The environmental justice element, or related environmental justice goals, policies, and objectives integrated in other elements, shall do all of the following: *(A) Identify objectives and policies to reduce the unique or compounded health risks in disadvantaged communities by means that include, but are not limited to, the reduction of pollution exposure, including the improvement of air quality, and the promotion of public facilities, food access, safe and sanitary homes, and physical activity.* *(B) Identify objectives and policies to promote civil engagement in the public decision making process.* *(C) Identify objectives and policies that prioritize improvements and programs that address the needs of disadvantaged communities.*

In 2016 California passed Senate Bill 1000 (SB 1000), the Planning for Healthy Communities Act, which mandates that cities and counties to adopt EJ elements or integrate EJ goals and policies into the elements of their General Plans when they are updating two or more elements of their General Plan concurrently on or after January 1, 2018. Environmental justice is defined by state law as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies" (Gov. Code § 65040.12(e)). According to the California Environmental Protection Agency (Cal EPA), SB 1000, and pursuant to Section 39711 of the California Health and Safety Code a DAC is a low-income area that is disproportionately affected by environmental pollution and other hazards that can lead to negative health effects, exposure, or environmental degradation.

Cities and counties are individually responsible for identifying EJ communities within their jurisdictions and incorporating the SB 1000 requirements into their planning processes. The City of Sebastopol incorporated these requirements into the LHMP, as this plan will be incorporated into their General Plan in accordance with Government Code Section 65302.10 (Assembly Bill [AB] 2140). The City can meet these requirements by identifying DACs and socially vulnerable communities, promoting engagement in the public decision-making process and in socially vulnerable communities through the implementation of an outreach strategy, addressing EJ considerations to a degree in the vulnerability assessment, and by considering prioritization criteria, such as social equity during the development of mitigation actions. For example, the HMPC addressed vulnerable and sensitive populations in the City and emphasized outreach and coordination with the senior population in Sebastopol by engaging a local senior center during the planning process. The HMPC distributed the Administrative Draft LHMP to the City's Climate Action Committee (CAC) and the CAC Equity Working Group. The City also distributed the plan survey to a large network of community members through the Map Your Neighborhood program. The following sections

summarize additional information on DACs within the City of Sebastopol Planning Area based on various state and local sources.

2.5.2 Disadvantaged Communities

DACs refer to areas in California that suffer the most from a combination of economic, health, and environmental burdens. These burdens include poverty, high unemployment, air and water pollution, the presence of hazardous wastes and the high incidence of asthma and other health diseases. DACs have been identified across the state, region, and Sonoma County using various criteria. The social equity considerations in this plan regarding DACs cover household income, ethnicity, English proficiency, senior population, disabled population, and single-parent households metrics. The considerations in this plan are broad in scope and are based on best available data and mapping information from the following state and local sources:

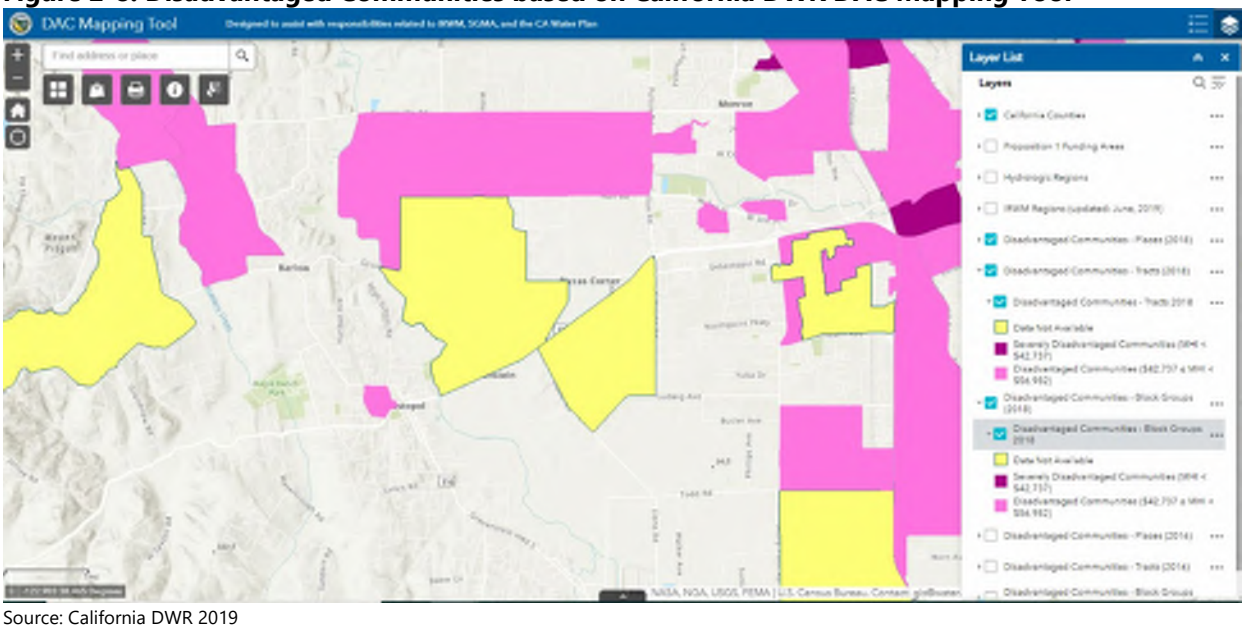
- California Department of Water Resources (DWR) Disadvantaged Communities (DAC) Mapping Tool,
- California Office of Environmental Health Hazard Assessment's (OEHHA) CalEnviroScreen Tool, and
- Sonoma County's Disadvantaged Communities Online Mapping Tool.

The metrics and methodology applied by each federal, state, and local source is summarized below, followed by a "snapshot" of the social vulnerability metrics and information available for the population in the City according to each tool.

California DWR Disadvantaged Community (DAC) Mapping Tool

California DWR defines DACs as a community with an annual median household income (MHI) that is less than 80 percent of the statewide annual MHI (Public Resources Code 7500(g)). Census geographies within an annual MHI less than 60 percent of the statewide annual MHI are considered "severely disadvantaged communities." Figure 2-8 shows there is one DAC within the City's Planning Area. As shown in Figure 2-8 there is one block group on the northwest end of Sebastopol identified as a DAC. The block group identified in in the northwest end of Sebastopol identified as a DAC has approximately 977 residents within 416 households; the median household income is $53,750.

Figure 2-8: Disadvantaged Communities based on California DWR DAC Mapping Tool



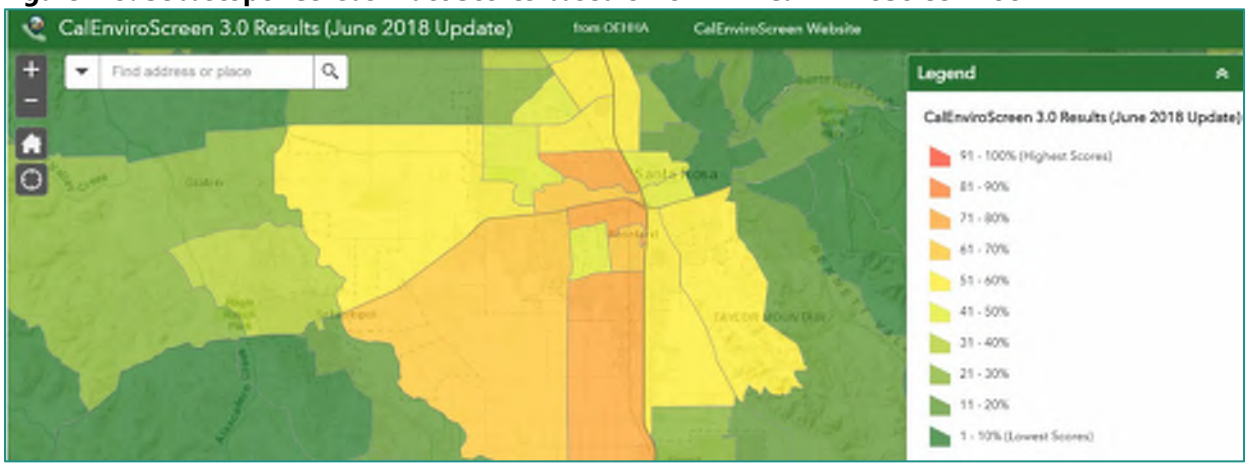
Source: California DWR 2019

California OEHHA CalEnviroScreen Tool

California's Office of Environmental Health Hazard Assessment (OEHHA) uses the CalEnviroScreen Tool to identify California communities by census tract that are disproportionately burdened by, and vulnerable to, multiple sources of pollution. CalEnviroScreen is a science-based mapping tool that uses environmental conditions such as proximity to solid waste sites, clean-up sites, etc.; personal health (sensitive populations with asthma, cardiovascular disease, etc.), and socioeconomic (poverty, unemployment, educational attainment, etc.) information to produce a numerical score for each census tract in the state. A census tract with a high score (orange to red) is a community that experiences higher pollution burden and vulnerability than census tracts with low score (yellow to green).

California's Global Warming Solutions Act of 2006 (Assembly Bill 32) implemented a cap-and-trade program as one of several strategies in California to reduce greenhouse gas (GHG) emissions that cause climate change. In 2012 the Legislature passed Senate Bill 535 that directed 25 percent of the proceeds from the Greenhouse Gas Reduction Fund (GHGRF) go to projects that provide benefit to DACs. As a result, the legislation gave California's EPA responsibility for identifying those communities. California EPA identified the 25 percent highest scoring CalEnviroScreen census tracts as DACs. The designation then led to AB 1550 that requires 25 percent of the proceeds from the GHGRF be spent on project located in DACs. As shown in Figure 2-9 there are no environmentally burdened or vulnerable communities with high scores in the City of Sebastopol with the exception of one community to the southeast of the City with a moderate score where 61 to 70 percent of the census tract has the potential to be burdened by pollution.

Figure 2-9: Sebastopol Census Tract Scores based on OEHHA CalEnviroScreen Tool



Source: California Office of Environmental Health Hazard Assessment 2018

Sonoma County's DAC Online Mapping Tool

The Sonoma County Transportation Authority (SCTA) functions as the countywide planning and fund programming agency for transportation projects. The SCTA was created in 1990 as a result of federal and state legislation to address regional planning, specifically the implementation of transportation improvement projects. The SCTA Board of Directors also coordinates countywide climate protection activities through its other role as the Sonoma County Regional Climate Protection Authority (RCPA).

SCTA defines DACs using different identification criteria than the tools developed by other state agencies. The following DAC designations are defined in the SCTA Disadvantaged Communities mapping tool, including whether the DAC designations occur within the City of Sebastopol:

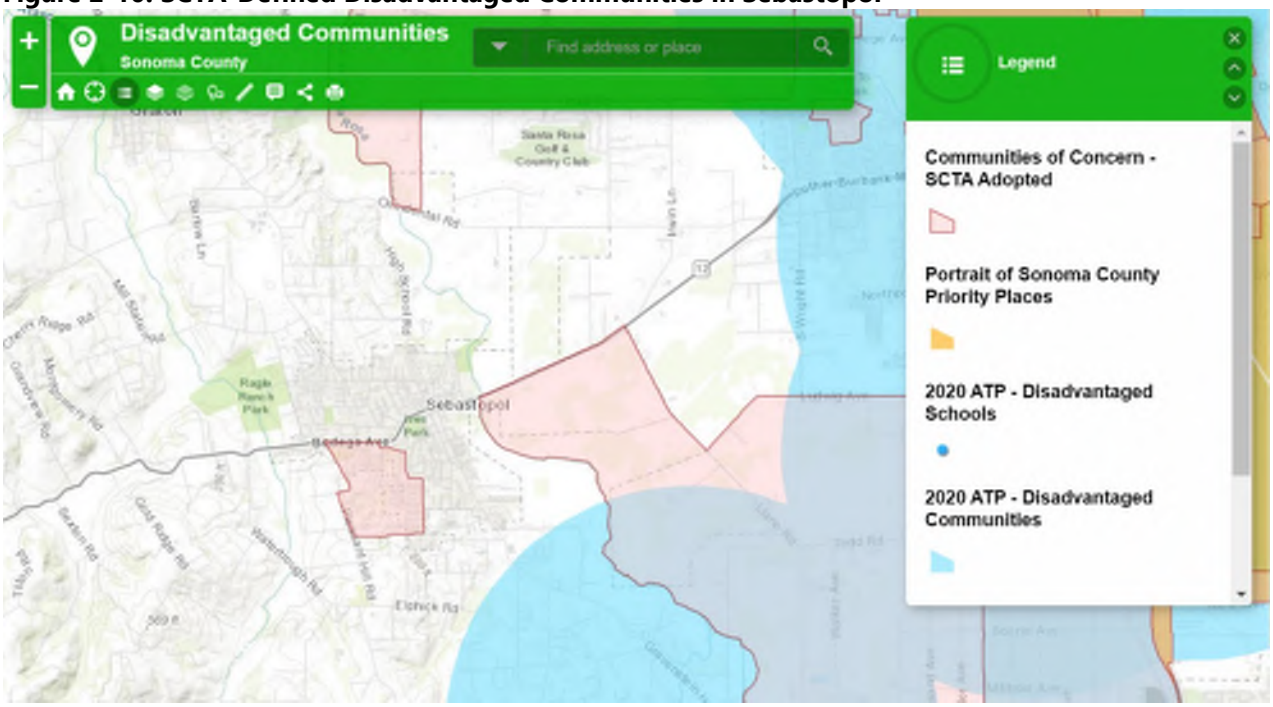
- **MTC Adopted Communities of Concern (COC):** MTC identified regional COCs use demographic variables including ethnicity, income, English proficiency, senior population, disabled population, single-parent households, zero-vehicle households, and overburdened renters using Census Tract

data from the 2005-2009 and 2010-2014 ACS 5-Year Average. These COCs were adopted as part of Plan Bay Area and are currently being revised as part of the Plan Bay Area update that is underway. There are no MTC Adopted COCs within the City of Sebastopol Planning Area.

- **SCTA Defined COCs:** SCTA Defined COCs use poverty level data (i.e., 30 percent of the census block group households earning 200 percent or less of the federal poverty level) and a more detailed level of census geography. Using census block groups allows better accuracy when identifying pockets of poverty in Sonoma County, especially in areas that are located in large census tracts, or that are adjacent to affluent areas. There is one census block group within the City of Sebastopol Planning Area. The census block identified as SCTA-defined COC is comprised of approximately 1,144 residents (14.7 percent of population) within 598 households.
- **2019 Caltrans Active Transportation Program (ATP) DACs:** The Caltrans ATP defines DACs using income, tribal lands, and proximity to disadvantaged schools. Disadvantaged schools are those where 75 percent of the students are eligible to receive free or reduced meals. The City's Planning Area is not identified as an ATP DAC.
- **Portrait of Sonoma County Priority Places.** Portrait of Sonoma County considers life expectancy, education, and income of county residents and combines the variables into a single Human Development Index (HDI), which can be used to identify disadvantaged communities and disparities among Sonoma County neighborhoods. The 20 census tracts in the County with the lowest HDI are identified as DACs and included in the mapping tool. There were no census tracts that met these criteria in the City of Sebastopol Planning Area.

Figure 2-10 shows the SCTA-defined COCs and 2019 Caltrans ATP DACs in and near the Planning Area.

Figure 2-10: SCTA-Defined Disadvantaged Communities in Sebastopol



Source: SCTA 2019

2.6 Economy and Employment

The most comprehensive economic data available for the City of Sebastopol comes from the U.S. Census Bureau ACS data and the California DOF. Select estimates of economic characteristics for the City of Sebastopol are summarized below.

As of 2019, Sebastopol had the highest unemployment rates of the cities in Sonoma County (Sonoma County 2019). The ACS 5-year estimates show a 4.1 percent unemployment rate, higher than the County (2.7 percent), and statewide rates (3.7 percent). Sebastopol's 52 percent labor force participation rate is lower than the County, but higher than the statewide rates. The labor force participation rate is calculated by dividing the number of people working or looking for work, by the total population. Stay-at-home parents, students not looking for work, retirees, and discouraged workers, are not included in the labor force. As a result, and as previously noted, low unemployment rate paired with a relatively lower labor force participation rate indicates an aging population (Sonoma County, 2019). Section 2.4 summarized the City's general economic characteristics. Unemployment rates have slightly decreased in the past three years based on the most recent ACS data and California DOF data.

Table 2-7 shows the breakdown of employment by industry in the City of Sebastopol from 2014-2018, as well as the number of people employed by each industry, and Table 2-8 lists the City's major employers and approximate number of employees.

Table 2-7: City of Sebastopol's Employment by Industry, 2014-2018

Industry	# Employed	% Employed
Agriculture, Forestry, Fishing, Mining	55	1.4
Construction	423	11.0
Manufacturing	178	4.6
Wholesale trade	218	5.6
Retail trade	363	9.4
Transportation and warehousing, utilities	128	3.3
Information	81	2.1
Finance, Insurance, Real Estate and rental and leasing	260	6.7
Professional, scientific, and management, and administrative and waste management services	542	14.0
Educational services and Health care and social assistance	1,047	27.1
Arts, entertainment, and recreation, and associated accommodation and food services	332	8.6
Other services	112	2.9
Public Administration	124	3.2
Totals	3,863	100

Source: U.S. Census Bureau American Community Survey, 2014-2018, Economic Characteristics, www.census.gov/
*Civilian population 16 or older

Table 2-8: City of Sebastopol's Major Employers

Employer
O'Reilly and Associates
Safeway
Analy Union High School
Sebastopol Union School
Palm Drive Hospital

Source: City of Sebastopol Demographics; City Snapshot https://ci.sebastopol.ca.us/Our-Community/Current-Snapshot

2.7 Commuter Population

Based on ACS five-year estimates data for 2014-2018, nearly 68.1 percent of Sebastopol's workforce travelled alone by car for employment. Approximately 7.8 percent during this same time period worked from home, but this percentage has likely increased in 2020 due to the stay-at-home orders in California and Sonoma County due to the COVID-19 pandemic (U.S. Census 2020). Also, in 2018, the Sebastopol area accommodated 11,168 jobs and 13,975 resident workers suggesting that 2,806 workers commuted out of Sebastopol for their work (Sonoma County EDB 2019). These commuter patterns likely change due to the ongoing COVID-19 pandemic and stay-at-home restrictions put into effect during 2020. Commuting patterns can increase congestion on SRs 116 and 12 and local county and city roads. Commute congestion can also affect the City's transportation infrastructure, as well as how the City responds to hazard events and evacuation procedures that may limit the commuting population's ability to travel to work and safely return to Sebastopol after an event.

2.8 Growth and Development Trends

Most of the development in the City of Sebastopol occurred prior to 1976. Residential development during this period was spread throughout the City whereas non-residential growth was concentrated along SR 116 and development north of Sebastopol Avenue along Morris Street. From 1990 to 1999, residential growth occurred in small subdivisions and various scattered sites (City of Sebastopol 2014). Non-residential growth continued to occur along the City's major arterials and also included small commercial centers in the City's neighborhoods. From 2000 to today, the pace of development slowed in the City. Residential development continued to occur on scattered sites throughout the City. Non-residential and commercial development consisted of several scattered sites but was primarily focused in the "Barlow" area, west of Morris Street and north of Sebastopol Avenue (City of Sebastopol 2014).

The City has limited developable areas and a history of a few annexations since the General Plan was adopted in 2015. The City of Sebastopol General Plan lists the following milestones in the City's growth management history designed to preserve the small-town character of the town:

- **1994 General Plan** - The 1994 General Plan recognized the importance of careful development patterns and environmental protection. It provided a framework for development within the City that intended to retain Sebastopol's small-town feeling and rural character and provide a safe and friendly environment. The main themes of the plan were focused on maintaining the character of existing residential neighborhoods; emphasizing infill development versus annexations; ensuring future growth matches available infrastructure; focusing development downtown; and implementing environmental protections through strong regulations to protect sensitive areas, such as the Laguna de Santa Rosa, Atascadero Creek, and the adjacent ecosystems. It also focused on providing housing opportunities and parks, employing an UGB for the 20-year time period of the plan, and reducing the SOI to ensure it is coterminous with the UBG and to prevent sprawl.
- **Urban Growth Boundary (UGB)** – The City's 1994 General Plan established an UGB. The UGB is a line beyond which development will not be allowed, except for public parks and public schools.
- **Growth Management Program** – The City's Growth Management Program was established by the 1994 General Plan and is implemented through Zoning Code Section 17.350 Growth Management. It allows for 575 dwelling units or the remaining wastewater treatment capacity, whichever is less. It stipulates that dwelling units may not exceed 25 dwelling units per year, averaged over a two-year prior (e.g. up to 50 dwelling units may be allocated in any given two-year period). The Growth Management Program exempts affordable housing units, second dwelling units, replacement residential structures, single-family homes on an existing lot of record as of November 1994,

homeless shelters, single-family occupancies, and community or health care facilities from the annual allocation.

- **Measure O** – Measure O was approved by Sebastopol voters in 1996. It amended the General Plan to reaffirm the City's UGB, amend specific land use policies (Policies P.8 and P.9) and keep the UGB in effect until December 2016.
- **2015 General Plan** – The latest General Plan carries forward the major goal and policy framework of the 1994 General Plan but has been substantially updated to address local current conditions, community priorities and goals, and has been reorganized to make the document more user-friendly and straightforward. The 2015 General Plan process identified the following distinct guiding principles: protect Sebastopol's small-town charm and unique character, sustain and encourage a vibrant downtown core and strong community identify, improve traffic conditions downtown, emphasize sustainability and environmental stewardship, and provide opportunities for extensive community input and participation.
- **Ordinance 1090 –** City Council adopted Ordinance 1090 in 2016, which re-established the UGB with minor modifications through 2030 (another 25 years). Ordinance 1090 defines the UGB and established standards for administration of the boundary.

The City continues to regulate and manage development through its two growth management programs the Growth Management Program and the UGB. Development on the western side of the City is constrained by the hilly topography and the UGB, while the east side is constrained by the UGB and the Laguna de Santa Rosa. As of February 2021, the City has 11 major development projects going through the planning process with the Planning Department or recently approved and under construction. A majority of the projects (6) are residential developments (i.e., residential townhomes, studios, condominium subdivisions, homeless housing), followed by commercial and mixed-use projects (5) (i.e., hotels, mixed-use commercial, car wash, bank). The major development projects are located throughout the City with a majority being concentrated near downtown Sebastopol along Sebastopol Avenue.

Table 2-9 shows the City's maximum projected development and land use acreages at complete General Plan buildout. This projection assumes every single parcel in the City will be developed at or near the higher end densities and intensities allowed under the current General Plan, while also considering growth restrictions.

Table 2-9: City of Sebastopol Land Use Acreages at Plan Buildout

Land use	Single-Family Units	Multi-Family Units	Commercial (square feet)	Office (square feet)	Industrial	Hotel (rooms)
Core Downtown	(1)	112	203,051	62,557	0	65
Community Facilities	0	0	0	0	0	0
Commercial Office	(3)	36	132,608	50,380	0	18
High Density Residential	131	247	0	0	0	0
Low Density Residential	29	0	0	0	0	0
Light Industrial	0	5	5,500	0	(7,665)	90
Medium Density Residential	167	0	0	0	-	0
Office/Light Industrial	0	22	0	28,982	67,624	0
Open Space	0	0	0	0	0	0
Very Low Density Residential	5	0	0	(4,544)	0	0

Land use	Single-Family Units	Multi-Family Units	Commercial (square feet)	Office (square feet)	Industrial	Hotel (rooms)
Total General Plan	**328**	**422**	**341,159**	**137,375**	**59,959**	**173**

Source: City of Sebastopol General Plan EIR 2016

Additional information on development trends in the City's Planning Area can be found in the Future Development section of each hazard profile in Chapter 4.

2.9 Mitigation Capability Assessment

During the development of this plan the City's HMPC completed a mitigation capability assessment to understand what loss prevention mechanisms are already in place. When combined with the risk assessment the mitigation capability assessment this results in the City's "net vulnerability" to disasters, and more accurately focuses the goals and proposed actions of this plan. For this planning effort, a representative from most departments where the City had in-house staff available, participated on the HMPC. The HMPC also consists of representatives from neighboring jurisdictions, fire districts, and CBOs.

The HMPC used a two-step approach to conduct the capability assessment for the City. First, an inventory of common mitigation activities was made through the use of a matrix. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken if deemed appropriate. Second, the HMPC conducted an inventory and review of existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses or if they inadvertently contributed to increasing such losses.

Similar to the HMPC's effort to describe hazards, risks, and vulnerability of the City of Sebastopol, this mitigation capability assessment describes the City's existing capabilities, programs, and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. It also identifies select state and federal departments/agencies that can supplement the City's mitigation capabilities. This assessment is divided into four sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation outreach and partnerships.

2.9.1 City of Sebastopol's Regulatory Mitigation Capabilities

Table 2-10 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Sebastopol. Excerpts from applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities.

Table 2-10: City of Sebastopol's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General Plan	Yes	The Sebastopol General Plan (2015) was last updated and amended in 2016. The Housing Element was last updated and amended in 2015. Both planning documents are the City's most comprehensive land use and development tools. Together, they establish the vision for the buildout of the City of Sebastopol through 2035. They include a set of broad-based goals, policies, and actions to guide development in the City. Upon adoption of the LHMP, the City should update the General Plan Safety Element (Chapter 8) and amend the General Plan to include the LHMP.

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Zoning Ordinance	Yes	The City's Zoning Ordinance is the part of Chapter 17 of the Municipal Code that contains regulations that pertain to land use in the City. The Zoning Ordinance includes requirements regarding zoning districts, use, density, intensity, setbacks, signs, accessory uses, and other land use matters. It also establishes the process by which development applications are processed at the City.
Subdivision Ordinance	Yes	Chapter 16 of Sebastopol's Municipal Code contains the City's subdivision provisions and tentative procedural requirements, and tentative subdivision maps.
Growth Management Ordinance	Yes	The City's Growth Management Program was established by the 1994 General Plan. The program is summarized in Chapter 15.500 and implemented through Zoning Code Section 17.350 Growth Management. It allows for 575 dwelling units or the remaining wastewater treatment capacity, whichever is less and stipulates that dwelling units may not exceed 25 dwelling units per year, averaged over the two prior years. The Growth Management Program exempts affordable housing units, second dwelling units, replacement residential structures, single-family homes on an existing lot of record as of November 1994, homeless shelters, single-family occupancies, and community or health care facilities from the annual allocation. The City's 1994 General Plan established the UGB – the line beyond which development will not be allowed, except for public parks and public schools. The UGB was renewed for another 25 years with the adoption of the 2015 General Plan.
Floodplain Ordinance	Yes	Articles I through V, the Flood Damage Prevention and Provisions for Flood Hazard Reduction in Chapter 15.16 of the City's Zoning Code contain standards of construction for all areas of special flood hazards, such as elevating structures two feet above the base flood elevation (BFE), which goes beyond the minimum National Flood Insurance Program (NFIP) standards. Construction standards include anchoring, construction materials and methods, elevation and floodproofing requirements (e.g., two feet above the BFE in zones AE, AH, and A1-30, etc.), and flood opening standards. Chapter 15 of the Sebastopol Municipal Code establishes the special flood hazard areas in the City based on the March 7, 2017 Flood Insurance Study (FIS) for the City of Sebastopol and accompanying Flood Insurance Rate Maps (FIRMs) and flood boundary and floodway maps (FBFMs). It limits development of projects in the flood hazard zone unless the project demonstrates flood management facilities will protect the project to the level of flood

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
		protection, implements conditions on the permit or project entitlement that protect the project to standard flood protection standards.
Other special purpose ordinance (e.g., stormwater, steep slope, wildfire)	Yes	Chapter 16.40, Design and Improvement Standards of the Municipal Code contains a range of requirements that pertain to lot design, circulation, drainage, and grading that also include specific standards for fire protection, scenic areas, resources areas, and soil investigation. For example, Chapter 16.40.110 requires adequate mitigation for the protection and preservation of scenic resources, such as ridges, hilltops, and other natural landforms. Chapter 16.40.120 requires protections for natural resources, such as riparian areas, wildlife areas, cultural resources sites, and wetland and water bodies through project design, setbacks, resource management plans, and mitigation.
Building Code	Yes	The City adopted the 2019 California Building Code (CBC) and the International Building Code (2019 Edition). Adoption and reference to the 2019 CBC (2019 Edition) is outlined in Chapter 15.04.040. Chapter 15.04.170 adopts the current edition of the National Fire Code, as published by the National Fire Protection Association (NFPA) (Ordinance 1128 Section 16, 2019; Ordinance 1093 Section 17, 2016)
Fire department Insurance Services Office (ISO) rating	Yes	Insurance Services Office (ISO) rating of 3
Erosion or Sediment Control Program	Yes	Chapter 15.08, Excavation, Grading, and Earthwork Construction covers erosion and sediment controls and specific amendments to the City's adoption of the 2019 CBC that includes requiring erosion control and sediment control plans for work that occurs between October 1st and April 15th, grading along Calder Creek or Zimpher Creek, grading on hillsides with a slope of 10 percent or greater.
Storm Water Management Program	Yes	They City complies with requirements under the Municipal Separate Storm Sewer System (MS4) Order No. R1-2015-0030, which was updated in 2015 as part of the second Phase II Small MS4 General Permit (adopted 2015). The City is a Co-Permittee of this permit (North Coast RWQCB 2015). They City is implementing a Storm Water Management Plan that contains processes that will be used to meet mandatory requirements under the 2015 order.
Site Plan Review Requirements	Yes	Discretionary projects involve site plan review as part of the planning and approval process conducted by the City's Planning Division. The Development Engineering Division of the Public Works Department provides review and permit processing. This division reviews subdivision maps, construction plans, public improvements, and grading plans for all residential, commercial, and industrial projects.

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Capital Improvements Plan	Yes	The Public Works Department and Engineering Division are responsible for the implementation of the City's Capital Improvement Program (CIP) each year with its annual budget. The CIP is a long-range plan that identifies capital projects, provides a planning schedule and identifies options for financing. The plan is linked between project priorities established by City Council and the City's annual budget. The current CIP covers 2021 through 2026. The Public Works Department and Engineering Division follows design standards, and standard plans made numerous accomplishments on the 2015-2020 CIP related to their pavement program; bicycle, pedestrian, and transportation projects; water and sewer projects; water production and distribution system; sewer collection and pumping system; storm drains; parks; government buildings; and energy efficiency (City of Sebastopol 2015). Several of the recently updated 2021-2026 projects may be integrated into the LHMP.
Economic Development Plan	Yes	The Economic Development Division contains business development and incentive and program resources for commercial, retail, and property owners. Oversight of the Community Block Grant (CDBG) and Housing Program are functions of the City Manager's Office.
Local Emergency Operations Plan	Yes	The City of Sebastopol is currently updating their Emergency Operations Plan (EOP), including an evacuation route planning effort.
Other special plans	Yes	The City of Sebastopol has administered an Emergency Preparedness and Disaster Planning division through the Fire Department.
Flood Insurance Study or other engineering study for streams	Yes	The City joined the NFIP on June 18, 1980. The City began implementing their NFIP floodplain regulations in 1980. The most recent FIS for the City was completed on March 7, 2017.
Elevation certificates	No	The City requires building elevation certificate but does not currently electronically track elevation certificates.
Other	No	

Source: HMPC Data Collection Guide

As indicated in the table above, the City of Sebastopol has several plans and programs that guide the City's development in hazard-prone areas. Starting with the Sebastopol General Plan, which is the most comprehensive of the City's plans when it comes to mitigation, these relevant plans and programs are described in more detail below.

Sebastopol General Plan (2016)

The Sebastopol General Plan provides a comprehensive and long-term blueprint for the future by establishing a framework for how Sebastopol should grow and change over the next two decades (Year 2035). The General Plan contains goals, policies, and actions that empower the City and community to achieve their future vision. The General Plan is the City's principal policy and planning document to guide future conservation, enhancement, and development in the City. It addresses all aspects of development organized in nine elements, including six required by State Planning law and three elements prepared to meet local needs and concerns. The seven mandatory elements include the Land Use Element, Housing Element, Circulation Element, Conservation Element, Open Space Element, Safety Element, and Noise Element. The three remaining elements include the Community Services and Facilities Element, Community Design Element, and Community Health and Wellness Element.

The Safety Element contains goals, policies, and action programs related to hazards and hazard mitigation, as detailed below:

- Safety Element

The Safety Element includes goal and policy statements relating to different aspects of the issues addressed in the element, including seismic and geologic hazards, flooding hazards and flood protection, emergency response and disaster preparedness, and hazardous materials. The summary below tracks the organization of the Safety Element and other relevant elements, with topically-focused goals and policies.

Safety Element

This element summarizes broad policies that ensure adequate public facilities and services exist and are maintained to meet the safety needs of the community. Relevant safety goals are outlined in Table 2-11.

Table 2-11: City of Sebastopol Safety Element Goals

Goal	Goal Description
Goal SA 1	Minimize the risk of injury and property damage resulting from seismic and geologic hazards
Goal SA 2	Reduce risks to human life, property, and public services associated with flood hazards
Goal SA 3	Protect the safety of life and property by ensuring emergency preparedness
Goal SA 4	Reduce fire hazards and maintain effective fire and emergency response services
Goal SA 5	Maintain effective police services
Goal SA 6	Reduce hazards associated with the transportation, use, storage, and disposal of hazardous wastes and hazardous materials

Conservation and Open Space Element

The Conservation and Open Space Element provides a framework to protect and maintain the City's natural and open space resources, specifically water and wetland resources and groundwater quality. It includes goals and policies to protect air quality in the City. Relevant natural resource and groundwater goals are outlined in Table 2-12.

Table 2-12: City of Sebastopol Open Space and Conservation Goals

Goal	Goal Description
Goal COS 1	Make proactive, forward-thinking environmental protection and resource management the cornerstone of Sebastopol's identity
Goal COS 2	Protect and enhance Sebastopol's ecosystem and natural habitats
Goal COS 3	Protect and enhance water resources in local creeks, riparian habitat, wetlands, the Laguna de Santa Rosa watershed, Atascadero Creek, and aquatic habitat

Goal	Goal Description
Goal COS 4	Proactively manage, protect, and restore the Laguna de Santa Rosa
Goal COS 5	Protect, manage, and enhance groundwater as a valuable and limited shared resource
Goal COS 6	Conserve, protect, and enhance trees and native vegetation
Goal COS 7	Improve air quality in Sebastopol and reduce air quality impacts from future development
Goal COS 8	Reduce emissions of greenhouse gases from City operations and community sources
Goal COS 9	Promote conservation of energy and other natural resources
Goal COS 10	Protect and preserve Sebastopol's historic and cultural resources
Goal COS 11	Preserve and enhance scenic views of the Laguna de Santa Rosa, Atascadero Creek, the hills to the west of Sebastopol, and other natural resources within the Sebastopol planning area
Goal COS 12	Ensure the provision and preservation of diverse and accessible open spaces throughout the Sebastopol planning area

Community Services and Facilities Element

Planning for growth and development requires the consideration of a wide range of public services and facilities. The City's Community Services and Facilities Element includes goals and policies related to water supply, fire prevention, the provision of community services related to public safety, and emergency preparedness. Relevant goals are outlined in Table 2-13.

Table 2-13: City of Sebastopol Community Services and Facilities Element Goals

Goal	Goal Description
Goal CSF 3	Provide an adequate, clean, safe, and environmentally sound water supply to all existing and future water users in Sebastopol
Goal CSF 5	Provide effective, high quality, and responsive police and fire services to all areas of the City
Goal CSF 6	Enhance the quality of life for all City residents through the provision of cultural and social resources including quality schools, libraries, and other community services and facilities

2023 Housing Element (2015)

The City prepared the latest Housing Element in 2015 for the 2015 to 2023 planning period. The Housing Element is one of the seven mandatory elements of the General Plan. The Housing Element provides a long-term comprehensive plan to address the housing needs for all economic segments of the community. It addresses existing and projected housing demand and establishes goals, objectives, policies, and actions to assist the City in implementing the plan in accordance with other General Plan policies. The 2015-2023 Housing Element was prepared under a separate timeline and under different detailed State criteria. The Housing Element includes a review of the 2010 Housing Element, an analysis of the City's current and future housing needs, an inventory of housing resources, an analysis of governmental and non-governmental constraints to housing production, a housing plan (goals, policies, and programs) to address housing needs, and a General Plan consistency analysis.

Floodplain Management Regulations and NFIP Participation (1983)

The City of Sebastopol has participated in the NFIP since 1980 by administering floodplain management regulations that meet or exceed the minimum requirements of the NFIP. The purpose of these regulations is to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas. These regulations apply to all areas of special flood hazards within the jurisdiction of Sebastopol identified in FEMA's most recent FIS completed for Sonoma County on March 7, 2017. The Special Flood Hazard Area (SFHA), also known as the base flood, 100 year flood (1 percent annual chance flood) in the City is mapped as Zone A or AE.

Floodplain management is administered through the City's Building and Safety Department. The City maintains records of BFE certificates for the properties within the SFHA (although they are not tracked electronically). The NFIP is administered by the City Building Official (Floodplain Administrator).

City of Sebastopol Emergency Operations Plan

The City's recently initiated updating their EOP. The EOP is a basic plan that addresses the City of Sebastopol's responsibilities for emergencies associated with natural disaster, human-caused emergencies, and technological incidents. It provides a framework for coordination of response and recovery efforts within the City and in coordination with local, state, and federal agencies. The plan establishes emergency organization staff to direct and control operations during a period of emergency by assigning responsibilities to specific personnel. It includes procedures for emergencies that may or may not require the full or partial activation of an Emergency Operation Center (EOC). The City's response to an emergency incident is coordinated through the EOC. As part of this effort, the City is also preparing a City-wide evacuation route plan.

2.9.2 City of Sebastopol Administrative/Technical Mitigation Capabilities

Table 2-14 identifies the City personnel responsible for activities related to mitigation and loss prevention in the City of Sebastopol.

Table 2-14: City of Sebastopol's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Planning Department/Planning Director/Associate Planner
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Building and Safety Department / Chief Building Official
Planner/engineer/scientist with an understanding of natural hazards	Yes	Fire Department/Fire Chief
Personnel skilled in GIS	No	GIS Services hosted by the City of Santa Rosa
Full-time building official	Yes	Building and Safety Department / Chief Building Official
Floodplain manager	Yes	Building and Safety Department / Chief Building Official (Floodplain Administrator)
Emergency manager	No	Fire Department/Fire Chief
Grant Writer	No	Handled within each department/program
GIS data—Hazard areas	No	GIS Services hosted by the City of Santa Rosa
GIS data—Critical facilities	No	GIS Services hosted by the City of Santa Rosa
GIS data—Building footprints	No	GIS Services hosted by the City of Santa Rosa
GIS data—Land use	No	GIS Services hosted by the City of Santa Rosa
GIS data—Assessor's data	No	GIS Services hosted by the City of Santa Rosa
Warning Systems/Service (Reverse 911, cable override, outdoor warning signals)	Yes	Flood alert system; Cal WARN; EAS; SoCo Alert

Source: HMPC Data Collection Guide; City of Sebastopol GIS Viewer is hosted here: https://maps.srcity.org/Html5Viewer/Index.html?viewer=sebastopol

City Departments/Agencies

The City of Sebastopol government consists of a City Council with five members including the Mayor. The City Council appoints the City Manager. Each City of Sebastopol department and service group is summarized below.

City Attorney's Office

The City Attorney is responsible for legal advice and representation of the City Council and all city departments. The City Attorney coordinates all legal representation of the City, including outside counsel, if needed. At the direction of the City Council, the City Attorney prepares all ordinances and other legal documents for Council consideration.

City's Clerk Office

The City Clerk's office provides a variety of administrative services in support of the City Council. The City Clerk's role includes coordination of local ballot measures and City Council elections with the County Registrar of Voters, compliance with state campaign reporting and conflict of interest laws, and overall records keeping of the City. The City Clerk serves as Clerk of the Council and maintains all official City records, administers Fair Political Practice and conflict of interest legislation; maintains official City seal; administers municipal elections; serves as an executive assistant to the City Manager and is responsible for providing confidential support to the City Manager, the Council and other City staff.

City Manager's Office

The City Manager is the administrative head of the government of the City and works under the direction and control of the City Council. The City Manager has authority over the City's employees, has the authority to appoint, remove, promote and demote any and all officers and employees of the City. The City Manager department provides oversight to the following six departments:

- **Building and Safety Division.** The Building and Safety Department is responsible for the administration and enforcement of the City of Sebastopol's construction codes relative to new and existing development, and alteration or repair to residential, commercial, and industrial buildings and properties. The Department plans, coordinates, and manages all City activities related to building and construction inspections, including review of construction plans, drawings, specifications for compliance with state and local requirements.
- **Planning Division.** The Planning Department provides planning and environmental review assistance to the City Council, Planning Commission, Design Review Board, and Public Arts Committee. The department also provides services to citizen committees, the City's residents and the real estate, development and construction industries. This service is divided into two primary functions. Current planning includes receiving and processing all applications for land use permits, subdivision and other development permits, preparing staff reports for the appropriate City boards and commissions and performing inspections to assure compliance with zoning and other planning regulations. This includes preparation of environmental documents as required by State and City law and policies. Advance planning includes preparation of long-range planning documents, special studies, policy development, and preparation of municipal ordinances.
- **Fire Department.** The Sebastopol Fire Department's mission is to be a leading emergency service organization by meeting the service requirements of our community in fire prevention, fire suppression, rescue and education; utilizing and improving the dedication and skills of our people; and continually improving all of City services and operations.

- **Administrative Services Department.** The Administrative Services (also referred to as the Finance Department) Department is responsible for the City's financial records including preparation of the annual City budget and ongoing monitoring of City's financial health. This Department prepares and issues financial status or informational reports; prepares annual User Fee Schedule updates; and completes the annual State Controllers reports. The Department services the City's municipal bond debt; manages two assessment districts; provides Risk Management services; maintains the Fixed Asset inventory for the City; and provides financial support to other departments with the administration and management of grants and projects. The department also provides financial management for the Water and Sewer enterprise funds by billing, collecting, and rate setting.
- **Police Services Department.** The Police Department administers two budgets: Police Service and Animal Control, providing comprehensive community-based police services. The department coordinates counseling with a community-based agency for at-risk youth. Current personnel includes 16 sworn Police Officers, including the Chief of Police and Lieutenant; six Dispatchers and one Police Technician.
- **Public Works Department and Engineering Division.** The Public Works Department is responsible for operation and maintenance of the City infrastructure, including the water and sewer systems, industrial waste system, streets, parks, swimming pool, parking lots and government buildings. Public Works Department also provides inspection of private and public construction projects on public streets and properties and supervises City Engineering Division. The Engineering Division provides administrative and technical engineering services.

2.9.3 City of Sebastopol Fiscal Mitigation Capabilities

Table 2-15 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table 2-15: City of Sebastopol's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Yes	The City is an Entitlement Jurisdiction under the CDBG Program. A majority of CDBG allocation is for housing development and housing-related services. The funds, granted through the U.S. Department of Housing and Urban Development (HUD) target programs and/or projects geared towards assisting low and moderate-income persons by providing decent housing, a suitable living environment, and expanding economic opportunity.
Capital Improvements Project funding	Yes	The City implements their Capital Improvement Program: 2021 – 2026 and relies on HMGP grants or Cal OES planning grants for project implementation.
Authority to levy taxes and assessments for specific purposes	Yes	Tax assessment for water and wastewater department services via billing, collecting and rate setting. Assessments can also be tied to specific mitigation projects.

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Fees for water, sewer, services	Yes	Utility fees can be used for hazard mitigation of water and sewer projects. These fees are currently collected by the Administrative Services Department.
Impact fees for new development	Yes	The City oversees a comprehensive development impact fee program.
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	
Incur debt through private activities	Yes	
Withhold spending in hazard prone areas	No	

2.9.4 Mitigation Outreach and Partnership Capabilities

Sonoma County Community Wildfire Protection Plan (2016)

The Sonoma County Community Wildfire Protection Plan (CWPP) consists of three components: a collaborative effort of input from various agencies and community members, the identification of prioritized treatment areas and mitigation strategies, and the recommendation of measures to reduce ignitability of structures. The plan was developed with Fire Safe Sonoma, Cal Fire, and Sonoma County. The Sonoma County Board of Supervisors unanimously approved the Fire Safe Sonoma's 2016 CWPP. The County is currently updating the CWPP; the update is anticipated to be complete in 2021.

Regional Climate Protection Authority Climate Action Plan (2016)

The RCPA is governed by a twelve member Board of Directors comprised of representatives from the Sonoma County Board of Supervisors and Council Members from each of the nine cities – Cloverdale, Cotati, Healdsburg, Sebastopol, Rohnert Park, Santa Rosa, Sebastopol, Sonoma and Windsor. The RCPA coordinates climate protection activities countywide and performs a variety of important related functions including advocacy, project management, planning, finance, grant administration, and research. The *Climate Action 2020 and Beyond, Sonoma County's Regional Climate Action Plan* published in 2016 was a collaborative effort between Sonoma County and all nine cities within the County. The Regional Climate Action Plan (CAP) is specific to the reduction of countywide GHG emissions. The Regional CAP sets forth near-term actions to be implemented through 2020 to achieve a 25 percent reduction in countywide GHG emissions. Although this plan is still referenced as it relates to the County's GHG emissions inventory and targets, it was not formally adopted by the County.

Climate Mobilization Strategy (2021)

In 2020 the RCPA developed the Climate Mobilization Strategy to support a resolution that declared a Climate Emergency that was adopted by the RCPA Board in September 2019. This strategy solidifies the County's commitment to mobilizing an emergency response commensurate with the scale of the climate crisis (RCPA 2021). The 10-year Emergency Policy package outlines 14 countywide actions with the potential to reduce GHG emissions by 2030 under local authority. This Strategy was adopted by the RCPA in March 2021. The RCPA has since convened working groups to begin funding and implementing the plans for the Strategy.

City of Sebastopol Climate Emergency Resolution (2019)

The City Council adopted a climate emergency resolution in November 2019. The City established a Climate Subcommittee of the City Council to evaluate and propose actions to reduce GHG emissions and increase climate resilience and adaptation.

Sonoma County Operational Area Hazard Mitigation Plan (2021)

The Sonoma County HMP assesses the County's vulnerabilities to hazards and presents a mitigation strategy of actions intended to reduce the disruption to life, property, and economy that might result from a natural disaster. Permit Sonoma and the Fire Prevention Division prepared the update in 2021. The HMP focuses on earthquake, flood, wildland fire, and landslide hazards, as they were considered to constitute the greatest risk to the County based on past disaster events, future probabilities, and vulnerability. Within the risk assessment, secondary and tertiary are addressed, such as winter storms, coastal erosion, bluff failure, tsunamis, and post fire erosion. The planning process for updating this plan utilizes a MJHMP approach. It involved collaboration with local jurisdictions in the community, including the cities of Santa Rosa, Cotati, and Sonoma; the Town of Windsor; two resource conservation districts; and five fire districts.

Sonoma Water Local Hazard Mitigation Plan (2018)

Sonoma Water, previously referred to as Sonoma County Water Agency, is a wholesale provider of potable water that serves nine municipal customers in Sonoma and Marin counties. The water agency maintains a water transmission system that provides naturally filtered Russian River water, builds variety of flood protection projects, manages the county sanitation zones and districts that provide wastewater collection and treatment and recycled water distribution, and produces recycled water from its wastewater treatment plants to offset surface water drawn from the Russian River.

Sonoma Water implements the Sustainable Groundwater Management Act (SGMA) in Sonoma County and is actively working to protect the basins throughout the region. The water agency adopted a LHMP in 2018 to assess the natural hazard risks and vulnerabilities facing the agency's infrastructure, and to articulate a plan to address the vulnerabilities. The plan includes three tailored mitigation strategies focusing on water supply and distribution, sewer and sanitation, and flood control projects.

Community Shelters

The Sebastopol Community Center at 390 Morris Street has been designated a community shelter during recent wildfires.

Other Planning Capabilities (Ongoing)

The HMPC noted the following additional mitigation outreach efforts during planning sessions:

- **Emergency Response Plan.** The City Public Works Department is in the process of updating their ERP. It contains a detailed summary of the City's public utilities, including all water and wastewater system, such as the four City groundwater wells, three steel water storage tanks, and chemical storage facilities. The ERP inventories the City's response resources, including generators and wastewater pump station information. The ERP outlines resilience strategies, including resources in place to improve the resilience of the utility system, including the physical security and cybersecurity of the system. It will also consist of incident-specific response procedures for cybersecurity, drought, earthquake, extreme cold/winter storms, extreme heat, flooding, algal blooms, and wildfires. Other mitigation actions, with the exception of earthquake anchoring and security detection strategies and operations in the ERP are under development.
- **Map Your Neighborhood.** The Map Your Neighborhood (MYN) program is sponsored by the Gravenstein Health Action Coalition with task force members from the City of Sebastopol Fire Department. MYN is designed to help neighborhoods prepare for disasters. When a crisis occurs, those physically closest to you may be your greatest help. Emergency personnel will likely not be available to immediately assist your area. The MYN provides basic education to prepare

neighborhoods through a step-by-step process to customize an emergency preparedness plan for an area.

- **City's Website.** The City of Sebastopol's website provides public information and resource. Including information related to the PG&E Public Safety Power Shutoff (PSPS). The City's social media accounts (Twitter, Facebook) are used to disseminate public information.
- **Barlow Flood Emergency Operation Plan (2020).** The City required that Barlow Planned Development prepare and implement a Flood Emergency Operation Plan and Inspection and Maintenance Plan to establish flood emergency operations as part of its floodproofing design. The initial plan was completed in December 2011 and complied with the FEMA Technical Bulletin 9-93 Non-Residential Floodproofing Requirements and Certification for Buildings Located in Special Flood Hazard Areas in accordance with the NFIP. In April 2012 the City issued the Flood Plain Development Permit for the development, which incorporated the Flood Emergency Operation Plan, as well as an Inspection and Maintenance Plan and the backup power plan. Between 2012 and 2016, the Barlow development team tested the system to ensure the plan met the FEMA requirements and found the testing of the system was successful and in compliance with the flood mitigation plan approved by the City. However, during the 2019 flood event, the development sustained significant flood damage and the City directed the developers to review their plan and make amendments to ensure it was consistent with FEMA regulations. The City Council approved the revised plan on February 18, 2020.

2.9.5 Opportunities for Enhancement

Based on the capability assessment, the City has several existing mechanisms in place that help to mitigate hazards. In addition to these existing capabilities, there are opportunities for the City to expand or improve on these policies and programs to further protect the community. Future opportunities for enhancement to comply with Assembly Bill 2140 include amending the Sebastopol General Plan Safety Element to incorporate the LHMP by reference. The City can update other plans, such as the City's 5 Year CIP to include hazard mitigation actions and climate adaptation strategies that relate to infrastructure resiliency. Other future improvements may include providing hazard training for staff or hazard mitigation grant funding in partnership with Sonoma County and Cal OES.

CRS Program Participation

The City of Sebastopol does not currently participate in the NFIP CRS Program. There are also only 37 flood insurance policies in effect in the City. With a small number of policies, the City will need to determine if it makes sense to apply to participate in the program. Table 2-16 shows the CRS discount for policy holders if the City did participate in the program at a Class 9.

Table 2-16: Cost Savings by Policy and by Community under CRS Class 9

CRS Class	Description	Total	SFHA	X-STD/AR/A99
9	Per Policy	$529	$592	$34
	Per Community	$19,558	$19,524	$34
8	Per Policy	$1,056	$1,183	$34
	Per Community	$39,082	$39,048	$34
7	Per Policy	$1,584	$1,775	$34
	Per Community	$58,606	$58,572	$34
6	Per Policy	$2,113	$2,367	$68
	Per Community	$78,164	$78,096	$68
5	Per Policy	$2,640	$2,958	$68
	Per Community	$97,688	$97,620	$68
4	Per Policy	$3,168	$3,550	$68
	Per Community	$117,213	$117,144	$68

CRS Class	Description	Total	SFHA	X-STD/AR/A99
3	Per Policy	$3,696	$4,141	$68
	Per Community	$136,737	$136,668	$68
2	Per Policy	$4,223	$4,773	$68
	Per Community	$156,261	$156,192	$68
1	Per Policy	$4,751	$5,325	$68
	Per Community	$175,785	$175,716	$68

[1] – SHFA includes Zones A, AE, A1-A30, V, V1-V30, AO, and AH; discount varies depending on class.

[2] – SFHA includes Zones A99, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO; 10 percent discount for Classes 1-6; 5 percent discount for Classes 7-9

Source: CRS 2021

At Class 9, there is an average discount of $592 per policy for the 33 policies in place within the Special Flood Hazard Area (SFHA) and approximately $19,000 in annual savings. This is a substantial saving from a per policy perspective. However, the City needs to determine what works best for their community. CRS participation will only provide specific benefits to 37 policy holders; however, the program does provide benefits to the greater community beyond the policy holder insurance discounts, such as comprehensive floodplain management practices, public awareness about flood hazards and insurance, and flood protection assistance.

Other Opportunities

Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City of Sebastopol will lead to more informed staff members who can better communicate this information to the public.

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3 Planning Process

44 U.S. Code of Federal Regulations Requirements §201.6 Local Mitigation Plans (b) and §201.6(c)(1): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and

3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

3.1 Background on Mitigation Planning in the City of Sebastopol

This multi-hazard, single-jurisdiction Local Hazard Mitigation Plan (LHMP) Update is customized plan tailored for the City of Sebastopol (City). The City's previous plan, "Taming Natural Hazards," adopted in 2005, was a regional, multi-jurisdictional LHMP for all nine counties within the Bay Area prepared on behalf of the City by the Association of Bay Area Governments (ABAG). The City participated as an annex to the regional plan in 2010 which has since expired in 2015. ABAG is no longer managing the update of the multi-jurisdictional LHMP which requires the City to create a single-jurisdiction update to their original annex.

The increasing cost of disaster recovery in the nation and the State of California over the past decades, and specifically from the recent wildfires in 2017, 2019, and 2020, has prompted a renewed interest in determining effective and holistic approaches to minimize natural hazards. Hazard mitigation planning plays an important role in building community resilience through the identification of hazards, assessment of vulnerabilities, and the development of mitigation actions. The City recognized the importance of developing a customized and updated LHMP and was responsible for initiating its development in 2020. The goal of the LHMP Update is to develop practical, attainable, and cost-effective mitigation actions to reduce vulnerability to the identified hazards and reduce human, property, and economic losses from hazard events. The City contracted with Wood Environment & Infrastructure Solutions, Inc. (Wood) to facilitate and develop the plan. Wood's role was to:

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390) commonly known as the 2000 Stafford Act Amendments;
- Meet the DMA requirements as established by federal regulations and follow the Federal Emergency Management Agency (FEMA) planning guidance;
- Facilitate the entire planning process based on a Public Outreach Strategy;
- Identify the data requirements for the HMPC and conduct the research and documentation necessary to augment that data;
- Perform risk assessments that identify, evaluate, and prioritize natural and human-caused hazards that could impact the City;

- Conduct a vulnerability assessment to identify the hazard's impacts on the City's critical facilities, infrastructure, property, and future development;
- Assist in facilitating the public input process;
- Integrate the risk and vulnerability assessment to help the City determine appropriate mitigation goals and objectives to minimize long-term vulnerabilities to the identified hazards;
- Produce draft and final plan documents; and
- Coordinate with California Office of Emergency Services (Cal OES) and FEMA Region IX plan reviews.

The original plan developed by ABAG broadly covered natural hazards and vulnerabilities in the City of Sebastopol. This new and updated plan expands on the multi-jurisdictional LHMP and is tailored to address the natural and human-caused hazards in the City, the identified hazard impacts specific to Sebastopol's critical facilities and infrastructure, and the development of a locally attainable mitigation strategy. The new LHMP will involve adopting, implementing, assigning responsibility, monitoring, and reviewing the mitigation actions over time to ensure the goals and objectives of the plan are being achieved and the plan remains relevant. The remainder of this chapter provides a narrative of the steps taken to prepare the LHMP.

3.2 Local Government Participation

The LHMP Update is a single-jurisdictional plan that covers the City of Sebastopol Planning Area, which is the same boundary as the City's Sphere of Influence (SOI) boundary. The DMA planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the HMPC
- Identify potential mitigation actions; and
- Formally adopt the plan.

For the City of Sebastopol's HMPC, "participation" was defined at the outset of the planning process as the following:

- Providing a virtual meeting space to ensure HMPC engagement during in the LHMP planning process;
- Completing and returning the Wood Data Collection Guide;
- Collecting and providing other requested data (as available);
- Managing administrative details;
- Engaging the community during the facilitation of two public outreach workshops;
- Making decisions on plan process and content;
- Identifying mitigation actions for the plan;
- Reviewing and providing comments on plan drafts;
- Informing the public, local officials, and other interested parties, such as the Planning Commission and Climate Action Commission about the planning process and providing opportunity for them to comment on the plan;
- Advertising, coordinating, and participating in the public input process; and

- Coordinating the formal recommendation of the plan by the City Planning Commission and formal adoption of the plan by the City Council.

The City met all FEMA's requirements for plan participation. The City brought together a local planning team with representatives from City departments to help collect data, identify mitigation actions and implementation strategies, and review and provide data on plan drafts. The City engaged several federal, state, regional, and local stakeholder representatives from various agencies and municipalities in the region. In most cases, one or more representatives from each City department and each agency attended the three HMPC meetings.

The preparation of the updated LHMP was also intended to assist the City in reducing its risk from natural and man-made hazards by identifying resources, information, and strategies for risk reduction. For the City's HMPC, the intention of the plan is to help guide and coordinate mitigation activities throughout the City's various departments, as this is their first stand-alone and customized LHMP since the multi-jurisdictional regional LHMP prepared by ABAG. As a result, the HMPC set out to develop a plan that would meet the objectives summarized below.

- The plan would meet or exceed program requirements specified under the DMA of 2000.
- The plan would not only meet Cal OES and FEMA requirements, but also the needs of the City.
- The plan would coordinate existing and ongoing plans and programs already established at the City so that high priority initiatives and projects to mitigate possible disaster impacts would be funded and implemented.
- The plan would create a linkage between the LHMP and established plans such as the Sebastopol General Plan Safety Element and City's Capital Improvement Plan (CIP) so that existing planning mechanisms can be integrated to help the City achieve successful mitigation.

Given plan integration is a key strategy in the success of LHMP implementation, the HMPC focused on consistency between plans and programs at the City, including the Sebastopol General Plan and the City's CIP. The HMPC focused on ensuring each department representative consulted with their individual departments in between meetings to ensure existing capabilities were adequately documented in the LHMP and that mitigation actions were thoroughly reviewed and developed by a range of department leads throughout the City. Appendix A provides additional information and documentation of the planning process.

3.3 The 10-Step Planning Process

The City followed a planning process for the LHMP Update that uses the DMA planning requirements and FEMA's associated guidance. This guidance is structured around a four-phase process:

1) Organize Resources
2) Assess Risks
3) Develop the Mitigation Plan
4) Implement the Plan and Monitor Progress

Into this process, the City integrated a detailed 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance (FMA) programs, if Sebastopol intends to join the CRS. Thus, the modified 10-step requirements of the Hazard Mitigation Assistance grants (HMA) including Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation program (PDM) (now Building Resilient Infrastructure and Communities [BRIC]), FMA, CRS, and the flood control projects authorized by the U.S. Army Corps of Engineers (USACE) are addressed. FEMA's March 2013 *Local Mitigation Planning Handbook*

recommends a nine step process within the four-phase process. Table 3.1 summarizes the four-phase DMA process, the detailed CRS planning steps and work plan used to develop the plan, the nine handbook planning tasks from FEMA's 2013 *Local Mitigation Planning Handbook*, and where the results are captured in the plan. The sections that follow describe each planning step in more detail, including information on the schedule and general timeframe of activities that took place to develop the plan.

Table 3-1: Mitigation Planning Processes Used to Develop the City of Sebastopol's LHMP Update

FEMA 4-Phase Guidance Phases	CRS Planning Steps	2013 FEMA Local Mitigation Planning Handbook Steps (44 CFR Part 201)	Location in LHMP
Phase 1: Organize Resources	Step 1. Organize Resources	1: Determine the Planning Area and Resources	Chapters 1, 2, and 3
		2: Build the Planning Team 44 CFR 201.6(c)(1)	Chapter 3, Section 3.3.1
	Step 2. Involve the public	3: Create an Outreach Strategy 44 CFR 201.6(b)(1)	Chapter 3, Section 3.3.1
	Step 3. Coordinate with Other Agencies	4: Review Community Capabilities 44 CFR 201.6(b)(2) & (3)	Chapter 2, Section 2.2; Chapter 3, Section 3.3.1
Phase 2: Identify Hazards and Assess Risks	Step 4. Assess the hazard	5: Conduct a Risk Assessment 44 CFR 201.6(c)(2)(i) 44 CFR 201.6(c)(2)(ii) & (iii)	Chapter 4, Sections 4.1 through 4.3
	Step 5. Assess the problem		Chapter 4, Sections 4.1 through 4.3
Phase 3: Develop a Mitigation Strategy	Step 6. Set goals	6: Develop a Mitigation Strategy 44 CFR 201.6(c)(3)(i); 44 CFR 201.6(c)(3)(ii); and 44 CFR 201.6(c)(3)(iii)	Chapter 5, Section 5.1
	Step 7. Review possible activities		Chapter 5, Section 5.2
	Step 8. Draft an action plan		Chapter 5, Section 5.3
Phase 4: Implement and Monitor the Plan	Step 9. Adopt the plan	8: Review and Adopt the Plan	Chapter 6, Appendix C
	Step 10. Implement, evaluate, and revise	7: Keep the Plan Current	Chapter 7
		9: Create a Safe and Resilient Community 44 CFR 201.6(c)(4)	Chapter 7

3.3.1 Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

The organization of the planning effort was initiated as a joint commitment and effort by the City's Planning Department and Fire Department to develop the plan and establish the framework and organization for the planning process. Organizational efforts were initiated with the City to inform and educate the HMPC participants of the purpose and need for the City, single-jurisdictional LHMP update. The City held an initial call on July 9, 2020 with Wood to discuss the organizational aspects of this planning process. On August 2, 2020 the City circulated the HMPC invitee list. The schedule of subsequent planning activities is summarized in Table 3-2.

Table 3-2: Local Hazard Mitigation Plan Schedule of Planning Activities

Project Task	Meeting Date(s)
Project Kick-Off Meeting	July 9, 2020
Circulate Draft HMPC Invitee List	August 2, 2020
Submit HMPC Meeting #1 Agenda	August 17, 2020
HMPC Meeting #1	October 20, 2020
Submit Draft Public Outreach Strategy	October 16, 2020
City and HMPC Review of Public Outreach Strategy	October 20, 2020
Public Outreach Meeting/Workshop #1	October 27, 2020

Project Task	Meeting Date(s)
Circulate Public Survey (3-month survey period)	November 1, 2020
Prepare Hazard Identification and Risk Assessment	January 20, 2021
HMPC Meeting #2	February 4, 2021
Develop Goals and Objectives	February 15, 2021
HMPC Meeting #3	March 16, 2021
Compile Mitigation Action Worksheets	April 15, 2021
Submit 1st Administrative Draft LHMP	April 30, 2021
City and HMPC provides consolidated comments on 1st Administrative Draft LHMP	May 14, 2021
Submit 2nd Administrative Draft LHMP	May 28, 2021
Complete FEMA Region IX Review Tool: Elements A through D	May 31, 2021
Circulate Public Review Draft LHMP (30-day public review)	October 21, 2021
Public Meeting/Workshop #2	October 26, 2021
Public Review Ends	November 19, 2021
Submit Final Draft LHMP to Cal OES for review (45-day review period)	December 3, 2021
Submit Final Draft LHMP to FEMA Region IX for review	January 17, 2021
City Council Hearing*	TBD

**City Council Meetings are held on the first and third Tuesdays of each month.*

Invitations to the kick-off meeting were extended to key City departments, and federal and state agencies, Sonoma County, neighboring municipalities, and key stakeholders. Using FEMA planning guidance, representatives from City departments established the base membership for the HMPC stakeholder committee. The HMPC also included representatives from federal, state, and local agencies, and stakeholders from the local school district, senior center, and other organizations. Key representatives from neighboring communities included staff from the Sonoma County Department of Emergency Management, Sebastopol Union School District, and City of Petaluma. The list of agencies and individuals invited to participate is included in Appendix A.

The HMPC was established as a result of this effort, as well as through interest generated through outreach conduced for this project, which is outlined in more detail in the Public Outreach Strategy. The HMPC collectively developed the plan with leadership from the City and facilitation by Wood. The HMPC meetings also had participation from other agency stakeholders with an interest in hazard mitigation, which are described in Planning Step 3. Representatives from the following City departments and other agencies participated on the HMPC:

City of Sebastopol

- City Manager's Office
- City Clerk Office
- City Attorney
- Building and Safety Department
- Planning Department
- Administrative Services (Finance) Department
- Police Department
- Public Works Department and Engineering Division

Other Agency and Organization Stakeholders

- Sonoma County

- Sebastopol Union School District
- City of Petaluma

A list of participating HMPC representatives is included in Appendix B. This list includes all HMPC members that attended one or more HMPC meetings detailed in Table 3-2. The City also utilized the support of other City staff in order to collect and provide requested data and to conduct timely reviews of draft documents. The core HMPC group was also supplemented by input from other government and stakeholder representatives that contributed to the planning process as identified in Planning Step 3: Coordinate with Other Department and Agencies.

The planning process officially began with a kick-off meeting on October 20, 2020. The meeting covered the scope of work and an introduction to the DMA requirements. Participants were provided with a Data Collection Guide, which included worksheets to facilitate the collection of information necessary to support development of the plan. Using FEMA guidance, Wood designed these worksheets to capture information on past hazard events, identify hazards of concern to the jurisdiction, quantify values at risk to identified hazards, inventory existing capabilities, and record possible mitigation actions. A copy of the Data Collection Guide for this project is included in Appendix A. The City completed and returned the worksheets in the data collection guide to Wood staff for incorporation into the plan.

During the planning process, the HMPC communicated through virtual sessions/workshops, email, and monthly virtual meetings, and added information to the City's LHMP Webpage. Draft documents were distributed via email to the City (Planning and Fire Department representatives) and then distributed to the HMPC stakeholders. The HMPC met three times during the planning period (October 20, 2020 through March 23, 2021).

The dates and purposes of these meetings are described in Table 3-3. The HMPC also met internally (monthly) in between meetings to help the City's Planning Department and Fire Department track deliverables, worksheet materials, and public outreach documentation. Agendas for each of the meetings and lists of attendees are included in Appendix A. Figure 3-1 is from HMPC Meeting #1.

Table 3-3: Schedule of Planning Meetings

Meeting Type	Meeting Topic	Meeting Date(s)
HMPC Meeting #1	Kick-off meeting: introduction to DMA, the planning process, and hazard identification	October 20, 2020
HMPC Meeting #2	Risk assessment overview and work session on new goal development	February 4, 2021
HMPC Meeting #3	Development of mitigation actions; selection and prioritization of mitigation recommendations	March 23, 2021

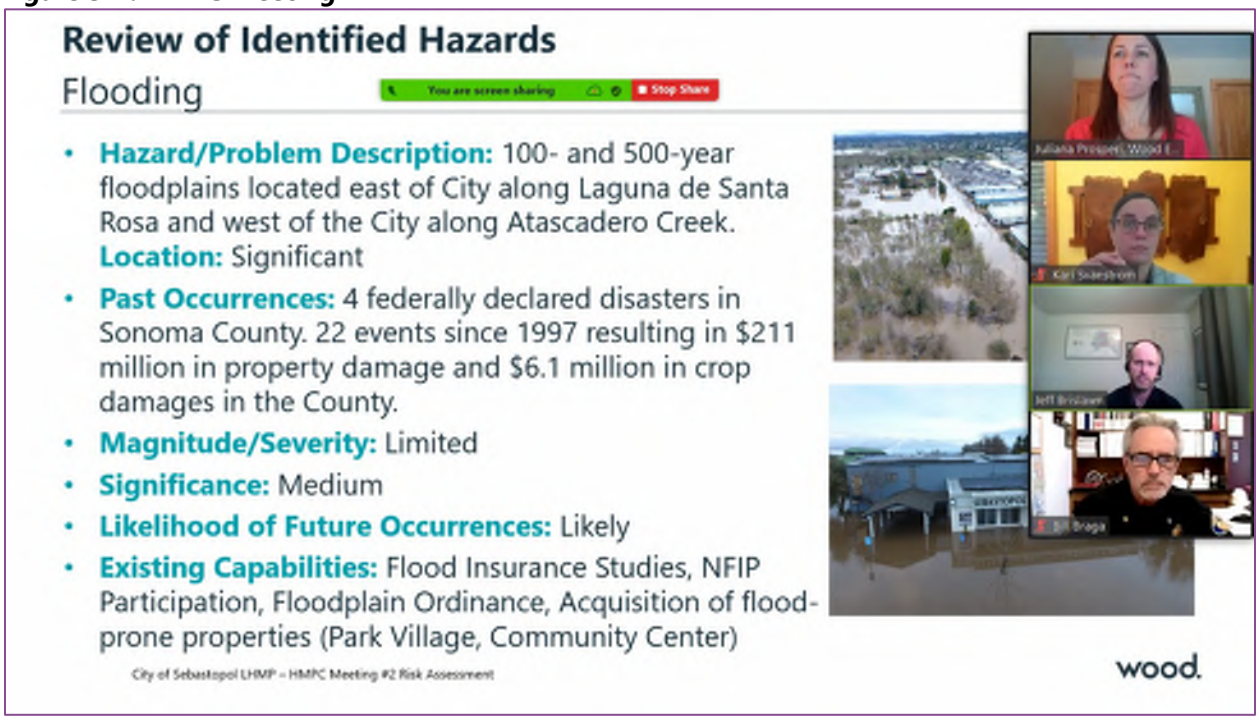
At HMPC Meeting #1, the planning process scope and schedule were discussed, along with the list of hazards addressed in the plan, followed by a presentation that summarized hazard vulnerability. The group was asked what hazards presented the greatest concern. Figure 3-1 is from HMPC Meeting #1.

Figure 3-1: HMPC Meeting #1



HMPC Meeting #2 focused on the findings from the Risk Assessment and the specific vulnerabilities to the City's critical assets and infrastructure that need to be addressed in the mitigation strategy. The HMPC also developed goals and objectives during HMPC Meeting #2. Figure 3-2 is from HMPC Meeting #2.

Figure 3-2: HMPC Meeting #2



This led to further discussion and the prioritization of mitigation actions developed at the HMPC Meeting #3. Figure 3-2 is from HMPC Meeting #3.

Figure 3-3: HMPC Meeting #3



Planning Step 2: Involve the Public

Early discussions with the City of Sebastopol established the initial plan for public involvement. At the kick-off meeting, the HMPC discussed options for public involvement and agreed to an approach using established public information mechanisms and resources within the community with a focus on digital platforms such as Zoom meetings, virtual public workshops scheduled in conjunction with Planning Commission meetings, and social media postings. This approach was outlined in the project's Public Outreach Strategy (Appendix C). The approach was supported and implemented by the City's Planning Department.

Public outreach was initiated during the plan development process with an informational press release to notify the public of the purpose of DMA and the hazard mitigation planning process for the City of Sebastopol. The City Planning Department coordinated the circulation of outreach materials, such as press releases and social media postings and advertisements prior to the first public workshop. Public involvement activities included the development of the LHMP Webpage, the organization of two public outreach workshops, and circulation of press releases and an online survey. The City compiled public comments received during the first public workshop and based on the first online survey.

The City also compiled public comments on the planning process, hazard profiles, risk assessment, and the Draft LHMP during a second public workshop. During this time formal comments on the draft plan circulated during public review were compiled and organized. These comments were submitted by email and through the second online form. The City received a total of one written public comment on the plan, in addition to several verbal comments provided by the Planning Commission and Climate Action Commission. The City incorporated public input by reviewing the comments and revising the LHMP prior to submittal to Cal OES and FEMA Region IX.

The City also took public comment during the second public workshop. The second public workshop was held as a virtual webinar. The City notified the project stakeholders and public about the second public workshop via email, the circulation of press releases, newspaper notices, and social media postings. The second public workshop was also advertised on daily and weekly City of Sebastopol news updates. The City received several verbal public comments during the second public workshop. Most of these

comments were regarding the critical facilities located within the floodplain and wildfire threat zones within the State Responsibility Areas (SRAs) around the City. A written comment letter was also submitted that noted minor typographical errors in the document.

Project Webpage

At the beginning of the planning process, the City created a LHMP Webpage linked to the City's Main Website to keep the public informed on hazard mitigation, the development of the LHMP and the planning process, and as a place to solicit public input. The LHMP Webpage include a background section on hazard mitigation planning and the DMA. It also highlighted recent natural hazard events that have occurred in the City of Sebastopol and adjacent unincorporated Sonoma County. The LHMP Webpage publicized on all media releases, mailings, newsletters, surveys, and public meeting advertisements. It has a sidebar with the key deliverables, including the meeting agenda's, minutes, sign-in sheets, and presentations from the various HMPC meetings and public workshops. The City intends to keep the LHMP Webpage active after the plan is completed to keep the public informed about the status of the mitigation actions. Figure 3-4 shows the City of Sebastopol LHMP Webpage.

The City made the Public Review Draft LHMP available on the LHMP Webpage in October 2021 here: https://ci.sebastopol.ca.us/City-Government/Departments-Services/Fire/Local-Hazard-Mitigation-Plan

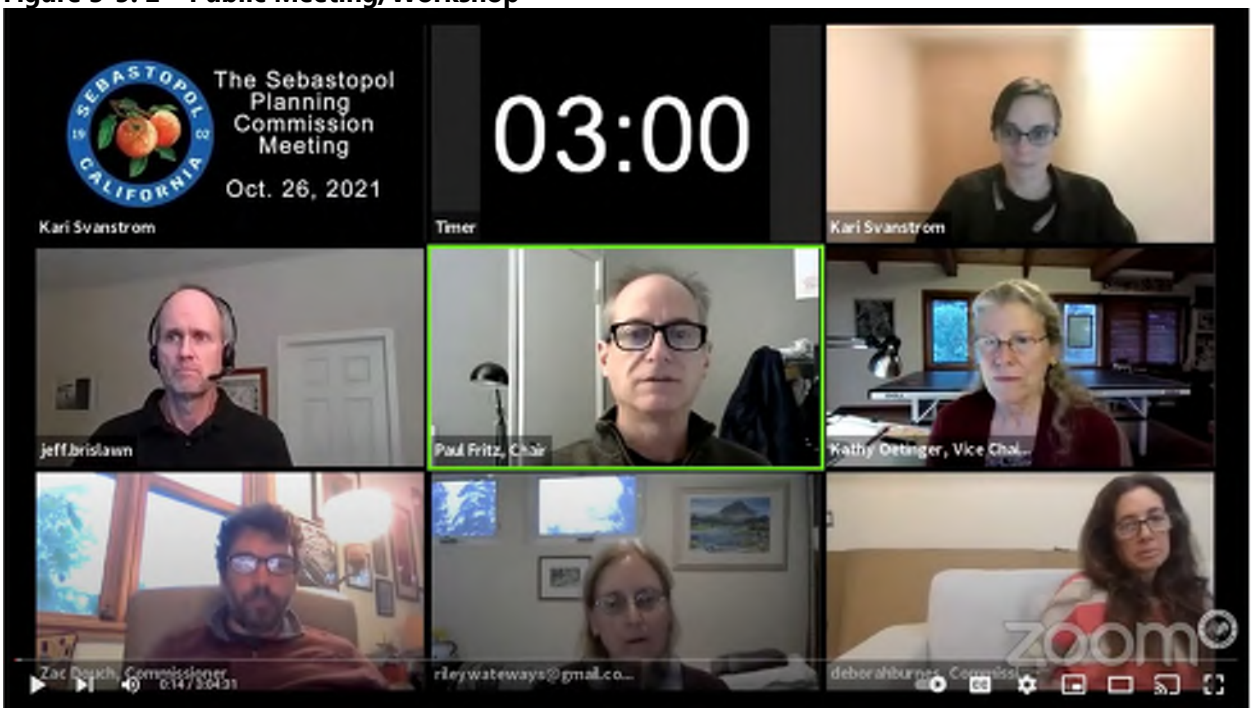
Figure 3-4: City of Sebastopol Local Hazard Mitigation Plan Website (Original)



Public Meetings/Workshops

Public meetings were held during the draft-plan development process and prior to finalizing the plan as further described in Table 3-4. The first public meeting was held on October 27, 2020 in conjunction with the City's Planning Commission meeting. The second public meeting was held via a livestream virtual workshop on October 26, 2021. Figure 3-6 is a screenshot of the second public meeting/workshop.

Figure 3-5: 2nd Public Meeting/Workshop





All press releases and website postings are on file with the City of Sebastopol Planning Department. The public outreach activities described here were coordinated and fully supported by the City of Sebastopol. The two public meetings/workshops scheduled and organized by the City are detailed in Table 3-4.

Table 3-4: Public Meetings

Meeting Topic	Meeting Dates	Meeting Locations
1st Public Meeting	October 27, 2020	Livestream Virtual Workshop

Meeting Topic	Meeting Dates	Meeting Locations
2nd Public Meeting	October 26, 2021	Livestream Virtual Workshop

The first public meeting was held to solicit public and stakeholder input during draft development of the plan. Public outreach included an email distribution with a notice of the public meeting to the HMPC with direction to share with other associations, boards and committees and postings around the workplace. The meeting notice was also posted on the City of Sebastopol LHMP Webpage. Approximately ten people attended the first Public Meeting. Workshop materials are included in Appendix A. There were several general comments during a presentation from the Planning Commissioners and the general public on the need to prepare a LHMP. One participant asked for information about the proposed outreach tools the team plans to use to engage the community. Another participant asked about collaborating with the Map your Neighborhood program. Where appropriate, stakeholder and public comments were incorporated into the final plan, including the sections that address mitigation goals and strategies.

The second public meeting was held to solicit pubic and stakeholder input after the Public Review Draft LHMP was circulated for input. The meeting was noticed the same way as the first meeting, which was through email distribution, press releases, social media, and the City's LHMP Webpage. Approximately nine people participated in the meeting, including the City's Planning Commissioners. An additional 11 people viewed the City's meeting via the YouTube posting on social media and the City's Webpage. Comments submitted during the second public meeting also addressed proposed mitigation actions.

Where appropriate, stakeholder and public comments and recommendations were incorporated into the final plan, including the risk assessment and sections that address mitigation goals and strategies. Comments submitted during the second public workshop and during public review will be summarized in this chapter. A summary of the meeting will also be shared with the HMPC and is included in Appendix A.

Prior to finalization of the plan a draft was made available on the City's LHMP Webpage for a 30-day public comment period. The Public Review Draft LHMP update was circulated from October 21, 2021, through November 19, 2021. The City also posted an electronic form with the plan on the City's LHMP Webpage to capture electronic comments (see Appendix A).

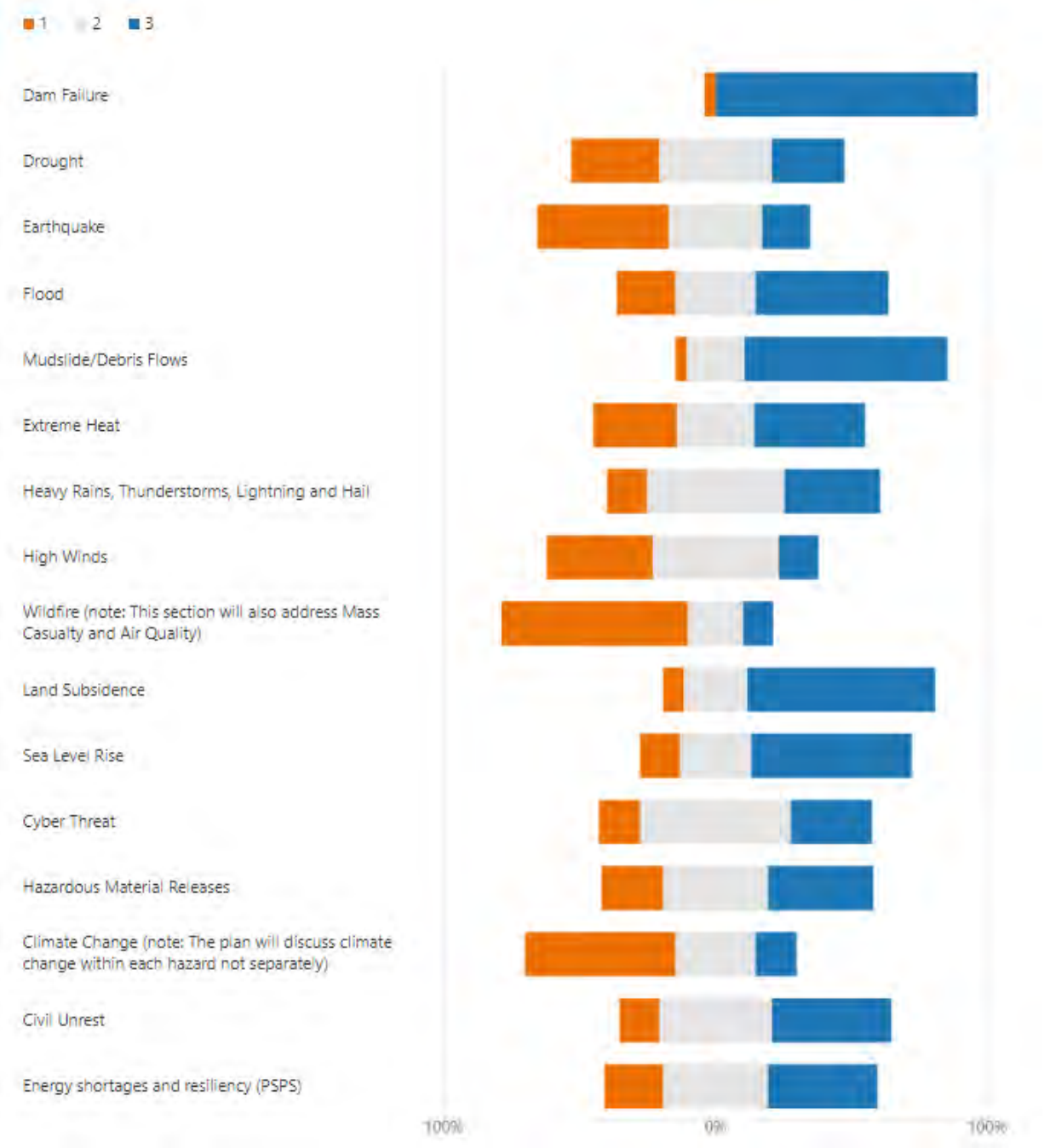
Online Survey

During the planning process and drafting stage, one web-based public survey was developed as a tool to gather public input. The survey was for the public to provide feedback to the HMPC on topics related to hazard concerns and reducing hazard impacts. The survey provided an opportunity for public input during the planning process and prior to finalization of the plan. The survey gathered public feedback on concerns about earthquakes, flooding, wildfires, climate change, and other hazards and solicited input on strategies to reduce their impacts. The first survey was released as on November 1, 2020 and closed on January 31, 2021 and (3-month comment period). The HMPC provided links to the public survey by distributing it using social media, email, and posting the link on the City's LHMP Webpage. 137 responses were received on the survey. This information was shared with the HMPC to inform the process.

The survey included a total of 10 questions. There was a short section of questions on demographics, specifically on whether participants were residents of the City or the unincorporated portion of Sonoma County outside the City of Sebastopol. These questions also inquired about homeownership and insurance; the questions are also intended to compile information on what segments of the population participated on the survey and where additional outreach efforts may be necessary. The next section included questions on ranking hazard significance. The results track with the significance levels noted in Chapter 4 of this plan, with flooding, wildfires, and climate change being considered the most significant. Public Safety Power Shutoffs (PSPS) and high wind events also ranked highly in significance based on the public input. The last section of the survey focused on questions related to mitigation actions that the City should consider in the plan. The results indicated that public education/awareness, planning/zoning,

floodplain management improvements, indoor/outdoor warning systems were popular topics to the public. These results were shared with the HMPC and considered during the planning process. Figure 3-5 shows an example of the responses from the survey. The full results of the survey are included in Appendix A.

Figure 3-5: Example of Public Survey Response



Social Media

The City of Sebastopol used the following social media platforms to circulate information on the LHMP:

- City Facebook (7,680+ followers);
- City Twitter (1,030+ followers); and

- City Nextdoor (1,000+ followers).

The three social media platforms announced the kick-off of the LHMP planning process, advertised the City's LHMP Webpage and other events, included a link to the online survey, notified the public about meetings and workshops, and announced the availability of the plan for public input and comment. Figure 3-6 and Figure 3-7 are examples of news feeds from the social media platforms: the City's Facebook and Nextdoor pages that announced the first public workshop. Figure 3-8 advertised the availability of the Public Review Draft LHMP.

Figure 3-6: Example on Announcement of Public Workshop #1 on City's Facebook Page

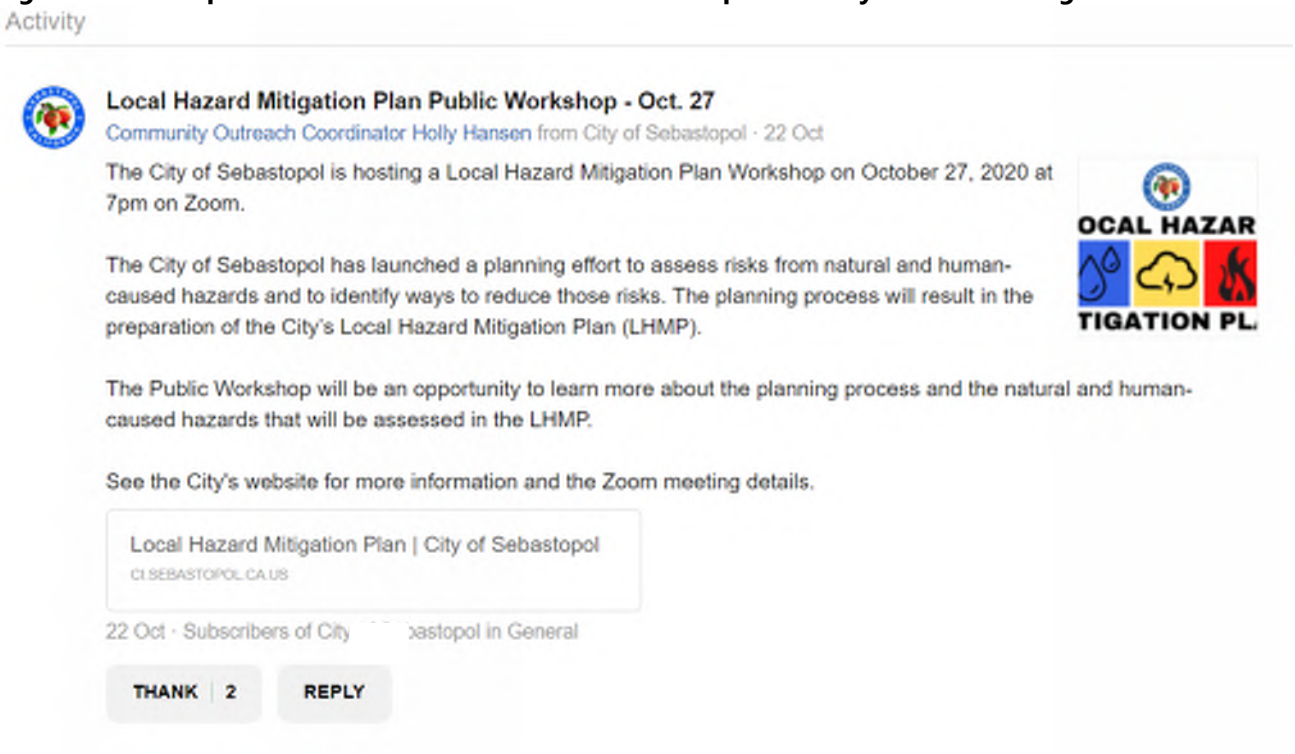


Figure 3-7: Notice of Public Workshop on City's Nextdoor Page



Newspapers

The following regional and local print newspapers were used to circulate and advertise information on the LHMP, specifically the announcement of the public workshop:

- Sonoma West Times & News; and
- Press Democrat.

Press Releases

The City was encouraged to distribute and circulate press releases over the course of the LHMP development. The City and Wood staff also encouraged HMPC participants and stakeholders to distribute press releases during the project. Press releases were distributed as informational flyers, advertisements, posters, and public notices handed out during community events. These communication platforms were used to spread the news about the LHMP and invite the public to participate in the process.

Advertisements and press releases announced the kick-off of the LHMP planning process, advertised the City's LHMP Webpage and other events, included links to the public survey, notified the public about workshops, and announced the availability of the plan for public input and comment. Press releases were distributed to multiple print and digital news agencies. Figure 3-8 is an example of a press releases and used to announce the public workshop in October 2020 and to notify the public about the LHMP update.

Figure 3-8: Press Release published prior to the 1st Public Meeting/Workshop

Public Notice Advertisement
FOR IMMEDIATE RELEASE
October 14, 2020
Contact: Kari Svanstrom, City of Sebastopol, Planning Director (707) 823-6167

CITY OF SEBASTOPOL LOCAL HAZARD MITIGATION PLAN
PUBLIC WORKSHOP

The City of Sebastopol has launched a planning effort to assess risks from natural and human-caused hazards and to identify ways to reduce those risks. The planning process will result in the preparation of the City's Local Hazard Mitigation Plan (LHMP). The preparation of a LHMP is required under the Federal Disaster Mitigation Act of 2000 as a prerequisite to be eligible to receive federal disaster assistance and funding.

Most people who live and work in the City of Sebastopol are vulnerable to a wide range of natural hazards, including earthquakes, flooding, and wildfires. The community may be exposed to potential human-caused hazards associated with facilities and infrastructure that contain hazardous materials. Climate change is also expected to intensify the impacts of natural hazards assessed in the plan. The LHMP will provide the City with valuable tools to identify risks and mitigate hazards through future project-specific actions and climate adaptation strategies. The plan will also support the City's participation in the National Flood Insurance Program and include recommendations to improve the City's floodplain policies and regulations.

The City will be hosting a Public Workshop during the regularly scheduled Planning Commission meeting on **Tuesday, October 27, 2020 at 6:00 p.m.** The Public Workshop will be an opportunity to learn more about the planning process and the natural and human-caused hazards that will be assessed in the LHMP. Following the Public Workshop presentation there will be an opportunity for the public to comment on the planning process and the Draft LHMP, which is anticipated to be available for public review by 2021. The community is encouraged to participate in the planning process by providing feedback during the virtual Public Workshop and visiting the City's LHMP webpage. Information on how to participate is provided below:

- Public Workshop – Tuesday, October 27, 2020, 6:00 p.m.

To participate review the meeting details: http://bit.ly/LHMPMeetingDetails and join the Zoom Meeting at: https://bit.ly/LHMPZoomMeeting, Meeting ID: 894 8333 0962, Passcode: 562564. Additional information on the planning process can be found on the City's LHMP Webpage: (https://ci.sebastopol.ca.us/City-Government/Departments-Services/Fire/Local-Hazard-Mitigation-Plan). Questions may be directed to Kari Svanstrom, Planning Director by calling (707) 823-6167 or by email at ksvanstrom@cityofsebastopol.org.

Public Review and Comments on the Draft LHMP

The City circulated the Public Review Draft LHMP for 30 days; it was posted on the City's LHMP Webpage and circulated from October 21, 2021, to November 19, 2021. The City solicited public input on the Draft LHMP by collecting and reviewing comments received during the public review period. Comments submitted during public review are summarized in this chapter and incorporated in the revised version of the Draft LHMP submitted to Cal OES and FEMA Region IX. Public comments received consisted of one written letter and several verbal comments made during the public meetings/workshops. General

comments consisted of relatively minor text errors and corrections, map updates related to critical facilities, flood risk in the City, and input on mitigation projects.

Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, the HMPC determined that data collection, mitigation strategy development, and plan approval would be greatly enhanced by inviting state and federal agencies and organizations to participate in the process. Based on their involvement in hazard mitigation planning, their landowner status in the County, and/or their interest as a neighboring jurisdiction, representatives from the following agencies were invited to participate on the HMPC:

- Graton Fire Protection District
- Sonoma County Department of Emergency Management
- City of Petaluma
- Sebastopol Union School District
- Sebastopol Area Senior Center
- Sebastopol Chamber of Commerce

Wood in coordination with the City and the HMPC also used technical data, reports, and studies from the following agencies and groups:

- American Red Cross
- California Department of Finance
- California Department of Fish and Game
- California Department of Forestry and Fire Protection (Cal Fire)
- California Department of Parks and Recreation Office of Historic Preservation
- California Department of Public Health
- California Department of Water Resources
- California OES
- California Geological Survey
- Sonoma County Department of Health Services Environmental Health and Safety Division
- USACE
- U.S. Center for Disease Protection
- U.S. Bureau of Land Management
- U.S. Bureau of Reclamation
- U.S. Fish and Wildlife Service
- U.S. Forestry Service
- U.S. Geological Survey
- U.S. Census Bureau
- Federal Emergency Management Agency
- National Weather Service
- National Oceanic and Atmospheric Administration, National Climatic Data Center
- National Resource Conservation Service

Several opportunities were provided for the above groups to participate in the planning process. At the beginning of the planning process, invitations were extended to the first group to actively participate on the HMPC and as a stakeholder representative to support the DMA planning process and to maximize credits under the NFIP CRS program if the City decides to participate in this program. Specific participants from these groups are detailed in Appendix C.

The City also provided various opportunities for Sonoma County and other neighboring communities, such as the City of Petaluma to participate in the City of Sebastopol LHMP update development. Others assisted in the process by providing data directly as requested in the Data Collection Guide or through data contained on their websites or as maintained by their offices. These groups were also invited to participate through the public outreach process, which included public workshops as previously described. Further as part of the HMPC and public outreach processes, all groups were invited to review and comment on the plan during public review and prior to submittal to Cal OES and FEMA.

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is paramount to the success of this plan. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. The City of Sebastopol uses a variety of comprehensive planning mechanisms, such as general plans and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this plan establishes a credible and comprehensive plan that ties into and supports other community programs. The development of this plan incorporated information from the following existing plans, studies, reports, and initiatives listed in Table 3-5. Other related planning efforts were inventoried in the capability assessment in Chapter 2.

Table 3-5: Incorporated Planning Mechanisms

City of Sebastopol Plans	How Plan is Incorporated in LHMP
City of Sebastopol General Plan Safety Element (2015)	• Incorporated relevant hazard information from the Safety Element (Chapter 8) into the LHMP. • Reviewed the Safety Element goals in HMPC Meeting #2 and developed new goals for the LHMP that were consistent and mutually reinforcing. • Reviewed the implementation program for the General Plan to determine if plan updates occurred, when, how often, and whether the next update can integrate the LHMP into the Safety Element. • Discussed whether the Planning Commission wanted to participate and provide a consistency review with the City's General Safety Element (and other elements). • Assembly Bill 2140 requires the adoption of LHMPs into the General Plan Safety Element after LHMP Approval; this topic was discussed during each HMPC meeting. • The LHMP emphasizes need to ensure General Plan is amended to include the LHMP after it is approved by City Council; this information is included in the chapter on the adoption process.
Zoning Ordinance	• Chapter 16.40, Design and Improvement Standards of the Municipal Code contains a range of requirements that pertain to lot design, circulation, drainage, and grading that also include specific standards for fire protection, scenic areas, resources areas, and soil investigation. Chapter 16.40.110 requires mitigation for the protection and preservation of natural landforms. Chapter 16.40.120 requires protections for natural resources, such as riparian areas, wildlife areas, cultural resources sites, and wetland and water bodies through project design, setbacks, resource management plans, and mitigation. • The HMPC reviewed these existing zoning requirements during HMPC Meeting #3 to develop new actions that exceeded existing requirements.
Growth Management Ordinance	• The City's Growth Management Program was established by the 1994 General Plan, which also established the UGB – the line beyond which development will not be allowed, except for public parks and public schools. The UGB was renewed for another 25 years with the adoption of the 2015 General Plan. The City's HMPC reviewed both the SOI and UGB (both areas share mostly similar boundaries) to determine the best "planning area" for the City's LHMP and selected the SOI.
NFIP Participation (1980)	• The City of Sebastopol has participated in the NFIP since June 8, 1980 by administering floodplain management regulations; the current effective map date is March 7, 2017. • The LHMP integrates information in the risk assessment on the most recent Flood Insurance Study (FIS) completed for Sonoma County on March 7, 2017. • Reviewed DFIRMS and base flood elevation (BFE) data for critical facilities and properties identified within the flood hazard zones.

City of Sebastopol Plans	How Plan is Incorporated in LHMP
	• Reviewed Repetitive Loss and Severe Repetitive Loss information from the Community Information System (CIS) and discussed the benefits of joining the CRS while also taking into account the low number of policy holders in the City (37 flood insurance policies).
Floodplain Ordinance	• Articles I through V, the Flood Damage Prevention and Provisions for Flood Hazard Reduction in Chapter 15.16 of the City's Zoning Code contain standards of construction for all areas of special flood hazards, such as elevating structures two feet above the BFE, which goes beyond the minimum NFIP standards. The HMPC reviewed and discussed these standards during HMPC Meeting #3. • Chapter 15 of the Sebastopol Municipal Code establishes the special flood hazard areas (SFHAs) in the City based on the March 7, 2017 Flood Insurance Study (FIS) for the City of Sebastopol and accompanying Flood Insurance Rate Maps (FIRMs) and flood boundary and floodway maps (FBFMs). It limits development of projects in the SFHA unless the project demonstrates flood management facilities will protect the project to the level of flood protection, implements conditions on the permit or project entitlement that protect the project to standard flood protection standards. These standards were also reviewed during the development of new mitigation actions in an effort to enhance the floodplain management activities in the City's LHMP.
City of Sebastopol Fire-Year Capital Improvement Plan: 2015 – 2020 (2021-2026 Update was underway during LHMP planning process)	• The CIP is a long-range plan that identifies capital projects, provides a planning schedule and identifies options for financing. It is considered the link between the project priorities of the City Council and the City's annual budget. • The CIP was reviewed to understand the prioritized projects the City wished to implement over the past five years (2021 – 2026 CIP was under development during this planning process) and to understand existing capabilities. These projects were reviewed during HMPC Meeting #3 to inform the development of new mitigation actions. Subsequent monthly follow-up meeting with the HMPC and City staff were organized to ensure the two plans were consistent and contained complementary projects. • Information from the CIP was also aggregated into the LHMP and supported by additional project information and programs outlined in the City's General Plan, Utility Master Plans (Sewer, Water and Storm Drain Master Plans [2006]), and other goal-oriented planning documents. • Completed projects are cross referenced in the LHMP in some instances as they related to hazard mitigation (solar installations, sewer/pump station replacement, park improvements, groundwater studies, groundwater management plans, new wells [Well 8]). • Projects that were tied to water supply and addressed mitigation of drought hazards were reviewed, as well as information on the City's water and well production and distribution system. This information was integrated into the Risk Assessment and mitigation action planning session. • The City's Public Works Superintendent also discussed the CIP and integration with the LHMP as it related to the City's sanitary sewer collection system and the 14-inch main line that conveys wastewater to the City of Santa Rosa Wastewater Treatment Facility.
City of Sebastopol Community Water System Emergency Response Plan (2020)	• The City's Emergency Response Plan (ERP) was completed in 2020; it addresses utility information and summarizes protocols on actions that must be taken during a hazard incident. It covers all utility information, including the City's pumping and storage facilities, water treatment

City of Sebastopol Plans	How Plan is Incorporated in LHMP
	facilities, and pump stations. The City's four wells are noted, as well as the chemical storage facilities in Sebastopol. • The ERP was reviewed during the development of new mitigation actions to ensure the plan information is incorporated into the new mitigation actions, and matches the critical facilities evaluated in the Risk Assessment.
City of Sebastopol Emergency Operations Plan (No Date)	• The EOP is a basic plan that addresses the City of Sebastopol's responsibilities in emergencies associated with natural disaster, human-caused emergencies, and technological incidents. It provides a framework for coordination of recovery efforts within the City. • The EOP was discussed at most HMPC meetings given it is outdated and needs to address current hazard issues in the City, especially because the Emergency Operation Center (EOC) has been activated over the past few years due to flooding, wildfires, and PSPS.
Climate Emergency Resolution (2019)	• The City Council adopted a climate emergency resolution in November 2019. The City established a Climate Subcommittee of the City Council to evaluate and propose actions to reduce GHG emissions and increase climate resilience and adaptation. The City asked the Climate Subcommittee (also referred to as the Climate Action Committee [CAC]) to review the Public Review Draft LHMP.
Laguna Santa Rosa Master Restoration Plan	• The Laguna Santa Rosa Master Restoration Plan (also referred to as the Restoration VISION for the Laguna Santa Rosa) details the restoration vision for the Laguna that incorporates the best available science, landscape change over the past 200 years, projected climate change impacts, and known constraints associated with restoration. • The plan was reviewed to understand the increased stormwater runoff and flooding issues associated with the waterway, as one of the first steps in the development of the plan was the vision for the 100-year floodplain. Any infrastructure redesign goals associated with the plan could benefit floodplain management within the City of Sebastopol. • The LHMP incorporates future flood flow information on the Laguna based on the four downscaled global climate models (GCMs) considered by the State and summarized in the Master Restoration Plan. These models show an increase in both the average and maximum number of days per decade the Laguna flows reach 6,000 cubic feet per second (cfs).
Other Plans	
Sebastopol Municipal Services Review (2006)	• The City of Sebastopol's 2006 Municipal Services Review (MSR) identifies the future needs for the extension of infrastructure and the provision of services from the City to new development within the planning horizon. • This plan was reviewed to ensure facility and infrastructure needs were integrated into the LHMP and were consistent to the needs outlined in the City's CIP (current MSR references to the City's budget and CIP in the plan are based on 2005-2006 City budget and capital improvement information). • The plan provides information on the City's facilities and infrastructure and staff could compare facility lists to understand what is include in the LHMP and what facility was not included and why. • The 2006 MSR was also reviewed to provide information to the City on the selection of the "planning area" for the LHMP given it provided detailed descriptions and maps of the City limits, SOI, and UGB. • The LHMP notes that the City's ability to serve the anticipated growth within the SOI is not anticipated to have any adverse effects on the City,

City of Sebastopol Plans	How Plan is Incorporated in LHMP
	as there are mechanisms in place to effectively expand facilities and services.
Sonoma County Operational Area Hazard Mitigation Plan (2016)	• Hazard profile information from the 2016 Sonoma County Operational Area HMP was incorporated throughout the LHMP, where appropriate; this included information on flooding, landslides, and earthquake hazards. • HMPC reviewed the Sonoma County Operational Area HMP goals during the development of the City of Sebastopol LHMP goals and objectives. • There are comparative tables on the hazards profiled in the state and county plan to those addressed in the Safety Element of the City's General Plan. This information was helpful for the HMPC to compare which hazards to address and which to prioritize. • Sonoma County stakeholder from the Department of Emergency Management participated in the HMPC meetings and provided mitigation goals and action strategies to consider developing in the City's LHMP. • Sonoma County intends to update their plan in 2021; this provides the City with another opportunity to participate with hazard mitigation planning efforts in the region.
California State Hazard Mitigation Plan (2018)	• Reviewed goals and objectives in the State Hazard Mitigation Plan (SHMP) and noted the new and revised hazards related to community resilience • Reviewed the hazards profiled in the SHMP and compared those with the hazards summarized in the City's 2016 Safety Element and the 2016 Sonoma County Operational Area HMP. • Integrated disaster declaration information and other key findings on major hazards from the SHMP into the City's LHMP Update. • Under 44 CFR Section 201.6, LHMPs must be consistent with the SHMP. In updating this plan, HMPC and Wood staff reviewed California's SHMP to identify key relevant state plan elements. • Climate change is expected to intensify existing hazards in the City. Consistent with the organization of the 2018 California SHMP, the City and HMPC integrated a discussion of climate change hazards and considerations throughout the hazard profiles in the Risk Assessment.
Santa Rosa Plain Groundwater Sustainability Agency Draft Groundwater Sustainability Plan (2020)	• The 20-year Groundwater Sustainability Plan (GSP) ensures the sustainable use of groundwater within the Santa Rosa Plain Groundwater Basin (City's water supply also comes from the Wilson Grove Formation area, which is part of the Petaluma Valley Groundwater Sustainability Agency. • The plan establishes standard groundwater management tools and incorporates best available scientific and technical information by building on the technical foundation established for the Santa Rosa Plain. • The plan integrates the interests of many users and uses of groundwater resources and is cross referenced in the LHMP Risk Assessment. The Risk Assessment notes the relatively stable groundwater conditions in the Wilson Grove basin and adjacent areas of the Santa Rosa Plain groundwater basin where the City operates their groundwater wells. This information was reviewed during the development of the City's LHMP goals and mitigation actions to ensure they aligned with the GSP.

Other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. Appendix B References identifies additional documents and community planning efforts utilized in the development of this plan. Specific references relied on in the development of this plan are also sourced throughout the document as appropriate.

3.3.2 Phase 2: Assess Risks

Planning Steps 4 and 5: Identify the Hazards and Assess the Risks

Wood led the HMPC in a comprehensive research effort to identify and document all the hazards that have, or could, impact the City's Planning Area. Data collection worksheets were developed and used in this effort to aid in determining hazards and vulnerabilities and where risk varies across the Planning Area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities. The HMPC conducted a capability assessment to review and document the Planning Area's current capabilities to mitigate risk and vulnerability from hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC could assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. Using this information, Wood developed the risk assessment portion of the plan, which contained the hazard identification, the vulnerability assessment, and the capability assessment. Wood completed the risk assessment in January 2021 and the information was presented at the second HMPC meeting on February 2, 2021. A more detailed description of the risk assessment process and the results are included in Chapter 4 Risk Assessment. The risk assessment also included a vulnerability assessment on flooding and increased risk due to climate change.

3.3.3 Phase 3: Develop the Mitigation Plan

Planning Steps 6 and 7: Set Goals and Review Possible Activities

Wood facilitated brainstorming and discussion sessions with the HMPC on March 23, 2021, including a description of the purpose and process of developing planning goals, as well as discussion of a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. Additional details of the process to develop goals and actions is included in Chapter 5 Mitigation Strategy. Documentation on the process the HMPC used to develop the goals and strategy is in Appendix C.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC during the March 23, 2021 meeting and from subsequent review of the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, the City (with support from Wood) produced a complete first draft of the plan. This complete draft was internally circulated for HMPC review and comment in May 2021. HMPC and agency comments were integrated into the second draft in June 2021.

Public Review Draft LHMP

The Public Review Draft LHMP was advertised and distributed to collect public input and comments. The City circulated the Public Review Draft LHMP for 30 days from October 21, 2021 to November 17, 2021. During this time, Wood integrated comments and issues from the public and stakeholders, as appropriate, along with additional agency and other stakeholder internal review comments. During the public review period, the City received one comment from the public. This public comment is briefly summarized in Table 3-6. Additional comments were also collected from the Planning Commission and Climate Action Commission related to public health hazards, climate change, and recent amendments to the County's climate strategy.

Table 3-6: Summary of Comments Received during Public Review

Comment	Response
Written Comment #1 (Paul Fritz)	
• An email pointed out various minor typographical errors in the LHMP text.	• The City revised the text in the LHMP to address the minor errors.

Wood produced a final draft LHMP in December 2021 for Cal OES and FEMA Region IX staff to review and approve, contingent upon final adoption by Sebastopol City Council.

3.3.4 Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the plan, the plan will be reviewed by the Planning Commission and adopted by the Sebastopol City Council on the dates included in the corresponding resolution in Appendix D: Adoption Resolution.

Planning Step 10: Implement, Evaluate, and Revise the Plan

The true worth of any mitigation plan is in the effectiveness of its implementation. In the previous steps of the planning process the HMPC's efforts have been directed at researching data, gathering information for the plan, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead entity and possible funding sources, to help initiate implementation. An overall implementation strategy for the City's LHMP is described in Chapter 7 Plan Implementation and Maintenance.

Finally, there are numerous organizations within the City of Sebastopol's Planning Area whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is key to the ongoing success of this plan and mitigation in the City of Sebastopol and is addressed further in Chapter 7. A plan update and maintenance schedule and a strategy for continued public involvement are also included in Chapter 7.

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4 Risk Assessment

44 U.S. Code of Federal Regulations Requirement §201.6 Local Mitigation Plans (c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

As defined by the Federal Emergency Management Agency (FEMA), risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

A key step in preventing disaster losses in the City of Sebastopol's Planning Area is developing a comprehensive understanding of the City's hazards, vulnerabilities, and risks. The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards, as well as the vulnerabilities of a community. The process allows for a better understanding of a jurisdiction's potential risk to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events. Environmental and social impacts are taken into consideration wherever possible. The following terms are used throughout the Local Hazard Mitigation Plan (LHMP).

- **Hazard:** Event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, damage to the environment, interruption of business, other types of harm or loss.
- **Vulnerability:** Degree of susceptibility to physical injury, harm, damage, or economic loss; depends on an asset's construction, contents, and economic value of its functions.
- **Risk:** The potential for damage, loss, or other impacts created by the interaction of hazards with vulnerabilities.

The relationship between hazards, vulnerabilities, and risk is depicted in Figure 4-1. This risk assessment covers the entire geographical extent of the City of Sebastopol Sphere of Influence (SOI) boundary, herein referred to as the City's Planning Area. The Hazard Mitigation Planning Committee (HMPC) agreed that the City's Planning Area for the LHMP should include the SOI.

Figure 4-1:Risk Graphic



This risk assessment followed the methodology described in the FEMA *Local Mitigation Planning Handbook* (FEMA 2013a), which breaks the assessment into a four-step process:

1. Describe hazards
2. Identify community assets
3. Analyze risks
4. Summarize vulnerability

In other words, this risk assessment evaluates potential loss from hazards by assessing the vulnerability of the City's critical facilities, buildings, and infrastructure. Data collected through this process has been incorporated into the following sections of this chapter:

- **Section 4.1 Hazard Identification** profiles the natural hazards that threaten the City's Planning Area and describes why some hazards have been omitted from further consideration.
- **Section 4.2 Asset Summary** describes the methodology for determining vulnerability of the Planning Area to the identified hazards.
- **Section 4.3 Hazard Profiles and Risk Assessment** discusses the threat to the Planning Area and describes previous occurrences of hazard events and the likelihood of future occurrences. All the hazards identified in Section 4.1 are profiled and assessed individually in this section. Research and information from the City's HMPC are integrated into this section. This section also includes the identified vulnerability to each of the priority hazards, describing the impact that each hazard would have on the City. The vulnerability assessment quantifies (to the extent possible) using best available information, assets at risk to hazards and estimates potential losses.
- **Section 4.4 Human-Health and Human-Caused Hazards** identifies the hazards that threaten the City's Planning Area resulting from public health hazards and hazardous material incidents.
- **Section 4.5 Hazards Summary** summarizes the results of the hazard identification and hazard profiles for the Planning Area based on the hazard identification data and input from the HMPC.

This assessment qualitatively discusses critical facilities within the City's water and wastewater service area that extend beyond the City's SOI to ensure that all the City's facilities are infrastructure and essential services are addressed in the risk assessment because some of these facilities were located outside the City's Planning Area. Additional information on the City's Planning Area as it pertains to this plan is provided in Chapter 2: Community Profile.

4.1 Hazard Identification: Natural and Human-Caused Hazards

44 U.S. Code of Federal Regulations Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the jurisdiction.

The first step in developing a risk assessment is identifying the natural hazards. The HMPC conducted a hazard identification study to determine the hazards that threaten the City's Planning Area. The identification of human-health and human-caused hazards is summarized in Section 4.4.

4.1.1 Methodology and Results

Using existing natural hazards data and input gained through planning meetings, the HMPC agreed upon a list of natural and human-caused hazards that could affect the City of Sebastopol (City). Hazards data was examined to identify and assess the significance of these hazards to the Planning Area. The sources of data included information from the California Office of Emergency Services (Cal OES), FEMA, the National Oceanic and Atmospheric Administration (NOAA), Sonoma County Office of Emergency Management, and other sources as referenced in this assessment. The assessment also relied on the City's *2010 LHMP Taming Natural Disasters* plan prepared by the Association of Bay Area Governments (ABAG) (referred to

as the City's 2010 LHMP Annex), relevant City planning documents, such as the *Sebastopol General Plan Safety Element*, and adopted hazard mitigation plans in the region.

Table 4-1 below provides a crosswalk of the hazards identified in the *Sebastopol General Plan*, *2010 LHMP Annex*, *2016 Sonoma County Operational Area Hazard Mitigation Plan*, *2018 Sonoma County Water Agency LHMP*, and *2018 California State Hazard Mitigation Plan (SHMP)* (City of Sebastopol 2016; ABAG 2020; Sonoma County 2017; Sonoma Water 2018; Cal OES 2018). Numerous hazards were identified in the state and County plan, including two natural hazards identified in the *Sebastopol General Plan Safety Element*. Natural hazards discussed in this element included seismic and geologic hazards and flooding. Human-caused hazards discussed in the Safety Element included the use, storage, and transport of hazardous materials. Water supply and fire protection services are addressed in the Community Services and Facilities Element. Air pollution is addressed in the Conservation and Open Space Element. In summary, the crosswalk was used to develop a list of preliminary hazards for the HMPC to evaluate which were most relevant to the City's Planning Area.

The significance of each hazard was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths, injuries, and property and economic damage. The natural and human-caused hazards evaluated as part of this plan include those that occurred in the past or have the potential to cause significant human and/or monetary losses in the future.

Table 4-1: Crosswalk with Other Hazard Mitigation Plans

Hazard	Sebastopol General Plan (2016)	ABAG LHMP City of Sebastopol Annex Plan (2010)	Sonoma County Operational Area HMP (2016)	Sonoma County Water Agency LHMP (2018)	California SHMP (2018)
Natural, Human-Health, and Climate and Weather-Influenced Hazards					
Agricultural and Silvicultural Pests and Diseases					√
Air Pollution	√				√
Aquatic Invasive Species					√
Avalanches					√
Dam Incidents/Failure		√		√	
Drought and Water Shortage	√	√		√	√
Climate Change			√	√	√
Earthquake and Geologic Hazards		√	√	√	√
Energy Shortage and Energy Resiliency					√
Epidemic/Pandemic/Vector-Borne Disease					√
Flood: 100-, 200-, 500-Year Events	√	√	√	√	√
Sea Level Rise				√	√
Severe Weather: Extreme Heat		√		√	√
Severe Weather: Heavy Rain/Thunderstorm/Lightning/ Hail/Fog		√		√	√
Severe Weather: Wind		√		√	√

Hazard	Sebastopol General Plan (2016)	ABAG LHMP City of Sebastopol Annex Plan (2010)	Sonoma County Operational Area HMP (2016)	Sonoma County Water Agency LHMP (2018)	California SHMP (2018)
Tree Mortality					√
Tsunami				√	
Volcano					√
Wildfire/Fire Protection	√	√	√		√
Technological Hazards					
Hazardous Materials Release	√				√
Oil Spills	√				√
Natural Gas Pipeline Hazards					√
Radiological Accidents					√
Transportation Accidents					√
Threat and Disturbance Hazards					
Terrorism				√	√
Cyber Threats				√	√
Civil Disorder					√

1. Hazards listed is based on the natural, technological, and human-caused hazards in the California SHMP.

In alphabetical order, the natural hazards identified and investigated for the City of Sebastopol 2021 LHMP include:

- Dam Incidents
- Drought
- Earthquake
    - Surface Rupture
    - Ground Shaking
    - Liquefaction
    - Subsidence
    - Landslides
- Flooding
- Severe Weather: Heavy Rain/Thunderstorm/Hail/Lightning
- Severe Weather: Extreme Heat
- Severe Weather: Wind
- Wildfire

The human-health and human-caused hazards identified and investigated for the City of Sebastopol 2021 LHMP include:

- Public Health Hazards (Epidemic/Pandemic/Vector-Borne Disease)
- Hazardous Material Incidents: Hazard Material Releases, Chemical Facilities, Gas Pipelines

Based on discussions at the early planning meetings and preliminary analyses, the following natural and human-health hazards were eliminated from further consideration in this risk assessment because of a

lack of past occurrences in the City or based on minimal potential impacts. Certain hazards were also eliminated based on separate State and Sonoma County regulatory programs and planning documentation that thoroughly addresses the hazard profile.

- Agricultural Hazards
- Air Pollution
- Aquatic Invasive Species
- Avalanches
- Civil Unrest/Civil Disturbance
- Energy Shortage and Energy Resiliency (integrated in the Extreme Weather: Winds vulnerability assessment)
- Tree Mortality (integrated into the Drought vulnerability assessment)
- Terrorism
- Tsunami
- Volcano

Sebastopol is a semi-urban city surrounded largely by rural land uses in the unincorporated portion of Sonoma County that consist of both agriculture and open space. According to the *Sebastopol General Plan* and General Plan Update Draft Environmental Impact Report (EIR), as of 2015 there were approximately 77 acres of designated agricultural land within the city limits (City of Sebastopol 2016). Most of the designated agricultural land outside the city limits is within the Sonoma County Agricultural Preservation and Open Space District (SCAPOSD) or consists of private agricultural and grazing lands. Land within the SCAPOSD is designated as greenbelt agriculture, priority greenbelt, priority riparian corridors, wetland priority areas, and priority recreation areas. While other land uses include farms, dairies, livestock ranches, and vineyards, the greenbelt land uses function as a separation between urban areas and active farming areas, thereby minimizing agricultural hazards and nuisances in the City.

Air quality and emissions within the Bay Area are generated by a variety of sources, including stationary sources, such as fireplaces and heating systems to mobile sources, such as vehicles and truck traffic. The Bay Area Air Quality Management District (BAAQMD) is the regional agency with the authority to develop and enforce regulations for the control of air pollution throughout the Bay Area. The Clean Air Plan is the BAAQMD's triennial plan for reducing air pollutant emissions in the Bay Area. The Bay Area is considered in "attainment" for all of the national standards of carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, and particulate matter, with the exception of ozone. Given there are federal, state, and local laws and regulations in place for controlling air pollution and minimizing greenhouse gas (GHG) emissions, in addition to air quality management plans administered by the California Air Resources Board and BAAQMD, air pollution hazards and GHG emissions are not addressed in this plan.

Aquatic invasive species are non-indigenous species transported to new environments through human activities. The introduction of non-indigenous species into Sebastopol's marine, estuarine, and freshwater environment can cause economic, human health, and ecological impacts. Invasive aquatic plants, such as water hyacinth has clogged the waterways in the California Delta, and invasive aquatic plants, such as water primrose impact water quality within the Russian River, and Laguna Santa Rosa has a high percentage of introduced aquatic species (Laguna Foundation, No Date). Known past occurrences related to aquatic invasive species in the City were mostly identified at the Laguna Wetlands Preserve along the Laguna Santa Rosa River, both within and outside the Planning Area (Laguna Foundation, No Date). Algae, also known as cyanobacteria can also be found in water environments such as the Laguna Santa Rosa. When high temperatures and increased nutrient levels in the water occur, algae and other invasive species can grow, and some algal blooms can produce toxins that can be harmful to humans and animals. The Laguna is listed as impaired with the U.S. Environmental Protection Agency (US EPA) for indictor bacteria.

For these reasons, the consumption of aquatic wildlife from the Laguna Santa Rosa is not recommended. This hazard is currently addressed by the Sonoma County Department of Health Services (DHS), Environmental Health and Safety Public Health Division. The Division regularly tests water bodies in the County for aquatic invasive species, and specifically algae blooms at various beach and river park locations throughout the County. Given County monitoring programs are in place, this hazard was not addressed in this plan.

Avalanches and volcano hazards were not addressed in this plan. The City does not receive snowfall to have avalanche hazards and according to the 2018 California SHMP, only ten volcanic eruptions have occurred in California in the last 1,000 years and the likelihood of another eruption in the state is low (Cal OES 2018). Of the 20 volcanoes in the state, only a few are active and pose a threat (Cal OES 2018). Of these, the Clear Lake Volcano is the closest volcano to the City, and while it has been known for substantial geothermal activity, there are no past occurrences associated with the volcano. Given this volcanic field is approximately 80 miles to the north, volcano hazards were not addressed in this plan.

Energy shortage hazards can include energy disruptions related to electricity, renewable energy, natural gas, and gasoline and diesel fuels. Based on these energy types, electrical power outages, both planned and unscheduled disruptions can result in cascading hazards related to traffic, economic losses, other utility disruptions, and extreme heat and public health hazards. Climate change is also expected to bring more frequent and intense natural disasters, which could put greater strain on Pacific Gas & Electric's (PG&E's) electricity grid and in turn result in planned or unscheduled power outages or energy shortages and related social and economic disruptions. Given the PG&E's Public Safety Power Shutoff (PSPS) that began in October 2019, energy shortage hazards are a major concern for the region and the City and the City is interested in improving the continuity of operations during such events to enhance the community's energy resiliency and reduce energy consumption. Energy shortages are discussed as a secondary hazard impact in the vulnerability assessment in the Severe Weather: Wind section of this chapter.

Drought conditions can cause increased tree mortality associated with lack of moisture, pest infestations, and other drought-related issues. Tree mortality is discussed as a subsection of wildfire hazards and as a secondary hazard.

Based on the U.S. Geological Survey (USGS) Tsunami Inundation Map for Emergency Planning (CalOES 2009; CGS 2009; and USC 2009) and the Sonoma County Tsunami Inundation Maps, the City of Sebastopol is situated approximately 30 miles upstream of the San Pablo Bay and approximately 20 miles east of the Bodega Head – Valley Ford area along the Sonoma Coast, two areas susceptible to tsunami hazards (CalOES 2008; CGS 2009; USC 2009). Based on this information, tsunami and coastal erosion hazards were not further analyzed in this plan.

Other human-caused hazards, such as terrorism, and civil unrest or disturbances were considered and discussed during HMPC meetings, and while Sebastopol has an active and engaged community and frequent political protests, based on HMPC input none of these protest events have resulted in civil unrest, disorder, or terrorism concerns over the past two decades. Therefore, civil unrest was not discussed in detail in this plan.

The following technological and human-caused hazards were eliminated from further analysis in the City of Sebastopol LHMP because they are either addressed as secondary impacts associated with other hazards (e.g. earthquakes) or because they are addressed in other City plan documents (e.g. General Plan Transportation Element):

- Oil Spills
- Radiological Accidents

- Transportation Accidents

Gas pipeline hazards are addressed as a secondary hazard associated with earthquakes in the vulnerability assessment and further addressed in the Hazardous Material Incidents section. Oil spill and radiological accidents were not further evaluated in this plan, as there are few oil pipelines or oil wells in the City, and few areas at risk to radiological accidents according to the HMPC. Both these pipeline hazards are also currently addressed in Hazardous Materials Business Plans (HMBPs), which are managed by Sonoma County's Certified Unified Program Agency (CUPA). The purpose of the HMBPs is to protect public health and the environment from risks or adverse effects associated with the storage and transport of hazardous materials, such as natural gas, oil, and other materials.

4.1.2 Overall Hazard Significance Summary

Overall hazard significance was based on a combination of geographic extent, probability of future occurrences, and potential magnitude/severity. Climate change considerations are discussed qualitatively in each hazard profile, specifically on whether it is anticipated to have a low, medium, or high influence on future impacts. The individual ratings shown in Table 4-2 are based on or interpolated from the analysis of the hazards in the sections that follow.

Table 4-2: City of Sebastopol Hazard Significance Summary

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Overall Significance
Earthquake	Extensive	Likely	Catastrophic	High
Flooding	Significant	Likely	Limited	Medium
Wildfire	Limited	Occasional	Limited	Medium
Drought	Significant	Likely	Limited	Medium
Dam Incidents	Limited	Unlikely	Negligible	Low
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium
Severe Weather: Heavy Rain/Thunderstorms/Hail/Lighting	Extensive	Likely	Limited	Medium
Severe Weather: High Winds	Extensive	Likely	Limited	Medium
Public Health Hazards	Extensive	Likely	Critical	High
Hazardous Material Releases	Limited	Likely	Negligible	Low

Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	**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, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid
Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.	

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Overall Significance
		Overall Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

FEMA's Hazus 4.2 Loss Estimation Tool

Hazus Multi-Hazard Loss Estimation tool (Hazus-MH) is FEMA's standardized method for modeling and estimating potential losses from earthquakes, tsunamis, floods, and hurricanes. For the purposes of this plan, Hazus Version 4.2 was used with Geographic Information System (GIS) software to estimate economic and social impacts from the occurrence (or potential occurrence) of flood and earthquake hazards (FEMA 2018a).

Hazus-MH provides tabular outputs as well as graphic and illustrative results of identified high-risk areas due to the profiled hazards of interest, with reports summarizing losses or damages from structures and critical facilities, populations affected or at risk, and debris generated from an event. Hazus 4.2 is a key component of the pre-disaster planning process and is used for mitigation and recovery, given its ability to estimate potential losses and damages on a city, county, and multi-regional context. For this LHMP, Hazus-MH was used to estimate effects from a probabilistic 2,500-year earthquake scenario as well as a USGS ShakeMap-based deterministic scenario, and the software is referenced in the flooding section to point out methodologies applied to the vulnerability assessments as indicated in Hazus-MH loss calculation procedures (e.g. the FEMA flood depth damage functions per the Benefit Cost Analysis application) (FEMA 2018b). For more information on the earthquake scenarios processed with Hazus 4.2, refer to the Section 4.3.1 Earthquakes and for information on the flood analysis, refer to Section 4.3.2.

4.1.3 Disaster Declaration History

One method the HMPC used to identify hazards was researching past events that triggered federal and state emergency or disaster declarations in the Planning Area. Federal and state disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments' capacities are exceeded, a federal presidential emergency or disaster declaration may be issued allowing for the provision of federal assistance to help disaster victims, business, and public agencies.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), or the Small Business Administration (SBA). FEMA also issues emergency declarations which are more limited in scope and without the long-term federal recovery programs of major disaster declarations (Farm Service Agency 2021). The quantity and types of damage are the determining factors in the type of declaration issued. This section focuses on state and federal disaster and emergency declarations.

The City is among many communities in California that are susceptible to disaster. Details on federal and state disaster declarations were obtained by the HMPC, FEMA, and Cal OES and compiled in chronological order in Table 4-3.

Table 4-3: Sebastopol and Sonoma County State and Federal Disaster Declarations, 1950-2020

Event/ Hazard	Year	Disaster #	Declaration Type
Heavy Rains and Flooding	1964	183	Major Disaster Declaration
Severe Storms and Flooding	1969	253	Major Disaster Declaration
Drought	1977	3023	Emergency Declaration
Flood	1982	651	Major Disaster Declaration
Coastal Storm	1983	677	Major Disaster Declaration
Flood	1986	758	Major Disaster Declaration
Freeze	1991	894	Major Disaster Declaration
Flood	1993	979	Major Disaster Declaration
El Niño - Fishing Losses	1994	1038	Major Disaster Declaration
Flood	1995	--	Local Emergency
Flood	1995	--	Local Emergency
Winter Storm	1995	--	Local Emergency
Severe Storm(s)	1995	1044	Major Disaster Declaration
Severe Storm(s)	1995	1046	Major Disaster Declaration
Cavedale Fire	1996	--	Local Emergency
Jenner Sand Barrier	1996	--	Local Emergency
Severe Storm(s)	1997	1155	Major Disaster Declaration
Flood	1997	--	Local Emergency
Severe Storm(s)	1998	1203	Major Disaster Declaration
Flood	1998	--	Local Emergency
Severe Storm(s)	1999	--	Local Emergency
Severe Storm(s)	2002	--	Local Emergency
Geysers Fire	2004	2554	Fire Management/Local Emergency
Flood	2005	--	State and Federal Disaster Declaration
Severe Storm(s)	2006	1646	Major Disaster Declaration
San Francisco Bay Oil Spill	2007	--	Gubernatorial Declaration
H1N1 Influenza Pandemic	2009	--	Local Emergency
Great Tohoku Tsunami	2011	--	Gubernatorial Declaration
Drought	2014-2016	--	Gubernatorial Declaration
South Napa Earthquake	2014	4193	Major Disaster Declaration
Severe Storm(s)	2014	--	Local Emergency
Valley Fire	2015	4240	Major Disaster Declaration
Severe Storm(s)	2017	4301	Major Disaster Declaration
Flood	2017	4308	Major Disaster Declaration
Wildfires	2017	4344	Major Disaster Declaration
Wildfires and High Winds	2018	4382	Major Disaster Declaration
Severe Winter Storm(s), Flooding, Landslides, Mudslides	2019	4431	Major Disaster Declaration
Severe Winter Storm(s), Flooding, Landslides, Mudslides	2019	4434	Major Disaster Declaration
COVID-19	2020	4482	Major Disaster Declaration
Wildfires	2020	4558	Major Disaster Declaration
Wildfires	2020	4569	Major Disaster Declaration

Sources: FEMA Disaster Designation Information 2020; 2018 California State Hazard Mitigation Plan; 2016 Sonoma County Hazard Mitigation Plan

Most disaster declarations are issued on a county-wide basis. In some limited instances a city or area within a county is specifically designated. Sonoma County has received 41 declarations between 1964 and 2020, 24 of which received federal disaster declarations, 4 received a Gubernatorial Declaration, 11 were local emergency declarations and 1 for fire management assistance. Of the 41 disaster declarations, 11 were associated with severe storms and heavy rain (also includes the 1 coastal storm event), 9 associated with flooding, and 5 declarations related to wildfires; freeze, earthquake and pandemic all received 1 declaration. The County also received 1 declaration related to fishing losses, 1 related to the Cosco Busan oil spill in San Francisco Bay, and 1 related to the 2011 Japan Tsunami.

Since 1976, there have been 17 drought declarations issued by the Secretary of Agriculture for Sonoma County, 10 of which were "Fast Track Secretarial Disaster" designations; refer to Section 4.3.4 on drought hazards for more details on previous occurrences of drought events. According to the Secretary of Agriculture, a Fast Track designation is for a severe drought and provides an automatic designation when any portion of the county meets the severe drought intensity value for eight consecutive weeks during the growing season.

This combined federal and state disaster history suggests that Sonoma County (and the City of Sebastopol) experiences a major event worthy of a disaster declaration every 1.9 years. The County has a 39 percent chance of receiving a disaster declaration in any given year. Further, a review of these events helps the City identify risk reduction targets and ways to improve their capabilities to avoid large-scale hazard events in the future.

4.1.4 Climate Change Considerations Summary

Climate change is an increasingly important factor now affecting all phases of the disaster management cycle. The City of Sebastopol and Sonoma County acknowledge that climate change is occurring and began to plan for it when the City Council adopted a climate emergency resolution in November 2019. The City's focus on addressing climate policy was further underscored by the establishment of a Climate Subcommittee of the City Council. This subcommittee, also referred to as the Climate Action Committee (CAC) evaluates and propose actions to reduce GHG emissions and increase climate resilience and adaptation. The CAC has seven working groups that focus on outreach, energy, equity, funding, research, sequestration, and transportation.

What is Climate Change?

Climate change refers to distinct changes in weather conditions that result from increased atmospheric and human-caused greenhouse gas (GHG) emissions. Monthly mean GHG levels now exceed 410 parts per million (ppm) for the first time in recorded history. This GHG increase has trapped heat in the atmosphere and is linked to an increase in average global temperature and these global temperature and GHG increases are resulting in a series of changes to the global climate. These changes include shifts in seasonal temperature patterns; altered precipitation timing, amount, and location; sea level rise due to melting glaciers and ice caps; ocean acidification due to increased carbon dioxide (CO_2) absorption; and altered wind and storm event frequency and severity, including more frequent and intense storms, droughts, and heat waves. Climate change is not a discrete event, but a long-term hazard that already affects communities in California.
Sources: NOAA 2017; IPCC 2018; SHMP 2018

Sonoma County also initiated climate change efforts in 2009 by the establishment of a Regional Climate Protection Authority (RCPA). The RCPA was formed through locally sponsored state legislation to coordinate countywide climate protection efforts among Sonoma County's nine cities and multiple county agencies. The RCPA focuses on efficient buildings, clean energy, alternative transportation, and conservation and adaptation. In 2014, the RCPA prepared a climate hazard and vulnerability assessment, known as *Climate Ready Sonoma County: Climate Hazards and Vulnerabilities*. In 2016, the RCPA prepared Sonoma County's *Regional Climate Action Plan: Climate Action 2020 and Beyond* (referred to as the County's CAP). Although not formally adopted by the County, climate change projections summarized in the CAP are based on the Basin Characterization Model (BCM)

prepared by scientists from the USGS and the University of California, Davis Center for Environment. The projections were developed by applying scaled-down models that identify watershed-level climate change impacts specific to Sonoma County; the projections represent the best available climate data for the County (RCPA 2016). The BCM projections and recent studies indicate that climate change could affect Sonoma County (and the City of Sebastopol) in the following ways:

- **Higher Average Temperature and More Extreme Heat Events:** For scenarios with mitigated emissions, summer high temperatures are expected to rise by 1 to 2°F; scenarios with unmitigated emissions project average summer high temperatures will increase by up to 9 to 11°F by 2100.
- **More Frequent and Intense Droughts:** Three of the four climate scenarios examined indicate a rising climate water deficit (CWD), a numeric measure of drought stress, over this century, producing 10 to 20 percent drier soil conditions in the summer months. The greatest increases in soil dryness are projected to occur in the south and southeastern portions of the County.
- **More Frequent and Intense Wildfire:** Wildfire risk will continue to rise due to increased dryness of vegetation compounded by the productivity of plants in the spring. By the end of the century, the chances of one or more fires during a 30-year period are projected to increase from 15 to 20 percent to 25 to 33 percent in the mountainous areas of the County.
- **Fewer Winter Nights that Freeze.** Projected winter low temperatures are expected to rise in the future. For scenarios with mitigated emissions, winter low temperatures are expected to rise by 1 to 2°F. In the two scenarios with unmitigated emissions, average winter low temperatures are projected to increase by up to 7 to 9°F by 2100.
- **Increased Risk of Extreme Floods:** Climate scenarios project increased seasonal variability of precipitation, runoff, and stream flows for Sonoma County, along with increased likelihood of "extreme" precipitation and drought events. There may be more years with more frequent storm events and occasional events that are much stronger than historical ones and the length of season over which storm events occur is predicted to increase.
- **More Frequent Coastal Flooding, Increased Erosion, and Saltwater Intrusion:** Sea levels are projected to rise between 16.5 and 65.8 inches by 2100. Rising sea levels combined with increased storm surge will lead to more frequent inundation of the low-lying areas, and flooding of homes, infrastructure, agricultural land, and natural areas on the shores of San Pablo Bay. The greatest impacts are anticipated during winter storms.

In 2020 the RCPA developed the Climate Mobilization Strategy to support a resolution that declared a Climate Emergency that was adopted by the RCPA Board in September 2019. This strategy solidifies the County's commitment to mobilizing an emergency response commensurate with the scale of the climate crisis (RCPA 2021). The 10-year Emergency Policy package outlines 14 countywide actions with the potential to reduce GHG emissions by 2030 under local authority. This Strategy was adopted by the RCPA in March 2021. The RCPA has since convened working groups to begin funding and implementing the plans for the Strategy.

The important consideration for hazard mitigation is that climate change is exacerbating the hazards which are already identified and profiled in this plan. The City and California are also already experiencing the impacts of climate change including prolonged drought, increased flooding, increased average temperatures, shifts in the water cycle, and changes to precipitation patterns and the intensity of extreme events resulting from hazards, such as wildfires. Climate change not only results in progressive changes, such as shifting weather patterns, but affects the frequency and severity of hazard events (SHMP 2018). Climate change also results in an increase in the variance of climate patterns and this increased variance creates challenges for hazards planning, which previously used historic recurrence rates to predict future events, and now must incorporate changes to the frequency, severity, and location due to climate change.

Risk assessment for hazards is built upon the frequency of past events and the assumption that historic occurrence rates are a good predictor of future event probability. With climate change; however, history is not an adequate predictor of the probability of future occurrences (SHMP 2018). Planning for climate change (and understanding the probability of future occurrences [see Section 4.3 below]) is based on understanding and integrating evolving climate change science and modeled projections that account for shifts in historic conditions due to climate change (SHMP 2018) into hazard mitigation planning.

Additional information associated with the hazards are discussed in the Climate Change Considerations subsection of each hazard profile. This section also summarizes whether climate change is anticipated to have a low, medium, or high influence on future hazards.

4.2 Asset Summary

As a starting point for analyzing the City's Planning Area vulnerability to identified hazards, the HMPC used a variety of data, including data provided by Sonoma County (e.g. structure values, assessor data) to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster were to occur in the Planning Area, this section describes significant assets exposed or at risk in the Planning Area. Data used in this baseline assessment included:

- Total assets at risk;
- Critical facility inventory;
- Cultural, historical, and natural resources; and
- Population statistics, land use, and growth/development trends.

4.2.1 Total Assets at Risk

A spatial parcel dataset containing attributes such as structure values and year of property construction was provided by the City through coordination with the City of Santa Rosa GIS Department (co-host of the Sebastopol GIS data), alongside a building outline layer useful in counting buildings per parcel. Property type, valuation details, and other information contained in this plan are based on data from the Sonoma County Assessor's Office. This data provided the baseline for an inventory of the total exposure of developed properties within the City of Sebastopol. This data helps to ensure that the LHMP can be updated over time to reflect changes in development. It is important to note that depending on the nature and type of hazard event or disaster, it is generally the value of the infrastructure or improvements to the parcels that are of concern or at risk. Generally, the land itself is not a total loss, but may result in a reduction in value. Thus, the parcel analysis excludes land value.

Once the dataset was reviewed and organized, the parcel layer was clipped to the boundaries of the City of Sebastopol SOI boundary. For the purpose of parcel analysis and exposure calculations only parcels with improved values were used, except for exempt or government properties (which may not include an improvement value per its categorization and is one limitation that results in the total improvement values underestimating the actual value). "Improved" parcels have an improvement value greater than zero. Contents values were also estimated, as a percentage of building value based on their property type, using FEMA/Hazus guidelines. Content value estimates are based on 100 percent of the structure value for commercial and religion structures, 150 percent of the structure value for industrial structures, and 50 percent for residential and multi-family structures. Improvement values were added to contents values to calculate the total structure values for all properties in the parcel layer. The parcel layer, originally in the form of polygons, was then converted into points based on the center (or centroid) of a parcel to then used in overlay analysis with those hazards profiled in this plan that are available in spatial format (i.e., flood and fire). These outputs summarize the count and value of improved properties, contents, and total

values for the property inventory, and the exposure values by property type for the City. Table 4-4 summarizes the total improved parcel exposure by parcel type for the City.

Table 4-4: City of Sebastopol Total Improved Parcel Exposure by Parcel Type

Parcel Type	Total Parcels	Improved Value	Content Value	Total Value
Commercial	269	$197,164,224	$196,667,133	$393,831,357
Industrial	9	$7,175,176	$10,762,764	$17,937,940
Multi-Family	230	$100,155,507	$50,077,754	$150,233,261
Religion	14	$7,540,667	$7,540,667	$15,081,334
Residential	2,443	$659,783,848	$329,891,924	$989,675,772
TOTAL	2,965	$971,819,422	$594,940,242	$1,566,759,664

Sources: Wood analysis based on City of Sebastopol and Sonoma County Assessor's Office Data 2020

Critical and City Facility Inventory

A critical facility is defined (within the context of this plan) as a facility that is essential in providing utilities or support either during the response to an emergency or during a recovery operation. FEMA created Community Lifelines to reframe incident information, understand and communicate incident impacts using plain language, and promote unity of effort across the whole community to prioritize efforts to stabilize the lifelines during incident response. A Community Lifeline is defined as a facility that enables the continuous operation of critical government and busines functions and is essential to human health and safety or economic security. They provide the following services to communities:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

FEMA Community Lifelines are also the U.S. Department of Homeland Security's current recommended way to standardize the classification of critical facilities and infrastructure which provide indispensable service, operation, or function to a community. These categorizations are particularly useful as they:

- Enable effort consolidations between government and other organizations (e.g. infrastructure owners and operators).
- Enable integration of preparedness efforts among plans; easier identification of unmet critical facility needs.
- Refine sources and products to enhance awareness, capability gaps, and progress towards stabilization.
- Enhance communication among critical entities, while enabling complex interdependencies between government assets.
- Highlight lifeline related priority areas regarding general operations as well as response efforts.

FEMA organizes lifelines into the following six categories. These categories were used to differentiate critical assets and facilities in Sebastopol:

- **Communications –** Facilities and infrastructure that includes responder communications, alerts and warnings, messaging, finance, and 911 and dispatch services.
- **Energy –** Facilities and structures consist of power grid and fuel facilities, such as oil, natural gas, electric power systems.
- **Food, Water, and Shelter –** These may include food, water, shelter, and agricultural facilities.
- **Health and Medical –** Facilities or centers aimed at providing for the health and welfare of the whole population. These facilities can include hospitals, medical care units, public health facilities, patient movement centers, medical supply chains, and fatality management centers.
- **Safety and Security –** Facilities consist of law enforcement, police, and security facilities, fire protection, search and rescue, government services, and community safety centers.
- **Transportation –** These may include highway and roadway infrastructure, motor vehicle amenities, mass transit, railways, aviation facilities, and maritime facilities.
- **Hazardous Materials** – Hazardous material facilities consist of HAZMAT operations, pollutants, and contaminants.

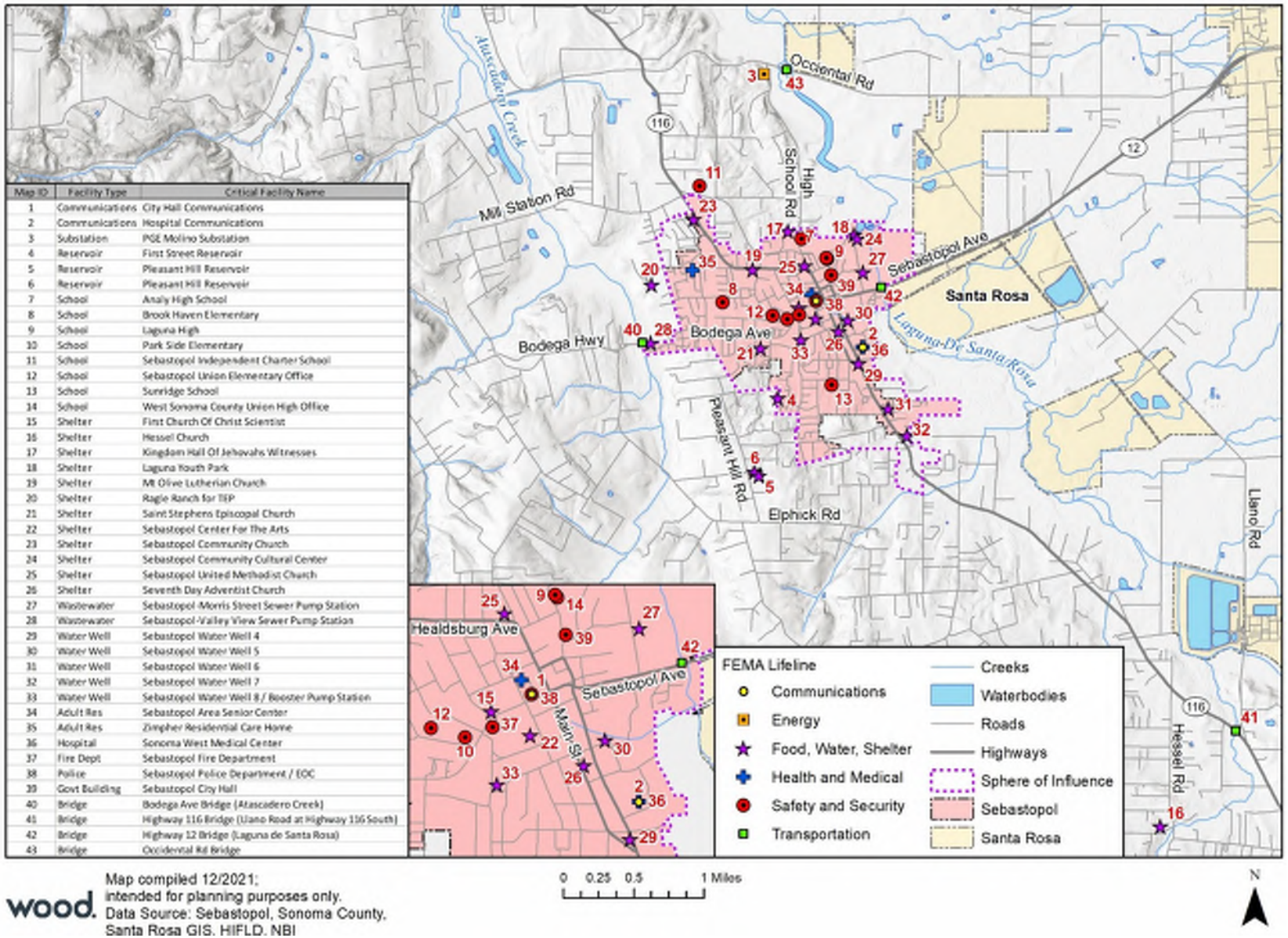
The City of Sebastopol provided key facilities that it deems essential to City operations and during response and recovery activities following an emergency. Table 4-5 lists both critical facilities obtained from the Homeland Infrastructure Foundation-Level Data (HIFLD) (HIFLD 2020), a federal dataset, as well as the City-provided structure data. Table 4-5 shows the City's critical facilities organized by Community Lifelines and Figure 4-2 shows the location of each critical facility in the City.

Table 4-5: Sebastopol Critical Facilities by FEMA Community Lifeline and Type Counts

FEMA Lifeline	Critical Facility Type	Total
Communications	Communications Facility	2
TOTAL		**2**
Energy	Substation	1
TOTAL		**1**
Food, Water, Shelter	Reservoir	3
	School	8
	Shelter	12
	Wastewater	2
	Water Well	5
TOTAL		**30**
Health and Medical	Adult Residential Home	2
	Hospital	1
TOTAL		**3**
Safety and Security	Fire Department	1
	Police	1
	Government Building	1
TOTAL		**3**
Transportation	Bridge	4
TOTAL		**4**
GRAND TOTAL		**43**

Sources: City of Sebastopol 2020, HIFLD 2020

Figure 4-2: Critical and FEMA Community Lifeline Facilities in Sebastopol by Overall Category



Map ID	Facility Type	Critical Facility Name
1	Communications	City Hall Communications
2	Communications	Hospital Communications
3	Substation	PGE Molino Substation
4	Reservoir	First Street Reservoir
5	Reservoir	Pleasant Hill Reservoir
6	Reservoir	Pleasant Hill Reservoir
7	School	Analy High School
8	School	Brook Haven Elementary
9	School	Laguna High
10	School	Park Side Elementary
11	School	Sebastopol Independent Charter School
12	School	Sebastopol Union Elementary Office
13	School	Sunridge School
14	School	West Sonoma County Union High Office
15	Shelter	First Church Of Christ Scientist
16	Shelter	Hessel Church
17	Shelter	Kingdom Hall Of Jehovahs Witnesses
18	Shelter	Laguna Youth Park
19	Shelter	Mt Olive Lutheran Church
20	Shelter	Ragle Ranch for TEP
21	Shelter	Saint Stephens Episcopal Church
22	Shelter	Sebastopol Center For The Arts
23	Shelter	Sebastopol Community Church
24	Shelter	Sebastopol Community Cultural Center
25	Shelter	Sebastopol United Methodist Church
26	Shelter	Seventh Day Adventist Church
27	Wastewater	Sebastopol-Morris Street Sewer Pump Station
28	Wastewater	Sebastopol-Valley View Sewer Pump Station
29	Water Well	Sebastopol Water Well 4
30	Water Well	Sebastopol Water Well 5
31	Water Well	Sebastopol Water Well 6
32	Water Well	Sebastopol Water Well 7
33	Water Well	Sebastopol Water Well 8 / Booster Pump Station
34	Adult Res	Sebastopol Area Senior Center
35	Adult Res	Zimpher Residential Care Home
36	Hospital	Sonoma West Medical Center
37	Fire Dept	Sebastopol Fire Department
38	Police	Sebastopol Police Department / EOC
39	Govt Building	Sebastopol City Hall
40	Bridge	Bodega Ave Bridge (Atascadero Creek)
41	Bridge	Highway 116 Bridge (Llano Road at Highway 116 South)
42	Bridge	Highway 12 Bridge (Laguna de Santa Rosa)
43	Bridge	Occidental Rd Bridge

Cultural, Historical, and Natural Resources

Assessing the City's vulnerability to disaster also involves inventorying the natural, historical, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- In the event of a disaster, an accurate inventory of natural, historical and cultural resources allows for more prudent care in the disaster's immediate aftermath when the potential for additional impacts is higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, for example, wetlands and riparian habitat which help absorb and attenuate floodwaters and thus support overall mitigation objectives.

Cultural Resources

Historical resources are buildings, structures, objects, places, and areas that are eligible for listing in the National Register of Historic Places (NRHP), the California Register of Historic Resources (CRHR), or the City's List of Historic Resources, have an association with important persons, events in history, or cultural heritage, or have distinctive design or construction method.



The Petaluma and Santa Rosa Railway Powerhouse is one of example of a historic place in Sebastopol. From its initial settlement in 1812 to the development of the railroad in 1870, Sebastopol and Sonoma County were dependent on horse and wagon for transportation. This powerhouse, and the wooden passenger depot at the West County Museum were constructed in 1902. *Source: NRHP 2020*

For purpose of federal actions, a qualified historic resource is defined as a property listed in or formally determined eligible for listing in the NRHP before a disaster occurs. The NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the U.S. Department of the Interior National Park Service. Local and state agencies may consider a broader definition of qualified historic properties in the review, evaluation, and treatment of properties damaged during a disaster.

The State of California Office of Historic Preservation (SHPO) can provide technical rehabilitation and preservation services for historic properties affected by a natural disaster. Depending on the hazard, protection could range from emergency preparedness, developing a fire safe zone around sites susceptible to wildfires, or seismically strengthening or structurally reinforcing structures.

State and local registers of historic resources provide designated Historical Landmarks, Points of Historical Interest, and Historic Buildings. These resources include, but are not limited to:

- The California Register of Historical Resources
- The California Historical Landmarks
- The California Inventory of Historical Resources
- The California Points of Historical Interest

- County of Sonoma Historic Landmarks in District 5 (The 5th District encompasses the west county including the entire Sonoma County coast, lower Russian River area, Sebastopol, and the west and southwest Santa Rosa areas extending to Highway 101).

Table 4-6 summarizes the historic and cultural resources found in the NRHP for the Sebastopol area; several of these historical sites are located outside the City's Planning Area.

Table 4-6: City NRHP Historical Resources and Sonoma County District 5 Historic Landmarks

Historical Resource Name	Listed Date	Location	Other Names or Description
Petaluma and Santa Rosa Railway Powerhouse	7/23/1991	238 – 258 Petaluma Avenue,	Hogan Building, P & SR Substation
Gold Ridge Farm	12/14/1978	West of Sebastopol	Luther Burbank's Experimental Farm and Cottage
Llano Road Roadhouse	5/22/1978	4353 Gravenstein Highway South	None
Sebastopol Depot of the Petaluma and Santa Rosa Railway	2/16/1996	261 South Main Street	West County Museum
George A. Strout House	6/17/1980	253 Florence Avenue	Strout House, Kimball House
Green Valley School	1992	4060 Green Valley School Road	Green Valley School
Sanders House	2000	2020 Sanders Road	Sanders House, Residence

Sources: NRHP 2020; Sonoma County 2020 (County of Sonoma List of Historic Landmarks in 5th District)

Lists of designated historical resources change periodically, and they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for listing on the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Cultural resources defined in California Environmental Quality Act (CEQA) Section 15064.5 include prehistoric and historic archaeological resources; historic-period resources (buildings, structures, area, place, or objects). Archaeological resources reflect past human activity extending from Native American prehistoric cultures throughout the early 20th century. The artifacts left by previous occupants may be encountered in small to large residential sites, or special use areas.

Many cultural and historical resources in the City are vulnerable to several hazards due to location and the nature of their construction. Some of these risks include earthquakes, wildfires, or adverse weather.

Natural Resources

The City of Sebastopol contains diverse natural resources, exemplified by the creeks and rivers and wetland complex within its watershed that drain inland mountains to the confluence of the Russian River and Laguna de Santa Rosa.

Natural resources are important to include in benefit/cost analyses for future projects and may be used to leverage additional funding for mitigation projects that also contribute to community goals for protecting sensitive natural resources. Inventory and awareness of natural resource assets is vital to meeting conservation objectives. For example, protecting wetland areas provides sensitive habitat protection as well as floodwater conveyance and storage, which further enhances public safety.



The Laguna Wetlands Preserve is comprised of five properties along the eastern boundary of Sebastopol that include the 22-acre Laguna Youth Park, 59-acre Meadowlark Field, 7-acre AmeriCorps Trail south of the Youth Park, 13-acre Tomodachi Park, and 7-acre Railroad Forest property bounded by Joe Rodota Trail, and Tomodachi Park and Village Park to the northeast. *Source: City of Sebastopol 2020a*

Natural resources also exhibit varied levels of resiliency to anthropogenic impacts, climate change, and natural hazards such as flooding, drought, coastal storms or wildfire. Climate change is one of the most substantial threats to conserving the biodiversity and ecological habitat of the County (OPR 2019). Habitat resiliency is exemplified in coastal habitat migration to inland areas as a result to sea level rise, and recovery of burn areas following a wildfire.

Special Status Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (endangered and threatened species) potentially located in the City Planning Area. The US Fish and Wildlife Service (USFWS) maintains a list of federally-listed threatened and endangered species for the country, which can be queried at the state and county levels. The California Department of Fish and Wildlife (CDFW) also maintains species lists and accounts for threatened and endangered species. State and federal laws protect the habitat of these species through the environmental review process. Species of special concern may additionally include species that meets the State definition of threatened or endangered but has not been formally listed, experiences seriously population declines or habitat decline, or has naturally small populations exhibiting high susceptibility to population decline (CDFW 2019). Table 4-7 summarizes those special status animal species as indicated in the USFWS database that are located in Sonoma County and likely the areas surrounding the City Planning Area.

Table 4-7: Threatened and Endangered Species in Sonoma County and the Planning Area

Common Name	Scientific Name	Group	Status
California tiger Salamander	Ambystoma californiense	Amphibians	Endangered
California red-legged frog	Rana draytonii	Amphibians	Threatened
Short-tailed albatross	Phoebastria (=Diomedea) albatrus	Birds	Endangered
California least tern	Sterna antillarum browni	Birds	Endangered
California clapper rail	Rallus longirostris obsoletus	Birds	Endangered
Yellow-billed Cuckoo	Coccyzus americanus	Birds	Threatened
Western snowy plover	Charadrius nivosus	Birds	Threatened
Northern spotted owl	Strix occidentalis caurina	Birds	Threatened
Marbled murrelet	Brachyramphus marmoratus	Birds	Threatened
California freshwater shrimp	Syncaris pacifica	Crustaceans	Endangered
Conservancy fairy shrimp	Branchinecta conservatio	Crustaceans	Endangered
Vernal pool fairy shrimp	Branchinecta lynchi	Crustaceans	Threatened

Common Name	Scientific Name	Group	Status
longfin smelt	Spirinchus thaleichthys	Fishes	Candidate
Sonoma alopecurus	Alopecurus aequalis var. sonomensis	Flowering Plants	Endangered
Clara Hunt's milk-vetch	Astragalus clarianus	Flowering Plants	Endangered
White sedge	Carex albida	Flowering Plants	Endangered
Vine Hill clarkia	Clarkia imbricata	Flowering Plants	Endangered
Baker's larkspur	Delphinium bakeri	Flowering Plants	Endangered
Yellow larkspur	Delphinium luteum	Flowering Plants	Endangered
Contra Costa goldfields	Lasthenia conjugens	Flowering Plants	Endangered
Pitkin Marsh lily	Lilium pardalinum ssp. pitkinense	Flowering Plants	Endangered
Few-flowered navarretia	Navarretia leucocephala ssp. pauciflora (=N. pauciflora)	Flowering Plants	Endangered
Many-flowered navarretia	Navarretia leucocephala ssp. plieantha	Flowering Plants	Endangered
Slender Orcutt grass	Orcuttia tenuis	Flowering Plants	Threatened
Lake County stonecrop	Parvisedum leiocarpum	Flowering Plants	Endangered
Calistoga allocarya	Plagiobothrys strictus	Flowering Plants	Endangered
Napa bluegrass	Poa napensis	Flowering Plants	Endangered
Kenwood Marsh checker-mallow	Sidalcea oregana ssp. valida	Flowering Plants	Endangered
Sonoma sunshine	Blennosperma bakeri	Flowering Plants	Endangered
Sonoma spineflower	Chorizanthe valida	Flowering Plants	Endangered
Marin dwarf-flax	Hesperolinon congestum	Flowering Plants	Threatened
Burke's goldfields	Lasthenia burkei	Flowering Plants	Endangered
Petaluma meadowfoam	Limnanthes vinculans	Flowering Plants	Endangered
Showy Indian clover	Trifolium amoenum	Flowering Plants	Endangered
Loch Lomond coyote thistle	Eryngium constancei	Flowering Plants	Endangered
Clover lupine	Lupinus tidestromii	Flowering Plants	Endangered
Pennell's bird's-beak	Cordylanthus tenuis ssp. capillaris	Flowering Plants	Endangered
Myrtle's silverspot butterfly	Speyeria zerene myrtleae	Insects	Endangered
San Bruno elfin butterfly	Callophrys mossii bayensis	Insects	Endangered
Callippe silverspot butterfly	Speyeria callippe	Insects	Endangered
Behren's silverspot butterfly	Speyeria zerene behrensii	Insects	Endangered
Salt marsh harvest mouse	Reithrodontomys raviventris	Mammals	Endangered
Point Arena mountain beaver	Aplodontia rufa nigra	Mammals	Endangered
Leatherback sea turtle	Dermochelys coriacea	Reptiles	Endangered
Leatherback sea turtle	Dermochelys coriacea	Reptiles	Endangered
Olive ridley sea turtle	Lepidochelys olivacea	Reptiles	Threatened

Source: USFWS – Environmental Conservation Online System, 2020

Population, Growth, and Development Trends

As discussed in Chapter 2, as of February 2021, the City had 11 special projects underway or recently approved and under construction (City of Sebastopol 2020b). These are projects initiated by the City, such as public facilities, or they are private-development projects of a significant size and scope (development projects over 7,500 square feet) (City of Sebastopol 2020b). A majority of the projects are residential projects, including residential townhomes, residential studios, workforce housing, and a condominium subdivision, followed by commercial projects that include mixed-use commercial with housing, a new car wash facility, and a hotel. These major development projects are located throughout the City and most are located near downtown Sebastopol.

Between 2015 and 2020 the population in Sebastopol steadily increased by 305 persons, or 3.9 percent. Compared to population growth in Sonoma County during the same period, this growth is relatively minor given the small size of the City. The City's General Plan Housing Element also estimates an additional 455 residents in the City by 2030, which would translate to a 5.5 increase over the next decade.

Most of the development in the City occurred prior to 1976 and residential development during this period was spread throughout the City whereas non-residential growth was concentrated along State Highway 116 and development north of Sebastopol Avenue along Morris Street. From 1990 to 1999, residential growth occurred in small subdivisions and various scattered sites (City of Sebastopol 2014). Non-residential growth continued to occur along the City's major arterials and also included small commercial centers in the City's neighborhoods.

With the City's two growth management programs in place – the Urban Growth Boundary (UGB) and the Growth Management Program (Zoning Code Section 17.350) – as well as environmental constraints related to the Laguna de Santa Rosa Wetland Preserve, the pace of development has slowed in the City. Residential development continues to occur on scattered sites throughout the City and non-residential and commercial development consists of scattered sites but has been focused in the "Barlow" area, west of Morris Street and north of Sebastopol Avenue (City of Sebastopol 2014). The City also has limited developable areas and few annexations since the General Plan was adopted in 2015.

Additional information on population and growth and development trends are in Section 2.4 and Section 2.8 in Chapter 2.

4.3 Hazard Profiles and Risk Assessment

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The hazards identified in Section 4.1 Hazard Identification: Natural Hazards are profiled individually in this section. In general, information provided by HMPC is integrated into this section with information from other data sources. These profiles set the stage for the vulnerability assessment for each natural hazard that follow the detailed hazard profiles.

Each hazard is profiled in the following format:

- **Hazard Description** - This section gives a description of the hazard and associated issues followed by details on the hazard specific to the City Planning Area.
- **Location** – This section provides a spatial description of the potential locations or geographic areas in the City of where the hazard is expected to impact.
- **Extent (Magnitude/Severity)** - This section gives a description of the potential strength or magnitude of the hazard as it pertains to the City. Different hazards may have different measures of extent.
- **Previous Occurrences** - This section contains information on historical incidents, including impacts where known. The extent or location of the hazard within or near the Planning Area is also included in this subsection. Historical incident worksheets and other data sources were used to capture information on past occurrences.
- **Probability of Future Occurrence** - The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. Frequency was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of an event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of a drought in any given year). The likelihood of future occurrences is categorized into one of the following classifications:
    - **Highly Likely** - Nearly 100 percent chance of occurrence in next year or happens every year.
    - **Likely** - Between 10 and 99 percent chance of occurrence in next year or has a recurrence interval of 10 years or less.
    - **Occasional** - Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.
    - **Unlikely** - Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of every 100 years or greater.

The risk assessment for most hazards is built upon the frequency of past events and the assumption that historic occurrence rates are a good predictor of future event probability. With climate change; as previously noted, history is not an adequate predictor of the probability of future occurrences (SHMP 2018). Planning for climate change is based on understanding and integrating evolving climate change science and modeled projections that account for shifts in historic conditions due to climate change into hazard mitigation planning (SHMP 2018). For these reasons, the likelihood of future occurrences for climate change and sea level rise impacts (along the Laguna de Santa Rosa) is based on climate change science and modeled projections.

- **Climate Change Considerations** – Climate change refers to a long-term change in the earth's temperature, precipitation, humidity, and seasons. This section addresses the probable effects of climate change qualitatively and as a secondary impact for each identified hazard. In other words, it describes the potential for climate change to affect the frequency and severity of natural hazards. Impacts can include water supply shortages; changes in the frequency, intensity, and extent of drought and extreme heat events; more precipitation and flooding risk;, and increasing temperatures. This section concludes whether climate change is anticipated to have a low, medium, or high influence on future hazard impacts.

  The discussion relies on information from the Sixth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) *Climate Change 2021: The Physical Science Basis* Contribution of Working Group I to the Sixth Assessment Report of the IPCC (IPCC 2018). It also relies on numerous California publications on climate change and climate adaptation including:

- California's Fifth Climate Change Assessment: Climate Change 2013: The Physical Science Basis Contribution of Working Group I to the Fifth Assessment Report of the IPCC (IPCC 2018)
- *California's Fourth Climate Assessment* (California Natural Resources Agency 2018a);
- Safeguarding California Plan: 2018 Update – California's Climate Adaptation Strategy (California Natural Resources Agency 2018b);
- 2014 Safeguarding California: Reducing Climate Risk (California Natural Resources Agency 2014); and
- *2009 California Climate Adaptation Strategy* (CAS) (California Natural Resources Agency 2009).

  The discussion integrates climate information from Cal-Adapt, a website that gathers data on how climate change might affect California at the local level based on the state's scientific and research community (CEC 2018). The climate change considerations subsections also summarizes climate change modelling and findings from the following two RCPA-prepared documents: *Climate Ready Sonoma County: Climate Hazards and Vulnerabilities* (2014) and *Sonoma County's Regional Climate Action Plan: Climate Action 2020 and Beyond* (2016) (referred to as the County's Climate Action Plan [CAP]). Climate change projections summarized in Sonoma County's CAP are based on BCM projections, which as previously mentioned were developed by applying scaled-down models that identify watershed-level climate change impacts specific to Sonoma County (RCPA 2016). Climate change is addressed in the plan as a secondary impact for each hazard.

Vulnerability Assessment – The vulnerability of the Planning Area to a specific natural hazard is assessed through the study of potential impacts to specific sectors:

- Property
- People
- Economy
- Critical Facilities and Infrastructure
- Historic, Cultural, and Natural Resources
- Future Development

Risk Summary – This is a summary of key findings and risk based on threat, vulnerability and consequences to the Planning Area from the specific hazard.

The significance of each hazard was determined based on the hazard profile, focusing on key criteria such as frequency and resulting damage, including deaths/injuries, and property and economic damage. This assessment was used by the HMPC to prioritize those hazards of greatest significance to the Planning Area thereby allowing the City to focus resources where they are most needed. The following sections provide profiles of the natural hazards, listed alphabetically that the HMPC identified in Section 4.1 Identifying Hazards. Human-caused hazards are addressed in Section 4.4.

4.3.1 Earthquake

Hazard Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface (see discussion in the Extent section). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

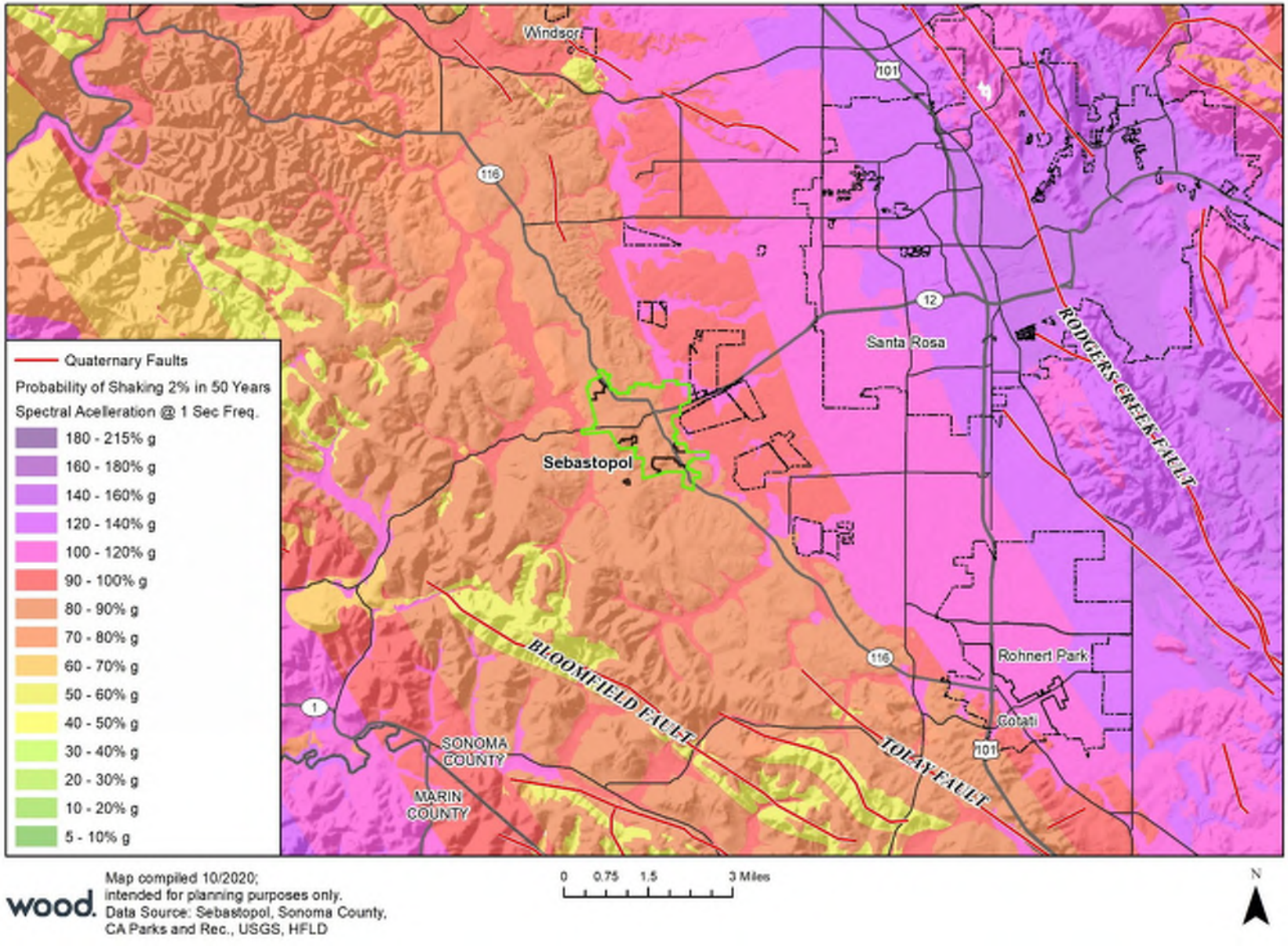
Seismic Hazards

Earthquakes can cause structural losses, injury, and possibly death, as well as damage to infrastructure such as water, power, gas, communication, and transportation networks and systems. The degree of damage depends on many interrelated factors. Among these are the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction. Primary hazards associated with seismic activity include surface rupture along faults, ground shaking, and associated building failure. Secondary hazards result from the interaction of ground shaking with existing ground instabilities or facilities and include liquefaction, settlement, debris flows, landslides, tsunamis and seiches, and flooding or wildfires from broken pipelines, gas, or electrical infrastructure.

Ground Shaking

When movement occurs along a fault, the energy generated is released as waves, which cause ground shaking. Ground shaking intensity varies with the magnitude of the earthquake, the distance from the epicenter, and the type of rock or sediment through which the seismic waves move. The geological characteristics of an area can be a greater hazard than the area's distance to the earthquake epicenter. The City is situated within an area of high potential seismic activity (the San Francisco Bay Region), and so the fault systems within and around the City have the potential to produce earthquakes that could impact the City significantly (e.g. the San Andreas Fault System which is currently active). A high-magnitude earthquake on one of these faults could cause moderate to high ground shaking in the City. Figure 4-3 below is an earthquake shaking map for the City that is based on the two percent probability of occurrence in 50 years, based on the USGS analyses of nearby faults (USGS 2003). Also known as the 2,500 year probabilistic scenario map, this scenario indicates that the City has the potential to experience strong ground shaking at a level that will be damaging to buildings and structures.

Figure 4-3: Potential Ground Shaking Probability in the City of Sebastopol



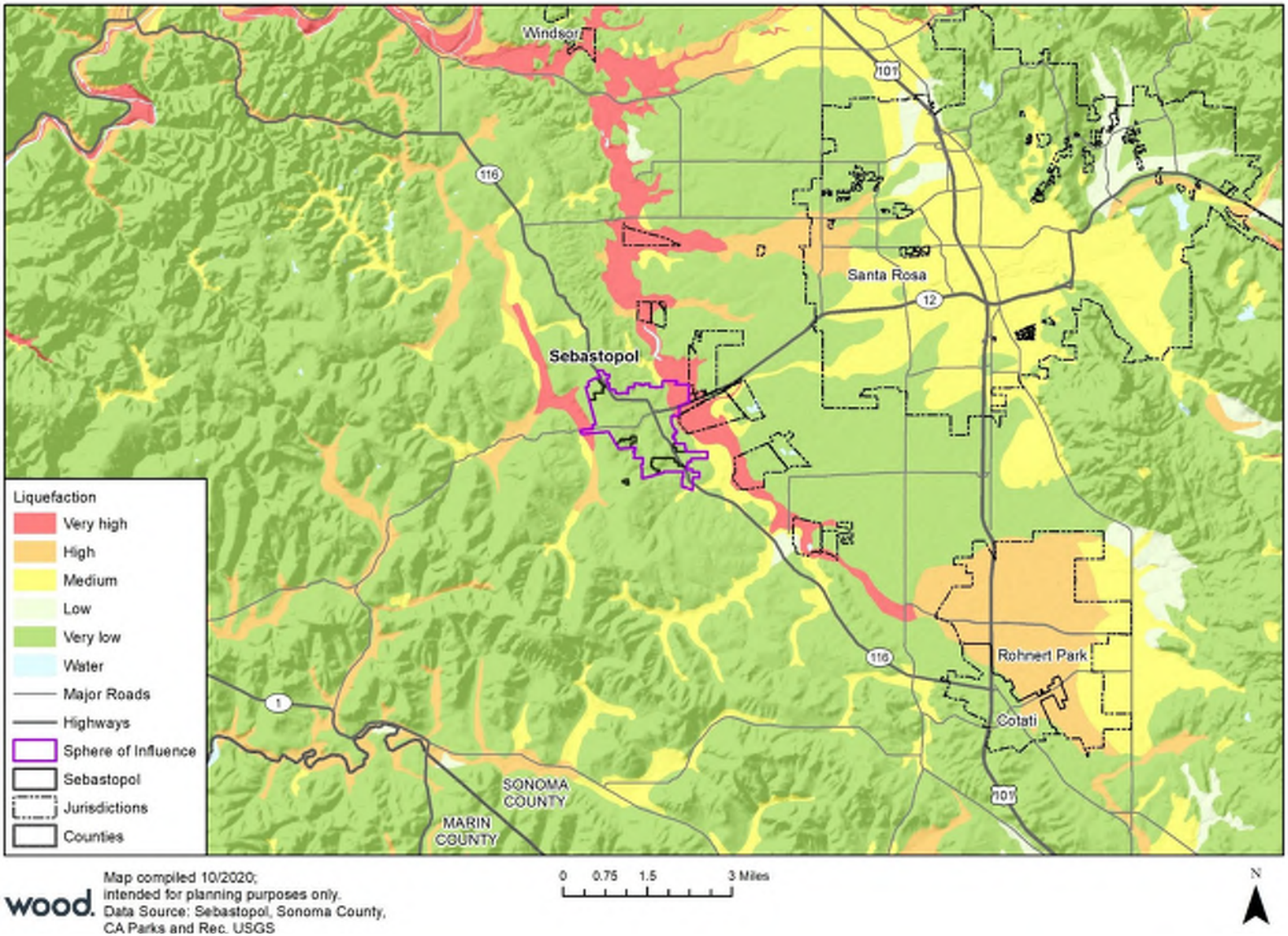
Liquefaction Susceptibility

Liquefaction can be defined as the loss of soil strength or stiffness due to a buildup of pore-water pressure during a seismic event, and is associated primarily with relatively loose, saturated fine to medium-grained unconsolidated soils. Seismic ground shaking of relatively loose, granular soils that are saturated or submerged can cause the soils to liquefy and temporarily behave as a dense fluid. If this layer is at the surface, its effect is much like that of quicksand for any structure located on it. If the liquefied layer is in the subsurface, the material above it may slide laterally depending on the confinement of the unstable mass. Liquefaction is caused by a sudden temporary increase in pore-water pressure due to seismic densification or other displacement of submerged granular soils. Liquefiable soil conditions are not uncommon in alluvial deposits in moderate to large canyons and could also be present in other areas of alluvial soils where the groundwater level is shallow (i.e. 50 feet below the surface). Bedrock units, due to their dense nature, are unlikely to present a liquefaction hazard.

According to the USGS Earthquake Hazards Program data for liquefaction susceptibility, there are several areas of liquefaction susceptibility in the City Planning Area (see Figure 4-4). The majority of the City is in the very low liquefaction susceptibility zone, while parts of the City are in a very high zone on the east and west edges of town. Approximately 120 acres fall in the very high liquefaction susceptibility areas within Sebastopol and 1,277 acres in the very low liquefaction susceptibility areas within the City's Planning Area. Most of the highly susceptible category is situated east of town and follows the Laguna de Santa Rosa River that crosses the main bridge along Sebastopol Road or Highway 12 East.

Earthquakes can also lead to secondary hazards including flooding, building structure failure, debris flows, and fire (among others).

Figure 4-4: Liquefaction Susceptibility in the City of Sebastopol



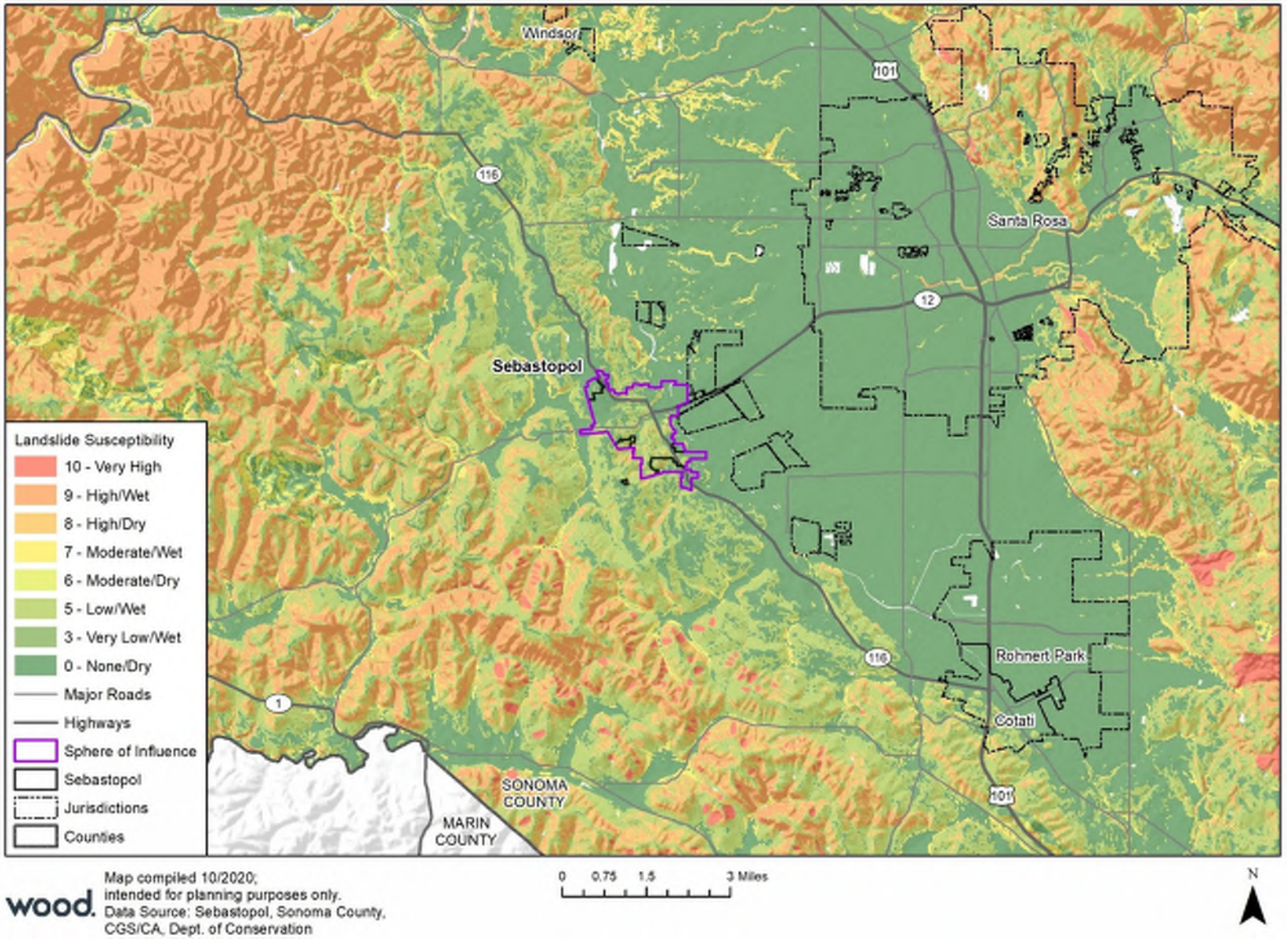
Landslide Potential and Susceptibility

A landslide is a geologic hazard where the force of gravity combines with other factors to cause earth material to move or slide down an incline. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Slopes with the greatest potential for sliding are between 34 degrees and 37 degrees. Although steep slopes are commonly present where landslides occur, it is not necessary for the slopes to be long.

There are predictable relationships between local geology and landslides. The down-slope movement of earth material as a landslide is part of the continuous, natural process of erosion. This process, however, can be influenced by a variety of causes that change the stability of the slope. Slope instability may result from natural processes, such as the erosion of the toe of a slope by a stream, or by ground shaking caused by an earthquake. Slopes can also be modified artificially by grading, or by the addition of water or structures to a slope. Landslide problems can be caused by land mismanagement, particularly in mountain, canyon, and coastal regions. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides and debris flows. As human populations expand over more of the land surface, these processes become an increasing concern. Development that occurs on a slope can substantially increase the frequency and extent of potential slope stability hazards. Knowledge of these relationships can improve planning and reduce vulnerability. Slope stability is dependent on many factors and their interrelationships, including rock type, moisture content, slope steepness, and natural or man-made undercutting.

The California Geological Survey (CGS) along with the California Department of Conservation have generated a landslide dataset that classifies susceptibility in California to various degrees, from very high (the most potentially dangerous) to a none or dry category (the least risk) (CGS 2019). Unknown or undetermined areas exist as well, as displayed in Figure 4-5 below. In Sebastopol the majority of the Planning Area is in the lower risk categories of landslide susceptibility, meaning that the local soils, slopes and geology are not very likely to lead to landslide activity.

Figure 4-5: Landslide Susceptibility in the City of Sebastopol and Its Planning Area



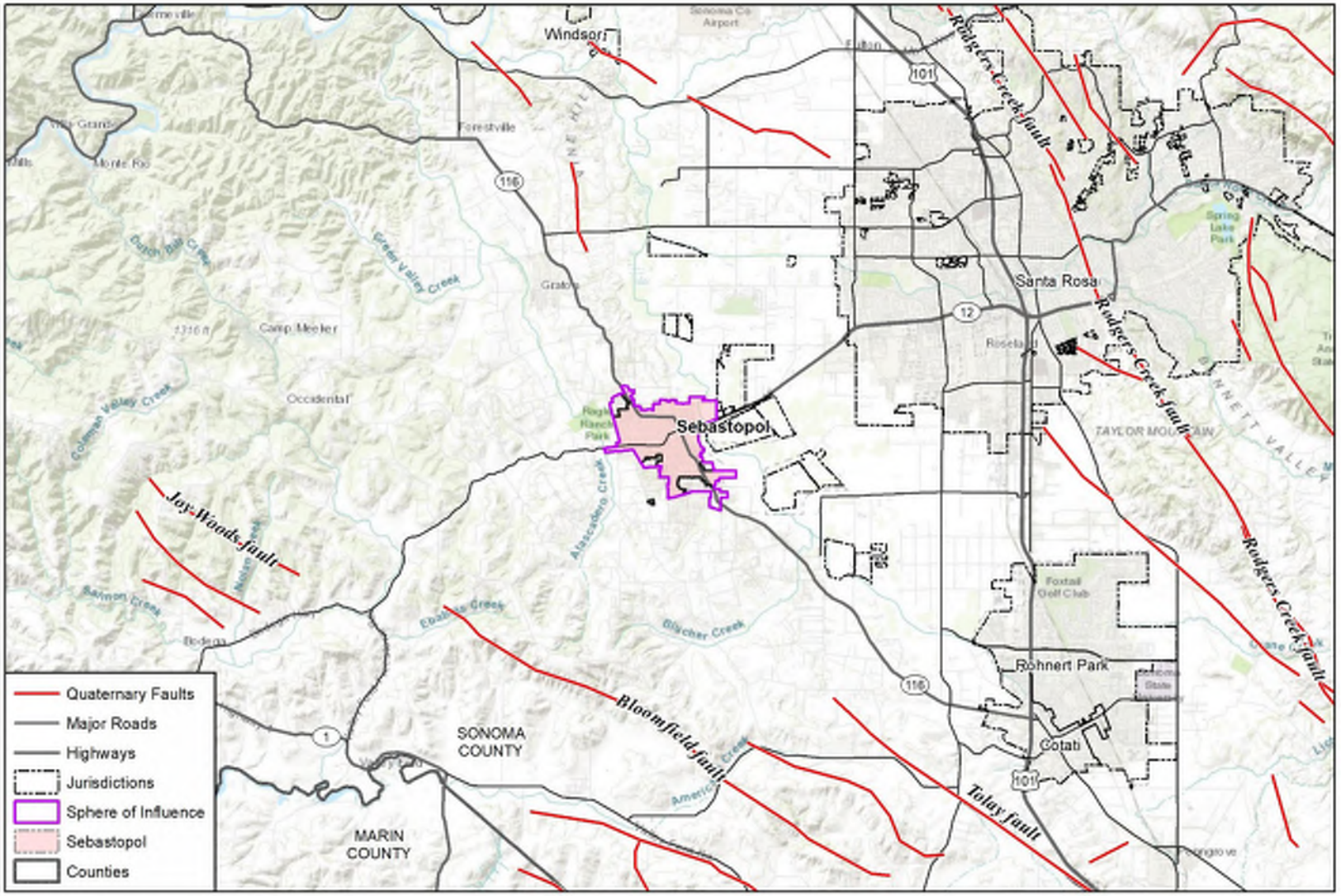
Faults

California is a seismically active area with numerous faults throughout the region. An active fault is defined by CGS as a fault that has had surface rupture or displacement within the last 11,000 years (Holocene times). This does not mean, however, that faults having no evidence of surface displacement within the last 11,000 years are necessarily inactive. Potentially active faults are those that have shown displacement within the last 1.8 million years (Quaternary period) but have not moved within the Holocene times. Any fault older than Pleistocene (>1.8 million years) is considered inactive and dormant. Although based on the history of fault movement and seismic activity in the area, it is known that the main faults posing risk to the City are the San Andreas Fault system and the Healdsburg-Rodgers Creek Fault (northern portion of the Hayward Fault), although none of these faults are within the City (see the Location section of this chapter for additional details).

As shown in Figure 4-6, there are several earthquake faults classified as Quaternary (those which are recognized at the surface and which have shown activity in the past 1.6 million years, or during the geologic Quaternary epoch) in the Planning Area. Additional faults are present, which are located farther from the City and could cause seismic activity in the future. The faults illustrated in Figure 4-6 are summarized below:

- Joy Woods fault is west of the City.
- San Andreas fault is west of the City.
- Part of Tolay fault is southeast of the City boundary but outside of the limits.
- Bloomfield fault is south of the City but outside of its limits.
- Healdsburg-Rodgers Creek fault, along Rodgers Creek to the east of the City but outside of the limits.

Figure 4-6: Earthquake Faults near the Planning Area



Location

Extensive – There are no known faults within the City, but there are many near the Planning Area, which are discussed in more detail below. Additional faults nearby the Planning Area are illustrated in Figure 4-6. There are two active faults: San Andreas Fault and active the Healdsburg-Rodgers Creek Fault (northern portion of the Hayward Fault) that fall outside the Planning Area but have historically been the source of earthquakes felt in Sebastopol. These local and regional faults are described in more detail below based on information summarized in the Sonoma County HMP.

- **San Andreas Fault.** The San Andreas Fault is located approximately 14 miles west of the Planning Area. It is a shallow fault and is considered the most active fault in California. Historically, the San Andreas Fault system is the main fault responsible for earthquakes felt in the City and is also expected to continue being the source of future earthquake activity.
- **Healdsburg-Rodgers Creek Fault**. The Healdsburg-Rodgers Creek Fault is an active fault known as the northern extension of the Hayward Fault and it is associated with the Santa Rosa Plain, in Sonoma County. It marks the break between the Santa Rosa Plain and the uplifting Santa Rosa block to the east and the Sebastopol fault to the west marks the break between the Valley and the uplifting Sebastopol Block to the west (SFEI 2020). It is a strike slip fault, measuring around 117 kilometers in length. The most notable earthquake activity along the Healdsburg-Rodgers Creek fault took place in 1969 during the Santa Rosa Earthquakes. These were a pair of earthquakes, one a magnitude of 5.6 and the other a magnitude of 5.7 both that struck early October of that year in the nearby City of Santa Rosa northwest of the City of Sebastopol. The two earthquakes resulted in $8.35 million in damages related to building removal and repairs.
- **Tolay Fault.** The Tolay Fault is located south of the City of Sebastopol along the slope of the southwestern ridge in the lower portion of the Tolay Creek watershed. This fault, like the Healdsburg-Rodgers Creek fault, have produced sheared or weak zones in rock formations that weather and erode, and sometimes form conditions for hillslope wetlands. According to the USGS Earthquake Hazards Program, the fault lacks associated historic seismicity.

Extent (Magnitude/Severity)

Catastrophic – Extent (meaning the severity of an earthquake) refers to the amount of energy released during an earthquake and is usually expressed in terms of intensity or magnitude. These metrics are measured directly from the earthquake as recorded on seismographs.

Intensity represents the observed effects of ground-shaking at any specified location, and earthquake shaking decreases with distance from the earthquake epicenter. Intensity is an expression of the amount of shaking at any given location on the ground surface based on felt or observed effects. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. Intensity is measured with the Modified Mercalli Intensity (MMI) scale (see Table 4-8).

Magnitude represents the amount of seismic energy released at the hypocenter of an earthquake and is based on the amplitude of the earthquake waves recorded. Seismologists have developed several magnitude scales; one of the first was the Richter Scale, developed in 1932 by Dr. Charles F. Richter of the California Institute of Technology. The Moment Magnitude Scale is the current scale used to quantify the magnitude or strength of the seismic energy released by an earthquake.

Table 4-8 below compares magnitude and the felt effects associated with the MMI scale. Damage typically occurs in MMI of VII or above and based on Figure 4-3. The majority of the City is found in areas where spectral acceleration is expected to surpass the 70 percent g (or gravitational velocity); this means that there is a high probability of the City experiencing strong seismic movements in the next few decades.

Table 4-8: Magnitude and Mercalli Intensity Scale Measurements and Associated Characteristics

Magnitude	Mercalli Intensity	Effects	Frequency
Less than 2.0	I	Micro-earthquakes, not felt or rarely felt; recorded by seismographs.	Continual
2.0-2.9	I to II	Felt slightly by some people; damages to buildings.	Over 1M per year
3.0-3.9	II to IV	Often felt by people; rarely causes damage; shaking of indoor objects noticeable.	Over 100,000 per year
4.0-4.9	IV to VI	Noticeable shaking of indoor objects and rattling noises; felt by most people in the affected area; slightly felt outside; generally, no to minimal damage.	10K to 15K per year
5.0-5.9	VI to VIII	Can cause damage of varying severity to poorly constructed buildings; at most, none to slight damage to all other buildings. Felt by everyone.	1K to 1,500 per year
6.0-6.9	VII to X	Damage to a moderate number of well-built structures in populated areas; earthquake-resistant structures survive with slight to moderate damage; poorly designed structures receive moderate to severe damage; felt in wider areas; up to hundreds of miles/kilometers from the epicenter; strong to violent shaking in epicentral area.	100 to 150 per year
7.0-7.9	VIII<	Causes damage to most buildings, some to partially or completely collapse or receive severe damage; well-designed structures are likely to receive damage; felt across great distances with major damage mostly limited to 250 km from epicenter.	10 to 20 per year
8.0-8.9	VIII<	Major damage to buildings, structures likely to be destroyed; will cause moderate to heavy damage to sturdy or earthquake-resistant buildings; damaging in large areas; felt in extremely large regions.	One per year
9.0 and Greater	VIII<	At or near total destruction - severe damage or collapse to all buildings; heavy damage and shaking extends to distant locations; permanent changes in ground topography.	One per 10-50 years

Source: USGS

Previous Occurrences

Earthquakes have occurred nearby the Planning Area in the past (within Sonoma County and adjacent areas). According to the USGS, a recent earthquake event of a magnitude of 6.0 took place near South Napa, about 30 miles to the southeast of the City Planning Area. This event occurred the morning of August 24, 2014 and had a reported intensity of VII in the Mercalli scale. The earthquake was on the West Napa Fault, which was not mapped under the Alquist-Priolo earthquake fault hazard zone and was the largest event of this kind in the San Francisco Bay area since the 1989 Loma Prieta earthquake (further summarized below). The seismic activity of this event had an estimated 11.1 kilometers of depth. Thousands of structures across Sonoma County were damaged, and hundreds of people were injured during the earthquake across the affected areas in the



In 2014 a 6.0 magnitude earthquake occurred in the southern portion of the City of Napa on the West Napa Fault. The event was the largest earthquake in the San Francisco Bay Area since the 1989 Loma Prieta earthquake. Total damage in the southern Napa and Vallejo areas ranged from $362 million to $1 billion. *Photo Credit: LA Times 2014*

County. One person was reported as being killed during the earthquake. Because of the extensive damages, the California Governor issued an emergency proclamation on August 24, 2014, and the U.S. President declared the incident a major disaster on September 11, 2014. Total economic losses were around $400 million, and state and federal assistance surpassed the $30 million mark. The SBA granted over $21 million in low-interest disaster loans to local businesses and agencies affected by the event.

Other recent earthquake events in the area include smaller magnitude earthquakes such as:

- A magnitude 2.6 earthquake with reported intensity of III occurred on September 8, 2020. The epicenter of the event was approximately 4 kilometers southeast of Larkfield-Wikiup at a depth of 6.8 kilometers.
- A magnitude 3.2 earthquake occurred on May 2, 2019. The event's epicenter was approximately 4 kilometers south/southwest of Calistoga, CA in adjacent Napa County. The depth of the event was 10.9 kilometers.
- A magnitude 2.8 earthquake with reported intensity of III, on December 24, 2017. This event's epicenter was about 6 kilometers west of Temelec, near Sonoma. The depth of the event was of 1 kilometer.
- A magnitude 2.7 earthquake with reported intensity of II, on November 17, 2013. The epicenter of this incident was about 5 kilometers east-southeast of Penngrove, southeast of Sebastopol. The depth of the event was of 4.4 kilometers.
- A magnitude 3.3 earthquake took place on July 25, 2011 and had a reported intensity of IV. Its depth was of 6.7 kilometers and the epicenter was located approximately 17 kilometers south-southeast from Sebastopol.

The Bay Area, including the City, has experienced several significant and other well-documented earthquakes and since 1855, and more than 140 earthquakes have been felt in the Santa Rosa near Sebastopol (Sonoma County 2017). The three major earthquakes included the 1906 San Francisco Earthquake, 1969 Rodgers Creek-Healdsburg Fault Earthquake, and 1989 Loma Prieta Earthquake. These three major earthquakes are summarized below:

- **1906 San Francisco Earthquake.** This earthquake had an 8.3 magnitude and occurred on the northern segment of the San Andreas Fault and resulted in devastating damage to San Francisco and major damage in Santa Rosa, Sebastopol, Healdsburg, Petaluma, and other Sonoma County communities. Nearby Santa Rosa suffered more damage proportionally to its size than any other Bay Area city and the only casualties reported were in the City of Santa Rosa, where 65 people died and 12 went missing (Sonoma County 2017).
- **1969 Rodgers Creek - Healdsburg Fault Earthquake.** Two earthquakes with Magnitudes of 5.6 and 5.7 originated near the juncture of the Rodgers Creek and Healdsburg Fault, approximately two miles north of Santa Rosa. Damage was concentrated in the City of Santa Rosa, and principally confined to the partial collapse or near collapse of unreinforced masonry (URM) buildings and wood frame buildings with substandard foundations or inadequate bracing. According to the *2016 Sonoma County Operational Area HMP*, 99 structures were significantly damaged, approximately half in the business district and half in residential areas (Sonoma County 2017). Nearly half of all significantly damaged buildings were demolished. Total building damage was estimated at $6 million, with dwelling contents losses at $1.25 million.
- **1989 Loma Prieta Earthquake.** This 6.9 magnitude earthquake was caused by a slip along the San Andreas Fault south of the Bay Area. Though the damage in Sonoma County from the earthquake was minor, the earthquake killed 63 people and injured 3,757 throughout northern California. It caused a total of over 16,700 housing units to be uninhabitable throughout the Monterey and San Francisco Bay Areas and left approximately 3,000-12,000 people homeless. The earthquake caused severe

damage in specific locations in the San Francisco Bay Area, most notably on unstable soil in San Francisco and Oakland, where approximately 12,000 homes and 2,600 businesses were damaged. In Santa Cruz, close to the epicenter, 40 buildings collapsed. The earthquake caused an estimated $6 billion ($11 billion in current value) in property damage, becoming one of the most expensive natural disasters in U.S. history at the time. It was the largest earthquake to occur on the San Andreas Fault since the 1906 San Francisco earthquake.

Probability of Future Occurrences

Likely – Given the information presented herein as well as recent earthquake activity history, earthquake hazards are expected to be a likely occurrence in the City as well as in Sonoma County. It is estimated that similar seismic activity events may occur every 20 to 30 years in the Planning Area and the overall San Francisco Bay region (State of California Seismic Safety Commission 2020).

The USGS noted in 2014 that there was a 72 percent probability of a strong earthquake (of magnitude 6.7 or greater) striking the San Francisco Bay Region (of which Sebastopol is part) by 2043. The probability of having a strong earthquake (of this magnitude 6.7 or greater) generated from the Healdsburg-Rodgers Creek Fault was then estimated at about 33 percent. However, more recent information released in 2015 by the USGS new Uniform California Earthquake Rupture Forecast 3, or UCERF3, considers additional parameters and data. With this new criteria and advanced technology, the updated results estimate that the actual chance of a strong earthquake of magnitude 6.7 or above is around 72 percent in the San Francisco Bay Region. The San Andreas fault now has a 33 percent chance of rupturing and causing earthquake activity, though the Rodgers Creek fault system's probability has decreased to about 15 percent chance of rupture (UCERF3 2014).

Climate Change Considerations

While climate change is not expected to directly affect earthquake frequency or intensity it could exacerbate indirect or secondary impacts of earthquakes. For example, climate change could increase the frequency and intensity of extreme precipitation events, in turn increasing the probability of landslides and liquefaction events during an earthquake if the earthquake coincided with a wet cycle. Increased precipitation due to climate change will also result in increased frequency of landslide potential, as the added weight of rain-saturated soils on steeper hill slopes and the weakening of slopes caused by the pressure groundwater exerts on porous hillsides could trigger slope failure (SHMP 2018). These impacts are more likely to occur along the southern portion of the City's Planning Area where there is low to moderate landslide potential; the majority of the City otherwise has a low landslide potential. For these reasons, climate change would have a "low" influence on earthquake hazards, specifically landslide susceptibility within the City.

Vulnerability Assessment

Ground shaking is the primary hazard related to earthquake activity. Many factors affect the survivability of structures and systems from earthquake-caused ground motions. These factors include proximity to the fault, direction of rupture, epicentral location and depth, magnitude, local geologic and soils conditions, types and quality of construction, building configurations and heights, and comparable factors that relate to utility, transportation, and other network systems. Ground motions become structurally damaging when average peak ground accelerations reach 10 to 15 percent of gravity, average peak velocities reach 8 to 12 centimeters per second, and when the MMI Scale is about VII, which is considered to be very strong (general alarm; walls crack; plaster falls).

Fault rupture itself contributes very little to damage unless the structure or system element crosses the active fault. In general, newer construction is more earthquake resistant than older construction because

of improved building codes and enforcement. Manufactured housing is very susceptible to damage because rarely are the foundation systems braced for earthquake motions. Locally generated earthquake motions, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of URM.

URM buildings can pose significant loss of life, and social and economic risks in the City even when few buildings have this building composition or have been retrofitted. Risks to URM buildings are often located in the downtown areas of older cities. URM buildings without retrofits are also more vulnerable to life-threatening damage than other building types (Turner 2020). Numerous earthquakes over the past century have led to modifications to construction techniques in California and in the 1920's to seismic provisions for new construction as part of the first edition of the Uniform Building Code (UBC). At the same time, local municipalities began adopting various editions to the UBC and establishing building departments to enforce the revised construction standards and ordinances.

The City was one of the first of two cities to enact an URM Ordinance following the two earthquakes of magnitudes 5.6 and 5.7 that occurred in 1969 and originated near the juncture of the Rodgers Creek and Healdsburg Fault (Turner 2020). These earthquakes resulted in damage that was concentrated within the City of Santa Rosa and related to partial collapse and near collapse of URM buildings and wood frame buildings with substandard foundations or inadequate bracing. Other common impacts from earthquakes include damage to infrastructure and buildings (e.g., crumbling of URM, failure of architectural facades, rupturing of underground utilities, and road closures). Earthquakes also frequently trigger secondary hazards, such as dam and levee failures, flooding, and fires that can become disasters themselves.

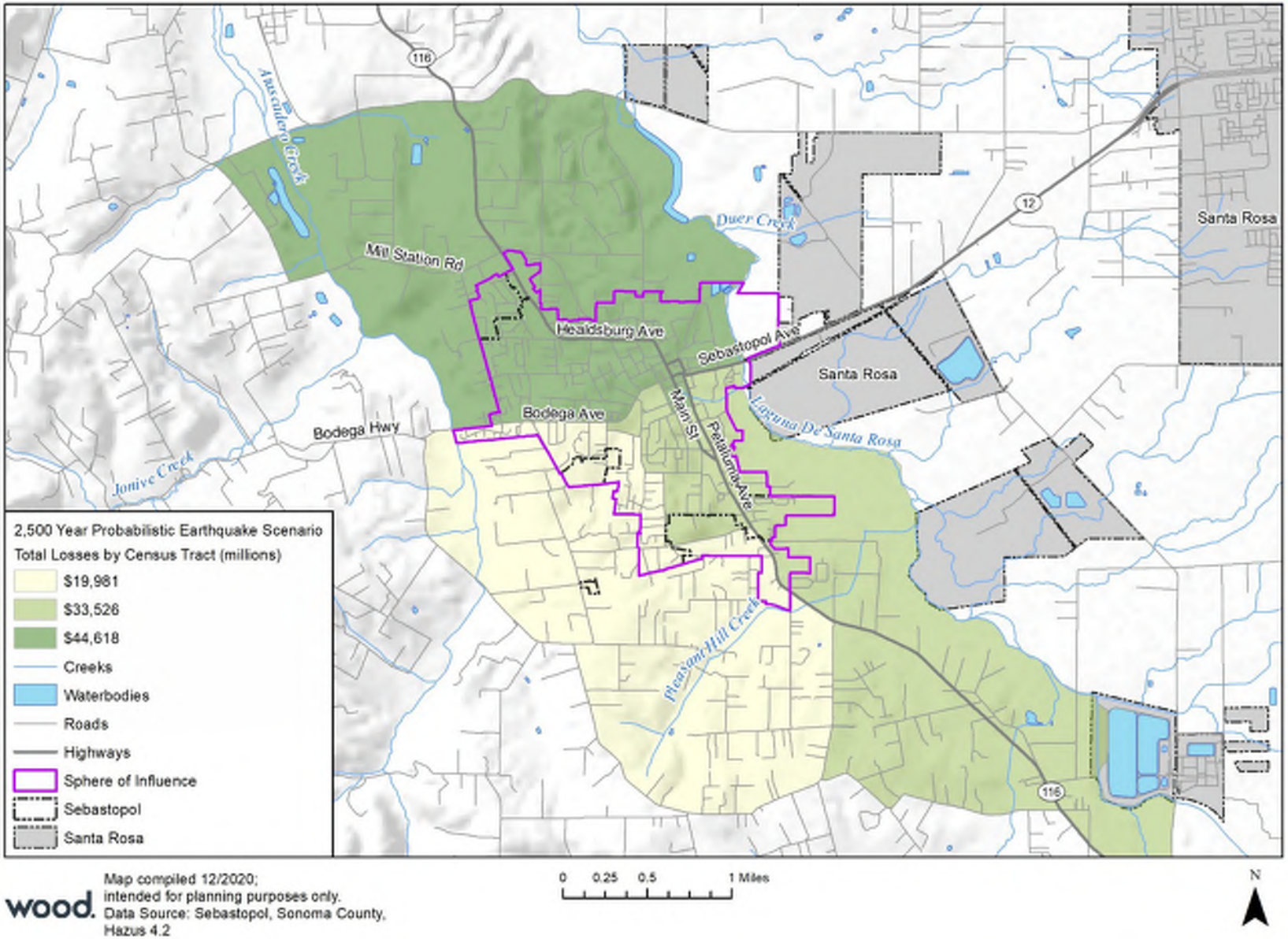
FEMA's loss estimation software, Hazus-MH was used to analyze the City's vulnerability to earthquakes, at the census tract level (for three tract units that cover the City of Sebastopol, displayed in Figure 4-7 below). Note that these census tract boundaries do not neatly line up with the City's boundary, and as such a slightly larger area than that covered in this planning context was necessary to include Sebastopol. Because of these boundary differences, the damage and loss estimates may be slightly exaggerated (given the larger coverage of structures and population).

2,500-Year Probabilistic Earthquake Scenario

A Level 1 Plus 2,500-year probabilistic Hazus earthquake scenario was performed for Sebastopol. This Level 1 Plus analysis is a standard Level 1 Hazus model that incorporates liquefaction susceptibility data and updated parameters that were imported into Hazus to enhance the accuracy of earthquake modelling for the City. Loss estimates and vulnerability assessment discussions are based on the following subsections: property; people; economy; critical facilities and infrastructure; historic, cultural, natural resources; and future development in the Planning Area.

The total losses by census tract are shown in Figure 4-7. Refer to Section 4.1.1 and FEMA's Hazus 4.2 Loss Estimation Tool for more information on the Hazus tool and its analysis functions. This methodology was selected to support the vulnerability assessment, as it is a national standard for modelling earthquake loss. To evaluate potential losses associated with earthquake activity in the Planning Area, the Hazus Level 1 Plus 2,500-year probabilistic scenario including liquefaction susceptibility was run for the City's three census tracts, using a Magnitude of 7.0 as the driving magnitude parameter. Due to these inputs, this 2,500-year scenario is representative of a worst-case level of shaking that considers multiple faults in the region. Hazus estimates the number of people displaced, the number of buildings damaged and their type (e.g., construction material, occupancy class), the number of causalities, and the damage to transportation systems and utilities (e.g., critical facilities).

Figure 4-7: Hazus 2,500 Year Probabilistic Earthquake Scenario with Liquefaction Susceptibility – Total Losses by Census Tract



A summary of the key losses based on the Hazus earthquake analysis results included the following:

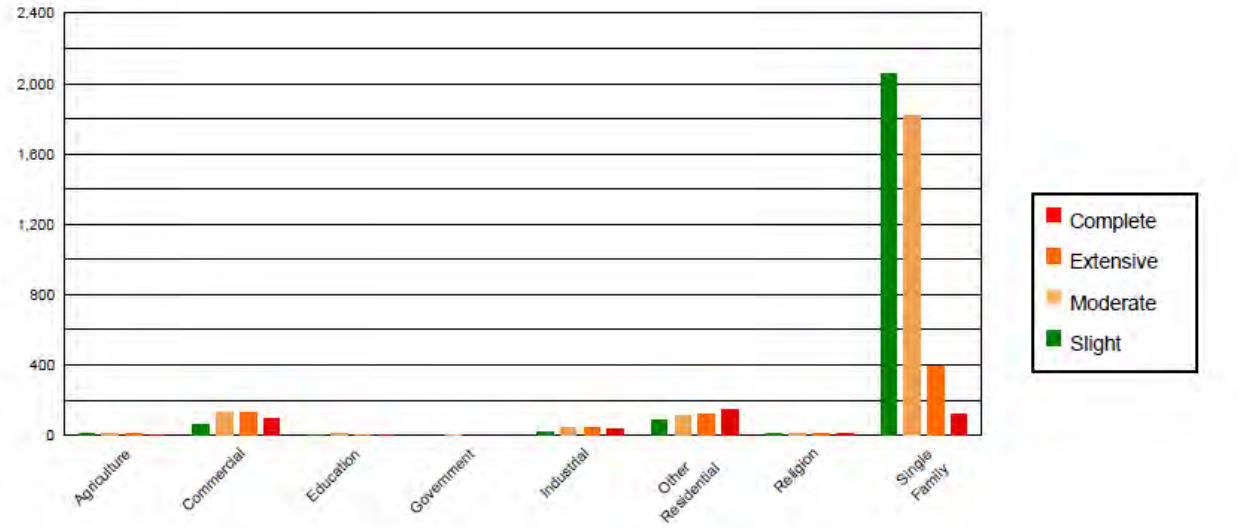
- Total economic loss estimated for the earthquake was $782.5 million, which includes building losses and lifeline related losses based on the Hazus inventory for the Planning Area.
- Building-related losses, including direct building damages and business interruption losses, totaled $767.9 million.
- $108.2 million in losses came from income related losses from wage-related, capital-related, rental properties, and relocation costs, while almost $767.9 million came from capital stock losses related to structural, contents-based, and inventory property categories.
- 14 percent of the estimated losses were related to business interruptions.
- 3,243 buildings (51 percent of total in the region) would be at least moderately damaged; 413 of those buildings would be damaged beyond repair.
- Residential structures made up 57 percent of the total earthquake-induced losses.
- $11.6 million in losses are associated with transportation system economic damages and losses (e.g. highways, buses, airport facilities and related infrastructure).
- $2.9 million in losses are associated with utility and lifeline system economic damages and losses (e.g. potable water, wastewater, natural gas, oil systems, communications, and related infrastructure).
- The mid-day earthquake (2 p.m.) caused the most injuries and casualties: 273 injuries and 19 fatalities.
- The model estimates that a total of 119,000 tons of debris will be generated. Brick and wood structures will comprise 34 percent of the total, with the rest being reinforced concrete and steel materials.
- Around 5,619 households are expected to suffer from potable water or electric power losses, or both, in the first day of the earthquake event.
- Of the total 18 essential facilities considered by the Hazus earthquake scenario for the Planning Area (hospitals, schools, emergency operations centers, police stations, and fire stations), all 18 will be at least moderately damaged.
- Before the earthquake, the region had 82 hospital beds available for use. On the day of the earthquake, the model estimates that only 23 hospital beds (28 percent) would be available for use by patients already in the hospital and those injured by the earthquake.

Property

Significant earthquakes can cause damages to buildings, private and public property, and other infrastructure. The number of properties at risk is also based on when the majority of development was constructed in the City's Planning Area and whether that development was developed after the City adopted the latest state seismic code. The CBC was modified several times since 1960, which resulted in code requirements that directly affected the structural integrity of development in California. According to the HMPC, the City adopted the 2019 CBC, which includes the building and seismic code improvements, and most redevelopment in the City's Planning Area occurred during the past 40 years when the City enforced the new code requirements. The Hazus earthquake results also accounted for the improved seismic codes in the model, given the City requires new construction in the to comply with the 2019 CBC.

Hazus estimates that 3,243 buildings (51 percent of the total buildings in the region) would be at least moderately damaged, and of these 413 buildings would be damaged beyond repair by the earthquake scenario. A majority of the buildings experiencing damage are residential structures, and wood frame construction makes up the majority of building/structure material in the planning area's inventory. Figure 4-8 shows a graph and table that summarize the specific estimated damages to buildings based on occupancy and damage category.

Figure 4-8: Estimated Building Damage by General Occupancy Type and Damage Category



	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	2.57	0.30	6.57	0.29	9.69	0.45	6.81	0.97	5.37	1.30
Commercial	22.97	2.73	59.47	2.66	126.47	5.94	125.61	17.91	96.48	23.34
Education	2.02	0.24	4.54	0.20	6.44	0.30	4.38	0.62	2.61	0.63
Government	0.44	0.05	0.86	0.04	1.09	0.05	0.89	0.13	0.72	0.17
Industrial	5.64	0.67	16.18	0.72	40.45	1.90	43.03	6.14	35.70	8.64
Other Residential	33.25	3.95	88.11	3.94	115.67	5.43	118.14	16.85	141.84	34.31
Religion	2.59	0.31	6.21	0.28	10.09	0.47	8.68	1.24	6.43	1.56
Single Family	773.06	91.75	2053.14	91.86	1818.87	85.44	393.68	56.14	124.26	30.06
Total	843		2,235		2,129		701		413	

Source: Hazus 4.2

With a majority of the buildings in the Planning Area being residential, the Hazus model estimates that over 57 percent of the total losses incurred by this earthquake scenario are single family homes and other residential categories. The building inventory in the region varies in terms of construction types. A large number of buildings are also constructed of wood materials, though the building inventory includes URM buildings and manufactured housing. These types of wood, masonry, and manufactured housing structures are particularly vulnerable to ground shaking in an earthquake event. Table 4-9 describes the Hazus results of expected building damage by building type. Most buildings/structures found are expected to sustain slight to moderate damages.

Table 4-9: Expected Building Damage by Building Type (All Building Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	811.59	96.33	2162.39	96.75	1920.38	90.21	417.74	59.57	135.36	32.74
Steel	4.56	0.54	11.59	0.52	39.93	1.88	50.64	7.22	39.05	9.45
Concrete	7.04	0.84	19.69	0.88	34.13	1.60	32.29	4.60	25.27	6.11
Precast	3.48	0.41	10.95	0.49	33.33	1.57	37.88	5.40	31.07	7.52
RM	15.21	1.81	24.72	1.11	59.16	2.78	63.68	9.08	39.99	9.67
URM	0.34	0.04	1.67	0.07	7.21	0.34	10.60	1.51	16.80	4.06
MH	0.32	0.04	4.06	0.18	34.61	1.63	88.40	12.61	125.85	30.44
Total	**843**		**2,235**		**2,129**		**701**		**413**	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Source: Hazus 4.2

People

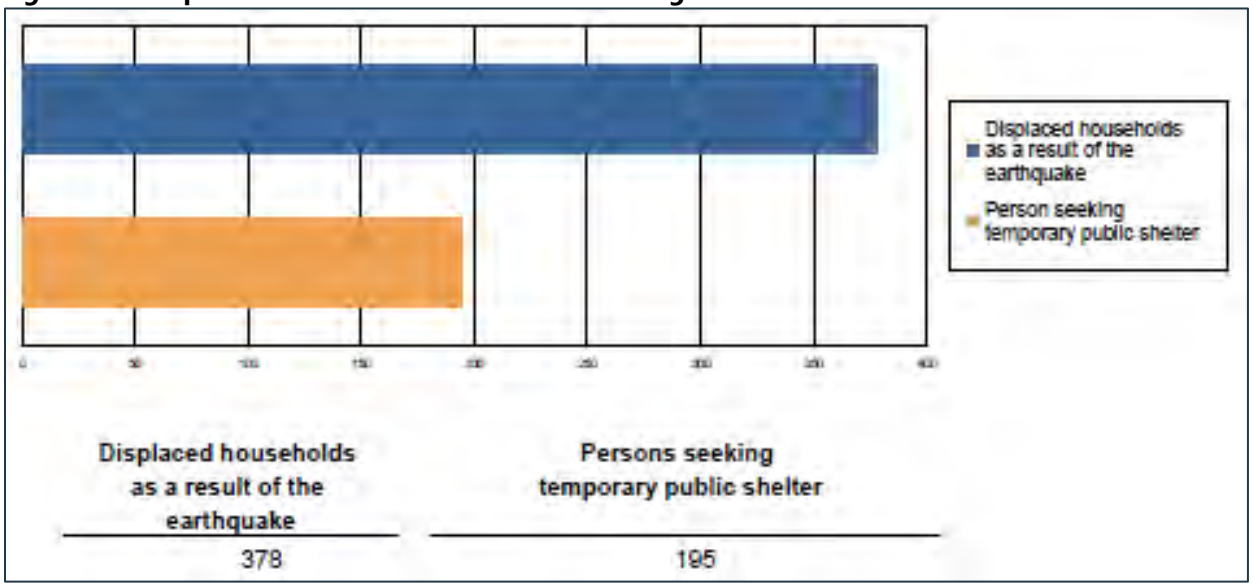
Hazus estimates the number of people that would be injured or killed by the 2,500-probabilistic earthquake scenario, which includes liquefaction susceptibility. The causalities are broken down into four severity levels. Level 1 means that injuries occur but do not need hospitalization (i.e. the lowest level, causing the least damages or injuries) to Level 4, where victims are killed by the earthquake (i.e. the highest, or worst, of the levels). The estimates are provided for three times of the day which represent the periods of a standard working day when different sectors of the community are likely at their peak occupancy loads (e.g., in business/office settings versus residing at home).

As shown in Table 4-10 below, the highest number of injuries and casualties are estimated to occur in the early afternoon (2 p.m.) with the greatest impacts on the commercial and educational sectors when those sector loads are considered to be at their maximum. The 2 p.m. time has the greatest potential for fatalities, with an estimate of 19, followed by the 5 p.m. scenario which estimates 14 fatalities (more information below).

Some populations in the Planning Area may be more vulnerable to an earthquake event than others. For example, those with mobility issues as well as the elderly may have challenges with evacuating or traveling to a shelter without assistance if they cannot stay in their homes. Other vulnerable populations may be individuals whom English is not their native language. Of these socially vulnerable populations and according to the census tracts and block groups in the City, several of these populations are anticipated to reside within central Sebastopol and within older housing that may have been constructed prior to the seismic code improvements.

According to 2015-2019 American Community Survey (ACS), 9.8 percent of individuals in the City speak a language other than English in their home. These individuals may not receive or understand evacuation information including where shelters are located or where to receive resources to aid in the recovery process. These same individuals and households are designated as socially vulnerable populations, many which reside in the downtown area. Figure 4-9 shows a graph from the Hazus report estimates for the total number of households expected to be displaced as result of the earthquake. The report estimates 378 households to be displaced, and of those, 195 individuals will be seeking temporary shelter. This does not take into account future population growth or other variables, such as populations increases due to tourism.

Figure 4-9: Displaced Households and Persons Seeking Shelter Estimates



Source: Hazus 4.2

Table 4-10 shows the Hazus estimates for total casualties and injuries related to the earthquake scenario.

Table 4-10: Casualty and Injury Estimates from Hazus Results

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	2.24	0.68	0.11	0.22
	Commuting	0.04	0.05	0.09	0.02
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	3.33	1.01	0.16	0.32
	Other-Residential	23.57	6.17	0.70	1.32
	Single Family	39.67	7.05	0.42	0.73
	Total	**69**	**15**	**1**	3
2 PM	Commercial	127.85	38.79	6.47	12.72
	Commuting	0.38	0.46	0.83	0.16
	Educational	36.12	10.98	1.87	3.66
	Hotels	0.00	0.00	0.00	0.00
	Industrial	24.58	7.43	1.21	2.37
	Other-Residential	4.62	1.21	0.14	0.26
	Single Family	8.08	1.44	0.10	0.15
	Total	**202**	**60**	**11**	**19**
5 PM	Commercial	89.40	27.03	4.52	8.78
	Commuting	6.71	8.27	14.79	2.82
	Educational	3.41	1.03	0.18	0.35
	Hotels	0.00	0.00	0.00	0.00
	Industrial	15.36	4.64	0.76	1.48
	Other-Residential	8.80	2.31	0.27	0.49
	Single Family	15.62	2.78	0.19	0.28
	Total	**139**	**46**	**21**	**14**

Source: Hazus 4.2

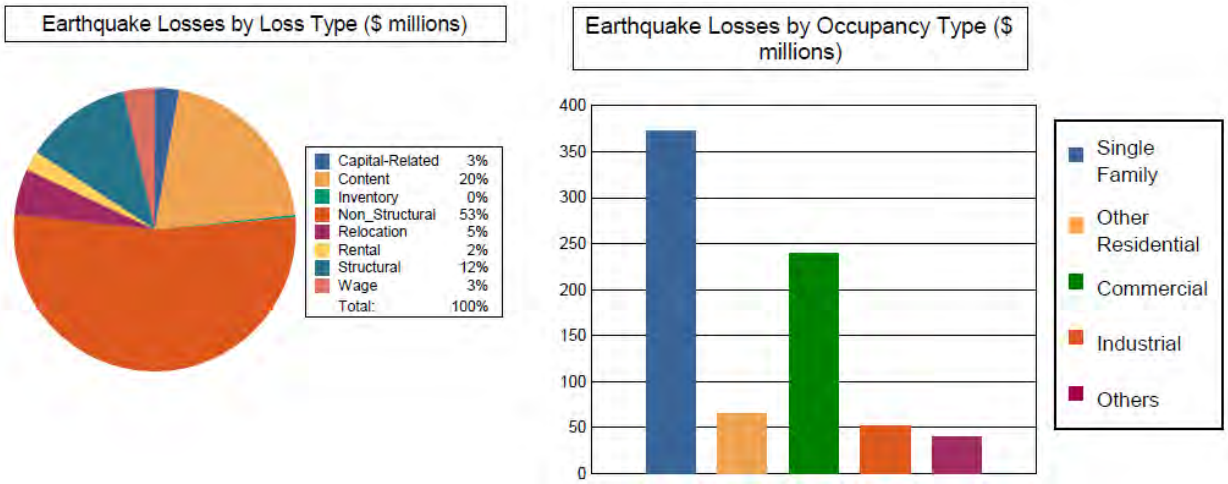
Economy

Earthquakes can have a severe impact on local and regional economies. Impacts can be both direct, such as damages to commercial and residential structures, as well as indirect such as cascading effects involving business interruptions due to employees being displaced from their homes. Another secondary or cascading impact an earthquake could have on Sebastopol is causing damages to transportation infrastructure that is critical to employees and business activity in the region. Based on the Hazus results, Sebastopol could potentially experience approximately $782.5 million in economic losses. This amount includes both income losses (estimated to be $108.2 million) as well as capital stock losses ($659.7

million). Another secondary impact of an earthquake is business disruption and the resulting economic loss as a result of that disruption. Hazus describes business interruption losses as those losses associated with the inability to operate a business because of the damage sustained by the earthquake and includes the temporary living expenses for individuals displaced from their homes.

Hazus also estimates the total building-related losses. This includes business interruption losses and direct building losses (the estimated costs to repair or replace the damage caused to buildings and its contents) at $767.9 million, 14 percent of which are related to business interruption in the region. As shown in the pie charge and graphs in Figure 4-10 and Table 4-11 below, the largest loss in this scenario consisted of non-structural losses, which are sustained by residential occupancies, making up 57 percent of total loss. The following figures and tables report the estimate of losses by loss type, occupancy type, and building-related loss.

Figure 4-10: Economic Loss Estimates by Loss Type and Occupancy Type



Source: Hazus 4.2

Table 4-11: Building-Related Economic Loss Estimates (Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.7756	23.6844	0.6310	0.6101	26.7011
	Capital-Related	0.0000	0.7530	20.7611	0.3784	0.2373	22.1298
	Rental	6.0529	2.7076	8.6056	0.2214	0.2607	17.8482
	Relocation	21.8160	2.3541	13.0509	1.1974	3.0757	41.4941
	Subtotal	**27.8689**	**7.5903**	**66.1020**	**2.4282**	**4.1838**	**108.1732**
Capital Stock Losses							
	Structural	46.7877	7.6251	26.3087	6.1295	7.1125	93.9635
	Non_Structural	224.4587	40.3823	98.4930	24.6172	18.1700	406.1212
	Content	73.3574	10.0050	47.6402	15.9505	9.6277	156.5808
	Inventory	0.0000	0.0000	0.7263	2.0653	0.2810	3.0726
	Subtotal	**344.6038**	**58.0124**	**173.1682**	**48.7625**	**35.1912**	**659.7381**
	Total	**372.47**	**65.60**	**239.27**	**51.19**	**39.38**	**767.91**

Source: Hazus 4.2

In addition to economic losses experienced by building-related losses, Hazus estimates the economic losses as a result of transportation and utility lifeline losses and the direct repair cost for each component. As shown in Table 4-12 and Table 4-13 below it is estimated that $11.6 million will be lost as a result of

damages to transportation components and $2.9 million are expected to be lost as result of utility system damages.

Table 4-12: Transportation System Economic Losses (Millions of Dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	362.6004	7.2642	2.00
	Bridges	17.3642	4.3740	25.19
	Tunnels	0.0000	0.0000	0.00
	Subtotal	379.9646	11.6382	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
	Total	379.96	11.64	

Source: Hazus 4.2

Table 4-13: Utility System Economic Losses (Millions of Dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	5.3571	1.7797	33.22
	Subtotal	5.3571	1.7797	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.2143	0.8940	27.81
	Subtotal	3.2143	0.8940	
Natural Gas	Pipelines	110.4931	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.1429	0.3063	14.29
	Subtotal	112.6360	0.3063	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
	Total	121.21	2.98	

Source: Hazus 4.2

Critical Facilities and Infrastructure

Large seismic events could have catastrophic effects on the City and surrounding areas, possibly damaging transportation and utility lifelines, bridges, railroads, and other critical facilities and infrastructure, similar to the economic losses associated with these facilities. Hazus estimates impacts to essential facilities including hospitals, schools, Emergency Operations Centers (EOCs), police stations, and fire stations. The Hazus analysis also takes into account hazardous material sites; however, no hazardous material sites, nuclear power plants, or military installations fall within the City's Planning Area.

According to the earthquake analysis, there is one hospital with a total capacity of 47 beds, 15 schools, Hazus data; current data lists 37 beds are available [American Hospital Directory 2020]). Hazus estimates that 18 of these essential facilities are expected to suffer moderate damage. With regards to

transportation systems, 11 bridges will suffer at least moderate damage, and one will suffer complete damage. However, no utility system facilities will suffer moderate damage.

Table 4-14, Table 4-15, and Table 4-16 summarize the expected damages generated by the Hazus scenario for each type of transportation system and utility system, including pipelines in the area.

Table 4-14: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	27	0	0	26	26
	Bridges	11	11	1	0	5
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Source: Hazus 4.2

Table 4-15: Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Source: Hazus 4.2

Table 4-16: Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	166	257	126
Waste Water	100	129	64
Natural Gas	88	0	0
Oil	0	0	0

Source: Hazus 4.2

Historic, Cultural, and Natural Resources

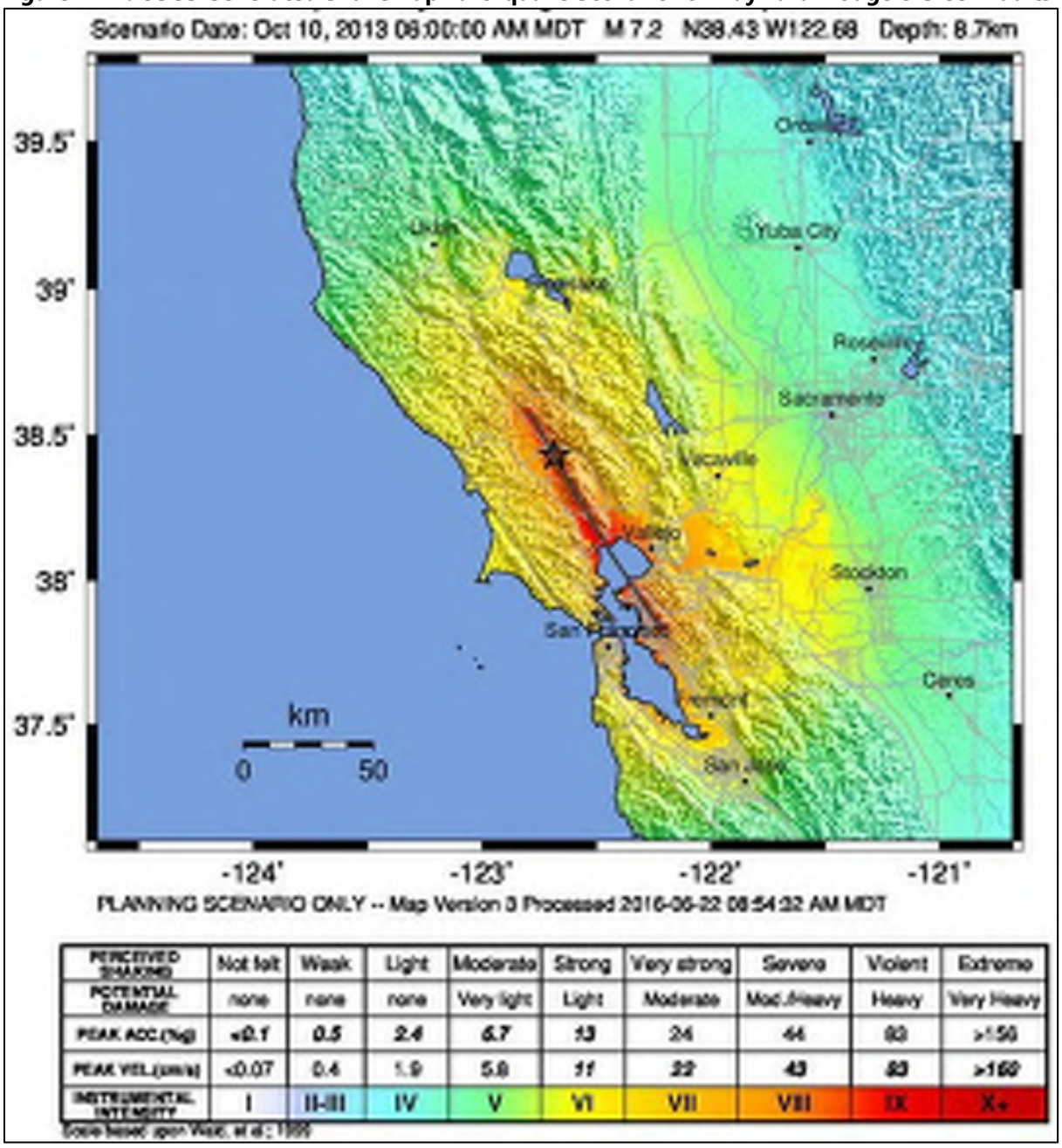
An earthquake in the City's Planning Area or in the surrounding region could cause cascading (secondary) effects, including dam or pipeline failure that would impact the natural environment in different ways, depending on the extent of the cascading hazard. For example, earthquake-induced landslides or debris flows could significantly damage habitat and re-route streams and waterways, causing water quality impacts. Other types of ground deformation could also result. Earthquakes could also damage historic buildings in downtown Sebastopol.

Magnitude 7 Deterministic ShakeMap Earthquake Scenario

A second Hazus-based earthquake scenario was run for the Sebastopol Planning Area using census tract units that was based on a deterministic model. A deterministic scenario relies on seismic data to predict the outcome of a specific earthquake event. This deterministic scenario used USGS provided ShakeMap datasets to model what a Magnitude 7.2 earthquake of the Hayward-Rodgers Creek Faults (Rodgers Creek – Hayward North Fault [northern portion of the Hayward fault]) would generate in terms of damages and losses for the chosen area of interest (i.e. the Sebastopol Planning Area). These faults were selected because they are known to have caused seismic activity and pose a risk to Sebastopol and nearby communities. The M7.2 ShakeMap scenario datasets used to import into Hazus 4.2 include four USGS-provided key data layers in spatial format: peak ground velocity, peak ground acceleration, peak spectral acceleration for 0.3 seconds (0.3 percent g, or gravitational velocity), and peak ground acceleration for 1.0 seconds (1.0 percent g) (USGS 2016a). The epicenter of this USGS modeled scenario is located at latitude

38.43 North and 122.68 West and had a depth of 8.7 kilometers. A fifth layer of liquefaction susceptibility was also included in the Hazus model, which is the same utilized in the previous 2,500-year probabilistic scenario to enhance the model with more accurate ground and soil conditions. Figure 4-11 includes the general location of the scenario's epicenter (marked with a start northeast of the San Francisco Bay area) as well as intensity information and reference to the USGS ShakeMap data.

Figure 4-11: USGS Generated ShakeMap Earthquake Scenario for Hayward-Rodgers Creek Faults



Sources: USGS 2016b, Weld, et al 1999

For more information on the USGS generated ShakeMap scenarios, modeling criteria, manual information, and overall catalog of available data refer to the [USGS Earthquake Hazards Program ShakeMap information page.]

This deterministic M7.2 scenario results included liquefaction susceptibility. Loss estimates and vulnerability assessment were completed based on the following subsections, similar to the previous scenario: property; people; the local economy; critical facilities and infrastructure; historic, cultural, natural resources; and future development of the Planning Area. The total losses by census tract from this M7.2 scenario are shown in Figure 4-11 and summarized in Table 4-17 below.

Refer to Section 4.1.1 and FEMA's Hazus 4.2 Loss Estimation Tool for more information on the Hazus tool and its analysis functions. As stated in the previous section, Hazus is a loss estimation tool which derives totals on the number of people displaced, the number of buildings damaged and their type (e.g. construction material, occupancy class), the number of causalities, and the damage to transportation systems and utilities (e.g. critical facilities) given the input parameters, scenario type, and region/area of interest. In comparison to the Hazus Level 1 Plus 2,500 Probabilistic Scenario, the deterministic M7.2 scenario results in $66.7 million in total economic losses (compared to $782.5 million), 340 buildings with moderate to complete damage (compared to 3,243 buildings), 61 percent of damage related to residential structures (compared to 57 percent), $53,800 in transportation system economic losses (compared to $11.6 million), eight casualties and no fatalities (compared to 273 casualties and 19 fatalities), and 6,000 tons of debris generation (compared to 119,000 tons). This scenario also results in eight displaced households (compared to 378 households) compared to the 2,500 probabilistic scenario.

Table 4-17: Hazus 4.2 Deterministic M7.2 Earthquake Scenario Loss Estimations for Sebastopol's Census Tracts

Type of Impact	Impacts to Planning Area
Total Buildings Damaged	Slight: 1274 Moderate: 301 Extensive: 35 Complete: 4
Building and Income Related Losses	$ 66.5 million 61 % of damage related to residential structures 12 % of loss due to business interruption
Total Economic Losses (Includes building, income, and lifeline/critical facility losses)	$ 66.7 million
Casualties (Based on a 2 a.m. time of occurrence)	Without requiring hospitalization: 4 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on a 2 p.m. time of occurrence)	Without requiring hospitalization: 7 Requiring hospitalization: 1 Life threatening: 0 Fatalities: 0
Casualties (Based on a 5 p.m. time of occurrence)	Without requiring hospitalization: 5 Requiring hospitalization: 1 Life threatening: 0 Fatalities: 0
Transportation System Economic Losses	$ 0 damages to highway $ 53,800 in damages to bridges $ 0 damages to airport facilities or runways $ 0 damages to bus facilities $ 0 damages to light rail $ 0 damages to ferry and port facilities
Damage to Transportation Systems	0 damages to highway or bridges 0 damages to airport facilities or runways 0 damages to bus facilities

Type of Impact	Impacts to Planning Area
	0 damages to light rail 0 damages to ferry and port facilities
Damage to Essential Facilities	0 damages to schools, police stations, fire stations, emergency operations centers, or hospitals
Damage to Utility Systems	2 of the following facilities will suffer damages: potable water; wastewater; natural gas; oil systems; electrical power; and communications. Potable water breaks: 5 Wastewater breaks: 3 Natural gas breaks: 0 Oil pipeline breaks: 0
Households without Power/Water Service (Based on 26,824 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0 Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	8
Persons Seeking Temporary Shelter	4
Debris Generation	6,000 tons

Sources: Hazus 4.2, USGS ShakeMap M7.2 Scenario for Hayward-Rodgers Creek

Future Development

The Hazus scenario only estimates damage and causalities for existing building inventory and populations and does not consider future development plans. The City of Sebastopol has experienced growth over the 10 years since the last Census (2010-2020), after experiencing a drop in population of approximately 5 percent since the 2000 Census which was the City's highest recorded population. (Refer to Chapter 2: Community Profile for further discussion on demographics and population changes). The latest California Department of Finance (DOF) estimates show the population is 7,745 as of 2020, which reflects a growth rate of 4.7 percent since 2010 (DOF 2020).

According to the Sonoma County Economic Development Board's *2018 City Profile and Projection's Report for Sebastopol*, the City is expected to grow in population to 7,955 by 2022 and according to the City's *General Plan Housing Element* by an additional 455 residents by 2030, resulting in a 5.5 percent increase over the next decade. This is on the lower end of growth rates for Sonoma County, but still outpaces the state and national projected growth rates. With this in mind, the *Sebastopol General Plan* and its Safety Element establishes goals to protect the safety of life and property by ensuring emergency preparedness with efforts to increase community awareness of earthquakes and preparedness measures. New development projects will also be reviewed for conformance with applicable City building standards related to geologic and seismic safety.

Risk Summary

- The overall risk significance of earthquake hazards to the City of Sebastopol is **High**.
- Earthquakes and seismic activity are expected to have a probability of occasional occurrence in the future, given the local seismic conditions, past history, and input from the City.

- Two earthquake faults of concern can affect the City: the San Andreas Fault and the Healdsburg-Rodgers Creek Fault (modelled as the Hayward – Rodgers Creek Fault), both are considered to be active faults that may lead to damages or losses in the future.
- The City of Sebastopol was one of the first cities to enact an URM Ordinance following two earthquakes that occurred in 1969 and originated near the juncture of the Rodgers Creek and Healdsburg Fault.
- The majority of the Planning Area is within very low liquefaction susceptibility zones, with some areas on the far west and far east of the City extending into very high liquefaction susceptibility zones.
- Climate change is not expected to directly affect earthquake frequency or intensity but it could exacerbate secondary impacts by increasing the frequency and intensity of extreme precipitation events. This could increase the likelihood of landslides and liquefaction events during an earthquake, therefore climate change would have a "low" influence on earthquake hazards.
- Based on the first Hazus earthquake analysis, it is expected that a 2,500-year probabilistic earthquake (worst-case scenario) with liquefaction susceptibility taken into account would cause $782.5 million in total economic losses. A M7 deterministic earthquake scenario would cause $66.7 million in total economic losses.
- Under the 2,500-year probabilistic scenario, it is estimated that 3,243 buildings (51 percent of total in the region) would be at least moderately damaged; 413 of those buildings would be damaged beyond repair. Residential structures made up 57 percent of the total earthquake-induced losses. In comparison, the M7 deterministic scenario would result in 340 buildings being moderate to complete damage.
- The 2,500-year probabilistic Hazus scenario resulted in $11.6 million in losses to the transportation systems, while $2.9 million would be incurred in damages and losses to the utility and lifeline systems. Around 5,619 households would be affected by potable water or electric power losses, or both, on the first day of this earthquake scenario.
- The 2,500-year probabilistic Hazus scenario also estimates that around 119,000 tons of debris would be generated, while the M7 deterministic scenario resulted in 6,000 tons of debris, with wood, masonry, and manufactured housing structures suffering the most.
- The potential for casualties during the worst-case 2,500-year probabilistic scenario for which time of day of the earthquake might hit (the 2 p.m. scenario) would lead to 19 fatalities and 273 injuries, while the M7 deterministic scenario resulted in only eight casualties and no fatalities.

4.3.2 Flooding

Hazard Description

Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss. Flooding is usually the result of, or often exacerbated by, weather events. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Certain health hazards are also common to flood events; standing water and wet materials in structures can become breeding grounds for microorganisms such as bacteria, mold, and viruses. Standing water or affected infrastructure can in turn cause disease, trigger allergic reactions, and damage materials long after the flood. When floodwaters contain sewage or decaying animal carcasses, infectious disease also becomes a concern. Direct impacts such as drowning can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts.

Floodplains are defined as the areas immediately adjacent to a channel from a river, stream, or other waterway. Floodplains are illustrated on inundation maps, which show areas of potential flooding and

water depths. In its common usage and based on FEMA guidelines, the floodplain most often refers to the area that is inundated by the 100-year flood, or the flood that has a one percent chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the FEMA National Flood Insurance Program (NFIP). The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. A 500-year flood event would be slightly deeper and cover a greater area than a 100-year flood event. The potential for flooding can change and increase through various land use changes and changes to land surface, which then may result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

The City of Sebastopol is susceptible to various types of flood events as described below.

- **Riverine Flooding** - Riverine flooding, defined as the condition when a watercourse (e.g. river or channel) exceeds its "bank-full" capacity, generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. This type of flood occurs in river systems whose tributaries may drain large geographic areas and include one or more independent river basins. The onset and duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. In the Planning Area, flooding is largely caused by heavy and continued rains, increased outflows from upstream dams, and heavy flow from tributary streams. Local intense storms can overwhelm nearby waterways as well as the integrity of flood control structures. The warning time associated with slow rise floods assists in life and property protection.
- **Localized Flooding** - Flash flooding describes localized floods of great volume and short duration. This type of flood usually results from a heavy rainfall on a relatively small drainage area. Precipitation of this sort usually occurs in the winter and spring. Flash floods often require immediate evacuation. Related to this type of flooding is also localized flooding, which is often caused by flash flooding, severe weather, or an unusual amount of rainfall. Flooding from these intense weather events occurs in areas experiencing an increase in runoff from impervious surfaces associated with development and urbanization as well as inadequate storm drainage systems.
- **Dam Incident Flooding** – Potential inundation caused by failure or mis-operation of one or more upstream dams is also a concern to the City. A catastrophic flood control or water retention structural failure could easily overwhelm local response capabilities and require evacuations. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public, as well as the magnitude of the event. Loss of life could potentially result, however, and there could be associated health concerns as well as negative effects to local buildings and infrastructure. Dam failure and associated inundation is addressed in more detail under Section 4.3.5 Dam Incidents.

Location

Significant – Flooding of various types may occur anywhere within the City's Planning Area, and the City has a history of flooding along the Laguna de Santa Rosa. Details on local water features, watersheds, and flood control structures and systems are provided below.

City of Sebastopol Watersheds and Waterways

The City of Sebastopol is primarily located within the Mark West Creek and Lower Russian River watersheds, under Hydrologic Unit Codes (HUCs): 1801011007 and 18011009. The main waterways in the City include the Laguna de Santa Rosa, Atascadero Creek, Zimpher Creek, Calder Creek, and Pleasant Hill

Creek. The Laguna de Santa Rosa is one of the largest freshwater marshes in Northern California and has a critical role in reducing flood levels in the Russian River. The Laguna de Santa Rosa drains on the eastern side of Sebastopol and is identified in the Sonoma County Flood Insurance Study (FIS) as being the principal flooding problem for the City due to ponding on the lower reaches caused by backwater from the Russian River. The City's watersheds are described below and illustrated in Figure 4-12.

Mark West Creek Watershed (HUC 1801011007) – Mark West Creek is the second largest sub-watershed in the Russian River basin (CDFW 2018). The Mark West Creek Watershed covers approximately 254 square miles (162,792 acres) and spans the cities of Sebastopol, Santa Rosa, and Cotati all within Sonoma County.

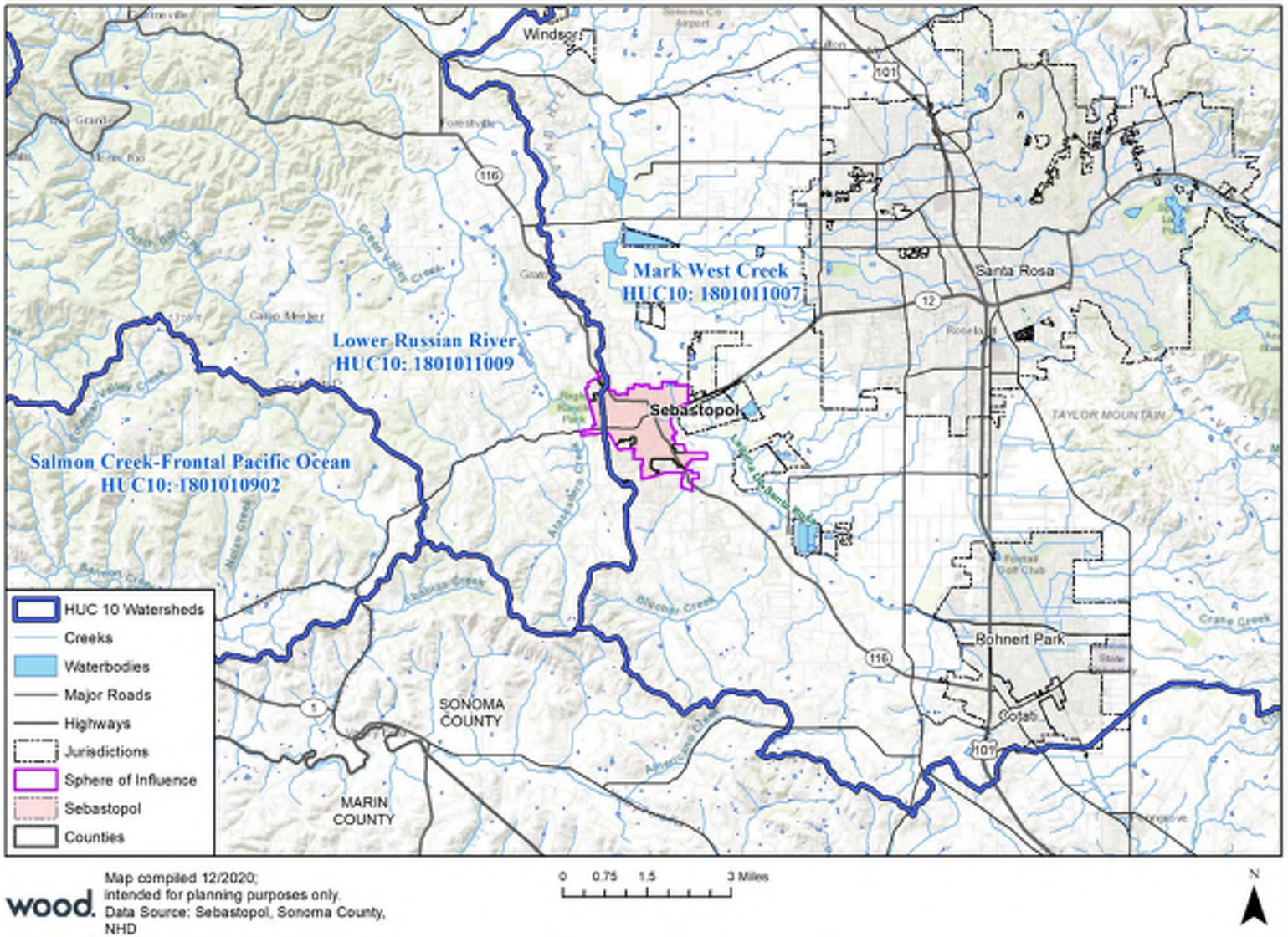
Lower Russian River Watershed (HUC 1801011009) – The Lower Russian River Watershed covers approximately 382 square miles (94,495 acres) and covers the western side of Sebastopol. The Lower Russian River is a sub-watershed to the larger Russian River Watershed.

Local and Regional Drainage Facilities

Major drainage features within the Planning Area or managed by the City include:

- Laguna De Santa Rosa
- Atascadero Creek
- Zimpher Creek
- Calder Creek
- Pleasant Hill Creek

Figure 4-12: Watersheds in the City of Sebastopol Planning Area



Floodplain Mapping and Studies

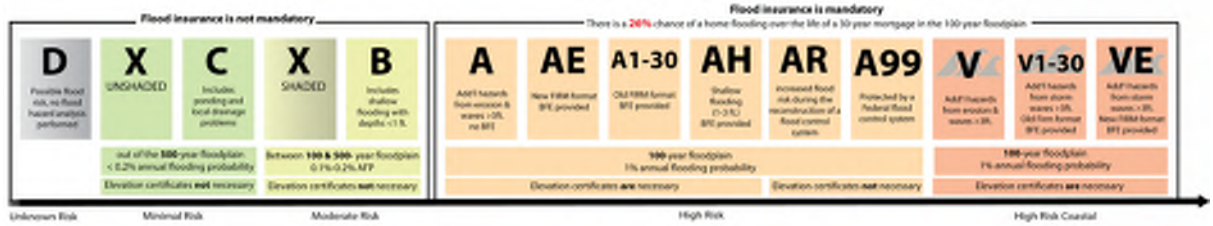
FEMA established standards for floodplain mapping studies as part of the NFIP (FEMA 2019). The NFIP makes flood insurance available to property owners in participating communities adopting FEMA-approved local floodplain studies, maps, and regulations. Floodplain studies that may be approved by FEMA include federally funded studies; studies developed by state, city, and regional public agencies; and technical studies generated by private interests as part of property annexation and land development efforts. Such studies may include entire stream reaches or limited stream sections depending on the nature and scope of a study. An overview of floodplain mapping is provided below.

Flood Insurance Study (FIS) - The FIS develops flood-risk data for various areas of a community that are used to establish flood insurance rates and assist the community in its efforts to promote sound floodplain management. The latest FIS applicable to the City of Sebastopol was included in a five-volume report along with other incorporated jurisdictions and unincorporated areas studied in Sonoma County; this recent report was last revised March 7, 2017 (FEMA 2017a).

Flood Insurance Rate Map (FIRM) - The FIRM is designed for flood insurance and floodplain management applications. For flood insurance, the FIRM designates flood insurance rate zones to assign premium rates for flood insurance policies. The designated flood zones are based on flood risk in the area. For floodplain management, the FIRM delineates 100- and 500-year floodplains, floodways, and the locations of selected cross sections used in the hydrology and hydraulic analyses and local floodplain regulations.

Land areas that are high risk within the 100-year floodplain (meaning they have a one percent annual chance of flooding), are called Special Flood Hazard Areas (SFHAs) and are mapped as A or AE zones. The difference between A and AE zones are the level of detail in analysis and mapping, so that A zones are more general while AE contain additional detail and also display Base Flood Elevations, or BFEs. In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to Zones A and AE (i.e., those areas subject to a 100-year flood event).

What are flood zones?



Flood zones are geographic areas on a flood map that indicate flood risk. Zones are determined by assessing the expected height of a flood that has a 1 percent chance of occurring in any given year ("100-year flood"), as well as potential wave heights, the distance from the nearest water body, and the ground elevation. While there is only a 1 percent chance of a flood of such magnitude to occur every year, there is a 26 percent chance of such a flood to occur over the lifecycle of a 30-year mortgage.
Source: Wetlands Watch 2019

The City of Sebastopol FIRMs, as with most portions of California and larger developments across the U.S., have been replaced by new digital flood insurance rate maps (or DFIRMS) as part of FEMA's Risk Map and Map Modernization programs. DFIRMs and related datasets (e.g. cross sections used in floodplain studies and analyses, BFEs, etc.) are now delivered via National Flood Hazard Layer (NFHL) databases, accessible for free online at FEMA's Flood Map Service Center site.

These digital DFIRMs achieve the following purposes:

- Incorporate the latest flood study updates (LOMRs and LOMAs);
- Utilize community supplied data;

- Verify the currency of the floodplains and refit them to community supplied base maps and base data
- Upgrade the FIRMs to a GIS database format to set the stage for future updates and to enable manipulation, storage, and support for GIS analyses and other digital applications; and
- Solicit community participation.

The most current DFIRMs for the City of Sebastopol and other jurisdictions or unincorporated areas within Sonoma County are included in the County's NFHL database. The latest effective date for studies in the County is March 7, 2017 (FEMA 2017a). The spatial features available in this NFHL database, such as floodplains, cross sections and the discharge summary table were used for the analyses and mapping in this plan as they relate to flooding hazards.

Letter of Map Revision (LOMR) and Letter of Map Amendment (LOMA) - LOMRs and LOMAs represent separate floodplain studies dealing with individual properties or limited stream segments that update the FIS and FIRM data (as revisions or amendments) between periodic FEMA publications of the FIS and FIRM products.

Major Sources of Flooding

General rainfall floods, primarily associated with the rainy season, taking place from October to May, with the most severe flooding, historically, taking place between December and March (City of Sebastopol 2015). This type of flood results from prolonged heavy rainfall over tributary areas and is characterized by high peak flows of moderate duration. Flooding is more severe when antecedent rain has resulted in saturated ground conditions.

In the more urbanized areas of Sebastopol, flood problems intensify because the immediate areas are developed and contain mostly impervious surfaces such as roads and paved structures. Because of this, the nearby open land available to absorb rainfall and runoff is often limited or difficult to access naturally. In other words, the decrease in the amount of open land that can absorb precipitation increases the volume of water that must be carried away by waterways and developed infrastructure, causing localized flash flooding and stormwater issues.

The latest FEMA NFHL data indicates that 100- and 500-year floodplains are predominantly located east and west of the City, along the Laguna de Santa Rosa and Atascadero Creek (see Figure 4-13) While the Laguna de Santa Rosa is critical to reducing flood levels in the Russian River, ponding due to backwater from the Russian River on the lower reaches of Laguna de Santa Rosa is identified in the Sonoma County FIS as the principal flooding problem for the City. The river levels and flooding in the City are not directly related, in addition to the ponding in the Laguna de Santa Rosa other factors including tidal influences affecting the Russian River, the intensity and duration of precipitation, soil saturation can also lead to flood impacts in Sebastopol (City of Sebastopol 2016). Based on input received from the public survey for the planning process, the following were identified by members of the public as being problem areas for flooding:

- Laguna floodplains along Highway 12 impact exit on main highway out of City, and
- Heavy rains flowing on Edman Way into businesses on Main Street.

The Sonoma Water Authority was enabled, in 1958, to create several geographic zones encompassing major watersheds in the County to finance development and maintenance of flood protection projects as flood control zones. The City falls in Zone 1A1, named the Laguna de Santa Rosa – Mark West Creek Watershed. Zone advisory committees exist which are in charge of prioritizing, managing, and approving zone related capital improvement plans (CIPs) and projects such as flood protection and drainage facility works, natural waterway maintenance, plan development, erosion and sedimentation control activities, and others also pertaining to Sonoma Water Authority's goals and objectives.

Localized Flooding Problem Areas

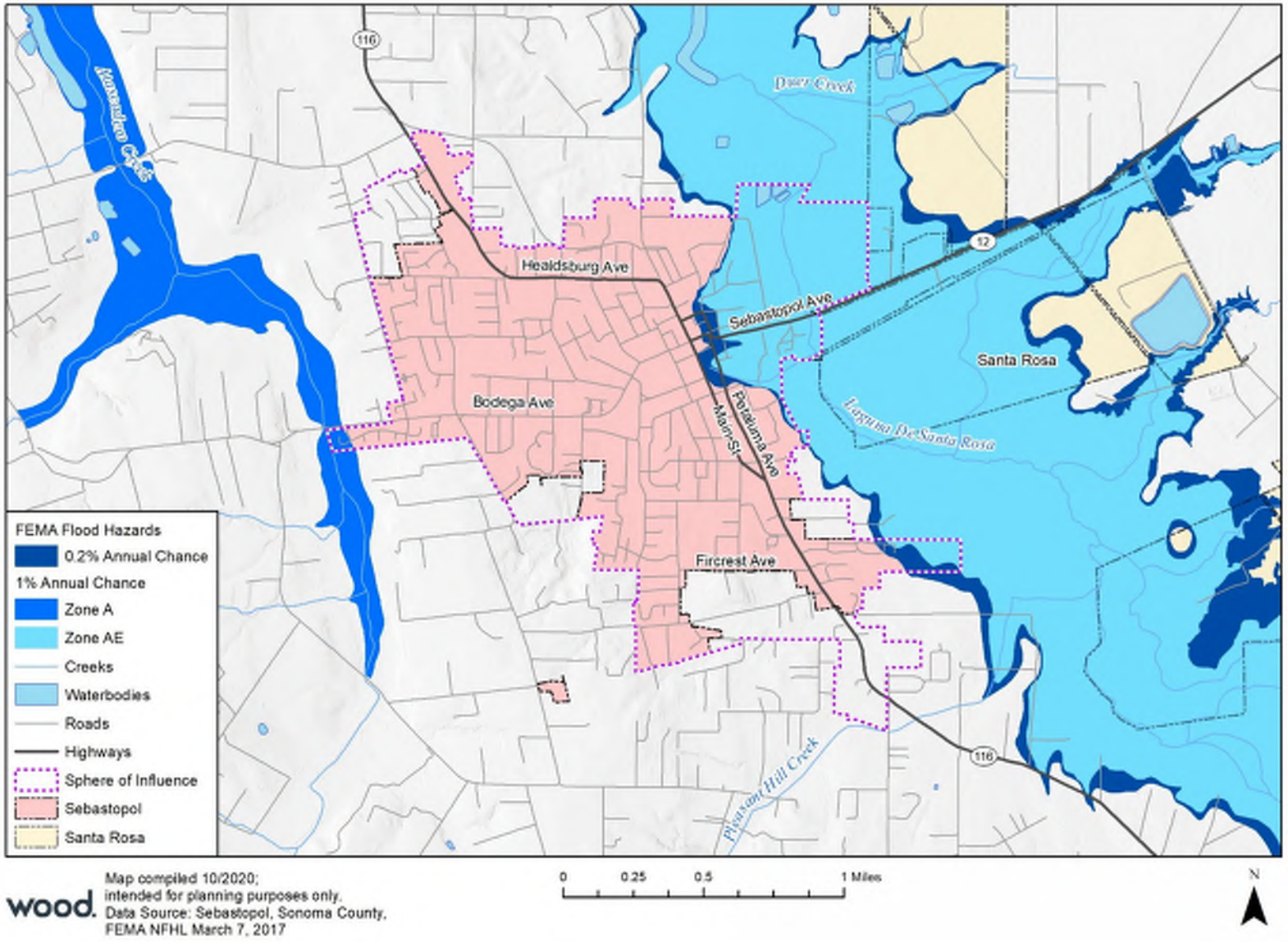
Based on historical occurrence data, the eastern portion of the City along Sebastopol Avenue, and Morris Street, near the Laguna de Santa Rosa floodplain, as well as Pleasant Hill Road have been severely impacted by flooding from storms and flash floods compared to other locations in the City's Planning Area. More information on potential flood-affected areas is summarized in the Previous Occurrences subsection and the Vulnerability Assessment (including the Insurance Coverage and NFIP Claims and Losses subsection, information on repetitive loss properties and Community Information System [CIS] records for Sebastopol).

Extent (Magnitude/Severity)

Limited – Flood maps can be used as an indicator of flood extent. Flood depth and velocity also affect the extent of flood hazards and resulting damage. The deeper and faster flood flows become, the more damage they can cause in a community. However, shallow flooding with high velocities (e.g., such as a flash flood event caused by precipitation) can cause as much damage as deep flooding with a slow velocity (e.g., from a riverine flood event). This typically happens when a channel migrates over a floodplain and redirects flows and transports debris and sediment.

While cities can implement measures to prevent or reduce the severity and magnitude of flood hazards, some level of risk often remains. These types of threats include upstream dam failure, infrastructure failure, and severe flood events that exceed flood design standards or drainage capacity, leading to flash flooding. Flood severity can be determined by logging peak discharge flows. This information is tracked by both FEMA and the USGS. FEMA's BFE depth datasets can provide further insight as to how much of a community gets flooded and where exactly, enhancing the level of detail on the magnitude of flooding that can affect a particular community. Based on the most recent NFHL database from FEMA (which includes these BFEs), the City's Planning Area is expected to experience the worst flooding conditions on the east with pockets of deep inundation across the central portions of the Laguna de Santa Rosa near the commercial areas, and along Sebastopol Avenue, SR 12, a major state highway into the City.

Figure 4-13: FEMA Special Flood Hazard Areas for the 1% and 0.2% Annual Chance Flood Events in the City of Sebastopol



Other localized flooding from existing stormwater infrastructure, for example, is more difficult to estimate but could happen anywhere in the Planning Area and could be severe depending on the flood event itself and the conditions of the existing infrastructure. Table 4-18 below summarizes the general FEMA-available flood zones for context.

Table 4-18: FEMA's Special Flood Hazard Area Zone Descriptions

Flood Zone	Definition
FEMA Special Flood Hazard Areas (SFHA) Subject to Inundation by the 100- or 500-Year Floods	
Zone A	100-year floodplain, or areas with a 1% annual chance of flooding. Because detailed analyses are not performed these areas, no depths or base flood elevations are shown in Zone A areas.
Zone AE	Detailed studies for the 100-year floodplain. The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 zones.
Zone AH	Areas with a 1% chance of shallow flooding, usually in the form of a pong with an average depth ranging from 1 to 3 feet. These are flood elevations derived from detailed analyses.
Zone AO	River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. Average flood depths derived from detailed analyses.
Zone A99	100-year floodplain, areas with a 1% annual chance of flooding that will be protected by a federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
Other Flood Areas	
Floodway	A regulatory floodway is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
Zone X (shaded)	Areas with a 0.2% annual chance flooding (1 in 500 chance), between the limits of the 100-year and 500-year floodplains. This zone is also used to designate base floodplains of lesser hazards, such as areas protected by levees from the 100-year flood, shallow flooding areas with average depths of less than one foot, or drainage areas less than 1 square mile.
Zone X (unshaded)	500-year floodplain (0.2% annual chance). Area of minimal flood hazard.

Source: FEMA Flood Map Service Center 2018

Previous Occurrences

The City has historically been impacted by flooding from sources such as general riverine and flash flooding from winter and early spring storms as well as atmospheric river events. Historical records are described below but may not represent all historical events. The records below are from several sources, including NOAA's National Center for Environmental Information (NCEI) Storm Events database; 2016 Sonoma County Operational Area HMP; and the 2018 California SHMP.

January 1, 1997 – Heavy rain fell for several hours across Sonoma County. The Russian River at the Hacienda Bridge was above the flood stage and continued to rise during the event.

December 31, 2005 – Widespread flooding occurred across Sonoma County causing many of the mainstem river gages along the Russian River to remain above flood stage for several days. In Sebastopol, water covered Morris Street from Sebastopol Avenue to the Sebastopol Community Cultural Center. Flood waters approximately 18 inches to 2 feet deep engulfed the City's sewer pump station and caused damages to buildings at the Barlow Company. Countywide property damages are estimated to be

$104,000 and $3,000,000 crop damages were reported. This flood event led to a State and Federal Disaster Declaration.



In February 2019, several businesses in The Barlow shopping district suffered from flooding after an atmospheric river stalled over the Russian River Watershed. An estimated two-thirds of the shopping district was flooded, including Park Village, a City-owned low income housing site, and the Community Cultural Center located on Morris Street.
Photo Credit: John Burgess/The Press Democrat

January 6, 2016 – A strong Pacific storm produced heavy rain flooding and damaging winds. In Sebastopol, roadways were completely flooded including Pleasant Hill Road at Mitchell Court.

February 7, 2017 – An atmospheric river swept through the Bay Area beginning on the night of February 6th. This system produced widespread roadway flooding, debris flows, and strong winds. In Sebastopol roadway flooding was reported at Pleasant Hill Road and Grundel Drive.

February 13, 2019 – An atmospheric river with an associated cold front moved through the region from February 12th to the 15th bringing widespread flooding and debris flows. Multiple mainstem rivers flooded prompting evacuations from local officials. Strong wind gusts caused downed trees, power outages, and structural damage. Roadways in Sebastopol were reported to include flooding including SR 116 and Sparkes Road, Pleasant Hill Road and Bodega Avenue.

February 26, 2019 – An atmospheric river moved through the region near the end of the month with the most impacts occurring in the North Bay. Widespread flooding was reported from minor roadway flooding to major flooding of mainstem rivers. The Russian River reached major flood stage (45.5 feet highest level in almost a quarter century) flooding dozens of homes and businesses prompting mandatory evacuations and rescues. Flooding in the westbound lane of SR 116 at Sparkes Road was reported in Sebastopol. Low-lying areas within and close to the Laguna de Santa Rosa floodplain experienced significant flooding including, an estimated two-thirds of the Barlow shopping district, a neighborhood on Flynn Street, Park Village a City-owned low-income housing site, and the Community Cultural Center located on Morris Street. The Sebastopol Fire Department performed water rescues within these areas. Countywide the flood events is estimated to have resulted in $150 million in private property damages and $77.9 million in public infrastructure, emergency response costs, and debris removal.

November 30, 2019 – A low pressure system moving in from the Gulf of Alaska and drawing in moisture from the tropics combined to bring the first atmospheric river event of the winter season to the Greater Bay Area. This system brought widespread heavy rainfall, roadway flooding, and strong winds to the region. Flooding from the Atascadero Creek was reported in the South Bound lanes of Watertrough Road and Blackney Road, causing vehicle hydroplaning due to large amount of water in the roadway.

Probability of Future Occurrences

Likely – The 100-year flood is the flood that has a one percent chance in any given year of being equaled or exceeded, while the 500-year flood is expected to have a 0.2 percent chance of occurring (or being exceeded) in any year, respectively. As such, it is likely that riverine flooding will occur in the future, though localized stormwater flooding and general flash flooding is also expected to take place especially during the wet months and heavy rain or storm events.

Climate Change Considerations

Emerging findings from California's Fourth Climate Assessment show that costs associated with direct climate change impacts by 2050 will be dominated by human mortality, coastal damage, and the potential

for droughts and mega-floods (California Natural Resources Agency 2018a). Scientific studies outlined in the same assessment indicated shifts in California's precipitation regime, which show more dry days, more dry years, a longer dry season, mixed with increases in occasional heavy precipitation events and floods (i.e., a shift towards potentially less frequent but more extreme precipitation events). Studies also project great storm intensity with climate change, resulting in more direct runoff and flooding due to the flash flooding or precipitation nature of these expected events. As a result of fewer but more violent precipitation events, high frequency flood events will increase with climate change. Also, with wildfires already being a problem in California, increasing periods of drought and lack of precipitation are expected to exacerbate conditions for wildfires to occur, and in turn worsen the potential for runoff and flooding associated with burned areas due to increased impermeability and damage terrain and soils.

This Fifth Climate Assessment indicates that climate change is expected to alter built water supply systems, so that current management practices for flood control and water supplies across the state of California may need to be revised. Future revisions should aim to account for subsidence-prone infrastructure (e.g. levees), which coupled with rising sea levels and worsening storm conditions can lead to overtopping or failure of these flood control structures (IPCC 2020).

Based on Sonoma County's 2016 CAP and GHG emission modelling, climate change is projected to result in an increased risk of extreme flood, and an increased seasonal variability of precipitation, runoff, and stream flows for Sonoma County, along with increased likelihood of "extreme" precipitation and drought events. There may be more years with more frequent storm events and occasional events that are much stronger than historical ones and the length of season over which storm events occur is predicted to increase (SCTA 2016). Also, according to the CAP, more frequent coastal flooding and increased erosion is anticipated.

In addition to flooding, sea levels are projected to rise between 16.5 and 65.8 inches by 2100. Rising sea levels combined with increased storm surge is anticipated to lead to more frequent inundation of low-lying areas, and flooding of homes, infrastructure, agricultural land, and natural areas. Sea level rise is also expected to substantially influence the Russian River and the tidally-influenced Laguna de Santa Rosa and FEMA studies are underway to better understand the level of effect on these waterways. For example, while the Laguna de Santa Rosa functions as a huge reservoir for water storage that can lower the Russian River's downstream flood levels by more than 10 feet, FEMA studies underway indicate flood elevation levels in the Laguna de Santa Rosa could rise by approximately one foot due to various factors such as erosion and sedimentation (decreasing the capacity of the reservoir) and sea level rise. The greatest impacts are anticipated during winter storms. For these reasons, climate change would have a "high" influence on flooding hazards.

Vulnerability Assessment

Historically, the Planning Area has been at risk to flooding primarily on the east and west portions of the City. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures (e.g., levees), but there are no accredited or non-accredited levees within the City (National Levee Database 2020). Occasionally, extended heavy rains result in floodwaters that exceed local drainage infrastructure capacity and cause damage.

Flooding has occurred in the past: within the 100-year floodplain and in other localized areas. In addition to damage to City facilities and infrastructure, other problems associated with flooding include erosion, sedimentation, degradation of water quality, loss of environmental resources, health hazards, and the inconvenience or financial and accessibility issues that come with road closures and other such effects.

The City of has mapped flood hazard areas as illustrated in the figures contained throughout this section. For the following vulnerability assessment, GIS was used to identify and quantify the possible impacts of

flooding within the City's Planning Area. The methodologies described in the following subsections was followed to develop the flood vulnerability maps and determine values at risk to the 100- and 500-year flood events.

Insurance Coverage and NFIP Claims and Losses for Repetitive Loss Properties

The City of Sebastopol joined the NFIP (regular entry) on June 18, 1980. The current effective map date is from October 16, 2012. NFIP CIS insurance data indicates that as of January 7, 2021 there were 36 policies in place in the City, resulting in $15,008,600 of insurance in effect. Since the City began participating in the NFIP there have been 63 total closed losses, amounting to $1,630,932 in payments.

NFIP Claims

The following table summarizes the NFIP claims by property type. Single-family homes represented the largest amount (37) of closed paid losses in the City, followed by non-residential properties (17). While non-residential had less paid losses, this property type had the largest amount of closed paid losses. Not shown in Table 4-19 is manufactured homes. This type of property represents one closed paid loss and $10,000 in closed paid losses.

Table 4-19: NFIP Claims in City of Sebastopol by Building Type (Residential versus Non-Residential)

Property Type	Policies in Force	Insurance in Force	Number of Closed Paid Losses	Amount of Closed Paid Losses
Single Family	5	$1,480,000	37	$450,805.09
2-4 Family	1	$250,000	6	$78,938.48
All Other Residential	0	$0	3	$11,213.24
Non-Residential	30	$13,278,600	17	$1,089,976.17
Total	**36**	**$15,008,600**	**63**	**$1,630,932.98**

Source: CIS Repetitive Loss report for the City of Sebastopol (FEMA) 2021

Repetitive Loss Properties

According to the 2018 California SHMP, in 2017, Sonoma County was the top-ranking county in state for repetitive losses, accounting for more than 48 percent of the total top 10 repetitive losses. According to the latest data available through CIS, the City shows a total of 23 Repetitive Loss buildings (3 of which are insured) as defined by FEMA. Repetitive loss properties have incurred 31 total losses, 4 of which were insured cases, and these accrued a total of $1,478,770 in payments from both building- and contents-related losses. The majority of these repetitive loss properties fell within AE, A, A1-A30, AO, AH flood hazard areas (FEMA 2021). Table 4-20 below summarizes the repetitive loss information detailed in the City's latest CIS report for repetitive loss properties (FEMA 2021a).

Table 4-20: City of Sebastopol Repetitive Losses in Floodplains

Repetitive Loss Component	Zones AE, A, A1-30, AO, AH	Zones B, C, X	Total
Total Buildings	18	5	23
Insured Buildings	2	1	3
Total Losses	23	8	31
Insured Losses	3	1	4
Total Payments	$1,339,904.97	$138,865.38	$1,478,770.35
Building related losses	$739,549.89	$72,922.36	$812,472.25
Contents related losses	$600,355.08	$65,943.02	$666,298.10
Insured Payments	$333,836.18	$22,356.39	$356,192.57
Building related payments	$312,738.04	$21,542.56	$334,280.60
Contents related payments	$21,098.14	$813.83	$21,911.97

Source: Sebastopol CIS Repetitive Loss Report (FEMA 2021a); no repetitive loss information was noted for Zones VE, V, or V1-30; column was excluded.

Severe Repetitive Loss Properties

According to the City Floodplain Administrator and CIS Severe Repetitive Loss Report for the City of Sebastopol, of the 23 Repetitive Loss buildings, there is one Severe Repetitive Loss property within the City that has incurred two total losses for a total of $21,000 in building payments (FEMA 2021b).

Property

To determine vulnerability of people and property to riverine flood, an enhanced flood risk analysis was performed utilizing FEMA's Hazus software. The analysis used for Sebastopol consisted of a Level 2 assessment, with depth grids to enhance the accuracy of flood risk modelling within Hazus and Parcels imported into Hazus through the Comprehensive Data Management System (CDMS) tool as a User Defined Facility (UDF).



The 2019 flood event inundated a large portion of the eastern end of the City, including the City-owned Park Village, a low-income and homeless housing site along Sebastopol Avenue, and the Sebastopol Community Cultural Center on Morris Street as shown above. *Photo Credit: Dante del Prete/2019*

Depth grids were created for the Laguna de Santa Rosa River within Hazus utilizing FEMA-created cross sections from the effective NFHL and the Summary of Discharges by flooding source from the FEMA FIS for Sebastopol. The Laguna de Santa Rosa is the only waterbody with a FEMA detailed study within the City. However, there is a FEMA approximate flood zone west of the City on the Atascadero Creek that intersects the Bodega Highway on the edge of the Planning Area. Since there is not a detailed study for this area, depth grids could not be made for this area of flooding within Sebastopol. The properties that intersected with the Zone A floodplain were analyzed with the use of FEMA Depth Damage Curves outside of Hazus to estimate loss and combined to the final Hazus Level 2 results.

Default Hazus inventories for structures were replaced by using the parcel layer and additional structure attributes in the Assessor's data. GIS was used to create a centroid or point representing the center of the parcel polygon in the parcel layer to show the location of the primary structure on each parcel. The structure inventory data set was formatted using the CDMS tool for use in Hazus. This tool syncs data and the attribute fields necessary for Hazus analysis and imports the enhanced data set into the Hazus study region. After the hazard and inventory data was imported into Hazus, analysis was completed to determine the potential losses as a result of a one percent annual chance flood.

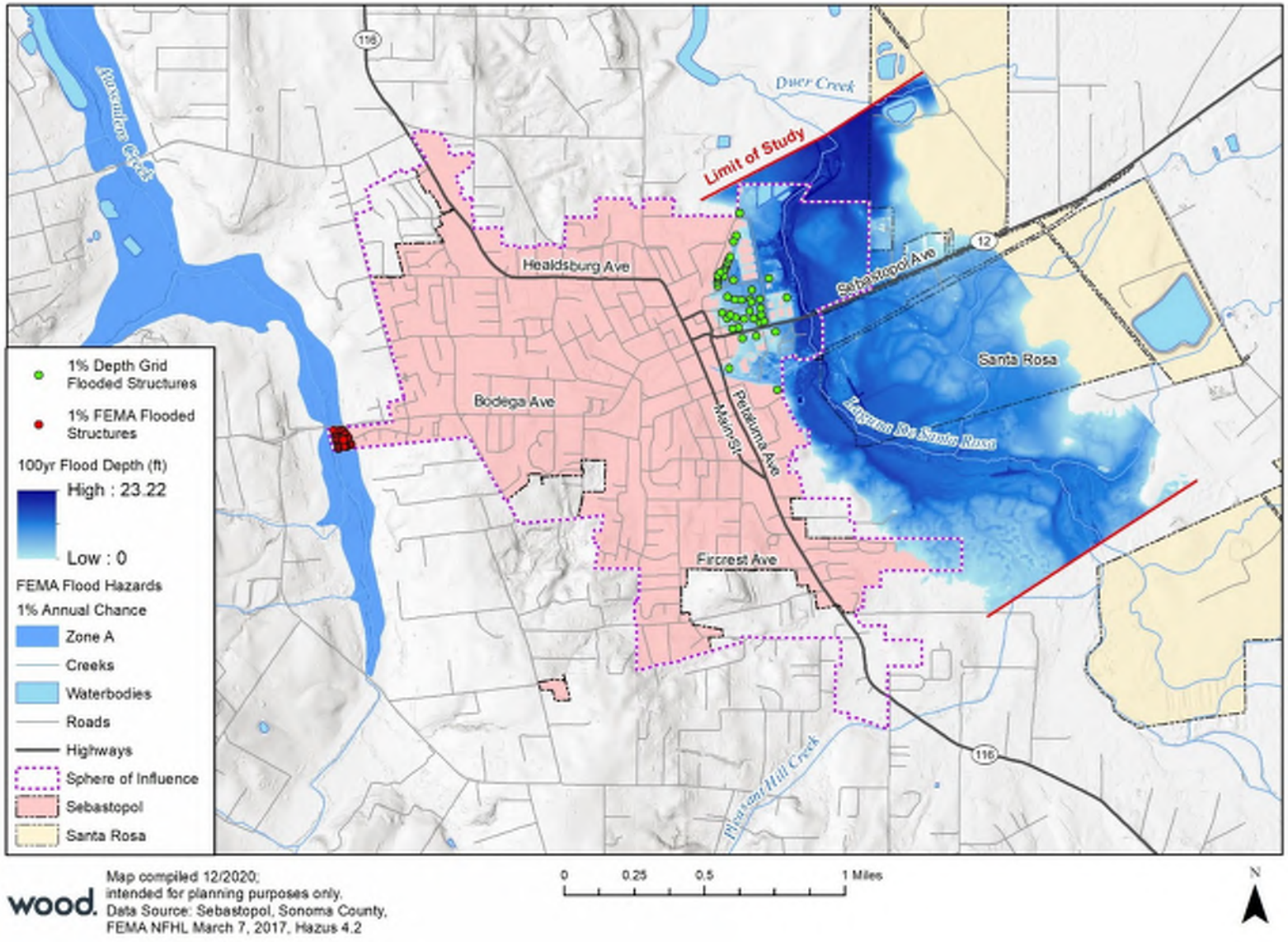
According to the Level 2 assessment for flood hazards, Sebastopol has 72 parcels within the one percent annual chance floodplain with a total value of $35 million at risk. Hazus estimated total losses are $19.5 million. Table 4-21 summarizes the values at risk in the created depth grid and approximate floodplain. Figure 4-14 displays the location of flooding within Sebastopol based on the depth grid information.

Table 4-21: City of Sebastopol Combined Hazus Level 2 & FEMA Flood Loss Estimates

Property Type	Improved Parcel	Improved Value	Estimated Building Loss	Content Value	Estimated Content Loss	Total Loss Estimate	Population at Risk
Commercial	25	$25,557,464	$3,977,180	$25,557,464	$12,112,037	$16,089,217	0
Industrial	3	$197,649	$33,235	$296,474	$92,736	$125,971	0
Multi-Family	3	$1,083,094	$160,841	$541,547	$86,616	$247,456	9
Residential	41	$8,925,689	$2,300,383	$4,462,845	$774,960	$3,075,343	129
Total	**72**	**$35,763,896**	**$6,471,638**	**$30,858,329**	**$13,066,349**	**$19,537,987**	**139**

Sources: City of Sebastopol, Sonoma County Assessor's Office, FEMA NFHL, Hazus 4.2, Wood Parcel Analysis

Figure 4-14: City of Sebastopol Parcels in the FEMA and Hazus One Percent Annual Chance Depth Grid Floodplain



The Level 2 assessment does not include five parcels that contain City-owned buildings that are within the one percent annual chance floodplain. These parcels included the City's Police Department and Emergency Operations Center (EOC), Laguna Youth Park, Sebastopol Community Cultural Center, Public Works Department building (part of the EOC), and Wischeman Hall. The City-owned buildings do not have an assessed value associated with the parcels and they were therefore not accounted for in the parcel-level analysis. Parcels that lack improved values, but contain a building or structure commonly refer to an exempt property (e.g. public buildings). The HAZUS-generated depth grid model also does not match the FEMA 100-year flood hazard boundary since it takes into account varying ground level elevations and flood depths compared to a distinct boundary delineated in the FEMA effective maps. While these five parcels were not accounted for in the Level 2 assessment, with the exception of Wischeman Hall, each City-owned building is considered a critical facility. Therefore, each structure was evaluated as part of the critical facility overlay analysis.

A second flood assessment was performed using the NFHL and the same parcel layer database that was imported into Hazus, because Hazus does not model the 0.2 percent annual flood risk. Based on this second flood assessment, there are 23 parcels at risk to the 0.2 percent annual chance floodplain totaling $29 million. A 25 percent damage factor was applied to the total value column of the tables below to estimate potential losses from flood related hazards to the City's parcels. Twenty-five percent is the typical loss ratio associated with a 2-foot-deep flood, based on FEMA and U.S. Army Corp of Engineer depth-damage relationships. The total values were calculated by adding up the improved structure values of the parcels in the floodplains with the content values. These values were then estimated with the following formulas: a) residential and multi-family properties received contents valued at 50 percent of the parcel improved value; b) commercial contents were valued at 100 percent of the parcel improved value; and c) industrial parcels were valued at 150 percent of the parcel improved value. These valuation assignments are based on FEMA's methodology for estimating contents within their loss estimation.

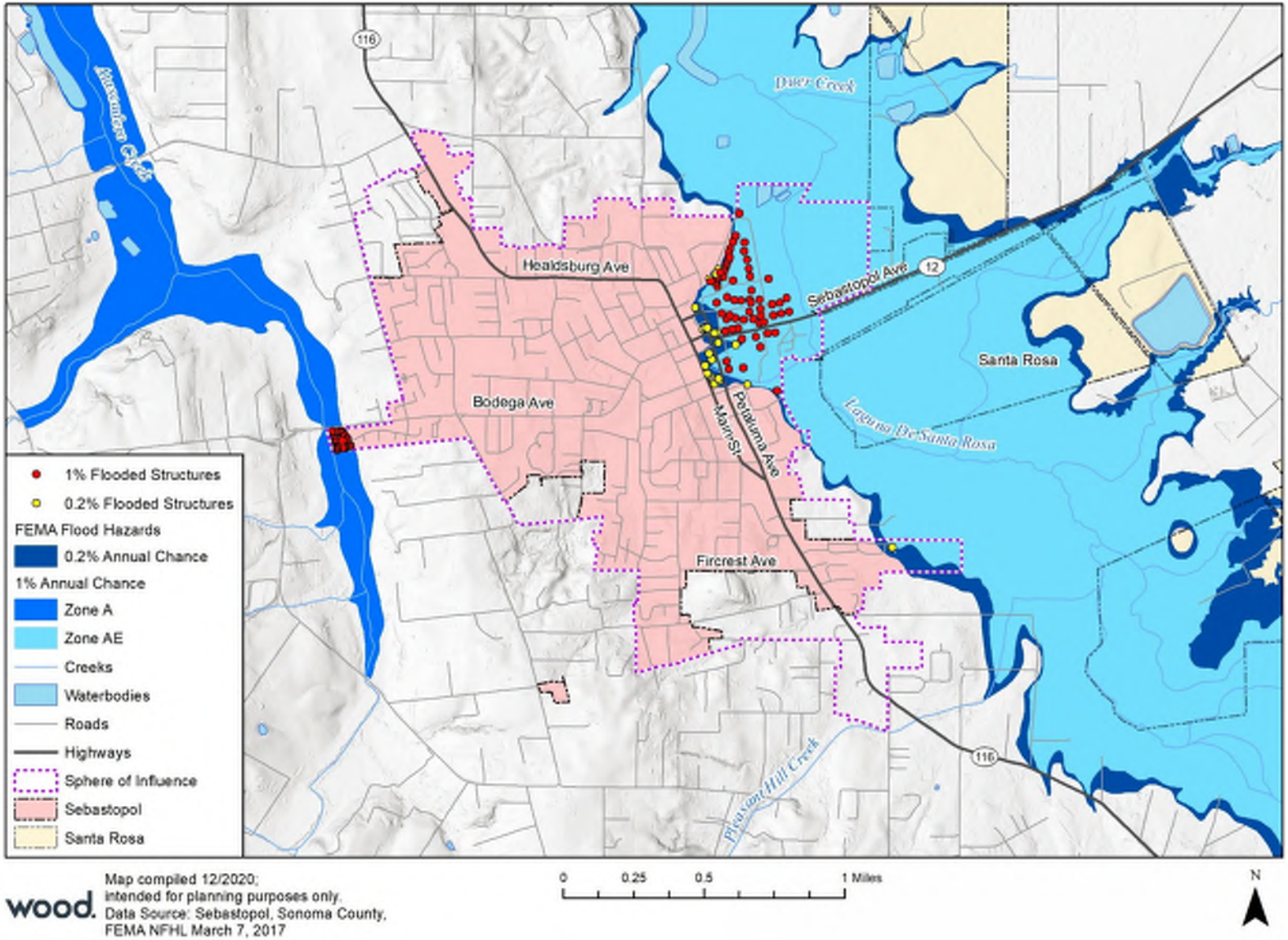
Table 4-22 and Table 4-23 summarize the values at risk based on the 0.2 percent annual flood risk, or the 500-year event floodplain. Figure 4-15 displays the location of these parcels in the 500-year flood areas. Overall, Sebastopol has 23 parcels valued at roughly $29.3 million that are within the 500-year floodplain, $7.3 million of which is estimated to be a potential loss if a flood event of this magnitude were to take place.

Table 4-22: City of Sebastopol Parcels in 0.2 Percent Annual Chance Floodplains by Property Type

Flood Event	Property Type	Improved Parcel	Improved Value	Content Value	Total Value	Loss Estimate (25% of the Total Value)	Population at Risk
0.2% Annual Chance	Commercial	18	$14,288,020	$13,790,929	$28,078,949	$7,019,737	0
	Multi-Family	1	$240,664	$120,332	$360,996	$90,249	3
	Residential	4	$602,565	$301,283	$903,848	$225,962	13
	Total	**23**	**$15,131,249**	**$14,212,544**	**$29,343,793**	**$7,335,948**	**16**

Sources: City of Sebastopol GIS, Sonoma County Assessor's Office, FEMA NFHL, Wood Parcel Analysis

Figure 4-15: City of Sebastopol Parcels in the 1% and 0.2% Annual Chance Floodplains



People

Of greatest concern in the event of a flooding event is the potential for injury or loss of life. Based on the U.S. Census Bureau's 2018 populations estimates, the City's average household size is 3.16. This metric was multiplied by the number of parcels of defined as residential at risk of flooding to determine the total potential affected population. Population at risk estimates are summarized in the last column of Table 4-24 for the Hazus Level 2 assessment and Table 4-25 for the FEMA floodplain analysis for the 500-year flood event above, by flood event type and parcel type. Based on both assessments, there are nearly 139 people at risk to the 100-year floodplain based on the Hazus Level 2 analysis and 16 people are at risk within the 500-year floodplain.

Economy

Flood events have the potential to affect infrastructure (e.g. roads), homes, and populations (possibly displacing families), impacts to the local economy could include business interruptions, lost or reduced wages from potential relocation of populations, infrastructure and resource downtime costs, and reduced city revenues from lack of tourism or inability to run/maintain certain services (like potable water based utilities). Other secondary hazard impacts such as reduced water quality or resource availability, which could in turn raise costs of water processing and distribution are also possible results from a severe flooding event, whether from riverine flooding, flash flooding, or an event caused by local stormwater/drainage infrastructure failures. Based on the history of flooding in Sebastopol, the Barlow shopping district and nearby commercial areas on the eastern side of the City near the Laguna de Santa Rosa have historically been affected the most in terms of economic losses, which largely encompass damages to property (including disruption to business and commerce operations), as well as City infrastructure.

Critical Facilities and Infrastructure

Critical facilities are those community components that are most needed to withstand the impacts of disaster as previously described. GIS was used to determine what City facilities and infrastructure occur within Sebastopol's mapped flood hazard areas. The NFHL flood layers were used to identify where the 100- and 500-year floodplains intersected with critical facilities. Figure 4-16 illustrates the locations of these critical facilities relative to the FEMA floodplains and Figure 4-17 illustrates facilities within the Hazus Depth Grid. Table 4-23 provides an inventory of the eight facilities that are located within the 100-year FEMA floodplain. None are in the 500-year floodplain.

The impact to the community could be substantial if these critical facilities were damaged or destroyed during a flood event, particularly those which provide lifeline utilities or health/medical services. Overall, the breakdown by FEMA Community Lifelines is there is a total of one Energy facility in the flooding areas, three facilities in the Food Water Shelter category (one shelter facility is the City Community Cultural Center), one Safety and Security facility, and three bridges in the Transportation Community Lifeline found at risk in FEMA SFHAs. A separate analysis was conducted by intersecting the critical facilities with the Hazus Depth Grid and flood depth values. This information is summarized in Table 4-23.

Figure 4-16: City of Sebastopol Critical Facilities and Infrastructure in the 1% and 0.2% Annual Chance Floodplains

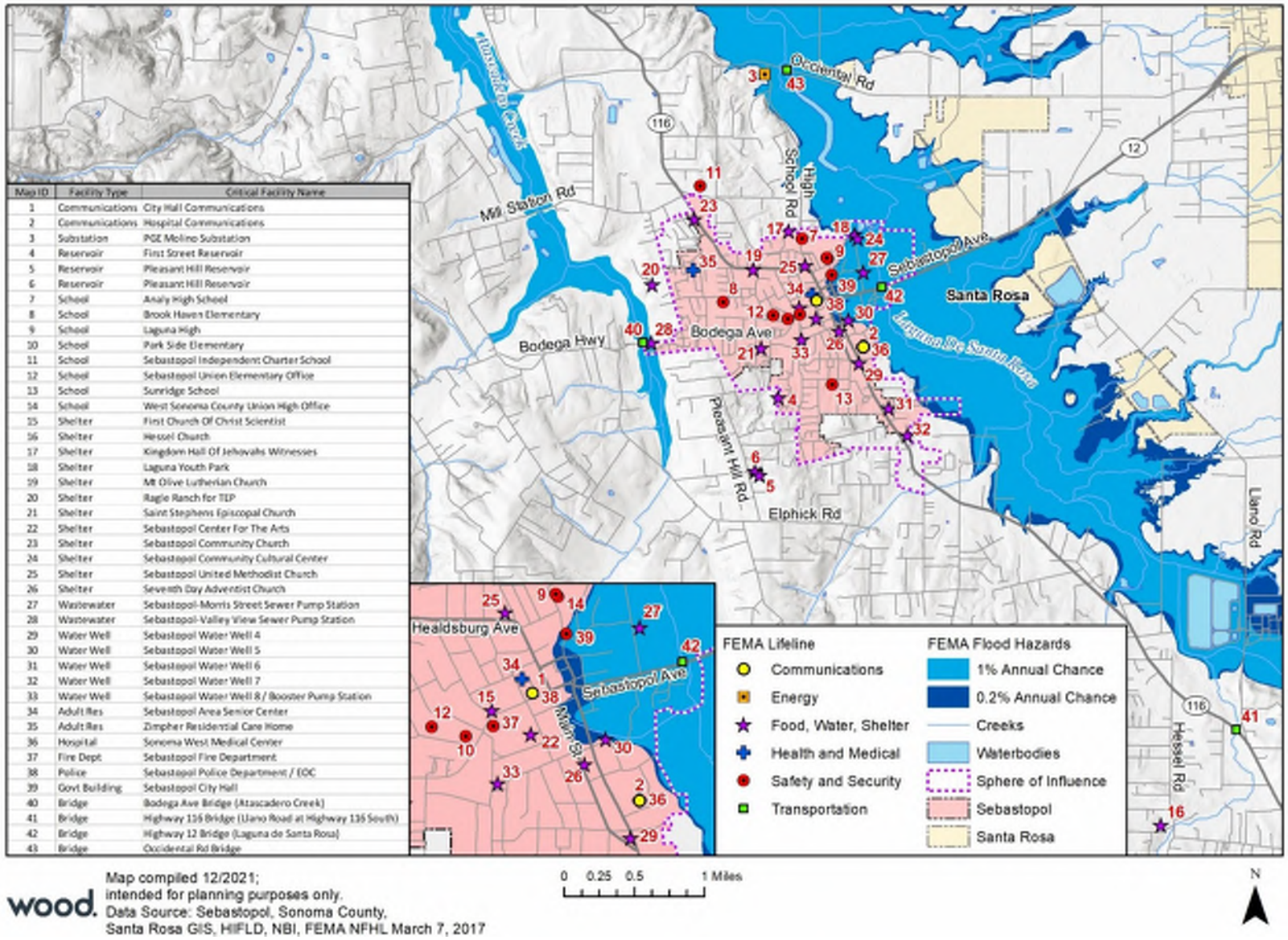


Figure 4-17: City of Sebastopol Critical Facilities and Infrastructure in the Hazus One-Percent Annual Chance Depth Grid Floodplain

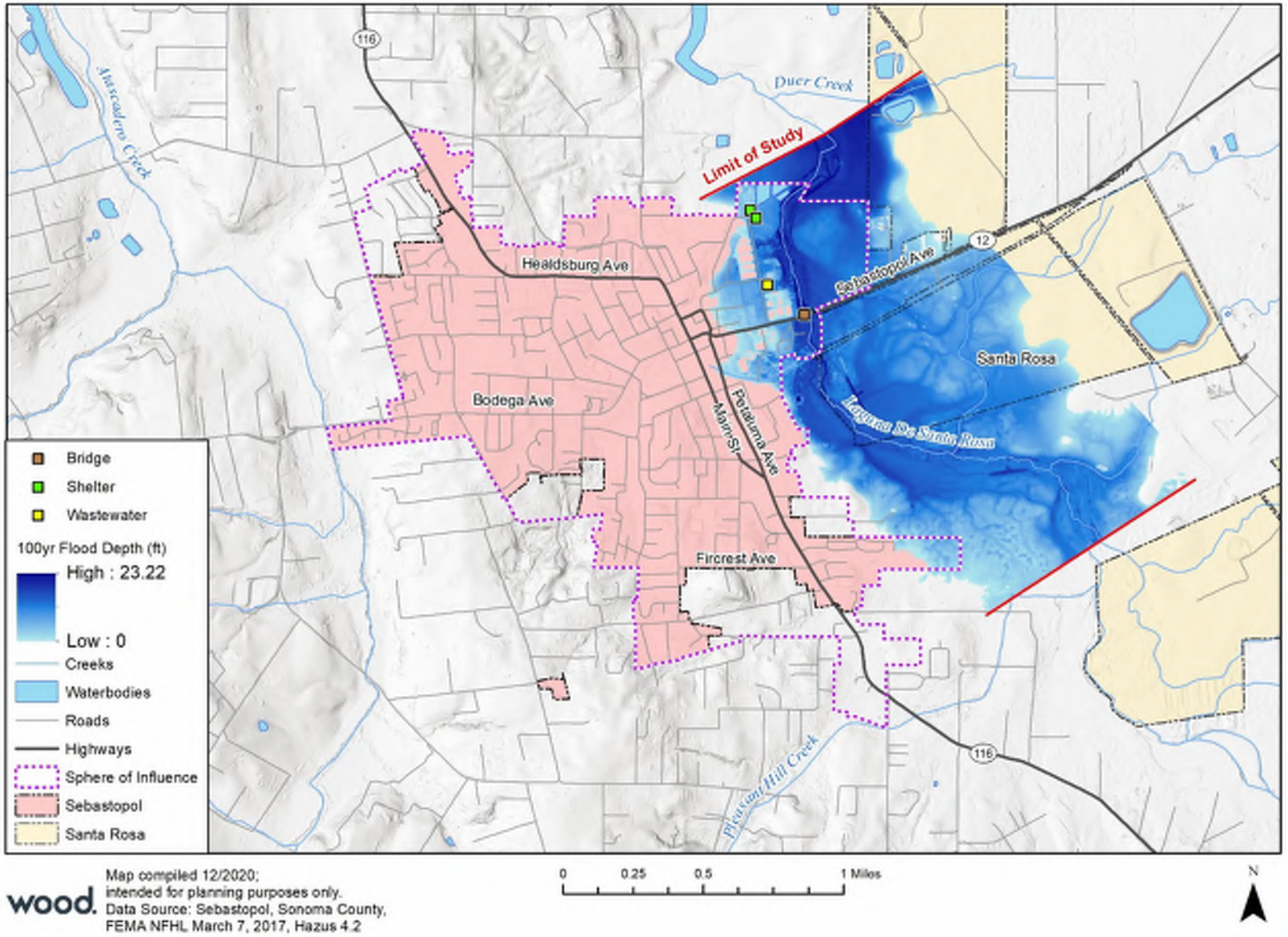


Table 4-23: Sebastopol's Critical Facilities in the 100-Year Floodplain and Hazus Level 2 Depth Grid

FEMA Lifeline	Critical Facility Type	Total Facilities	Flood Depth
Energy	Substation	1	n/a
Food, Water, Shelter	Shelter	1	4.53
	Shelter	1	7.24
	Wastewater	1	9.13
Safety and Security	Police	1	n/a
Transportation	Bridge	1	22.01
	Bridge	2	n/a
	Total	**8**	

Source: City of Sebastopol 2020; Santa Rosa GIS 2020; HIFLD 2020,; NBI, FEMA NFHL, Wood GIS Analysis

Historic, Cultural, and Natural Resources

The City of Sebastopol has seven historic and cultural resources located in or nearby the Planning Area boundaries as previously described in Section 4.2 Asset Summary, under the Historic, Cultural, and Natural Resources subsection. Cultural or historical resources such as older buildings or districts may be more affected by flooding hazards, given their likely older construction methods, weaker materials, and potential failure to meet current building code standards. However, none of these seven historic resource sites would be impacted by flood hazards, and several of them are located outside the City's Planning Area.

Climate change studies at the county and regional level indicate the likelihood that increasingly unpredictable flash flooding and uncertainty in storm occurrence will lead to a worsening in erosion and sedimentation conditions. However, natural areas within the floodplain around the Laguna de Santa Rosa for instance benefit from periodic flooding as a naturally recurring phenomenon, and these natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters.

Future Development

The potential for flooding may increase as stormwater runoff increases due to land development. Such changes can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on buildout land use to ensure that all new development is properly designed and remains safe from future flooding. While certain local floodplain management and water quality regulations and policies exist, as well as specific regulatory control of building codes, flood insurance requirements, and other such aspects at the federal or state level, the cumulative effects of flood related hazards can have a negative impact on the floodplain and the community into the future.

City floodplain management ordinances require that new construction be built at least one foot above the BFE (per Sebastopol Municipal Code Chapter 15.16 Flood Damage Protection Section 120) and for certain building structures up to two feet above the BFE (Chapter 15.16.200 Standards for Manufactured Homes). New development that complies with the mandated elevation requirements in addition to other requirements for maintaining elevation certificates, implementing stormwater program elements, and complying with erosion or sediment controls for all new development in the floodplain may protect new constructions from 100-year and possibly other floods events (refer to Section 2.9: Mitigation Capabilities in Chapter 2: Community Profile for more information on the City's existing floodplain standards and regulations).

Risk Summary

- Overall, the significance of flood hazards is **Medium.**
- Floods impacts will vary by location and severity and will likely only affect certain areas of the City Planning Area at any one time.
- Based on the risk assessment, floods will continue to have economic impacts to certain areas of the City's Planning Area, and the estimated losses for properties based on the Hazus Level 2 Assessment impacts 72 parcels and amounts to $19.5 million at risk (with a total of 167 potential people at risk), in addition to the 8 critical facilities which are located in the floodplains.
- 23 properties are at risk of the 500-year (0.2 percent annual chance) floodplain, roughly valued at $7.3 million.
- Seven noteworthy flooding events have taken place in Sebastopol since 1986. These caused significant damages and several required water rescues, though other minor flooding cases have taken place in the City.
- Impacts that are not directly quantified but could be anticipated in large future events include: 1) injury and loss of life; 2) disruption of and damage to public infrastructure; 3) disruption to trade, commerce, commuting, mobility, and other activities that may rely on the road networks; 4) health hazards associated with mold and mildew; 5) significant direct and indirect economic impact (jobs, sales, tax revenue) upon the community; and 6) negative impact on commercial and residential property values.
- NFIP CIS insurance data indicates that as of January 7, 2021 there were 36 policies in place in the City, resulting in $15,008,600 of insurance in effect. Since the City began participating in the NFIP there have been 63 total closed losses, amounting to $1,630,932 in payments.
- There are 23 Repetitive Loss buildings (2 of which are insured) in Sebastopol. Repetitive loss properties have incurred 31 total losses, 4 of which were insured cases, and these accrued to $1,478,770 in payments from both building- and contents-related losses.

4.3.3 Wildfire

Hazard Description

Wildfires are any uncontrolled fires that occur most often on undeveloped land and require fire suppression. They are caused by lightning or by human-activities such as smoking, arson, equipment misuse, and from electrical infrastructure. Wildfires are a significant concern throughout California. In recent years wildfires have occurred in vegetated areas in the vicinity of the City. Wildfires even a few counties away, can create significant impacts to the City such as those stemming from intense smoke, which can then lead to poor air quality, traffic visibility issues, and public health concerns. Generally, the fire season extends from June through October of each year during the hot, dry months. Wildfire conditions arise from a combination of high temperatures, intense sunlight, low rainfall, an accumulation of vegetation, and high winds.

Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. While wildfire risk is predominantly associated with wildland-urban interface (WUI) areas, significant wildfires can also occur in heavily populated areas. The WUI is a general term that applies to development adjacent to landscapes that support wildfire.

Location

Limited – Wildfires affect grass, forest, and brushlands, as well as any structures populations located within or surrounding them. Where there is human access to wildland areas the risk of fire increases due

to a greater chance for human carelessness and historical fire management practices. In other areas, large concentrations of highly flammable brush and grasslands located in flat open spaces are also susceptible to wildfire.

The California Department of Forestry and Fire Protection's (CAL FIRE) Fire and Resource Assessment Program (FRAP) models map wildfire hazards using a science-based approach and computerized techniques to classify moderate, high, and very high fire severity zones in a Fire Hazard Severity Zone (FHSZ) dataset. The model uses existing CAL FIRE data and hazard information based on fuel, weather, and terrain, explained in more detail in the Extent (Magnitude/Severity) section below.

Figure 4-18 displays the FHSZs falling within State Responsibility Areas, or SRAs, and Local Responsibility Areas, or LRAs, in and surrounding the City. As shown in Figure 4-18, most of the City is within the LRA, and classified as "Unzoned" or within a "moderate" FHSZ. Fire threat zones, which are a combination of fire frequency (or likelihood of a given area burning) and potential fire behavior, are displayed in Figure 4-19. These two maps provide general indications of potential future fire behavior as well as where fire occurrence might take place. The southern portions of the City, particularly the Fircrest Mobile Home Park area and along Robinson Road show moderate and high severity hazard areas based on fire threat data and the FHSZs mapped for LRA levels. Other potential areas of concern are along the eastern edges of the City's Planning Area where moderate and high severity zones intermingle.

Figure 4-18: FHSZs in State Responsibility Areas (SRAs) and Local Responsibility Areas (LRAs)

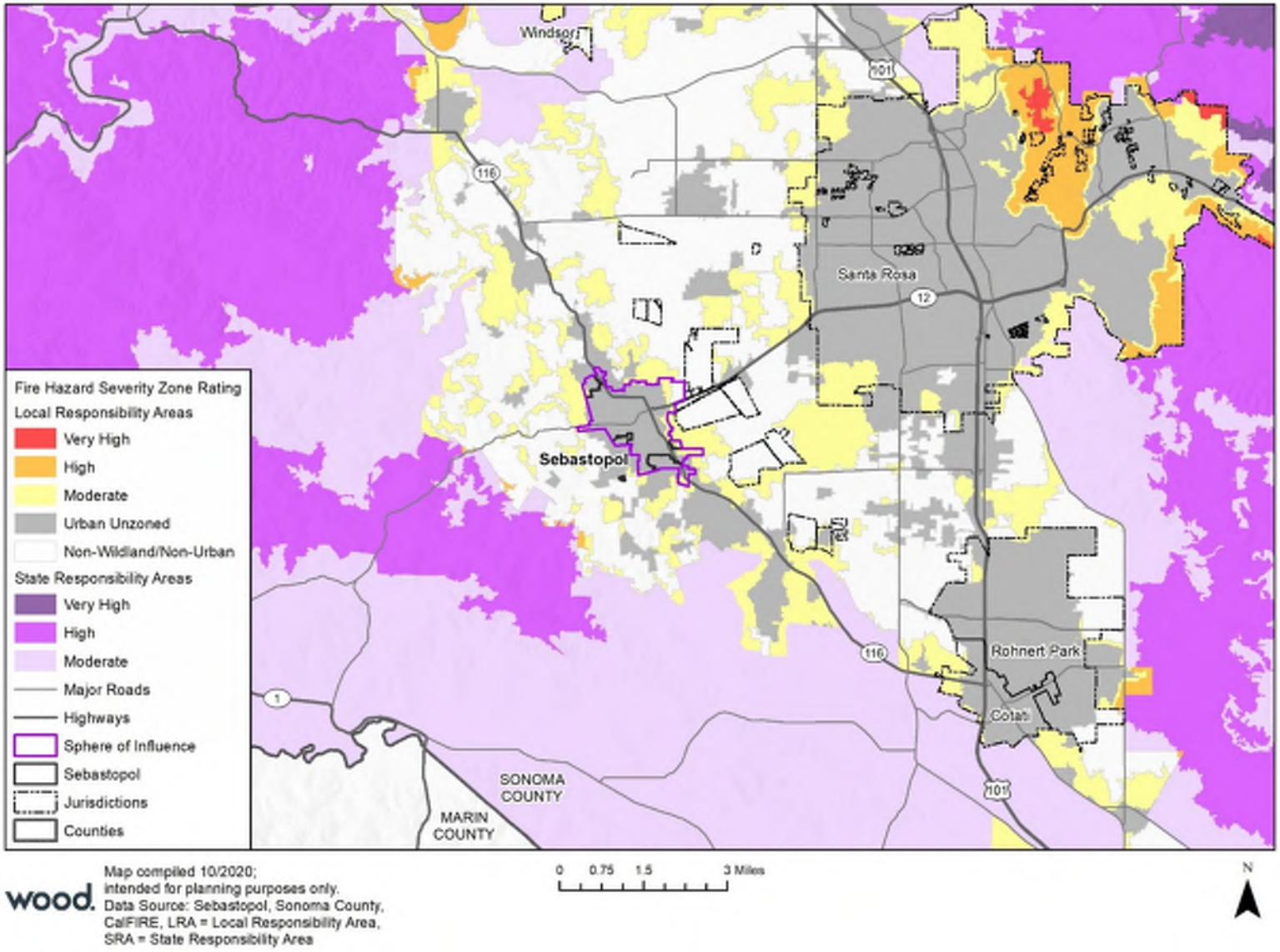
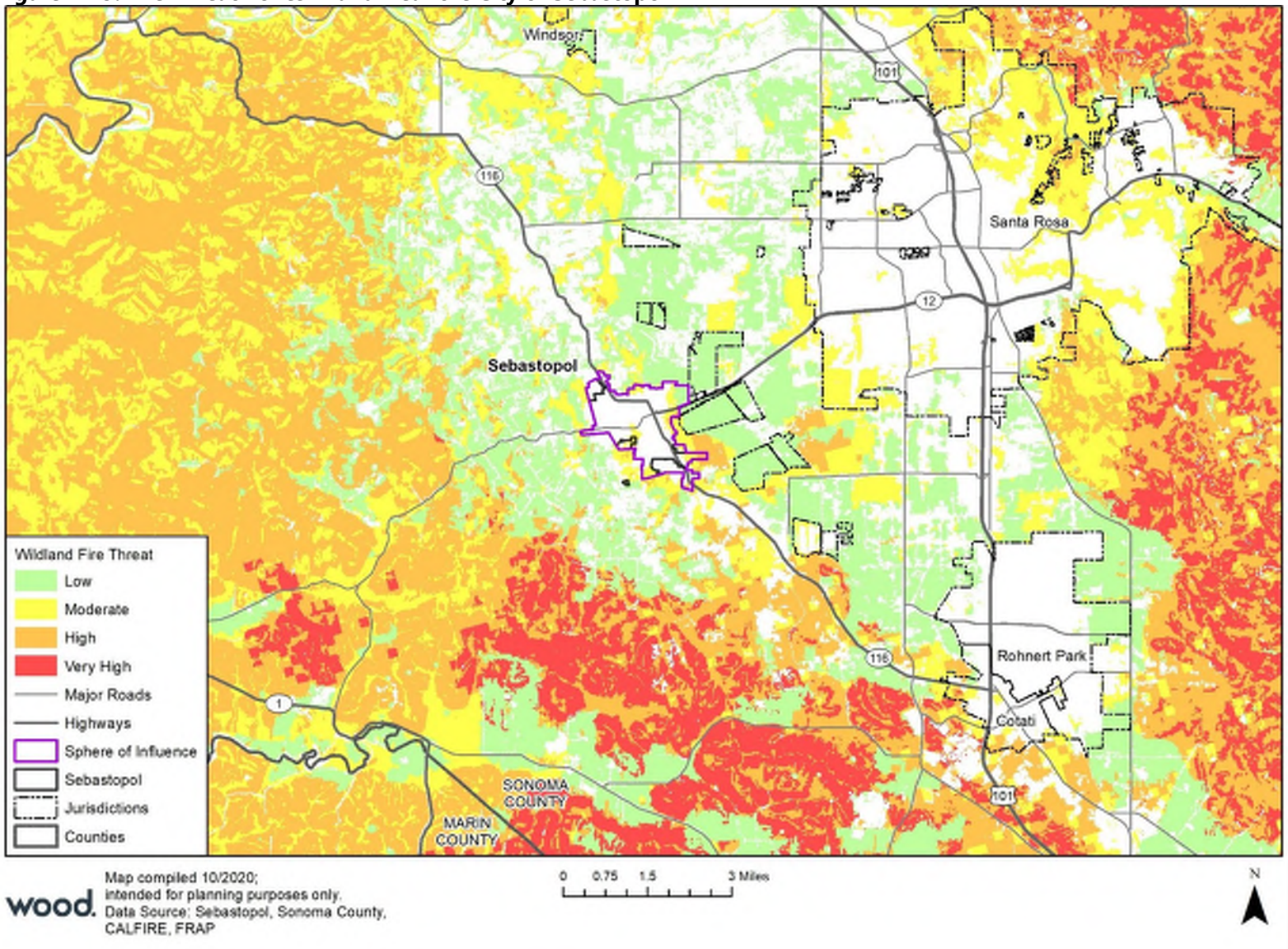


Figure 4-19: Fire Threat Zones in and Near the City of Sebastopol



Extent (Magnitude/Severity)

Limited – Potential losses from wildfires include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, recreational opportunities, and impacts to the community's way of life. Economic losses could also result from reduced tourism and visitation and generally impacted economic sectors. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other secondary hazards such as flooding, landslides, and erosion during the rainy season. Typically, the potential for significant damage to life and property exists in areas designated as "wildland-urban interface" areas, or WUIs, where development is adjacent to densely vegetated area.

Generally, there are three major factors that sustain wildfires and predict a given area's potential to burn. These factors are fuel, topography, and weather, as described below.

- **Fuel** - Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Manmade structures, such as homes and other associated combustibles are also fuel sources. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that is under human control. Fuel types within the City include seasonal grasses, and mature landscaping, such as deciduous and evergreen oaks, and conifers. Fuel types surrounding the City Planning Area include mainly seasonal grasslands and brush.
- **Topography** - An area's terrain and land slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.
- **Weather** - Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will more readily ignite and burn more intensely. Thus, during periods of drought, the threat of wildfire increases. Wind is the most treacherous weather factor. The greater a wind, the faster a fire will spread and the more intense it will be. Lightning can also ignite wildfires, often in difficult to reach areas for firefighters.

Wildfires in the broader region (Sonoma County and bordering counties such as Mendocino or Napa) in recent years have resulted in the loss of property as well as human injuries or even deaths. The smoke and air pollution from wildfires are also severe health hazards particularly for sensitive populations including the elderly, children, and people with respiratory and cardiovascular diseases. Wildfires can threaten the health and safety of those fighting the fires, so the overall magnitude or severity of fires can be wide-reaching and incur many types of impacts. Wildfire severity can usually be quantified in terms of acres burned during an event, number and cost of properties/structures damaged (including critical facilities), money lost from disruption of services, and population affected by the fires (e.g. people displaced, injured or killed). A widely damaging wildland fire within the City is considered to be unlikely, although changing issues and increasing record-high temperatures accompanied by low humidity, strong winds, and drought conditions could worsen the likelihood of fires in the Planning Area, or near the Planning Area in the future.

Previous Occurrences

Wildfires are a significant concern throughout California. According to CAL FIRE, vegetation fires occur across California on a regular basis; most can be controlled and contained early with limited damage. The foothills and mountain areas of California have experienced numerous devastating fires over the last 100

years, with the fire risk significantly increasing in recent years due to high fuel loads and expansion of development into the WUI areas. For those ignitions that are not readily contained and become wildfires, damage can be extensive. There are many causes of wildfire, from naturally caused lightning fires to human-caused fires linked to activities such as smoking, campfires, debris burning, equipment use, and arson. Recent studies conclude that the greater the population density in an area, the greater the chance of an ignition from human sources, as well as powerlines or other electrical or utility infrastructure.



The Tubbs Fire, as shown above, was a wildfire that impacted parts of Napa, Sonoma, and Lake counties, and inflicted the greatest losses on the City of Santa Rosa. The Tubbs Fire was one of more than a dozen large fires that started in October 2017. It burned approximately 36,702 acres and destroyed more than 5,643 homes, half of which were located in Santa Rosa. *Photo Credit: Dante De Prete/2017*

Based on Cal FIRE's wildfire history data, there were no reported fires within a ten-mile buffer around Sebastopol; however 25 fires were within the vicinity of the City from 1944 to 2020. Table 4-24 summarizes the fires that occurred around Sebastopol, while Figure 4-20 displays the fires that have occurred close to the City. The fires have been organized by acres burned, with the oldest fire taking place in 1944 and the most recent of record in November 2020. In terms of the largest fires close to the City, the LNU Lightning Complex Fire occurred in August 2020 with 363,219 acres burned, Kincade Fire occurred in 2019 and burned 77,762 acres, and the Glass Fire in northeast Santa Rosa started in September 2020 and burned 67,484 acres.

The NOAA NCEI database was queried for past wildfire events in or near Sebastopol. This NCEI query yielded five records of "Dense Smoke" events between 2018 and 2020. These events were related to the 2018 Camp Fire, 2019 Kincade Fire and 2020 Glass Fire. The 2018 record specifically calls out neighboring community of Santa Rosa as shutting down city operations due to the dense smoke from the Camp Fire. As such, even events that take place elsewhere can affect the Planning Area as noted herein.

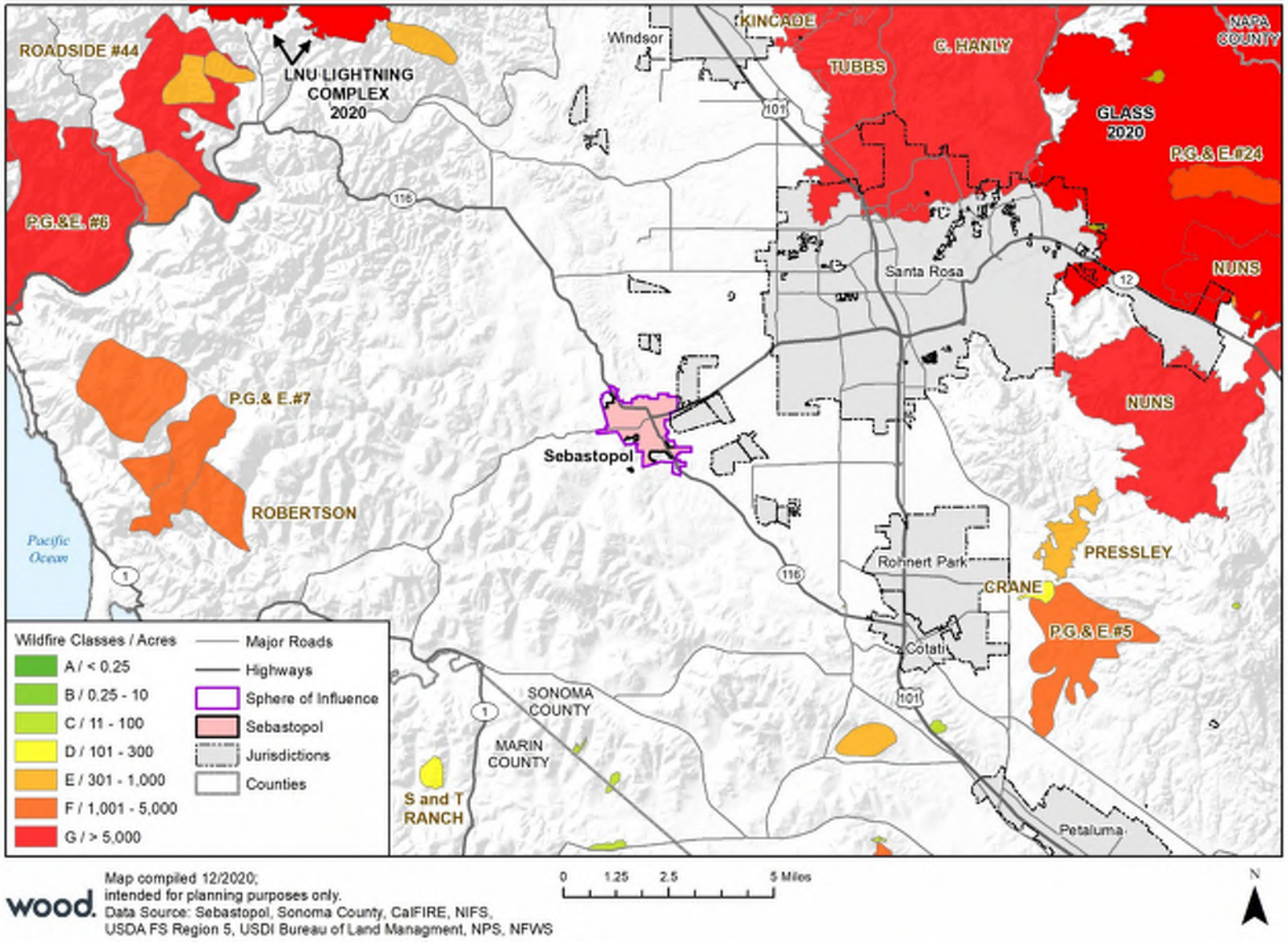
Table 4-24: Summary of Fire History within 10 miles of the City of Sebastopol

Fire Name	Year	Cause of Fire	Acres Burned	Details/Agency in Charge
LNU Lightning Complex	2020	Lightning	363,219	California Department of Forestry and Fire Protection
Kincade	2019	Power Line	77,762	California Department of Forestry and Fire Protection
Glass	2020	Unknown / Unidentified	67,484	California Department of Forestry and Fire Protection
C. Hanly	1964	Unknown / Unidentified	55,961	California Department of Forestry and Fire Protection
Nuns	2017	Unknown / Unidentified	55,798	California Department of Forestry and Fire Protection
Tubbs	2017	Unknown / Unidentified	36,702	California Department of Forestry and Fire Protection
Roadside #44	1961	Unknown / Unidentified	5,968	California Department of Forestry and Fire Protection

Fire Name	Year	Cause of Fire	Acres Burned	Details/Agency in Charge
Anderson	1965	Unknown / Unidentified	4,954	California Department of Forestry and Fire Protection
P.G.& E.#5	1965	Unknown / Unidentified	3,250	California Department of Forestry and Fire Protection
-	1964	Unknown / Unidentified	2,603	California Department of Forestry and Fire Protection
Robertson	1961	Unknown / Unidentified	2,208	California Department of Forestry and Fire Protection
P.G.& E.#7	1965	Unknown / Unidentified	1,840	California Department of Forestry and Fire Protection
P.G.& E. #4	1950	Unknown / Unidentified	1,133	California Department of Forestry and Fire Protection
Pressley	2017	Unknown / Unidentified	792	California Department of Forestry and Fire Protection
-	1944	Unknown / Unidentified	541	California Department of Forestry and Fire Protection
-	1945	Unknown / Unidentified	526	California Department of Forestry and Fire Protection
S and T Ranch	1969	Unknown / Unidentified	210	Contract County
Crane	2013	Unknown / Unidentified	159	California Department of Forestry and Fire Protection
Alexander	1982	Unknown / Unidentified	80	Contract County
Grade 2	2007	Unknown / Unidentified	60	California Department of Forestry and Fire Protection
Carmody	1991	Unknown / Unidentified	54	Contract County
Martinoni	2012	Unknown / Unidentified	30	Contract County
Oceguera	2004	Unknown / Unidentified	20	California Department of Forestry and Fire Protection
Bodega	2017	Unknown / Unidentified	18	California Department of Forestry and Fire Protection
Stony	2012	Vehicle	6	California Department of Forestry and Fire Protection

Source, CalFire and National Incident Feature Service (NIFS) 2020

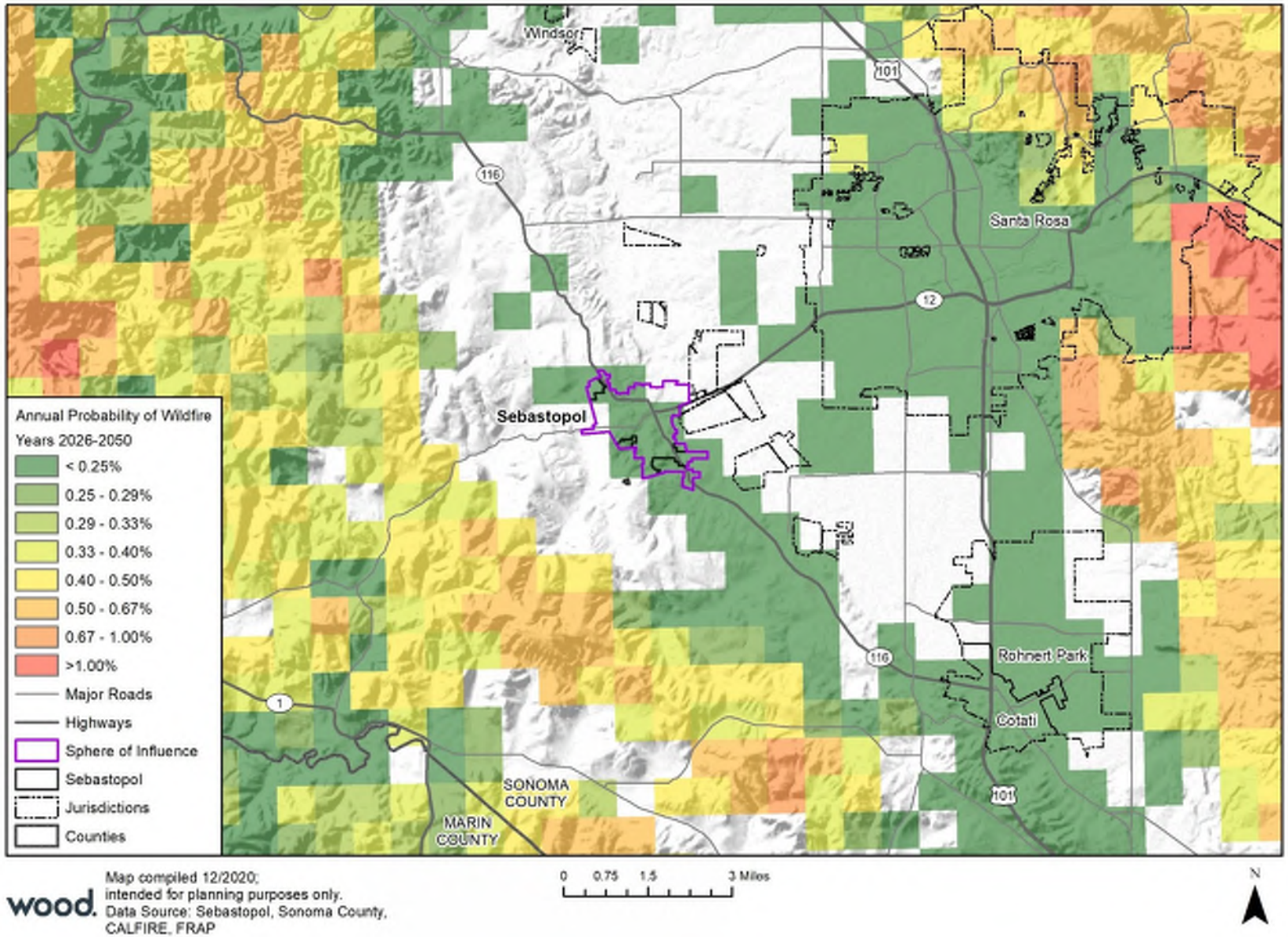
Figure 4-20: Fire History and Burn Perimeters near the City of Sebastopol 1944 to 2020



Probability of Future Occurrences

Occasional – Considering the local fuels, weather conditions, and the flat topography in the area combined with a lack of extensive WUI development means that fires may only occur occasionally in or immediately surrounding the City. Based on the CAL FIRE Probability and Carbon Accounting mapping, which is based on Mann et al.'s projections for the years 2026-2050 (shown on Figure 4-21 below), the annual probability of fire occurrence is low for the most the City (CalFIRE 2020) and most of the surrounding land uses to the west (grid cells colored white or undefined in Figure 4-21) consist of farmland (e.g., prime farmland, farmland of statewide importance, etc.) and grazing land. However, due to the effects of climate change and because the probability of future occurrences outside the City's Planning Area ranges from likely to high likely, the City recognizes the probability of future occurrences of wildfires in the City's Planning Area would increase when taking into consideration climate change and wildfire risk in the region. Recent wildfires in various parts of Sonoma County and in the region have had significant impacts on the City, and in some instances required City residents to evacuate, which was the case during the 2019 wildfires. During these wildfires several of the required evacuations led to gridlock traffic conditions in the City, which limited the ability for the community to evacuate in a timely manner. These recent wildfires also caused many residents to temporarily evacuate due to poor air quality and smoke. For more information on this CAL FIRE probability mapping methodology and related resources, visit https://frap.fire.ca.gov/frap-projects/fire-probability-and-carbon-accounting/

Figure 4-21: Annual Fire Probability in the City of Sebastopol for the Years 2026-2050



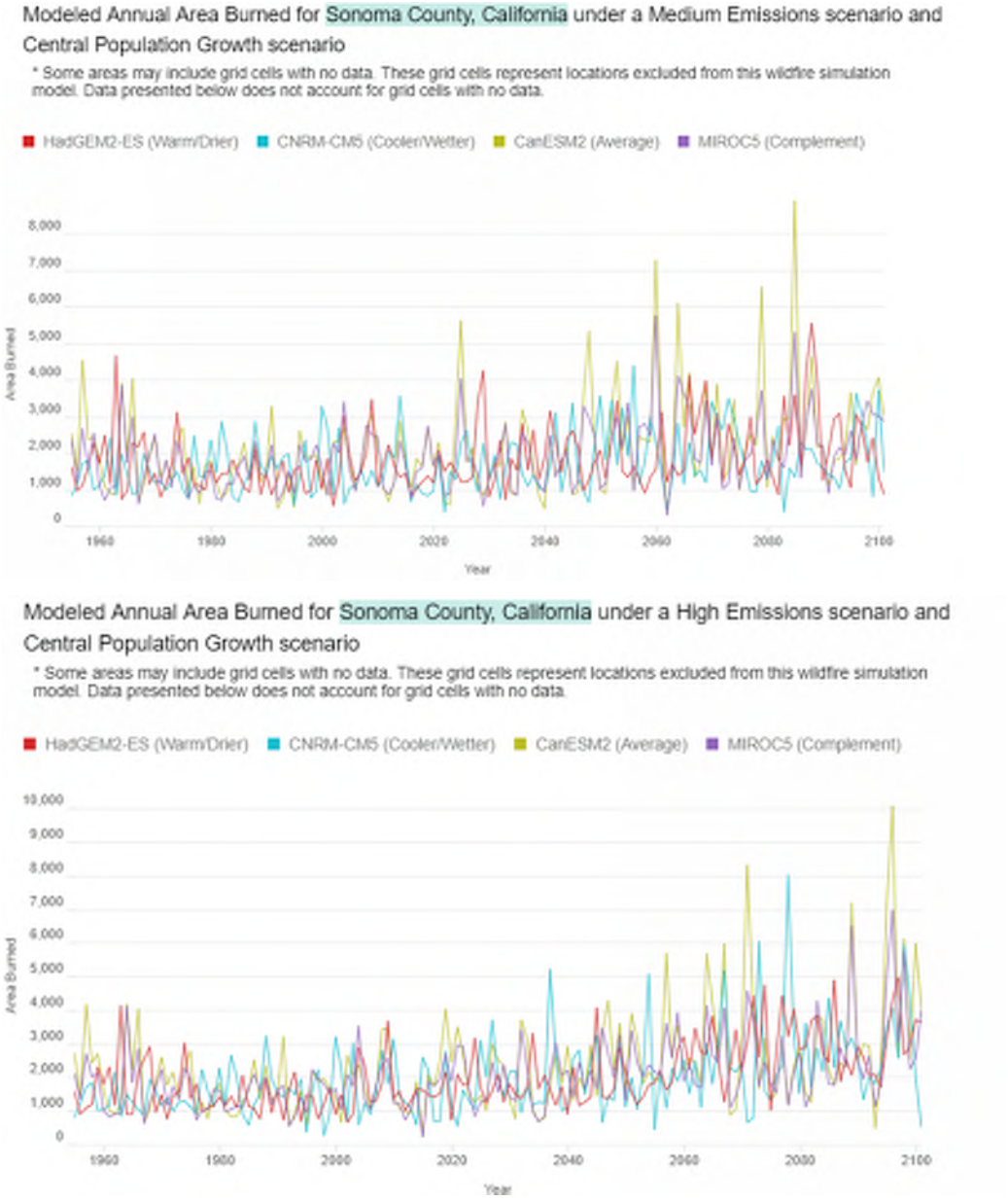
Climate Change Considerations

Increases in GHG emissions coupled with population growth and development are expected to continue impacting California's forests and natural resources. Likewise, the effects of climate change will impact wildfire behavior, the frequency of ignitions, fire management, and fuel loads. Increasing temperatures will intensify wildfire threat and susceptibility to more frequent wildfires in the grasslands that surround the Planning Area, in addition to wildlands throughout Sonoma County.

Uncertainty exists in how climate change will affect total precipitation, but models suggest that there is a tendency for wetter conditions in the northern part of the state and drier conditions in the south (California Natural Resources Agency 2018). Forests are also sensitive to variable precipitation events, and damaging droughts such as the multi-year event from 2012-2017, which contributed to widespread tree mortality as warmer temperatures stressed trees and made them more susceptible to pests and pathogens (California Natural Resources Agency 2018). While the surrounding hillsides near the City's Planning Area consist of mostly grasslands, there are emerging studies that indicate that hot and dry winds can influence shrubland and grassland fires. Studies noted in California's Fourth Assessment indicate climate change impacts on wind patterns may strongly affect forests, potentially serving as a trigger mechanism for conversion of forest to other types of vegetation (California Natural Resources Agency 2018).

Cal-Adapt conducted wildfire risk projections based on statistical modeling from historical data of climate, vegetation, population density, and fire history. The wildfire risk simulations were used in California's Fourth Climate Change Assessment and based on four models that produced a warm/dry simulation (HadGEM2-ES), cooler/wetter simulation (CNRM-CM5), average simulation (CanESM2), and a simulation that is most unlike the first three for the best coverage of different possibilities (MIROC5). These wildfire risk simulations are shown in Figure 4-22. The upper chart shows the modeled annual averages of area burned in Sonoma County under the RCP 8.5 scenario, while the lower chart shows modeled annual averages of area burned for Sonoma County under the RCP 4.5 scenario. Sonoma County was selected as the data boundary layer to better represent the impact of wildfires in the region and on a County-level, given City may be more affected by nearby wildfires and resulting smoke than wildfires within the City itself.

Figure 4-22: Future Annual Averages of Acres Burned in Sebastopol under Low and High Emission Scenarios



Source: Cal-Adapt 2021

According to the Sonoma County's 2016 Regional CAP, climate change is expected to result in more frequent and intense wildfires. These risks are expected to continue to rise due to increased dryness of vegetation compounded by the productivity of plants in the spring. Based on the Regional CAP data, by the end of the century, the chances of one or more fires during a 30-year period are projected to increase from 15 to 20 percent to 25 to 33 percent in the mountainous areas of the County.

While the CAL FIRE program actively collaborates with state, local, and national agencies to reduce climate change impacts, current scientific models expect California will be affected by increased numbers of forest fires with added intensity due to longer warmer seasons, reduced distribution of biodiversity, lack of moisture, changes in ecosystems, drought impacts (e.g. pest diseases and continued spread of invasive

species), and other such impacts in coming years. Due to these increasingly worsening and recurring issues, wildfire hazards should be carefully studied by the City with regards to future negative effects in or near the City Planning Area related to wildfire risk. For these reasons, climate change would have a "high" influence on wildfire hazards.

Vulnerability Assessment

The City's wildfire risk and vulnerability is a medium concern. Wildfires can affect major transportation roads, such as SRs 116 and 12 by impeding commuters to get to and from their destinations (e.g. to the Bay Area), as well as potentially block emergency responders. As previously mentioned, wildfire can also damage or destroy property and infrastructure, injure people or even cause death. During the May to November fire season, which accounts for seasons during the past decade that now last longer each year (into November and December), the dry vegetation and hot and windy weather, combined with a growing population, results in an increase in the number of potential ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. Fires that prevent essential goods or services from entering or leaving the City could negatively affect local residents and businesses by impacting the local economy and the community's livelihood (e.g. limited access to jobs, daycare, schools, resources, and residences).

The CAL FIRE-produced FHSZs within LRAs displayed in Figure 4-23 were used to assess general wildfire risk in the Planning Area, using methodology detailed below. The results are summarized in the tables and maps that follow. The City's parcel layer was used as the basis for the inventory of parcels, while the CAL FIRE FHSZs in LRAs, ranked by severity, was used to intersect the parcels and determine general risk based on the severity rank categorization, all in GIS. Centroids were generated for each parcel for simpler overlay analysis, so that a parcel was either "in" a fire threat layer of type "moderate severity," "high severity," or "very high severity," or "out" of any of these fire threat categories (e.g. in Urban Unzoned or Non-Wildland/Non-Urban areas). For purposes of this analysis, it was assumed that every parcel with an improved value greater than zero was developed in some way, even those stated as "vacant." This specification ensures parcels such as rights-of-way are discarded for the purposes of determining vulnerability to fire, and to be able to aggregate valuations based on each parcel type (e.g. residential, commercial, agricultural). The assessor's office data calculates improved values based on the "annual structure value" which relates to the improvements of the parcel; this was the field used to determine improved values for each parcel.

Once parcels in the form of centroids are categorized by property type, next the content values were calculated as follows: a) residential and multi-family properties received contents valued at 50 percent of the parcel improved value; b) commercial and agricultural properties' contents were valued at 100 percent of the parcel improved value; and, c) vacant parcels (if applicable) received 0 percent content values. These valuation assignments are based on FEMA's methodology for estimating contents within their loss estimation software, Hazus-MH.

Properties located within the FHSZs are listed in Table 4-25, along with a summary of all improved structure values, contents values, and total values (which are the aggregated improved structure values plus the content values). Loss estimates are equal to 100 percent of the total building and content values, as wildfires typically result in complete loss. Population at risk is also estimated based on the GIS modeling. As Figure 4-24 illustrates, the areas with parcels exposed to the FHSZs within the LRAs are found along the southern and eastern edges of the City's Planning Area.

Property

The fire severity zones, and parcel overlay analysis yielded the following results below for fire hazards within LRAs. The highest number of parcels at risk fall under the residential category (with a total of 98

parcels), followed by the commercial category (with 17 parcels), multi-family (with 8 parcels), and industrial (with 2 parcels at risk). A total of $78 million is at risk of being affected by potential fires, based on a $45.77 million improved structure value combined between all the parcel types, and $32 million in content values. The moderate FHSZ category contains all the parcels at risk, with 126 parcels. No parcels fall in the high or very high FHSZ areas. Figure 4-24 displays parcels located in the FHSZ areas.

Table 4-25: Parcels in FHSZs within LRAs in Sebastopol

Property Type	Improved Parcel	Improved Value	Content Value	Total Value	Population at Risk
Commercial	17	$16,951,433	$16,454,342	$33,405,775	
Industrial	2	$1,153,481	$1,730,222	$2,883,703	
Multi-Family	8	$2,291,851	$1,145,926	$3,437,777	25
Religion	1	$900,896	$900,896	$1,801,792	
Residential	98	$24,416,846	$12,208,423	$36,625,269	309
Total	**126**	**$45,714,507**	**$32,439,808**	**$78,154,315**	**335**

Source: City of Sebastopol, Sonoma County Assessor's Office; CalFire; Wood Parcel Analysis

The wildland fire threat zones and parcel overlay analysis yielded the following results below for fire hazards. There are six residential parcels at risk to high fire threat with a total value of risk at $1.9 million. The moderate fire threat hazard severity category has the highest risk in Sebastopol. The highest number of parcels at moderate risk fall under the residential category (with a total of 194 parcels), followed by the multi-family category (with 13 parcels), and commercial (with 9 parcels at risk). A total of $136.7 million in parcel value is located within the moderate risk area, based on a $87 million improved structure value combined between all the parcel types, and $49 million in content values. Figure 4-23 displays parcels located in the Wildland Fire Threat areas.

Table 4-26: Parcels in Wildland Fire Threat Areas in Sebastopol

Fire Threat	Property Type	Improved Parcel	Improved Value	Content Value	Total Value	Population at Risk
High	Residential	6	$1,295,586	$647,793	$1,943,379	19
Moderate	Commercial	9	$9,858,059	$9,360,968	$19,219,027	
	Industrial	2	$964,660	$1,446,990	$2,411,650	
	Multi-Family	13	$9,622,722	$4,811,361	$14,434,083	41
	Religion	1	$900,896	$900,896	$1,801,792	
	Residential	194	$65,911,037	$32,955,519	$98,866,556	612
	Total	**219**	**$87,257,374**	**$49,475,734**	**$136,733,108**	**653**
Low	Commercial	1	$50,428	$50,428	$100,856	
	Multi-Family	1	$133,804	$66,902	$200,706	3
	Residential	2	$1,182,335	$591,168	$1,773,503	6
	Total	**4**	**$1,366,567**	**$708,498**	**$2,075,065**	**9**

Sources: City of Sebastopol, Sonoma County Assessor's Office; CalFire; Wood Parcel Analysis

Figure 4-23: Fire Hazard Severity Zones in Local Responsibility Areas - City of Sebastopol

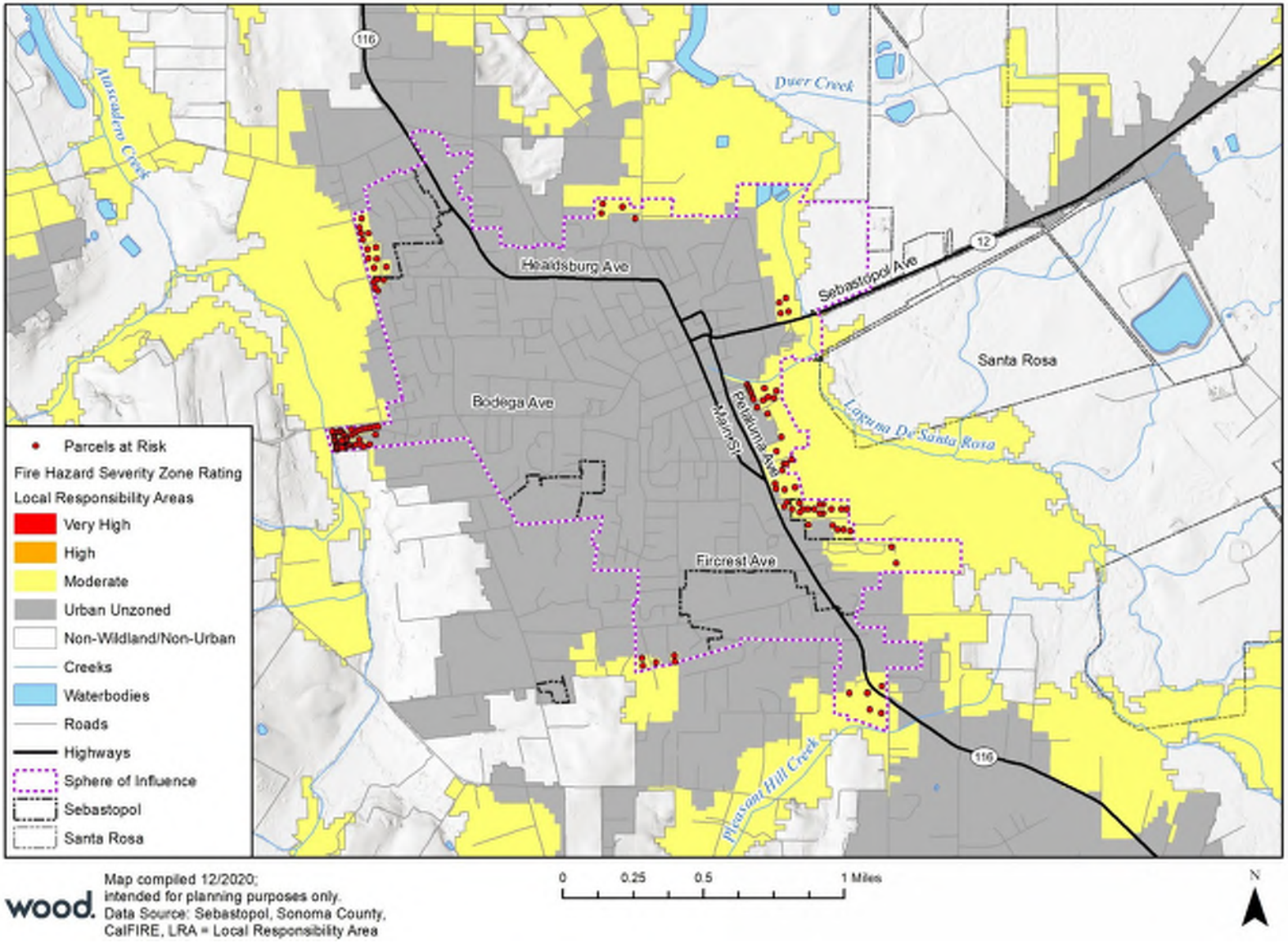
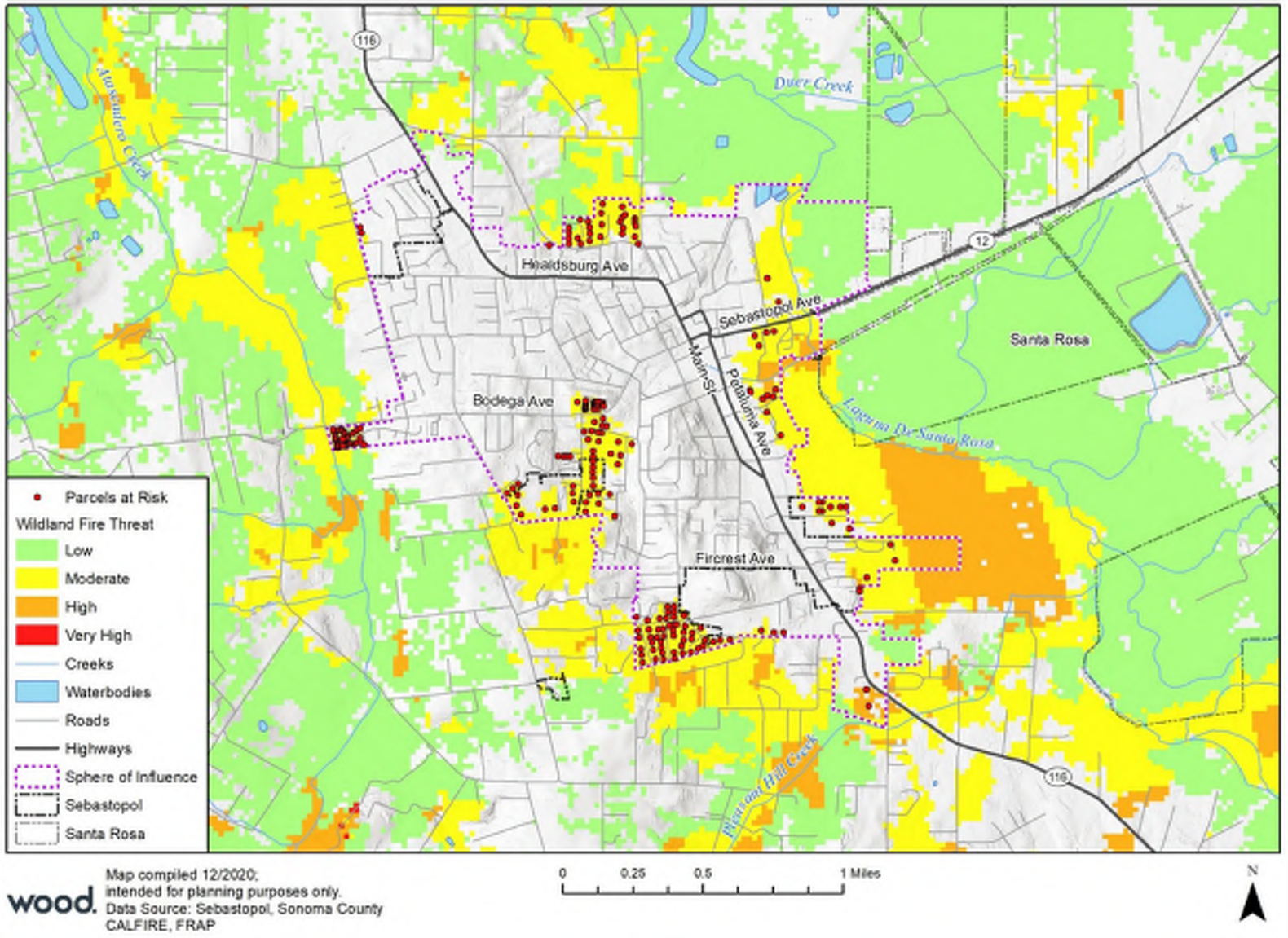


Figure 4-24: Wildland Fire Threat Areas within and around the City of Sebastopol



People



The 2020 Glass Fire began in late September in the North Bay region. Several homes in the Skyhawk subdivision of Santa Rosa were burned. Dense smoke from the wildfire decreased air quality, impacting the City of Sebastopol.
Photo Credit: Black Rock Inn. St. Helena. San Francisco Chronicle 2019 Noah Berger/Associated Press

Wildfire risk is of greatest concern to populations residing in the moderate, high, and very high wildfire threat zones. The 2018 U.S. Census estimates were used to show the average persons per household in the City, so that total persons at risk of each fire threat category could be calculated, based on property type. For each residential property type (i.e., general residential, multi-family), an average household value of 3.16 people per parcel (based on U.S. Census estimates) was applied to roughly estimate potential population at risk. Table 4-25 and Table 4-25 above summarized the estimated population residing in each fire threat zone along with the parcel analysis summary by LRA FHSZ and Fire Threat type. The results were estimated by multiplying the average persons per household in Sebastopol times the number of residential parcels in each fire threat zone. Based on the analysis, the moderate Fire Threat has 335 potential people at risk and high Fire Threat has a population of 19 at risk with 653 at moderate risk.

Other indirect impacts from wildfires on people are related to dense smoke from fires within the region. Wildfires in the past three years have decreased the air quality in the Sebastopol area and throughout Sonoma County. Dense smoke poses a risk to both people with compromised health as well as those considered healthy. Studies have also shown an increase in ambulance calls, hospital visits and an increase of people experiencing respiratory or cardiac emergencies (NPR 2020).

Economy

Wildfires can be incredibly destructive depending on the circumstances of the event, particularly the type of resources and populations they affect due to fire size, location, length of the burn, and ongoing or existing weather or hazard conditions. For example, damages to structures and properties are obvious impacts to the economy due to fire, though cascading negative effects on the economic sectors include road closures, lower revenue to the City based on reduced tourism and visitation, or excessive costs of firefighting and relocating people or natural and man-made resources (thus indirectly impacting city revenues). Transportation lifelines being closed and/or damaged could impede a majority of the population's ability to commute to nearby cities and the Bay Area. Additional direct or indirect impacts to the economy could be further exacerbated by existing hazard issues such as earthquakes, drought, or severe weather, if those make it difficult to control wildfires or reestablish the economic drivers in the Planning Area.

Critical Facilities and Infrastructure

Critical facilities are those community components that are most needed to withstand the impacts of a disaster. An overlay analysis using GIS was performed to determine where critical facilities are located within FHSZs ranked moderate, high, or very high (within the LRAs as defined by CAL FIRE). Only those facilities located in these zones are noted as being at risk. Figure 4-25 shows those critical facilities located in the City that fall in the FHSZs, while Table 4-27 describes the types of facilities. Based on these results, a total of six critical facilities are located in zones of the type "moderate." No other fire threat zones contain critical facilities in the Planning Area. Of these facilities, three are within the FEMA Community Lifelines category for Food, Water, Shelter and the other three fall under the Transportation category.

Table 4-27: The City of Sebastopol's Critical Facilities at Risk to Wildfire based on FHSZs in LRAs

FEMA Community Lifeline	Facility Type	Total
Food, Water, Shelter	Shelter	2
	Wastewater	1
Transportation	Bridge	3
	Total	**6**

Source: City of Sebastopol; HIFLD; CalFire FRAP 2010; Wood GIS Analysis

An additional analysis was performed on the Wildland Fire Threat layer. Overlay analysis using GIS was performed to determine where critical facilities are located within threat areas ranked moderate, high, or very high. Only those facilities located in these zones are noted as being at risk. Figure 4-25 shows those critical facilities located in the City, while Table 4-28 describes the types of facilities. Based on these results, a total of six critical facilities are found in the "moderate" zone. No other fire threat zones contain critical facilities in the Planning Area. From these facilities, five are within the FEMA Community Lifeline category for Food, Water, Shelter and one falls under the Transportation category.

Table 4-28: City of Sebastopol's Critical Facilities at Risk to Wildfire based on Wildfire Threat

FEMA Lifeline	Facility Type	Total
Food, Water, Shelter	School	1
	Shelter	2
	Wastewater	1
	Water Well	1
Transportation	Bridge	1
	Total	**6**

Source: City of Sebastopol; HIFLD; CalFire FRAP 2010a; CalFire FRAP 2010b; Wood GIS Analysis

Figure 4-25: Critical Facilities and Infrastructure within Local Responsibility Hazard Areas in the City of Sebastopol

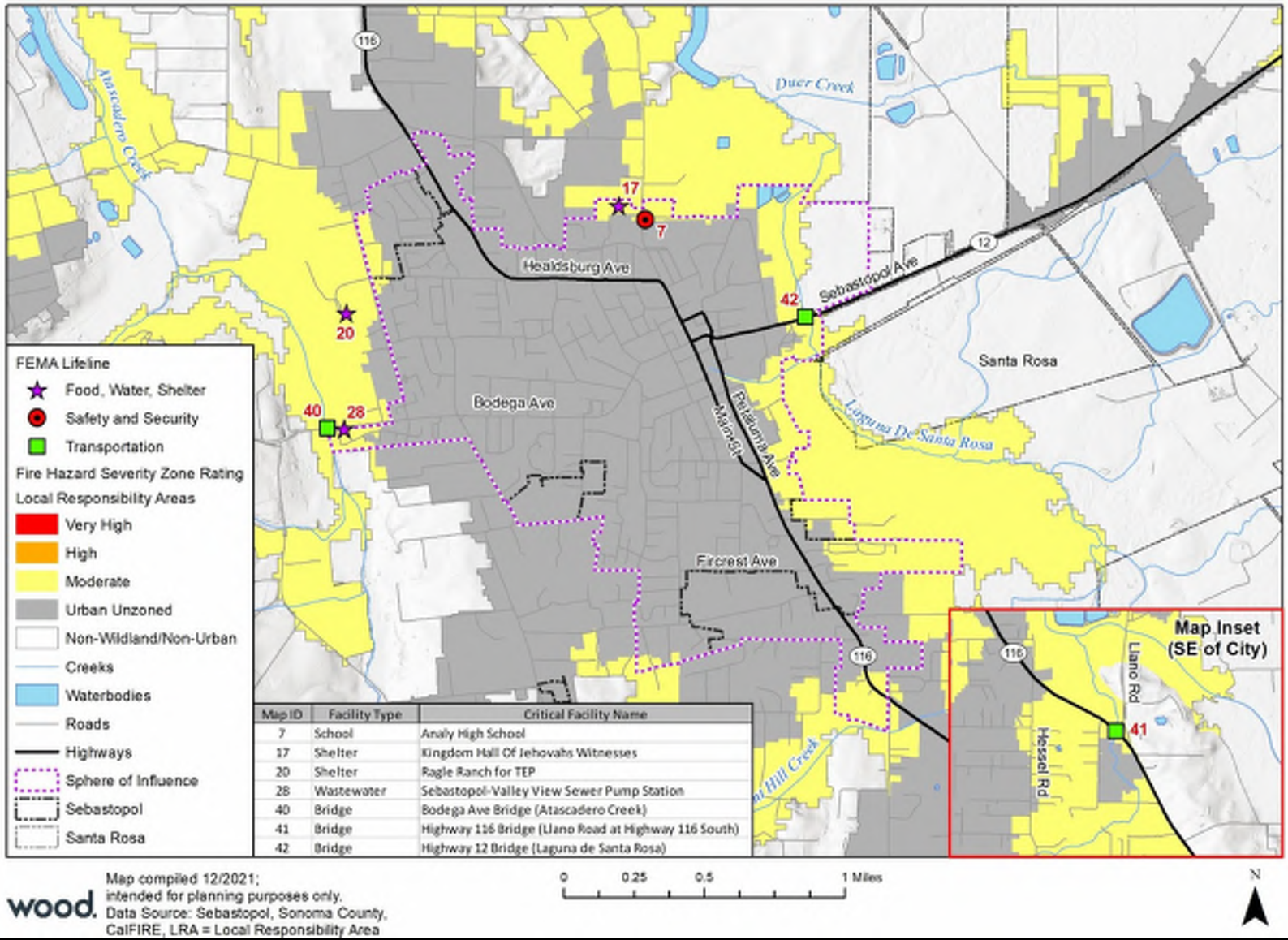
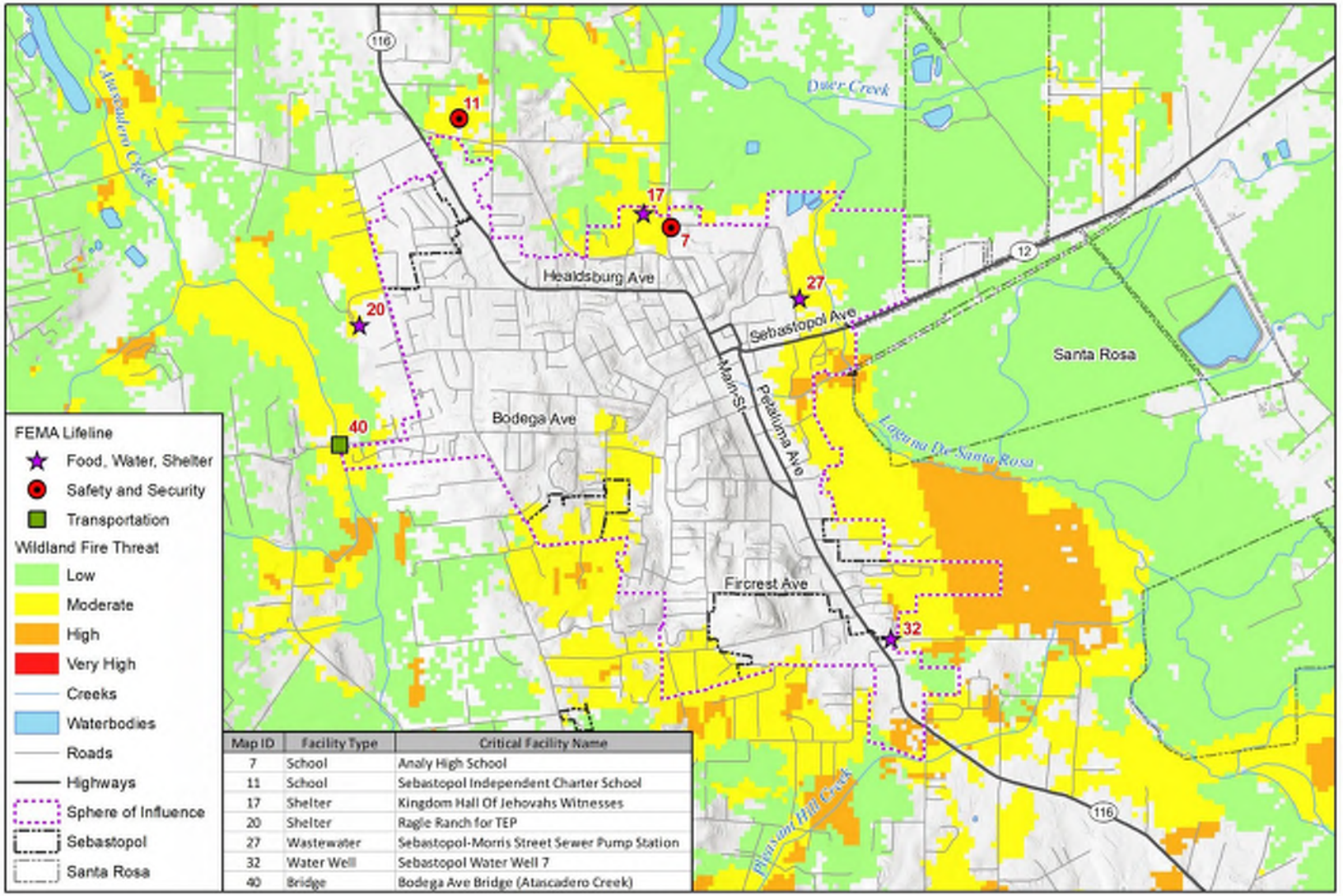


Figure 4-26: Critical Facilities and Infrastructure within Fire Threat Zones in the City of Sebastopol



Map ID	Facility Type	Critical Facility Name
7	School	Analy High School
11	School	Sebastopol Independent Charter School
17	Shelter	Kingdom Hall Of Jehovahs Witnesses
20	Shelter	Ragle Ranch for TEP
27	Wastewater	Sebastopol-Morris Street Sewer Pump Station
32	Water Well	Sebastopol Water Well 7
40	Bridge	Bodega Ave Bridge (Atascadero Creek)

wood.

Map compiled 12/2021;
intended for planning purposes only.
Data Source: Sebastopol, Sonoma County
CALFIRE, FRAP

According to California's Fourth Climate Assessment, wildfire may be the biggest immediate threat to California's transportation system, as vegetation fuel accumulation continues to increase (California Natural Resources Agency 2018). Wildfires can also lead to mudslides and debris flows, later resulting in the temporary transportation system closures or other key impacts to the community. Studies cited in the most recent climate assessment found that a considerable amount of infrastructure is exposed to wildfire risk, with the highest risk being roads and highways, such as SRs 12 and 116. Railroads may also be at risk of warping during wildfires, and transportation or freight activity disrupted, while smoke and fire-fighting operations can lead to temporary service disruptions that can additionally affect movement of goods and services (California Natural Resources Agency 2018).

Historic, Cultural, and Natural Resources

The City has seven cultural and historic resource places, as summarized under Section 4.2 of this plan. Since these structures are sensitive in nature and may not have been built according to the latest building codes due to their age, it is expected that they might be at risk of wildfires (e.g. because of their potential inability to withstand significant heat). Several of these historic sites are located outside the City's Planning Area, and potentially closer to areas prone to wildfires. However, parks or natural spaces, such as the Laguna de Santa Rosa Wetland Preserve, the second largest freshwater marsh in Northern California, could also be at risk of a wildfire, but these places would need to be further studied to determine vulnerability and risk more specifically. Other City park facilities with existing infrastructure, such as park amenities, like playgrounds and ball fields may also be susceptible to wildfires.

Future Development

Any population increases in the Planning Area will continue to make wildfire vulnerability a growing issue, as future development in the WUI will increase risk to this hazard citywide. WUI related risks can however be managed with strong land use regulations and building code requirements. For example, development in the WUI can be limited, or where permitted can require firebreaks between development and grasslands, as well as the enforcement that building construction be compliant with the CBC Chapter 7A: Materials and Construction Methods for Exterior Wildfire Exposure. The Sebastopol General Plan and Zoning Code can also be amended to address these land use regulations.

Risk Summary

- The overall risk significance of wildfire hazards to the City of Sebastopol is **Medium**.
- The level of wildfire risk will likely increase in the future due to the effects of climate change, and as the City assesses and monitors the level of risk.
- Wildfires are expected to have a probability of occasional occurrence in the future, given the local fuel, topography, and weather conditions and the extent of the WUI. Based on recent CAL FIRE future fire occurrence probability mapping, the City is mostly expected to have a low likelihood of fire from years 2026 to 2050.
- The areas of the City with high and moderate, which in turn pose the highest risk to life and property, are located on the southern portion of the Planning Area. There are no areas of very high fire threat in the Planning Area.
- A majority of parcels fall within the moderate fire threat areas (219 improved parcels) with a total value of roughly $136 million. Six residential parcels were identified as being located in the high fire threat areas in the City.
- Although the probability of future occurrence of wildfire risk is occasional within the City's Planning Area, the future occurrence outside the City is ranges from likely to highly likely and must account for areas where future occurrence of major wildfires will significantly affect the City through mandated evacuation and poor air quality, among other impacts.

- Approximately 355 people may be at risk of the moderate FHSZs within the LRA.
- Six critical facilities are in moderate fire threat areas within the City of Sebastopol (no other facilities fall in any additional fire threat zones).
- Seven historic and cultural properties and places are exposed to wildfire risks, based on the NRHP database; however, several of these facilities occur outside the City's Planning Area.
- Population growth in Sebastopol is expected to result in a 5.5 percent increase over the next decade (by 2030) according to the City's Housing Element, so WUI development may become a larger issue into the future. Building to the current code with regards to materials and structures is recommended based these development trends.

4.3.4 Drought

Hazard Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, many times over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Drought is a complex issue involving many factors; it occurs when a normal amount of moisture is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its causes or effects:

- **Meteorological** drought is usually defined by a period of below average water supply.
- **Agricultural** drought occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- **Hydrological** drought is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
- **Socioeconomic** drought occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

The California Department of Water Resources (DWR) says the following about drought (DWR 2015):

> "One dry year does not normally constitute a drought in California. California's extensive system of water supply infrastructure—its reservoirs, groundwater basins, and inter-regional conveyance facilities—mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions."

The drought issue in California is further compounded by water rights. Water is a commodity possessed under a variety of legal doctrines. The prioritization of water rights between farming and federally protected fish habitats in California is part of this issue.

Drought impacts are wide-reaching and may be economic, environmental, or societal. During a drought, water allocations go down, which results in reduced water availability. Voluntary water conservation measures are typically implemented during extended droughts. A reduction of electric power generation and water quality deterioration are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Location

Significant – Drought is a regional hazard, and during severe drought conditions, it can affect the entire state of California with varying levels of dryness. In other words, drought affects all aspects of the economy and environment and the community simultaneously. The most significant impacts associated with drought in the City's Planning Area are those related to water intensive activities such as municipal usage and general water supply (e.g. irrigation for parks and open spaces), wildfire protection (including relief and response activities), commerce, agriculture, and tourism.

According to City of Sebastopol's s General Plan Existing Conditions Report the City relies exclusively on groundwater as its water supply source. The City of Sebastopol has five permitted wells, three of which are active for potable, non-potable, irrigation, and industrial water uses. The City has no backup system nor the ability to connect to other water systems. City officials closely monitor their water supply and encourage residents to conserve water through monetary incentives when water-conserving toilets and washing machines are installed and using recycled water for City landscaping. In addition, water saving devices will be incorporated into all new construction, including remodeling of existing kitchens and bathrooms. Water supply sources and projected acre-feet (AF) available for 2025 are displayed in Table 4-29.

Table 4-29: Sebastopol's Current Water Supply Sources and Projected Availability for 2025

Water Supply	2019 Usage	2025 Projected Availability
Surface Water	0	0 AF
Groundwater	1,000	2,780 AF
TOTAL	**1,000 AF**	**2,780 AF**

Sources: City of Sebastopol 2019 Level of Service Report.

Notes:

2. One Acre-Foot = 43,560 cubic feet.

In 2014, the City adopted a Water Shortage Contingency Plan (WSCP) and applied a three-stage conservation plan during declared water shortages (City of Sebastopol Municipal Code (Ord. 1070 § 1, 2014)). Stage 1 involves Voluntary Conservation to achieve a reduction goal of up to 10 percent of water supply conditions, stage 2 builds to a mandatory compliance and involves moderate reductions of 25 percent, and stage 3 requires mandatory compliance and involves severe reductions of 30 percent.

Sustainable Groundwater Management Act of 2014

Groundwater resources play a significant role in the development, growth, and sustainability of the City as 100 percent of its municipal water is from groundwater. The residents of Sebastopol and all of California have been experiencing significant drought and water shortages since 2011 and only recently did the City and the majority of the state come out of drought. In January 2014 the Governor declared an emergency proclamation due to multiple years of drought. The proclamation called on citizens to reduce water use by 20 percent; with a subsequent Executive Order that directed urban water agencies to reduce water use by 25 percent. In September 2014, the Governor signed a three-bill package (California Senate Bills 1168 and 1319, and Assembly Bill 1739), known as the Sustainable Groundwater Management Act of 2014 (SGMA). The SGMA establishes local Groundwater Sustainability Agencies (GSAs) to manage groundwater sustainability within the groundwater sub-basins defined by the California DWR.

There are three GSAs in Sonoma County: Santa Rosa Plain, Sonoma Valley, and the Petaluma Valley. The City of Sebastopol's water-producing wells overlay the Wilson Grove Formation, which is part of the Petaluma Valley GSA. However, a small portion of the City covers a part of the Santa Rosa Plain (SRP). The City had a choice to join the Wilson Grove or the Santa Rosa Plain; the City applied to California for inclusion in the Santa Rosa Plain GSA and received admittance in 2019. The California DWR has listed the City as a public water agency located within the Santa Rosa Plan Sub-basin.

The Santa Rosa Plain spans approximately 167,410 acres and includes the Santa Rosa Plain and Rincon Valley groundwater subbasins, as well as parts of the Wilson Grove Formation Highlands (WGFH) groundwater basin, Kenwood Valley groundwater basin, Healdsburg area groundwater subbasin, and Alexander Valley groundwater subbasin. The Santa Rosa Plain drains northwest toward the Russian River and is, therefore, part of the North Coast Hydrologic Region.

Much of the City is located within the Wilson Grove Formation Highlands groundwater basin, which is an area of approximately 140 square miles. The City of Sebastopol occupies its eastern-most boundary. The California DWR monitored wells located outside of the City, and within or near the WGFH. Monitoring data indicates groundwater level recharge and discharge have remained in balance.

Groundwater records indicate that long-term groundwater trends have remained relatively stable in the Wilson Grove basin and adjacent areas within the Santa Rosa Plain groundwater sub-basin. Included in these trends are shorter-term declining trends, ranging up to 6 to 7 years in duration, which subsequently stabilize or recover. These short-term trends may be related to localized variations of groundwater production or climatic conditions such as the 1987-1993 timeframe, which is characterized as a period of below-average rainfall, thereby reducing recharge of the aquifer.

In general, the water quality of the Wilson Grove and Santa Rosa Plain groundwater sub-basin is very good to excellent. However, naturally occurring arsenic and manganese have been detected over state/federal maximum contaminant levels (MCLs) in the upper approximately 100 feet of the well screen. It has been found that arsenic concentrations drop in deeper portions of the aquifer (PES Environmental, Inc. 2007).

Extent (Magnitude/Severity)

Limited – Extent can be measured according to a scale developed by the United States Drought Monitor, which measures drought in five categories: "abnormally dry," "moderately dry," "severely dry," "extremely dry," and "exceptionally dry". The City is vulnerable to all levels of drought, which are further subject to the effects of climate change, precipitation trends, and wet and dry periods. Drought can have a widespread impact on the environment and economy in the Planning Area, but it typically does not result in loss of life or damage to property. Rather drought may have an impact on agriculture, business, and the movement of goods and services related to agricultural, commodities, tourism and recreation, and water supply sectors.

Given that the City's water users fall within the categories of residential (67 percent of water users) and commercial/office, industrial, and institutional (non-residential represents 33 percent of water users), climatic, demographic, and economic factors have an effect on water demands. These are described below and are expected to influence water demands in the future, as they have in the past.

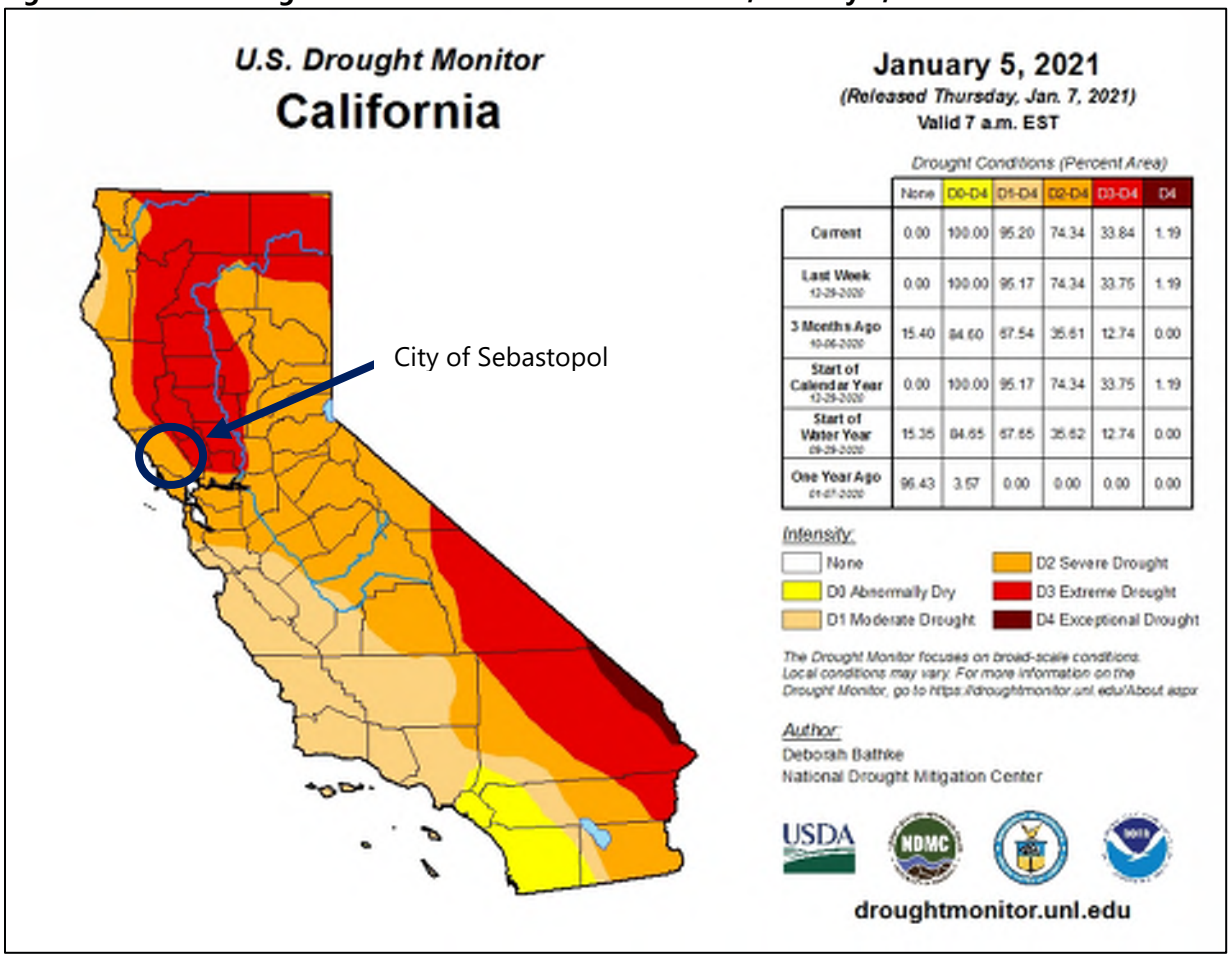
- **Climatic**. The weather in Sebastopol is mild with a mean annual temperature of 56.7 degrees Fahrenheit. Average annual precipitation is about 25 inches. Climate has the most dramatic annual effect on water demands, and severe deviations from normal temperatures and average rainfall can increase or decrease annual water demands. Although Sebastopol's municipal supply does not rely on surface water sources, precipitation shortages can have negative effects on what the City receives and can process for potable and other key water uses.
- **Demographic**. Since water use is related to demographics and population change, an accurate description of population and housing stock in the service area (Planning Area) serves as a basis for water planning activities described in the City's Planning Documents. According to the City's Level of Service report, the City's population was 7,826 in 2019 (City of Sebastopol 2019). Increases to the population are expected to be modest as the current population represents a growth of 40 persons since 2018.

- **Economic**. Commercial water users have the second highest water demand after residential users (both single family and multi-family). According to the City's Level of Service report, commercial water use may increase by 2.5 percent of annual production if approved construction occurs and those projects currently under review are approved (City of Sebastopol 2019).

The magnitude or severity of a drought across the City could vary and is difficult to predict. However, understanding the total population affected as well as economy and resources vulnerable provides insight on how to estimate potential losses and damages to the City's assets; drought related information can be obtained and measured from the National Drought Mitigation Center's Impact Reporter and Drought Monitor tools (United States Drought Monitor 2020; United States Drought Impact Reporter 2018).

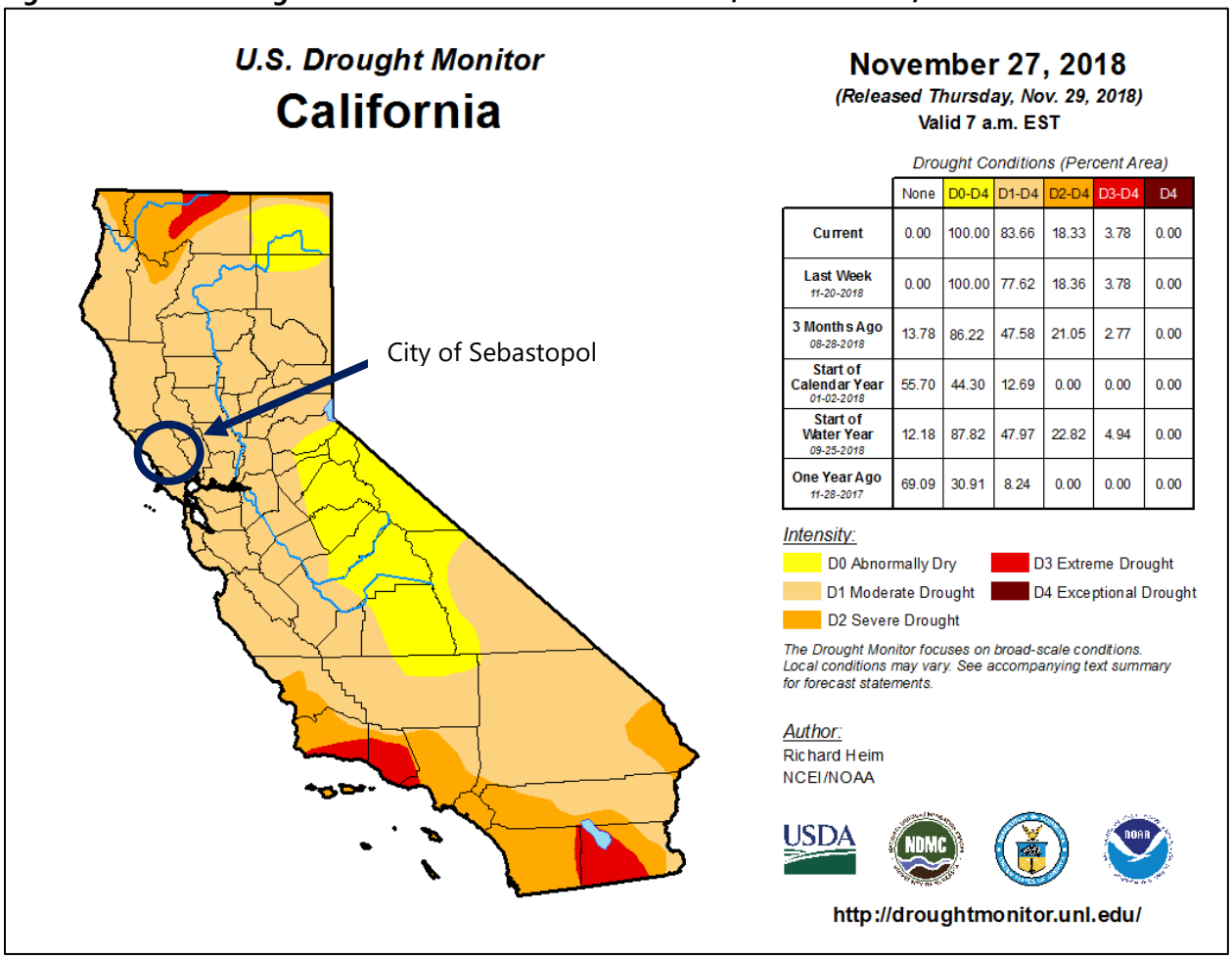
Figure 4-27, Figure 4-28, and Figure 4-29 provide "snapshots in time" of the drought conditions in California as of January 2021, November 2018, and August 2015 (during the period of the last multi-year drought in the state, from 2012- 2017). The snapshots selected are instrumental in depicting both the historic and potential change in drought's geographic range and severity in the City (circled in blue). These maps were extracted from the National Drought Mitigation Center and consider several factors including the Palmer Drought Index, Soil Moisture Models, USGS Weekly Stream flows, Standardized Precipitation Index, and Satellite Vegetation Health Index (United States Drought Monitor 2020).

Figure 4-27: U.S. Drought Monitor Conditions for California, January 5, 2021



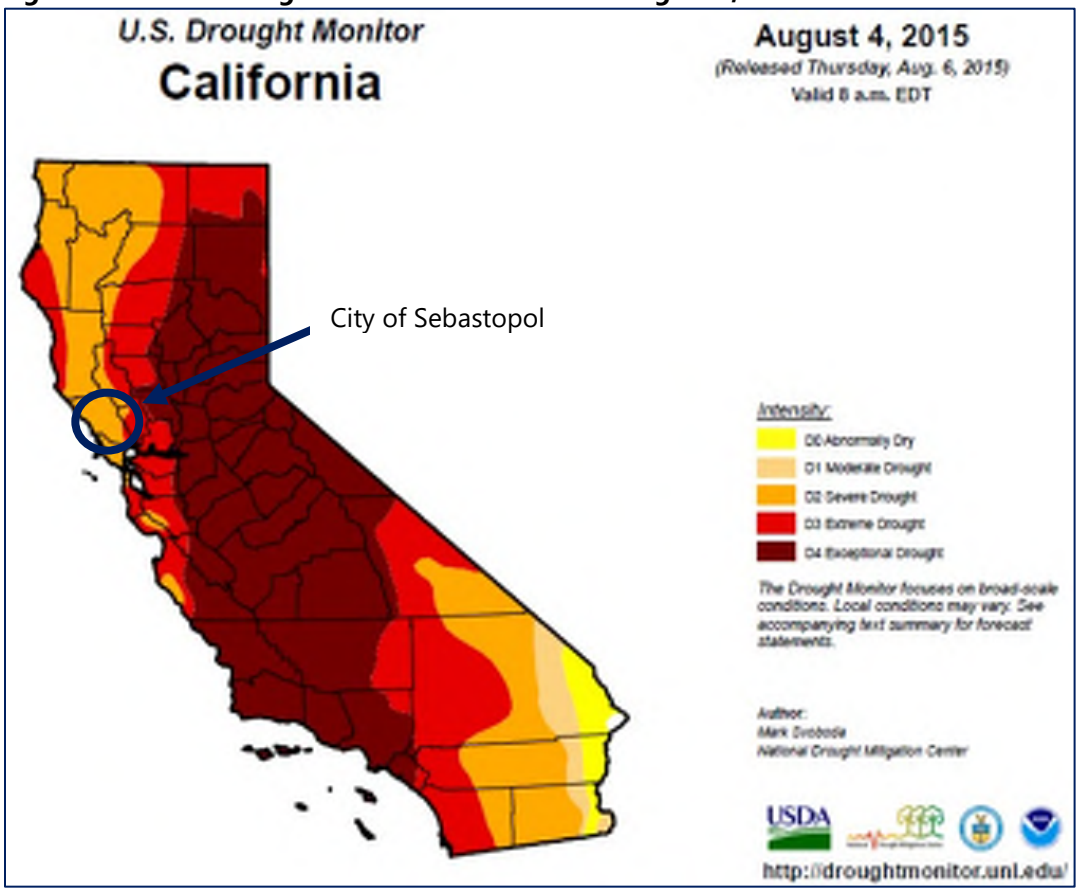
Source: National Drought Mitigation Center 2018

Figure 4-28: U.S. Drought Monitor Conditions for California, November 29, 2018



Source: National Drought Mitigation Center, 2018

Figure 4-29: U.S. Drought Monitor for California: August 4, 2015

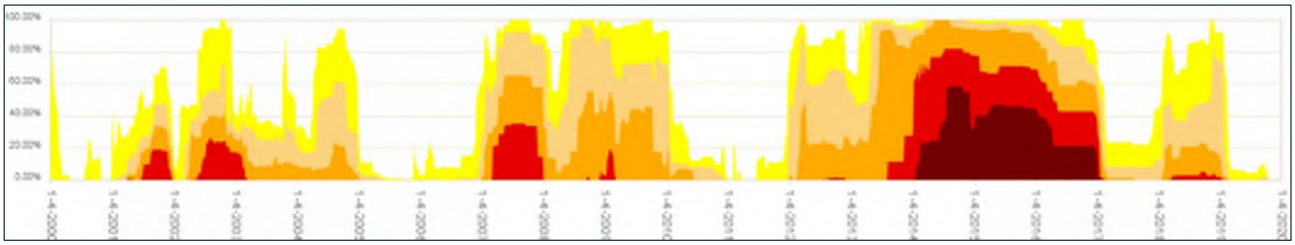


Source: National Drought Mitigation Center, 2018

Previous Occurrences

Historically, California has experienced multiple severe droughts. According to California's DWR, droughts exceeding three years are relatively rare in Northern California, the source of much of the state's developed water supply. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large Northern California reservoirs. Figure 4-30 depicts California's multi-year historical dry periods from 2000-2019.

Figure 4-30: Drought Conditions in California – 2000 – 2019



Source: U.S. Drought Monitor https://droughtmonitor.unl.edu/Data/Timeseries.aspx

Since the year 2000 there have been several cases of multi-year droughts across California; these are described below:

2007-2009 – Water years 2007-2009 were the seventh driest three-year period in the measured record for state-wide precipitation and the fifteenth driest three-year period for DWR 8-station precipitation

index (a rough indicator of potential water supply available to the State Water Project and Central Valley Project)(California Natural Resources Agency 2010).

2012-2017 – The water years of 2012-14 stand out as California's driest three consecutive years in terms of statewide precipitation. The drought occurred at a time of record warmth in California, with new climate records set in 2014 for statewide average temperatures. On January 17, 2014, California declared a drought state of emergency and during this time the state assisted farmers and communities that were most impacted by the drought conditions and helped with drinking water shortages. The state also directed all state agencies to use less water and expand their water conservation campaigns. During this time, these factors have led to excessively dry conditions in the City and the surrounding areas than in past years, often requiring disaster declarations to be enacted to combat drought conditions. Sonoma County declared a Proclamation of Local Emergency Due to Drought Conditions from February 2015 to December 2015. In September 2015, Sebastopol imposed Stage 2 (mandatory) restriction, requiring a reduction of water use by 25 percent.

This drought period now marks the second time a statewide proclamation of emergency has been issued for this hazard. On April 17, 2017 Executive Order B-40-17 was issued, which officially ended the drought state of emergency in California, except for Fresno, Kings, Tulare, and Tuolumne counties. Table 4-30 summarizes the drought-related disaster declarations proclaimed for Sonoma County from 1976 through 2020. These declarations include those from FEMA, the USDA's Secretary of Agriculture, and events noted in the State of California's 2018 SHMP.

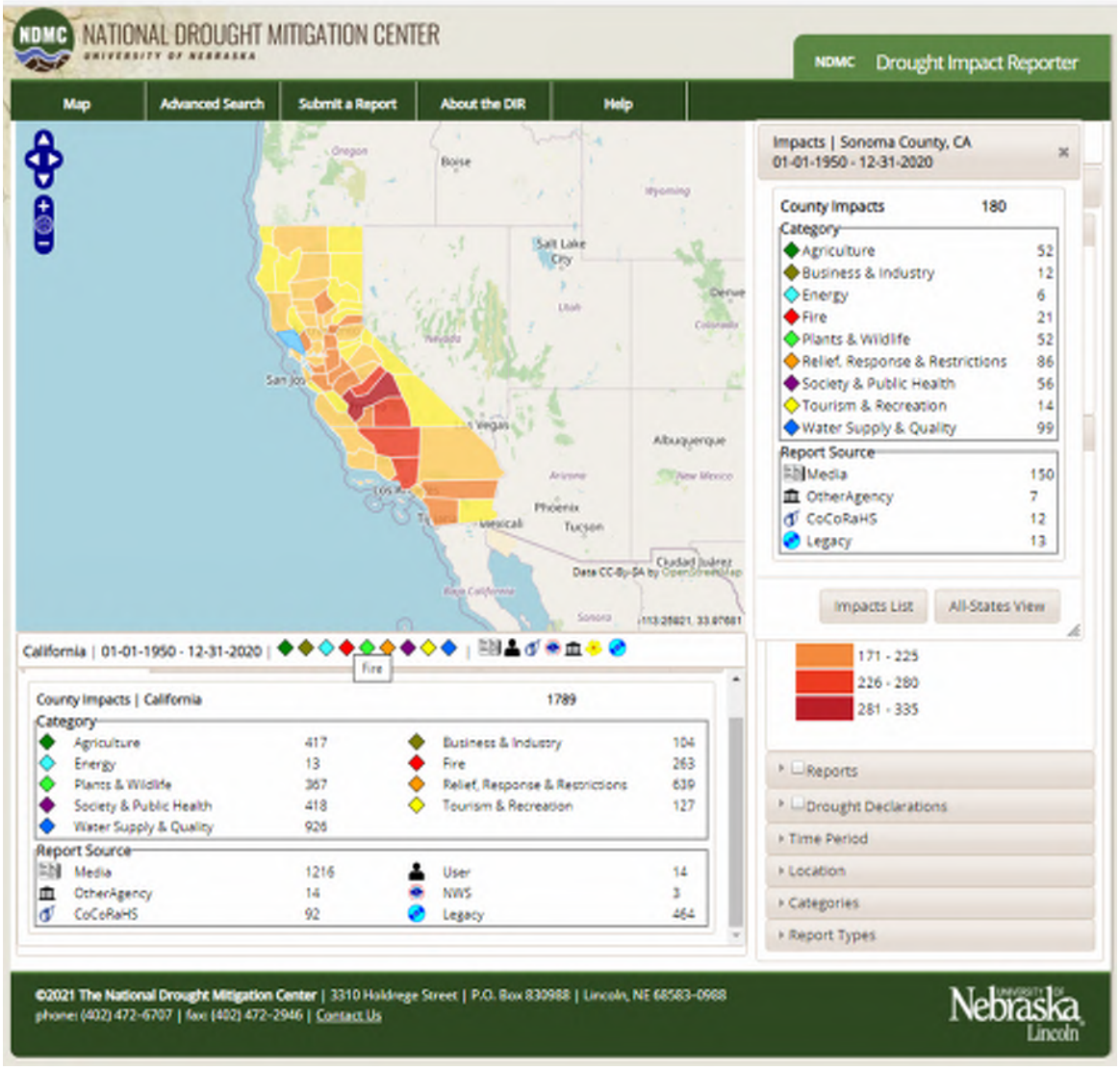
Table 4-30: Disaster Declarations and Proclamations Related to Drought in Sonoma County

Declaration or Order	Date
1976 Drought (State)	1976
EM-3023 (FEMA)	1/20/1977
S3248 (Secretary of Agriculture)	2012
S3452 (Secretary of Agriculture)	2012
S3565 (Secretary of Agriculture)	2013
S3569 (Secretary of Agriculture)	2013
S3637(Secretary of Agriculture)	2014
S3743 (Secretary of Agriculture)	2014
S3797 (Secretary of Agriculture)	2014
S3784 (Secretary of Agriculture)	2015
S3943 (Secretary of Agriculture)	2015
S3952 (Secretary of Agriculture)	2016
S3964 (Secretary of Agriculture)	2016
S4163 (Secretary of Agriculture)	2016-2017
S4144 (Secretary of Agriculture)	2017
S4691 (Secretary of Agriculture)	2020
S4697 (Secretary of Agriculture)	2020

Source: USDA Disaster Designations 2020) California SHMP 2018; FEMA

Figure 4-31 graphically displays the amount of drought-related reported impacts to Sonoma County (United States Drought Impact Reporter 2019). While it is difficult to extract the impacts specifically affecting Sebastopol, a total of 180 reports were made within Sonoma County between January 1, 1950 and December 31, 2020. It is assumed that these drought-related impacts for areas across Sonoma County are likely to have also affected Sebastopol at some point or to some extent. Based on the summary of negative effects to Sonoma County since 1950, the categories of water supply/quality have had the most reports, followed by relief, response, and restrictions operations and society and public health impacts. Agriculture and plants and wildlife have also suffered the effects of drought, but to a lesser extent.

Figure 4-31: Drought Impact Reporter Impacts at the County Level in Sonoma County, 1950-2020



Source: National Drought Mitigation Center Drought Impact Reporter, 2020

Probability of Future Occurrences

Likely – Historical drought data for California and more particularly the Sonoma County municipalities indicate there have been significant droughts and negative effects from water shortages in the past and the present. Based on this data, droughts are likely to affect the City's Planning Area and surrounding parts approximately every ten years; some of these droughts may persist for multiple years.

Climate Change Considerations

Scientific studies prepared for various California climate assessments and adaptations strategies show that drought conditions in California are likely to become more frequent and persistent over the next century due to climate change. Temperatures are warming, heat waves are more frequent, and precipitation has become increasingly variable (Natural Resources Agency 2018a). Water resources are also already experiencing the following stresses: population growth, poor water quality, groundwater overdraft, and aging water infrastructure.

The recent drought conditions over the past decade underscore the need to examine water supply and distribution management, conservation, and use policies. California and Sonoma County have experienced a succession of dry spells, and with warmer temperatures the impacts of drought conditions have increased (OEHHA 2018). In an average year, approximately 40 percent of the state's total water supply comes from groundwater, and during a dry year this increases to more than half of the state's water supply, with groundwater acting as a critical buffer against the impacts of drought and climate change (Natural Resources Agency 2018a). However, The City receives 100 percent of its municipal water supply from groundwater (City of Sebastopol 2020). Historical records show that groundwater declines during dry water years by 5 to15 feet; however, groundwater level declines at this magnitude are not anticipated to affect the current or projected operating capacity of the City's municipal supply wells. Therefore, water supply will not significantly change during single or multiple dry water years.

According to California's Climate Adaptation Strategy, also referred to as *Safeguarding California Plan: 2018 Update*, climate change is likely to significantly diminish California's future water supply. As a result, the state must change its water management, as climate change will create greater competition for limited water supplies (California Natural Resources Agency 2018b). Similarly, as summarized in the Sonoma County CAP, climate change could result in hotter and drier weather, and more frequent and intense droughts. The CWA (numeric measure of drought stress that quantifies the extent to which plants need for water exceeds moisture available in soil) for the region is projected to increase over this century, producing 10 to 20 percent drier soil conditions in the summer months, leaving less water available for groundwater recharge or runoff into rivers and creeks (SCTA 2016). For these reasons, climate change would have a "high" influence on drought hazards, as well as water shortages.

Vulnerability Assessment

Property

Drought impacts are wide-reaching and may be economic, environmental, and societal. The most significant impacts associated with drought in the City's Planning Area are those related to water intensive activities, such as agriculture, followed by municipal water use, commerce, tourism, and recreation. The vulnerability of a water intensive activity to the effects of drought usually depends on its water demand, whether the demand is met, and what water supplies are available to meet the demand. During extended droughts, water restrictions and conservation measures are implemented, and these can result in economic impacts on water utilities managed by the City. Drought conditions can also cause soil to compact and not absorb water efficiently, potentially making areas more susceptible to flooding.

According to the Drought Impact Reporter the Sonoma County recorded a total of 180 impacts to drought in the survey period between 1/1/1950 and 12/31/2020 (70-year period). Of these, the majority of the impacts were associated with Water Supply and Quality; and Relief, Response, and Restrictions. These statistics are shown in Figure 4-31 (above). While the Drought Impact Reporter data reflects impacts at the county-level, the data should be used to develop an ongoing record of drought impacts that can be more specifically tied to events that occur within the City's Planning Area to better understand city-specific vulnerable sectors and impacts.

People

According to the California DOF as of 2019 the City population was around 7,826. The City supplies a majority of its water (67 percent) to residential users. The population is expected increase modestly in the future (up to 5.5 percent by 2030); however, the projected growth is not anticipated to strain water supplies. There are also several initiatives (WSCPs and groundwater management policies) that emphasize

water conservation. Water conservation will ensure that the existing groundwater remains operational during severe drought conditions and readily available during emergencies.

Drought can cause public health problems related to poor water quality, and health problems can become exacerbated due to dust. Generally, drought may require conservation of water resources, which means that water use is restricted to essential uses, which may reduce watering for landscaping. The community may also exhibit a range of abilities to prepare for, respond to, and recover from drought hazards, as these conditions impact populations with health-related issues related to heat-related illness, respiratory problems, and people who work outdoors. These conditions can impact lower-income populations, as food and water prices increase. There are sensitive and socially vulnerable populations residing near the downtown area of the Planning Area that may be the most susceptible to water restrictions, and health-related illnesses. Socially vulnerable populations may also be sensitive to increases in water rates and in turn, food prices.

Economy

Drought impacts to the local and regional economy can be difficult to quantify but can be extensive and long-lasting depending on the circumstances during and after a severe drought event. If water resources are limited, effects would be more severe for industries that rely on large amounts of water, and any prolonged drought would intensify these impacts. Sectors critical to the economy such as commerce, distribution, agriculture, tourism, related environmental resources, municipal and industrial water supply, key city assets, energy generation, and even socioeconomic aspects can be affected due to lack of or reduced quality of water resources.

Critical Facilities and Infrastructure

The most direct impact of drought will be on the City's water supply system. Drought can also directly affect the water storage, treatment, and distribution and conveyance systems. Landscaping around City facilities may no longer be maintained during water restrictions, and the risk within the Planning Area will be largely aesthetic.

Historic, Cultural, and Natural Resources

Severe, prolonged drought can impact the natural environment. Wildlife and natural habitats including the Laguna de Santa Rosa Wetland Preserve, including the shrinkage of habitat, habitat fragmentation, reduced food supply for wildlife, and possibly the migration of species in the nearby hillsides that define the City of Sebastopol. Prolonged drought can also cause poor soil quality, loss of wetlands, tree mortality (along the periphery of the City's Planning Area), and increased soil erosion.



At least 75,000 acres of Sonoma County is affected by Sudden Oak Death mortality, which equates to 23 percent of the County forests that are at-risk for infection, including parts of western Sonoma County. *Photo Credit: University of California Cooperative Extension, Sonoma County Department of Emergency Services/January 2008*

Tree mortality is identified as a cascading impact that can affect (or worsen) other hazards, such as wildfire and wind conditions. For example, drought-impacted trees can become susceptible to diseases, such as Sudden Oak Death caused by fungus-like pathogens *Phytophthora ramorum* (the disease kills oak and tanoak species, but primarily coast live oak). Drought-affected trees can also become susceptible to insect infestations that further exacerbate the risk of tree mortality

and those trees resilient to wildfires (Matthews 2020). One of the most prevailing impacts of drought to the natural environment is the increased risk of wildfires, as seen during the 2017-2018 wildfire seasons. Wildfires now burn larger and more intensely during dry conditions and are happening outside the typical fire season. Lastly, drought conditions can cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Impacts to the City's seven historic and cultural buildings may be negligible. The City's open spaces and park and public lands can suffer during droughts, though the ability of the City to integrate more drought-tolerant landscaping and the use of drip irrigation and other conservation efforts can offset this vulnerability.

Future Development

Future development and water conservation are the focus of each update to the Sebastopol General Plan. The planning process addresses drought conditions and water contingencies. In 2014, the City provided water to approximately 2,650 customers. The Sebastopol General Plan describes how current and future water resources and demands within the City's service area will be managed to provide adequate and reliable water supply.

As the population grows over time the City will have to revise their reliability and supply projections. The City relies 100 percent on groundwater for its water supply and currently supplies a majority of water supply to single and multi-family residential users. Though future growth is projected to be modest, consistent with Senate Bill 610, any proposed developments in the City are mandated to estimate future water uses and identify water supplies that may be used to meet their uses. This water supply assessment process is intended to ensure that adequate water supplies exist to support new growth.

Risk Summary

- There have been six multi-year droughts since 1950, three of which have occurred since 2000. The most recent drought lasted from 2012 to 2017 and resulted in a declared state of emergency.
- 180 drought impact reports were made within Sonoma County between 1950 and 2020.
- The City relies exclusively on groundwater as its water supply source, which is provided from five wells. Typically municipalities that rely mostly on groundwater are less vulnerable to drought, but because the City has no backup system or the ability to connect to other water systems, a diversified supply may allow the City to rely on alternative water sources during emergencies.
- As of 2019, the City was supplying 323 million gallons of (about 1,000 acre feet), the majority of which is supplied to single family residential properties.
- Population is expected to modestly increase as the City has added about 9 persons per year since 2009. This projected growth will not add additional strain to the water supply, even during future severe drought events.
- Climate change projections indicate the region will experience more frequent and intense droughts due to drier soil conditions in the summer months, leaving less water available for groundwater recharge.
- The enforcement of water conservation policies will help ensure the City is resilient to drought events in the future.
- Overall, the significance of extreme drought is **Medium.**

4.3.5 Dam Incidents

Hazard Description

Dams are manmade structures built for a variety of uses, including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped and fail. Overtopping is the primary cause of earthen dam incidents and failure in the United States. Dam incidents can also result from any one or a combination of the following causes:

- Earthquake
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage or piping or rodent activity
- Improper design
- Improper maintenance
- Negligent operation
- Failure of upstream dams on the same waterway

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam incident or failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, and homes. Associated water quality and health concerns could also be issues. Factors that influence the potential severity of a full or partial dam failure or dam incident are the amount of water impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

Controlled release or spillway flooding: inadequate spillway capacity results in excess overtopping flows, though the potential for flooding as a result of discharge from dam outlet structures or spillways could be expected during excessive rain events. However, controlled releases of water from dams is a measure that can prevent or minimize spillway flooding or structure failure, by regulating capacity in a managed way. Even controlled releases can lead to unwanted or unpredicted flooding, depending on environmental and weather conditions, or even human error.

In general, there are three types of dams: concrete arch or hydraulic fill, earth-rockfill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously: the flood wave builds up rapidly to a peak then gradually declines. An earth-rockfill dam fails gradually due to erosion of the breach: a flood wave will build gradually to a peak and then decline until the reservoir is empty. A concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

Location

Limited – According to the U.S. Army Corps of Engineers' National Inventory of Dams (NID) database, last updated in 2018, there is one potential dam of concern upstream of the City of Sebastopol, the Warm Springs Dam (NID 2020). This and other nearby dams have been constructed for flood control, irrigation storage, recreation, and stock watering purposes. This dam of concern is considered to pose a high hazard.

Warm Springs Dam is an earthen dam constructed in 1982 located along Dry Creek in northern Sonoma County approximately 30 miles north of the City. The dam storage capacity is 449,000 acre-feet. This is a high hazard dam owned and operated by the U.S. Army Corps of Engineers and has an Emergency Action Plan (EAP) in place. Dam inundation mapping has been completed for Warm Springs Dam, but the inundation was not available for analysis (Sonoma County 2016).

Table 4-31 below details the dams that could potentially affect the City given their close proximity and potential to inundate if either were to fail. Delta Pond is a significant hazard earthen dam located along a tributary of the Russian River approximately 5 miles north of the City. The dam storage capacity is 1,950 acre-feet and is owned and operated by the City of Santa Rosa. Based on dam inundation mapping data, failure of this dam would not affect the City of Santa Rosa. Figure 4-32 illustrates the location of the closest identified dam of concern near the City, but Meadow Lane Dam is located downstream of the City and associated with the City of Santa Rosa Wastewater Treatment Plant (WWTP).

Table 4-31: Characteristics of the Dams of Concern Upstream of the City of Sebastopol

Hazard Rating	Dam Name	River Drainage	Downstream Community	Dam Type	Dam Height (in Feet)	Storage Capacity (Acre-Feet)	Emergency Operations Plan	Dam Owner
High	Warm Springs Dam	Dry Creek	Healdsburg	Earth	356	449,000	Yes	U.S. Army Corps of Engineers
Significant	Delta Pond	Russian River Tributary	Santa Rosa	Earth	27	1,950	Yes	City of Santa Rosa
Significant	Meadow Lane	Off stream	Rohnert Park	Earth	30	2,100	No	City of Santa Rosa

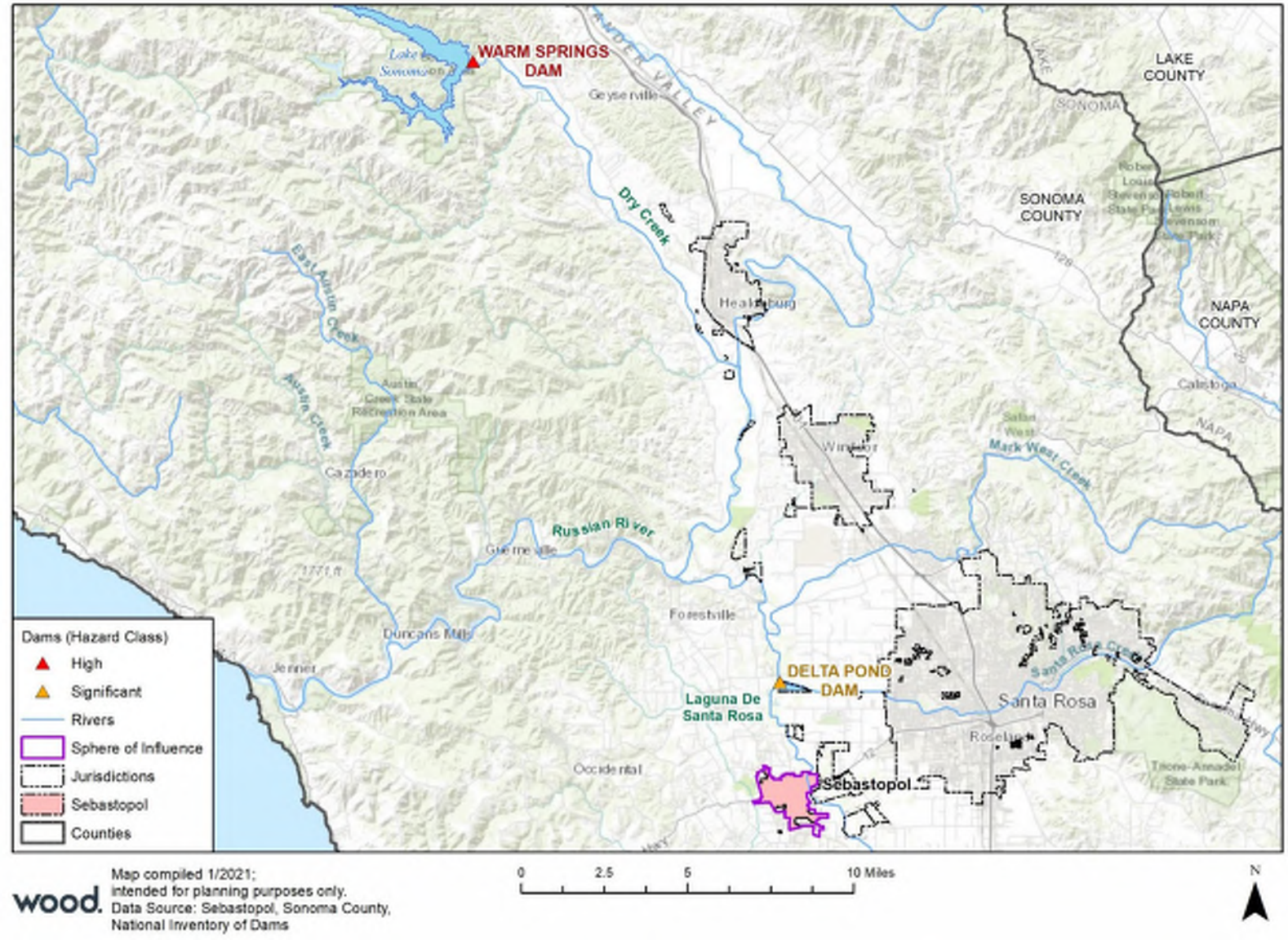
Source: U.S. Army Corps of Engineers' National Inventory of Dams, 2020; DWR 2021; DWR 2019b
Note: 1 acre-foot = 325,851 gallons

Extent (Magnitude/Severity)

Negligible – Standard practice among federal and state dam safety offices is to classify a dam according to the potential impact a dam failure (breach) or mis-operation (unscheduled release) would have on downstream areas (National Performance of Dams Program 2019). The hazard potential classification system categorizes dams based on the probable loss of human life and the impacts on economic, environmental, and lifeline facilities. Dams are classified into the following three categories which identify their potential hazard to life and property:

- High hazard indicates that a failure would most probably result in the loss of life;
- Significant hazard indicates that a failure could result in appreciable property damage;
- Low hazard indicates that failure would result in only minimal property damage and loss of life is unlikely; and
- Undetermined hazard dams have not been rated or their hazard rating is not known.

Figure 4-32: Dams of Interest in the Vicinity of the City of Sebastopol



Since there are two potentially hazardous dams upstream of the City (one significant- and one high-rated hazard dam), there is some, though limited, potential for loss of life and/or property damage. Adjacent unincorporated portions of Sonoma County could also be affected by a dam failure upstream of the City, although the specific extent of impacts would depend on the nature of the failure, local emergency response capabilities, people and property found in the path of the dam inundation areas, and other factors. Based on the dam capacity of Delta Pond and the distance of Warm Springs Dam from the City, it is unlikely that much risk would be imposed on those areas near Sebastopol. However, given the moderate size of the downstream population from Warm Springs Dam, in addition to the residential structures, roads, farmland, bridges, and utilities also located downstream, there are consequences that would occur in the event of a dam breach caused by seepage, overtopping, or an earthquake (City of Rohnert Park 2018; Sonoma County 2016). According to the City of Rohnert Park LHMP, portions of the communities of Healdsburg, Windsor, Santa Rosa, Sebastopol, and Guerneville, as well as rural population area in the floodplain immediately downstream of the dam, would be at risk if the dam failed, as these communities and areas are within the 1 to 24-hour flood wave trave time bracket (City of Rohnert Park, 2018). Based on the dam inundation mapping for the Delta Pond dam, failure or breach of this dam will not impact the City of Sebastopol.

Previous Occurrences

There is no history of dam incidents or failures affecting the City.

Probability of Future Occurrences

Unlikely – The City remains at risk to upstream dam failures or incidents, particularly from one of the two dams that are classified as a high hazard structure that has the potential to partially inundate the City. However, based on the lack of previous dam inundation events, HMPC input, and the fact that the dam posing risk to the City is relatively far from the City, dam failure and dam incidents are unlikely in the area. Nevertheless, the potential exists for future dam incidents in the City or portions of it, but the likelihood of this is low. Uncontrolled or controlled release flooding as well as spillway flooding below dams due to excessive rain or runoff are more likely to occur than failures.

Climate Change Considerations

The potential for climate change to affect the likelihood of dam failure and incidents is not fully understood at this point in time. With a potential for more extreme precipitation events a result of climate change, this could result in large inflows to reservoirs. However, this could be offset by generally lower reservoir levels if storage water resources become more limited or stretched in the future due to climate change, drought and/or population growth. For these reasons, climate change would have a “low” influence on dam incidents.

Vulnerability Assessment

A dam incident can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is confined to the areas and populations subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the dam itself and associated revenues that accompany those functions, including potential potable water uses or critical irrigation for crops.

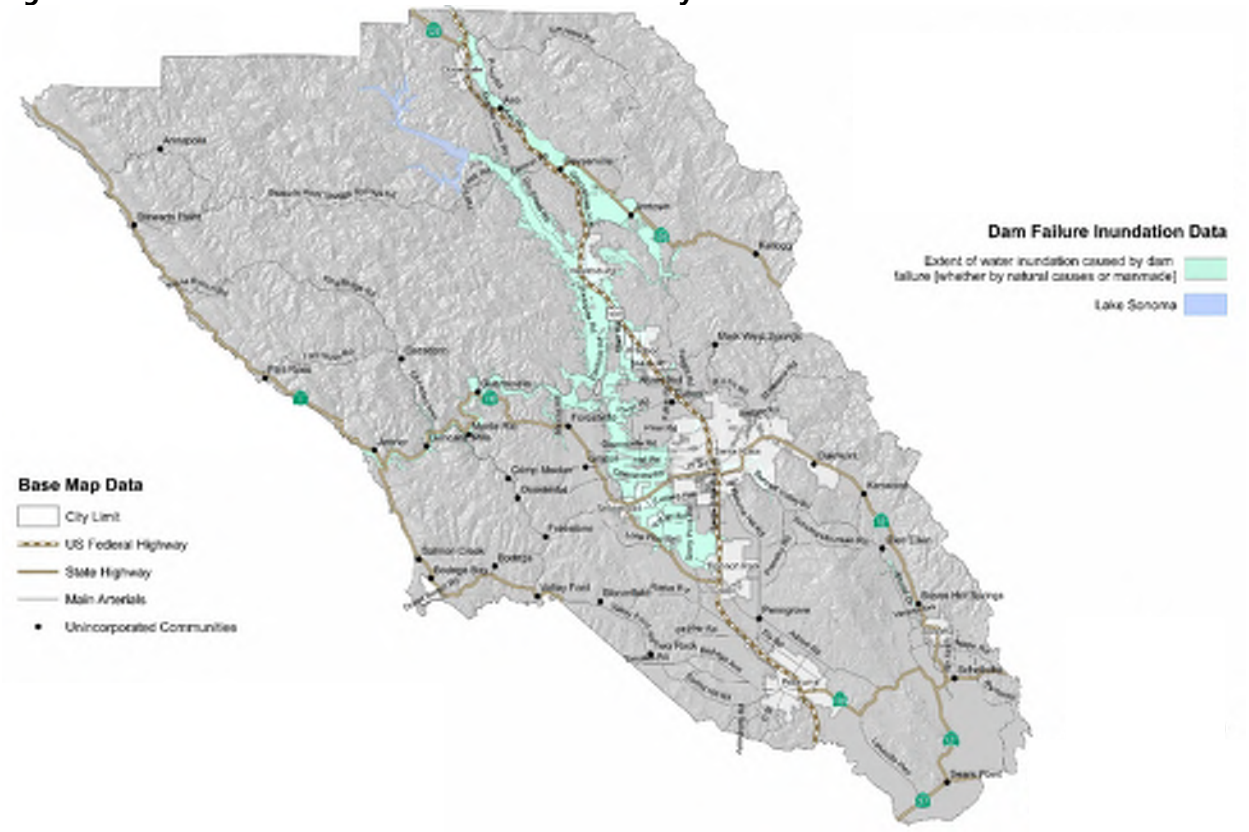
Property

Communities located below a high or significant hazard dam and along a waterway are potentially exposed to the impacts of a dam failure. For reference, high hazard dams threaten lives and property, significant hazard dams threaten property only. Inundation maps that identify anticipated flooded areas

(which may not coincide with known floodplains) are often produced for all high hazard dams and are contained in the EAP required for each dam. The potential magnitude of a dam incident depends on the time of year and the base flow of the river when the incident or failure occurs. During the winter months, when the river flows are higher, the impact to the area would be much greater and evacuation times even shorter.

Based on the location of the one high hazard dam, Warm Springs Dam, and one significant hazard dam, Delta Pond, both outside and upstream of the City in a sparsely populated area, there are impacts to cities and communities located immediately downstream of each dam. However, the potential impacts to buildings and infrastructure within the City, which is much further downstream are minimal. Spatial GIS dam inundation data for Warm Springs Dam was not publicly available; however, according to mapping and findings in the City of Rohnert Park LHMP and Sonoma County Operational Area HMP, which summarizes dam inundation mapping for the Warm Springs Dam as shown in Figure 4-33, impacts to the City would occur, but be limited to the north-eastern and southern parts of the City along the Laguna de Santa Rosa. (City of Rohnert Park 2018; Sonoma County 2016). Dam inundation data for Delta Pond Dam was available, but the inundation area does not extend into the City of Sebastopol.

Figure 4-33: Dam Failure Inundation in Sonoma County



Source: Sonoma County 2016

People

Persons located underneath or downstream of a dam are at risk of a dam failure, though the level of risk can be tempered by topography (specifically where populations are located within the inundation path of a dam but at higher elevations), amount of water in the reservoir/damming structure, and time of day of the breach. Injuries and fatalities can occur from debris, bodily injury, and drowning. Once a dam has breached, standing water presents all the same hazards to people as floodwater from other sources.

People in the inundation area may need to be evacuated, cared for, and possibly permanently relocated. Impacts could include hundreds or thousands of evacuations and likely casualties, depending on the dam involved. Inundation may also have a disproportionate impact on socially vulnerable or sensitive populations in the City's Planning Area.

Economy

Extensive and long-lasting economic impacts could result from a major dam failure including the long-term loss of water in a reservoir after a failure event. A major dam failure or incident and loss of water from the associate reservoir could include direct business and industry damages and indirect disruption of the local economy, including the disruption of irrigation water for crops or even water for livestock which may be key components of the local economy and its sectors.

Critical Facilities and Infrastructure

A total dam failure can cause catastrophic impacts to areas downstream of the water body, including critical infrastructure and essential facilities. Dam incidents may result is less severe downstream impacts, depending on the severity of the incident. Any critical asset located under the dam in an inundation area would be susceptible to the impacts of a dam incident. Of particular risk would be roads and bridges that could be vulnerable to washouts, further complicating response and recovery by cutting off impacted areas. Risk to specific facilities could be considered sensitive information, especially those such as water treatment facilities or water delivery systems which may provide potable water for the local population. Based on location of the two upstream dams and inundation data, it appears the failure or a major incident at the Warm Springs Dam, a high hazard dam could potentially impact portions of the City's buildings and infrastructure located along the Laguna de Santa Rosa along the north-eastern side of the City (City of Rohnert Park 2018; Sonoma County 2016).

Historic, Cultural, and Natural Resources

Dam failure effects on the environment would be like those caused by flooding from other causes. Water could erode stream channels and topsoil and cover the environment with debris. For the most part the environment is resilient and would be able to rebound from whatever damages occur, though this process could take years. Historic and cultural resources could be affected just as housing or critical infrastructure would, were a dam to fail and cause downstream inundation that could further erode surfaces or cause scouring of structural foundations. Given only one of the upstream dams would partially inundate the north-eastern portion of the City, most historic, cultural, and natural resources that may be affected are limited to open space lands and a ballfield located within the Laguna de Santa Rosa floodplain.

Future Development

Areas slated for future development should take into consideration potential impacts from dam failure risk upstream and should attempt to overlay the existing digital dam inundation maps (if available) with proposed future development. In the case of a dam failure, inundation would follow existing FEMA mapped floodplains, which contains development restrictions for areas in the one percent annual chance floodplain, but it could exceed those floodplains and affect areas that are not regulated for flood hazards. Also, added development could compromise dams and reservoir resources if populations depend on them for critical needs such as potable water during or after a dam failure event.

Risk Summary

- The overall significance of dam inundation in the City is **Low**.
- Warm Springs Dam and Delta Pond Dam are two dams of concern located upstream of the City.

- Warm Springs Dam is a high hazard earthen dam constructed in 1982 located along Dry Creek in northern Sonoma County approximately 30 miles north of the City of Sebastopol. The dam storage capacity is 449,000 acre-feet. This dam owned and operated by the U.S. Army Corps of Engineers and has an active EAP in place.
- Due to the lack of historic occurrence data on dam inundation associated with Warm Springs Dam and regular inspection monitoring, and the implementation of the EAP, potential failure of this dam is expected to be unlikely to severely impact the City's population, property, and critical infrastructure.

4.3.6 Severe Weather

Severe weather is generally any destructive weather event, but usually occurs in the Planning Area as localized thunderstorms that bring heavy rain, hail, lightning, high winds, and dense fog. Severe weather can also include extreme heat events.

The NOAA NCEI has been tracking severe weather since 1950. Their Storm Events Database tracks severe weather events on a county basis and contains data on the following: all weather events from 1993 to current (except from 6/1993-7/1993); and additional data from the Storm Prediction Center, which includes tornadoes (1950-1992), thunderstorm winds (1955-1992), and hail (1955-1992). This database contains 708 severe weather events that occurred in Sonoma County between January 1, 1950, and December 31, 2020. Table 4-32 summarizes these events.

Table 4-32: NCEI Hazard Event Reports for the Sonoma County: 1950-2020

Type	# of Events	Property Loss ($)	Crop Loss ($)	Deaths	Injuries
Debris Flow	60	25,916	20,000	1	0
Dense Fog	14	100,000	0	0	2
Dense Smoke	9	0	0	0	0
Extreme Cold/Wind Chill	2	0	0	0	0
Flash Flood	44	8,018,000	164,000	1	1
Flood	193	208,097,400	6,150,000	1	0
Frost/Freeze	9	60,000	3,000,000	0	0
Funnel Cloud	1	0	0	0	0
Hail	21	0	$300,000	0	5
Heat	7	0	0	1	0
Heavy Rain	52	383,500	30,250,000	1	2
High Wind	84	713,500	0	2	0
Lightning	3	1,000,000	0	0	0
Strong Winds	174	3,141,200	0	3	5
Tornado	13	1,558,500	500	0	1
Wildfire	22	505,000	5,000	3	14
Total**	**708**	**$224,735,016**	**$39,889,500**	**13**	**30**

Source: NOAA's National Centers for Environmental Information https://www.ncdc.noaa.gov/stormevents/

*Note any reference to a coastal type weather event for Sonoma County has been excluded from this table given Sebastopol's distance from the coast.

**Losses reflect totals for all impacted areas, inclusive of Sonoma County

Only a few of the events resulted in state and federal disaster declarations. While the HMPC recognizes these inconsistencies, this data provides value in depicting the City of Sebastopol's severe weather hazards as they relate to Sonoma County's "big picture" hazard environment.

As previously mentioned, several state and federal disaster declarations including the City of Sebastopol have been a result of severe weather. For this plan, severe weather is broken down as follows:

- Extreme Heat

- Heavy Rain/Thunderstorm/Hail/Lightning/Dense Fog
- High Winds

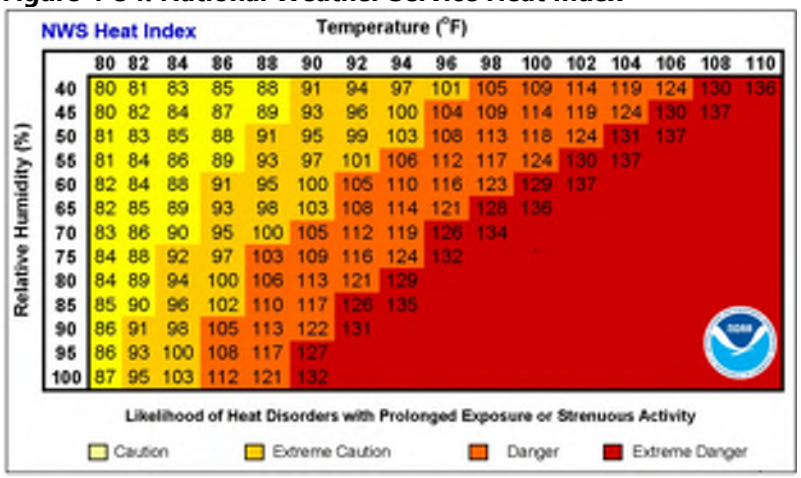
4.3.7 Severe Weather: Extreme Heat

Hazard Description

Extreme heat events can have severe impacts on human health and mortality, natural ecosystems, the agriculture sector and other economic sectors. According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter takes a greater toll nationally — not lightning, hurricanes, tornadoes, floods, or earthquakes. During the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died. The 2018 California SHMP notes the heat wave during the summer of 2006 lead to 650 deaths in a 13-day period (Cal OES 2018), and in the past 15 years heat waves have claimed more lives in California than all other declared disaster events combined (California Natural Resources Agency 2018a). However, there are a lack of cold weather and extreme cold temperatures events in Sonoma County.

Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds the level the body can remove, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise, and heat-related illness may develop. The elderly, small children, patients with chronic medical conditions, those on prescription medication therapy, and people with weight or alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where moderate climate usually prevails. Figure 4-34 illustrates the relationship of temperature and humidity to heat disorders.

Figure 4-34: National Weather Service Heat Index



Source: National Weather Service

Note: Since heat index values were devised for shady, light wind conditions, exposure to full sunshine can increase heat index values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

Location

Extensive – Severe weather events have the potential to happen anywhere in the Planning Area. According to the City and HMPC, extreme heat, occasional heavy rain and thunderstorms, and wind events have occurred in the City.

Extent (Magnitude/Severity)

Limited – The City begins to experience hot weather in June or July of each year, and the heat continues throughout the summer months. According to the Western Regional Climate Center (WRCC), the average high temperature for the City in July is 82.5°F (WRCC 2020). Temperatures that are 10 degrees above normal are considered excessive. The California OES Contingency Plan for Excessive Heat Emergencies (CalOES 2014) indicates that through the use of historical weather and mortality data, the NWS and the California Department of Public Health (CDPH) have identified five major types of climate regions within California to account for climate differences among regions in order to recognize what constitutes an excessive heat event in each of the regions. When temperatures spike for two or more consecutive days without an adequate drop in nighttime temperature to cool the outdoor and indoor environments, there is a significant increase in the risk to vulnerable populations.

The NWS has a system to initiate alert procedures (advisories, watches, and warnings) when high temperatures are expected to have a significant impact on public safety. The expected severity of the heat determines which type of alert is issued. During past heat waves, Sonoma County has designated facilities as Cooling Centers, as have the cities of Santa Rosa and Petaluma. The closest designed cooling centers to the City of Sebastopol are in Petaluma and Santa Rosa. The Petaluma Community Center at Lucchessi Park was designated as a City Cooling Center and the Rincon Valley Library and Salvation Army Senior Center in Santa Rosa. In summary, extreme heat impacts would likely be limited in the Planning Area, with 10 to 25 percent of the Planning Area affected. Extreme heat will have an impact on vulnerable populations and could also impact livestock and crops if the event occurs during certain times of the year.

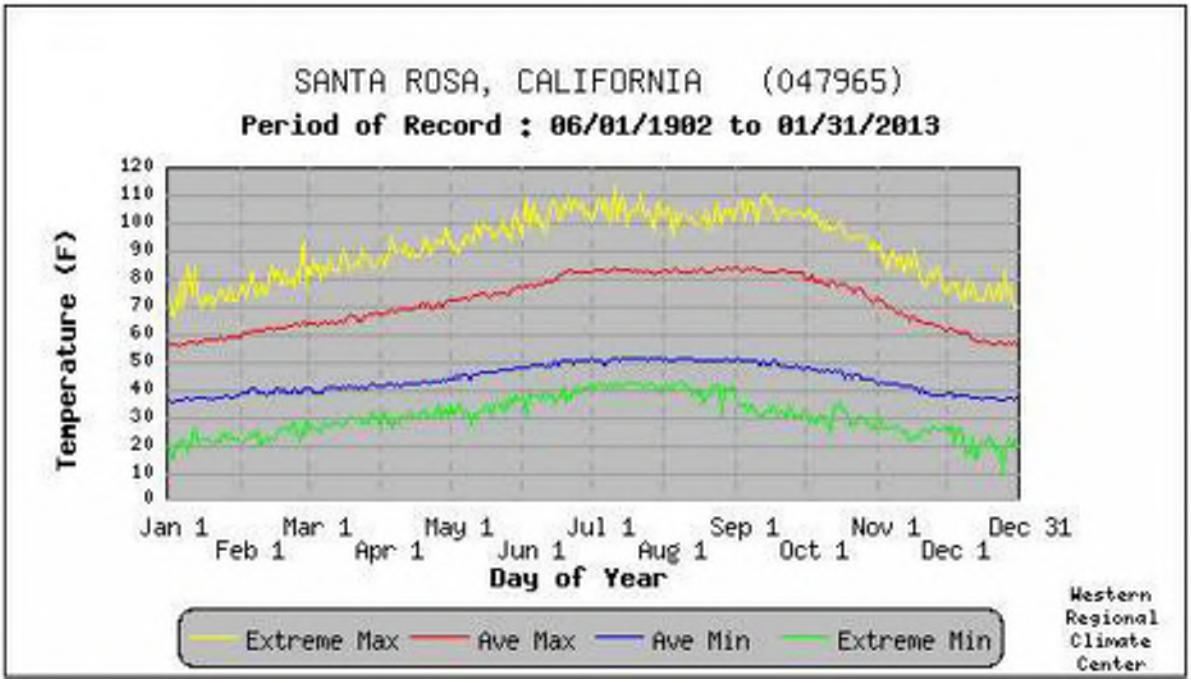
Previous Occurrences

Information from the closest weather station with the most comprehensive data, the Santa Rosa Weather Station (047965), is summarized below and in Figure 4-35 to illustrate daily temperature averages near the City's Planning Area.

The City of Santa Rosa (Period of Record 1902 – 2013)

The City of Santa Rosa is approximately seven miles from Sebastopol. Monthly average maximum temperatures in the warmest months (May through October) range from the mid-70s to the low 80s. Monthly average minimum temperatures from November through April range from the upper 30s to mid-40s. The highest recorded daily extreme was 111°F on September 6, 2020. The lowest recorded daily extreme was 16°F on December 14, 1932. In a typical year, maximum temperatures do not exceed 82°F and minimum temperatures do not fall below 36°F.

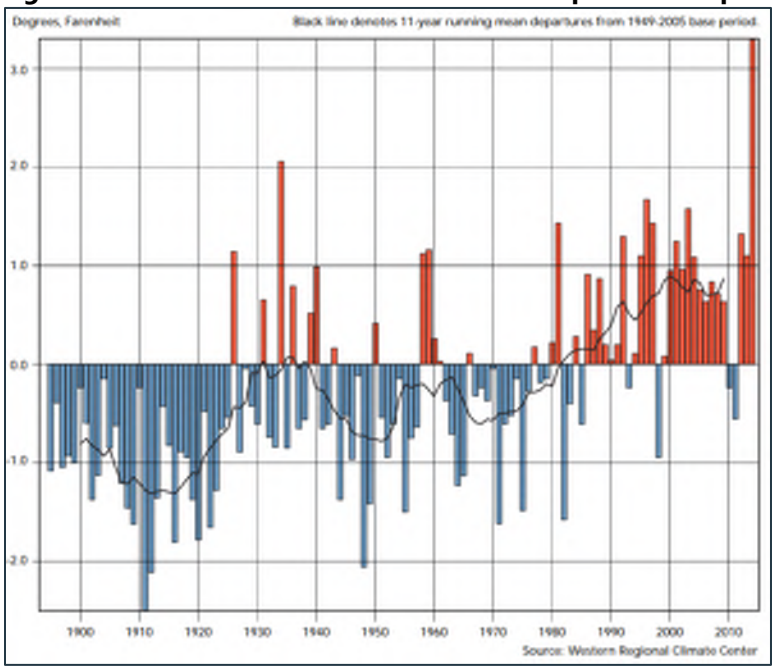
Figure 4-35: The City of Santa Rosa's Daily Temperature Averages and Extremes



Source: Western Regional Climate Center 2020, www.wrcc.dri.edu/

The California statewide mean temperature departures from the 1900s to mid-2010s are displayed in Figure 4-36. This graphically highlights the general warming trend across the state, and how climate change can have significant implications in future water supply availability, as well as higher mean temperatures.

Figure 4-36: California's Statewide Mean Temperature Departure, 1900-2014



Source: Drought in California Report (CA DWR; Natural Resources Agency; State of California, 2015)

Probability of Future Occurrences

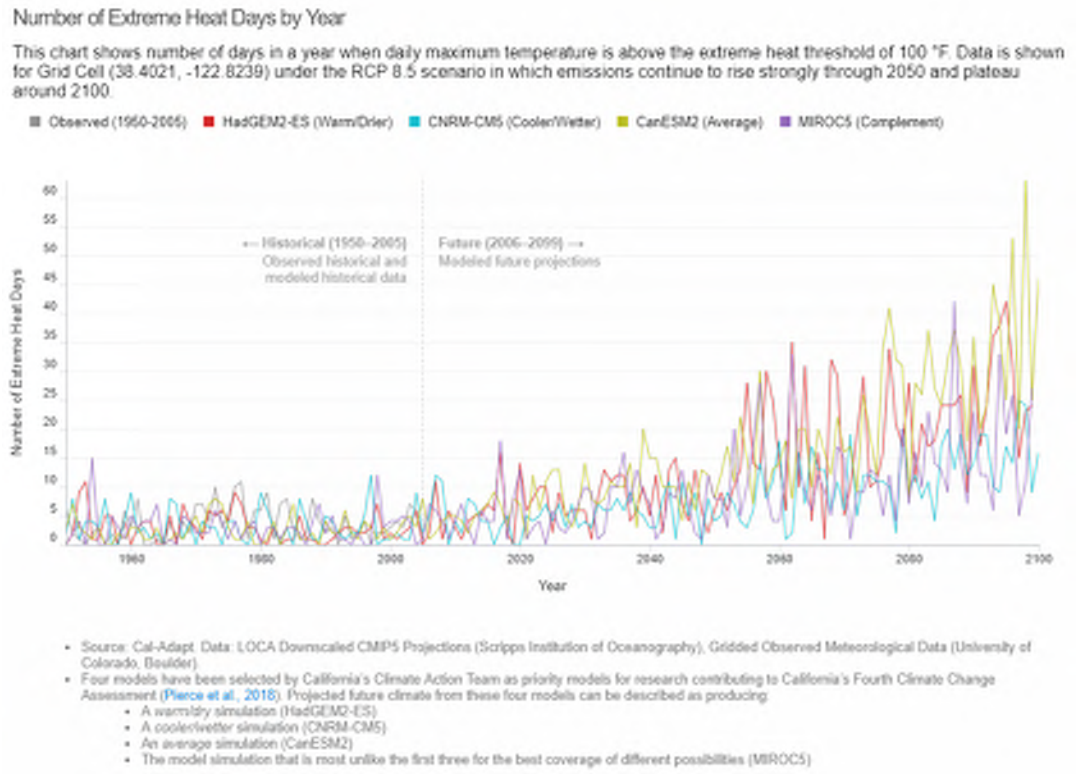
Likely – Temperatures of extreme heat are likely to continue to occur annually in the Planning Area.

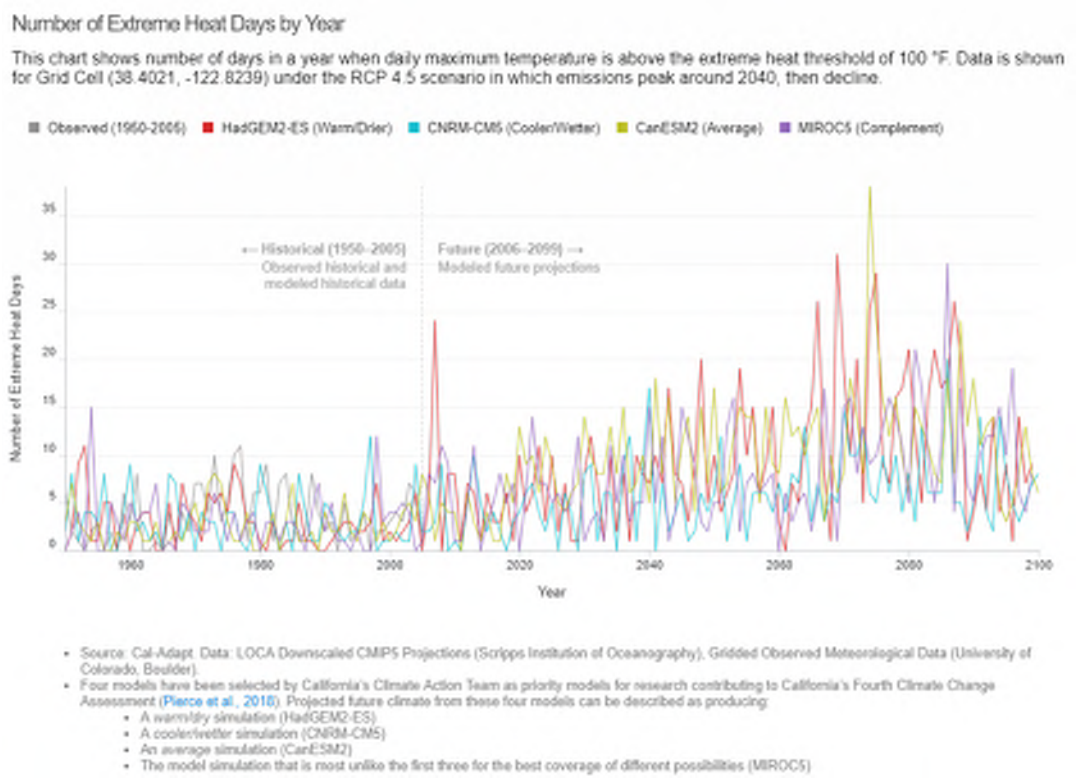
Climate Change Considerations

Heat waves are likely to become more frequent, which will have direct impacts on human health in terms of heat related illness. With the general trend of increased warming of average temperatures, extreme high temperatures will likely also increase. Cascading impacts include increased stress on water quantity and quality, degraded air quality, and increased potential for more severe or catastrophic natural events such as heavy rain, droughts, and wildfire. Another cascading impact includes increased duration and intensity of wildfires with warmer temperatures.

According to the 2013 document, *Preparing California for the Extreme Heat*, Cal-Adapt projects that throughout California urban and rural population centers will experience an average of 40 to 53 extreme heat days by 2050 and an average of 40 days by 2099 (Cal-Adapt 2013). This compares to a historical average of four days per year (CalEPA 2013). Cal Adapt also projects that temperatures are expected to rise substantially throughout this century. Future temperature estimates from Cal Adapt for the City under high and low emission scenarios are shown in Figure 4-37. The top graph shows the number of days per year when daily maximum temperature is above the extreme heat threshold of 100°F under the RCP 8.5 scenario (business as usual). The bottom graph shows the number of days per year when daily maximum temperature is above the extreme heat threshold of 103.9°F under the RCP 4.5 scenario.

Figure 4-37: City of Sebastopol – Future Extreme Heat Days in High and Low Emission Scenarios





Source: Cal-Adapt 2021

Extreme heat has also been shown to accelerate wear and tear on the natural gas and electrical infrastructure (California Natural Resources Agency 2018a). Projected increases in summer demand associated with rising temperatures may increase risks to energy infrastructure and may exceed the capacity of existing substations and distribution line infrastructure and systems.

A recent study on extreme heat released by the Union of Concern Scientists in July 2019 analyzed three global climate scenarios associated with different levels of heat-trapping emissions and future warming (Union of Concerned Scientists 2019). The results of the analysis showed that with no actions taken to reduce heat-trapping emissions by midcentury (2036-2065) the average number of days per year in the United States with a heat index above 100°F will double, while the number of days per year above 105°F will quadruple (Union of Concerned Scientists 2019). The modeling completed for the study showed that the most dramatic transformations will be felt in areas where the climate has been temperate. The City could experience up to 11 more times as many days per year in which the heat feels like 90 degrees (KQED 2019a). According to Cal-Adapt Climate Projections for the Bay Area Region as stated in the *2017 Climate Change Health Profile Report for Sonoma County*, by 2100 the number of heat waves in the Bay Area Region is expected to be between 6 to 10 heatwaves per year.

Based on Sonoma County's 2016 CAP, climate change is also expected to result in higher average temperature and more extreme heat events. If future GHG emissions are mitigated or reduced over time, summer high temperatures are expected to rise by 1 to 2°F. Whereas, if GHG emissions are not mitigated average summer high temperatures will increase by up to 9 to 11°F by 2100 (SCTA 2016). For these reasons, climate change would have a "high" influence on extreme heat hazards.

Vulnerability Assessment

Property

Recent research indicates that the impact of extreme heat, particularly on populations, has been historically under-represented. The risks of extreme heat are profiled as part of larger hazards, such as drought or wildfire. However, as temperature variances may occur independent of other hazards or outside of the expected seasons, but still incur large costs, it is important to examine them as stand-alone hazards. Extreme heat can overload demands for electricity to run air conditioners in homes and businesses during prolonged periods of exposure and presents health concerns to individuals who are outside.

Extreme heat may also be a secondary effect of droughts or may cause temporary drought-like conditions. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist. Extreme heat can cause infrastructure damage to roads. In summary, all property in Sebastopol is vulnerable to extreme heat.

People

Traditionally, the very young and very old are considered at higher risk to the effects of extreme heat, but any population outdoors during periods of extreme temperatures are exposed, including otherwise young and healthy adults and homeless populations. While everyone is vulnerable to extreme heat incidents, some populations are more vulnerable than others. Extreme heat poses the greatest danger to outdoor laborers, such as highway crews, police and fire personnel, and construction workers. The elderly, children, people in poor physical health, and the homeless are also vulnerable to exposure. Arguably, the young-and-otherwise-healthy demographic may also experience a higher vulnerability of exposure due to the increased likelihood that they will be out in temperatures of extreme heat, whether due to commuting for work or school, conducting property maintenance such as lawn care, or for recreational reasons.

It is difficult to isolate the City's specific vulnerability to this hazard, as the impacts from extreme heat can be spread across an entire state or region. In general, all the population of the City can be considered at-risk to this hazard, but given the senior population in the City, the elderly may be most exposed and vulnerable to extreme heat.

Economy

Extreme heat impacts on the economy may be more indirect compared to other hazards. Infrastructure such as roads could be damaged and lead to increased need for repaving. Critical facilities may be vulnerable to the indirect impact of prolonged excessive heat (i.e., electrical power outages), which may impact response capabilities or care capabilities for hospitals and clinics. Hospitals and clinics may see a surge in patients during the heat event as the exposed population suffers from the effects of the heat, but it is not anticipated that these increases will overwhelm the capacities of hospitals and clinics near the City of Sebastopol. Essential infrastructure, especially the electrical distribution system, is also poised to be stressed during extreme heat events as demand increases to run air conditioning. Peak demand exceeding PG&E's capacity for supply can lead to blackout or brownout conditions.

Critical Facilities and Infrastructure

Extreme heat can affect road infrastructure, but direct impacts to critical infrastructure is expected to be minimal. Critical infrastructure that relies on public utility systems that could be overloaded may result in impacts during extreme heat events. The loss of utilities or power outages during extreme heat events

could also result in adverse secondary impacts to sensitive populations, such as the seniors in the community.

Historic, Cultural, and Natural Resources

Extreme heat may cause temporary drought-like conditions. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist. Changing heating and cooling patterns globally can have destructive secondary impacts, intensifying a variety of weather-related disasters that directly impact jurisdictions, which could in turn impact cultural and natural resources.

Future Development

Since structures are not usually directly impacted by severe temperature fluctuations, continued development is less impacted by extreme heat than others in the plan. Continued development implies continued population growth, which raises the number of individuals potentially exposed to temperature variations. Public education efforts should continue to help the sensitive populations understand the risks and vulnerabilities of outdoor activities, property maintenance, and regular exposures during periods of extreme heat.

Risk Summary

- The highest recorded temperature in the Planning Area was 111°F on September 6, 2020.
- Extreme heat can have severe impacts on human health, the natural environment, and the economy.
- The very young, the elderly, people with poor physical health, and the homeless are more susceptible to the impacts of extreme temperatures.
- The average number of days per year in the United States with a heat index above 100°F will double, while the number of days per year above 105°F will quadruple if no actions to reduce heat-trapping emissions are taken.
- Climate change is expected to result in higher average temperature and more extreme heat events and have a "high" influence on the number of extreme heat days.
- Overall, the significance of extreme heat in the City is **Medium.**

4.3.8 Severe Weather: Heavy Rain/ Thunderstorm/ Hail/ Lightning/ Dense Fog

Hazard Description

Severe storms in the Planning Area are generally characterized by heavy rain accompanied by strong winds, and lightning. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado.

Heavy Rain

Atmospheric rivers, a climate pattern that leads to adverse weather in the City, are responsible for up to 50 percent of California's precipitation annually and 65 percent seasonally (Arcuni, 2019). An atmospheric river (AR) is a long, narrow region of the atmosphere, like a river in the sky, that transports most of the water vapor outside of the tropics. ARs can be 300 miles wide, a mile deep and more than 1,000 miles long and carry an amount of water vapor roughly the same as the average flow of water at the mouth of Mississippi River (NOAA 2015). Warm water storms over the Pacific Ocean lead to evaporation and create a high concentration of moisture in the air, while prevailing winds create the distinctive river shape, which

is often compared "to a fire hose pointed at California" (KQED 2019b). When an atmospheric river reaches land, it releases the water vapor in the form of rain or snow. Atmospheric rivers play an important role in the global water cycle and are closely tied to both water supply and flooding risk.

Research suggests that atmospheric rivers contributed to the collapse of both Orville Dam spillways in February 2017 (NASA Global Hydrology Resource Center 2019), as well as the winter flooding in 1861-1862, which inundated Sacramento and is considered the worst flood event in California's history (Ingram 2013). When an atmospheric river forms in the tropical regions of the Pacific near Hawaii it is known as a "Pineapple Express". This type of atmospheric river can produce as much as five inches in one day (NOAA 2018b). In 2018, two Pineapple Express ARs hit California causing significant heavy precipitation events throughout state.

Sonoma Water entered into a cooperative agreement with Scripps Institution of Oceanography and the Center for Western Extremes (CW3E) to advance the research in ocean science and meteorology. Three projects have come from the initial agreement: 1) research to help define the role of atmospheric rivers in filling Lake Mendocino and potentially offering predictability in retaining water without increasing flood risk; 2) a NOAA-funded climate program project to study the role of atmospheric rivers in ending droughts on the Russian River; and 3) cooperation in developing a feasibility assessment for potential use of forecast-informed reservoir operations for Lake Mendocino in cooperation with the U.S. Army Corps of Engineers.

Hail

Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the Planning Area. Hail falls when it becomes heavy enough to overcome the strength of the updraft and is pulled by gravity towards the earth. Hailstorms occur throughout the spring, summer, and fall in the region, but are more frequent in late spring and early summer. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 mph. Hail causes nearly $1 billion in damage to crops and property each year in the United States. Hail is also one of the requirements which the NWS uses to classify thunderstorms as 'severe.' If hail more than ¾ of an inch is produced in a thunderstorm, it qualifies as severe. Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

The NWS classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4-34 under the Extent subsection below indicates the hailstone measurements utilized by the NWS.

Dense Fog

Fog results from air being cooled to the point where it can no longer hold all of the water vapor it contains. For example, rain can cool and moisten the air near the surface until fog forms. A cloud-free, humid air mass at night can lead to fog formation, where land and water surfaces that have warmed up during the summer are still evaporating water into the atmosphere. This is called radiation fog. A warm moist air mass blowing over a cold surface also can cause fog to form, which is called advection fog.

Sonoma County is made up of three major climactic zones, with the major climatic influence being the Pacific Ocean. The City of Sebastopol falls within the marine zone, which is under direct ocean influence. The prevailing weather and winds tend to come from the Pacific Ocean from the northwest. Areas such as Sebastopol tend to receive more precipitation in the fall and winter and more wind and fog in early morning of the summer months.

Lightning

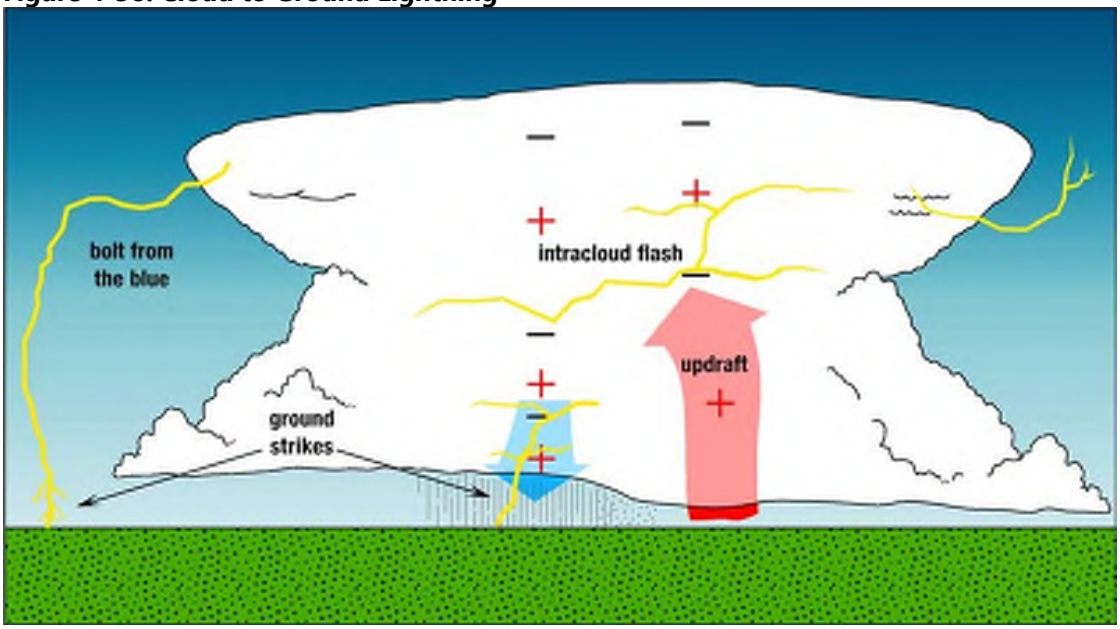
Lightning is an electrical discharge between positive and negative regions of a thunderstorm. A lightning flash is composed of a series of strokes with an average of about four. The length and duration of each lightning stroke vary, but typically average about 30 microseconds.

Lightning is one of the more dangerous weather hazards in the United States. Each year, lightning is responsible for deaths, injuries, and millions of dollars in property damage, including damage to buildings, communications systems, power lines, and electrical systems. Lightning also causes forest and brush fires, and deaths and injuries to livestock and other animals. According to the National Lightning Safety Institute, lightning causes more than 26,000 fires in the United States each year. The Institute estimates property damage, increased operating costs, production delays, and lost revenue from lightning and secondary effects to be in excess of $6 billion per year. Impacts can be direct or indirect. People or objects can be directly struck, or damage can occur indirectly when the current passes through or near it.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 4-38). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 4-38: Cloud to Ground Lightning



Source: National Weather Service Pueblo Office

The ratio of cloud-to-ground and intra-cloud lightning can vary significantly from storm-to-storm. Depending upon cloud height above ground and changes in electric field strength between cloud and earth, the discharge stays within the cloud or makes direct contact with the earth. If the field strength is highest in the lower regions of the cloud, a downward flash may occur from cloud to earth.

Location

Extensive – Heavy rains, hail, lightning, and severe storms have the potential to occur anywhere in the Planning Area. Dense fog is more likely to occur within the western portion of the City, or closer to the coast.

Extent (Magnitude/Severity)

Limited – Extent for severe weather, particularly severe storms that involve heavy rain and hail, can be measured according to hail by diameter size, as it corresponds to everyday objects to define the severity to the population (see Table 4-33).

Common problems associated with severe storms include the loss of utilities or immobility. Loss of life is uncommon but can occur during severe storms. Immobility can occur when roads become impassable due to dense fog, flooding, downed trees, ice, or a landslide. Fog specifically poses a risk to commuters and driving conditions as fog typically forms rapidly in the early morning hours. Nighttime driving in the fog is dangerous and multi-car pileups have resulted from drivers using excessive speed for the conditions and visibility. Within the City's Planning Area, fog is likely to be problem given the City's proximity to the Pacific Ocean

Loss of utilities can occur when severe thunderstorms cause trees or tree limbs to fall and damage power lines. Lightning can also cause severe damage and injury, particularly when it causes wildfires.

The NWS classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4-33 indicates the hailstone measurements utilized by the NWS.

Table 4-33: Hail Measurements

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

There is no clear distinction between storms that do and do not produce hailstones. Nearly all severe thunderstorms produce hail aloft, though it may melt before reaching the ground. Multi-cell thunderstorms produce many hailstones, but not usually the largest hailstones. In the life cycle of the multi-cell thunderstorm, the mature stage is relatively short so there is not much time for growth of the hailstone. Supercell thunderstorms have sustained updrafts that support large hail formation by repeatedly lifting the hailstones into the very cold air at the top of the thunderstorm cloud. In general, hail two inches (5 centimeters) or larger in diameter is associated with supercells (a little larger than golf ball size which the NWS considers to be 1.75 inch.). Non-supercell storms are capable of producing golf ball size hail.

In all cases, the hail falls when the thunderstorm's updraft can no longer support the weight of the ice. The stronger the updraft the larger the hailstone can grow. When viewed from the air, it is evident that hail falls in paths known as hail swaths. They can range in size from a few acres to areas 10 miles wide and 100 miles long. In some instances, piles of hail have been so deep that snow plows have been required to remove them, and occasionally hail drifts have been reported.

Lightning is measured by the Lightning Activity Level (LAL) scale, created by the NWS to define lightning activity into a specific categorical scale. The LAL is a common parameter that is part of fire weather forecasts nationwide. The City is at risk to experience lightning in any of these categories. The LAL is reproduced in Table 4-34.

Table 4-34: Lightning Activity Level Scale

LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five-minute period
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a five-minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strikes in a five-minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a five-minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag warning.

Source: National Weather Service

The heavy precipitation that is possible in the City and all of California is often the result of an atmospheric river. Atmospheric rivers are categorized by a unit of measurement known as the Integrated Water Vapor Transport (IVT), which considers the amount of water vapor in the system and the wind that moves it around. For a storm to be classified as an atmospheric river it has to reach an IVT threshold of 250 units; 1,000 IVT or more is considered to be "extreme" (Arcuni, 2019).

A system for categorizing the strength and impacts of atmospheric rivers was developed in 2019 by the Center for Western Weather and Water Extremes (CW3E), out of the Scripps Institution of Oceanography at the University of California San Diego (Scripps Institution of Oceanography 2019). The newly developed scale ranks ARs into five categorizes from weak to exceptional. Unlike the Fujita scale for tornadoes that focuses on potential damages, the AR scale accounts for both storms that may be hazardous and storms that can provide benefits to the local water supply. A category one AR is considered to be primarily beneficial, generally lasting only 24 hours and produces modest rainfall. On the other end of the scale, a category five AR is considered "exceptional" and primarily hazardous, lasting for several days and associated with heavy rainfall and runoff that may cause significant damages. Table 4-35 describes the AR scale. CW3E developed the scale as a tool for officials with an operational need to assess flooding potential in their jurisdictions before the storms makes landfall.

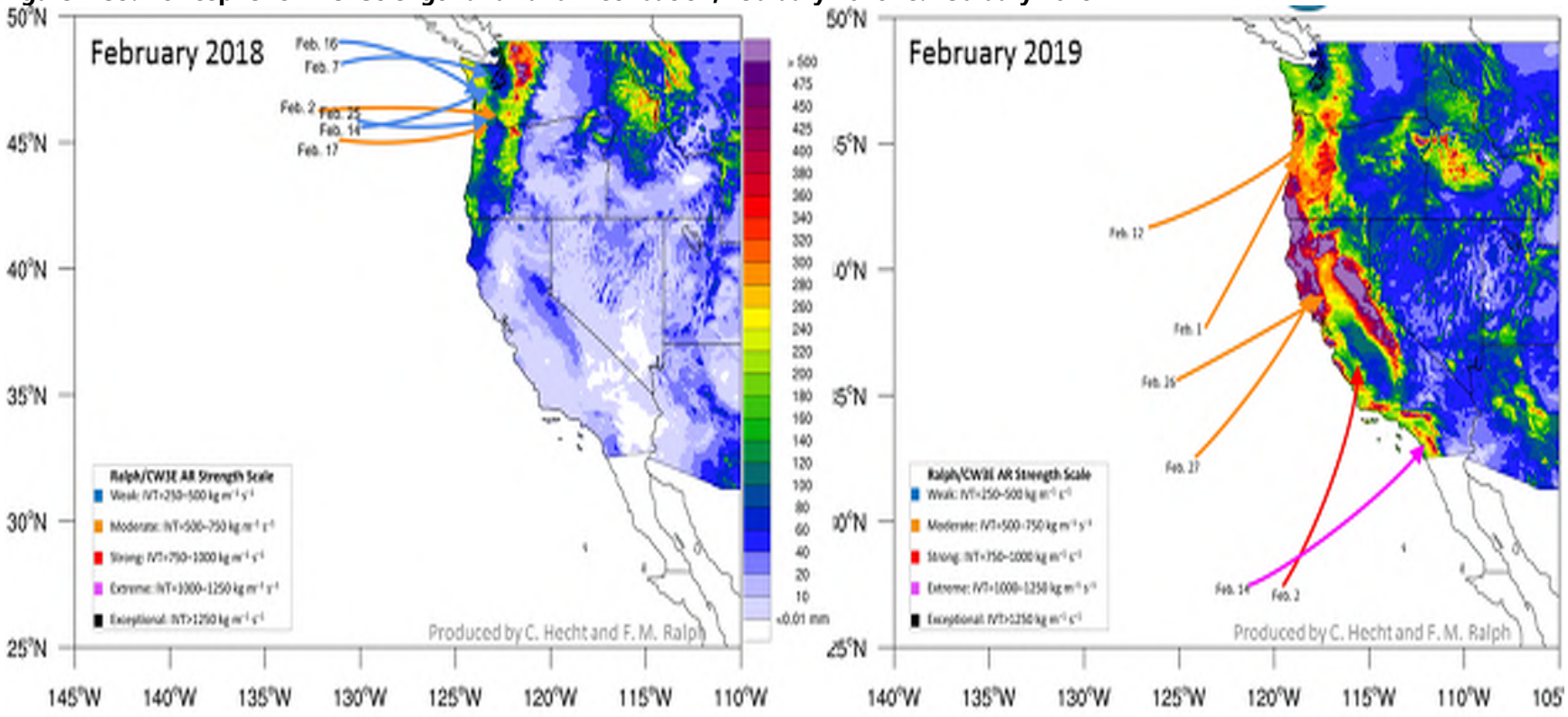
In both February 2018 and 2019 the West Coast experienced six atmospheric rivers. But as Figure 4-39 from the CW3E shows, California experienced vastly different precipitation totals due to the location of where the AR made landfall as well as each atmospheric river's IVT. Using the AR scale developed by CW3E, the ARs in February 2019 were all considered to be moderate to extreme and concentrated more on California, resulting in heavy precipitation.

Table 4-35: Atmospheric River Categories

Category	Potential Impacts
AR Cat 1: Weak	Primarily beneficial. For example, a Feb. 2, 2017 AR hit California, lasted 24 hours at the coast, and produced modest rainfall.
AR Cat 2: Moderate	Mostly beneficial, but also somewhat hazardous. An atmospheric river on Nov. 19-20, 2016 hit Northern California, lasted 42 hours at the coast, and produced several inches of rain that helped replenish low reservoirs after a drought.
AR Cat 3: Strong	Balance of beneficial and hazardous. An atmospheric river on Oct. 14-15, 2016 lasted 36 hours at the coast, produced 5-10 inches of rain that helped refill reservoirs after a drought, but also caused some rivers to rise to just below flood stage.
AR Cat 4: Extreme	Mostly hazardous, but also beneficial. For example, an atmospheric river on Jan. 8-9, 2017 that persisted for 36 hours produced up to 14 inches of rain in the Sierra Nevada and caused at least a dozen rivers to reach flood stage.
AR Cat 5: Exceptional	Primarily hazardous. For example, a Dec. 29, 1996 to Jan. 2, 1997 atmospheric river lasted over 100 hours at the Central California coast. The associated heavy precipitation and runoff caused more than $1 billion in damages.

Source: Center for Western Weather and Water Extremes, Scripps Institution of Oceanography at UC San Diego. Scale was developed by F. Martin Ralph Director of CW3E in collaboration with Jonathan Rutz of NWS

Figure 4-39: Atmospheric River Strength and Land Distribution, February 2018 vs. February 2019



Source: Center for Western Weather and Water Extremes, Scripps Institution of Oceanography at UC San Diego 2019

Previous Occurrences

Heavy rains and severe storms occur in the Planning Area primarily during the late fall and winter. According to information obtained from the WRCC the majority of precipitation is produced by storms during January and other winter months. Precipitation during the summer months is in the form of rain showers and is rare. Snowstorms and ice storms occur infrequently in the City. The Storm Events Database records one snow event in the vicinity of the City on January 28, 2002 with one to two inches of snow falling near Petaluma and Sonoma Valley; the database notes this was "quite a rare event". The only other recorded snow events near Sonoma County occurred in Napa County on January 1, 2011 near the St. Helena area and near the Napa County/Lake County border. The records 90 hail, heavy rain, lighting and dense fog events that have taken place in Sonoma County in the past 70 years (1950 –2020). Table 4-36 is a summary of the most significant severe weather events for Sonoma County. An asterisk (*) indicates events where the City of Sebastopol was specifically mentioned.

Table 4-36: Severe Weather Events recorded in Sonoma County (1950-2020)

Hazard Type	Date	Hazard Description
Dense Fog	February 8, 2012	Dense fog is blamed in 11 crashes on Highway 37 near Skaggs Island Rd. There were 31 vehicles involved in the crashes. Two people suffered minor injuries. $100,000 in property damages were recorded.
	December 10-11, 2018	Widespread dense fog impacted the Bay Area blanketing the Bay and interior valleys. Numerous reports of dense fog with visibility less than 1/4 mile. A Dense Fog Advisory was issued for the North and East Bay Valleys as well as the San Francisco Peninsula and surrounding bay coastline. Fog caused numerous diverts at KSFO.
Hail	Jan. 19, 2018	A cold front swept through the region late on the 18th. Small scattered thunderstorms were generated behind the front bringing pea sized hail (0.25 in.) to the region.
	Jan. 25, 2018	Isolated thunderstorms developed behind a cold front that passed through the area on the 25th. These thunderstorms caused minor roadway flooding and small hail (0.25 in.)
	March 14, 2018	The Press Democrat in Santa Rosa showed multiple reports of accumulating small hail in downtown Petaluma (0.25 in.); An upper level disturbance moved through the area on the afternoon of the 14th. This disturbance created scattered thunderstorms that resulted in lightning and accumulating hail in the North and East Bay areas.
Lightning	March 14, 2018	The Press Democrat in Santa Rosa reported that lightning struck a PG&E circuit at 11 am the morning of the 14th causing a power outage for 25 Petaluma residents lasting through the evening. An upper level disturbance moved through the area on the afternoon of the 14th. This disturbance created scattered thunderstorms that resulted in lightning and accumulating hail in the North and East Bay areas.
Heavy Rain	December 15, 2008	Heavy rain caused a fatality of a 32-year-old man when his vehicle collided with another vehicle. Highways 116 and 121 were closed for about three hours after the collision. A cold core low pressure system produced winter storm conditions causing low elevation snow, minor flooding and isolated strong wind through the period December 15 through 17, 2009. $25,000 in property damages is recorded.
	December 22, 2012	A series of storm systems, part of a large Atmospheric River type of pattern, impacted the area during late December 2012. From the 21st through 26th of December, heavy rain, gusty winds, flooding, and mudslides occurred across the Bay Area in these consecutive events.

Hazard Type	Date	Hazard Description
		Downed trees, powerlines, and flooded roadways impacted residents over the Christmas holiday season. $30,000 in property damages were recorded.
	September 26, 2014*	On September 26, the approach of an upper level low pressure system brought isolated thunderstorms to the area. Small hail and lightning was observed in several locations. Hail of 1/4 to 1/2 inch was commonly reported in the North Bay as well as near Santa Cruz. Hail fell heavily in Napa and covered the ground to a depth of 3 to 6 inches in some locations. Brief heavy rainfall also accompanied the storms.
	December 11, 2014	An Atmospheric River event brought heavy rain and gusty winds with a strong winter storm that impacted the Bay Area for several days in mid-December. Many locations around the entire Bay Area had flooding: urban flooding of streets and highways, flooding of creeks and even one large river in the North Bay. Eventually the NCFR (narrow cold frontal rainband) slowed around the Big Sur Coast. The stalling was likely due to another 'wave' in the atmosphere, farther to the southwest, riding along the boundary. The end result was to have the weakened NCFR lift back northward, almost like a quasi-warm front, producing another round of moderate to locally heavy rainfall around the Bay Area, compounding flooding concerns. The event was followed by several weaker storm systems that week that brought additional rainfall, continued flooding and mudslide concerns to the area.
	January 16, 2019	A moderate to strong atmospheric river impacted much of California in the middle of the month. A weak surface low developed off the coast on January 15th bringing moderate to heavy rainfall to portions of the region. Over the next 24 to 36 hours a second strong low-pressure system moved to the north and east bringing heavy rain, destructive winds, high surf, flooding, and thunderstorms to the Bay Area. Numerous reports were received of downed trees and power lines. Winds were recorded between 60 and 100 mph. Downed trees resulted in two fatalities.

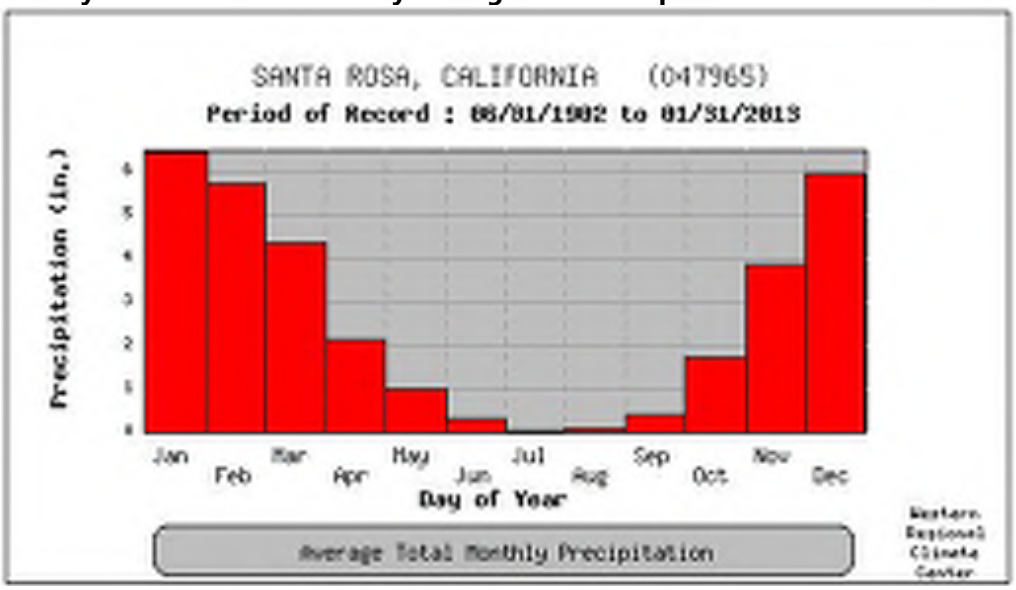
Source: National Centers for Environmental Information, Storm Events Database 2020

*Notes events that were specific to the City of Sebastopol

City of Santa Rosa—Period of Record 1893 to 2016)

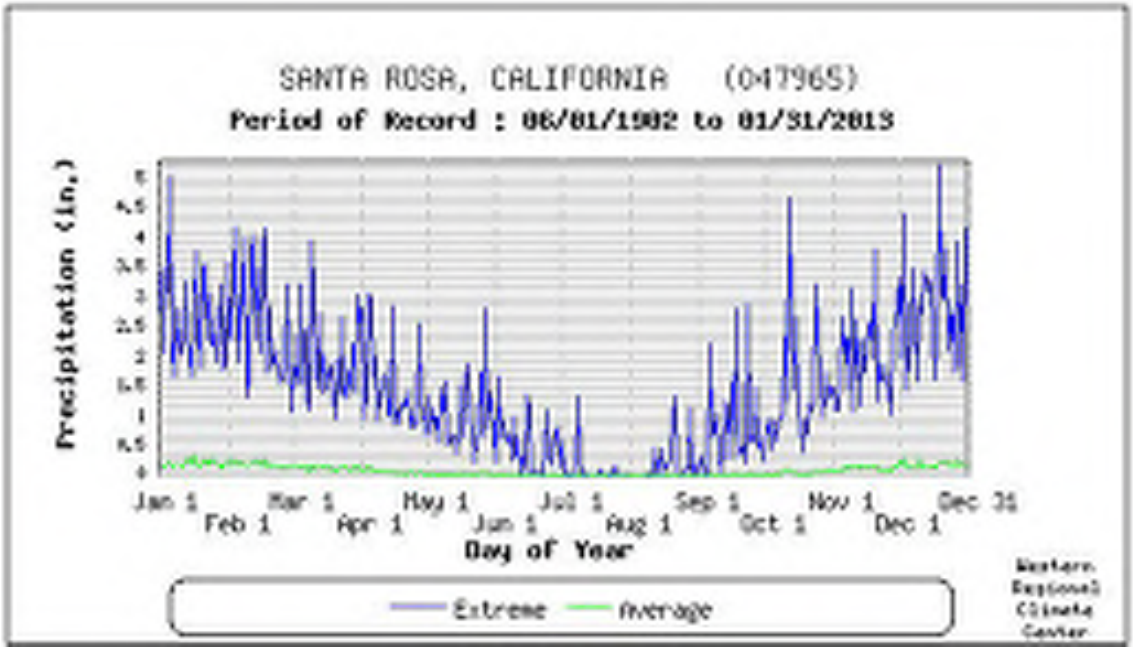
Information from the closest weather station with the most comprehensive data, the Santa Rosa Station (047965), is summarized below in Figure 4-40 and Figure 4-41. Average annual precipitation in the Planning Area is 30.13 inches per year. The highest recorded monthly precipitation was 19.42 inches in 1998; the highest recorded precipitation for a 24-hour period is 5.23 inches on December 19, 1981. The lowest recorded annual precipitation was 0.03 inches in July 1974.

Figure 4-40: City of Santa Rosa's Monthly Average Total Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 4-41: City of Santa Rosa's Daily Average and Extreme Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Probability of Future Occurrences

Likely – Heavy rain, thunderstorms, hail, and lightning wind and fog events are well-documented seasonal occurrences that will continue to occur annually in the Planning Area.

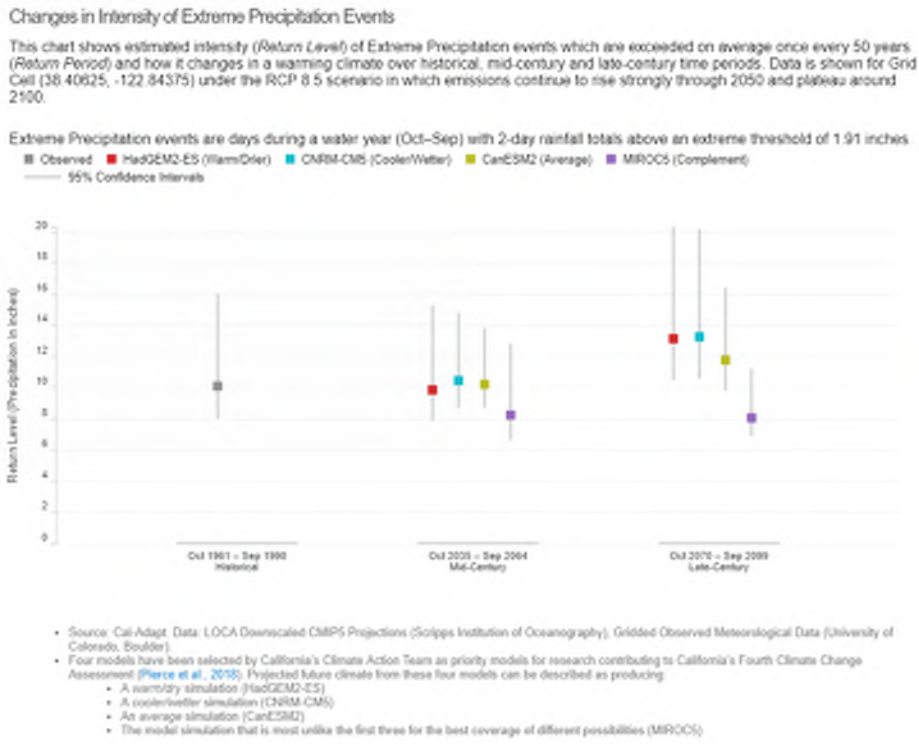
Climate Change Considerations

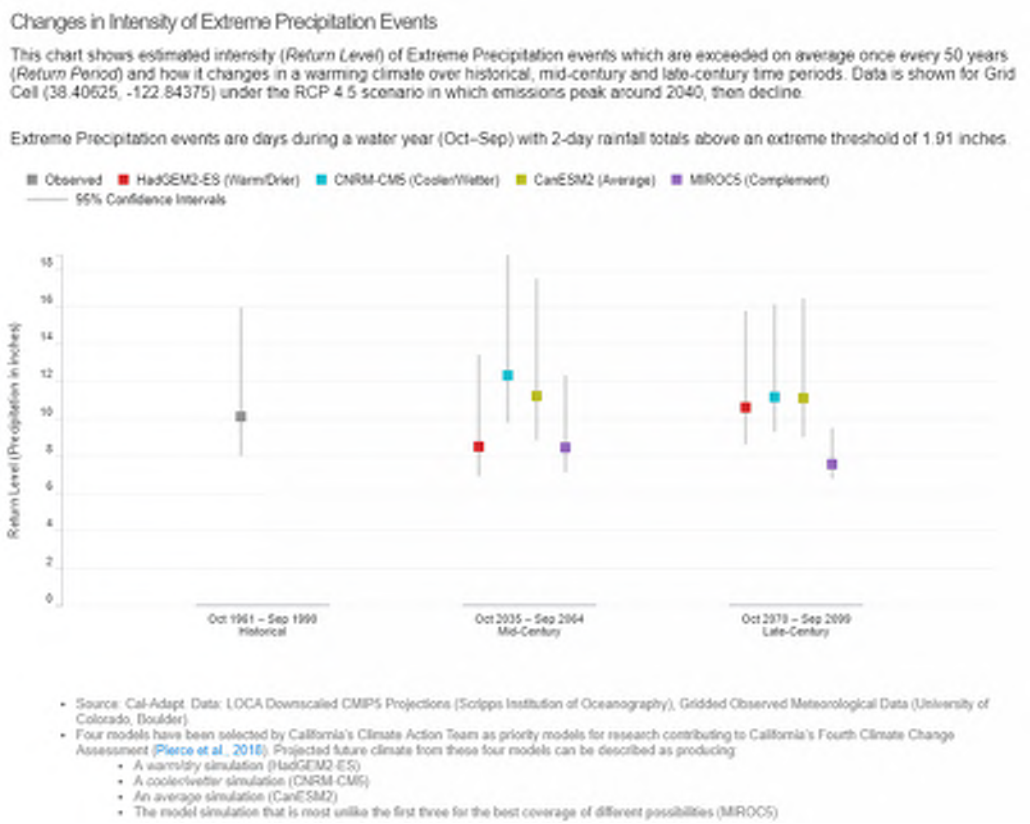
As average temperatures increase over time, this generally will result in higher extreme temperatures and more warming in the atmosphere can trigger climate changes, which could result in more frequent

extreme weather events. According to California's Fourth Climate Change Assessment, the number of days each year on which ARs bring "extreme" amounts of rain and snow to the region are expected to increase under the projected climate change for the state, possibly increasing more than a quarter. Pacific Northwest National Laboratory researchers found that ARs will reach the West Coast more frequently if GHG emissions continue to rise under business as usual conditions. Currently, the West receives rain or snow from these ARs between 25 and 40 days each year. By the end of this century, days on which the ARs reach the coast could increase by a third this century, between 35 and 55 days a year. Meanwhile, the number of days each year on which the ARs bring "extreme" amounts of rain and snow to the region could increase by more than a quarter.

Cal-Adapt indicates that on average, projections show little change in total annual precipitation in California; however, the Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during the winter months from North Pacific storms. Cal-Adapt provides extreme future precipitation estimates that summarize the intensity and frequency of events. Future extreme precipitation estimates for the City are shown in Figure 4-42. The upper chart shows estimated intensity of extreme precipitation events under the RCP 8.5 scenario that are exceeded on average every 50 years and how it changes in a warming climate over historical, mid-century, and late-century time periods. This chart shows that emissions rise strongly through 2050 and plateau by 2100 and that extreme precipitation events are days during a water year (October – September) with two-day rainfall totals above an extreme threshold of one inch. The lower chart also shows estimated intensity of extreme precipitation events but under the RCP 4.5 scenario that are exceeded on average every 50 years. This chart shows that emissions peak by 2040 and then decline and that extreme precipitation events are days during a water year (October – September) with two-day rainfall totals above an extreme threshold of 1.53 inches.

Figure 4-42: City of Sebastopol Future Precipitation Estimates in High and Low Emission Scenarios





Source: Cal-Adapt 2019

It is difficult at this point in time to predict the effects climate change will have on these hazards. However, as average temperatures increase over time, this generally will result in higher extreme temperatures. More warming in the atmosphere will trigger climate changes, which will result in more frequent extreme weather events. Much of the U.S. has already experienced prolonged periods of heavy downpours and severe flooding as a result of more extreme heavy rain and thunderstorm events. For these reasons, climate change would have a "high" influence on severe weather, specifically more heavy rainfall and precipitation events.

Vulnerability Assessment

Property

Based on historic information, these storms have not directly resulted in significant injury or damages to people and property, or the losses are typically covered by insurance. It is the secondary hazards caused by weather, such as floods, that have had the greatest impact on the City's Planning Area. But while the primary effects may not result in significant injury or property damage, all property is vulnerable during severe weather events; properties in poor condition or closer to overhead power lines and large trees may be more vulnerable to damage.

People

Exposure is the greatest danger to people from severe thunderstorms. People can be hit by lightning, pelted by hail, and caught in rising waters. However, serious injury and loss of human life is rarely associated with hailstorms.

Reduced visibility is the greatest risk to people when heavy fog is prevalent. Particularly when fog is dense, it can be hazardous to drivers, mariners, and aviators and contributes to numerous accidents each year. To reduce injury and harm, people should avoid driving when dense fog is prevalent, if possible. If driving is pertinent, emergency services advise driving with lights on low beam, avoiding stopping on highways, and avoiding crossing traffic lanes.

While national data shows that lightning causes more injuries and deaths than any other natural hazard except extreme heat, there does not seem to be any trend in the data to indicate that one segment of the population is at a disproportionately high risk of being directly affected. Anyone who is outside during a thunderstorm is at risk of being struck by lightning. Aspects of the population who rely on constant, uninterrupted electrical supplies may have a greater, indirect vulnerability to lightning. As a group, the elderly or disabled, especially those with home health care services rely heavily on an uninterrupted source of electricity. Resident populations in nursing homes, residential facilities, or other special needs housing may also be vulnerable if electrical outages are prolonged. If they do not have a back-up power source, rural residents and agricultural operations reliant on electricity for heating, cooling, and water supplies are also vulnerable to power outages. Thunderstorms have the potential energy and strong winds to topple dead trees and injure people. As a result, power outages that occur from severe weather can be life threatening and these populations could face more exposure and could experience greater secondary effects of the hazard. Refer to the Vulnerability Assessment for Severe Weather: Winds hazards below for analysis related to electricity dependent populations in the City.

Economy

Economic impacts of severe weather are typically short term. Lightning can cause power outages and fires. Hail can destroy exposed property; an example is car lots, where entire inventories can be damaged. Generally, long-term economic impacts center around hazards that cascade from a severe thunderstorm, including wildfires ignited by lightning and flooding due to heavy rain.

Critical Facilities and Infrastructure

Due to the unpredictability of severe thunderstorm strength and path, most critical infrastructure that is above ground is equally exposed to the storm's impacts. According to historical data the Planning Area has experienced power outages in the past due to severe storms, but due to the random nature of these hazards, a more specific risk assessment was not conducted for this plan. Heavy rain and thunderstorms, particularly those that result in hail could significantly impact motorists travelling along SR 116, SR 12, and Bodega Highway. Depending on the severity of the storm, these events could slow traffic, reduce visibility, and increase the likelihood of vehicle accidents along the highway, which may result in greater traffic delays. These effects are also likely to occur along highway segments in adjacent counties.

Fog can have devastating effects on transportation corridors in the City and throughout the County. Dense fog may increase the potential for transportation accidents along SR 116 which could in turn cause longer traffic delays and timely movement of goods and services. Multi-car pileups have resulted from drivers using excessive speed for the conditions and visibility. These accidents can cause multiple injuries and deaths and could have serious implications for human health and the environment if a hazardous were involved. Other disruptions from fog include delayed emergency response vehicles and school closures.

Historic, Cultural, and Natural Resources

Severe thunderstorms are a natural environmental process. Environmental impacts include the sparking of potentially destructive wildfires by lightning and localized flattening of plants by hail. As a natural process,

the impacts of most severe thunderstorms by themselves are part of the overall natural cycle and do not cause long-term consequential damage.

Future Development

New critical facilities, such as communication towers, pump stations, and other water or wastewater utilities should be built to withstand heavy rain, lighting, and hail damage. Population and commercial growth in the City will increase the potential for complications with traffic accidents and commerce interruptions associated with dense fog. Future development projects should also consider severe weather hazards at the planning, engineering and architectural design stage with the goal of reducing vulnerability. Storm water master planning and site plan review should account for buildings to withstand severe weather events and be considered for all new development. Future development in the City is not expected to be vulnerable to the hazard, but all development will be affected by severe weather and storm events and population growth will increase potential exposure to hazards such as lightning and hail.

Risk Summary

- Sonoma County has experienced 90 hail, heavy rain, lighting, and dense fog events in past 70 years.
- The average annual precipitation is 30.12 inches.
- The highest recorded monthly precipitation was 19.42 inches in 1998.
- The highest recorded precipitation for a 24-hour period was 5.23 inches on December 19, 1981.
- Overall significance for severe weather hazards such as heavy rain, thunderstorms, hail, lightning, and dense fog is **Medium.**

4.3.9 Severe Weather: High Winds

Hazard Description

High winds, often accompanying severe thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. The wind patterns in Sebastopol are strongly influenced by the Petaluma Gap, the region from the Estero Lowlands to San Pablo Bay (BAAQMD 2019). The predominant wind pattern is out of the south and southeast and tends to be light in the morning and windier in the afternoon when the sea breeze arrives.

Windstorms in the City are typically straight-line winds. Straight-line winds are generally any thunderstorm wind that is not associated with rotation (i.e., is not a tornado). These winds can exceed 100 miles per hour (mph) and are responsible for most wind damage related to thunderstorms. These winds can overturn mobile homes, tear roofs off houses, topple trees, snap power lines, shatter windows, and sandblast paint from cars. Other associated hazards include utility outages, arcing power lines, debris blocking streets, dust storms, and an occasional structure fire.

High winds and tornadoes can cause damage to property and loss of life. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, broken sewer and water mains, and the outbreak of fires. Agricultural crops and industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response.

Location

Extensive – Strong winds have the potential to happen anywhere in the City's Planning Area. The resulting damage from wind events may be most severe in the downtown area of the City where there are more large trees, infrastructure, and higher density development.

Extent (Magnitude/Severity)

Limited –The Beaufort wind scale describes the damaging effects of wind speed, as shown in Table 4-37.

Table 4-37: Beaufort Wind Scale

Wind Speed (mph)	Description—Visible Condition
0	Calm; smoke rises vertically
1-4	Light air; direction of wind shown by smoke but not by wind vanes
4-7	Light breeze; wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle breeze; leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate breeze; raises dust and loose paper; small branches are moved
19-24	Fresh breeze; small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong breeze; large branches in motion; telephone wires whistle; umbrellas used with difficulty
32-38	Moderate gale whole trees in motion; inconvenience in walking against wind
39-46	Fresh gale breaks twigs off trees; generally, impedes progress
47-54	Strong gale slight structural damage occurs; chimney pots and slates removed
55-63	Whole gale trees uprooted; considerable structural damage occurs
64-72	Storm very rarely experienced; accompanied by widespread damage
73+	Hurricane devastation occurs

Source: NWS

Based on NCEI records between January 1, 1950 and December 30, 2020 there have been 258 high and strong wind events in Sonoma County, causing a total of $3,859,000 in property damage. The most damaging event took place on December 27, 2006 and was a 30 mph wind event on the Beaufort Wind Scale that resulted in over $1 million of property damage to both commercial and residential structures.

The highest magnitude event recorded occurred on October 27, 2019 and was in association with a series of offshore wind events that were the result of strong surface high pressure and a trough along the California coast that provided one of the strongest offshore winds over the Bay Area since the 2017 North Bay wildfires, as winds remained elevated for 24 hours with gusts in the hills at 60 to 80 miles per hour. These winds promoted the rapid spread of the Kincade Fire and along with very dry conditions allowed for multiple new wildfires to spark in the greater Bay Area. In response to these winds, PG&E shut off power to over 2 million people across California.

High wind events in Sonoma County have led to five recorded fatalities and five injuries (due to fallen trees). High wind event impacts would likely be limited, with a majority of impacts being related to property damages caused by down trees as well as power outages. Overall, impacts from high wind events would likely be limited, with 10 to 25 percent of property severely damaged.

Previous Occurrences

The City lies north of the Petaluma Gap, and subsequently experiences lower wind speeds. However, high wind events have occurred in the City which led to downed trees and power outages throughout the City. The following events are recorded in the NCEI Storm Events Database that are specific to the City and nearby areas.

January 25, 2010 - Strong wind brought down a large oak tree along Fitch Mountain Road in Healdsburg. The tree smashed into a home and caused the road to be closed. Some of the other areas experienced downed trees and power lines were Sebastopol, Forestville and Santa Rosa. Approximately 1,200 customers were without power.

December 2, 2012 - High winds caused a power pole to fall at Hall Road and Third Street in Sebastopol. It took down a high voltage line and cut power to a significant portion of western Santa Rosa.

January 16, 2019 - Sebastopol Road closed between Fresno Ave and Corporate Center Parkway due to a PG&E power pole that broke and hung over the roadway.

Probability of Future Occurrences

Likely – A total of 258 combined high and strong wind events have occurred in Sonoma County over 70 years of record keeping, which equates to an average of three events in a typical year. Historical wind activity within the Planning Area indicates that the area will likely continue to experience high wind events during adverse weather conditions. The actual risk of a wind event to the City is dependent on the nature and location and the magnitude of a high wind event.

Climate Change Considerations

There presently is not enough data or research to quantify the magnitude of change that climate change may have related to wind frequency and intensity. Studies referenced in *California's Fourth Climate Assessment* indicated that extreme fire weather, particularly in the form of hot and dry winds, can strongly influence shrub-land fire regimes. Strong winds have also been associated with severe forest fires in California, meaning climate change impacts on wind patterns may also affect forest health and wildfire susceptibility. Other ongoing research compiled in the recent climate assessment has resulted in different conclusions on the effect of climate change on wind regimes, particularly extreme wind events, such as the Santa Ana and Diablo winds that created some of the most devastating wildfires in recent years (California Natural Resources Agency 2018a). At this time, these changing factors are not well understood and are still being incorporated into state and regional research and risk analysis.

Vulnerability Assessment

Property

General damages from high wind events can be both direct and indirect. Direct impacts refer to what the wind physically destroys, while indirect impacts include additional costs, damages and losses attributed to secondary hazards generated by the event or resulting from the direct damages caused by the wind event. Construction practices and building codes can help maximize the resistance of the structures to damage.

Secondary impacts of damage caused by wind events often result from damage to infrastructure. Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies. These indirect impacts of a wind event put tremendous strain on a community.

People

Community members are the most vulnerable to high wind events and of the five fatalities associated with high wind and strong wind events, four were associated with wind knocking down trees and one occurred in 2018 when two people fell out of a row boat during a gale warning in 2018 (NCEI 2020). However, there are also segments of the population that are especially exposed to the indirect impacts of high winds, particularly the loss of electrical power. These populations include the elderly or disabled, especially those with medical needs and treatments dependent on electricity. Nursing homes, community-based residential facilities, other special needs housing facilities, and other socially susceptible populations are vulnerable if electrical outages are prolonged since backup power generally operates only minimal functions for a short period of time.

The U.S. Department of Health and Human Services ePOWER Mapping tool provides information on Medicare beneficiaries who rely on electricity-dependent medical equipment such as ventilators to live independently in their homes. According to the tool, there are 8,601 Medicare beneficiaries located in the City (within the zip codes of 95472 and 95473) ((https://empowermap.hhs.gov/) (U.S. Department of Health & Human Services 2021b). Of these individuals, 219 are considered electricity dependent and are highly vulnerable to power outages as a result a high wind event.

Following the unprecedented 2018 wildfire season in California, PG&E announced it will be conducting PSPS when there are high winds and dry conditions and generally a heightened fire risk forecasted. The outages could last several days, and PG&E has suggested customers be prepared for outages that could last longer than 48 hours. A majority of Sonoma County could be affected by the power outages including almost the entirety of the City. PG&E does plan to install a resource area at the Sonoma-Marin Fairgrounds within 24 hours of a PSPS, and will offer power, air conditions and updates for local residents.

Economy

Winds typically don't have long-term impacts on the economy. The most common problems associated with high winds are loss of utilities. Downed power lines can cause power outages, leaving large parts of the City isolated, and without electricity, water, and communication. Damage may also limit timely emergency response and the number of evacuation routes.

In the event of a PSPS during red flag warnings, as described above, large portions of the City could be without power including several businesses. Economic impacts due to the PSPS depend on the length of the shutoff. Based on the planned PSPS in October 2019, economic impacts were reported across northern California as many businesses and restaurants and other tourism-based operations had to close due to limited to no power supply. In 2018, PG&E abruptly shut down the power in the Napa Valley region and the City of Calistoga reported that numerous small business lost tens of thousands of dollars in missed revenue and inventory (Argus-Courier 2019).

Critical Facilities and Infrastructure

Public gathering places such as schools, community centers, shelters, nursing homes, and churches may have increased impacts at certain times of day due to high wind events and PSPS. Due to the random nature of wind hazard, a more specific risk assessment was not conducted for this plan.

Historic, Cultural, and Natural Resources

High winds can cause massive damage to the natural environment, uprooting trees and other debris. This is part of a natural process, however, and the environment will return to its original state over time. Wind damage to historic or cultural resources on the other hand may result in more severe and permanent damage that could temporarily impact the historic aesthetic of downtown Sebastopol or require extensive restoration and rehabilitation of certain buildings and structures.

Future Development

As the City continues increasing in population, the number of people and housing developments exposed to the wind hazards increases. Proper education on building techniques and the use of sturdy building materials, basements, attached foundations, and other structural techniques may minimize the property vulnerabilities. Public shelters at parks and open spaces may help reduce the impacts of high wind events on the recreational populations exposed to storms.

Risk Summary

- Increase in post-failure or secondary hazards such as flooding and long-term power outages can occur from high wind events.
- 219 individuals in the City are electricity dependent, and highly vulnerable to power outages due to high wind events.
- Damage to natural resource habitats and other resources may result from severe weather-associated wind.
- Severe wind events could result in the loss of water, communication lines, or power; closures to roads and transportation lifelines, which could impact, strand, and/or impair mobility for emergency responders and/or City residents.
- Economic losses (jobs, sales, tax revenue) associated with loss of commercial structures and/or inability to move through transportation lifelines could occur.
- Severe wind hazards could result in loss or damages to historic and cultural resources, which could severely impact the social fabric of Sebastopol.
- Timely removal of debris, specifically downed trees must be addressed, as this can impact the severity of the severe weather events and the secondary impacts (e.g. localized flooding, loss of power).
- Overall, the significance of severe weather associated with wind is **Medium.**

4.4 Human-Health and Human-Caused Hazard Profiles and Risk Assessment

The DMA does not require an assessment of human-caused hazards, but the City and HMPC decided to include human-health and human-caused hazards in this LHMP to several reasons. First, the City wants to inform the public about all hazards, including both natural and human-caused hazards. The City is also interested in the impact human-caused hazards could have on their community and on the daily movement of goods and services through the City. The City intends to take a proactive approach to disaster preparedness, and the HMPC indicated that preparation for and response to a human-caused disaster involves the same training and commitment of City resources as a natural hazard. Lastly, the City recognizes that the likelihood of some human-caused hazard events in the Planning Area is greater than several of the natural hazard events identified in the plan.

The City also recognizes that while Sonoma County has several hazardous material management and planning procedures in place through their CUPA administered through their Fire Prevention Division and Hazardous Materials Division (Permit Sonoma), it is equally important to highlight the hazardous material hazards present in the City's Planning Area in this plan for the purpose of public education and awareness. The City wants to ensure that these hazards do not exacerbate secondary impacts associated with natural hazard events.

The following human-caused hazards are discussed in this plan:

- Public Health Hazards
- Hazardous Material Releases

Other potential human-caused hazards, such as civil unrest, civil disturbance, and terrorism threats were dismissed from further study. The City and HMPC noted that while these human-caused hazards, specifically civil unrest, or political activism tend to occur in the City, they have not resulted in civil disturbance or other negative impacts over the past two decades.

4.4.1 Public Health Hazards

Hazard Description

A public health emergency is defined as an emergency need for health care [medical] services to respond to a disaster, significant outbreak of an infectious disease, bioterrorist attack or other significant or catastrophic event. Public health emergencies can occur as primary events by themselves, or they may be secondary to another disaster or emergency, such as tornado, flood, or hazardous material incident.

Public health emergencies have the potential to cause serious illness and death, especially among those who have compromised immune systems due to age or underlying medical conditions. There are several contagious and infectious diseases present in Sonoma County that constitute a public health risk. The Sonoma County Emergency Operations Plan (EOP) provides an organizational framework for public health and medical service preparedness, response, and recovery efforts for various emergency epidemics.

Unlike influenza viruses that have achieved ongoing transmission in humans, the sporadic human infections with avian A (H5N1) viruses are far more severe and result in high mortality. Initial symptoms include high fever and other influenza-like symptoms. It also appears that the incubation period in humans may be longer for avian (H5N1) viruses, ranging from 2 to 8 days, and possibly as long as 17 days. Diarrhea, vomiting, abdominal pain, chest pain, and bleeding from the nose and gums have also been reported. The disease often manifests as a rapid progression of pneumonia with respiratory failure ensuing over several days.

According to the World Health Organization (WHO), a pandemic can be defined as the worldwide spread of a new disease, and specifically as an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people (WHO 2011). It is a global disease outbreak that attacks a large population across great geographic distances. Pandemics are larger than epidemics in terms of geographic area and number of people affected. Epidemics tend to occur seasonally and affect much smaller areas. Pandemics, on the other hand, are often caused by new subtypes of viruses or bacteria for which humans have little or no natural resistance or immunity, and for which there is no vaccine. The United States Centers for Disease Control and Prevention (CDC) works with the WHO to detect outbreaks that might cause a pandemic and assist in planning and emergency preparation for pandemics. Consequently, pandemics typically result in more deaths, social disruption, and economic loss than epidemics.

There are three conditions that must be met before an influenza pandemic begins:

1. A new virus subtype must emerge that has not previously circulated in humans (and therefore there is no pre-existing immunity),
2. This new subtype must be able to cause disease in humans, and
3. The virus must be easily transmissible from human to human.

As of January 2021, Sonoma County and the nation are continuing to deal with the COVID-19 coronavirus pandemic, confirming that pandemics can have a significant impact on the County and on a global scale. This hazard risk assessment includes an analysis of pandemic risk in Sonoma County and the City and an analysis of the impacts of the hazards profiled in this plan on public health.

Geographic Location

Extensive – Pandemics occur not only on a county or state level, but on a national and global scale. It is likely that most communities in Sonoma County would be affected, either directly or by secondary impacts. More highly-populated areas may be affected sooner and may experience higher infection rates.

The current COVID-19 pandemic has impacted all 58 California counties. As of January 20, 2020, Sonoma County had reported 23,997 active COVID-19 cases (4.71 percent of the County population); 242 people have died and 17,631 people have recovered (74 percent of the cases) and is currently noted as having a sustained decline in new cases per 100,000 residents (approximately 40 new cases per day per 100,000 people). At the time, this resulted in a 9.6 percent positivity rate, which was similar to the State 8.4 percent positivity rate tracked at the same time (Sonoma County 2021). All communities in the County, including the District's Planning Area in Sonoma Valley are likely to continue to be impacted, either directly or indirectly. Some indirect consequences may be the diversion of resources that may be otherwise available.

Magnitude/Severity

Critical – The magnitude of a public health emergency will range significantly depending on the aggressiveness of the virus in question and the ease of transmission. Pandemic influenza is more easily transmitted from person-to-person but advances in medical technologies have greatly reduced the number of deaths caused by influenza over time.

Today, a much larger percentage of the world's population is clustered in cities, making them ideal breeding grounds for epidemics. Additionally, the explosive growth in air travel means a virus could spread around the globe within hours making the speed of onset of a pandemic short and the duration variable, but pandemics typically last for several months to 1-2 years, or until a vaccine becomes available. Under such conditions, there may be very little warning time. Most experts believe we will have just one to six months between the time that a dangerous new influenza strain is identified and the time that outbreaks begin to occur in the United States. Outbreaks are expected to occur simultaneously throughout much of the nation, preventing shifts in human and material resources that normally occur with other natural disasters. These and many other aspects make influenza pandemic unlike any other public health emergency or community disaster. There is also currently no scientific scale to measure the magnitude of a pandemic, but they are usually measured by the population affected, and by the population that have died from complications associated with the virus. The magnitude and severity of pandemics are also measured based on the Pandemic Intervals Framework (PIF).

The PIF is a six-phased approach to defining the progression of an influenza pandemic. This framework is used to guide influenza pandemic planning and provides recommendations for risk assessment, decision-making, and action. These intervals provide a common method to describe pandemic activity which can inform public health actions. The duration of each pandemic interval might vary depending on the characteristics of the virus and the public health response.

The six-phase approach was designed for the easy incorporation of recommendations into existing national and local preparedness and response plans. Phases 1 through 3 correlates with preparedness in the **pre-pandemic interval**, including capacity development and response planning activities, while Phases 4 through 6 signal the need for response and mitigation efforts during the **pandemic interval**.

Pre-Pandemic Interval

- **Phase 1** is the natural state in which influenza viruses circulate continuously among animals but do not affect humans. Even though such viruses might develop into pandemic viruses, in Phase 1 no viruses circulating among animals have been reported to cause infections in humans.
- **Phase 2** involves cases of animal influenza that have circulated among domesticated or wild animals and have caused specific cases of infection among humans. In Phase 2 an animal influenza virus circulating among domesticated or wild animals is known to have caused infection in humans and is thus considered a potential pandemic threat.
- **Phase 3** represents the mutation of the animal influenza virus in humans so that it can be transmitted to other humans under certain circumstances (usually very close contact between individuals). At this

point, small clusters of infection have occurred. In Phase 3 an animal or human-animal influenza virus has caused sporadic cases or small clusters of disease in people but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks. Limited human-to-human transmission may occur under some circumstances, for example, when there is close contact between an infected person and an unprotected caregiver. Limited transmission under these circumstances does not indicate that the virus has gained the level of transmissibility among humans necessary to cause a pandemic.

Pandemic Interval

- **Phase 4** involves community-wide outbreaks as the virus continues to mutate and become more easily transmitted between people (for example, transmission through the air) Phase 4 is characterized by verified human to human transmission of the virus able to cause "community-level outbreaks." The ability to cause sustained disease outbreaks in a community marks a significant upward shift in the risk for a pandemic.
- **Phase 5** represents human-to-human transmission of the virus in at least two countries. Phase 5 is characterized by verified human to human spread of the virus into at least two countries in one WHO region. While most countries will not be affected at this stage, the declaration of Phase 5 is a strong signal that a pandemic is imminent and that the time to finalize the organization, communication, and implementation of the planned mitigation measures is short.
- **Phase 6** is the pandemic phase, characterized by community-level influenza outbreaks. Phase 6, the pandemic phase, is characterized by community-level outbreaks in at least one other country in a different WHO region in addition to the criteria defined in Phase 5. Designation of this phase will indicate that a global pandemic is underway.

Previous Occurrences

There has been one state and one federal disaster declaration due to a pandemic (DR-4482). These declarations both occurred in 2020. The federal declaration for the COVID-19 pandemic was made on January 20, 2020, and the state declaration followed on March 4, 2020.

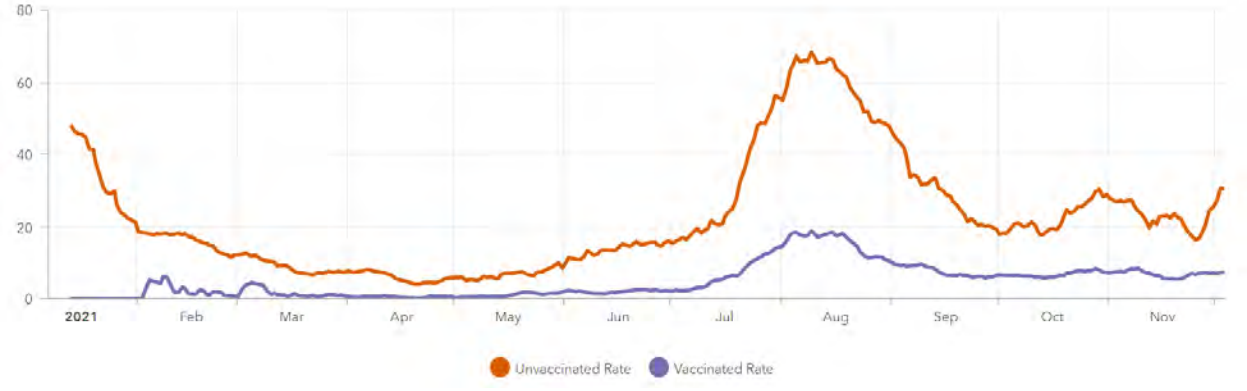
Since the early 1900s, five other lethal pandemics have swept the globe:

- **1918-1919 Influenza (H1N1) (Spanish Flu):** The Spanish Flu was the most severe pandemic in history. The number of deaths was estimated to be 50-100 million worldwide and 675,000 in the United States. Its primary victims were mostly young, healthy adults. At one point, more than 10 percent of the American workforce was bedridden.
- **1957-1958 Asian Influenza (H2N2):** The 1957 Asian influenza killed 1-2 million people worldwide, including about 70,000 people in the United States, mostly the elderly and chronically ill. Fortunately, the virus was quickly identified, and vaccine production began in May 1957.
- **1968-1969 Hong Kong Influenza (H3N2):** The 1968 Hong Kong Flu killed 34,000 Americans. The elderly were more severely affected. This pandemic peaked during school holidays in December, limiting student-related infections, which may have kept the number of infections down. Also, people infected by the Asian Flu ten years earlier may have gained some resistance to the new virus. The same virus also returned in 1970 and 1972.
- **2009-2010 Swine Influenza (H1N1):** The Swine influenza pandemic emerged from Mexico in early 2009 and was declared a public health emergency in the U.S. on April 26. By June, approximately 18,000 cases had been reported in the U.S. and the virus had spread to 74 countries. Most cases were fairly mild, with symptoms similar to the seasonal flu, but there were cases of severe disease requiring hospitalization and a number of deaths. The CDC estimates that 43-89 million people were infected worldwide, with an estimated 8,870 to 18,300 H1N1 related deaths, including 12,469 deaths in the United States. While this is more than those infected by the Spanish Flu, the Swine influenza only

resulted in about 150,000 to 575,000 deaths. Follow-up studies have since showed that the risk of serious illness resulting from the Swine influenza was no higher than that of the yearly seasonal influenza.

- **2020-Ongoing COVID-19:** The COVID-19 or novel coronavirus disease pandemic began in December 2019 and was declared a pandemic in March of 2020. COVID-19 is an infectious disease caused by the newly discovered coronavirus. As of January 20, 2021, it has killed more than 2.14 million people worldwide and more than 400,300 Americans (CDC 2021b). It is now expected to last through 2022 with the development of variants and the potential to impact communities that have large percentages of unvaccinated populations. Figure 4-43 illustrates the number of new cases reported in the County since December 2021. New cases have since declined with the availability of the COVID-19 vaccine, however, there have been recent increases in cases due to new SARS-VoV-2 variants.

Figure 4-43: Sonoma County New Cases per 100,000 Residents by Vaccination Status



Source: Sonoma County Emergency Management 2021.

The California Department of Public Health and Environment releases an annual reportable disease summary for each county. The diagnoses with the highest incidences in Sonoma County for 2016 through 2019 are summarized in Table 4-38.

Table 4-38: Annual Cases of Communicable Diseases in Sonoma County: 2015 – 2019

Disease	Year of Reported Cases				
	2015	2016	2017	2018	2019
Ambeiasis	3	9	9	0	11
Anaplasmosis	--	1	2	0	0
Babesiosis	0	0	0	0	0
Botulism (Food-borne)	0	0	0	0	0
Botulism (Wound)	--	0	0	0	0
Brucellosis	1	0	1	1	0
Campylobacteriosis	52	60	184	191	187
Chikungunya Virus	0	0	0	0	0
Cholera	0	0	0	0	0
Ciguatera (Fish Poisoning)	0	0	0	0	0
Coccidioidomycosis	1	2	3	3	12
Creutzfeldt Jakob	0	1	1	0	1
Cryptosporidiosis	5	3	7	6	7
Cyclosporiasis	0	0	0	1	0
Cysticercosis	1	0	0	0	0
Dengue Virus	0	2	1	0	4
Ehrilichiosis	0	0	0	0	0
Flavivirus	0	0	0	0	0

Disease	Year of Reported Cases				
	2015	2016	2017	2018	2019
Giardiasis	50	32	43	49	72
Hantavirus	0	0	0	0	0
Hepatitis E	1	2	3	1	2
Legionellosis	1	7	6	5	2
Leprosy (Hansen's Disease)	0	0	0	0	0
Leptospirosis	0	0	1	0	0
Listeriosis	1	3	1	2	1
Lyme Disease	13	14	18	11	10
Malaria	0	0	3	0	0
Paralytic – Shellfish Poisoning	0	0	0	1	0
Parathyroid Fever	0	0	0	0	0
Plague – Human	0	0	0	0	0
Psittacosis	0	0	0	0	0
Q Fever	3	1	0	1	1
Rabies (Animal)	5	5	3	5	5
Rabies (Human)	0	0	0	0	0
Relapsing Fever	0	0	1	0	0
Salmonellosis	58	60	80	83	61
Scrombroid Fish Poisoning	0	00	0	0	0
Shiga Toxin-producing E.Coli	27	25	35	50	76
Hemolytic Uremic Syndrome	0	1	0	0	3
Shigellosis	0	12	35	71	51
Spotted Fever Rickettsiosis	0	1	0	0	0
Streptococcal Infection	0	0	0	0	0
Trichinosis	0	0	0	0	0
Tularemia	1	0	0	0	0
Typhoid Fever	0	1	1	0	1
Typhus Fever	0	0	0	0	0
Yersiniosis	0	3	1	2	1
Vibrio Infection	2	0	2	2	10
Zika Virus	--	10	7	1	1

Source: California Department of Public Health 2018.

As shown in Table 4-38 above, common communicable diseases in Sonoma County (including the City of Sebastopol) include Campylobacteriosis, Giardiasis, Lyme Disease, and Salmonellosis. Campylobacteriosis is a common bacterial infection in humans; it is often a food-borne illness. Giardiasis is a diarrheal disease caused by the microscopic parasite Giardia. Once a person has been infected with Giardia, the parasite lives in the intestines and is passed in feces. Lyme disease is a bacterial infection you get from the bite of an infected tick. Salmonellosis is also a common bacterial disease that affects the intestinal tract; humans become infected through contaminated food and water.

The CDPH obtains data on laboratory-confirmed influenza and other respiratory viruses from a number of laboratories throughout the state. These laboratories include the CDPH Viral and Rickettsial Disease Laboratory (VRDL) and 24 local public health laboratories, collectively known as the Respiratory Laboratory Network (RLN), and 16 clinical, academic, and hospital laboratories. According to the CDC, at a national level, the 2019–2020 influenza season (October 1, 2019 – April 4, 2020) was a moderate severity season (CDC 2020a). Influenza activity during the 2019–2020 season began to increase in November and was consistently high through January and February. The season was characterized by two consecutive waves of activity, beginning with influenza B viruses and followed by A(H1N1)pdm09 viruses. Overall, influenza A(H1N1)pdm09 viruses were the most commonly reported influenza viruses this season (CDC

2020a). Activity began to decline in March, and this decline is assumed to be associated with community prevention measures that went into effect to minimize the spread of COVID-19.

Influenza resulted in 39 to 56 million flu illnesses, 18 to 26 million medical visits, 410,000 to 740,000 hospitalizations, and approximately 24,000 to 62,000 deaths (CDC 2020a). During the influenza season, the burden was higher in young children (0-4 years) and adults (18-49 years) compared with the recent 2017-2018 season, a recent season with high severity (CDC 2020b).

Probability of Future Occurrences

Likely – Even before the COVID-19 pandemic began, the CDPH considered a pandemic to be inevitable. However, there is no definite way to predict when the next pandemic might happen. Some indicators will be present, but not every new virus turns into a pandemic. Based on the five pandemics that have affected the United States in roughly the last 100 years, a pandemic occurs on average roughly every 20 years.

Climate Change Considerations

There is no direct evidence that climate change is influencing the spread of public health hazards, or the spread of COVID-19. Climate change does alter how we relate to other species and that can affect human health and risk for infections. Many of the root causes of climate change can also increase the risk of pandemics (Bernstein 2020). Deforestation is the largest loss of habitat worldwide and this loss forces animals to migrate and potentially contact other animals or people and spread germs. Large livestock can serve as a source for spillover infections from animals to people (Bernstein 2020). Climate change has also made conditions more favorable to the spread of some infectious diseases, including Lyme disease, waterborne diseases, and mosquito-borne diseases, such as malaria and dengue fever.

According to the WHO, there has been research development into the linkages between climate and infectious disease transmission that examine the associations between climate variability and infectious disease occurrence, early indicators of emerging infectious disease impacts of climate change and using predictive models to estimate the future burden of infectious disease under different climate change scenarios (WHO 2003). In summary, future risks associated with climate change are difficult to predict, but changes in infectious disease transmission patterns are likely consequences of climate change and it impacts when and where pathogens appear, particularly related to temperature and rainfall patterns. As a result, climate change is expected to have a low influence on public health hazards.

Vulnerability Assessment

Public health hazards, particularly pandemics and other infectious diseases will continue to have a human health impact on the region and the country. Although the City of Sebastopol's infrastructure would not be directly affected by a public health hazard, or a pandemic, the City's community lifelines, such hospitals and medical facilities would be directly affected when pandemics result in limited capacity. Reduced access to facilities and infrastructure in the area of the incident may be restricted or denied until decontamination and disinfection is complete and it is safe to access the area.

People

Public health hazards, such as pandemics can have varying levels of impacts on the City's population. These impacts can range from hospitalizations and fatalities to school and business closures to the interruption of basic services, such as public transportation, access to in-person health care, and the delivery of food and essential services. Impacts on people in the City's Planning Area are expected to be severe for unprotected people, which may involve hospitalizations and moderate for people protected from human-health hazards, such as people with jobs that have less exposure to people and possible sources of transmission. For example, people with jobs in education or the medical field may be more

frequently exposed to different groups of people (students, patients) that can transmit infectious diseases. Medications may be limited to help prevent or treat the infectious disease. It can also take years to manufacture a vaccine and would likely become available in small quantities. It may become necessary to ration limited amounts of medications, vaccinations, and other health care supplies. Risk groups cannot be predicted with certainty; the elderly, people with underlying medical conditions, and young children are usually at higher risk, but as discussed above this is not always true for all coronavirus or influenza strains. People without health coverage or access to good medical care are also likely to be more adversely affected.

Critical Facilities and Infrastructure

Public health hazards can directly impact critical facilities or infrastructure and specifically community lifelines, such as the healthcare system, by overwhelming hospitals and intensive care units and limiting the number of beds; doctor, nursing, and support staffing availability; laboratory testing capacity, and resulting in personal protective equipment (PPE) shortages. Indirect impacts can also result in these facilities being temporarily offline due to testing or other precautionary monitoring of downed systems.

The onset of public health hazards may postpone the delivery of essential services, such as water supply, electrical power, natural gas, or other community lifelines. It is also possible that infrastructure may not be able to be maintained during a pandemic because of a significantly decreased workforce. Public health incidents and disease outbreaks may cause restricted access or delays in working in certain communities, work areas, or sites where incidents may be tied to environmental factors (e.g. water-borne diseases transmitted through contaminated water). Such work areas or sites may not be accessible again until there are safety protocols in place. In these cases, remediation, sanitization, and good hygiene practice is needed.

Historic, Cultural, and Natural Resources

Public health hazards are not expected to result in any direct impacts to historic or cultural resources. Preliminary studies indicate that shelter-in-place restrictions during the early stages of the COVID-19 pandemic may have improved habitat conditions for wildlife given there were less cars on the roads, and fewer people outside.

Economy

As a result of the COVID-19 pandemic, multiple businesses were forced to close temporarily, and some permanently closed throughout Sonoma County. Unemployment also increased significantly during 2020. Other economic impacts included varying disruptions in food supply chains and other essential medical supplies.

Future Development

Future development in Sebastopol has some potential to change how infectious diseases spread through the community and impact human health in both the short and long term. New development may increase the number of people and care facilities exposed to public health hazards, but development is not expected to significantly impact public health hazards. In general, greater population concentrations (often found in special needs facilities, businesses, school campuses) will put more people at risk to exposure, and as the median age of City residents increases, the vulnerability of future pandemics may increase since infectious diseases are more often more deadly to senior citizens. Also, as populations increase and the cost of health care increases, potential losses due to pandemics can be expected to rise.

Risk Summary

- Pandemics occur on a national and global scale and it is likely that most communities like Sebastopol in Sonoma County would be affected, either directly or by secondary impacts. More highly-populated areas may be affected sooner and may experience higher infection rates.
- The PIF) is a six-phased approach to defining the progression of an influenza pandemic. Phases 1 through 3 correlates with preparedness in the pre-pandemic interval, including capacity development and response planning activities, while Phases 4 through 6 signal the need for response and mitigation efforts during the pandemic interval.
- As of December 2021, Sonoma County had reported 43,440 active cases (8.53 percent of the County population); 414 people have died and 41,814 people have recovered (96 percent of the cases). Since the availability of the COVID-19 vaccine there was initially a sustained decline in new cases per 100,000 residents but recent increases likely due to the variants and changes in health and safety measures (approximately 7.3 new cases per day per 100,000 people vaccinated and approximately 30.6 new cases per day per 100,000 people unvaccinated). This results in a 2.9 percent positivity rate overall as of December 2021.
- Common communicable diseases in Sonoma County include Campylobacteriosis, Giardiasis, Lyme Disease, and Salmonellosis.
- Five lethal pandemics have occurred since the early 1900s: 1918-1919 Spanish Flu, 1957-1958 Asian Flu, 1968-1969 H3N2 Hong Kong Flu, 2009-2010 H1N1 Swine Flu, and the current COVID-19 novel coronavirus. Based on the five pandemics that have affected the United States in roughly the last 100 years, a pandemic occurs on average roughly every 20 years.
- There has been one state and one federal disaster declaration due to a pandemic that both occurred in 2020.
- Public health hazards can have varying levels of impacts on the City's population ranging from school and business closures, the interruption of basic services, such as public transportation, access to in-person health care, and the delivery of food and essential services.
- While public health hazards do not directly impact City buildings, critical facilities, or infrastructure, when disruptions related to public health hazards occur, they indirectly result in facilities being temporarily offline due to testing or other precautionary monitoring of downed systems. Cities and utilities may also postpone the delivery of essential services, such as water supply, electrical power, natural gas, or other community lifelines.
- Overall, the significance of public health hazards is **High.**

4.4.2 Hazardous Material Releases

Hazard Description

Generally, a hazardous material is a substance or combination of substances which, because of quantity, concentration, or physical, chemical, or infectious characteristics, may either cause or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. Hazardous materials may also pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous material incidents can occur while a hazardous substance is stored at a fixed facility, or while the substance is being transported along a road corridor or railroad line or via an enclosed pipeline or other linear infrastructure.

The U.S. Department of Transportation (DOT), U.S. Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) all have responsibilities relating to the transportation, storage, and use of hazardous materials and waste. The Right-to-Know Network (RTK

NET), maintained by the U.S. EPA's National Response Center (NRC), is a primary source of information on the use and storage of hazardous materials, as well as data regarding spills and releases. The California EPA and Department of Toxic Substances Control (DTSC) are authorized by the U.S. EPA to enforce and implement federal hazardous materials laws and regulations within the state. At the local level, Sonoma County's Fire Prevention Division and Hazardous Materials Division (also known as Permit Sonoma) is the approved CUPA responsible for administration of permitting, inspections, and enforcement for hazardous waste and hazardous materials programs. The CUPA administers the Hazardous Material Business Plan (HMBPs), California Accidental Release Prevention (Cal-ARP) program, and the Aboveground Storage Act, as well as permitting and inspection activities for hazardous waste generators, and onsite hazardous waste treatment facilities, and underground storage tanks. The City of Sebastopol Fire Department also maintain annual reports on hazardous material incidents.

Hazardous materials can be divided into the following classes:

- Explosives
- Compressed gases: flammable, non-flammable compressed, poisonous
- Flammable liquids: flammable (flashpoint below 141 degrees Fahrenheit) combustible (flashpoint from 141 - 200 degrees)
- Flammable solids: spontaneously combustible, dangerous when wet
- Oxidizers and organic peroxides
- Toxic materials: poisonous material, infectious agents
- Radioactive material
- Corrosive material: destruction of human skin, corrodes steel

It is common to see hazardous materials releases as escalating incidents resulting from other hazards such as floods, wildfires, and earthquakes. The release of hazardous materials can complicate or even eclipse the response to the natural hazards disaster that caused the spill.

The Safety Element of the *2016 Sebastopol General Plan* contains goals, policies, actions, and an implementation program pertaining to hazardous materials. Additionally, Sonoma County has prepared and adopted the Sonoma County *Operational Area Hazardous Materials Incident Response Plan*, in accordance with the California Health and Safety Code (HSC) (Division 20, Chapter 6.95, §25500 et seq.) and California Code of Regulations (CCR) (Title 19, Article 3, §2270 et seq.). This plan describes the policies and procedures relating to hazardous materials emergency response throughout Sonoma County and is reviewed and updated every three years.

Location

Limited – Hazmat incidents can occur at a fixed facility or during transportation. Hazardous materials facilities are identified and mapped by the counties they reside in, along with the types of materials stored there; facilities generally reside in and around communities. The Sebastopol Fire Department and Hazardous Materials Division manages the prevention, control and mitigation of dangerous conditions related to hazardous materials and enforces state and local laws regulating the storage, use, dispensing and handling of hazardous materials. The Division is responsible for the enforcement of the regulatory-based HMBP Program, Hazardous Waste Program, Underground Storage Tank Program, Above Ground Petroleum Storage Tank Program, Accidental Release Program, and the portions of the California Fire Code that address hazardous materials. Inspections of businesses are conducted on a routine basis, and the Division.

Under Chapter 6.95 of the California HSC and the Federal Resource Conservation and Recovery Act (RCRA), any business storing quantities of hazardous materials greater than 55 gallons of liquid, 500 pounds of solid or 200 cubic feet of some compressed gasses must file a HMBP annually that establishes

incident prevention measures, hazardous material handing protocols and emergency response and evacuation procedures.

The California Accidental Release Prevention (CalARP) Program is a statewide initiative to reduce the likelihood and severity of consequences of extremely hazardous materials releases. CalARP requires certain facilities (referred to as "stationary sources") which handle specified chemicals (termed "regulated substances") to take specified actions to proactively prevent and prepare for chemical accidents. Because the CalARP program is implemented at the local government level by the CUPAs, they can work directly with regulated facilities. The Sebastopol Fire Department administers CUPA at the local level and provides response and mitigation services to the City.

Some facilities contain extremely hazardous substances; these facilities are required to generate Risk Management Plans (RMPs) and resubmit these plans every five years. According to the RTK NET, there are no industrial facilities that use large amounts of hazardous substances to file a RMP in the City of Sebastopol (RTK NET 2019).

In transit, hazardous materials generally follow major transportation routes, including road, rail and pipelines, creating a risk area immediately adjacent to these routes. The City's nearby transportation network, primarily SR 116, has the potential for hazardous material incidents. Railroad lines and the Charles M. Schulz Sonoma County Airport north of Santa Rosa may also transport hazardous materials.

According to the Federal Motor Carrier Safety Administration and the National Hazardous Materials Route Registry, U.S. Highway 101 running east of Sebastopol in Santa Rosa is a designated as a hazardous materials route. However, local deliveries of hazardous materials can be found on any of the City's major roads, such as SR 116.

Hazardous materials releases can also result from natural disasters, such as floods or earthquakes that may cause containment systems to fail. In summary, hazardous material incidents have the potential to occur in business and industrial areas (where fixed facilities are located). Often these facilities are concentrated in the Planning Area due to their manufacturing operations. Hazardous material incidents are also located in agricultural areas surrounding the Planning Area; these types of facilities typically use pesticides, fertilizers, and other agricultural chemicals that are harmful to people and the environment. Illegal drug operations and dumping sites have also been known to pose a hazardous threat.

Lastly, pipelines can transport large quantities of hazardous materials. The National Pipeline Mapping System (NPMS) shows the approximate location of a gas transmission pipeline passing through the City, primarily transporting gas or fuels. There are no hazardous liquid pipelines passing through the City, nor are there any near the City (NPMS 2020).

Extent (Magnitude/Severity)

Negligible – Hazardous materials come in the form of explosives, flammable and combustible substances, poisons and radioactive materials. Hazards can occur during production, manufacturing, storage, transportation, use, or disposal. Numerous factors influence the impacts of a hazardous materials release, including method of release, the type of material, location of release, weather conditions, and time of day. This makes it difficult to predict precise impacts. Impacts from hazardous waste releases can include:

- Injury
- Loss of life (human, livestock, fish and wildlife)
- Evacuations
- Property damage
- Air pollution
- Surface or ground water pollution/contamination

- Interruption of commerce and transportation

CAL FIRE notes several additional factors that can contribute to the impact of hazardous materials releases from a fixed facility or transportation incident:

- Solid, liquid, and/or gaseous hazardous materials can be released from fixed or mobile containers either accidentally or on purpose.
- The resulting release can last for hours or for days.
- The substances released may be corrosive or otherwise damaging over time, and they may cause an explosion and/or fire.
- Contamination may be carried out of the incident area by people, vehicles, water, and/or wind.
- Weather conditions will directly affect how the hazard develops.
- The micrometeorological effects of buildings and terrain can alter travel and duration of agents.
- Shielding in the form of sheltering in place can protect people and property from harmful effects.
- Noncompliance with fire and building codes as well as failure to maintain existing fire protection and containment features can substantially increase the damage from a hazardous materials release.

The release or spill of hazardous materials also requires different emergency response depending on the amount, type, and location of the spill incident.

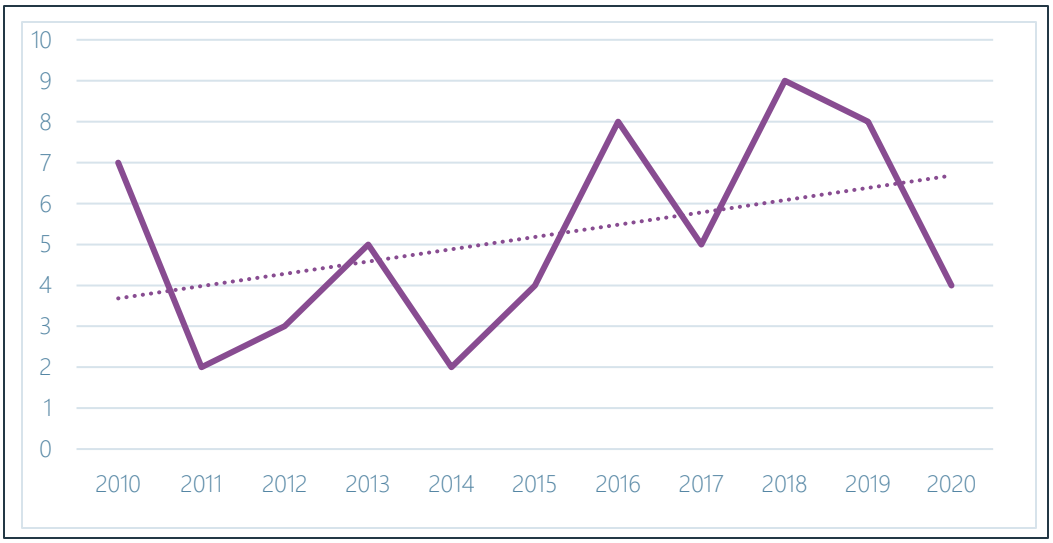
The Planning Area has energy pipelines, nearby railroad tracks which carry many types of hazardous materials, and state highways running through its boundaries. A variety of hazardous materials originating in the Region or elsewhere are transported along these routes and could be vulnerable to accidental spills. Consequences can vary depending on whether the spill affects a populated area versus an unpopulated but environmentally sensitive area.

Potential losses can vary greatly for hazardous material incidents. For even a small incident, there are cleanup and disposal costs. In a larger scale incident, cleanup can be extensive and protracted. There can be deaths or injuries requiring doctor's visits and hospitalization, disabling chronic injuries, soil and water contamination can occur, necessitating costly remediation. Evacuations can disrupt home and business activities. Large-scale incidents can easily reach $1 million or more in direct damages.

Previous Occurrences

The City experiences multiple hazardous materials incidents every year. The vast majority of these incidents are minor with very localized impacts. The Cal OES Warning Center reported 57 hazardous materials incidents in Sebastopol from 2010 through 2020; this works out to an average of 5.18 incidents per year. Even this total likely excludes a large number of unreported minor spills. Figure 4-44 below shows the number of incidents within the City limits reported to Cal OES over the last 10 years. These hazardous material spills consisted of varying quantities of fuels, hydraulic fluids, diesel oil, point, gasoline, transformer oil, chlorinated hydrocarbons, winery waste, mineral oil, and sewage. While the number of incidents can vary considerably from year to year, the number of hazardous materials spills or accidents in the City has remained steady over the last 10 years. This is in contrast to the statewide trend, which has seen hazardous materials incidents increase by 30 percent during the same time period.

Figure 4-44: Hazardous Materials Incidents in Sebastopol Reported to Cal OES: 2010-2020



Source: Cal OES Spill Release Reporting (https://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials/spill-release-reporting), analysis by Wood

The majority of hazardous materials incidents have only minimal life safety impacts. Of the 57 incidents reported above, only one (2 percent) resulted in any injuries and fatalities. Some incidents did result in temporary evacuations. This translates to an average of one damaging hazardous materials incident roughly every three years. In all, Cal OES recorded one injury, no fatalities, and 16 evacuations associated with the 57 incidents (Cal OES 2021).

The Toxic Release Inventory (TRI) is a resource for learning about toxic chemical releases and pollution prevention activities by industrial and federal facilities. Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) created the TRI program. According to the TRI database, there were four facilities within 10 miles of Sebastopol that have produced or managed approximately 40,394 pounds of waste at the TRI facilities in the vicinity (US EPA 2021). These facilities dispose, treat, recover, and recycle various types of waste and chemicals and ultimately "release" the waste or chemicals into the air or water, or some form of land disposal.

Probability of Future Occurrence

Likely – The City experiences anywhere from five to twenty reportable hazardous materials incidents per year, with various degrees of impact; there is effectively a 100 percent chance that the City will see a hazardous materials incident in any given year. However, hazardous materials incidents that cause deaths, injuries, or evacuations are rarer, occurring once every three years on average. These can occur at any time and with little predictability given the presence of major transportation routes in the City's Planning Area.

Climate Change Considerations

There are no known effects of climate change on human-caused hazards, such as hazardous material incidents. However, hazmat incidents may indirectly increase the risk by increasing the frequency, severity, or range of other hazards, such as severe storms or fires. It is possible that an increase in these other hazards may increase the likelihood of an accidental hazardous materials release.

Vulnerability Assessment

Property

The impact of a fixed hazardous facility, such as a chemical processing facility, will likely be localized to the property where the incident occurs. The impact of a small spill (i.e. liquid spill) may also be limited to the extent of the spill and remediated if needed. A blanket answer for potential impacts is hard to quantify, as different chemicals may present different impacts and issues. Property within a half mile in either direction of designated hazardous materials routes are at increased risk of impacts. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to property.

People

People living near hazardous facilities in the Planning Area may be at a higher risk of exposure, however; few people live near these facilities as most industrial land uses are sited away from residential land uses. Still, people living downstream and downwind from a hazardous material facility (or hazardous material release) could be more vulnerable. For example, a toxic spill or a release of an airborne chemical in a populated area like the City could have a greater potential for loss of life, particularly if is spreads towards residential areas surrounding the downtown area. In addition to the immediate health impacts of releases, studies have found long term health impacts such as increased incidence of certain cancers and birth defects among people living near certain chemical facilities. However, there has not been sufficient research done on the subject in the Planning Area to support detailed analysis.

Critical Facilities and Infrastructure

Impacts from hazardous material incidents on critical facilities would be localized. That is, they will be limited to the area or facility where they occurred, such as at a transit station, airport, fire station, hospital, or railroad. Whereas hazardous material incidents to major transportation infrastructure would be localized to some extent, they may also be further reaching if they result in major delays in the movement of goods and services and if they result in long-term traffic delays and road closures. These incidents would be more severe if they result in traffic delays or road closures along SR 116.

Economy

The primary economic impact of hazardous material incidents result in lost business, delayed deliveries, property damage, and potential contamination. Large and publicized hazardous material-related events can deter tourists and recreationists too. If incidents occur along major transportation corridors, they can temporarily close routes and result in traffic delays. Economic effects from major transportation corridor closures can be significant.

Historic, Cultural, and Natural Resources

Hazardous material incidents may affect a small area at a regulated facility or cover a large area outside such a facility. Widespread effects occur when hazardous materials contaminate the groundwater and eventually the municipal water supply, or they migrate to a major waterway or aquifer. These types of widespread events may be more likely to occur during a transportation incident.

Future Development

The City anticipates the greatest growth in the downtown area. Future development in central Sebastopol is close to major roads and local thoroughfares, as well as some operations that are known to store, handle, and transport hazardous materials. As a result, future development would be exposed to potential

hazardous material releases to some extent. Careful review and management of HMBPs and implementation of Hazardous Materials Incident Response Plans during events should minimize risks.

Risk Summary

- There are no RMP facilities located within the City limits, but there are four TRI facilities within 10 miles of Sebastopol that have produced or managed approximately 40,394 pounds of waste.
- Over the last 10 years the City has averaged 5.18 hazardous materials incidents per year. Hazardous materials incidents that cause deaths, injuries, or evacuations are far rarer, occurring 1.6 times per year.
- One gas transmission pipeline transports gas or fuels across the City; however, there are no hazardous liquid pipelines passing through the City, nor are there any near the City.
- Incidents at hazardous facilities will likely be localized to the property where the incident occurs.
- People living near, downstream, or downwind of hazardous facilities could be more vulnerable to airborne or water quality related contamination associated with a hazardous material incident.
- Hazardous materials releases can complicate response to and recovery from natural disasters such as foods and earthquakes.
- Hazardous Materials incidents can cause injuries and fatalities, as well as long term health problems like increased cancer risks.
- Impacted properties and infrastructure can require cleanup, but the effects are usually localized to the site of the release.
- Extended road closures can result in economic losses and impact tourism.
- Overall significance level for hazardous materials is **Low.**

4.5 Hazard Summary

Table 4-39 summarizes the results of the hazard identification and hazard profiles for the Planning Area based on the hazard identification data and input from the HMPC. For each hazard profiled in Section 4.2 on natural hazards and in Section 4.3 on human-health and human-caused hazards, this table includes the likelihood of future occurrence and whether the hazard is considered a priority hazard for the Planning Area.

Table 4-39: Hazard Identification and Determination of Priority Hazard

Hazard	Priority Hazard
Natural Hazard	
Earthquake	Yes
Flooding	Yes
Wildfire	Yes
Drought	Yes
Dam Incidents	No
Severe Weather: Extreme Heat	Yes
Severe Weather: Heavy Rain/Thunderstorm/ Hail/Lightning/Dense Fog	Yes
Severe Weather: Winds	Yes
Human-Caused Hazards	
Public Health Hazards	Yes
Hazardous Material Releases	No

Source: HMPC 2021

The HMPC determined that earthquake; flooding; wildfires; drought; heavy rain, thunderstorms, hail, lightning, and high winds; and public health hazards are the most significant hazards in the Planning Area. These hazards have also been categorized as priority hazards by the HMPC regarding the development of mitigation strategies.

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5 Mitigation Strategy

44 U.S. CFR Requirement §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the process to develop the mitigation strategy and mitigation action plan for the City of Sebastopol Local Hazard Mitigation Plan (LHMP) update. It describes how the City met the requirements for the Federal Emergency Management Agency (FEMA) 10-step planning process. This chapter specifically discusses:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the participation of the Hazard Mitigation Planning Committee (HMPC) led to the action plan documented in Section 5.3 Mitigation Action Plan. Taking all the above into consideration, the HMPC developed the following overall mitigation strategy:

- **Communicate** the hazard information collected and analyzed through this planning process so that the community better understands what can happen where and what they can do to be better prepared.
- **Implement** the action plan recommendations of this plan.
- **Use** existing rules, regulations, policies, and procedures already in existence.
  - Given the flood hazards in the Planning Area, an emphasis should be placed on continued compliance with the National Flood Insurance Program (NFIP) and possible future participation in the Community Rating System (CRS).
- **Monitor** multi-objective management actions so that funding opportunities may be shared, projects may be packaged, and broader constituent support may be garnered among neighboring communities.

5.1 Goals and Objectives

Requirement §201.6(c)(3)(i): The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals and mitigation actions were developed based on these tasks. The HMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section.

During the initial goal-setting meeting, the HMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and the ultimate mitigation strategy for the City of Sebastopol Planning Area.

5.1.1 Goals Development Process

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- Are time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation cost, schedule, and means. Goals are defined before considering how to accomplish them so that they are not dependent on the means or cost of achievement. The goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

During the planning process, HMPC members were given a list of sample goals to consider from the California 2018 State Hazard Mitigation Plan (SHMP), the 2010 City of Sebastopol LHMP Annex to the Association of Bay Area Government's (ABAG) *Taming Natural Disasters* regional multi-jurisdictional LHMP for the Bay Area, City of Sebastopol General Plan Safety Element, and the 2016 Sonoma County Operational Area HMP. They were also provided a list of goal statements from neighboring city and county hazard mitigation plans (e.g. City of Santa Rosa LHMP). They were told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind. The HMPC participated in a virtual meeting and were asked to write or revise a goal statement and share it in the meeting chat room. Goal statements were reviewed and grouped into similar themes and discussed during the meeting. The goal statements from the HMPC were reviewed until the team came to consensus. Some of the statements were determined to be better suited as objectives or actual mitigation actions and were set aside for later use by the City.

5.1.2 Objectives Development Process

Next, the HMPC was asked whether they wanted to develop objectives that summarized strategies to achieve each goal. The HMPC agreed they would consider the development of objective statements as part of the goal development process and refine the objectives during review of the Draft LHMP. The HMPC also reviewed the General Plan Safety Element to look for opportunities to align the Safety Element with the LHMP goals and objectives, and vice versa. The HMPC revisited the goal statements prepared and categorized during the third HMPC meeting. During this meeting, the Wood team explained that Wood staff and the City's Planning Department and Fire Department reviewed each goal, provided minor edits, and removed duplicate goal statements. The draft goals focus on loss of life and property prevention, resilience of the natural and built environment, emergency response coordination, public education, and plan implementation.

Based on the risk assessment review and goal setting process, the HMPC identified the following four goals, which provide direction for reducing future hazard-related losses within the City of Sebastopol Planning Area.

- **Goal 1:** Minimize new development in hazard-prone areas.
- **Goal 2:** Minimize hazard impacts on existing development.
- **Goal 3:** Build resiliency in the community and build capacity against hazards in the City.
- **Goal 4:** Improve infrastructure and lifeline resiliency and redundancy against disruption and interruption.

5.1.3 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the vulnerability assessment, and the mitigation strategy will be used by the City to help inform updates and the development of local plans, programs and policies. The City Planning Department may use this information when updating the

General Plan Safety Element, the Building Department may use the hazard information when reviewing site plans included in residential and commercial development applications, and the Public Works Department may utilize the hazard information when implementing the City's Capital Improvement Program (CIP). The City should also incorporate information in this LHMP into future updates to the City's park and recreation plans. Information may include hazard profile information on climate change impacts and the incorporation of climate change adaptation strategies into other local and regional plans and outreach programs. The City will also incorporate this LHMP into the Safety Element of the General Plan, in accordance with California's Assembly Bill (AB) 2140.

Lastly, the HMPC representatives report on efforts to integrate the LHMP into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

5.2 Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 Identifying Hazards: Natural Hazards was evaluated, as well as human-caused and human-health hazards identified in Section 4.4 Human-caused and Human-health Hazards. Only those hazards that were determined to be a priority hazard were considered further in the development of hazard-specific mitigation actions.

The natural hazards in order of priority level are:

- Earthquake
- Flood: 100/200/500-Year
- Wildfire
- Drought
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains/Thunderstorms/Hail/Lightning/Dense Fog
- Severe Weather: High Winds
- Dam Incidents

Hazardous materials incidents (releases from a fixed facility or transportation accidents) and public health hazards were also identified by the HMPC as priority hazards, as noted in Section 4.4 Human-Health and Human-Caused Hazard Profiles. Climate change impacts are qualitatively discussed in each hazard profile section. Public Safety Power Shutoffs (PSPS), commonly associated with high wind and wildfire events, are addressed by the Severe Weather: High Wind actions as secondary impacts.

Once it was determined which hazards warranted the development of specific mitigation actions, the HMPC analyzed viable mitigation options that supported the identified goals and objectives. The HMPC was provided with the following list of categories of mitigation actions, which originate from the Community Rating System (CRS):

- **Prevention**: Administrative or regulatory actions or processes that influence the way land and buildings are developed and built to reduce hazard losses. This includes planning and zoning, floodplain regulations, capital improvement programs, open space preservation, and stormwater management regulations.

- **Property Protection**: Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area. This includes acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- **Structural**: Actions that involve the construction of structures to reduce the impact of a hazard.
- **Natural Resource Protection**: Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. This includes dams, levees, floodwalls, and retaining walls.
- **Emergency Services**: Actions that protect people and property during and immediately after a disaster or hazard event. This includes warning systems, emergency response services, and the protection of essential facilities.
- **Public Information/Education and Awareness**: Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. This includes outreach, real estate disclosure, hazard information kiosks, and education programs.

At the mitigation strategy meeting the HMPC was provided with a matrix showing examples of potential mitigation action alternatives for each of the above categories, for each of the identified hazards. The HMPC was also provided a handout that explains the categories and provided further examples. Another reference document titled "Mitigation Ideas" developed by FEMA was distributed to the HMPC during the mitigation strategy meeting, as well as FEMA's more recent publication, "Mitigation Action Portfolio." The document lists the common alternatives for mitigation by hazard, and the second document introduces the National Mitigation Investment Strategy for advancing mitigation investment to reduce risks and increase the nation's resilience to natural hazards, where the portfolio showcases mitigation projects to provide practitioner's with examples of activities that integrate the Investment Strategy's goals. The HMPC was instructed to consider both future and existing buildings in considering possible mitigation actions.

The HMPC was also asked to consider possible climate adaptation strategies in order comply with California Government Code Section 65302 subsection (g)(4). This code section addresses Senate Bill 379 requirements related to the probable consequences of climate change and assessing how climate change may affect critical facilities, infrastructure, and land uses. Additionally, the HMPC was provided the California Adaptation Planning Guide (APG) that provide guidance to support communities in addressing the consequences of climate change. Specific climate adaptation strategies were discussed as they relate to the priority natural hazards. The HMPC also discussed which mitigation actions and strategies should be pursued first to address immediate community needs.

A facilitated discussion took place to examine and analyze the options. Appendix C provides the matrix of alternatives considered. Each proposed action was shared during the meeting discussion and through the virtual chat room, and later organized by the hazard it addressed.

5.2.1 Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- **Social:** Does the measure treat people fairly? (e.g., social equity, different groups, different generations)
- **Technical:** Is the action technically feasible? Does it solve the problem?
- **Administrative:** Are there adequate staffing, funding, and other capabilities to implement the project?
- **Political:** Who are the stakeholders? Will there be political and public support for the project?
- **Legal:** Does the jurisdiction have the legal authority to implement the action? Is it legal?

- **Economic:** Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- **Environmental:** Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

The HMPC also discussed prioritizing actions that focus on climate adaptation, social equity, and community resiliency. They reviewed planning materials and tools designed to assist local communities in the development of climate adaptation and social equity goals and strategies.

In accordance with the Disaster Mitigation Act requirements (44 CFR , Section 201.6(c)(3)), an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. As part of this evaluation, the benefits of proposed actions were weighed against estimated costs as part of the prioritization process. Other criteria used to assist in evaluating the benefit-cost of a mitigation action included:

- Does the action address priority hazards or areas with the highest risk?
- Does the action protect lives?
- Does the action protect infrastructure, community assets or critical facilities?
- Does the action meet multiple objectives (Multiple Objective Management)?
- What will the action cost?
- What is the timing of available funding?

The mitigation categories, multi-hazard actions, and criteria are included in Appendix C: Mitigation Strategies.

At the mitigation strategy meeting the HMPC used STAPLEE to determine which of the identified actions were most likely to be implemented and effective. With these criteria in mind, team members later re-prioritized the mitigation actions through an electronic polling exercise with the above criteria in mind, essentially voting on the projects. The electronic survey poll was completed based on additional mitigation action ideas and worksheets received after the third HMPC Meeting. In summary, the projects with the most points became the higher priority projects. This process provided both consensus and priority for the recommendations.

The process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to collectively prioritize recommended mitigation actions. During the polling process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. Benefit-cost was considered in greater detail in the development of the Mitigation Action Plan detailed below in Section 5.3. For example, parameters were established for assigning subjective ratings (high, medium, low) to the benefits and costs of each mitigation action. Specifically, each action developed for this plan contains a description of the problem and proposed project, the entity with primary responsibility for implementation, any other alternatives considered, a cost estimate, expected project benefits, potential funding sources, and a schedule for implementation. Development of these project details for each action led to the determination of an overall high, medium, or low priority for each action.

Recognizing the limitations in prioritizing actions from multiple departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the HMPC decided to pursue mitigation action strategy development and implementation according to the nature and extent of damages, the level of protection and benefits each action provides, political support, project cost, available funding, and jurisdiction and department priority. This process guided the development of a prioritized action plan for the City of Sebastopol. Cost-effectiveness will be considered in greater detail through a formal benefit-cost analysis when seeking FEMA mitigation grant eligibility and funding (e.g.

Hazard Mitigation Grant Program, Pre-Disaster Mitigation grant program) for eligible actions associated with this plan.

5.3 Mitigation Action Plan

Requirement §201.6(c)(3)(iii): The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the HMPC for how the City of Sebastopol can reduce the vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Over time, the implementation of these projects will be tracked as a measure of demonstrated progress on meeting the plan's goals.

5.3.1 Progress on 2010 City of Sebastopol LHMP Annex Mitigation Actions

The City of Sebastopol has been implementing actions identified in the City of Sebastopol LHMP Annex developed and last updated by the ABAG in 2010 and working steadily towards meeting the 2010 plan goals based on funding and staff availability. During the 2020 – 2021 LHMP update process the City reported on the status of the 2005 and 2010 actions. The City provided input on whether the action had been completed, was deferred (not yet implemented, but still relevant for the updated plan), was in progress, or should be deleted.

For this 2020 – 2021 LHMP update, new flood hazard, landslide, drought, and wildfire mitigation actions were developed, and nine of the ten of the mitigation strategies from the 2010 LHMP Annex were carried forward into the 2020 – 2021 LHMP. This includes four mitigation actions related to earthquake hazards, one mitigation action associated with para-transit response, two mitigation actions related to improved and back-up radio communications, two mitigation actions associated with critical facility inspections, and one mitigation action focused on the EOP update.

A mitigation action focused on seismic retrofits and specifically an investigation of financial, procedural, and land use incentives for private owners of soft-story buildings to conduct retrofits was deleted. The City previously proposed preparing a seismic retrofit ordinance for City Council consideration in 2013, but this ordinance never materialized and was not proposed to the City Council for adoption. None of the previous mitigation actions have been completed, but two of the nine mitigation actions are in progress. Details on the progress of the existing actions since the 2010 LHMP Annex planning process can be found in Section 5.3.3 and Table 5-1 below.

5.3.2 Continued Compliance with National Flood Insurance Program

Recognizing the importance of the National Flood Insurance Program (NFIP) in mitigating flood losses, an emphasis will be placed on continued compliance with the NFIP by the City of Sebastopol. As a NFIP participant, Sebastopol will continue to make every effort to remain in good standing with NFIP. This includes continuing to comply with the NFIP's standards for updating and adopting floodplain maps and maintaining and updating the floodplain regulations. Other details related to NFIP participation are discussed in the flood vulnerability discussion in Chapter 4 and in the capability assessment in Chapter 2. Additional actions are related to possible future participation with the CRS program.

5.3.3 Mitigation Action Plan

This action plan presents the recommendations developed by the HMPC outlining how the City of Sebastopol can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. The mitigation actions developed by the HMPC are summarized in Table 5-1 and listed in detail in the mitigation action worksheets that follow. Table 5.1 is a summary table for quick reference. It identifies the mitigation action title, lead agency/department, hazards mitigated, priority and if the action mitigates losses to existing or future development. The 'Related Goal' column notes which of the four goals in Section 5.2 that the action helps achieve. The action worksheets that follow provide more background information, ideas for implementation, lead agency, partners, potential funding sources, cost estimates, benefits, and timeline for each identified action.

The City of Sebastopol has other existing, detailed action descriptions in planning documents, such as General Plan Safety Element, CIP, and other planning mechanisms. These actions are considered to be part of this plan, and the details, to avoid duplication, should be referenced in their original source document. The HMPC also realizes that new needs, priorities, and adaptation strategies may arise as a result of a disaster or other circumstances and reserves the right to support new actions and strategies, as necessary, as long as they conform to the overall goals of this plan.

The actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The City is not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the City, the HMPC, and the community to mitigate the risks and vulnerabilities from identified hazards.

Many of the action items included in this plan are also a collaborative effort among City of Sebastopol departments, Sonoma County, the City of Petaluma, Planning Commission, the Sebastopol Senior Center, and other state, regional, and local agencies and stakeholders in the City of Sebastopol Planning Area.

Table 5-1: Mitigation Action Summary Table

Action ID	Action Title	New Action/2010 Action	Hazard(s) Mitigated	Responsible Office / Agency	Address Existing or Future Development	Priority	Related Goal
			Earthquake				
E-1	Inventory soft-story structures in the City and provide notification to property owners of the findings of those inspections	2010 Action	Earthquake	Building Department	Both	High	1, 2, 3
E-2	Inventory all non-ductile concrete, concrete tilt-up, and other suspicious building in the City	2010 Action	Earthquake	Building Department	Both	High	1, 2, 3
E-3	Use both the non-ductile concrete and concrete tilt-up inventory and the soft-story inventory to recommend private owners to inform existing tenants (and prospective tenants prior to signing a lease agreement) that they live in this building type	2010 Action	Earthquake	Building Department	Both	Low	1, 2, 3
E-4	Adopt incentives to encourage retrofitting of privately-owned seismically vulnerable residential buildings	2010 Action	Earthquake	Building Department	Both	Medium	1, 2, 3
E-5	Hillside Slope Stabilization Project at Burbank Farm	New	Earthquake, Landslide	Public Works Department	Both	Low	1, 2, 3, 4
			Flood				
F-1	Temporary Flood Protection for the Sebastopol Community Cultural Center Main Hall	New	Flood	Engineering Department	Both	High	1, 2, 3, 4
F-2	Housing Replacement and Recreation Easement Project at the Park Village Property	New	Flood	Planning Department	Both	High	1, 2, 3, 4
F-3	Repetitive Loss Area Analysis	New	Flood	Building Department	Both	Medium	1, 2, 3, 4
F-4	Consider joining Community Rating System Program	New	Flood	Building Department	Both	Low	1, 2, 3, 4

Action ID	Action Title	New Action/2010 Action	Hazard(s) Mitigated	Responsible Office / Agency	Address Existing or Future Development	Priority	Related Goal
F-5	Participation in the FEMA Sea Level Rise Study	New	Flood	Planning Department	Both	High	1, 2, 3, 4
F-6	Sebastopol Community Cultural Center Main Hall Flood Mitigation Alternative Implementation	New	Flood	Planning Department	Both	High	1, 2, 3, 4
F-7	Ives Park Calder Creek Daylighting and Stormwater Improvement and Green Infrastructure Project	New	Flood	Public Works Department / Planning Department	Both	Medium	1, 2, 3
Wildfire							
W-1	Promote Wildfire-Resistant Construction Materials for New Construction in the City	New	Wildfire	Building Department	Both	High	1, 2, 3, 4
W-2	Develop a Tree Ordinance that requires defensible space maintenance and promotes healthy landscapes	New	Wildfire	Fire Department	Both	High	1, 2, 3, 4
W-3	Develop a Sebastopol Community Wildfire Protection Plan	New	Wildfire	Fire Department	Both	High	1, 2, 3, 4
Drought							
D-1	Continue participation in the Groundwater Sustainability Agency and support future project-specific groundwater management projects related to the City's water system	New	Drought	Engineering Department	Both	Medium	1, 2, 3, 4
D-2	Build resiliency in the City's water conveyance system by upgrading and replacing water line infrastructure	New	Drought	Public Works Department	Existing	High	1, 2, 3, 4
D-3	Enhance the City's local drought contingency plan to focus on	New	Drought	Public Works Department	Existing	Low	1, 2, 3, 4

Action ID	Action Title	New Action/2010 Action	Hazard(s) Mitigated	Responsible Office / Agency	Address Existing or Future Development	Priority	Related Goal
	additional water conservation measures						
D-4	Conduct a City-wide Facility Energy and Water Audit	New	Drought	Public Works Department	Existing	Medium	3, 4
Dam Incidents							
DI-1	Participate in the Emergency Action Plan for Warm Springs Dam	New	Dam Incidents	Fire Department	Both	Medium	1, 2, 3, 4
Extreme Heat							
EH-1	Identify locations for Sebastopol Designated Cooling Centers and including the locations in updated outreach information	New	Extreme Heat	Fire Department	Existing	Medium	1, 2, 3, 4
Severe Weather: Heavy Rain/Thunderstorms/Lightning/Dense Fog							
SW-1	Upgrade emergency back-up power generation for essential areas of the public safety building	New	Severe Weather; Multi-Hazard	Public Works Department	Both	Low	1, 2, 3, 4
Severe Weather: High Wind							
HW-1	PSPS Readiness & Community Outreach Preparedness Program	New	Severe Weather: High Wind; PSPS, Wildfire	Fire Department	Both	Low	1, 3, 4, 5
HW-2	Inspect City-owned critical facilities and create a plan that corrects deficiencies and addresses infrastructure hardening and utility undergrounding to ensure resiliency to high winds and severe weather	New	Severe Weather: High Wind; PSPS; Wildfire; Multi-Hazard	Building Department	Existing	Low	1, 2, 3
Public Health Hazards							
PH-1	Pandemic Preparedness and Response Plan	New	Public Health Hazards: Epidemic/Pandemic	City Manager's Office	Both	Medium	1, 2, 3, 4
Multi-Hazard							

Action ID	Action Title	New Action/2010 Action	Hazard(s) Mitigated	Responsible Office / Agency	Address Existing or Future Development	Priority	Related Goal
M-1	Ensure that the Police and Fire Departments have adequate and interoperable radio communication systems and equipment to meet current technology requirements and to support first responders during response and recovery operations	2010 Action	Multi-Hazard, Earthquake, Flooding, Wildfire	Fire Department	Both	High	1, 2, 3
MH-2	Ensure that emergency operational plans meet SEMS and NIMS compliance and are adequate for federal and state response and recovery	New	Wildfire	Fire Department	Existing	High	1, 2, 3, 4
MH-3	Develop plans and procedures for Para-Transit system response and recovery from disasters that utilizes the Sonoma County Mutual Aid Program	2010 Action	Multi-Hazard, Earthquake, Flooding, Wildfire	Fire Department	Both	High	1, 2, 3, 4
MH-4	Update the City Emergency Operations Plan	New	Multi-Hazard	Fire Department	Both	High	1, 2, 3, 4
MH-5	Evacuation Route Plan	New	Earthquake, Flooding, Wildfire, Multi-Hazard	Fire Department	Both	High	1, 2, 3, 4

The following mitigation actions provide project specific information and implementation details on each mitigation activity identified. They are grouped by the type of hazard(s) they address.

E-1 Inventory soft-story structures in the City and provide notification to property owners of the findings of the inspections to promote participation in seismic retrofits

Mitigation Project Title	Inventory soft-story structures in the City and provide notification to property owners of the findings of the inspections to promote participation in seismic retrofits
Hazard(s) Mitigated	Earthquake
Project Description, Issue/Background	A soft-story or weak story floor, wood-frame building is a structure where the first story is substantially weaker and more flexible than the stories above due to lack of walls or frames at the first floor. Typically, these buildings contain large open areas for parking or commercial space such as restaurants or convenience stores on the first floor leaving the building vulnerable to damage in an earthquake. The inspections of soft-story buildings were conducted with the assistance of staff from the Association of Bay Area Governments (ABAG) after the adoption of the City's 2010 LHMP Annex and an inventory list was prepared for those buildings. Property owners were notified and advised that they should notify their tenants of the issues with these buildings. As of 2021, the City has no regulatory means to require tenant notification regarding the inspection process. As a result, the City modified this action to focus on voluntary seismic retrofits that seek to strengthen older buildings that contain a soft story condition often found in the lower levels.
Related planning mechanisms	General Plan Safety Element, Emergency Operations Plan
Other Alternatives	Mandatory Seismic Retrofit Program, Enhancing Local Building Ordinance
Responsible Office/ Agency	Building Department
Partners	None
Priority (High, Medium, Low)	High
Cost Estimate	> $150,000 depending on the building size and the level of the hazard and the needed seismic upgrade work needed in Sebastopol. Building owners will need to consult a licensed structural engineer or architect that specializes in seismic retrofits.
Benefits (Avoided Losses)	Performing a seismic upgrade of a soft story building will reduce the risk of collapse during an earthquake. This will prevent more people and businesses from being displaced.
Potential Funding	General Fund, Private financing options may be available
Schedule	2021 – 2026, Short-Term (1 to 5 years)

E-2 Inventory all non-ductile concrete, concrete tilt-up, and other suspicious buildings in the City

Mitigation Project Title	Inventory all non-ductile concrete, concrete tilt-up, and other suspicious building in the City
Hazard(s) Mitigated	Drought
Project Description, Issue/Background	Non-ductile concrete and concrete tilt-up buildings are concrete buildings built before 1980 that have poor seismic performance largely due to brittle concrete materials (columns, beams, walls, etc.) and lack of lateral reinforcement (steel beams, structural force-resisting systems, etc.), causing them to potentially fail without warning and result in the loss of human life, injury, and property damage. This failure was evident during the Northridge earthquake in 1994. The construction of non-ductile concrete buildings was common prior to the enforcement of modern seismic codes for ductile concrete in the mid-1970s, and the construction of non-ductile concrete buildings likely continued into the 1980s while the new seismic code requirements came into effect. This mitigation action involves the inventory of all non-ductile concrete buildings in the City of Sebastopol that should be subject to seismic retrofits.
Related planning mechanisms	Title 15 Building and Construction Code, Sebastopol Municipal Code
Other Alternatives	Mandatory Seismic Retrofit Program, Enhancing Local Building Ordinance
Responsible Office/ Agency	Building Department
Partners	None
Priority (High, Medium, Low)	High
Cost Estimate	$50,000 – $150,000 depending on the building size and the level of the hazard and the needed seismic upgrade work. Building owners will need to consult a licensed structural engineer or architect that specializes in seismic retrofits.
Benefits (Avoided Losses)	Completing a comprehensive inventory of non-ductile concrete buildings in the City will identify at-risk buildings and subsequent seismic retrofits will reduce the risk of collapse during an earthquake. This will prevent more people and businesses from being displaced.
Potential Funding	General Fund
Schedule	2021 – 2026, Short-Term (1 to 5 years)

E-3 Use both the non-ductile concrete and concrete tilt-up inventory and the soft-story inventory to recommend private owners to inform existing tenants (and prospective tenants prior to signing a lease agreement) that they live in building type

Mitigation Project Title	Use both the non-ductile concrete and concrete tilt-up inventory and the soft-story inventory to recommend private owners to inform existing tenants (and prospective tenants prior to signing a lease agreement) that they live in this building type
Hazard(s) Mitigated	Earthquake
Project Description, Issue/Background	This inventory has been partially completed to date. Concrete tilt-up buildings have been identified and inventoried, but the identification of other suspicious buildings and the soft-story inventory in the City will require engineering professionals to perform a complete inventory of all building in the City of Sebastopol. The City has also lacked funding for this mitigation project in the past. This project is focused on an effort to increase property owner and tenant safety in the City. Using information from the inspection inventory and subsequent engineering evaluations, this action will involve notification of affected property owners and the possible installation of other signate and warning information so that renters or tenants are aware that such a building may not be safe during an earthquake.
Related planning mechanisms	Title 15 Building and Construction Code, Sebastopol Municipal Code
Other Alternatives	Mandatory Seismic Retrofit Program, Enhancing Local Building Ordinance, Soft Story Ordinance
Responsible Office/ Agency	Building Department
Partners	None
Priority (High, Medium, Low)	Medium
Cost Estimate	$10,000 – $100,000
Benefits (Avoided Losses)	Notification of property owners and tenants will increase property and tenant safety and promote needed seismic retrofits that will reduce the risk of collapse during an earthquake.
Potential Funding	General Fund, FEMA HMA Grants
Schedule	2021 – 2026; Short-Term (1 to 5 years) Notification requirement can be phased in over 1-2 years following the building inventory

E-4 Adopt strategies to encourage retrofitting of privately-owned seismically vulnerable residential buildings

Mitigation Project Title	Adopt strategies to encourage retrofitting of privately-owned seismically vulnerable residential buildings
Hazard(s) Mitigated	Earthquake
Project Description, Issue/Background	Private property owners are responsible for the success and completion of needed seismic retrofits and it is important for jurisdictions like the City of Sebastopol to provide them information about a voluntary retrofit program, strategies for retrofits, voluntary steps or requirements, and financial incentives. To develop a successful voluntary seismic retrofit program a property owner needs to be notified that their buildings were identified in a soft-story concrete inventory and why retrofits are important. Notifications may alert owners that their buildings are vulnerable to collapse and may not meet standards. Second, the City will need to provide technical assistance that may include construction publications and educational materials on the need for seismic evaluations and information on where to find engineers and construction contractors to perform retrofits. The City may also train Building Department staff to provide plan review and advice on the incentives for retrofits and tools for financing improvements, such as property-assessed financing, (Open Property Assessed Clean Energy [PACE] program that includes seismic strengthening improvements), real estate transfer tax rebates, waivers for building permit fees, tax credits, tax reductions for historic properties, and private loans.
Related planning mechanisms	Title 15 Building and Construction Code, Sebastopol Municipal Code
Other Alternatives	Mandatory Seismic Retrofit Program, Soft Story Ordinance
Responsible Office/ Agency	Building Department
Partners	ABAG
Priority (High, Medium, Low)	Medium
Cost Estimate	> $100,000 to develop Incentive Program; $50,000 – $100,000 per building ($5,000 per unit)
Benefits (Avoided Losses)	Adoption of a seismic retrofit program will increase property and tenant safety and promote needed seismic retrofits that reduce the risk of collapse during an earthquake.
Potential Funding	General Fund, FEMA HMA Grants
Schedule	2021 – 2026; Short-Term (1 to 5 years) An incentive program can be phased in or developed based on a tier system that allows owners of certain building types more time to retrofit

E-1 Hillside Slope Stabilization Project at Burbank Farm

Mitigation Project Title	Hillside Slope Stabilization Project at Burbank Farm
Hazard(s) Mitigated	Earthquake, Landslide
Project Description, Issue/Background	A small section of the City of Sebastopol is susceptible to small landslides or mudslides and erosion following rain events. This hillside slope stabilization project is proposed along the southside of Bodega Avenue in between 7781 Bodega Avenue near Luther Burbank Experiment Farm and Pleasant Hill Road. The project will be designed to minimize potential erosion at along Bodega Avenue and rehabilitate the adjacent road conditions. This project is also related to the City's CIP focused on the rehabilitation of the adjacent bike lanes and road conditions, given the existing Class II bike lane only extends from Nelson Way-Gold Ridge Farm Road and ends before Virginia Avenue. The CIP project is needed to address paving deterioration and includes the construction of shoulder improvements on the south side of Bodega Avenue near Luther Burbank Experiment Farm.
Related planning mechanisms	General Plan Circulation Element, 5-Year Capital Improvement Program (FY 2021-22 to FY 2025-26), 2017 Pedestrian Crossings Safety Study for Bodega Way
Other Alternatives	None
Responsible Office/ Agency	Public Works Department
Partners	Metropolitan Transportation Commission (MTC)
Priority (High, Medium, Low)	Medium
Cost Estimate	$50,000 – $100,000
Benefits (Avoided Losses)	Slope stabilization will reduce potential erosion and instability concerns along Bodega Avenue that may be impacted during a rain or earthquake event. The project will also minimize potential impacts to vehicles and bicyclists travelling along the road.
Potential Funding	General Fund, One Bay Area Grant (OBAG)
Schedule	2021 – 2026; Short-Term (1 to 5 years)

F-1 Temporary Flood Protection for the Sebastopol Community Cultural Center Main Hall

Mitigation Project Title	Temporary Flood Protection for the Sebastopol Community Cultural Center Main Hall
Hazard(s) Mitigated	Flooding
Project Description, Issue/Background	The main hall for the Sebastopol Community Cultural Center (SCCC) is located in the 100-year flood plain and has flooded three times in the last 30 years. Significant effort over the past two decades has gone into trying to find another location for the main hall or funding sources to elevate the main hall building, and none of these alternatives have been successful. This mitigation action involves the implementation of temporary flood protection at the main hall building.
Related planning mechanisms	General Plan Safety Element
Other Alternatives	Over the last two decades a number of temporary damming and flood protection technologies have been developed and used successfully in many locations. A permanent alternative would involve the relocation or elevation of the building.
Responsible Office/ Agency	Engineering Department; Building Department, SCCC Board
Partners	SCCC Board
Priority (High, Medium, Low)	High
Cost Estimate	> $50,000 for Engineering Study of Temporary Flood Protection and Dams; Cost Estimates for Construction are underway
Benefits (Avoided Losses)	Avoided damage caused by flood events and lost revenue associated with the SCCC Main Hall closures during repair and rehabilitation work.
Potential Funding	General Fund, $1.1 Million Fund from State Allocation for Flood Damage
Schedule	2021 – 2026; Long-Term (> 5 years)

F-2 Housing Replacement and Recreation Easement Project at the Park Village Property

Mitigation Project Title	Housing Relocation and Recreation Easement Project at the Park Village Property
Hazard(s) Mitigated	Flooding
Project Description, Issue/Background	The City acquired the approximate 13-acre "Village Park" residential mobile home property at 6665 Sebastopol Avenue (State Highway 12) in 2007 with the long-term intention to convert the property into park and open space use. This property includes fixed mobile housing units (on foundations) and trailers located within a 5-acre portion of the site, and an approximate 8-acre portion that includes picnic tables, barbecues, and a short trail that makes up Tomodachi Park. The entire 13-acre site was renamed "Park Village" mobile home and Tomodachi Park are within the 100-year floodplain. The lower areas of the property are generally subject to annual flooding, but the entire site is at risk to major flood events. While the park improvements were designed to be compatible with flooding, the mobile homes on the property continue to be subject to continual flood risk. The lower most structures and campground have been removed, and the City has adopted a policy of converting permanent foundation mobile homes to truly mobile residential units that can be evacuated in the event of flooding (as was successfully done in accordance with its adopted Flood Plan in 2019 flood event). The 13-acre site is within the planning area of the City's Laguna de Santa Rosa Master Plan adopted in 1993. This plan serves as an overall guide for implementation of specific park development objectives that are compatible with the community's recreation desires, protection and enhancement of the Laguna de Santa Rosa, and regulatory requirements. The site plans are also based on the 2012 Village Park Feasibility and Planning Study that outlines design recommendations for the property. The Park Village and Tomodachi Park property occupies a prominent location at the entry way into Sebastopol. It is a gently sloping, riparian woodland with oak, willow, and ash forest and open grassland surrounding the mobile home sites. The wooded Laguna de Santa Rosa channel is located to the east. This mitigation project involves a plan to relocate the vulnerable residential housing out of the floodplain and create a recreation easement and restore habitat along the parcel that connects to existing recreational amenities to the north. The housing units would be proposed for relocation to affordable housing locations in the City through a separate planning and community engagement process.
Related planning mechanisms	General Plan Safety Element, 2012 Village Park Feasibility Planning Study, 1993 Laguna de Santa Rosa Park Master Plan
Other Alternatives	Other Flood Mitigation Projects, Non-Structural Projects

Responsible Office/ Agency	Planning Department
Partners	Sonoma County Agricultural Preservation and Open Space District, West County Community Services
Priority (High, Medium, Low)	High
Cost Estimate	$500,000 – $2,000,000
Benefits (Avoided Losses)	The replacement of fixed unit housing with mobile housing units, and the continued oversight and operation of the mobile home by a social service provider contracted with the City will ensure the City continues to provide adequate flood protection, which will minimize flood-related losses associated with property damage related to the housing in the mobile home property.
Potential Funding	General Fund, FEMA HMA Grants, BRIC Grants
Schedule	2021 – 2026; Long-Term (> 5 years)

F-3 Repetitive Loss Area Analysis

Mitigation Project Title	Repetitive Loss Area Analysis
Hazard(s) Mitigated	Flooding
Project Description, Issue/Background	The Barlow neighborhood consists of an outdoor market and shopping district in downtown Sebastopol that has a history of repetitive flooding. It flooded most recently in February 2019, and before that it flooded in January 2017, February 2004, 1995, 1986, and 1964. The objective of a Repetitive Loss Area Analysis (RLAA) is to help property owners in the neighborhood reduce their flood risk by providing a greater understanding of the flooding problem in their neighborhood and identifying solutions to the distress related to repetitive flooding. An RLAA will identify repetitive loss areas, discusses flooding issues and potential mitigation measures for homes and businesses located in the City's Barlow area, and discuss the most appropriate alternatives to reduce future losses.
Related planning mechanisms	General Plan Safety Element, Barlow Flood Plan, 2020 Barlow Flood Emergency Operation Plan
Other Alternatives	Floodplain Regulation Enforcement, Enhancing Building Codes and Development Standards, Building Elevation Certification, CRS Program Participation
Responsible Office/ Agency	Building Department
Partners	FEMA, Barlow Development Company
Priority (High, Medium, Low)	Low
Cost Estimate	< $50,000
Benefits (Avoided Losses)	Understanding flood risks, issues, and mitigation actions specific to the Barlow neighborhood would reduce repetitive losses related to flooding.
Potential Funding	FEMA HMA Grants, BRIC Grants
Schedule	2021 – 2026; Short-Term (1 to 5 years)

F-4 Consider joining Community Rating System Program

Mitigation Project Title	Consider joining Community Rating System Program
Hazard(s) Mitigated	Flooding
Project Description, Issue/Background	The CRS is a national program developed by FEMA under the NFIP. The City of Sebastopol participates in the NFIP and enforces floodplain regulations to monitor and regulate development in flood hazard zones in order to minimize flood damage to new development. While the NFIP is effective in requiring new buildings to be protected from damage by a one percent chance flood, flood damage still results from floods that exceed the base flood or from flooding in unmapped areas. Under the CRS, the City of Sebastopol can be rewarded for doing more than enforcing their floodplain regulations. Under the CRS, property owners are notified of the current hazards of living in a flood area and flood insurance premiums are discounted to reflect a community's work to reduce flood damage to existing buildings, manage development in areas not mapped by the NFIP, protect new buildings beyond the minimum NFIP protection level, and help people obtain flood insurance. This action would look at the cost/benefit of joining the CRS based on this plan and the findings from the RLAA and compare the findings to the number of flood prone properties and insurance policies in the City. Being in the CRS includes, but is not limited to public notification, community education classes, and other measures to raise awareness of flood hazards and promote flood safety. Actions would need to be documented to allow FEMA/ISO (Insurance Services Office) to determine the appropriate class rating. Severe repetitive loss properties could also pursue flood mitigation assistance grants designed to reduce flood exposure.
Related planning mechanisms	General Plan Safety Element, Sebastopol Municipal Code, Floodplain Ordinance
Other Alternatives	Continued NFIP Compliance
Responsible Office/ Agency	Building Department
Partners	None
Priority (High, Medium, Low)	Low
Cost Estimate	< $10,000
Benefits (Avoided Losses)	Reduction in flood insurance rates for the general public of the City of Sebastopol, greater understanding of flood hazards by City residents and business owners, better property protection, improved public safety
Potential Funding	FEMA HMA Grants, BRIC Grants
Schedule	2021 – 2026; Short-Term (1 to 5 years)

F-5 Participation in the FEMA Sea Level Rise Study

Mitigation Project Title	Participation in the FEMA Sea Level Rise Study
Hazard(s) Mitigated	Flooding, Sea Level Rise
Project Description, Issue/Background	FEMA is in the process of updating portions of Sonoma County's flood maps in 2021 to account for new hydraulic and hydrologic data and sea level rise projections. The new maps will identify the current flood hazards that help building officials and homeowners make effective mitigation decisions, which contribute to safety and more resilient communities. The new mapping study will also take into account climate change and sea level rise projections within the Russian River watershed, and the tidally-influenced Laguna Santa Rosa. Before the new Sonoma County Flood Insurance Rate Maps (FIRMs) become effective, there is an appeal period set for December 2021 where residents can review and appeal the flood risk information. FEMA anticipates adopting the new FIRMs in Summer 2022 and they become effective in 2023. While these FIRMS are preliminary drafts, the proposed base flood elevation (BFE) is proposed to rise by one half-foot to 78.5'. Given the impact of sea level rise on the Laguna de Santa Rosa, the City wants to take in account the effects of climate change on flooding and understand the potential impacts of rising tides, changing shorelines, and sea level rise on Sebastopol.
Related planning mechanisms	General Plan Safety Element, NFIP Participation, CRS Participation, Preliminary FIRMs
Other Alternatives	None
Responsible Office/ Agency	Building Department, Planning Department
Partners	FEMA, Sonoma County
Priority (High, Medium, Low)	Low
Cost Estimate	< $10,000
Benefits (Avoided Losses)	Maximizing participation in FEMA Sea Level Rise Study and Preliminary FIRM Map updates will provide the City with an understanding of flooding issues and how climate change may impact BFEs along the Laguna de Santa Rosa. This understanding will help the City prepare and develop strategies to mitigation future flooding issues that may be exacerbated by climate change and sea level rise.
Potential Funding	General Fund
Schedule	2021 – 2026, Short-Term (1 to 5 years)

F-6 Sebastopol Community Cultural Center Main Hall Flood Mitigation Alternative Implementation

Mitigation Project Title	Sebastopol Community Cultural Center Main Hall Flood Mitigation Alternative Implementation
Hazard(s) Mitigated	Flooding
Project Description, Issue/Background	The City of Sebastopol recently conducted a flood mitigation alternatives analysis of flood projects designed to reduce or eliminate flooding at the SCCC. An engineering study is underway that will identify and cost several mitigation alternatives. The City should implement one alternative that focuses on permanent flood mitigation versus temporary floodproofing actions. This mitigation action will focus on early implementation of a long-term mitigation project that protects the SCCC and other city-owned and publicly owned facilities in the 100-year floodplain near Laguna Youth Park and the Laguna Wetlands Preserve.
Related planning mechanisms	General Plan Safety Element, Floodplain Ordinance
Other Alternatives	Short-term flood protection
Responsible Office/ Agency	Building Department
Partners	SCCC Board
Priority (High, Medium, Low)	Low
Cost Estimate	$100,000 – $1,000,000
Benefits (Avoided Losses)	A plan with an informed community will lead to less confusion and more timely reaction to any accident that requires a response from the community.
Potential Funding	General Fund, FEMA HMA Grant, BRIC Grants
Schedule	2021- 2026; Long-Term (> 5 years)

F-7 Ives Park Calder Creek Daylighting and Stormwater Improvement and Green Infrastructure Project

Mitigation Project Title	Ives Park Calder Creek Daylighting and Stormwater Improvement and Green Infrastructure Project
Hazard(s) Mitigated	Flooding
Project Description, Issue/Background	Ives Park is located in downtown Sebastopol in a residential neighborhood adjacent to the commercial district. Calder Creek flows west to east as an open concrete channel or drainage ditch through Ives Park. This mitigation project involves daylighting Calder Creek through Ives Park and the area east of Petaluma Avenue to alleviate flooding and improve surface water flood and stormwater runoff. This mitigation project includes installing stormwater and green infrastructure improvements east of Petaluma Avenue to minimize historical flooding along Petaluma Avenue. The mitigation project is tied to the 2013 Ives Park Master Plan Report and 2005 Stormwater Plan. This project is also in the 2020-21 to 2025-26 CIP. The City currently proposes to complete a Hydrology Study and Conceptual Design for the Improvement Project. This mitigation project involve re-naturalizing the Calder Creek streambed as it traverses the Park by removing concrete materials and replacing them with vegetative, natural features. This would alleviate localized stormwater flooding and runoff issues within and around Ives Park and flooding within the area east of Petaluma Avenue; this area recently flooded in October 2021. The project is also designed to restore and realign a segment of Calder Creek to a more natural state to improve access, enhance habitat, and incorporate sustainable stormwater infiltration.
Related planning mechanisms	General Plan Safety Element, Conservation and Open Space Element, 5-Year Capital Improvement Program (FY 2021-22 to FY 2025-26), 2005 Stormwater Management Plan
Other Alternatives	Setback policies, Improved Building Codes, The City prefers a nature-based solution over the existing underground stormwater conveyance system within Ives Park.
Responsible Office/ Agency	Planning Department and Public Works Department
Partners	None
Priority (High, Medium, Low)	Low
Cost Estimate	> $30,000 for Hydrology Study and Conceptual Design Plan, $1,200,000 for construction
Benefits (Avoided Losses)	Reduced potential for flooding and stormwater issues in the Calder Creek area and area east of Petaluma Avenue/State Highway 116.
Potential Funding	General Fund, Measure M Parks Fund, Park Improvement Fund, EPA Green Infrastructure Grant

Schedule	2021 – 2026, Short-Term (1 to 5 years)

W-1 Promote Wildfire-Resistant Construction Materials for New Construction in the City

Mitigation Project Title	Promote Wildfire-Resistant Construction Materials for New Construction in the City
Hazard(s) Mitigated	Wildfire
Project Description, Issue/Background	During a wildfire, buildings including commercial buildings and residential homes are at risk of wildfire in the City of Sebastopol. The majority of homes that burn during wildfires are ignited by burning embers carried by wind and ignite combustible exterior components of a building, such as roof coverings, siding, and decking that can lead to severe damage or the total loss of a structure. These risks can be reduced through the use of appropriate construction materials, such as non-combustible or fire-resistant materials for exterior components and the creation of defensible space. This mitigation action promotes the use of wildfire-resistant construction materials for all new construction in the City of Sebastopol. It would involve voluntary participation of the community residents. FEMA recommends that State and local building codes include requirements for wildfire mitigation for both new construction and upgrades to existing buildings in wildfire zones (e.g. High Fire Hazard Severity Zones [FHSZs]. Such projects are also eligible for FEMA mitigation funding if the local government has an approved LHMP. Eligible projects include the installation of asphalt shingle roofs, encasing buildings with ignition-resistant siding, installing non-combustible exterior doors and tempered glass panels, and installing dual-pane windows and metal gutters.
Related planning mechanisms	General Plan Safety Element, Sebastopol Building Code
Other Alternatives	Mandatory Wildfire-Resistant Fire Construction Requirements
Responsible Office/ Agency	Building Department
Partners	None
Priority (High, Medium, Low)	High
Cost Estimate	< $10,000
Benefits (Avoided Losses)	Wildfire-resistant construction and building code requirements save lives and protect the environment. Buildings that meet the 2018 International Residential Code (IRC) and 2018 International Building Code (IBC) lead to $11 saved for every $1 invested compared to old requirements.
Potential Funding	General Fund, FEMA HMA Grants, BRIC Grant funding
Schedule	2021 – 2026, Short-Term (1 to 5 years)

W-2 Develop a Tree Ordinance that requires defensible space maintenance and promotes healthy landscapes

Mitigation Project Title	Develop a Tree Ordinance that requires defensible space maintenance and promotes healthy landscapes
Hazard(s) Mitigated	Wildfire
Project Description, Issue/Background	Defensible space, coupled with home hardening, is essential to improve a home's chance of withstanding a wildfire. It is the buffer created between a building on a property and the grass, trees, shrubs, and any wildland area around it. The space is needed to slow or stop the spread of wildfire and it helps a home from catching on fire from embers, direct flame, or radiant heat. California law requires (California Public Resources Code Section 4290 and 4291) that homeowners maintain 100 feet of defensible space around homes and structures. The 100 feet of defensible space is broken down into two zones currently required by law. Zone 1 consists of 30 feet of space referred to as the "Lean, Clean, and Green Zone" and involves removal of all dead plants and pine needles from the yard and trimming tree branches so they are at least 10 feet away from the home. Zone 2 consists of 30 to 100 feet of reduced fuel and is referred to as the "Reduce Fuel Zone" and involves cutting annual grass to a maximum height of 4 inches, creating a horizontal space between shrubs and tress and creating a vertical space between gras and shrubs. Recent legislation, passed in 2020 (Assembly Bill 3074) now requires a third zone of defensible space. This law requires the Board of Forestry and Fire Protection to develop a regulation for a new ember-resistant zone, referred to as Zone 0 within 0 to 5 feet of a home. This requirement must be met by January 1, 2023. This mitigation action involves developing a local tree ordinance for the City of Sebastopol that requires defensible space maintenance consistent with state requirements and current legislation. The local tree ordinance is intended to promote healthy landscapes through selection of native and less flammable plant species, planting shorter plants, the use of green herbaceous plants rather than shrubs, and the avoidance of planting non-native species, such as Eucalyptus species. The City may also chose to develop a more stringent ordinance than the State's minimum requirements (e.g. some Counties require 50 feet clearance in Zone 1 in a Defensible Space Ordinance).
Related planning mechanisms	General Plan Safety Element, Sebastopol Municipal Code
Other Alternatives	Compliance with California Public Resources Code Section 4290 and 4291
Responsible Office/ Agency	Fire Department
Partners	Sonoma County

Priority (High, Medium, Low)	High
Cost Estimate	< $10,000
Benefits (Avoided Losses)	The accumulation of combustible vegetation, dead, and dying trees and other materials on private property can create hazardous fire conditions. This ordinance will reduce the potential of property damage or loss, and minimize impacts related to the health, safety, and general public welfare.
Potential Funding	General Fund
Schedule	2021 – 2026; Short-Term (1 to 5 years)

W-3 Develop a Sebastopol Community Wildfire Protection Plan

Mitigation Project Title	Develop a Sebastopol Community Wildfire Protection Plan
Hazard(s) Mitigated	Wildfire
Project Description, Issue/Background	A Community Wildfire Protection Plan (CWPP) is a science-based, hazard, asset, and risk assessment performed using high resolution topography, vegetation fuels data, and GIS information combined with local parcel, weather and fuel condition data. The City of Sebastopol is interested in developing a CWPP with local fire districts and partners around the City. The CWPP would focus on identifying areas of concern in the City limits and around the City and prioritize areas where wildfire threat is greatest based on the risk assessment. The plan will also cover pre-fire planning, outreach and education, vegetation management and fuels reduction, and maintaining defensible space by promoting building codes, local municipal ordinances, and state requirements. The plan would also be prepared by support and align with the California Fire Plan, CALFIRE's Unit Strategic Plan for the County (Sonoma-Lake-Napa Unit 2020 Strategic Fire Plan), and the Sonoma County CWPP that is currently being updated.
Related planning mechanisms	City Emergency Operation Plan, California Fire Plan, Sonoma-Lake-Napa Unit 2020 Strategic Fire Plan, Sonoma County CWPP
Other Alternatives	None
Responsible Office/ Agency	Fire Department
Partners	Sonoma County
Priority (High, Medium, Low)	High
Cost Estimate	$50,000 – $100,000
Benefits (Avoided Losses)	The results of the risk assessment and community-level hazard mitigation actions in the CWPP can be used to identify areas that are at greatest risk of being impacted by wildfires and prevent the loss of property.
Potential Funding	General Fund, FEMA HMA Grants
Schedule	2021 – 2026; Short-Term (1 to 5 years)

D-1 Continue participation in the Groundwater Sustainability Agency and support future project-specific groundwater management projects related to the City's water system

Mitigation Project Title	Continue participation in the Groundwater Sustainability Agency and support future project-specific groundwater management projects related to the City's water system
Hazard(s) Mitigated	Drought
Project Description, Issue/Background	The Santa Rosa Plains Groundwater Sustainability Agency (GSA) is required to prepare a Groundwater Sustainability Plan (GSP) by 2021. The City of Sebastopol already participates in the Santa Rosa Plains GSA. This mitigation action involves continued participation in the planning process, development of the Draft GSP, and implementation of project-specific efforts where the City can provide meaningful support.
Related planning mechanisms	5-Year Capital Improvement Program (FY 2021-22 to FY 2025-26)
Other Alternatives	None
Responsible Office/ Agency	Engineering Department
Partners	Sonoma County, City of Santa Rosa
Priority (High, Medium, Low)	Medium
Cost Estimate	$50,000
Benefits (Avoided Losses)	Participation on the Santa Rosa Plains GSA will promote awareness on groundwater management and minimize losses associated with economic disruptions that may occur due to droughts.
Potential Funding	General Fund
Schedule	2021 – 2026; Short-Term (1 to 5 years)

D-2 Build resiliency in the City's water and wastewater conveyance system by constructing alternative back-up systems for drought events

Mitigation Project Title	Build resiliency in the City's water and wastewater conveyance system by constructing an alternative back-up system for drought events.
Hazard(s) Mitigated	Drought
Project Description, Issue/Background	The City needs to enhance and build resiliency by constructing a secondary wastewater conveyance system to minimize disturbances during earthquake or wildfire events that may impact the City's one wastewater line to the City of Santa Rosa's WWTP. A redundant water system or strategies to reduce potable use will also minimize the impact of drought events on the ability of the City to delivery potable water to customers. This mitigation action is focused on building resiliency not capacity within the City's water and wastewater lifelines to minimize stressors on the system during earthquake, wildfire, and drought events. Alternative back-up systems may consist of new groundwater wells, reclaimed water strategies, and/or adding a secondary wastewater conveyance system that connects to the City of Santa Rosa's WWTP.
Related planning mechanisms	5-Year Capital Improvement Program (FY 2021-22 to FY 2025-26)
Other Alternatives	None
Responsible Office/ Agency	Engineering and Public Works Departments
Partners	None
Priority (High, Medium, Low)	High
Cost Estimate	> $500,000
Benefits (Avoided Losses)	Loss of disruption associated with the conveyance of wastewater out of the City to the City of Santa Rosa WWTP.
Potential Funding	General Fund, FEMA HMA Grants
Schedule	2021 – 2026; Long-Term (> 5 years)

D-3 Enhance the City's local drought contingency plan to focus on additional water conservation measures

Mitigation Project Title	Enhance the City's local drought contingency plan to focus on additional water conservation measures
Hazard(s) Mitigated	Drought
Project Description, Issue/Background	California and the City of Sebastopol continue to experience statewide and regional droughts. Since the last major statewide drought ended five years ago in 2015, the winters of 2016-2017 and 2018-2019 were some of the wettest in history. These wet winters were followed by dry seasons from 2019 through 2021 and the lack of precipitation and below average snowpack have strained the State's water supply. On April 21, 2021 the Governor issued a proclamation declaring a State of Emergency in California due to severe drought conditions and called for water use reductions. While the City of Sebastopol relies exclusively on groundwater this water supply source is limited and severe drought conditions will impact this groundwater source and the water delivery system. The City's Municipal Code requires that water resources available to the City be put to maximum beneficial use and promote the efficient use of potable water. As a result, the City established a water contingency plan in 2014 (Ordinance 1070), put into effect water conservation strategies to better manage their groundwater supply. The development of water usage reductions and conservation measures related to outdoor water irrigation for landscaping minimize drought impacts on the City's water supply. This mitigation action will include the development of water conservation measures the City can mandate that will help them reduce water use consumption during drought events. It will build on Ordinance 1070 adopted in 2014. It will also expand mandatory water prohibitions put in place during the recent State 2 mandatory compliance resolution adopted on July 6, 2021 calling for a mandatory 25% reduction of water use in the City. Additional water conservation measures that may be mandated in subsequent stages may include reducing lawn watering to two days per week, requiring pool covers, completing water-wise home surveys and audits, replacing old appliances with high-efficient alternatives, and installing smart water meters.
Related planning mechanisms	Sebastopol Municipal Code 13.06.070 (Water Shortage Contingency Plan); Title 15 (Building Code)
Other Alternatives	Bay Area Regional Energy Network (BayREN) – Water Upgrade Program (Water Upgrades $ave)
Responsible Office/ Agency	Public Works Department
Partners	Regional Climate Protection Authority (RCPA), Metropolitan Transportation Commission, Association of Bay Area Governments (ABAG)

Priority (High, Medium, Low)	High
Cost Estimate	$100,000
Benefits (Avoided Losses)	The development of additional water conservation measures associated with the City's water contingency plans will prevent economic losses associated with severe drought events.
Potential Funding	General Fund, FEMA HMA Grants
Schedule	2021 – 2026; 1 to 3 years

D-4 Conduct a City-wide Facility Energy and Water Audit

Mitigation Project Title	Conduct a City-wide Facility Energy and Water Audit
Hazard(s) Mitigated	Drought
Project Description, Issue/Background	Water rates have been rising dramatically over the past decades. The rising prices can impact the economic viability of water and energy conservation practices. Water audits, and often in conjunction with energy audits, is a practical step for local governments to conduct to improve the efficiency of buildings and property landscaping and irrigation. Benchmarking is a first step to monitoring water usage. The audits provide a way for the City to inventory water uses and identify ways to increase water use efficiency. The results of the audits will help the City prioritize steps to implement the most cost-effective water-saving measures first for the City and then for both residents and business owners.
Related planning mechanisms	General Plan, 5-Year Capital Improvement Program (FY 2021-22 to FY 2025-26)
Other Alternatives	None
Responsible Office/ Agency	Public Works Department
Partners	None
Priority (High, Medium, Low)	Medium
Cost Estimate	$10,000 – $100,000
Benefits (Avoided Losses)	Water and energy audits provide a way for the City to inventory water uses and identify ways to increase water use efficiency, thereby limiting the economic impacts that may occur during severe drought events.
Potential Funding	General Fund
Schedule	2021 – 2026; Short-Term (1 to 5 years)

DI-1 Participate in the Emergency Action Plan for Warm Springs Dam

Mitigation Project Title	Participate in the Emergency Action Plan for Warm Springs Dam
Hazard(s) Mitigated	Dam Incidents
Project Description, Issue/Background	There is one potential dam of concern located upstream of the City of Sebastopol. Warm Springs Dam, constructed for flood control, irrigation, and water storage purposes, poses a high hazard to the City of Sebastopol if it were to breach. The earthen dam is located along Dry Creek in northern Sonoma County, approximately 30 miles north of the City and has a capacity of 449,000 acre-feet. The Army Corps of Engineers has an Emergency Action Plan (EAP) in place for the dam. This action involves City participation in the EAP and any routine exercises for the dam incident planning and preparedness activities.
Related planning mechanisms	Warm Springs EAP
Other Alternatives	None
Responsible Office/ Agency	Fire Department, Police Department
Partners	Sonoma County, Army Corps of Engineers, Sonoma Water, City of Santa Rosa
Priority (High, Medium, Low)	Low
Cost Estimate	$10,000 – $50,000
Benefits (Avoided Losses)	The risk to the City is low due to the distance between the dam location and downstream development. Educating home buyers of the upstream dams and flood protections should be considered to avoid loss of life and injuries if an event where to occur. Understanding the risk could also improve warning and evacuation procedures.
Potential Funding	General Fund, FEMA Dam Safety Grants
Schedule	2021 – 2026; Short-Term (1 to 5 years)

EH-1 Identify locations for Sebastopol Designated Cooling Centers

Mitigation Project Title	Identify locations for Sebastopol Designated Cooling Centers
Hazard(s) Mitigated	Extreme Heat
Project Description, Issue/Background	Extreme heat is a severe weather and public health concern in California and in the City of Sebastopol as average annual temperatures continue to increase in frequency and duration in the region. Exposure to extreme heat can cause health problems, including heat stroke and death. The use of colling centers, a cool site, or air-conditioned buildings designated as a safe location during extreme heat is a common strategy to protect the public from high temperatures. This mitigation action includes the identification of locations and buildings to designated as cooling centers in the City. Preliminary locations under consideration include the High School and SCCC. The action takes into account the feasibility of the center, who runs them, what non-profit partners may be involved, and what sensitive populations the centers should target (vulnerable neighborhoods, etc.). The mitigation may also include an implementation plan when a heat wave occurs and how to communicate information on the cooling centers.
Related planning mechanisms	None
Other Alternatives	None
Responsible Office/ Agency	Fire Department
Partners	Sonoma County, Sebastopol Union School District, National Weather Service, American Red Cross, SCCC, Pacific Gas & Electric (PG&E)
Priority (High, Medium, Low)	Medium
Cost Estimate	$100,000
Benefits (Avoided Losses)	Studies have shown that spending time at a cooling center or building with an air conditioner or cooling unit reduces vulnerable populations risk to heat exposure. Cooling centers provide relief during extreme heat events
Potential Funding	General Fund
Schedule	2021 – 2026; Short-Term (1 to 5 years)

SW-1 Upgrade permanent emergency power generator for essential areas of the public safety building

Mitigation Project Title	Upgrade permanent emergency power generator for essential areas of the public safety building
Hazard(s) Mitigated	Severe Weather
Project Description, Issue/Background	This action ensures the Police Department emergency power generator has adequate electricity and capability to power all essential services of the public safety building. The installation of an upgraded generator will ensure the public safety building remains in operation during severe weather events and during PSPS events.
Related planning mechanisms	PSPS Readiness and Community Outreach Preparedness Program
Other Alternatives	None
Responsible Office/ Agency	Fire Department
Partners	Sonoma County Department of Emergency Management, Pacific Gas & Electric (PG&E)
Priority (High, Medium, Low)	High
Cost Estimate	< $50,000
Benefits (Avoided Losses)	Upgrades to the existing City power generators will provide an alternative power source during PSPS events, which would minimize the impacts of high wind and wildfire events that result in rolling blackouts or planned PSPS events. The generators also provide basic health and safety services to residents during extended events and allow the City to continue providing essential services.
Potential Funding	General Fund
Schedule	2021 – 2026, Short-Term (1 to 5 years)

HW-1 PSPS Readiness and Community Outreach Preparedness Plan

Mitigation Project Title	PSPS Readiness and Community Outreach Preparedness Plan
Hazard(s) Mitigated	High Winds, Public Safety Power Shutoffs (PSPS)
Project Description, Issue/Background	Northern California continues to face the possibility of multiple long periods of power brownouts, or intentional blackouts by Pacific Gas & Electric (PG&E) during anticipated or actual wind events that could result in wildfires or the spread of existing wildfires. There are raising concerns about the impact of PG&E's Public Safety Power Shutoffs (PSPS) on at-risk or vulnerable residents and the City's ability to sustain essential public services past the first 24 to 36 hours of a PSPS event. In order to plan for and minimize public and economic disruptions related to the PSPS events, the City needs more generators to serve as an alternative power supply. Most City buildings and facilities, with the exception of the Public Works Department building lack generator, which would severely limit their ability to perform most day-to-day operations. The City understands the public's concerns and needs to be prepared to continue providing the basic health and safety services to its residents. The action builds upon installing backup battery power and micro-grids at facilities and/or acquiring additional back-up generators at key City-owned facilities and providing generators at designated cooling centers. It is focused on the development of a PSPS readiness program through robust public outreach and engagement and the development of web-based information on the City's Website. The installation of backup battery power and micro-grids at City facilities will also ensure the City is prepared and ready to continue operations during PSPS events.
Related planning mechanisms	General Plan Safety Element, City Emergency Operations Plan
Other Alternatives	None
Responsible Office/ Agency	Fire Department
Partners	Sonoma County
Priority (High, Medium, Low)	High
Cost Estimate	< $100,000
Benefits (Avoided Losses)	Ensuring day-to-day operations continue within the City of Sebastopol, particularly at City administrative offices and related to the water supply conveyance and sewer connection to the City of Santa Rosa Wastewater Treatment Plan. The PSPS Readiness and Community Outreach Preparedness Plan will reduce impacts to at-risk populations from rolling blackouts; backup battery power and microgrids will also minimize the impact on City operations.
Potential Funding	General Fund
Schedule	2021 – 2026, Short-Term (1 to 5 years)

HW-2 Inspect City-owned critical facilities and create a plan that corrects deficiencies and addresses infrastructure hardening and utility undergrounding to ensure resiliency to high winds and severe weather

Mitigation Project Title	Inspect City-owned critical facilities and create a plan that corrects deficiencies and addresses infrastructure hardening and utility undergrounding to ensure resiliency to high winds and severe weather
Hazard(s) Mitigated	Severe Weather: Heavy Rain/Thunderstorms/Lightning/Hail/High Wind/Dense Fog
Project Description, Issue/Background	The City has several building and facilities, such as water wells and pump stations that are critical to the delivery of public services, such as potable water, sewer conveyance, and fire and police protection. Several of these critical facilities are vulnerable to earthquake, flood, and severe weather hazards, such as heavy rain, lightning, hail, high wind, and dense fog. There are improvements the City can take to harden facilities and infrastructure and minimize the natural hazards stressors. This mitigation action would involve implementing hardening susceptible facilities against severe weather events related to lightning, thunder, and high wind, as well as dense fog that may limit the accessibility of fire and police protection services. Specific actions may include adding concrete, masonry, steel, or other ignition-resistant materials during construction retrofits; incorporating baffled vents to prevent embers from entering structures and building panels and installing lightning protection devices (e.g. lightning rods and grounding devices) and surge protectors on electrical control panels and equipment. The City will also consider installing sirens or audible alarm systems notifying motorists of dense fog conditions along State Highway 12. The list of facilities vulnerable to severe weather events could be prioritized based on how critical each facility is to the functionality of the City's water and wastewater system and delivery of essential public services related to health and safety.
Related planning mechanisms	General Plan Safety Element, City Emergency Operations Plan
Other Alternatives	Replacement of Facilities, Building Modernization
Responsible Office/ Agency	Fire Department, Public Works Department
Partners	None
Priority (High, Medium, Low)	Medium
Cost Estimate	$100,000 - $200,000 depending on the actions and needs identified
Benefits (Avoided Losses)	The benefits include losses avoided related to limiting service disruptions and replacement costs of damaged facilities from severe weather events.
Potential Funding	General Fund, CIP Funds, FEMA HMA Grants
Schedule	2021 – 2026, Short-Term (1 to 5 years)

PH-1 Pandemic Preparedness and Response Plan

Mitigation Project Title	Pandemic Preparedness and Response Plan
Hazard(s) Mitigated	Public Health Hazards
Project Description, Issue/Background	A pandemic may occur when an influenza virus radically changes and easily infects humans, and against people that have little or no immunity. The City of Sebastopol has been working with Sonoma County to plan, prepare for, and response to the current COVID-19 pandemic. This action involves developing a detailed preparedness and response plan. This plan provides a roadmap on how the City can support testing, contact tracing and other health protections during a pandemic event. It also provides resilience strategies that the City can promote and enforce related to safety and preparedness for essential workers, lowering risk in workplaces and modifying school and childcare program safety guidelines, enforcing guidelines for high-risk work places, and announcing programs that end stay-at-home orders and promote the return to work.
Related planning mechanisms	General Plan Safety Element, City Emergency Operations Plan
Other Alternatives	None
Responsible Office/ Agency	City Manager's Office
Partners	Sonoma County Department of Public Health
Priority (High, Medium, Low)	High
Cost Estimate	< $50,000
Benefits (Avoided Losses)	A pandemic preparedness and response plan can improve public health, safety, and well-being and substantially minimize at-risk workers and segments of the populations exposure to influenza viruses and other public health hazards that can result in health problems and death.
Potential Funding	General Fund
Schedule	2021 – 2026, Short-Term (1 to 5 years)

HM-1 Protection of the City's groundwater resources

Mitigation Project Title	Protection of the City's groundwater resources
Hazard(s) Mitigated	Hazardous Materials, Drought
Project Description, Issue/Background	The City's water supply is from groundwater resources. Efforts to protect groundwater will minimize impacts associated with hazardous material releases as well as drought events. Groundwater protection should focus on protection of groundwater recharge and source zones . Recharge zones control both the quantity and quality of water reaching the discharge zone. The City can install protective measures, such as fencing around critical groundwater recharge areas based on property ownership near and around groundwater source wells and regional hydrogeology, which is commonly referred to as groundwater zoning. Examples to protect groundwater recharge zones can also be drawn from groundwater protection policies for drinking water supply regulations.
Related planning mechanisms	General Plan Safety Element, Sebastopol Municipal Code
Other Alternatives	None
Responsible Office/ Agency	Public Works Department
Partners	None
Priority (High, Medium, Low)	High
Cost Estimate	$50,000
Benefits (Avoided Losses)	Protects critical groundwater sources and recharge areas and avoids losses associated with disruptions in the delivery of potable water supplies.
Potential Funding	General Fund
Schedule	2021 – 2026, 1 to 5 years

MH-1 Ensure that the Police and Fire Departments have adequate and interoperable radio communication systems and equipment to meet current technology requirements to support first responders during response and recovery operations

Mitigation Project Title	Ensure that the Police and Fire Departments have adequate and interoperable radio communication systems and equipment to meet current technology requirements to support first responders during response and recovery operations
Hazard(s) Mitigated	Multi-Hazard
Project Description, Issue/Background	The issue of interoperability in emergency communications is a priority concern for first responders and public safety officials. Interoperability refers to the ability of first responders, emergency managers, and government agencies to seamlessly interact with one another and is a key element of emergency communications and data sharing. This mitigation action ensures the City of Sebastopol has an interoperable radio communication system that meets current technologies to support first responders during response and recovery operations.
Related planning mechanisms	General Plan Safety Element, City Emergency Operations Plan
Other Alternatives	None
Responsible Office/ Agency	Fire Department
Partners	Sonoma County, City of Santa Rosa
Priority (High, Medium, Low)	High
Cost Estimate	> $100,000
Benefits (Avoided Losses)	Communication interoperability makes it possible for emergency response agencies that respond to hazard events and disaster to work effectively together. It also reduces losses of life and property by allowing the response teams to maximize resources during response events and when providing disaster relief and recover support.
Potential Funding	General Fund
Schedule	2021 – 2026, 1 to 5 years

MH-2 Ensure that emergency operational plans meet SEMS and NIMS compliance and are adequate for federal and state response and recovery

Mitigation Project Title	Ensure that emergency operational plans meet SEMS and NIMS compliance and are adequate for federal and state response and recovery
Hazard(s) Mitigated	Multi-Hazard
Project Description, Issue/Background	The Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS) are designed to provide a comprehensive approach to incident management that is applicable to all jurisdictional levels and across functional disciplines. Both of these systems use the Incident Command System (ICS). ICS is a standardized emergency management system designed for meeting small and large emergency and non-emergency situations. SEMS contains several systems as part of its framework for responding to and managing emergencies involving multiple jurisdictions or multiple agency response. Most significant of these systems is the ICS. NIMS provides a consistent nationwide template that enables all government, private sector, and non-governmental organizations to work together during domestic incidents. The components of NIMS are complimentary to the SEMS components. The use of NIMS is required for Federal disaster assistance. This mitigation action aims to ensure that all Sebastopol emergency operation plans, such as the LHMP and the updated EOP meet SEMS and NIMS compliance. Both SEMS and NIMS would be formally adopted as standards for incident management in the City of Sebastopol. It also requires the City's Emergency Operations Center (EOC) to contain such systems and supporting materials necessary to implement ICS.
Related planning mechanisms	General Plan Safety Element, City EOP
Other Alternatives	None
Responsible Office/ Agency	Fire Department
Partners	Sonoma County
Priority (High, Medium, Low)	High
Cost Estimate	$100,000 – $300,000
Benefits (Avoided Losses)	Both SEMS and NIMS allow emergency personnel to respond to frequent and multiple disasters occurring anytime and anywhere in the City through a clear and consistent organizational structure. This structure allows different teams to communicate effective and work together to avoid losses and protect lives, property, and the environment.
Potential Funding	General Fund
Schedule	2021 – 2026, Short-Term (1 to 5 years)

MH-3 Develop plans and procedures for Para-Transit system response and recovery from disasters that utilizes the Sonoma County Mutual Aid Program

Mitigation Project Title	Develop plans and procedures for Para-Transit system response and recovery from disasters that utilizes the Sonoma County Mutual Aid Program
Hazard(s) Mitigated	Multi-Hazard
Project Description, Issue/Background	Transportation plays an essential support role during incidents and disasters that requires paratransit service. A paratransit providers focus is to serve people with limited accessibility and mobility based on the standards in the Americans with Disabilities Act (ADA). This mitigation actions involves planning for para-transit system response and recovery during disaster events in the City to ensure that all people, including those with disabilities are able to safety and efficiently evacuate. It will involve developing procedures for coordinating, scheduling, and dispatching paratransit services during emergency evacuations. This may include interfacing with human service organizations the Senior Center, SBCC, and other organizations and facilities with or supporting vulnerable, special access and functional needs, or disabled populations.
Related planning mechanisms	General Plan Safety Element, City Emergency Operations Plan, SEMS
Other Alternatives	None
Responsible Office/ Agency	City Manager's Office
Partners	Sonoma County Transit, Sebastopol Shuttle
Priority (High, Medium, Low)	High
Cost Estimate	$50,000
Benefits (Avoided Losses)	The implementation of a paratransit system and response and recovery plan will avoid the loss of property, injury, death, and disruptions in the normal functionality of transportation and transit services in the City.
Potential Funding	General Fund
Schedule	2021 – 2026, Short-Term (1 to 5 years)

MH-4 Update the City Emergency Operations Plan

Mitigation Project Title	Update the City Emergency Operations Plan
Hazard(s) Mitigated	Multi-Hazard
Project Description, Issue/Background	The City's EOP is outdated and needs to be updated. It currently is a basic plan that addresses the City of Sebastopol's responsibilities in emergencies associated with natural disaster, human-caused emergencies, and technological incidents. It provides a framework for coordination of response and recovery efforts within the City and in coordination with local, state, and federal agencies. The EOP establishes emergency organization staff to direct and control operations during a period of emergency by assigning responsibilities to specific personnel. The scope of the EOP update will address earthquakes, flooding, and wildfires, among other hazards addressed in this LHMP. A comprehensive update of the EOP would ensure it addresses all hazards covered in the General Plan Safety Element and the 2020-2021 LHMP and provides a more user-friendly plan for the City.
Related planning mechanisms	General Plan Safety Element
Other Alternatives	Existing EOP
Responsible Office/ Agency	Fire Department
Partners	Sonoma County Neighboring Jurisdictions, Mutual Aid Providers
Priority (High, Medium, Low)	High
Cost Estimate	$100,000
Benefits (Avoided Losses)	An updated plan that consists of training all EOC staff on the plan would help us better identify, prepare, and respond to incidents in a more efficient and productive manner. An updated EOP would also reduce the negative impacts on our community and more rapidly returning City services to normal.
Potential Funding	General Fund
Schedule	2021 – 2026, Short-Term (1 to 5 years)

MH-5 Evacuation Route Plan

Mitigation Project Title	Evacuation Route Plan
Hazard(s) Mitigated	Earthquake, Flooding, Wildfire, Multi-Hazard
Project Description, Issue/Background	The County of Sonoma and its incorporated cities are in the process of establishing standardized evacuation zones. In the past evacuation zones were different for each incident, but now zones will remain mostly the same and residents and workers in the City can be ready to go when an alert requesting a zone evacuate is issued. The City of Sebastopol is most vulnerable to flooding events that may have a slower onset than other hazards. This mitigation action builds on the development of the Sonoma County Evacuation Zone Maps and develops specific route scenarios for earthquake, flood, and wildfire events that take into consideration the road capacity of designated evacuation routes and the ingress/egress of specific neighborhoods within the four evacuation zones established for the City.
Related planning mechanisms	General Plan Safety Element, City Emergency Operations Plan
Other Alternatives	None
Responsible Office/ Agency	Fire Department
Partners	Sonoma County
Priority (High, Medium, Low)	High
Cost Estimate	$50,000
Benefits (Avoided Losses)	Evacuation scenario planning support efficient response and recovery, identify resources, and prepare residents for leaving their home or workplace in a short amount of time. These plans support life safety and incident response and recovery.
Potential Funding	General Fund
Schedule	2021 – 2026, Short-Term (1 to 5 years)

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6 Plan Adoption

44 U.S. CFR Requirement §201.6 Local Mitigation Plans (c)(5): The local hazard mitigation plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county commissioner, Tribal Council).

The purpose of formally adopting this plan is to confirm support from the City of Sebastopol, raise awareness of the plan, and formalize the plan's implementation. The adoption of this plan completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of DMA 2000. This adoption also establishes compliance with California Government Code Section 65302.12 (Assembly Bill 2140) requiring adoption by reference or incorporation into the safety element of the general plan. The Sebastopol City Council has adopted this Local Hazard Mitigation Plan by passing a resolution. A copy of the generic resolution is included in Appendix D: Adoption Resolution. Once the plan is adopted, Appendix D will include the executed copies.

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7 Plan Implementation and Maintenance

44 U.S. CFR Requirement §201.6 Local Mitigation Plans (c)(4): The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This chapter provides an overview of the overall strategy for plan implementation and maintenance, and outlines the method and schedule for monitoring, updating, and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

7.1 Implementation

Once adopted, the plan faces the test of its worth: implementation. While this plan contains many worthwhile actions, the City of Sebastopol will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned to each action and funding availability. Low or no-cost actions more readily demonstrate progress toward successful plan implementation. Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development.

Implementation will be accomplished by adhering to the schedules identified for each action (see Chapter 5: Mitigation Strategy) and through constant and energetic efforts to update and highlight the multi-objective, win-win benefits of each project to the City of Sebastopol community and its stakeholders. These efforts include the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable, and resilient community. The four main components of implementation are:

- **Implement** the actions recommended by this plan;
- **Utilize** and enforce existing rules, regulations, policies and procedures;
- **Communicate** the hazard information collected and analyzed through this planning process so that the community better understands what and where hazards can occur, and what they can do themselves to be better prepared; and
- **Publicize** the "success stories" that are achieved through the Hazard Mitigation Planning Committee's (HMPC) ongoing efforts.

An important implementation mechanism that is highly effective and low-cost is incorporation of the Local Hazard Mitigation Plan (LHMP) recommendations and their underlying principles into other plans, such as the Sebastopol General Plan. The City of Sebastopol already implements policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs, such as the Safety Element, and recommends implementing actions, where possible, through these other program mechanisms.

Simultaneously with these efforts, it is important to constantly monitor funding opportunities that can be leveraged to implement the more expensive recommended actions (for example, long-term structural flood control projects). This will include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the City of Sebastopol will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, special district budgeted funds, state and federal earmarked funds, and other grant programs, including those that can serve or support multi-objective applications.

7.1.1 Role of Hazard Mitigation Planning Committee in Implementation and Maintenance

With adoption of this plan, the City of Sebastopol will be tasked with plan implementation and maintenance. The City of Sebastopol established HMPC to help develop the City's LHMP. This team consists of a combination of City representatives from various departments, such as the Planning, Building and Safety, Police, and Fire departments, and the Public Works and Engineering Division. The HMPC also includes representatives from regional and local agencies and organizations, including the Sonoma County Department of Emergency Management, Sebastopol Union School District, City of Petaluma, Graton Fire Protection District, Sebastopol Community Cultural Center, Sebastopol Area Senior Center, and the American Red Cross.

During the development of the LHMP, HMPC participation involved attending planning meetings, completing data collection worksheets, identifying mitigation actions for the plan, reviewing the draft plan, and informing the public and local officials about the planning process. Additional information on the planning process is summarized in Chapter 3: Planning Process of this LHMP and in Appendix A. During the plan implementation and maintenance process the HMPC will be responsible for continuing to engage the department representatives and agency and organization stakeholders. To ensure successful implementation of the LHMP, the HMPC agrees to:

- Provide a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Monitor multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Assist in implementation and update of this plan;
- Report on plan progress and recommended changes to Sebastopol City Council; and
- Inform and solicit input from the public.

The primary duty of the City of Sebastopol HMPC is to see the plan successfully carried out and to report to the City Council and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the City of Sebastopol LHMP webpage (and others as appropriate). These activities can be achieved through reconvening the HMPC on at least an annual basis.

7.2 Maintenance

Plan maintenance is defined as the ongoing effort to monitor and evaluate plan implementation, and to update the plan as progress, roadblocks, or changing circumstances are recognized.

The Sebastopol City Council will designate a Lead Hazard Mitigation Manager that consists of representative from the City's Planning Department or Fire Department who will coordinate plan reviews in consultation with the City's Building and Safety Department and Public Works and Engineering Division and other participating jurisdictions and stakeholders that comprise the HMPC.

7.2.1 Maintenance Schedule

In order to monitor progress and update the mitigation strategies identified in the action plan, the Lead Hazard Mitigation Manager and the HMPC will revisit this plan annually and within 45 days after a hazard event. The annual review will be conducted by the HMPC each year. The HMPC will review progress on the

LHMP and complete an annual report to the Sebastopol City Council. This annual report will be prepared and completed within the first quarter of each year and timed to prepare for seasonal hazard events (e.g. flooding, wildfires) and the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) grant cycles.

This plan will be also updated, approved and adopted within a five-year cycle as per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000 unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With the initial approval of this plan occurring in late 2021, the plan will need to be updated, reviewed and approved by the California Office of Emergency Services (Cal OES) and by FEMA Region IX, and re-adopted by the City of Sebastopol by no later than December of 2026 (or within 5 years of the initial approval, which ever date occurs first).

During this time period, the City's Lead Hazard Mitigation Manager will monitor planning grant opportunities from Cal OES and FEMA for funds to assist with the update.

7.2.2 Maintenance Evaluation Process

The HMPC will continually monitor the incorporation process, evaluation and update methodology, continued public participation, and completion of the actions/projects to assure that the plan is being implemented. By monitoring these processes, the HMPC will be able to regularly evaluate the effectiveness of the plan and facilitate necessary changes as needed.

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability may include:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions,
- Increased vulnerability as a result of new development (and/or annexation) and/or,
- Increased vulnerability as a result of new hazards or circumstances.

The HMPC will use the following process to evaluate progress of any changes in vulnerability as a result of plan implementation.

- A representative from the department identified in each mitigation action will be responsible for tracking project status and reporting to the HMPC on an annual basis to provide feedback on whether the mitigation action as implemented meets the defined objectives and is likely to be successful in reducing vulnerabilities.
    - If the project does not meet identified objectives, or if the mitigation action is new, the HMPC will determine what alternate mitigation actions (or projects) may be implemented, and an assigned individual will be responsible for facilitating and overseeing the scope of action definition. The assigned individual will make any required modification recommendations of the plan to the HMPC, implement the action, monitor the results of the action, and report the findings to the HMPC.
- Projects that were not ranked high priority but were identified as potential mitigation strategies will be reviewed for feasibility and continued appropriateness during the annual monitoring period and the 5-year updating of this plan.
- Changes will be made to the plan to accommodate for mitigation action projects that have failed or are not considered feasible after a review for their consistency with established criteria, the time frame, priorities, and/or funding resources.

Updating of the plan will be by written changes and submissions, as the City of Sebastopol deems appropriate and necessary, and as approved by the Sebastopol City Council. Updates to this plan will:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Document hazard events and impacts that occurred within the five-year period;
- Incorporate new data or studies on hazards and risks, specifically on climate change and its effects on flooding, wildfires, and sea level rise, specifically flooding projections within the Laguna Santa Rosa;
- Incorporate new capabilities or changes in capabilities;
- Incorporate documentation of continued public involvement;
- Incorporate documentation to update the planning process that may include new or additional stakeholder involvement;
- Incorporate growth and development-related changes to building inventories;
- Incorporate new project recommendations or changes in project prioritization;
- Include a public involvement process to receive public comment on the updated plan prior to submitting the updated plan to Cal OES and FEMA Region IX; and
- Include adoption by Sebastopol City Council following Cal OES/FEMA approval.

Annual Review

As part of an annual review process, the City's HMPC will provide opportunities for public input on the LHMP. The City and HMPC will schedule formal LHMP updates at regularly scheduled public meetings to ensure routine maintenance and plan evaluation. The LHMP is designed to be a living document that can be annually updated or revised, as needed. Review will involve the following planning processes to encourage public participation, evaluate the effectiveness of the plan, and track mitigation action progress:

- Circulate a press release announcement on the annual review meeting. The press release will advertise the date, time, and location of the public meeting and provide contact information of the Lead Hazard Mitigation Manager.
- Electronic mailings regarding the annual review meeting will be emailed to federal, state, and local agencies, the HMPC, and other representatives.
- Prior to the annual review meeting, the HMPC and City departments will provide an update on their mitigation actions.
- The Lead Hazard Mitigation Manager will announce the meeting using other forms of traditional and digital media platforms, such as newspaper notices, radio announcements, and social media posts.
- An annual review meeting agenda and summary of the annual review meeting will be posted on the City's LHMP Webpage. It will include an annual report on the status of the implementation of the mitigation actions. An example of an annual review meeting agenda is included in Appendix E of this plan.
- The City should also consider inviting a representative from Cal OES to their annual meeting. The Cal OES representative will discuss current grant opportunities, provide guidance on plan implementation and compliance with new legislation, and make recommendations on incorporation of the plan into existing planning mechanisms.

The review process should also include information on changing conditions in the City. Specifically, the update should note growth and development changes (infill development), the number of retrofitted buildings or relocated housing, or improved buildings with new base elevation certificates, natural hazard events and damage information, and major capital improvement projects to utility infrastructure (e.g. water, sewer, storm water conveyance, roads, levees, gas and electric lines, etc.). The review process

should also address changing legislation and new federal and state policies, so these policy updates can be incorporated into the LHMP.

7.2.3 Incorporation into Existing Planning Mechanisms

Planning mechanisms are governance tools used to manage local land use development and community decision-making, such as general plans, floodplain management plans, building codes, emergency operation plans, capital improvement plans, or other long-range plans. Another important implementation mechanism that is highly effective and low-cost is incorporation of the LHMP recommendations and their underlying principles into existing City plans and mechanisms. Federal regulations require that LHMPs describe a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms, such as a general plan or capital improvement plan. An example of incorporating mitigation actions into other planning mechanisms would be to identify the goals and strategies of the LHMP and document how they have been used to further mitigation efforts in other planning documents.

As previously stated in Section 7.1 of this plan, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. As described in this plan's capability assessment, the City of Sebastopol already implements policies and programs to reduce losses to life and property from hazards. This plan therefore builds upon previous related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

These existing mechanisms include (but are not limited to) the following:

- Sebastopol General Plan (2016) (Safety Element)
- 2023 Housing Element Update (2015) (part of Sebastopol General Plan)
- Sebastopol Zoning Ordinance (including the City Floodplain Ordinance within Municipal Code)
- Emergency Operations Plan (EOP) (update in progress as of 2021)
- Storm Water Management Plan (MS4 Order No. R1-2015-0030)
- 5-Year Capital Improvement Program (CIP) Fiscal Year 2021-2022 to Fiscal Year 2025-2026
- National Flood Insurance Program (NFIP) participation
- Santa Rosa Plain Groundwater Sustainability Agency
  - Draft Groundwater Sustainability Plan (2021)
- City of Sebastopol Climate Emergency Resolution (2019)
- Laguna de Santa Rosa Park Master Plan
- Laguna Wetlands Preserve Restoration and Management (2016)
- Other plans and policies outlined in the capability assessment
- Other plans, regulations, and practices with a mitigation focus

7.2.4 Process for Plan Integration

HMPC members involved in the updates to the planning mechanisms listed above will be responsible for integrating the findings and recommendations of this LHMP with these other plans, programs, and mechanisms as appropriate. As an action step to ensure integration with other planning mechanisms, the Lead Hazard Mitigation Manager will discuss this topic at the annual meeting (refer to Section 7.2.1, Maintenance Schedule) with the HMPC. The HMPC will discuss if there are opportunities to incorporate the plan into other planning mechanisms and who will be responsible for leveraging those opportunities. HMPC members representing local jurisdictions will work with their jurisdictional planning teams to integrate their identified mitigation actions into their own local plans, programs, and mechanisms. Efforts

to integrate the LHMP into local plans, programs, and policies will be reported during the annual HMPC plan review meeting. Successful integration efforts will be recorded during the meeting.

Specific examples of incorporation of the LHMP into existing planning mechanisms include:

- City adoption (by reference or incorporation) of this LHMP into the Safety Element of the Sebastopol General Plan per California Government Code Section 65302.6 requirements (Assembly Bill 2140).
- Integration of wildfire actions identified in this mitigation strategy with the actions and implementation priorities established in the Fire Safe Sonoma plan, the countywide Community Wildfire Protection Plan (CWPP). Key people responsible for development of Fire Safe Sonoma CWPP and Steering Committee representatives for the CWPP Update should participate in the future HMPC, as they can identify key projects in the CWPP and integrate them into the mitigation strategy of the City of Sebastopol LHMP. Likewise, actual implementation of these wildfire projects will likely occur through the Cal Fire Units and Battalions, Sonoma County Department of Emergency Management, Sonoma County Fire Chief's Association, and the California Fire Safe Council. The implementation process will be successful through the coordination and effort of individuals from these various organizations.
- Using the risk assessment information in this plan to update the hazard analysis in the EOP update (in progress).
- Integration of this LHMP into City's 5-Year CIP. Information on 100-year flood hazards, stormwater flood hazards, and localized flooding can be integrated into the City CIP projects.
- Should the City be affected by a natural disaster, the City's Lead Hazard Mitigation Manager will integrate mitigation actions into any post-disaster recovery planning process, as applicable.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, the priority actions should be incorporated into updates of this hazard mitigation plan.

7.2.5 Continued Public Involvement

Continued public involvement is imperative to the overall success of the plan's implementation and goal(s). Efforts will be made to involve the public in the plan maintenance, evaluation, and review process. This includes maintaining a digital version of the plan on the City of Sebastopol LHMP webpage for public review. In addition, information on whom to contact within the City will be posted with the plan. The designated Lead Hazard Mitigation Manager at the City of Sebastopol will maintain a file of comments received for reference during the next five-year update.

Annual LHMP Review

Any revisions to the plan that may occur as a result of a disaster will also be made public and posted on the City's LHMP Webpage, social media sites, and local media platforms. The City's Lead Hazard Mitigation Manager will place an advertisement in the local newspaper, and also circulate electronic press releases that specify the date and time for review and public input. The City will also invite federal, state, and local agencies to participate, with the HMPC.

Five-Year LHMP Update

The five-year update process provides an opportunity to solicit participation from new and existing stakeholders, to publicize success stories from plan implementation, and seek additional public comment. A public hearing(s) or survey to receive public comment on the plan will be held during the plan update period. When the HMPC reconvenes for the update, the planning process will involve all stakeholders participating in the planning process, including those who joined the HMPC after the initial effort, to

update and revise the plan. Public participation will be encouraged and invited through LHMP Webpage postings and press releases, in addition to email and social media announcements.

Continued public outreach and education is also a mitigation strategy in Chapter 5 of this plan, emphasizing a multi-hazard public education and awareness program to be conducted on an annual basis. Activities related to public involvement during the 2020-2021 update are documented in Chapter 3 and Appendix A and C of this plan.

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Appendix A: Planning Process contains the following documents in this order:

- 2020-2021 Hazard Mitigation Plan Committee (HMPC) Invitee and Participant List
- Press Release Posted about 1st Public Workshop on LHMP
- City of Sebastopol Facebook Social Media Announcement on LHMP 1st Public Workshop
- City of Sebastopol LHMP Nextdoor Social Media Announcement
- City of Sebastopol Community Newsletter on City of Sebastopol LHMP
- City of Sebastopol LHMP Webpage
- City of Sebastopol Facebook Social Media Announcement on LHMP 2nd Public Workshop
- City of Sebastopol Notice of Availability of Public Review Draft Local Hazard Mitigation Plan (LHMP)
- Press Release Posted about 2nd Public Workshop on LHMP
- Public Comments – Received between October 21, 2021 through November 19, 2021
- Stakeholder Comments – Received November 19, 2021
- City of Sebastopol LHMP – Public Outreach Strategy (2020 – 2021)
- HMPC Meeting #1 Materials – October 20, 2020
- LHMP Data Collection Guide
- HMPC Meeting #2 Materials – February 2, 2021
- 1st Public Workshop Materials – October 27, 2020
- 2nd Public Workshop Materials – October 26, 2021
- City of Sebastopol Online Public Survey and Results (1st Survey Version)

The process and handouts provided in HMPC Meeting #3 (Mitigation Strategy) are compiled in Appendix C: Mitigation Strategy.

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Table A.1. Hazard Mitigation Planning Committee Invitee and Stakeholder List

Name	Agency/Department	Title	Phone	Email
City of Sebastopol Hazard Mitigation Planning Committee				
Kari Svanstrom	City of Sebastopol	Planning Director		ksvanstrom@cityofsebastopol.org
Bill Braga	City of Sebastopol	Fire Chief	(707) 823-8061	bbraga@cityofsebastopol.org
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Figure A.1. Press Release Posted about 1st Public Workshop on LHMP

Public Notice Advertisement
FOR IMMEDIATE RELEASE
October 14, 2020
Contact: Kari Svanstrom, City of Sebastopol, Planning Director (707) 823-6167

CITY OF SEBASTOPOL LOCAL HAZARD MITIGATION PLAN
PUBLIC WORKSHOP

The City of Sebastopol has launched a planning effort to assess risks from natural and human-caused hazards and to identify ways to reduce those risks. The planning process will result in the preparation of the City's Local Hazard Mitigation Plan (LHMP). The preparation of a LHMP is required under the Federal Disaster Mitigation Act of 2000 as a prerequisite to be eligible to receive federal disaster assistance and funding.

Most people who live and work in the City of Sebastopol are vulnerable to a wide range of natural hazards, including earthquakes, flooding, and wildfires. The community may be exposed to potential human-caused hazards associated with facilities and infrastructure that contain hazardous materials. Climate change is also expected to intensify the impacts of natural hazards assessed in the plan. The LHMP will provide the City with valuable tools to identify risks and mitigate hazards through future project-specific actions and climate adaptation strategies. The plan will also support the City's participation in the National Flood Insurance Program and include recommendations to improve the City's floodplain policies and regulations.

The City will be hosting a Public Workshop during the regularly scheduled Planning Commission meeting on **Tuesday, October 27, 2020 at 6:00 p.m.** The Public Workshop will be an opportunity to learn more about the planning process and the natural and human-caused hazards that will be assessed in the LHMP. Following the Public Workshop presentation there will be an opportunity for the public to comment on the planning process and the Draft LHMP, which is anticipated to be available for public review by 2021. The community is encouraged to participate in the planning process by providing feedback during the virtual Public Workshop and visiting the City's LHMP webpage. Information on how to participate is provided below:

- Public Workshop – Tuesday, October 27, 2020, 6:00 p.m.

To participate review the meeting details: http://bit.ly/LHMPMeetingDetails and join the Zoom Meeting at: https://bit.ly/LHMPZoomMeeting, Meeting ID: 894 8333 0962, Passcode: 562564. Additional information on the planning process can be found on the City's LHMP Webpage: (https://ci.sebastopol.ca.us/City-Government/Departments-Services/Fire/Local-Hazard-Mitigation-Plan). Questions may be directed to Kari Svanstrom, Planning Director by calling (707) 823-6167 or by email at ksvanstrom@cityofsebastopol.org.

Figure A.2. City of Sebastopol Facebook Social Media Announcement on LHMP 1st Public Workshop



Figure A.3. City of Sebastopol LHMP Nextdoor Social Media Announcement

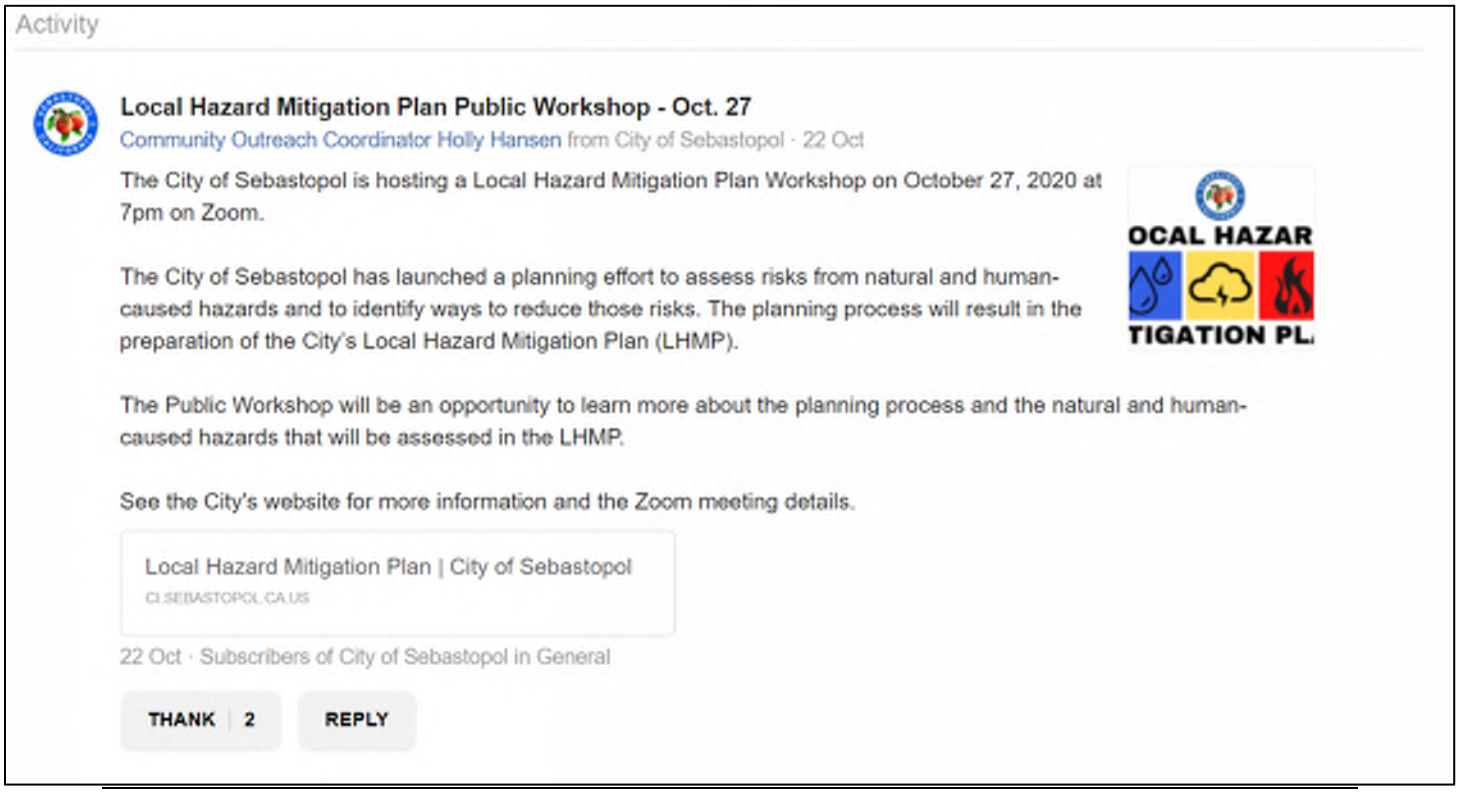

Figure A.4. City of Sebastopol Community Newsletter on City of Sebastopol LHMP



Participate in the creation of Sebastopol's Local Hazard Mitigation Plan

City of Sebastopol Community Newsletter, October 23, 2020

Public workshop planned for October 27

The City of Sebastopol has launched a planning effort to assess risks from natural and human-caused hazards and to identify ways to reduce those risks. The planning process will result in the preparation of the City's Local Hazard Mitigation Plan (LHMP). The preparation of a LHMP is required under the Federal Disaster Mitigation Act of 2000 as a prerequisite to be eligible to receive federal disaster assistance and funding.

Most people who live and work in the City of Sebastopol are vulnerable to a wide range of natural hazards, including earthquakes, flooding, and wildfires. The community may be exposed to potential human-caused hazards associated with facilities and infrastructure that contain hazardous materials. Climate change is also expected to intensify the impacts of natural hazards assessed in the plan. The LHMP will provide the City with valuable tools to identify risks and mitigate hazards through future project-specific actions and climate adaptation strategies. The plan will also support the City's participation in the National Flood Insurance Program and include recommendations to improve the City's floodplain policies and regulations.

The City will be hosting a Public Workshop on Tuesday, October 27, 2020 at 7:00 p.m. The Public Workshop will be an opportunity to learn more about the planning process and the natural and human-caused hazards that will be assessed in the LHMP. Following the Public Workshop presentation there will be an opportunity for the public to comment on the planning process and the Draft LHMP, which is anticipated to be available for public review by 2021. The community is encouraged to participate in the planning process.

Figure A.5. City of Sebastopol LHMP Webpage



Figure A.6. City of Sebastopol Facebook Social Media Announcement on LHMP 2nd Public Workshop



Figure A.7. City of Sebastopol Notice of Availability of Public Review Draft Local Hazard Mitigation Plan (LHMP)

FOR IMMEDIATE RELEASE
October 20, 2021
Contact: Kari Svanstrom, City of Sebastopol, Planning Director (707) 823-6167

NOTICE OF AVAILABILITY OF CITY OF SEBASTOPOL PUBLIC REVIEW DRAFT LOCAL HAZARD MITIGATION PLAN

Would you like to learn more about what the City of Sebastopol (City) will do to minimize the impacts of natural hazards, such as earthquake, flooding, wildfires, drought, dam incidents, extreme heat, high winds, and severe weather? Would you like to learn how the City will minimize impacts of human-caused hazards, such as public health hazards and hazardous material incidents? The City's Local Hazard Mitigation Plan (LHMP) update assesses the risk posed by natural, human-health, and human-caused hazards and identifies ways to reduce those risks through the development of specific mitigation actions. The LHMP update also addresses the effects of climate change on natural hazards and incorporates climate adaptation strategies. The plan allows the City to be eligible for mitigation grant funding from the Federal Emergency Management Agency (FEMA).

A Public Review Draft of the City's LHMP is now available for public review and comment. A Hazard Mitigation Planning Committee that included participating stakeholders from regional and local agencies, jurisdictions, and organizations in western Sonoma County, such as the City of Petaluma, Sebastopol Community Cultural Center, Sebastopol Senior Center, West Sonoma County High School District, and the Gold Ridge Fire Protection District developed the LHMP update over the past year with assistance from a consultant. The City is now soliciting public comments on the plan before it is finalized and submitted to the California Office of Emergency Services and FEMA Region IX for review and approval.

The City's residents and communities are encouraged to participate in the planning process and provide feedback by commenting the Public Review Draft LHMP. The plan is available on the City's LHMP Webpage here: https://ci.sebastopol.ca.us/City-Government/Departments-Services/Fire/Local-Hazard-Mitigation-Plan. The comment period will be for 30 days from Wednesday October 20, 2021 through Thursday, November 18, 2021. Written comments and questions may be directed to Kari Svanstrom, City of Sebastopol, Planning Director by email at ksvanstrom@cityofsebastopol.org or by calling (707) 823-6167.

Figure A.8. Press Release Posted about 2nd Public Workshop on LHMP

Public Notice Advertisement
FOR IMMEDIATE RELEASE
October 20, 2021
Contact: Kari Svanstrom, City of Sebastopol, Planning Director (707) 823-6167

CITY OF SEBASTOPOL PUBLIC REVIEW DRAFT LOCAL HAZARD MITIGATION PLAN
2nd PUBLIC WORKSHOP

The City of Sebastopol is in the final stages of a planning effort to assess risks from natural, human health, and human-caused hazards and to identify ways to reduce those risks. The planning process resulted in a comprehensive update to the City's Local Hazard Mitigation Plan (LHMP). The preparation of a LHMP is required under the Federal Disaster Mitigation Act of 2000 as a prerequisite to be eligible to receive federal disaster assistance and funding.

Most people who live and work in the City of Sebastopol are vulnerable to a wide range of natural hazards, including earthquakes, flooding, and wildfires. The community may be exposed to potential human-health hazards and human-caused hazards associated with hazardous material incidents. Climate change is also expected to intensify the impacts of natural hazards assessed in the plan. The LHMP provides the City with valuable tools to identify risks and mitigate hazards through future project-specific mitigation actions and climate adaptation strategies.

The City will be hosting a second virtual Public Workshop during the regularly scheduled Planning Commission meeting on **Tuesday, October 26, 2021 at 6:00 p.m.** The second workshop will be an opportunity to learn more about the updated Public Review Draft LHMP including the planning process, the hazards assessed, and the mitigation actions included in the plan. Following the presentation there will be an opportunity for the public to comment on the Draft LHMP. The community is encouraged to participate by providing feedback during the virtual Public Workshop, visiting the City's LHMP webpage, and reviewing the Public Review Draft LHMP. Information on how to participate is provided below:

- **Public Workshop** – Tuesday, October 26, 2020, 6:00 p.m. Join the Zoom Meeting at: https://us02web.zoom.us/j/82347396104, Meeting ID: 823 4739 6104.
- **Public Review Draft LHMP** – https://ci.sebastopol.ca.us/getattachment/City-Government/Departments-Services/Fire/Local-Hazard-Mitigation-Plan/City-of-Sebastopol-LHMP-Update_Oct2021.pdf.aspx?lang=en-US
- **City of Sebastopol Local Hazard Mitigation Plan Webpage:** https://ci.sebastopol.ca.us/City-Government/Departments-Services/Fire/Local-Hazard-Mitigation-Plan
- **Review Period:** Wednesday October 20, 2021 to Thursday November 18, 2021
- **Submit comments through the Electronic Submittal Form:** https://bit.ly/3G4zqPo

Table A-1: Public Comments Received – October 21, 2021 through November 19, 2021

Comment Letter	Response
Written Emailed Comment #1 (Email sent on 10/26/21 from Paul Fritz)	
• Commenter noted various minor edits that needed to be revised in the LHMP, including references to directions, the number of City Council members, threatened and endangered species, and grammatical errors.	• Chapters 2, 4, and 5 of the LHMP have been revised to address the minor grammatical and typo errors in the text.
Oral Comment #1 (Oral comment received during Public Workshop #2)	
• Commenter inquired about the process and schedule for finalizing the LHMP.	• The City and HMPC will review public comments after the close of the public review period and update the Draft LHMP, if needed. The City will then submit the Draft LHMP to the California Office of Emergency Services (Cal OES) for review. Cal OES has 45 days to complete review. Once reviewed, Cal OES will forward the plan to the Federal Emergency Management Agency (FEMA) Region IX for a 45-day review. City Council can consider the Draft LHMP for adoption once FEMA review is complete.
• Commenter asked about localized flooding areas and how they are getting incorporated into the LHMP.	• The risk assessment includes a detailed discussion and evaluation of flood hazards that covers the 100-year flood and 500-year flood hazards. The sections qualitatively discuss localized flood hazards. For example, flood hazards west of Petaluma Avenue are noted. Other local flood hazards were reviewed and summarized in the LHMP if submitted as part of the public survey.
• Commenter mentioned that one of the mitigation actions proposed is to not allow buildings in hazard-prone areas. He stated that this action can potentially conflict with the City's existing housing element.	• The mitigation action proposed are designed to limit new development in hazard-prone area. Existing development may already occur in such areas, such as mapped floodplains. The Draft LHMP goals and mitigation actions were reviewed for consistency with the goals of the current Housing Element to ensure the two document complement each other rather than conflict.
• Commenter asked about how this updated LHMP gets approved, what role does the City Council play, and how will the approved LHMP get incorporated into the City's General Plan.	• Both Cal OES and FEMA Region IX have 45 days to review the plan. Cal OES reviews the plan, and then sends it to FEMA for review. • The City Council will be notified when the plan is approved by Cal OES and FEMA. They will send the City a "Approvable Pending Adoption" letter. At this point, the Draft LHMP can go to City Council for review. • Once the LHMP is approved, the City must notify and provide Cal OES final adoption documentation. The City can then schedule another agenda item to

	incorporate the LHMP by reference into the City's General Plan Safety Element.
• Commenter asked about the data used to calculate commuters in the Plan and requested further elaboration.	• The commuter data was compiled from existing studies.
• Commenter mentioned that there are a couple of unclear points mapped on the Critical Facility map of the Wildfire Section.	• Comment noted. Several of the maps that illustrate critical facilities in the Public Review Draft LHMP were updated. These include Figures 4-2, 4-16, 4-25, and 4-26 in Chapter 4 – Risk Assessment. The revised maps contain a relocated point for Analy High School and include additional descriptions for the bridges and associated waterways.
• Commenter asked about when FEMA funding will start coming in and whether or not the City is eligible for funding before this newly updated LHMP gets approved.	• The City needs to be the LHMP approved by both Cal OES and FEMA Region IX before they are eligible for federal funding under the Hazard Mitigation Grant Program (HMGP).
• Commenter asked for more elaboration on how the proposed mitigation actions are prioritized	• Once the mitigation actions were identified, the HMPC was provided with decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following: Social, Technical, Administrative, Political, Legal, Economic, and Environmental. The HMPC discussed prioritizing actions that focus on climate adaptation, social equity, and community resiliency; these were additional prioritization criteria the City wanted to use to rate actions. They also reviewed planning materials and tools designed to assist in the development of climate adaptation and social equity goals and strategies.

Table A.2. Summary of Comments Received from the Climate Action Commission

Comment Letter	Response
Written Email #1 (Received 11/29/21 from the Climate Action Commission)	
• A Commissioner made a comment regarding the Public Health Hazards profile (infectious disease) in the risk assessment. She noted that the COVID-19 data was outdated and should reflect December 2021 data.	• The information in the Public Health Hazards represented COVID-19 statistics from January 2021, which was when the draft risk assessment was completed and circulated to the HMPC. The Public Health Hazards profile was updated to address the Commissioner's comments, The revised section includes the recent COVID-19 data, as of December 2021.
Written Email #2 (Received 12/1/21 from the Climate Action Commission)	
• The Commission made comments regarding the need to better emphasize social equity and environmental justice.	• Chapter 2 – Community Profile of the LHMP includes a discussion on social equity and environmental justice, as it relates to Senate Bill 1000 and the integration of the

	topic in General Plans, and other planning documents, like the LHMP. Socially vulnerable communities also also discussed in Chapter 2, specifically where these communities are located in the City of Sebastopol. Additionally, each hazard vulnerability assessment qualitatively discusses socially vulnerable communities in the City and general impacts to these populations. Additional emphasis can include ongoing outreach within these communities to ensure they are engaged during the development of mitigation actions.
• There could be a more detailed analysis of vulnerable groups impacted for each hazard – for example public health hazards – who is located near hazardous facilities in Sebastopol. This may be included in the next Housing Element.	• The risk assessment discusses socially vulnerable populations qualitatively in the "People" section of the vulnerability assessment. For example, disadvantaged communities are noted, as well as any other neighborhoods near mapped natural hazards. No major hazardous material facilities are noted in the LHMP.
• The Commenter noted the City may want to reference RCPA's Climate Mobilization Strategy where there is a discussion on the 2016 CAP. The updated strategy was completed in 2020.	• The Climate Mobilization Strategy is noted in Chapter 2 – Community Profile in the Capabilities section. It is also noted now in Chapter 4 – Risk Assessment in the "Climate Change Considerations Summary."
• The Commenter pointed out that on page 4-10 in the risk assessment climate change is human-caused, not just "atmospheric GHG emissions."	• Section 4.1.4, Climate Change Considerations Summary has been updated to indicate that climate change is "human-caused."
• The Commenter recommended the LHMP include a higher resolution logo.	• The higher resolution logo provided by the City has been added to the LHMP document.

wood.

Public Outreach Strategy

City of Sebastopol Local Hazard Mitigation Plan
Sebastopol, California

Prepared for:
City of Sebastopol
7120 Bodega Avenue, Sebastopol, CA 95472

November 16, 2020
Project No. SA20170850

Public Outreach Strategy

City of Sebastopol Local Hazard Mitigation Plan
Sebastopol, California

Prepared for:

City of Sebastopol
Planning Department
7120 Bodega Avenue
Sebastopol, CA 95472

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November 16, 2020

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Table of Contents

1.0 Purpose of the Public Outreach Strategy 1
2.0 Objectives of the Public Outreach Strategy 1
3.0 Local Government Public Outreach and Involvement Responsibilities 1
3.1 Outreach Coordinator 3
3.2 Communication Platforms 3
3.2.1 Community-Based Organizations 3
3.2.2 Webpage 4
3.2.3 Social Media 4
3.2.4 Newspapers 4
3.2.5 Press Releases 4
3.2.6 Public Survey 5
3.2.7 Informational Pop-Up Booths 5
3.2.8 Local Events and Weekly Newsletters 6
3.2.9 Public Workshops 6
3.2.10 Utility Roundtable 6
3.2.11 GIS Web Mapping Application 7
3.2.12 Map your Neighborhood Mailing List 7

Tables

Table 1. Public Outreach Strategy 8

1.0 Purpose of the Public Outreach Strategy

The purpose for the Public Outreach Strategy is to provide for a meaningful process through which the City of Sebastopol and its citizens, public officials, and stakeholder groups may effectively participate in the preparation of the City of Sebastopol Local Hazard Mitigation Plan (LHMP). The City is preparing the LHMP to develop a hazard mitigation strategy for the City's planning area. This strategy will be developed based upon the understanding that citizens and groups are the source of tremendous creativity, and that their input will produce better planning decisions. The emphasis is to recognize every citizen's right to participate in the process of making local government decisions.

A wide variety of public participation methods and tools, representing distinct purposes, will be employed in the strategy to provide for broad public engagement and participation. These purposes of public engagement are as follows:

- **Public Awareness** – to share information and to promote awareness of planning process, including ways the public can participate
- **Public Education** – to educate citizens and help them make more informed choices
- **Public Input** – to provide citizens and groups with opportunities to provide input and ideas during the planning process
- **Public Interaction** – to exchange views and ideas as a means of reaching consensus
- **Public Partnership** – to involve citizens in the decision-making process

2.0 Objectives of the Public Outreach Strategy

1. Recognizing that there are many levels of public participation, to provide for an effective mix of participation opportunities that include the above bulleted purposes.
2. Recognizing that not everyone participates in the same way or at the same time, to include a mix of participation strategies that provides for a broad and diverse set of participation opportunities that considers the diversity of the City's planning area.
3. Recognizing the City of Sebastopol's history of past public participation with planning and public safety outreach projects, the Hazard Mitigation Planning Committee (HMPC) will provide the public with opportunities to review, clarify, and provide input on generated information, as well as generate policies, goals, objectives, and information.
4. To build public support for, and ultimately ownership of, the City of Sebastopol LHMP.

3.0 Local Government Public Outreach and Involvement Responsibilities

The requirements related to public involvement in hazard mitigation plans according to the Disaster Mitigation Act of 2000 (44 CFR Section 201.6(b) and (c)) are listed below:

Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

1. An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

2. An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
3. Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): [The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Requirement §201.6(c)(4)(iii): [The plan maintenance process **shall** include a] discussion on how the community will continue public participation in the plan maintenance process.

Based on the requirements, the public participation process ensures citizens and local and regional agencies understand the risk and vulnerability and can work with the City of Sebastopol to support policies, actions, and tools to reduce future losses. This is why the public must have opportunities to comment on disaster mitigation plans during the drafting stage and prior to plan approval. The City is encouraged to conduct a public workshop or open house within 60 days of the project kick-off, or first HMPC meeting to maximize the number of credits they can achieve under the National Flood Insurance Program (NFIP) Community Rating System (CRS).

- To meet DMA requirements as well as the goals of the Public Outreach Strategy, the City is expected to engage in various public outreach and feedback efforts, which can include:
- Engage community-based organizations (CBOs)
- Assist in distributing press releases and information to local media
- Share public input/comment with the HMPC
- Document and report on progress/activities related to public involvement
- Review public input for incorporation in plan, as appropriate
- Assist with advertising and holding one (1) public workshop (during draft development) and one (1) public workshop once the Public Review Draft LHMP is circulated
- Announcing the planning effort at other public and Planning Commission meetings, or holding additional public meetings, if desired
- Announce how the plan can be accessed during the public review period. This can include providing links from the City's Website to the LHMP Webpage or providing a hardcopy of the plan in a public location, such as a municipal building (e.g. library, community center).
- Follow the recommendations for continued public involvement as designated in the implementation chapter of the LHMP.

The City of Sebastopol can implement a robust public outreach process by asking citizens to share local knowledge of the City's vulnerability to hazards based on past occurrences. For the City of Sebastopol this may include vulnerability to flooding and wildfires. Public involvement can be solicited by working with CBOs, or through direct outreach via multiple media platforms, including the City's Website and social media, as well as traditional materials, such as newspaper notices, questionnaires, public workshops, involvement at public events, and distribution of the plan for public input at repositories.

The overall goal of communication is to inform the public about the process and to seek input, and to engage early and often. Messaging should cover the following topics:

- Announce kick-off of preparing a LHMP (typically within 30 days of kick-off meeting)
- Advertising the City's LHMP Webpage
- Advertisement of Public Workshop and other events
- Distribution of the public survey
- Notification of public comment and availability of the Public Review Draft LHMP
- Announce public meeting or open house
- Notification of availability of Final LHMP
- Announce City Council Hearing

3.1 Outreach Coordinator

The City's Outreach Coordinator, or designated Project Manager will lead the public involvement process and implementation of the Public Outreach Strategy. This strategy will be overseen and managed by Ms. Kari Svanstrom, the City's Planning Director for the plan preparation, as well as the City's consultant, Wood Environment & Infrastructure Solutions, Inc. (Wood).

3.2 Communication Platforms

3.2.1 Community-Based Organizations

Inviting CBOs to participate during the LHMP planning process is important because they may represent traditionally under-served or disadvantaged communities (DACs), or socially vulnerable populations, such as seniors or disabled. As defined by Senate Bill 1000 (Health and Safety Code § 39711) disadvantaged communities are low-income areas disproportionately affected by environmental pollution or other hazards that can lead to negative health effects, exposure, or environmental degradation.[1]

Generally, CBOs represent various segments of the community. In some cases, CBOs may represent DACs, the senior population, parent-teacher/youth groups, church groups, or neighborhood associations and engagement can be most successful when it is started early in the process. Outreach to CBOs is useful when providing information to members of the public whose first language is not English. A CBO representative may also be able to inform a segment of the community about the LHMP process, plan implementation, and foster communication with residents during an emergency. CBOs may include neighborhood groups, the business community, educational groups, faith-based organizations, or healthcare advocates. Several CBOs were invited to participate on the HMPC, including the Sebastopol Area Senior Center, West County Community Health Center, and the City's Map your Neighborhood (MYN) program administrator. Ongoing outreach with these CBOs will enhance communication and outreach to a larger segment of the citizens in Sebastopol.

[1] According to the Department of Water Resources (DWR) DAC Mapping Tool, there are no census tracts that intersect with the City of Sebastopol that contain a DAC. These maps only show census tracts that meet the DAC definition (i.e., only those census tracts with an annual median household income (MHI) that is less than 80 percent of the statewide annual MHI (Public Resources Section 75005(g)). The census tract data within the City of Sebastopol is available for download here: https://gis.water.ca.gov/app/dacs/.

3.2.2 Webpage

At the beginning of the process, the City should create a Webpage to keep the public informed on the development of the LHMP and to solicit public input. This Webpage can be designed to complement the City's existing Disaster Preparedness Webpage that includes information on flood and emergency preparation resources. The LHMP Webpage should be publicized on all media releases, mailings, newsletters, surveys, and public meeting advertisements. The Webpage can include a section for the public to sign up for project email updates. The City can also keep the Webpage active after the plan is completed to keep the public informed about the status of the mitigation actions (see Photo 1).



Photo 1. *City LHMP Webpages can include information on hazard mitigation, disaster preparedness, and public review documents. It also functions as a repository of for all the planning process documentation, Draft LHMP, and Cal OES/FEMA approval letters.*

3.2.3 Social Media

The City of Sebastopol can use the following social media platforms to circulate information on the LHMP:

- City Facebook (7,530+ followers)
- City Twitter (1,000+ followers)

At a minimum, the social media platforms should announce the kick-off of the LHMP planning process, advertise the City's LHMP Webpage and other events, post a link to the public survey, notify the public about meetings and workshops, and announce the availability of the plan for public input and comment. The City can share LHMP information with other social media groups and organizations.

The City of Sebastopol may also want to post information about the LHMP on other agency social media platforms. The City could circulate information regarding the LHMP on the Sonoma County Fire and Emergency Services Department Emergency Management Division Webpage, as well as the Sonoma Water Webpage and social media feeds.

3.2.4 Newspapers

The following regional and local print newspapers can be used to circulate and advertise information on the LHMP:

- Sonoma West Times & News
- Press Democrat

3.2.5 Press Releases

The City can distribute and circulate press releases over the course of the LHMP development. They can also encourage HMPC participants and stakeholders to distribute press releases during the project. Press releases can be distributed as informational flyers, advertisements, and public notices during community events. These communication platforms can be used to spread the news about the LHMP and invite the public to participate in the process. According to the U.S. Census American Community Survey Population Estimates, the racial/ethnic distribution of Sebastopol residents for 2019 (July 1, 2019) was 82.6 percent White, 9.3 percent Hispanic, 2.7 percent Asian, 2 percent African American, and a small percentage of

Native Hawaiian/Pacific Islander, and other races. Based on this information, press releases will be published in English.

Advertisements can focus on emergency planning, natural hazards, mitigation projects, and how to get the community prepared for disasters. The press releases can include posts and links to the City's LHMP Webpage and the public survey. As previously mentioned, the press releases should also announce the kick-off of the LHMP planning process, advertise the City's LHMP Webpage and other events, post a link to the public survey, notify the public about meetings and workshops, and announce the availability of the plan for public input and comment.

3.2.6 Public Survey

The City can prepare and distribute a public survey during the planning process. The public survey can gauge information on household preparedness, hazard priorities, local knowledge of tools to reduce risk and loss, and mitigation projects. The number of questions in public surveys can vary according to the jurisdiction, but they typically range from 10 to 20 questions. The questions are designed to help the City and HMPC understand local hazards and select mitigation actions.



Photo 2. *Online surveys are easy ways to increase public participation and gather input on household preparedness, hazard priorities, local knowledge of tools to reduce risk and loss, and mitigation projects.*

The public survey should be made available on the LHMP Webpage, and paper copies should be left at informational booths. Some counties and cities have made the public survey available on tablets at various community events, although this may no longer be safely feasible with the recent shelter-in-place restrictions and health and safety precautions. In summary, the public survey is designed to help the City better understand the following based on public input:

- Perception of natural hazards and risks
- Hazards with the most concern
- Best communication methods
- Level of public support for mitigation actions
- Willingness to invest in hazard mitigation

3.2.7 Informational Pop-Up Booths

The City can advertise the LHMP planning process and seek public input at informational booths during local events or booths displayed at the local library or other public repositories. During local events, informational booths can be staffed by HMPC participants, or by other City staff or provide a repository of hard-copy informational brochures and flyers. HMPC participants or City staff should be able to speak to the public about the LHMP project, invite them to visit the LHMP Webpage, and ask them to take the public survey. Tablets, if available and feasible based on current safety precautions in Sonoma County, could be provided at the informational booths for easy access to the public survey. Paper copies can also be provided. Some cities have provided real-time hazard mapping services to the public interested in viewing hazard assessments for their property. For the City, this could include providing hazard mapping

information. Informational booths displayed at libraries and other repositories should provide map displays, handouts, copies of public surveys, and flyers.

3.2.8 Local Events and Weekly Newsletters

The City of Sebastopol and HMPC may want to consider advertising the LHMP process during the popular community events, such as local farmer's markets. The HMPC can also advertise the LHMP process in the City's Weekly Newsletter.

3.2.9 Public Workshops

The City should invite the public to attend a public workshop at the beginning of the planning process. The public workshop should cover the purpose of the plan, the components of the LHMP, background on hazard mitigation planning, and next steps. The City can provide regular and ongoing project status updates on the LHMP during regular Planning Commission and City Council hearings. Wood recommends the City host the first public workshop within 60 days of the kick-off meeting or by October after the first HMPC meeting.



***Photo* 3.** *Requirement §201.6(b) of the Disaster Mitigation Act states the planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.*

During the public comment period, the City can hold a second public workshop. The public workshops can be scheduled as either stand-alone public workshops, or as part of a regularly scheduled Planning Commission or City Council hearing. These meetings should be advertised to the public and provide an opportunity for public comment. The public can also comment on the LHMP during final review and consideration by the City Council.

3.2.10 Utility Roundtable

The City can schedule a roundtable meeting with local utility providers, such as Pacific Gas & Electric (PG&E) and Sonoma Water to review and discuss hazards specific to local utilities, such as electric, gas, water, sewer and wastewater treatment, stormwater management, and telecommunications.

3.2.11 GIS Web Mapping Application

The City can develop a mapping platform that uses hazard data layers developed in the LHMP. The platform could display hazard maps that can be viewed individually or with multiple hazard layers.

The following community engagement steps and activities are outlined in conjunction with the hazard mitigation planning steps to demonstrate how they are linked in the process. This Public Outreach Strategy is a document that will be utilized and updated during the plan development process. It can also serve to document the efforts made to involve the public during each plan update.



Photo 4. *The California Office of Emergency Services (Cal OES) MyHazards tool provides the public an opportunity to research earthquake, flood, fire, and tsunami hazards in their community.*

3.2.12 Map your Neighborhood Mailing List

The City has an existing email distribution list as part of their MYN program. The Sebastopol MYN program is administered by the City's Public Safety Outreach Coordinator and is designed to help groups of neighbors prepare to and respond to an emergency together. This program has helped neighborhoods work together to develop stronger communities.

The MYN email distribution list currently consists of up to 400+ emails of community members. The City and HMPC should build on this existing email distribution list to announce the LHMP planning process. The City and HMPC should also use this email distribution list to spread the word about the LHMP public survey and other announcements related to public workshops and the availability of the Public Review Draft LHMP.

Table 1. Public Outreach Strategy Schedule of Activities

Timeframe	Mitigation Planning Steps	Public Participation Steps/Ideas	Specific Activities/Actions
July – September 2020	1. Getting Organized 2. Plan for public involvement 3. Coordinate with other departments and agencies	• Consider inviting CBOs to participate in the process (i.e., Sebastopol Area Senior Center). • Schedule HMPC Meeting #1 • Set-up an informational display at a local library. • Create a Webpage for the LHMP (new Webpage or one linked to the Disaster Preparedness Webpage): what is hazard mitigation, invitation to take a public survey, input on mitigation actions/projects (Wood can provide the LHMP backgrounder content for webpage). • Build public awareness through media channels/platforms, such as Facebook and Twitter. • Outreach through other groups, Private, Non-Profit, Non-governmental organizations • Possible public groups include: Local media, Chamber of Commerce, and Sebastopol Union School District.	• HMPC formed in September 2020 (5 representatives on City Steering Committee; 5+ public/stakeholder representatives on Steering Committee) (Working Group) • HMPC Meeting #1 – Planning Process • Public Workshop #1/Planning Commission Meeting • Design a stand-alone LHMP Webpage • Advertisement for Public Workshop via Facebook, Twitter, Newspapers, Webpage, Paper Flyers, City Weekly Newsletters • Schedule Utility Roundtable (if desired) • Develop and display content on the LHMP Webpage ○ Risk Assessment Key Findings • Design and circulate a Public Survey
October 2020 – January 2021	4. Identify the hazards 5. Assess the risks	• Provide survey and materials at meetings • Share public input during HMPC Meeting #2 • Cooperative review of public input • Announce workshops • Build contact list of interested citizens based on survey to inform of future activities	• Plan and circulate press releases, post on LHMP Webpage • Collect public comments from a survey developed specifically for the plan • HMPC Meeting #2 – Hazard Identification • Additional outreach for Public Survey • Collection and compilation of survey results

February – April 2021	6. Set planning goals 7. Review mitigation alternatives 8. Draft an action plan	• Place draft plan online on City's LHMP Webpage • Advertise the plan and public comment period • Email list of interested citizens identified in previous step about the public review draft • Encourage public review of Final Draft LHMP	• HMPC Meeting #3 – Mitigation Strategy • Develop links from City's Main Website to LHMP Webpage, encourage review and comment on draft plan. • Develop Online Form so public could leave comments on Public Review Draft LHMP • Public Workshop #2/Planning Commission Meeting
May – August 2021	9. Adopt the plan 10. Implement the plan, evaluate its worth, and revise as needed	• Continue to host the LHMP Webpage on the City's Main Website with contact information for public inquiries • Celebrate successes – including receiving hazard mitigation funding, implementation of projects, and publicizing where the plan and its implementation is making a difference and building hazard and climate resilience.	• Presentation at City Council meeting during adoption • Annual HMPC Meetings (to discuss status of mitigation projects) • 5-Year Update (scheduled for 2026)

Hazard Mitigation Planning Committee (HMPC) Meeting #1 Agenda

Date: 20 October 2020
10:00 -11:30 AM PST

Meeting at: Zoom Meeting ID: 858 7711 1136
https://us02web.zoom.us/j/85877111136
One tap mobile:
16699006833,,85877111136# US

Project: City of Sebastopol Local Hazard Mitigation Plan

Subject/Purpose

The purpose of the meeting is to introduce the Disaster Mitigation Act of 2000 and summarize the nine-step hazard mitigation planning process that will be followed to prepare the City's Local Hazard Mitigation Plan (LHMP). The LHMP is intended to identify hazards, assets at risk, and ways to reduce impacts through long-term sustainable mitigation projects.

1. Introductions
2. Mitigation Planning and the Disaster Mitigation Act
3. Planning Process
4. Role of the Hazard Mitigation Planning Committee (HMPC)
5. Hazards Review
6. Community Outreach Strategy
7. Data Collection Guide
8. Schedule
9. Questions

Wood Environment & Infrastructure, Inc.
10940 White Rock Road, Suite 190
Rancho Cordova, CA 95670
(916) 636-3200
woodplc.com

Hazard Mitigation Planning Committee (HMPC)

Meeting #1 Minutes

Date/Time: Tuesday, October 20, 2020 10:00 – 11:30 AM

Location: Zoom Meeting ID: 858 7711 1136 **Project No.:** SA20170850
https://us02web.zoom.us/j/85877111136
One tap mobile:
16699006833, 85877111136# US

Written By: Juliana Prosperi (Wood, Project Manager)

Present: Kari Svanstrom (City of Sebastopol, Planning Director)
Bill Braga (City of Sebastopol, Fire Chief)
Daryl Philips (City of Sebastopol, Building and Safety, Floodplain Administrator)
Jeff Brislawn (Wood, Hazard Mitigation Lead/Senior Associate)
Dante Del Prete (City of Sebastopol, Public Works Superintendent)
Don Mort (City of Sebastopol, Police Department)
Skip Jirrels (City of Sebastopol, Public Safety Outreach Coordinator)
Zach Douch (City of Sebastopol, Planning Commissioner/Red Cross/Business Owner)
Katie Davis (Sebastopol Area Senior Center)
Diane Ramirez (City of Petaluma, Project Manager)
Jill McLewis (Sebastopol Community Cultural Center)
Jennie Bruneman (West Sonoma County High School District/Director of Facilities, Maintenance, and Operations)

Subject: City of Sebastopol Hazard Mitigation Planning Committee Meeting #1

AGENDA TOPICS

This document is a record of attendance and a summary of the topics discussed at the above meeting including the following:

1. Introductions
2. Mitigation Planning and the Disaster Mitigation Act
3. Planning Process
4. Role of the Hazard Mitigation Planning Committee (HMPC)
5. Hazards Review
6. Community Outreach Strategy
7. Data Collection Guide
8. Schedule
9. Questions

wood.

1. Introductions

Ms. Prosperi initiated the virtual meeting, thanked everyone one for attending, and explained the purpose of the meeting was to prepare the City's LHMP. The City had participated in a previous regional plan prepared by the Association of Bay Area Governments in 2005 and updated in 2010, but the plan expired.

Ms. Prosperi started introductions and asked the group to state their name, agency and role, and indicate whether they have participated in the preparation of a LHMP or have experience personally or professionally with disasters. Ms. Prosperi and Mr. Brislawn introduced themselves as the Wood Environment & Infrastructure Solutions consultants. Ms. Svanstrom introduced herself as the City's Planning Director and noted she has been involved with hazard mitigation planning efforts for another city. Mr. Braga introduced himself as the City's Fire Chief and said he was excited to be preparing a new LHMP for the City. Next, Mr. Don Mort introduced himself; he represents the City's Police Department. Mr. Del Prete introduced himself as the City's Public Works Superintendent and noted he has not worked on a LHMP. Mr. Jirrels works as the City's Public Safety Outreach coordinator. Mr. Zach Douch introduced himself and explained he is representing Red Cross and his local business; he is also on the Planning Commission. Ms. Davis represents the Sebastopol Area Senior Center and was excited to participate in the hazard mitigation planning process and to share information on behalf of the City's senior community. Ms. Bruneman represents the West Sonoma County High School District and noted she participated in the Sonoma County Board of Education LHMP planning process that covered all 40 school districts in the County. Ms. McLewis represents the Sebastopol Community Cultural Center. Ms. Ramirez is a Project Manager at the City of Petaluma and said she has experience developing Petaluma's LHMP and the plan goes to City Council on November 2nd.

The HMPC participants listed in the beginning of this meeting summary were present for the first meeting. They are also listed on the sign-in sheet.

2. Mitigation Planning and Disaster Mitigation Act

Ms. Prosperi explained that the purpose of the meeting is to discuss the LHMP update process; identify planning committee members, partners, and stakeholders; discuss the engagement strategy and GIS data needs; and review the scope of work and schedule. She began a PowerPoint presentation that described the goals for the LHMP, discussed the trends resulting in increased costs for disaster response and recovery, specifically related to the recovery costs associated with wildfires, and introduced the concept of hazard mitigation planning. She introduced the Disaster Mitigation Act of 2000, the legislation that requires local governments to have a LHMP to be eligible for hazard mitigation grant funding from FEMA. Ms. Prosperi also summarized the California legislation driving hazard mitigation, climate adaptation, and evacuation planning.

3. Planning Process

Ms. Prosperi provided an overview of the four-phase planning process. Ms. Prosperi discussed using the city limits as the City's planning boundary and whether there are any major critical facilities that need to be addressed in this plan that fall outside the city limits. Mr. Del Prete

noted the City's water and wastewater infrastructure extends outside the city limits in some instances and there is a non-contiguous area southwest of the City where there is vulnerable water infrastructure. Ms. Svanstrom and Mr. Del Prete indicated they will coordinate with Ms. Prosperi to ensure the Wood GIS Team has the latest water and wastewater facilities in GIS.

4. Role of the Hazard Mitigation Planning Committee

As part of the PowerPoint, Ms. Prosperi outlined the benefits of participating in the HMPC. She explained that participation in the planning process will include:

- Attending and participating in up to three HMPC meetings; she explained the second meeting may be formatted as 2-3 hour workshop where they cover the risk assessment;
- Providing available data requested by the HMPC Coordinators and Ms. Svanstrom;
- Providing hazard profiles and vulnerability details specific to the City's planning area;
- Developing the local mitigation strategies;
- Advertising and assisting with the public input process, including up to two public workshops or open houses;
- Reviewing and commenting on the Draft LHMP, and
- Coordinating formal re-adoption of the updated plan.

Ms. Prosperi explained the objectives behind the structure of the HMPC given the City and Wood will align the LHMP update with the National Flood Insurance Program's (NFIP) Community Rating System (CRS) if the City decides to participate in the CRS program in the future. She said the CRS program is structured and it requires an equal number of stakeholders (other agencies, academic institutions, etc.) and the public to participate as City employees for City to achieve the highest number of credits.

5. Hazards Review

Ms. Prosperi described the hazards her team considers for each LHMP starts by reviewing the hazards listed in the 2018 California Multi-Hazard Mitigation Plan, but noted that some of the hazards listed may not apply to Sebastopol because they are not present or they are present, but have a low probability of future occurrence or have minimal impacts. Ms. Prosperi explained the City may prioritize the hazards differently based on the results of the Hazard Identification and Risk Assessment.

Ms. Prosperi stated we are required to consider all potential hazards, but if it is a hazard that does not occur within the planning area, we can note that in the plan, and dismiss it from further analysis. Ms. Prosperi then shared a Slido event code for the HMPC to complete a virtual poll on the top five hazards the City should address in the LHMP. Below is a list of the potential hazards nine HMPC participants agree we should profile in the risk assessment:

- Flood: 100/500 year (100%)
- Wildfire (89%)

- Energy Shortages and Resiliency (Electrical Power Shut-Offs) (78%)
- Earthquakes (67%)
- Drought and Water Shortages (44%)
- Epidemic/Pandemic/Vector-Borne Disease (44%)
- Extreme Heat (22%)
- Climate Change (22%)
- Severe Weather/High Winds (11%)
- Hazardous Material Releases (11%)
- Terrorism/Cyber Threats/Civil Disorder (11%)
- Landslides (0%)
- Dam and Levee Incidents (0%)
- Agricultural Pests/Diseases (0%)
- Aquatic Invasive Species (0%)
- Tree Mortality (0%)
- Oil Spills/Natural Gas Pipeline Hazards (0%)

Wood will investigate the following hazards in the LHMP, but expect we will not provide a detailed profile on each due to the lack of coastal areas, distance to the Pacific Ocean, or past occurrences in the City:

- Coastal Erosion/Tropical Storms
- Hurricanes
- Tsunami

Ms. Svanstrom noted that civil unrest needs to be covered in the City's LHMP. FEMA requires that natural hazards are covered, and Mr. Brislawn added that human-caused hazards can be covered, but the assessment will be focused on the consequences of that hazard occurrence rather than a detailed hazard profile.

Ms. Svanstrom added that the City is susceptible to sea level rise. She explained that the Laguna de Santa, which is a large freshwater marsh east of the City, flows both ways. During heavy rains the Laguna flows south carrying floodwaters away from the Russian River, reducing its floodwaters. After rains subside and the tides change, the Laguna reverses its flow, returning the floodwater north, back into the Russian River and eventually to the Pacific Ocean. FEMA is in the process of updating the flood maps for this area, and Ms. Svanstrom recalls the flood levels are anticipated to increase by one-half foot (6 inches) in this century. Ms. Svanstrom stated these maps will be available in November and possibly a resource for the City's risk assessment.

Mr. Braga added the City has compiled a list of after-action reports since the Tubbs Fire that should inform the development of wildfire risk.

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6. Community Outreach Strategy

Ms. Prosperi reviewed the public involvement requirements. She stated the first public workshop is scheduled as the second agenda item during the October 27th Planning Commission meeting. She stated that the second workshop will be scheduled once the Public Review Draft LHMP is available. Ms. Prosperi will work with Ms. Svanstrom to create the City's LHMP Webpage, distribute notices, and provide outreach support.

Mr. Jirrels said the Map your Neighborhood network consists of 400 to 500 residents and the HMPC could distribute outreach materials to the same network. Ms. Svanstrom stated the City also plans to spread the word about the plan in the City's weekly newsletter. There was also mention that the City has a list of citizens interested in preparedness, including a Citizen Emergency Response Team (CERT) list.

7. Data Collection Guide

Ms. Prosperi indicated their Wood's GIS Specialist has been working with the City of Santa Rosa's GIS Host to compile, organize, and prepare LHMP hazard exposure maps. He is also compiling a list of critical facilities in the City. Ms. Prosperi explained these are facilities that allow the continuous operation of critical government and community functions that are essential to human health and safety. They commonly include safety and security facilities (e.g. fire station), water and shelter facilities (e.g. churches, shelters), health and medical (e.g., hospitals), energy (e.g., power poles, back-up power generation), communications (e.g., dispatch centers), transportation (e.g., bridges, evacuation routes, mass transit), and hazardous material facilities.

Ms. Svanstrom added that four bridges in the City were included in the list. Ms. Prosperi said her team identified the locations of each bridge. Mr. Braga stated that key evacuation routes by zone need to be taken into consideration, including the evacuation roads. During the Kincade Fire, the town was gridlocked during evacuation of neighboring areas and the City is now working on defining zones in order to evacuate neighborhoods more safely by zone. Ms. Svanstrom stated the Senior Center will be included as a critical facility; she mentioned this facility may function in the future as a cooling center to serve the needs of seniors. Mr. Del Prete mentioned a critical water line in Zone 2 south of the City that if impacted may disrupt the delivery of water to the rest of the City. In summary, Ms. Svanstrom stated the following key critical facilities will be included: bridges, churches, schools, community center, senior center, Red Cross shelters, and water facilities.

Ms. Prosperi explained the contents of the Data Collection Guide to the group. She said the Ms. Svanstrom will be providing this guide to the team within the next week after the City provides input. Ms. Bruneman stated the Sonoma County School District recently developed their LHMP and the draft should be available in the future. She said the LHMP covers 40 school districts in the County and the mitigation projects are organized by hazard type. Ms. Svanstrom and Ms. Prosperi agreed this would be a great resource.

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8. Schedule

Ms. Prosperi stated they expect to complete the Draft LHMP in 9 months and submit the plan to Cal OES in November 2021. Ms. Prosperi stated their preference for the next meeting is to schedule the next HMPC meeting in mid-January. The group noted Tuesday mornings are generally good.

Task	Anticipated Date
Project Kick-off Meeting	July 9, 2020
HMPC Planning Session #1	October 20, 2020
Circulate Online Public Survey	November 2, 2020
Public Outreach Workshop #1	October 27, 2020
Prepare Hazard Identification and Risk Assessment	January 15, 2021
HMPC Planning Session #2	January 22, 2021
Planning Commission Meeting #1	February 9, 2021
Finalize Goals and Objectives	February 12, 2021
HMPC Planning Session #3	February 23, 2021
Compile Mitigation Actions Worksheets	March 8, 2021
Submit 1st Administrative Draft LHMP	March 30, 2021
City provides consolidated comments on 1st Administrative Draft LHMP	April 16, 2021
Submit 2nd Administrative Draft LHMP	April 30, 2021
Circulate Public Review Draft LHMP (30-day public review)	May 3 – June 1, 2021
Public Outreach Workshop #2	May 25, 2021
Complete FEMA Region IX Review Tool	May 28, 2021
Submit LHMP to Cal OES for review (45-day review)	June 11, 2021
Submit LHMP to FEMA for Review (45-day review)	July 26, 2021
Planning Commission Meeting #2[1]	September 28, 2021
City Council Hearing[2]	October 12, 2021
Project Management Close-Out Meeting	November 1, 2021

Questions and Answers

At the end of the meeting, there were no additional questions. The meeting adjourned at 11:35 a.m.

ACTION ITEMS

No.	Item	Action	Completion Date
1.	Submit HMPC Meeting #1 Minutes	(Wood)	26 October 2020
2.	1st Public Workshop	(City)	27 October 2020
3.	Submit Draft Online Survey	(City)	30 October 2020
4.	Finalize Critical Facility List	(City)	30 October 2020

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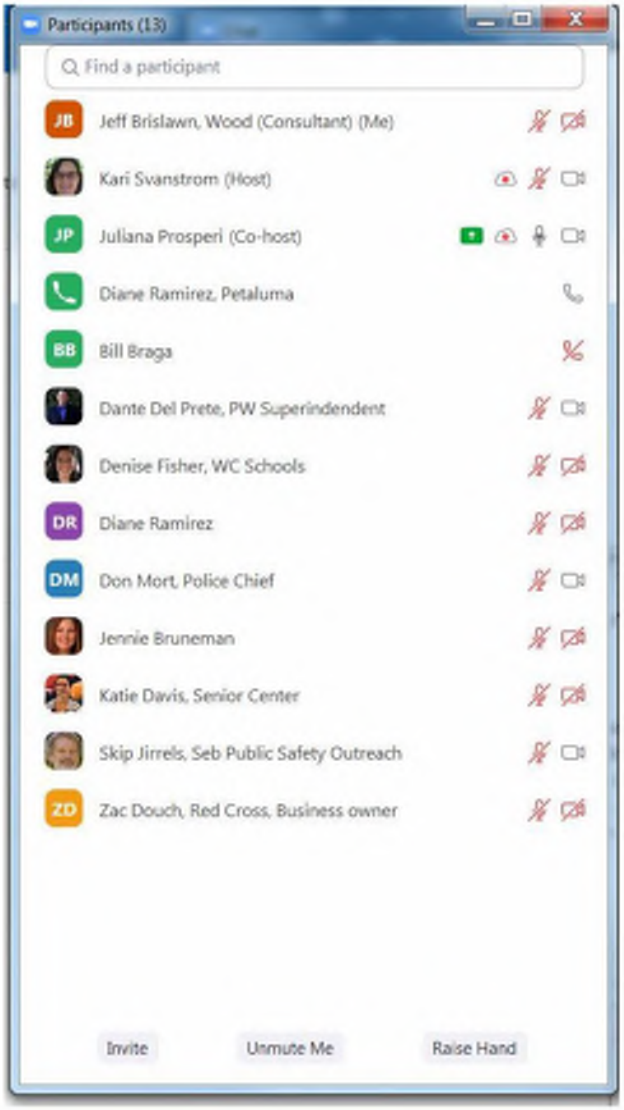
5.	Provide Webpage Backgrounder	(HMPC)	3 November 2020
6.	Community Outreach Strategy	(Wood)	6 November 2020

Attachment 1. HMPC Participant Sign-In



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City of Sebastopol
Local Hazard Mitigation Plan

Hazard Mitigation Planning Committee Meeting #1

October 20, 2020

1

Agenda

1. Introductions
2. Mitigation Planning and the Disaster Mitigation Act
3. Planning Process
4. Role of the Hazard Mitigation Planning Committee (HMPC)
5. Hazard Review
6. Community Outreach Strategy
7. Data Collection Guide
8. Schedule
9. Questions

2

Introductions

3

Introductions

- City of Sebastopol
  - Kari Svanstrom, Planning Director
  - Bill Braga, Fire Chief
  - Daryl Philips, Chief Building Official
- Wood Environment & Infrastructure Solutions, Inc.
  - Jeff Brislawn, Hazard Mitigation Lead
  - Juliana Prosperi, Project Manager

4

Mitigation Planning and the Disaster Mitigation Act

5

Mitigation Planning and Disaster Mitigation Act

What is Hazard Mitigation?

- Any sustained action taken to reduce or eliminate long-term risk to human life and property from natural and human-caused hazards.



6

Recent Natural Disasters around Sebastopol



"Every dollar invested on disaster prevention saves six dollars in costs related to response and recovery." -National Institute of Building Sciences

7

Disaster Mitigation Action of 2000

Federal Legislation

44 CFR 201.6

- Requires communities to update their hazard mitigation plans every 5 years to remain eligible for federal pre- and post-disaster funding (Hazard Mitigation Grant Program)
- Plan ensures the City will be become ready and eligible for mitigation projects when funding becomes available



8

Mitigation Planning and Disaster Mitigation Act

Trends Resulting in Increased Costs for Disaster Response and Recovery

- Population and community growth
  - More people
  - More infrastructure and buildings
  - More exposure to risk
- More natural and human-caused hazards
  - Technological, civil, terrorist hazards
  - Human-health hazards (pandemics)
- More disaster declarations
- Increase in disaster response and recovery costs



9

Mitigation Planning and Disaster Mitigation Act

Why do we need a Local Hazard Mitigation Plan?

- Increasing costs of response and recovery
- Many events are predictable and repetitive
- Prevents loss of life and injury and protects public safety
- Guides mitigation activities in a coordinated and transparent manner
- Eligibility for mitigation funds, pre- and post- disaster
- Integrates into other existing planning mechanisms
  - General Plan Safety Element
- Reduces risk to existing and future development
- Make community safer and more disaster resilient

10

National Flood Insurance Program Community Rating System

- Created in 1990 as a voluntary incentive program
- Recognizes communities that manage their floodplains beyond the minimum standards by providing discounted flood insurance rates
- Floodplain Management Planning earns credits in CRS



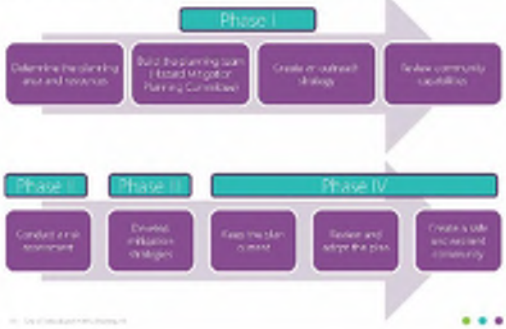
NFIP/CRS

11

Planning Process

12

FEMA's 4-Phase DMA Planning Guidance



13

FEMA's 2013 Nine-Step Process

Step 1	**Determine the Planning Area and Resources**
Step 2	**Build the Planning Team**
Step 3	Create an Outreach Strategy
Step 4	Review Community Capabilities
Step 5	Conduct a Risk Assessment
Step 6	Develop a Mitigation Strategy
Step 7	Keep the Plan Current
Step 8	Review and Adopt the Plan
Step 9	Create a Safe and Resilient Community

14

Phase I: Organize Resources

- **Define Planning Area**
  - City limits, Sphere of Influence boundary
- **City of Sebastopol Departments**
  - City Manager
  - City Attorney
  - City Clerk
  - Planning Department
  - Building & Safety (Floodplain Administrator)
  - Fire Department
  - Police Department
  - Public Works Department & Engineering Division
  - Administrative Services

15

Phase I: Plan for Public Involvement

- **Provide two opportunities**
  - During drafting stage
  - Prior to approval
- Include "public stakeholder" on planning team
- Public Workshop/Open House
- Community Outreach Strategy
- Online Survey
- Post Draft LHMP for public input
- Document process for 2020/2021 in plan

16

Phase I: Build a Hazard Mitigation Planning Team

- **Sebastopol Public Safety Outreach Coordinator**
- **Sonoma County**
  - Fire and Emergency Services Department
  - Office of Recovery and Resiliency
  - **Department of Emergency Management**
- Sonoma County Transit
- Sonoma County Water Agency
- Pacific Gas & Electric
- Federal, Regional, Businesses, Academia
- **Sebastopol Area Senior Center**
- **Red Cross**
- Cal Fire
- CVAA
- Ca OES
- **Neighboring Communities and Counties**
  - City of Santa Rosa
  - **City of Petaluma**
- FEMA Region IX
- US Bureau of Reclamation
- US Forest Service
- National Oceanic Atmospheric Administration/National Weather Service
- **West Sonoma County High School District/Analy High School**
- Health Care District
- Sonoma Specialty Hospital
- Sutter Pacific Medical Foundation
- **Gold Ridge Fire**
- **Sebastopol Community Cultural Center**

17

Phase II: Risk Assessment

Three Components

4) Hazard Identification (what can happen here?)

5) Vulnerability Assessment (what will be affected?)
   - Includes a Mitigation Capability Assessment



18

Phase II: Vulnerability Assessment

- Inventory residential and commercial structures
- Inventory critical facilities and infrastructure
  - Community Lifeline Facilities
- Determine value of structures
- Determine the number of people in hazard areas
- Identify vulnerable infrastructure
- Identify development trends / constraints
- Identify historic, cultural, and natural resource areas
- Estimate losses

19

Phase II: Mitigation Capability Assessment

- Inventory of the community's existing and proposed policies, programs, and ordinances that may affect its vulnerability to hazards
- Evaluate the effectiveness of each for mitigation purposes. Note gaps, shortfalls or conflicts associated with their design, enforcement of implementation. Identify any special opportunities
- Determine the City's technical and fiscal abilities to implement mitigation initiatives. Include ability to attract and leverage funding

20

Phase III: Develop a Mitigation Plan

- Set planning goals
- Review mitigation alternatives
  - FEMA Mitigation Ideas
  - NFIP CRS Guidance
    - Prevention
    - Property protection
    - Natural resource protection
    - Emergency services
    - Structural projects
    - Public information
    - Multi-hazard measures and considerations
  - Adaptation Planning Guide
- Draft an action plan



21

Phase III: Example Mitigation Projects

- Become a "StormReady" community
- Improve grading and drainage of wastewater effluent storage ponds
- City CWPP implementation
- Increase web-based public information outreach
- Acquire property in High Fire Hazard Zones
- Implement facility-specific flood mitigation projects
- Retrofit manhole covers
- Develop long-term flood control projects in Barlow district
- Enhance on-site coordination with Cal FIRE during fire events
- Develop mutual aid agreements with water providers and local and regional agencies for support during emergencies

22

Phase III: Review of Mitigation Alternatives

Criteria for Selecting Measures

- Will it work?
- Is it cost-beneficial?
- Is it affordable?
- Is it legal?
- Is it fair?
- Do people want it?
- Are there administrative burdens?
- Is it politically acceptable to community leaders?
- Is it environmentally sound?
- Is funding available?





23

Phase IV: Adopt & Implement the Plan

Adopt the Plan

- Official Adoption by Council
- Public input before adoption

Implement the Plan

- Assign an overall project manager
- Integrate actions into staff work plans
- Monitor and evaluate changes in vulnerability
- Report on progress, publicize successes
- Revise the plan every 5 years



24

Compliance and Beyond

SB 379	• Requires inclusion of climate change vulnerability assessment and integration of adaptation strategies in the Safety Element, encourages climate change efforts discussed in LHMPs. These requirements are included in Government Code Section 65302 (g)(4) (2015).
SB 1000	• Requires inclusion of environmental justice and equity goals and policies in the Safety Element. Identification of Disadvantaged Communities pursuant to Government Code Section 65302 (h) (2016).
AB 2140	• Links LHMP-based Safety Elements by encouraging the inclusion of LHMPs into Safety Elements and by tying funding eligibility to approval of LHMPs (2006).
SB 1241	• Requires Safety Elements to address wildfire risks in State Responsibility Areas and Very High Fire Hazard Severity Zones and include review by State Board of Forestry and Fire Protection (2012).
SB 747	• Requires Safety Element update to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. These requirements are included in Government Code Section 65302.15 related to land use (2018).
Other	• SB 99 (Reclassification of residential neighborhoods in hazard areas with only two emergency evacuation routes); SB 1383 (includes update to climate adaptation strategies in Safety Element at least every 8 years); AB 32 (Global Warming Solutions Act); emergency management plans; funding opportunities (e.g., Cal OES Hazard Mitigation Grant Program)

25

Role of the Hazard Mitigation Planning Committee

26

Role of the HMPC: Team Organization



27

Role of the HMPC: Benefits

- Collaboration on mitigation strategies and projects
- Determine eligibility for funding for mitigation projects
- Attend planning meetings
- Provide requested information related to data worksheets
- Review drafts and provide comments
- Assist with the public input process
- Coordinate formal adoption



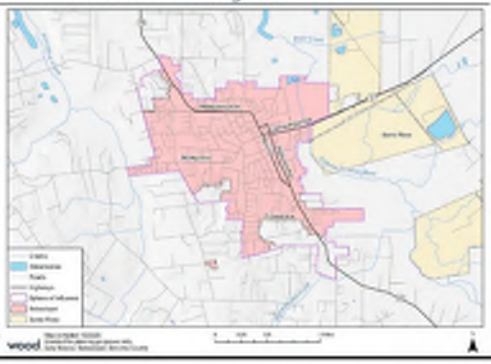


28

Hazards Review

29

Hazards Review: Planning Area



30

Hazards Review: Virtual Poll

- Join the poll at: www.slido.com #67399 and complete the poll!
- What are the top 5 hazards the City should assess in the Local Hazard Mitigation Plan?



31

Hazards Review: Hazards of Potential Concern

- Flooding
- Earthquake/Seismic Hazards
- Landslides/Debris Flows
- Wildfire
- Drought and Water Shortage
- Dam and Levee Incidents
- Severe Weather: Heavy Rain/Thunderstorms/Dense Fog
- High Winds
- Health Hazards
- Human-Caused Hazards
- Climate Change

32

Hazards Review: Profiles

Hazard/Problem Description
- Area, Seasonal Patterns, Speed of Onset/Duration

Geographic Extent (or Spatial Extent)
- Limited: Less than 10% of Planning Area
- Significant: 10-50% of Planning Area
- Extensive: >50-100% of Planning Area

Past Occurrences
- Information on Historical Incidents, Known Impacts

Magnitude/Severity:
- Catastrophic: More than 50% of property severely damaged
- Critical: 25-50% of property severely damaged
- Limited: 10-25% of property severely damaged
- Negligible: Less than 10% of property severely damaged

Significance
- Low: Minimal potential impact
- Medium: Moderate potential impact
- High: Widespread potential impact

Frequency/Likelihood of Future Occurrences
- Highly Likely: Near 100% chance of occurrence in next year
- Likely: Between 10-100% chance of occurrence in next year
- Occasional: Between 1-10% chance of occurrence in next year
- Unlikely: Less than 1% chance of occurrence in next year

33

Hazards Review: Climate Change

- Increasingly important factor affecting disaster management
- Addressed under each Hazard Profile as a factor intensifying impacts
- California is already experiencing impacts:
  - Prolonged drought
  - Increased coastal flooding and erosion
  - Sea level rise
  - Tree mortality
  - Larger wildfires
- Affect the frequency and severity of hazards





34

Community Outreach Strategy

35

Community Outreach Strategy: Toolbox

- Planning for Public Involvement
  - Website
  - Social Media
  - E-News
  - Newsletters
  - Online Public Survey
  - Pop-Up Events
  - Translation Services
  - Public Workshops



36

Community Outreach Strategy: Webpage



37

Data Collection Guide

38

Data Collection Guide: Sebastopol's Mitigation Capabilities

- 2004 Strategic Plan
- General Plan Safety Element
- Zoning Ordinance
- Building & Construction Code – Title 15 SMC
- Design & Improvement Standards – Title 16 SMC
- Five-Year Capital Improvement Plan
- PG&E Wildfire Safety
- Public Safety Power Shut Off
- Laguna Wetlands Preserve Restoration and Management Plan
- 2019 Climate Emergency Resolution
- Flood Alert System



39

Data Collection Guide: Other Capabilities

Sonoma County

- 2016 Sonoma County Operational Area HMP Update
- 2016 Sonoma County CWPP
- 2014 General Plan 2020 – Public Safety Element
- 2014 Climate Ready Sonoma County

Sonoma Water

- 2018 Sonoma County Water Agency LHMP
- 2019 Regional Water Supply Resiliency Study

Santa Rosa Plain Groundwater Sustainability Agency

- Draft Groundwater Sustainability Plan

40

Data Collection Guide: What's do we need?

- **GIS Data Needs List**
  - **Finalizing Critical Facilities List**
- Data Collection Guide
  - Worksheets #1 Hazard Identification
  - Worksheet #2 Historic Hazard Event
  - Worksheet #3 Vulnerability Assessment
  - Worksheet #4 Capability Assessment
- Recent hazard events
- Growth and development trends
- Recent updated plans and policies
- Follow-up with key staff where needed

41

Schedule

42


When will we meet next?
Months 1-2
Months 3-4
Months 5-6
Months 7-8
Months 9-10
Months 11-12

43


Detailed Schedule

44


Questions?
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Jeff Baldwin, CFM
(303) 820-4654
wood.

45

wood.

Local Hazard Mitigation Plan
Data Collection Guide

City of Sebastopol

Hazard Mitigation Planning Committee (HMPC)

Prepared by

Wood Environment & Infrastructure Solutions, Inc.

August 2020



Overview

The contents of this workbook have been designed to assist the City of Sebastopol (City) with the preparation of the 2020 Local Hazard Mitigation Plan (LHMP), in accordance with the Federal Disaster Mitigation Act (DMA) of 2000 requirements.

This guide includes a description of the necessary background information needed to support the hazard mitigation plan process. This includes the preparation of the hazard identification and vulnerability assessment, evaluating the City's current hazard mitigation capabilities, and a review of possible hazard mitigation projects or activities intended to prevent or reduce future losses. The plan's key components will be prepared through a formal planning process, which will ultimately culminate in adoption of the plan.

The essential information needed to support the planning process includes current background data about the City based on, but not limited to the following documents:

- City of Sebastopol General Plan (Adopted November 15, 2016)
- City of Sebastopol Housing Element Update (Adopted March 30, 2015)
- Taming Natural Hazards – Association of Bay Area Governments (ABAG) Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area 2010 [City of Sebastopol – Annex to 2010 ABAG Plan]
    - ABAG prepared a regional multi-jurisdictional LHMP Update for the San Francisco Bay Area in 2010. The goal of the regional multi-jurisdictional LHMP was to maintain and enhance a disaster-resistant region.
    - The City participated in the original LHMP and update by preparing an annex that was approved by FEMA and adopted by resolution in 2010 by the Sebastopol City Council as the City of Sebastopol 2010 LHMP Annex.
    - ABAG is no longer managing the update of the multi-jurisdictional LHMP and the plan has expired.

      Sebastopol's 2020 LHMP will supersede the 2010 LHMP Annex as a new and single jurisdictional stand-alone plan that is tailored to suit the needs and capabilities of the City and their planning partners rather than being a subset of a larger regional and multi-jurisdictional planning effort.

- City of Sebastopol Demographics (2010)
- San Francisco Bay Area 2017 Risk Profile
- 2016 California Building Standards Code

Other documentation may include ordinances, regulations, and procedures whose intent is to minimize future losses, as well as technical studies and reports. Additional information for the LHMP will include the City's technical and organizational capabilities to perform hazard mitigation/loss prevention functions. It is important that the plan shows what the City is doing now to limit future disaster losses and capture any mitigation success stories based on actions documented in other plans (e.g. Public Works Department and Engineering Division, Building and Safety Department, Zoning Ordinance development regulations, National Flood Insurance Program (NFIP) participation).

The planning process is heavily dependent on existing data to be supplied by each of the participants represented on the Hazard Mitigation Planning Committee (HMPC). The DMA plan development process does not require the development of new data but requires ***existing data only.*** The goal of this process is to produce a LHMP that meets the City's needs, as well as the requirements of the DMA of 2000 and contains a list of projects that may be eligible for streamlined federal pre- or post-disaster mitigation funding, including funding under the new Building Resilient Infrastructure and Communities (BRIC) grant program. BRIC is a new Federal Emergency Management Agency (FEMA) pre-disaster hazard mitigation program that replaces and expands upon the existing Pre-Disaster Mitigation (PDM) program.

What is Mitigation?

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of $6 in avoided future losses in addition to saving lives and preventing injuries (Natural Hazard Mitigation Saves: 2017 Interim Report).

Mitigation generally means reducing long-term risk from hazards to acceptable levels through pre-determined measures accompanying physical development, for example: strengthening structures to withstand high winds or snow loads; elevating, removing or limiting development in flood-prone areas; clearing defensible space around residences in Wildfire Urban Interface (WUI) areas; or designing development away from areas with geological instability. Mitigation can also protect existing development through seismic retrofitting, critical infrastructure protection, and floodproofing.

Mitigation is different from emergency preparedness or response. Preparedness concentrates on activities which make a person, place, or organization ready to respond to a disaster with emergency equipment, food, emergency shelter, and medicine. Response activities may reduce damages, such as sandbagging during a flood, but this is a short-term solution and requires advance warning and resources to be in place during the event. Mitigation of flood hazards through wise floodplain management and hazard avoidance is an example of a long-term solution.

Participation

The DMA planning regulations and guidance stress that each entity seeking the required FEMA approval of their mitigation plan must:

- Participate in the process;
- Detail areas within the planning area where the risk differs from that facing the entire area;
- Identify specific projects to be eligible for funding; and
- Have the City Council formally adopt the plan.

For HMPC members, 'participation' means the planning committee representatives will:

- Attend and participate in HMPC meetings;
- Provide available data that is requested of the HMPC coordinator;
- Provide input on specific sections of the Draft LHMP;
- Provide input on mitigation actions relevant to the jurisdiction's department;
- Review and provide/coordinate comments on the Draft Plan;
- Advertise, coordinate and participate in the public input process; and
- Coordinate the formal adoption of the plan by the City Council.

Hazard Mitigation Plan Data Collection Guide

This guide contains an explanation of the types of hazard mitigation/loss prevention data that is needed for the hazard mitigation planning process. This guide identifies specific requirements for the Risk Assessment Process, which includes the Hazard Identification, Vulnerability, and Capability Assessments. It also defines requirements for the Mitigation Strategy.

The worksheets have been developed to assist with the development of the Draft LHMP. The City should utilize members of their planning subcommittee to review the Draft LHMP and complete the worksheet forms. A step by step process is included in this guide.

Data collection worksheets are due by Friday October 30th to Juliana Prosperi.

Project Contacts

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Email: ksvanstrom@cityofsebastopol.org

Steps to prepare the City of Sebastopol LHMP

1. Attend planning meetings for the City of Sebastopol LHMP.
2. Download a Word (editable) version of the Data Collection Guide from the project file sharing site (link to be provided in email). Fill out the Worksheets.
3. Convene a HMPC (Hazard Mitigation Planning Committee).
    a. Include departments such as planning, engineering, public works, GIS, police, fire, etc as applicable
    b. Include outside stakeholders and general public, such as county, state agencies, faith-based groups, and educational representatives (e.g. Sebastopol Area Senior Center, Sebastopol Union School District, City of Santa Rosa, etc.)
    c. If the City intends to join the Community Rating System (CRS) program in the future, consider creating a steering committee that includes 50 percent of the group consisting of non-city stakeholders/general public to maximize potential credits for this planning step.
    d. Document any meetings with sign-in sheets (use blank template attached)
4. Review and complete Worksheets #1 and #2
    a. Identify hazard impacts (Use historic hazard event worksheet to provide details, or collect related reports, articles or memos with damage amounts, damage assessment reports, etc.)

b. Identify any hazard studies or plans – send electronic versions (preferred if available), web link, or hardcopies to City of Sebastopol HMPC Coordinator (Kari Svanstrom).

    i. Example: City of Sebastopol General Plan (adopted in 2016). This plan includes an Existing Conditions Report (prepared in August 2014), Housing Element Update (adopted in 2015), and a General Plan Update Environmental Impact Report (GPU EIR) that was adopted in May 2016. Each of these supporting documents contain background and existing conditions information on the City, including natural hazard information.

5. Review and complete Worksheet #3 Vulnerability Assessment

    a. Review discussion on potential losses and note where you may have more specific information on past losses or potential for future losses specific to the City, department, special district, or utility.

    Note: Wood will be evaluating the flood, earthquake and wildfire analyses based on current City of Sebastopol GIS datasets and recent Digital Flood Insurance Rate Maps (effective February 19, 2014) and current wildfire hazard data that will be provided by the City of Santa Rosa GIS Department that current hosts the City of Sebastopol's digital datasets.

6. Review and complete Worksheet #4 Capability Assessment

    a. Review the Jurisdiction-Specific Existing Capabilities, Development Trends

    b. Using the 'Track Changes' feature in Word, mark up the Worksheet #4 document with changes, ***OR*** use the attached worksheets to provide information on capabilities.

    c. Note any changes in hazard significance or reduction in vulnerability through the implementation of mitigation projects such as defensible space, stormwater improvements, public education efforts etc.

    d. Note any changes in development trends. Provide an estimate of future trends (building types and counts).

        i. According to the City's 2016 General Plan and 2015 Housing Element, most growth in the City occurred prior to 1976. Development during this period was spread throughout the City and non-residential growth during this period was focused along SR 116 going through the City, in the Downtown core, and the areas bordering Sebastopol Avenue through the City. From 1976 to 1989, growth was primarily residential from the Downtown core toward the west and the majority of residential growth occurred in subdivisions, generally located near the western edge of the

City both north and south of Covert Lane, along Jewell Avenue, and on Frankel Lane. Residential development also occurred on various in-fill lots throughout the City. Non-residential development occurred as in-fill development along SR 116 and development north of Sebastopol Avenue along Morris Street. From 1990 to 1999, residential growth occurred in small subdivisions and various scattered sites and non-residential growth continued to occur along the City's major arterials and also included small commercial centers in the City's neighborhoods. From 2000 to the present, the pace of development slowed. Residential development continued to occur on scattered sites throughout the City. Commercial development included several scattered sites, but was primarily focused in The Barlow area, west of Morris Street and north of Sebastopol Avenue.

ii. City of Sebastopol Municipal Services Review (2006)

e. Upload either 'Track Changed' Word version of Worksheet #4 to the file sharing site; provide this and notify the City of Sebastopol HMPC coordinator by **October 30th.**

7. Develop a Mitigation Action Plan
    a. Provide input to the details of the mitigation actions/projects, where applicable
    b. Prioritize actions/projects
    c. A worksheet and template will be provided to facilitate this, with due date TBD (after HMPC #3).
    d. Consider ideas for other projects in the City. These can be projects that may be in the works already but not captured in the plan or that may have become a priority following recent disaster declarations in neighboring jurisdictions. These will be discussed at a future HMPC meeting. A worksheet and template will be provided for both current and new project, with due date TBD (after HMPC #3).
8. Review Maintenance and Implementation chapter (when available)
    a. Review this section for future compliance strategies.
    b. Note any potential to incorporate the plan into existing planning mechanisms or opportunities to do so in the future ***(Important)*** *(e.g. amend General Plan Safety Element, ect.)*
    c. Note opportunities and strategies for continued public involvement (Wood will document meetings specific to the development of the proposed LHMP).
9. Help advertise and coordinate public meetings and workshops, where applicable
10. Provide documentation of all meetings to City of Sebastopol HMPC coordinator

11. Review and comment on the draft plan
12. When plan receives conditional approval from FEMA, adopt the plan
13. Implement the plan!

Information Sources

The following are possible sources of information to assist with the preparation of the plan:

- Sebastopol General Plan Safety Element (2016)
- Title 17 Sebastopol Municipal Code (Zoning Ordinance)
- City of Sebastopol Five-Year Capital Improvement Plan 2015 – 2020
- Sonoma County Hazard Mitigation Plan Update (2017) Available for download here: https://sonomacounty.ca.gov/PRMD/Long-Range-Plans/Hazard-Mitigation/Approved-Update/
    - The 2020 Sonoma County Multi-Jurisdictional HMP is underway and additional hazard information may become available from this plan that can inform the development of the City of Sebastopol LHMP.
- Sonoma County Water Agency Local Hazard Mitigation Plan Update (2018) Available for download here: https://www.sonomawater.org/secureourwater/
- GIS databases
- 2018 California State Hazard Mitigation Plan (Available here: https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/state-hazard-mitigation-plan
- Hazard specific plans (wildfire):
    - Sonoma County Community Wildfire Protection Plan (2016) Available for download here: http://www.firesafesonoma.org/main/docs
- Other related plans in region (nearby cities):
    - City of Santa Rosa Community Wildfire Protection Plan (under development, will be added as a Wildfire Annex to the 2016 LHMP)
    - City of Rohnert Park Local Hazard Mitigation Plan (2018) Available for download here: https://www.rpcity.org/city_hall/departments/development_services/planning_/development_activity/local_hazard_mitigation_plan
- Local Building codes/regulations

The Risk Assessment Process

The risk assessment process includes three components: hazard identification, vulnerability assessment, and capability assessment. Data needs and worksheets for each of the risk assessment components are included in this guide. Use these worksheets to evaluate the City's current vulnerability to the hazards that will be assessed in the plan. The intent is to identify the significance or risks to these hazards.

City of Sebastopol Hazard Mitigation Plan
Worksheet #1: Hazard Identification

Name of Department: _____

Use this worksheet to identify possible hazards that may impact the City of Sebastopol. Hazards identified in the 2018 California State Hazard Mitigation Plan are listed, and not ***all hazards may be applicable to the City***. Please rank according to the guidelines that follow the table. Use copies of Worksheet #2: Historic Hazard Event to provide evidence to justify your conclusions.

Hazard	Frequency of Occurrence	Hazard Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/ Source)
Dam & Levee Failure					
Drought and Water Storage					
Earthquakes					
Floods (including stormwater drainage)					
Agricultural and Silvicultural Pests/Disease					
Air Pollution					
Aquatic Invasive Species					
Avalanches					
Energy Shortage and Energy Resiliency					
Landslides					
Epidemic/Pandemic/Vector-Borne Disease					
Tree Mortality					
Severe Weather*					
Soil Hazards					
Volcanoes					
Wildfires					
Climate Change					
Human-Caused Hazards (sociotechnical/ technological)					
Hazardous Material Release					
Oil Spills					
Natural Gas Pipeline Hazards					
Radiological Accidents					
Train Accidents (Explosions/Toxic Releases)					
Well Stimulation and Hydraulic Fracturing Hazards					

Threat and Disturbance Hazards					
Terrorism					
Cyber Threats					
Civil Disorder					

Severe Weather includes dust storms, extreme temperatures, freeze cycles, fog, hail, heavy rains, lightning, tornadoes, windstorms, and winter storms

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Hazard Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance (your subjective opinion): Low, Medium, High

Prepared by: _____

Phone: _____

Email: _____

City of Sebastopol Local Hazard Mitigation Plan
Worksheet #2: Historic Hazard Event

Name of Department: _____

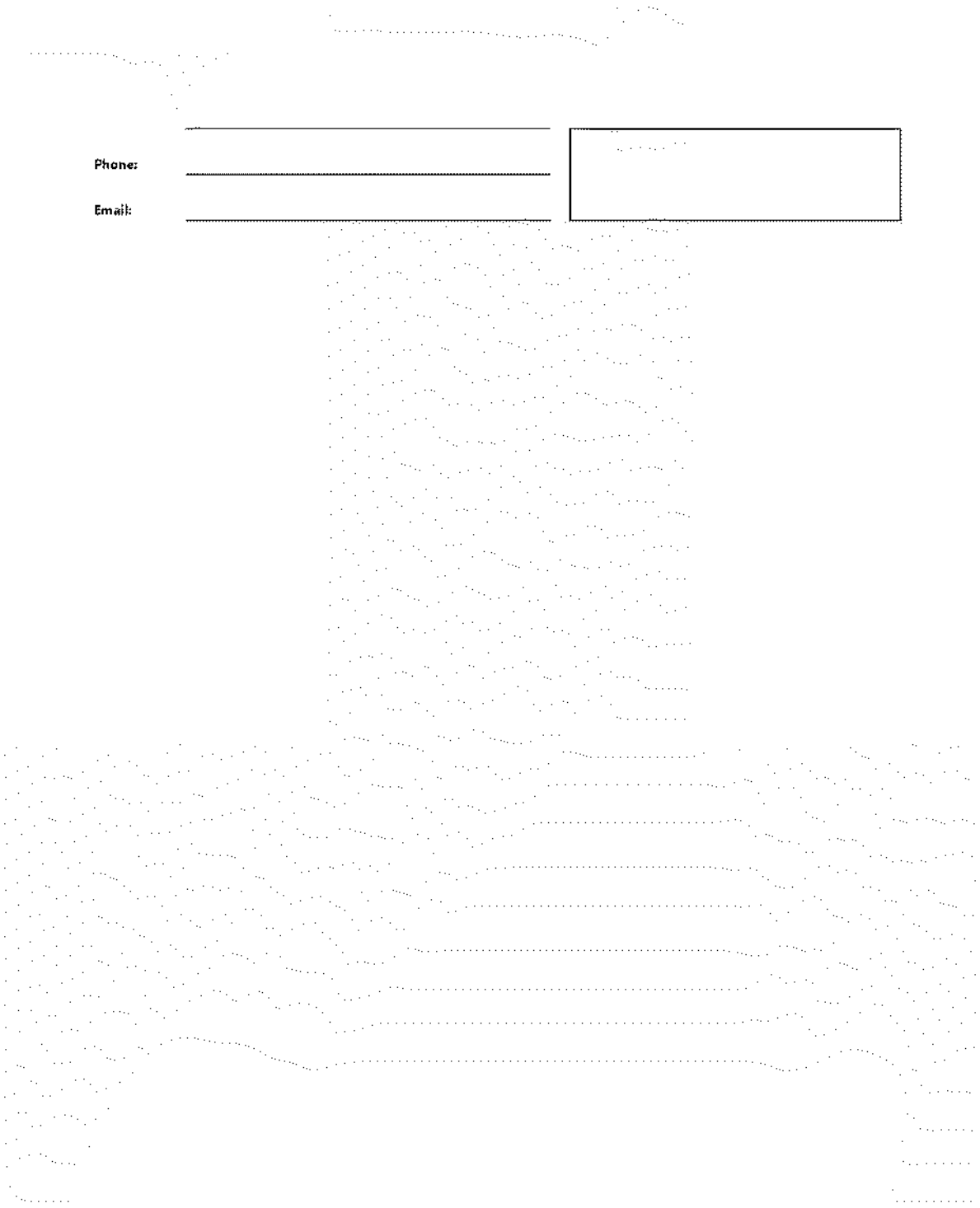
Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

Prepared by: _____

Phone: _____

Email: _____



City of Sebastopol Local Hazard Mitigation Plan
Worksheet #3: Vulnerability Assessment

Name of Department: _____

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table and questions that follow. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets as defined below. Attach supporting documentation, such as photographs, reports, or plans if possible. In the hazard column of the asset inventory table, indicate if there is a specific hazard to which the asset is at risk.

Critical Facilities and Community Lifelines

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Critical facilities must remain operational during any major disaster and be designed, located, and constructed accordingly. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical asset; examples are provided below.

Essential Facilities	High Potential Loss Facilities	Transportation and Lifeline
▪ Hospitals and other medical facilities ▪ Police stations ▪ Fire station ▪ Emergency Operations Centers	▪ Power plants ▪ Dams/levees ▪ Military installations ▪ Hazardous material sites ▪ Schools ▪ Shelters ▪ Day care centers ▪ Nursing homes ▪ Main government buildings	▪ Highways, bridges, and tunnels ▪ Railroads and facilities ▪ Bus facilities ▪ Airports ▪ Water treatment facilities ▪ Natural gas facilities and pipelines ▪ Oil facilities and pipelines ▪ Communications facilities

FEMA Lifelines are the U.S. Department of Homeland Security's current recommended way to standardize the classification of critical facilities and infrastructure which provide indispensable service, operation, or function to a community. According to FEMA, "a lifeline provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security" (FEMA Community Lifelines, 2019). These categorizations are particularly useful as they:

- Enable effort consolidations between government and other organizations (e.g. infrastructure owners and operators)

- Enable integration of preparedness efforts among plans and easier identification of unmet critical facility needs
- Refine sources and products to enhance awareness, capability gaps, and progress towards stabilization
- Enhance communication amongst critical entities, while enabling complex interdependencies between government assets
- Highlight lifeline related priority areas regarding general operations as well as response efforts.

Examples of critical facilities organized by FEMA's Community Lifelines are provided below.

FEMA Community Lifeline	Critical Facility Type
Communications	
	• Infrastructure • Alerts, Warnings, and Messages • 911 and Dispatch • Responder Communications • Finance
Energy (Power and Fuel)	
	• Power Grid • Fuel
Food, Water, and Shelter	
	• Food • Water • Shelter • Agriculture
Hazardous Materials	
	• Facilities • HAZMAT • Pollutants • Contaminants
Health and Medical	
	• Medical Care • Patient Movement • Public Health • Fatality Management • Medical Supply Chain
Safety and Security	
	• Law Enforcement/Security • Fire Services • Search and Rescue • Government Services • Community Safety
Transportation	
	• Highway/Roadway • Mass Transit

	• Railway • Aviation • Maritime

Source: FEMA Community Lifelines 2019

Natural, Cultural, and Historical Assets

Natural resource assets may include wetlands, threatened and endangered species, or other environmentally sensitive areas. Historical assets include state and federally listed historic sites.

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Name of Asset	Type*	Replacement value	Hazard Specific issues

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets

Additional Vulnerability Questions

Describe growth and development trends and future growth areas and how they relate to hazard areas and vulnerability concerns/issues.

Prepared by: _____

Phone: _____

Email: _____

City of Sebastopol Local Hazard Mitigation Plan
Worksheet #4: Capability Assessment

Name of Department: _____

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The region has developed innovative initiatives over the past decade to increase disaster resilience. Please complete this worksheet from your department's perspective and provide supporting documentation if possible.

Regulatory

The following planning and land management tools are typically used by local jurisdictions to implement hazard mitigation activities. Please indicate which your jurisdiction has in place. If your jurisdiction does not have this capability or authority, please indicate if a higher level of government has the authority. Also use the comments column to indicate how we can obtain a copy of the plan or document (i.e. available on the web (include address), will put on ftp, will e-mail or mail, will fax).

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan		
Zoning ordinance		
Subdivision ordinance		
Growth management ordinance		
Floodplain ordinance		
Other special purpose ordinance (stormwater, steep slope, wildfire)		
Building code		
Fire department ISO rating		
Erosion or sediment control program		
Stormwater management program		
Site plan review requirements		
Capital improvements plan		
Economic development plan		
Local emergency operations plan		
Other special plans		
Flood insurance study or other		

engineering study for streams		
Elevation certificates (for floodplain development)		
Other		

Administrative/Technical

Identify the technical and personnel resources responsible for activities related to hazard mitigation/loss prevention within your jurisdiction. If there are public resources at the next higher level government that can provide technical assistance, please indicate so in the comments column.

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices			
Engineer/professional trained in construction practices related to buildings and/or infrastructure			
Planner/engineer/scientist with an understanding of natural hazards			
Personnel skilled in GIS			
Full time building official			
Floodplain manager			
Emergency manager			
Grant writer			
Other personnel			
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)			
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)			
Other			

Additional Capabilities Questions

Does your community have any hazard-related certifications, such as Storm Ready certification or Firewise Communities certification?	
Describe any past or ongoing public education or information programs, such as for responsible water use, earthquake or fire safety, household preparedness, or environmental education.	
Describe any other past or ongoing projects or programs designed to reduce disaster losses. These may include projects to protect critical facilities.	

Prepared by: _____

Phone: _____

Email: _____

Sign-In Sheet – City of Sebastopol
Local Hazard Mitigation Plan

Jurisdiction:

Date: **Time:**

Location: **Meeting Purpose:**

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail

Hazard Mitigation Planning Committee (HMPC) Meeting #2 Agenda

Date: 2 February 2021
1:00 -2:30 PM PST

Meeting at: Zoom Meeting ID: 858 7711 1136
https://us02web.zoom.us/j/85877111136
One tap mobile:
+1 669 900 6833, 858 7711 1136 #US

Project: City of Sebastopol Local Hazard Mitigation Plan

Subject/Purpose

The purpose of the meeting is to review the findings from the Hazard Identification and Risk Assessment and to develop broad goals and objectives for the Local Hazard Mitigation Plan (LHMP) in coordination with related goals and objectives from the Sebastopol General Plan (2016) and from the Sonoma County Operational Area Hazard Mitigation Plan (2016).

1. Introductions
2. Review of Planning Process
3. Review of Identified Hazards
4. Vulnerability Assessment Overview by Hazard
5. Capabilities Assessment
6. Developing Goals for the Mitigation Strategy
7. Update on Public Outreach Strategy
8. Schedule and Next Steps
9. Questions and Answers

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Rancho Cordova, CA 95670

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woodplc.com

The City's goals and objectives should be integrated with the goals of the community, as laid out in the Safety Element of the Sebastopol General Plan (2016) and the Sonoma County Operational Area HMP (2016) because they target reducing the vulnerability of people and property exposed to natural hazards. The goals of each plan are provided below.

Sebastopol General Plan Safety Element (2016)

Goal SA 1: Minimize the risk of injury and property damage resulting from seismic and geologic hazards.

Goal SA 2: Reduce risk to human life, property, and public services associated with flood hazards.

Goal SA 3: Protect the safety of life and property by ensuring emergency preparedness.

Goal SA 4: Reduce fire hazards and maintain effective fire and emergency response services.

Goal SA 5: Maintain effective police services.

Goal SA 6: Reduce hazards associated with the transportation, use, storage and disposal of hazardous wastes and hazardous materials.

Sonoma County Operational Area Hazard Mitigation Plan (2016)

Goal PS-1: Prevent unnecessary exposure of people and property to risks of damage or injury from earthquakes, landslides and other geologic hazards.

Goal PS-2: Reduce existing flood hazards and prevent unnecessary exposure of people and property to risks of damage or injury from flood hazards

Goal PS-3: Prevent unnecessary exposure of people and property to risks of damage or injury from wildland and structural fires.

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Hazard Mitigation Planning Committee (HMPC)

Meeting #2 Minutes

Date/Time: Tuesday, February 4, 2021 1:00 – 3:00 PM

Location: Zoom Meeting ID: 858 7711 1136
https://us02web.zoom.us/j/85877111136
One tap mobile:
16699006833, 85877111136# US

Project No.: SA20170850

Written By: Juliana Prosperi (Wood, Project Manager)

Present:
Kari Svanstrom (City of Sebastopol, Planning Director)
Bill Braga (City of Sebastopol, Fire Chief)
Daryl Philips (City of Sebastopol, Building and Safety, Floodplain Administrator)
Jeff Brislawn (Wood, Hazard Mitigation Lead/Senior Associate)
Dante Del Prete (City of Sebastopol, Public Works Superintendent)
Don Mort (City of Sebastopol, Police Department)
Zach Douch (City of Sebastopol, Planning Commissioner/Red Cross)
Diane Ramirez (City of Petaluma, Project Manager)
Chris Anderegg (Sebastopol Community Cultural Center)
Jennie Bruneman (West Sonoma County HS District/Director of Facilities)
Denise Fisher (West Sonoma County Union HS District, Facilities Supervisor)

Not Present:
Katie Davis (Sebastopol Area Senior Center)
Skip Jirrels (City of Sebastopol, Public Safety Outreach Coordinator)
Shepley Schroth-Cary (Gold Ridge Fire Protection District)
Jeff DuVall (Sonoma County, Department of Emergency Management)
Lawrence McLaughlin (City of Sebastopol City Manager)
Mary Gourley (City of Sebastopol City Clerk)
Ron Nelson (City of Sebastopol Police Department)

Subject: City of Sebastopol HMPC Meeting #2

AGENDA TOPICS

This is a record of attendance and a summary of the topics discussed at the meeting:

1. Introductions
2. Review of Planning Process
3. Review of Identified Hazards/Vulnerability Overview by Hazard
4. Capabilities Assessment
5. Developing Goals for the Mitigation Strategy

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6. Update on Public Outreach Strategy
7. Schedule and Next Steps
8. Questions

1. Introductions

Ms. Prosperi initiated the virtual meeting, thanked everyone one for attending, and explained the purpose of the meeting was to review the risk assessment and vulnerability assessment findings and to share ideas on possible mitigation goals and objectives for the mitigation strategy. Ms. Prosperi started introductions and asked the group to state their name, agency, and role. She also asked the group to include this information in the chat room so the City can track participation. Information on the HMPC participants background and involvement in past hazard mitigation planning and disaster recovery efforts in Sebastopol and the Sonoma County region is provided in the 1st HMPC Meeting Minutes. The HMPC participants listed in the beginning of this meeting summary were present for the second meeting.

2. Review of Planning Process

Ms. Prosperi reminded the group of the concept of hazard mitigation planning and the legislation that requires local governments to have a LHMP in place to be eligible for hazard mitigation grant funding from FEMA. Ms. Prosperi also summarized the California legislation driving hazard mitigation, climate adaptation, social equity goals, and evacuation planning.

Ms. Prosperi provided an overview of the four-phase planning process, and FEMA's nine-step planning process the City is following to update their LHMP and explained the City has finished the risk assessment and vulnerability assessment for the plan. She said we will present the major findings of the risk assessment today and ask for input from the HMPC.

The City used the Sphere of Influence (SOI) boundary as the "planning area" to conduct the risk assessment based on feedback from the previous meeting, as there were critical facilities, such as water and wastewater infrastructure that fall outside the city limits. She pointed out that while the spatial analysis conducted quantitatively assessed properties and critical facilities within this planning area that several analyses considered regional hazards, such as wildfires and dam incidents that could occur in the region and have an impact on Sebastopol.

3. Review of Identified Hazards/Vulnerability Overview by Hazard

Ms. Prosperi described the hazards the City agreed to assess in detail in the risk assessment included eight natural hazards (earthquake, flooding, wildfires, drought, dam incidents, extreme heat, high winds, and severe weather) and two human-health and human-caused hazards (public health hazards and hazardous material incidents). Ms. Svanstrom noted that various hazards were dismissed from detailed assessment based on a low probability of occurrence, minimal impacts, and HMPC input. Ms. Prosperi added that some of these hazards were not entirely dismissed from further analysis but evaluated qualitatively or as a secondary hazard. This was the case for tree mortality and public safety power shutoffs (PSPS), which are addressed under the drought and high wind hazard profiles.

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Ms. Prosperi reviewed the risk summary table which assigns a hazard significance rating to each hazard to help the City prioritize hazards. She explained that based on her team's review of the data collection worksheets the City and HMPC may prioritize the hazards differently, but the results shown were based on the combination of the risk assessment and HMPC input from the worksheets. She also noted that the human-health and human-caused hazard profiles are organized similarly to the natural hazards, but the discussions are focused on the consequences of that hazard occurrence. The following summaries briefly highlight the key findings by hazard.

Flooding

Mr. Brislawn summarized the National Flood Insurance Program (NFIP) claims and the Repetitive Loss properties in the City. He reviewed the findings from the HAZUS Level 2 flood assessment, which considers the flood hazards based depth grids generated by HAZUS and explained the difference between the GIS overlay parcel-level analysis with the 100-year floodplain layer versus the parcel-level overlay using the depth grid data. The detailed terrain that was used to model the depth grid showed some areas where elevation on fill have removed certain properties from 1% annual chance flood risk. Ms. Svanstrom noted that elevation on fill is no longer allowed in the local floodplain ordinance. After review of the analysis, Mr. Del Prete and Mr. Braga noted that there were five City-owned buildings within the 100-year floodplain that were not shown on the depth grid figure including: 1) Youth Annex (425 Morris Street), 2) Sebastopol Community Cultural Center and Laguna Youth Park (390 Morris Street), 3) Wischeman Hall (465 Morris Street), 4) Police Department (6850 Laguna Parkway), and 5) Public Works Department (714 Johnson Street). These five buildings are within the 100-year floodplain as shown below.



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Ms. Bruneman added that the north end of several school district properties along Eddie Lane are along the edge of the floodplain. It was noted that the school has added several drainage improvements, but buildings have not been at risk. A culvert on Eddie Lane requires periodic clearing by Public Works. Ms. Svanstrom brought up the GIS Viewer for the City and pointed out the various City-owned and school district parcels (shown above) within or along the edge of the floodplain.

Following the meeting, Ms. Prosperi reviewed the 100-year floodplain overlay mapping and confirmed that all of the buildings in question with the exception of the Public Works Department and Wischeman Hall are accounted for in the analyses. Some buildings such as the Community Cultural Center and Youth Annex were included as part of the critical facility floodplain overlay analysis with the FEMA effective maps, which complements the parcel-level analysis, as shown below:

- **Police Department/Emergency Operations Center (EOC)** – not in parcel-level analysis but is included in the critical facility overlay with floodplain
- **Laguna Youth Park** – not in parcel-level analysis but is included in the critical facility overlay with floodplain
- **Youth Annex/Sebastopol Community Cultural Center** – not in parcel-level analysis but is included in the critical facility overlay with floodplain
- **Public Works Department/EOC** – not in parcel-level analysis and was not identified as a critical facility, but it is a city-owned building in the floodplain that will be added to the critical facility overlay analysis because it functions as part of the City's EOC
- **Wischeman Hall** – not in parcel-level analysis and was not identified in the critical facility overlay with the floodplain, but it is a city-owned building in the floodplain that will be added to the overall analysis

The City-owned buildings do not have an assessed value associated with the parcels and they were therefore not accounted for in the parcel-level analysis. Parcels that lack improved values, but contain a building or structure commonly refers to an exempt property (e.g. public buildings) and this is why they were not shown in the presentation. It is also noted that the HAZUS-generated depth grid model also does not exactly match the FEMA 100-year flood hazard boundary since it takes into account varying ground level elevations and flood depths compared to a distinct boundary delineated in the FEMA effective maps. Mr. Brislawn discussed the need to confirm with the State NFIP Administrator or Sonoma County whether there are any Severe Repetitive Loss properties in the City. Mr. Philips provided the Severe Repetitive Loss information on February 9, 2021. Ms. Prosperi also stated that FEMA is in the process of updating the flood maps for this area; Ms. Svanstrom stated flood levels are anticipated to increase by 6 inches.

Ms. Svanstrom clarified that according to the City's Building Code, all residential buildings require at least 2 feet of freeboard (elevating buildings lowest floor above the base flood elevation [BFE] or 1% annual chance flood, exceeding NFIP minimum height requirements) if

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located in the floodplain. She explained the City could consider updating the Building Code requirements to improve standards to better protect properties. Mr. Del Prete added that the City Council will review a consultant's assessment of a temporary flood barriers at the Council meeting that evening, which may provide helpful capability information for the plan update.

Earthquake

Mr. Brislawn discussed the seismic hazards in the region, including major faults outside the City, potential ground shaking, and liquefaction. He also reviewed the results of two HAZUS earthquake models: the probabilistic and deterministic scenarios conducted for the City. He explained that deterministic models are used to assess the worst-case scenario earthquakes (e.g. largest magnitude, closest distance) for specific scenarios, whereas a probabilistic model considers multiple scenarios with associated probabilities of occurrence. Based on the modelling, the probabilistic scenario resulted in greater damage and impacts to the City than the deterministic scenario. Mr. Anderegg asked if there were additional maps and tables on the earthquake model results specific to the City's critical facilities; Ms. Prosperi added that more mapping information is in the risk assessment The majority of the parcels and critical facilities in downtown Sebastopol are located within a zone with 80-90% peak ground acceleration potential, with the remainder of the City within the 90-100% peak ground acceleration zone.

Wildfire

Ms. Prosperi reviewed the findings of the wildfire analysis, including the Fire Hazard Severity Zone (FHSZ) and Fire Threat zones falling within the State Responsibility Areas and Local Responsibility Areas surrounding the City. She reviewed the fire history within a 25-mile buffer around the City and noted some of the largest and most devastating wildfires occurred in the last 5 years. Ms. Prosperi then reviewed the results of the parcel overlay analysis and noted the highest number of parcels at risk fell under the residential category and noted for all categories a total of $78 million in property was at risk based on those parcels within the moderate FHSZ category. She also reviewed the six critical facilities within the moderate FHSZ. It was noted that a sewer lift station on Morris street is very critical; Ms. Prosperi confirmed the sewer lift station is included in the City critical facilities list. If this facility was compromised there would be no connection to the City of Santa Rosa's wastewater treatment plant (WWTP).

Mr. Braga noted that several of the areas in the moderate FHSZ are outside the City limits, and a large portion of the mobile home park is near the Laguna Wetland Preserve, thereby limiting the amount of fire management activities the City can implement given the regulatory restrictions associated with permitting work in a wetland area. It was noted that the fire risk around the Robinson Road area crosses into County land but is within the City SOI. He added that the City has started evacuation route scenarios based on four quadrants that are broken down into sub quadrants for assigning neighborhood evacuation route. This program was initiated after the City experienced gridlock conditions the morning of the Glass Fire and Kincade fire evacuations.

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Dam Incidents
Ms. Prosperi reviewed the significant and high hazard dams upstream of the City, including the Warm Springs Dam located over 30 miles to the north of the City that has the potential to inundate a portion of the City in the event of a dam failure or breach event. She emphasized that dam incidents and flood inundation from failure events is a good example of a regional hazard that can affect multiple municipalities.

Drought
Ms. Prosperi reviewed the significance of drought hazards in Sebastopol and noted that because the City relies exclusively on groundwater supply via four groundwater wells, the City's vulnerability to drought is relatively low, provided groundwater levels and supplies can be sustained during drought. Ms. Svanstrom added that the City is participating in the development of the Groundwater Sustainability Agency's Groundwater Sustainability Plan. It was noted that there are 4 active wells for the City; a fifth well has been shut down due to contamination.

Extreme Heat
Ms. Prosperi reviewed extreme heat impacts in the state and region over the past 50 years and summarized climate projections from Cal-Adapt that show an increase in heatwaves by 2100. Ms. Svanstrom noted that most residents in Sebastopol do not have air conditioning and that there has been an increase in temperatures over the past several years. Swamp coolers are more prevalent than air conditioners. Ms. Prosperi highlighted a few nearby "cooling centers" and asked if there was any opened in the City during past summers. Mr. Anderegg noted the library has opened as a cooling center, the high school gym, and Ms. Svanstrom explained the Community Center can also be opened as a cooling center.

High Winds
Ms. Prosperi reviewed high wind hazards in the City and region, and noted several have resulted in fatalities, PSPS, and wildfire ignitions. She also noted that 219 Medicare beneficiaries are dependent on electricity and vulnerable to PSPS.

Severe Weather
Ms. Prosperi briefly profiled severe weather impacts on the City, particularly those that have resulted in heavy rain events. She asked the HMPC if there any capabilities related to severe weather hazards, but none were noted other than public education and warning notifications.

Public Health Hazards
The HMPC discussed public health hazards related to the ongoing pandemic, and recent capabilities the City developed to mitigate the spread of COVID-19.

Hazardous Material Incidents
Ms. Prosperi discussed hazardous material incidents in the City over the past 10 years and noted some of the County-level programs in place to track and minimize such events.

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4. Capabilities Assessment

The HMPC reviewed the City's existing capabilities focusing on the General Plan Safety Element, Zoning Ordinance, Building Code, and Capital Improvement Program. Ms. Svanstrom stated the City's floodplain regulations exceed the NFIP requirements and they require all residential buildings to be elevated two feet above BFE.

5. Developing Goals for the Mitigation Strategy

Ms. Prosperi defined mitigation goals for the group as broad statements on what the plan is intended to achieve. She explained they should be developed based on risk and losses. A range of goal statements were provided in the agenda handout that were from the Sebastopol General Plan Safety Element, 2016 Sonoma County Operational Area HMP, and other single-jurisdiction LHMPs in the region. The committee developed goals for the plan by providing ideas during the discussion. The preliminary goal statements developed by the committee are summarized below:

- **Goal 1:** Minimize new development in hazard-prone areas
- **Goal 2:** Minimize hazard impacts on existing development
- **Goal 3:** Build resiliency in the community and capacity against hazards in the City
- **Goal 4:** Improve infrastructure resiliency and redundancy against disruption and interruption

The last goal was focused on developing redundancies in the City's water and wastewater system. Mr. Del Prete noted that City is dependent on three large reservoirs for water supply and if they are damaged there is no back-up supply (reservoirs provide 7 days of storage for water). The City does not have back-up to transfer sewage out of the City; one 14-inch force main transfers wastewater to the City of Santa Rosa WWTP (City has 4 hours of capacity to store wastewater). The sewer pump station near the Highway 12 bridge is vulnerable to hazards. It was also noted that the Highway 12 bridge floods and roads to the north are also blocked, which leaves the only egress to the south.

Objectives were developed and participants will categorize and refine them at the next meeting.

6. Update on Public Outreach Strategy

Ms. Prosperi reviewed the public involvement requirements. She explained their first public workshop was in October 2020 in conjunction with the City's Planning Commission meeting and the second will be scheduled once the Public Review Draft LHMP is complete. Ms. Prosperi briefly reviewed the Public Survey results and documents on the LHMP Webpage.

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7. Schedule and Next Steps

Ms. Prosperi stated they expect to submit the plan to Cal OES in November 2021. Ms. Svanstrom stated they can schedule the 3rd HMPC Meeting on either March 9th or March 23rd.

Task	Anticipated Date
Project Kick-off Meeting	July 9, 2020
HMPC Planning Session #1	October 20, 2020
Circulate Online Public Survey	November 2, 2020 – February 1, 2021
Public Outreach Workshop #1	October 27, 2020
Prepare Hazard Identification and Risk Assessment	January 15, 2021
HMPC Planning Session #2	February 4, 2021
Finalize Goals and Objectives	March 9, 2021
HMPC Planning Session #3	March 9, 2021 or March 23, 2021
Submit 1st Administrative Draft LHMP	April 16, 2021
City provides consolidated comments on 1st Administrative Draft LHMP	April 30, 2021
Submit 2nd Administrative Draft LHMP	May 7, 2021
Circulate Public Review Draft LHMP (30-day public review)	May 10 – June 8, 2021
Public Outreach Workshop #2	May 25, 2021
Complete FEMA Region IX Review Tool	May 28, 2021
Submit LHMP to Cal OES for review (45-day review)	June 11, 2021
Submit LHMP to FEMA for Review (45-day review)	July 26, 2021
Planning Commission Meeting #2[1]	September 28, 2021
City Council Hearing[2]	October 12, 2021
Project Management Close-Out Meeting	November 1, 2021

Questions and Answers

At the end of the meeting, there were no additional questions. The meeting adjourned at 3:35 p.m.

ACTION ITEMS

No.	Item	Action	Completion Date
1.	Submit HMPC Meeting #2 Minutes	(Wood)	12 February 2021
2.	Schedule 3rd HMPC Meeting	(City)	16 February 2021

Attachment 1. Screenshot from HMPC Meeting #2; HMPC Participant Sign-In

City of Sebastopol HMPC Meeting #2
4 February 2021
Page 9

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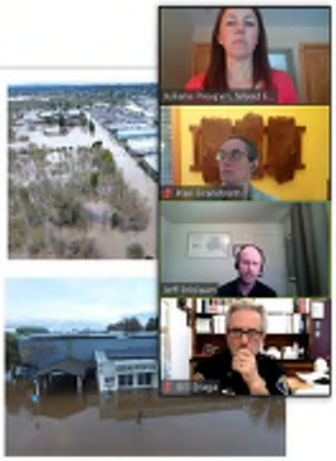
Review of Identified Hazards

Flooding

- **Hazard/Problem Description:** 100- and 500-year floodplains located east of City along Laguna de Santa Rosa and west of the City along Atascadero Creek. **Location:** Significant
- **Past Occurrences:** 4 federally declared disasters in Sonoma County. 22 events since 1997 resulting in $211 million in property damage and $6.1 million in crop damages in the County.
- **Magnitude/Severity:** Limited
- **Significance:** Medium
- **Likelihood of Future Occurrences:** Likely
- **Existing Capabilities:** Flood Insurance Studies, NFIP Participation, Floodplain Ordinance, Acquisition of flood-prone properties (Park Village, Community Center)



City of Sebastopol LHMP – HMPC Meeting #2 Risk Assessment

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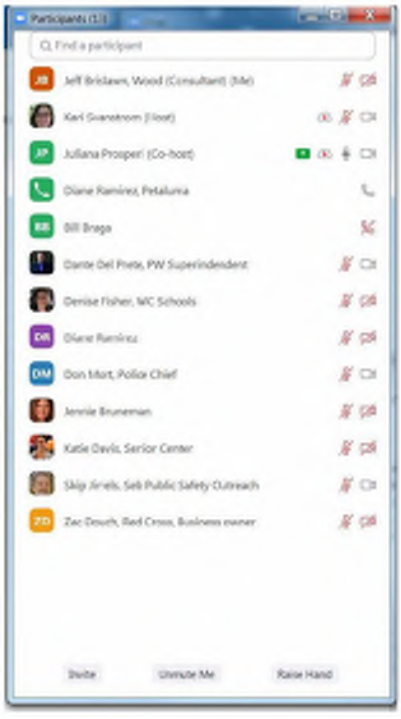

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City of Sebastopol
Local Hazard Mitigation Plan

Hazard Mitigation Planning Committee –
Meeting #2 – Risk Assessment

February 2, 2021 – 1:00-2:30 pm

1

Agenda

1. Introductions
2. Review of Planning Process
3. Review of Identified Hazards
4. Vulnerability Assessment Overview by Hazard
5. Capabilities Assessment
6. Developing Goals for the Mitigation Strategy
7. Update on Public Outreach Strategy
8. Schedule and Next Steps
9. Questions and Answers

2

Meeting Logistics

- Please mute your mic when not speaking.
- ...but please feel free to unmute when you have something to say!
- You can also use the chat log to make comments, ask questions, or provide information.
- This meeting is being recorded.
- Slides, meeting summary, and recording will be made available after the meeting.

3

Introductions

4

Introductions

- City of Sebastopol
  - Kari Svanstrom, Planning Director
  - Bill Braga, Fire Chief
  - Daryl Philips, Chief Building Official
- Wood Environment & Infrastructure Solutions, Inc.
  - Juliana Prosperi, Project Manager
  - Jeff Brislawn, Hazard Mitigation Lead/Sr Technical Advisor

5

Review of Planning Process

6

Review of Planning Process

Disaster Mitigation Act of 2000

What it is, why its important, and why we are here today!

- Requires local governments to have hazard mitigation plans for continued eligibility for mitigation funds, pre- and post- disaster
- Guide mitigation activities in a coordinated & economic manner
- Integrates into other existing planning mechanisms
- Directs future development: plan and build wisely
- Reduces losses
- Make communities more disaster resilient



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7

Mitigation Planning and Disaster Mitigation Act

National Flood Insurance Program/Community Rating System

- Created in 1990 as a voluntary incentive program
- Recognizes communities that manage their floodplains beyond the minimum standards by providing discounted flood insurance rates
- Floodplain Management Planning earns credits in CRS
- The City joined the NFIP in 1980, but is not a CRS participant

NFIP/CRS



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8

Mitigation Planning and Disaster Mitigation Act

California Legislation

- **AB 99:** Requires the General Plan Safety Element to identify residential developments in hazard areas that do not have at least two emergency evacuation routes.
- **SB 379:** Requires climate adaptation strategies in General Plan Safety Elements and encourages climate change discussion in LHMPs.
- **SB 1000:** Requires Environmental Justice and Equity goals in General Plan.
- **AB 2140:** Encourages the adoption of LHMPs into General Plan Safety Element (after LHMP Approval).
- **SB 1241:** Revised safety element requirement of General Plans to address risk of State Responsibility Areas (SRA) and Very High Fire Hazard Severity Zones





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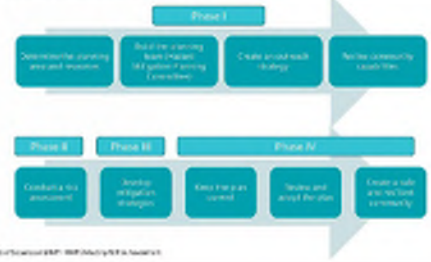
9

Mitigation Planning

FEMA's 4-Phase DMA Planning Phases



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10

Mitigation Planning

FEMA's 9-Task Process

- **Task 1** **Determine the Planning Area and Resources**
- **Task 2** **Build the Planning Team**
- **Task 3** **Create an Outreach Strategy**
- **Task 4** **Review Community Capabilities**
- **Task 5** **Conduct a Risk Assessment**
- **Task 6** Develop a Mitigation Strategy
- **Task 7** Keep the Plan Current
- **Task 8** Review and Adopt the Plan
- **Task 9** Create a Safe and Resilient Community

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11

Mitigation Planning

City of Sebastopol Departments

- City Manager
- City Attorney
- City Clerk
- Planning Department
- Building & Safety (Floodplain Administrator)
- Fire Department
- Police Department
- Public Works Department & Engineering Division
- Administrative Services

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12

Mitigation Planning

Progress so Far

- 1st HMPC Meeting on October 20, 2020
- 1st Public Workshop on October 27, 2020 with City Planning Commission
- Collected and reviewed hazard information in worksheets
- Developed a Critical Facilities GIS Database for the City
- Conducted GIS mapping and spatial analysis for the vulnerability assessment
- Completed the Risk assessment and Vulnerability Assessment
- Online Public Survey closed January 31st

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13

Mitigation Planning

What goes into a Local Hazard Mitigation Plan?

- **Section 1 – Introduction**
- **Section 2 – Community Profile**
- Section 3 – Planning Process
- **Section 4 – Risk Assessment, plus Capability Assessment**
- Section 5 – Mitigation Strategy
- Section 6 – Plan Adoption
- Section 7 – Plan Implementation and Maintenance

- Appendices

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14

Review of Identified Hazards

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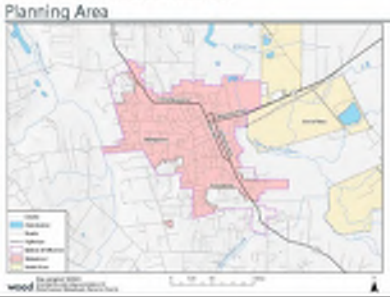
15

Review of Identified Hazards:

Planning Area



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16

Review of Identified Hazards

Hazards of Concern

- Natural Hazards:
  - Dam Incidents
  - Drought
  - Earthquake/Seismic Hazards
  - Flood
  - Severe Weather: Heavy Rain/Thunderstorms/Hail Lightning
  - Severe Weather: Extreme Heat
  - Severe Weather: Wind
  - Wildfire
- Human-Caused Hazards:
  - Hazardous Materials Incidents
  - Public Health Hazards

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17

Review of Identified Hazards

Other Hazards

Hazards Dismissed from Further Analysis

- Agricultural Hazards
- Air Pollution
- Aquatic Invasive Species
- Avalanches
- Civil Unrest/Civil Disturbance
- Energy Shortage & Energy Resilience (Integrated w/ Extreme Weather)
- Tree Mortality (Integrated w/ Drought)
- Terrorism
- Tsunami
- Volcanoes

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18

Review of Identified Hazards

Terminology

- **Hazard/Threat:** Act or phenomenon with potential to do harm
- **Vulnerability:** susceptibility to harm, damage, loss
- **Exposure:** People, property, systems or functions that could be lost to a hazard
- **Risk:** Combines hazard, vulnerability, exposure and probability
- **Mitigation:** Actions taken in advance of a hazard's impact that reduce its severity



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19

Hazard Identification and Risk Assessment

Hazard Profiles

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20

Review of Identified Hazards

Hazard Profiles

- **Climate Change Considerations**
  - Increasingly important factor affecting disaster management
  - Addressed under each Hazard Profile as a factor intensifying impacts of many natural hazards
  - California is already experiencing impacts:
    - Prolonged drought
    - Increased coastal flooding and erosion and sea level rise
    - Tree mortality
    - Larger wildfires
  - Can affect the frequency and severity of hazard events

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21

Review of Identified Hazards

Risk Summary

Hazard	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Earthquake	Extensive	Likely	Critical	High
Flood	Significant	Likely	Limited	Medium
Wildfire	Limited	Likely	Critical	Medium
Drought	Significant	Likely	Limited	Medium
Dam Incidents	Limited	Unlikely	Negligible	Low
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium
Severe Weather: Heavy Rain/Thunderstorm/Hail/Lightning	Extensive	Likely	Limited	Medium
Severe Weather: High Winds	Extensive	Likely	Limited	Medium
Public Health Hazards	Extensive	Likely	Critical	High
Hazardous Material Releases	Limited	Likely	Negligible	Low

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22

Review of Identified Hazards

Disaster Declarations in Sonoma County

Event / Hazard	Year	# of Declarations	Disaster #	Declaration Type
Heavy Rains and Flooding	1964	1	140	Major Disaster Declaration
Severe Storms and Flooding	1965	1	150	Major Disaster Declaration
Drought	1977	1	333	Emergency Declaration
Flood	1982	1	651	Major Disaster Declaration
Coastal Storm	1983	1	677	Major Disaster Declaration
Flood	1986	1	758	Major Disaster Declaration
Floods	1997	1	1155	Major Disaster Declaration
Flood	1998	1	1203	Major Disaster Declaration
Ice Storm – Falling Losses	1998	1	1200	Major Disaster Declaration
Severe Storm(s)	1995	2	1044, 1160	Major Disaster Declaration
Severe Storm(s)	1997	1	1203	Major Disaster Declaration
Severe Storm(s)	1998	1	1203	Major Disaster Declaration
Fire	2000	1	1314	Fire Management
Hurricane	2005	1	3248	Emergency Declaration
Severe Storm(s), Flood	2006	4	1646, 1646	Major Disaster Declaration
Fire	2015	1	4240	Fire Management
Severe Storm(s), Flood, Mud	2017	3	4344, 4382, 4564, 4570, 4572, 4572	Major Disaster Declaration or Fire Management
Fire, Severe Storm(s), Flood	2019	3	4382, 4404	Major Disaster Declaration or Fire Management
Wildfires & COVID-19 Pandemic	2020	4	4482, 4482, 4483, 4558	Emergency & Major Disaster Declarations, Fire Management

23

Review of Identified Hazards

Disaster Declarations in Sonoma County

Sonoma County has had 30 Federal Declarations Since 1956



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24

Risk Assessment

Hazard Identification and Vulnerability Assessment

- Hazard Identification
  - What, where, how often, how bad
- Vulnerability Assessment
  - What will be affected?
  - Estimate losses in City
  - Assess vulnerabilities of Critical Facilities
  - Includes a Mitigation Capability Assessment



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25

Vulnerability Assessment

What will be affected?

- Inventory residential and commercial structures
- Inventory vacant parcels
- Inventory critical facilities and infrastructure
- Determine value of structures
- Determine the number of people in hazard areas
- Identify vulnerable infrastructure
- Identify development trends/constraints
- Identify historic, cultural, and natural resource areas
- Estimate losses by hazard

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26

Review of Identified Hazards

Flooding

- **Hazard/Problem Description:** 100- and 500-year floodplains located east of City along Laguna de Santa Rosa and west of the City along Atascadero Creek.
  Location: Significant
- **Past Occurrences:** 4 federally declared disasters in Sonoma County: 22 events since 1997 resulting in $21 million in property damage and $6.1 million in crop damages in the County.
- **Magnitude/Severity:** Limited
- **Significance:** Medium
- **Likelihood of Future Occurrences:** Likely
- **Existing Capabilities:** Flood Insurance Studies, NFIP Participation, Floodplain Ordinance, Acquisition of flood-prone properties (Park Village, Community Center)





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27

Review of Identified Hazards

Flooding: NFIP Claims and Repetitive Loss Properties

- **Insurance Coverage and NFIP Claims**
  - City joined NFIP on June 18, 1980
  - 36 policies in place in the City resulting in $7.5 million of insurance in effect
  - 63 total closed cases amounting to $1.6 million in payments
  - 37 closed paid losses were single family properties compared to 17 non-residential properties
- **Repetitive Loss Properties**
  - 23 repetitive loss buildings
  - Incurred 31 total losses and these accrued $1.4 million in payments





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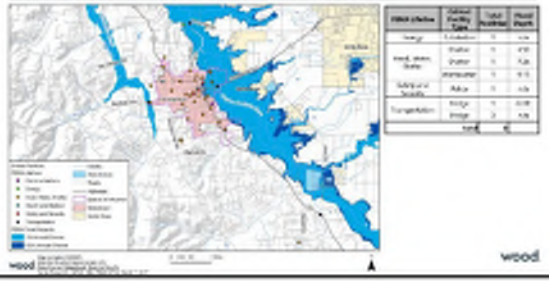
28

Review of Identified Hazards

Flooding: Critical Facilities at Risk of 100-year Flood



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29

Review of Identified Hazards

Flooding: Flood-Depth Properties at Risk Hazus Level 2 Assessment



wood

30

Review of Identified Hazards

Flooding: Flood-Depth Properties at Risk Hazus Level 2 Assessment

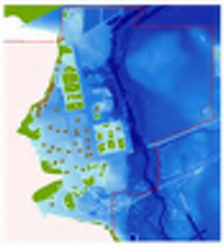
Property Type	Improved Parcel	Improved Value	Estimated Building Loss	Content Value	Estimated Content Loss	Total Loss Estimate	Population at Risk
Commercial	25	$25,331,694	$2,937,920	$25,557,464	$12,712,032	$15,649,217	0
Industrial	3	$197,545	$10,231	$196,434	$97,796	$121,971	0
Multi-Family	2	$1,283,334	$163,667	$541,547	$86,676	$247,456	3
Residential	41	$8,005,589	$2,269,269	$4,463,841	$779,369	$3,671,343	129
Total	**71**	**$35,768,896**	**$5,471,688**	**$30,958,329**	**$13,366,343**	**$19,537,987**	**139**

wood.

31

Review of Identified Hazards

Flooding: Flood-Depth Properties at Risk Hazus Level 2 Assessment



- **Comparison to the 1% Annual Chance Flood**
  - 91 improved parcels were at risk to the FEMA 100 year annual flood compared to 72 parcels at risk in the Hazus Level 2 Assessment
  - Total estimated loss to the 100 year annual flood is $19.5 million compared to $26.6 million in the Hazus Level 2 Assessment
  - Difference may be reflecting the City's floodplain regulations and elevated properties
  - Depth grid is not the exact extent of the FEMA 100 year floodplain and appears to account for elevated properties.

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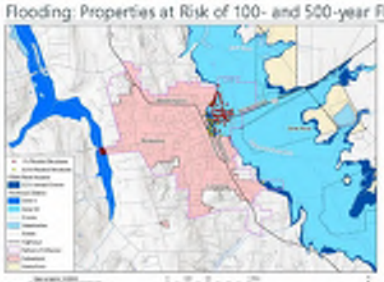
32

Review of Identified Hazards

Flooding: Properties at Risk of 100- and 500-year Flood



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33

Review of Identified Hazards

Flooding: Properties at Risk of 500-year Flood

Flood Event	Property Type	Improved Parcel	Improved Value	Content Value	Total Value	Loss Estimate (25% of Total Value)	Population at Risk
0.2% Annual Chance	Commercial	16	$14,769,859	$13,750,509	$28,520,368	$7,130,092	0
	Multi-Family	1	$240,844	$135,222	$376,066	$94,017	3
	Residential	4	$602,343	$307,282	$909,625	$227,406	12
	Total	**23**	**$15,531,249**	**$14,212,544**	**$29,343,730**	**$7,335,940**	**15**

wood.

34

Review of Identified Hazards

Earthquake Hazards

- **Hazards/Problem Description:**
  - Multiple faults of concern:
    - Healdsburg-Rodgers Creek Fault
    - San Andreas Fault
  - Potential for Strong Ground Shaking
  - Potential for Liquefaction
- **Geographic Extent:** Extensive
- **Past Occurrences:** South Napa Earthquake and Loma Prieta Earthquake
- **Magnitude/Severity:** Significant
- **Significance:** High
- **Future Likelihood of Occurrence:** Likely
  - M 6.7 or above is around 72% in the San Francisco Bay Region based on latest USGS estimates.
- **Existing Capabilities:** Sebastopol General Plan, 2019 CBC, URM Ordinance

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35

Review of Identified Hazards

Earthquake Hazards – Faults near the Planning Area

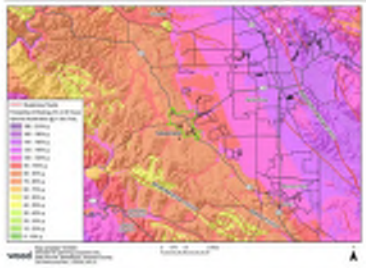


wood.

36

Review of Identified Hazards

Earthquake Hazards – Ground Shaking Probability



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37

Review of Identified Hazards

Earthquake Hazards – Liquefaction Susceptibility



wood

38

Review of Identified Hazards

Earthquake Hazards – Hazus Loss Modeling Results

2,500-year Probabilistic Scenario

- Total economic loss $782.5 million (includes building and lifeline losses based on the Hazus-MH inventory)
- Building-related losses $767.9 million (includes direct building losses and business interruption losses)
- 3,249 buildings (57 % of total in the study area) were at least moderately damaged
- 47 buildings were damaged beyond repair
- Residential structures made up 37% of total loss
- 14% of the estimated losses were related to business interruptions.
- Mid-day earthquake (2 p.m.) would cause the most injuries and casualties: 273 injuries and 19 fatalities



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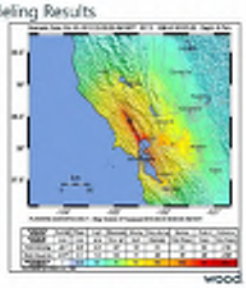
39

Review of Identified Hazards

Earthquake Hazards – Hazus Loss Modeling Results

M7.2 Deterministic ShakeMap Scenario

- Total economic loss $66.7 million (includes building and lifeline losses based on the Hazus-MH inventory)
- Building-related losses $66.5 million (includes direct building losses and business interruption losses)
- 301 buildings were at least moderately damaged
- 4 buildings were damaged beyond repair
- Residential structures made up 67 % of total loss
- 12% of the estimated losses were related to business interruptions.
- Mid-day earthquake (2 p.m.) would cause the most injuries and casualties: 7 injuries and 1 critical injury



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40

Review of Identified Hazards

Wildfire

- **Hazard/Problem Description:** Southern portions of the City, particularly the Fircrest Mobile Home Park area and along Robinson Road show moderate and high severity hazard areas based on fire threat data and the FHSZs mapped for LRA levels.
  - 126 parcels within the moderate FHSZ
- **Location:** Limited
- **Past Occurrences:** 25 wildfires within 25 miles of the City since 1944
- **Magnitude/Severity:** Critical
- **Significance:** Medium
- **Likelihood of Future Occurrences:** Likely
- **Existing Capabilities:** Community shelters, evacuation planning underway





wood

41

Review of Identified Hazards

Wildfire: Fire Hazard Severity Zones in SRAs and LRAs

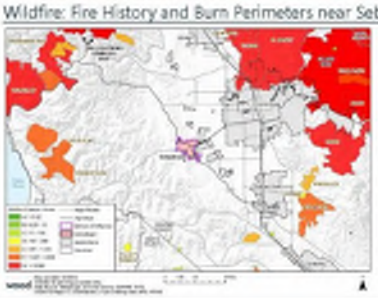


wood

42

Review of Identified Hazards

Wildfire: Fire History and Burn Perimeters near Sebastopol



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43

Review of Identified Hazards

Wildfire: Parcels at Risk to Moderate FHSZs in LRAs



wood.

44

Review of Identified Hazards

Wildfire: Parcels and Critical Facilities at Risk

Property Type	Improved Parcel	Improved Value	Content Value	Total Value	Population at Risk
Commercial	17	$16,951,410	$16,454,342	$33,405,775	0
Industrial	2	$1,153,481	$1,730,222	$2,883,703	0
Multi-Family	8	$2,291,851	$1,345,926	$3,637,777	35
Religion	1	$900,896	$900,896	$1,801,792	0
Residential	98	$24,416,846	$12,208,923	$36,625,769	309
Total	126	$45,714,507	$32,640,808	$78,354,315	335

FEMA Community Lifeline	Facility Type	Total
Food, Water, Shelter	Shelter	2
	Wastewater	1
Transportation	Bridge	3
	Total	6

wood.

45

Review of Identified Hazards

Dam Incidents

- **Hazard/Problem Description:** Two upstream dams of concern: Warm Springs Dam and Delta Pond Dam
  - Warm Springs – Earthen Dam along Dry Creek located 30 miles north of City that is owned and operated by USACE with storage capacity of 449,000 acre-feet.
- **Location:** Limited
- **Past Occurrences:** No history of dam incidents or failures affecting the City.
- **Magnitude/Severity:** Negligible
- **Significance:** Low
- **Likelihood of Future Occurrences:** Unlikely
- **Existing Capabilities:** High hazard dam that has an EAP in place and dam inundation mapping





wood.

46

Review of Identified Hazards

Dam Incidents: Dams of Concern Upstream of the City



wood.

47

Review of Identified Hazards

Dam Incidents: Dam Failure Inundation Data



wood.

48

Review of Identified Hazards

Drought

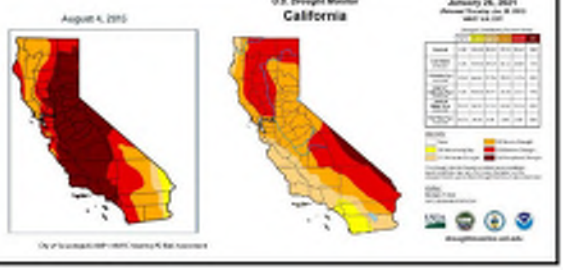
- **Hazard/Problem Description:** Impacts are wide-reaching and may be economic, environmental, or societal.
- **Location:** Significant
- **Past Occurrences:** 6 multi-year droughts sine 1950
  - 3 have occurred since 2000
  - Most recent 2012-2017 resulted in State of Emergency
- **Magnitude/Severity:** Limited
- **Significance:** Medium
- **Likelihood of Future Occurrences:** Likely
- **Existing Capabilities:** Water Shortage Contingency Plan (WSCP). City relies exclusively on groundwater which may minimize vulnerability

wood.

49

Review of Identified Hazards

Drought



50

Review of Identified Hazards

Severe Weather: Extreme Heat

- **Hazard/Problem Description:**
  - Period when high temperatures are expected to have a significant impact on public safety. Extreme temperatures have an adverse impact on human health and mortality, natural ecosystems, and economic sectors
- **Geographic Extent:** Extensive
- **Past Occurrences:**
  - Heat waves have claimed more lives in CA than all other declared disaster event combined over the past 75 years
  - Highest recorded daily extreme temperature was 111°F on September 6, 2020
  - Cal-Adapt Climate Projections for the Bay Area region show the region is expected to experience 6-10 heatwaves per year by 2100
- **Magnitude/Severity:** Limited
- **Significance:** Medium
- **Future Likelihood of Occurrence:** Likely
- **Existing Capabilities:** Designated Cooling Centers in Petaluma and Santa Rosa. Public Education efforts to help sensitive populations.

wood.

51

Review of Identified Hazards

Severe Weather: Extreme Heat – Climate Change Considerations



wood.

52

Review of Identified Hazards

Severe Weather: High Wind

- **Hazard/Problem Description:** Wind cause potential property and critical facilities damage, loss of life
- **Geographic Extent:** Extensive
- **Past Occurrences:**
  - 258 combined high wind events have occurred in Sonoma County in past 70 years.
  - Downed trees and power lines are common impacts
  - High Winds can contribute to rapid wildfire spread
  - 8,601 Medicare beneficiaries in the City and 219 are considered electricity dependent and vulnerable to power outages
- **Magnitude/Severity:** Limited
- **Significance:** Medium
- **Future Likelihood of Occurrence:** Likely
- **Existing Capabilities:** HMPC Needed

wood.

53

Review of Identified Hazards

Severe Weather: Heavy Rain, Thunderstorms, Hail, Lighting, Dense Fog

- **Hazard/Problem Description:** Heavy Rain, Thunderstorms, Hail, Lighting and Dense Fog
- **Geographic Extent:** Extensive
- **Past Occurrences:**
  - 90 Hail, Heavy Rain, Lightning, and Dense Fog events in past 70 Years in Sonoma County
  - Average annual precipitation: 30.13 inches
  - Highest recorded monthly precipitation: 19.42 inches (1998)
  - Highest recorded in 24 hour period was 5.23 inches on December 19, 1981
- **Magnitude/Severity:** Limited
- **Significance:** Medium
- **Future Likelihood of Occurrence:** Likely
- **Existing Capabilities:** HMPC Input Needed

wood.

54

Review of Identified Hazards

Public Health Hazards: Epidemic/Pandemic

- **Hazard/Problem Description:**
  - An emergency need for health care [medical] services to respond to a disaster, significant outbreak of an infectious disease, bioterrorist attack or other significant or catastrophic event.
- **Geographic Extent:** Extensive
- **Past Occurrences:**
  - One State and one Federal declaration for COVID-19
  - 5 pandemics since 1900's: 1918-1919 Spanish Flu, 1957-1958 Asian Flu, 1968-1969 H3N2 Hong Kong Flu, 2009-2010 H1N1 Swine Flu, and 2020 COVID-19.
- **Magnitude/Severity:** Critical
- **Significance:** High
- **Future Likelihood of Occurrence:** Likely
- **Existing Capabilities:** City COVID-19 Resource Webpage, Sonoma County's COVID-19 Case Data, Sebastomask Program, Weekly Newsletter

wood.

55

Review of Identified Hazards

Hazardous Materials Incidents

- **Hazard/Problem Description:**
  - Hazardous Materials, Gas Pipelines, Chemical Facilities, transportation related
  - 1 gas transmission pipeline passing through the City
- **Geographic Extent:** Limited
- **Past Occurrences:**
  - 57 incidents in past 10 years in City limits.
  - 1 incident led to a casualty; 16 led to evacuations
- **Magnitude/Severity:** Negligible
- **Significance:** Low
- **Future Likelihood of Occurrence:** Likely
- **Existing Capabilities:** CUPA, Sonoma County Operational Area HazMat Incident Response Plan

wood.

56

Capability Assessment

wood.

57

Capability Assessment

- Inventory the City of Sebastopol's existing and proposed policies, programs, and ordinances that may affect its vulnerability to hazards
- Evaluate the effectiveness of each for mitigation purposes. Note gaps, shortfalls or conflicts associated with their design, enforcement of implementation. Identify any special opportunities
- Determine the City's technical and fiscal abilities to implement mitigation initiatives. Include ability to attract and leverage funding

wood.

58

Capability Assessment

- General Plan Safety Element
- Zoning Ordinance
- Building & Construction Code – Title 15 SMC
  - 1 Foot Above Base Flood Elevation
  - 2 Feet Above Base Flood Elevation for Manufactured Homes
- Design & Improvement Standards – Title 16 SMC
- Five-Year Capital Improvement Plan
- PG&E Wildfire Safety/ Public Safety Power Shut Off
- Laguna Wetlands Preserve Restoration and Management Plan
- 2019 Climate Emergency Resolution
- Flood Alert System
- Weekly Newsletter



wood.

59

Developing Goals for the Mitigation Strategy

wood.

60

Developing Goals for the Mitigation Plan

What are Mitigation Goals?

Goals
- General guidelines that explain what you want to achieve
- Usually broad policy/vision statements

Objectives
- Define strategies or implementation steps to attain goals
- Specific and measurable

Actions
- Specific projects/activities to achieve goals & objectives



wood.

61

Developing Goals for the Mitigation Plan

What are Mitigation Goals?

- Broad statements of what the plan is to achieve
- Based on risk
- Estimated losses
  - At-risk facilities and infrastructure (e.g. transportation utility lines?)
  - At-risk critical facilities
  - At-risk cultural and natural resources
- Goals from other existing plans
  - Sebastopol General Plan
  - 2016 Sonoma County HMP
  - 2018 State HMP
  - 2018 Sonoma Water LHMP

wood.

62

Developing Goals for the Mitigation Plan

What are Mitigation Goals?

- Review example goals (in Presentation)
- Review sample goals from other plans (in Agenda)
- Write goal idea for mitigation planning effort in the Chat Room

wood.

63

Developing Goals for the Mitigation Plan

Sebastopol General Plan Safety Element Goals (2016)

- **Goal SA 1:** Minimize the risk of injury and property damage resulting from seismic and geologic hazards.
- **Goal SA 2:** Reduce risk to human life, property, and public services associated with flood hazards.
- **Goal SA 3:** Protect the safety of life and property by ensuring emergency preparedness.
- **Goal SA 4:** Reduce fire hazards and maintain effective fire and emergency response services.
- **Goal SA 5:** Maintain effective police services.
- **Goal SA 6:** Reduce hazards associated with the transportation, use, storage and disposal of hazardous wastes and hazardous materials.

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64

Developing Goals for the Mitigation Plan

Sonoma County Operational Area Hazard Mitigation Plan Goals (2016)

- **Goal PS-1:** Prevent unnecessary exposure of people and property to risks of damage or injury from earthquakes, landslides and other geologic hazards.
- **Goal PS-2:** Reduce existing flood hazards and prevent unnecessary exposure of people and property to risks of damage or injury from flood hazards
- **Goal PS-3:** Prevent unnecessary exposure of people and property to risks of damage or injury from wildland and structural fires.

wood.

65

Developing Goals for the Mitigation Plan

Example Goal Statements

- Minimize risk and vulnerability from natural hazards
- Increase [community] awareness of vulnerability to hazards
- Increase the use of shared resources
- Improve communities' capabilities to mitigate losses
- Maximize coordination of climate plans with changing DRR/RRM needs
- Maintain FEMA eligibility and position the City for grant funding
- Enhance the flood mitigation program (feasibility assessment to provide 200/500 year flood protection
- Maintain current service levels
- Provide protection for existing buildings from hazards
- Provide protection for future development from hazards
- Provide protection for natural and cultural resources from hazard impacts
- Provide protection for people's lives from hazards
- Provide protection for public health
- Provide protection for critical services (fire, police, etc.) from hazard impacts
- Provide protection for critical lifeline utilities from hazard impacts
- Reduce exposure to hazard related losses
- Reduce the number of emergency incidents
- Make better use of GIS and other technologies

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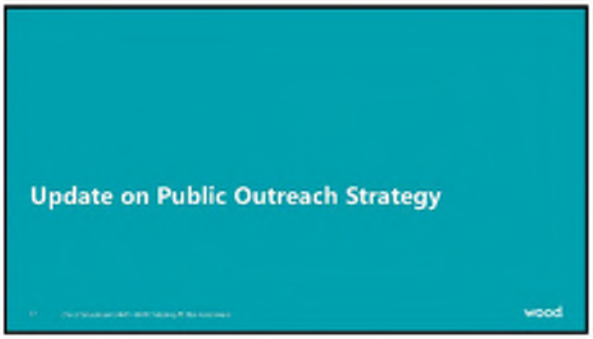

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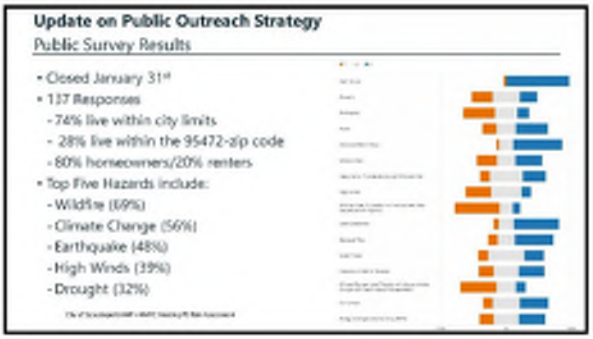

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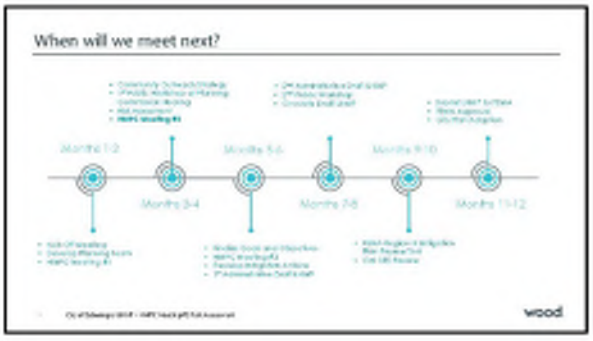

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72


Schedule and Next Steps
Breaking the Cycle of Disaster Losses
• Each time we experience a natural disaster, we learn how to make our people, infrastructure, and environment more resilient.
• These events underscore the need to assess and manage risk.
• Learning from the past to shape the future and continuing the shift towards mitigation!
Response
Recovery
Mitigation
Preparedness
Resiliency
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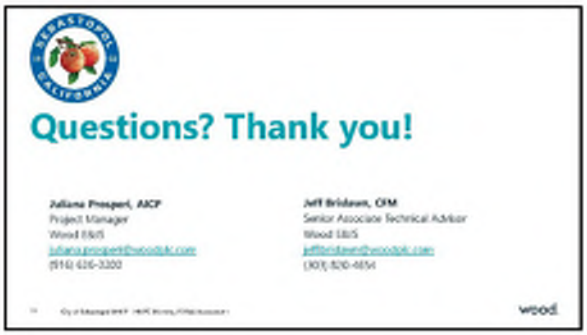
73


Questions? Thank you!
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(303) 820-4654
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74

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City of Sebastopol
Local Hazard Mitigation Plan

Public Workshop #1

October 27, 2020

1

Agenda

1. Introductions
2. Mitigation Planning and the Disaster Mitigation Act
3. Planning Process
4. Risk Assessment
5. Next Steps
6. Community Q&A

2

Introductions

3

Introductions

- City of Sebastopol
  - Kari Svanstrom, Planning Director
  - Bill Braga, Fire Chief
  - Daryl Philips, Chief Building Official
- Wood Environment & Infrastructure Solutions, Inc.
  - Juliana Prosperi, Project Manager

4

Mitigation Planning and the Disaster Mitigation Act

5

Mitigation Planning and Disaster Mitigation Act

What is Hazard Mitigation?

- Any sustained action taken to reduce or eliminate long-term risk to human life and property from natural and human-caused hazards.



6

Recent Natural Disasters around Sebastopol



"Every dollar invested on disaster prevention saves six dollars in costs related to response and recovery." –National Institute of Building Sciences

7

Disaster Mitigation Act of 2000

Federal Legislation
44 CFR 201.6

- Requires communities to update their hazard mitigation plans every 5 years to remain eligible for federal pre- and post-disaster funding (Hazard Mitigation Grant Program)
  - 2010 *Taming Natural Disasters Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area: City of Sebastopol Annex*
- Plan ensures the City will be become ready and eligible for mitigation projects when funding becomes available



8

Compliance and Beyond

SB 379	Requires inclusion of climate change vulnerability assessment and integration of adaptation strategies in the Safety Element; encourages climate change efforts discussion in LHMPs. These requirements are included in Government Code Section 65302 (g)(4) (2015).
SB 1000	Requires inclusion of environmental justice and equity goals and policies in the Safety Element, identification of Disadvantaged Communities pursuant to Government Code Section 65302.10 (2016).
AB 2140	Links LHMPs and Safety Elements by encouraging the adoption of LHMPs into Safety Elements and by tying funding eligibility to approval of LHMPs (2006).
SB 1241	Requires Safety Element to address wildfire risks in State Responsibility Areas and Very High Fire Hazard Severity Zones and includes review by State Board of Forestry and Fire Protection (2012).
SB 747	Requires Safety Element update to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. These requirements are included in Government Code Section 65302.15 added to land use (2018).
Other	SB 99 (identification of residential neighborhoods in hazard areas without two emergency evacuation routes); SB 1035 (requires update to climate adaptation strategies in Safety Element at least every 8 years); AB 32 (Global Warming Solutions Act); emergency management plans; funding opportunities (e.g., CalOES Hazard Mitigation Grant Program)

9

National Flood Insurance Program Community Rating System

- Created in 1990 as a voluntary incentive program
- Recognizes communities that manage their floodplains beyond the minimum standards by providing discounted flood insurance rates
- Floodplain Management Planning earns credits in CRS



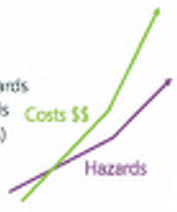
NFIP/CRS

10

Mitigation Planning and Disaster Mitigation Act

Trends Resulting in Increased Costs for Disaster Response and Recovery

- Population and community growth
  - More people
  - More infrastructure and buildings
  - More exposure to risk
- More natural and human-caused hazards
  - Technological, civil, terrorist hazards
  - Human-health hazards (pandemics)
- More disaster declarations
- Increase in disaster response and recovery costs



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Mitigation Planning and Disaster Mitigation Act

Why do we need a Local Hazard Mitigation Plan?

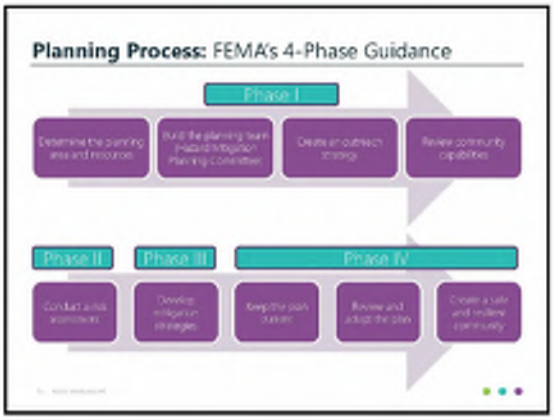
- Increasing costs of response and recovery
- Many events are predictable and repetitive
- Prevents loss of life and injury and protects public safety
- Guides mitigation activities in a coordinated and transparent manner
- Eligibility for mitigation funds, pre- and post- disaster
- Integrates into other existing planning mechanisms
  - 2016 General Plan Safety Element
- Reduces risk to existing and future development
- Make community safer and more disaster resilient

12

Planning Process

13

Planning Process: FEMA's 4-Phase Guidance



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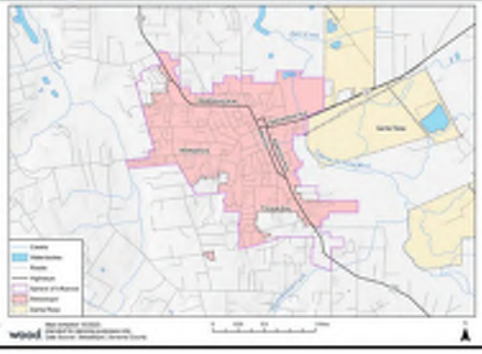
Planning Process: Define a Planning Area



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Planning Process: Build a Planning Team



16

Planning Process: Community Outreach Strategy

Provide Two Opportunities for Public Involvement:
during draft development and prior to plan approval.

- Website
- Stakeholder on Planning Team
- Social Media
- E-News
- Newsletters
- Newspaper Articles
- Online Public Survey
- Pop-Up Events
- Piggy-backing on School Outreach
- Public Workshops/Open House
- Circulate Draft LHMP for Public Comment



17

Planning Process: Review City's Capabilities

- General Plan Safety Element - 2016
- Zoning Ordinance
- Sebastopol Municipal Code
- Five-Year Capital Improvement Plan
- ABAG MJLHMP – 2010 Sebastopol Annex
- Sonoma County Operational Area HMP
- Laguna Wetlands Preserve Restoration and Management Plan
- Climate Emergency Resolution - 2019
- Sonoma County Regional Climate Action Plan – 2016
- Flood Alert System



18

Planning Process: Risk Assessment

1) Hazard Identification

2) Vulnerability Assessment

3) Mitigation Capability Assessment



19

Planning Process: Vulnerability Assessment

- Inventory residential and commercial structures
- Inventory Community Lifeline Facilities
- Determine value of structures
- Determine the number of people in hazard areas
- Identify vulnerable infrastructure
- Identify development trends / constraints
- Identify historic, cultural, and natural resource areas
- Estimate losses

20

Planning Process: Develop Mitigation Strategies

- **Set Planning Goals**
- **Review Mitigation Alternatives**
  - FEMA Mitigation Ideas
  - NFIP CRS Guidance
    - Prevention
    - Property protection
    - Natural resource protection
    - Emergency services
    - Structural projects
    - Public information
    - Multi-hazard measures and considerations
  - 2020 California Adaptation Planning Guide
- **Draft an Action Plan**



21

Planning Process: Adopt & Implement the Plan

Adopt the Plan
- Official Adoption by Council
- Public input before adoption

Implement the Plan
- Assign an overall project manager
- Integrate actions into staff work plans
- Monitor and evaluate changes in vulnerability
- Report progress and publicize successes
- Revise the plan every 5 years



22

Risk Assessment

23

Risk Assessment: Hazards of Potential Concern

Natural Hazards
- Flooding/Sea Level Rise
- Earthquake Hazards
- Landslides/Debris Flows
- Wildfire
- Drought and Water Shortage
- Dam and Levee Incidents
- Severe Weather: Heavy Rain/Thunderstorms/Dense Fog
- High Winds
- Climate Change

Health Hazards & Human-Caused Hazards
- Public Health Hazards
- Civil Unrest

24

Risk Assessment: Virtual Poll

- Join and complete the poll at: www.slido.com #29986.
- What are the top 5 hazards the City should assess in the Local Hazard Mitigation Plan?



25

Risk Assessment: Hazard Profiles & Prioritization

Hazard/Problem Description
- Area, Seasonal Patterns, Speed of Onset/Duration, Warning Time

Geographic Extent (or Spatial Extent)
- Limited: Less than 10% of Planning Area
- Significant: 10-50% of Planning Area
- Extensive: 50-100% of Planning Area

Past Occurrences
- Information on Historical Incidents, Known Impacts

Magnitude/Severity (Impact):
- Catastrophic: More than 50% of property severely damaged
- Critical: 25-50% of property severely damaged
- Limited: 10-25% of property severely damaged
- Negligible: Less than 10% of property severely damaged

Significance
- Low: Minimal potential impact
- Medium: Moderate potential impact
- High: Widespread potential impact

Frequency/Likelihood of Future Occurrences
- Highly Likely: Near 100% chance of occurrence in next year
- Likely: Between 10-100% chance of occurrence in next year
- Occasional: Between 1-10% chance of occurrence in next year
- Unlikely: Less than 1% chance of occurrence in next year

26

Risk Assessment: Climate Change

- Increasingly important factor affecting disaster management
- Addressed under each Hazard Profile as a factor intensifying impacts
- California is already experiencing impacts:
  - Prolonged drought
  - Increased coastal flooding and erosion and sea level rise
  - Tree mortality
  - Larger wildfires
- Affect the frequency and severity of hazards



27

Next Steps

28

Next Steps: Progress so Far



29

Detailed Schedule

Task	Anticipated Date
Project Kick-off Meeting	July 9, 2020
HMPC Planning Session #0	October 30, 2020
Circulate Online Public Survey	November 2, 2020
Public Outreach Workshop #1	October 27, 2020
Prepare hazard identification and risk assessment	January 15, 2021
HMPC Planning Session #1	**January 14, 2021 (Tentative)**
Planning Commission Meeting #1	February 9, 2021
Publish goals and objectives	February 12, 2021
HMPC Planning Session #2	February 19, 2021
Compile mitigation actions worksheets	March 8, 2021
Submit 1st Administrative Draft LHMP	March 30, 2021
Disseminate compiled plan comments on 1st Administrative Draft LHMP	April 15, 2021
Submit 1st Administrative Draft LHMP	April 30, 2021
Circulate Public Review Draft LHMP 30-day public review	May 3 – June 1, 2021
Public Outreach Workshop #2	May 26, 2021
Complete FEMA Region IX review tool	May 28, 2021
Submit LHMP to Cal OES for review (60-day review)	June 11, 2021
Submit LHMP to FEMA for Review (45-day review)	July 26, 2021
Planning Commission Meeting #2	September 14, 2021
City Council Hearing	October 12, 2021
Project Management Close-Out Meeting	November 1, 2021

The Sebastopol Planning Commission meets the 2nd and 4th Tuesdays of each month.
The Sebastopol City Council meets on the 1st and 3rd Tuesdays of each month.

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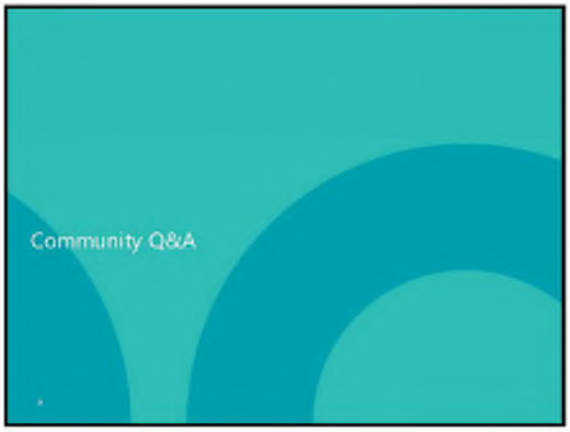
Community Q&A

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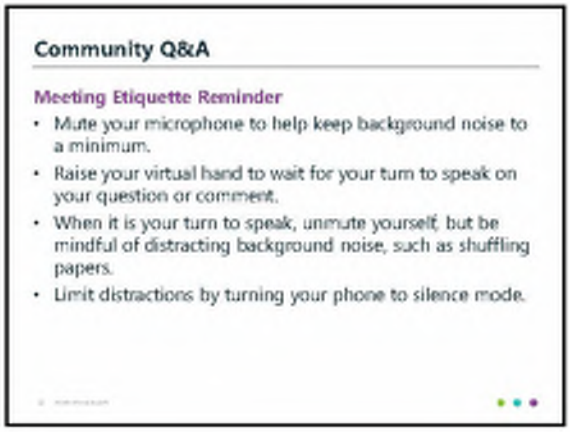
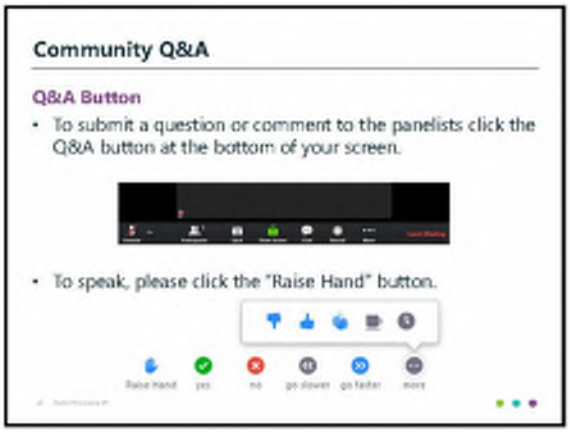

Community Q&A
Meeting Etiquette Reminder
• Mute your microphone to help keep background noise to a minimum.
• Raise your virtual hand to wait for your turn to speak on your question or comment.
• When it is your turn to speak, unmute yourself, but be mindful of distracting background noise, such as shuffling papers.
• Limit distractions by turning your phone to silence mode.

32


Community Q&A
Q&A Button
• To submit a question or comment to the panelists click the Q&A button at the bottom of your screen.
• To speak, please click the "Raise Hand" button.

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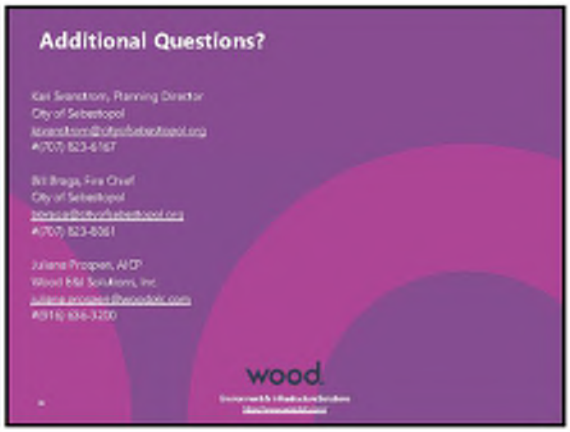
Additional Questions?
wood.

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wood.

City of Sebastopol
Local Hazard Mitigation Plan

Public Workshop #2 – Planning Commission Meeting

October 26, 2021 – 6:00-7:00 pm



1

Agenda

1. Introductions
2. Hazard Mitigation Planning and the Disaster Mitigation Act
3. Public Involvement Activities
4. Plan Format & Organization
5. Mitigation Strategy
6. Next Steps
7. Questions and Answers

wood.

2

Meeting Logistics

- The Live Event will have a 30-minute presentation, followed by a discussion/question and answer session.
- You can use the chat log to make comments, ask questions, or provide information.
- This meeting is being recorded.

wood.

3

Introductions

wood.

4

Introductions

- City of Sebastopol
  - Kari Svanstrom, Planning Director
  - Bill Braga, Fire Chief
  - Daryl Philips, Chief Building Official
- Wood Environment & Infrastructure Solutions, Inc.
  - Jeff Brislawn, Hazard Mitigation Lead/Sr Technical Advisor
  - Adam Qian, Environmental Planner

wood.

5

Hazard Mitigation Planning and the Disaster Mitigation Act

wood.

6

Mitigation Planning and Disaster Mitigation Act

What is Hazard Mitigation?

- Any sustained action taken to reduce or eliminate long-term risk to human life and property from natural and human-caused hazards.



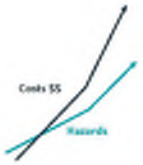
wood.

7

Mitigation Planning and Disaster Mitigation Act

Trends Resulting in Increased Costs for Disaster Response and Recovery

- Population and community growth
  - More people
  - More infrastructure and buildings
  - More exposure to risk
- More natural and human-caused hazards
  - Technological, civil, terrorist hazards
  - Human-health hazards (pandemics)
- More disaster declarations
- Increase in disaster response and recovery costs



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8

Mitigation Planning and Disaster Mitigation Act

Why do we need a Local Hazard Mitigation Plan?

- Required by DMA 2000 - 44 Code of Federal Regulations 201.6
- Increasing costs of response and recovery
- Many events are predictable and repetitive
- Prevents loss of life and injury and protects public safety
- Guides mitigation activities in a coordinated and transparent manner
- Eligibility for mitigation funds, pre- and post- disaster
- Integrates into other existing planning mechanisms
  - General Plan Safety Element
- Reduces risk to existing and future development
- Make community safer and more disaster resilient



wood.

9

FEMA's 4-Phase DMA Planning Process



wood.

10

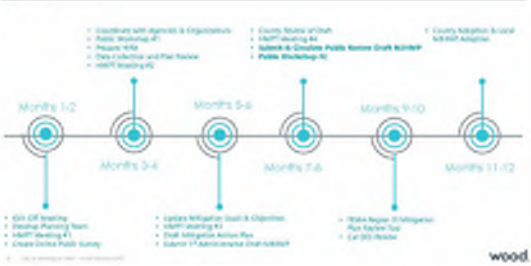
Hazard Mitigation Planning Committee



wood.

11

Project Timeline



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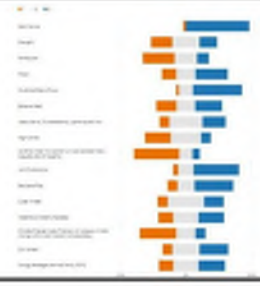
12

Public Involvement Activities

13

Public Survey Results

- Closed January 31st
- 137 Responses
  - 74% live within city limits
  - 28% live within the 95472 zip code
  - 80% homeowners/20% renters
- Top Five Hazards include:
  - Wildfire (69%)
  - Climate Change (56%)
  - Earthquake (48%)
  - High Winds (39%)
  - Drought (32%)



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City of Sebastopol LHMP Webpage



15

Plan Format & Organization

16

Plan Format: Organization

1 Introduction
2 Community Profile
3 Planning Process
4 Risk Assessment
5 Mitigation Strategy
6 Plan Adoption
7 Plan Implementation and Maintenance



17

Risk Assessment (Chapter 4)

- Plan assesses the following hazards:
  - Earthquake
  - Flooding
  - Wildfire
  - Drought
  - Dam Incidents
  - Severe Weather
  - Severe Weather: Extreme Heat
  - Severe Weather: Heavy Rain/Thunderstorm/Hail/Lightning/Dense Fog
  - Severe Weather: High Wind



18

Risk Assessment (Chapter 4 continued)

- Climate Change is addressed within each Hazard Profile
  - Discussed based on how it can intensify or exacerbate the severity of the hazards
- Includes profile of human-caused and human-health hazards:
  - **Public Health Hazards**
  - **Hazardous Material Releases**
- Hazard Risk Summary
  - Qualitative/Quantitative Method that assigns a "significance level" for the impact of each hazard
  - Allows the City to compare hazards

wood.

19

Hazard Profiles (Chapter 4 continued)

- Hazard Profiles include the following sections:
  - Hazard Description
  - Location
  - Extent (Magnitude/Severity)
  - Past Occurrences
  - Probability of Future Occurrences
  - Climate Change Considerations
  - Vulnerability Assessment
    - Exposure Analysis (Property, People, Economy, Critical Facilities and Infrastructure, and Historical, Cultural and Natural Resources)
    - Future Development Trends
    - Risk Summary

wood.

20

Risk Assessment Summary (Chapter 4 continued)

Hazard	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Flood	Significant	Likely	Critical	Medium
Earthquake	Extensive	Likely	Critical	High
Wildfire	Limited	Likely	Critical	Medium
Drought	Significant	Likely	Limited	Medium
Dam Incidents	Limited	Unlikely	Negligible	Low
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium
Severe Weather: Heavy Rain/Thunderstorms/Hail/Lightning	Extensive	Likely	Limited	Medium
Severe Weather: High Winds	Extensive	Likely	Limited	Medium
Public Health Hazards	Extensive	Likely	Critical	High
Hazardous Material Releases	Limited	Likely	Negligible	Low

wood.

21

Mitigation Strategy (Chapter 5)

- Goals and Objectives
- Identification and Analysis of Mitigation Actions
  - Prioritization Process
- Mitigation Action Plan
  - Progress on Previous Mitigation Actions
  - Updated Action Plan



wood.

22

2021 Goals (Chapter 5 continued)

- Goal 1: Minimize new development in hazard-prone areas.
- Goal 2: Minimize hazard impacts on existing development.
- Goal 3: Build resiliency in the community and build capacity against hazards in the City.
- Goal 4: Improve infrastructure and lifeline resiliency and redundancy against disruption and interruption.

wood.

23

Mitigation Actions Categories (Chapter 5 continued)

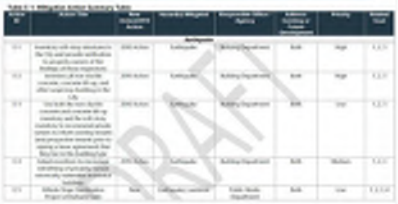
- **Prevention**
  - Planning/Zoning, Building Standards, Floodplain Regulations
  - Stormwater management, Capital Improvement Programs, Open Space Preservation
- **Property Protection and Structural Actions**
  - Acquisition, Elevation, Relocation, Structural Retrofits, Storm Shelters, Shelter Resistant Glass
  - Construction of structures to reduce the impact of a hazard
- **Natural Resource Protection**
  - Dams, Levees, Floodwalls, Retaining Walls
- **Emergency Services:**
  - Warning Systems, Emergency Response Services, and the Protection of Essential Facilities
- **Public Information/Education and Awareness**
  - Outreach, Real Estate Disclosure, Hazard Information Kiosks, Education Programs.

wood.

24

Mitigation Actions (Chapter 5 continued)

- 30 Citywide actions
  - Benefit the entire City planning area
  - Organized by Mitigation Goals and Hazard Mitigated
  - Details on implementation, timeframe, priority



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25

Citywide Mitigation Actions (Chapter 5 continued)

Mitigation Actions by Hazard Mitigated

- 5 Multi-Hazard
- 5 Earthquake
- 7 Flood
- 3 Wildfire
- 4 Drought
- 1 Dam Incidents
- 1 Extreme Heat
- 3 Severe Weather
- 1 Public Health Hazards

wood.

26

Snapshot of Specific Mitigation Actions (Chapter 5 continued)

- **Earthquake**
  - Inventory soft-story structures in the City and provide notification to property owners of the findings of the inspections to promote participation in seismic retrofits (Building Department)
  - Inventory all non-ductile concrete, concrete tilt-up, and other suspicious building in the City (Building Department)
  - Use both the non-ductile concrete and concrete tilt-up inventory and the soft-story inventory to recommend private owners to inform existing tenants (and prospective tenants prior to signing a lease agreement) that they live in this building type (Building Department)
  - Adopt incentives to encourage retrofitting of privately-owned seismically vulnerable residential buildings (Building Department)
  - Hillside Slope Stabilization Project at Burbank Farm (Public Works Department)

wood.

27

Snapshot of Specific Mitigation Actions (Chapter 5 continued)

- **Flood**
  - Temporary Flood Protection for the Sebastopol Community Cultural Center Main Hall (Engineering Department)
  - Housing Replacement and Recreation Easement Project at the Park Village Property (Planning Department)
  - Repetitive Loss Area Analysis (Building Department)
  - Consider joining Community Rating System Program (Building Department)
  - Participation in the FEMA Sea Level Rise Study (Planning Department)
  - Sebastopol Community Cultural Center Main Hall Flood Mitigation Alternative Implementation (Planning Department)
  - Ives Park Calder Creek Daylighting and Stormwater Improvement Project (Public Works Department / Planning Department)

wood.

28

Snapshot of Specific Mitigation Actions (Chapter 5 continued)

- **Wildfire**
  - Promote wildfire -resistant construction materials for new construction in the City (Building Department)
  - Develop a Tree Ordinance that requires defensible space maintenance and promotes healthy landscapes (Fire Department)
  - Develop a Community Wildfire Protection Plan (Fire Department)
- **Drought** –Upgrading and replacing water line infrastructure
- **Extreme Heat** – ID locations for designated cooling centers including updated outreach information
- **Severe Weather** –
  - Upgrade emergency back-up power for essential areas of the public safety building
  - PSPS Readiness and Community Outreach Preparedness Program

wood.

29

Plan Implementation and Maintenance (Chapter 7)

- Implementation
  - Schedule for annual review
  - Monitor grant and funding opportunities
- Maintenance
  - Incorporation with other planning mechanisms
    - General Plan Safety Element
    - Zoning Ordinance
    - Building & Construction Code – Title 15 SMC
    - Five-Year Capital Improvement Plan
  - Track progress and publicize success

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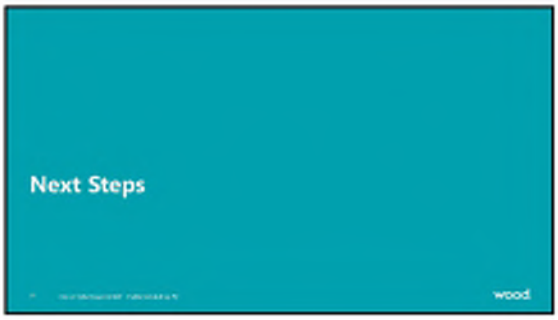
Next Steps
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31


Next Steps
• Soliciting public input on draft plan
• Download the Public Review Draft LHMP here:
https://ci.sebastopol.ca.us/City-Government/Departments-Services/Fire/Local-Hazard-Mitigation-Plan
• Submit your input using an Electronic Comment Form:
https://bit.ly/3G4bqRo
wood.
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32


Next Steps
• Stay updated regarding the LHMP process via:
https://ci.sebastopol.ca.us/City-Government/Departments-Services/Fire/Local-Hazard-Mitigation-Plan
• After public review the HMPC will incorporate comments into the Final Draft LHMP
• Cal OES and FEMA Region IX will each have 45 days for review
• City of Sebastopol will consider plan for adoption following an "approvable pending adoption" letter from Cal OES and FEMA
• Once approved and adopted, City of Sebastopol can implement mitigation actions to create a "safer and more resilient" community
• Annual meetings to assess progress before next required 5 year update cycle.
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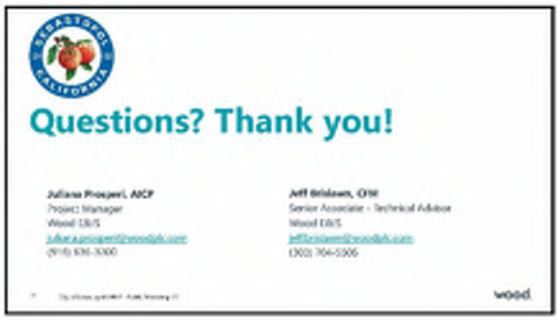

Questions? Thank you!
Juliana Prosperi, AICP
Project Manager
Wood E&S
(916) 636-3300
Jeff Bridawn, CFM
Senior Associate – Technical Advisor
Wood E&S
(303) 704-5306
wood.

34

City of Sebastopol Hazard Mitigation Plan Public Input Survey

138	40:18	Closed
Responses	Average time to complete	Status

1. Do you live within the city limits of Sebastopol or within the 95472 zip code?

   If neither please select 'Other' and state where you live or the zip code.

Yes	102
No but I live within the 95472 ...	28
Other	8



2. Are you representing a business or community group? (e.g. resident, business, community organization, non-profit, agency)

Yes	29
No	107



3. If yes, please indicate what organization

30	Latest Responses
Responses	

4. Do you own or rent your home?

Own	109
Rent	28



5. Do you have homeowner's insurance or renter's insurance for your home?

Homeowner's Insurance	109
Renter's Insurance	24
Neither	4



6. Do you have specialty insurance for your property?

Earthquake	38
Flood	5
Other	58

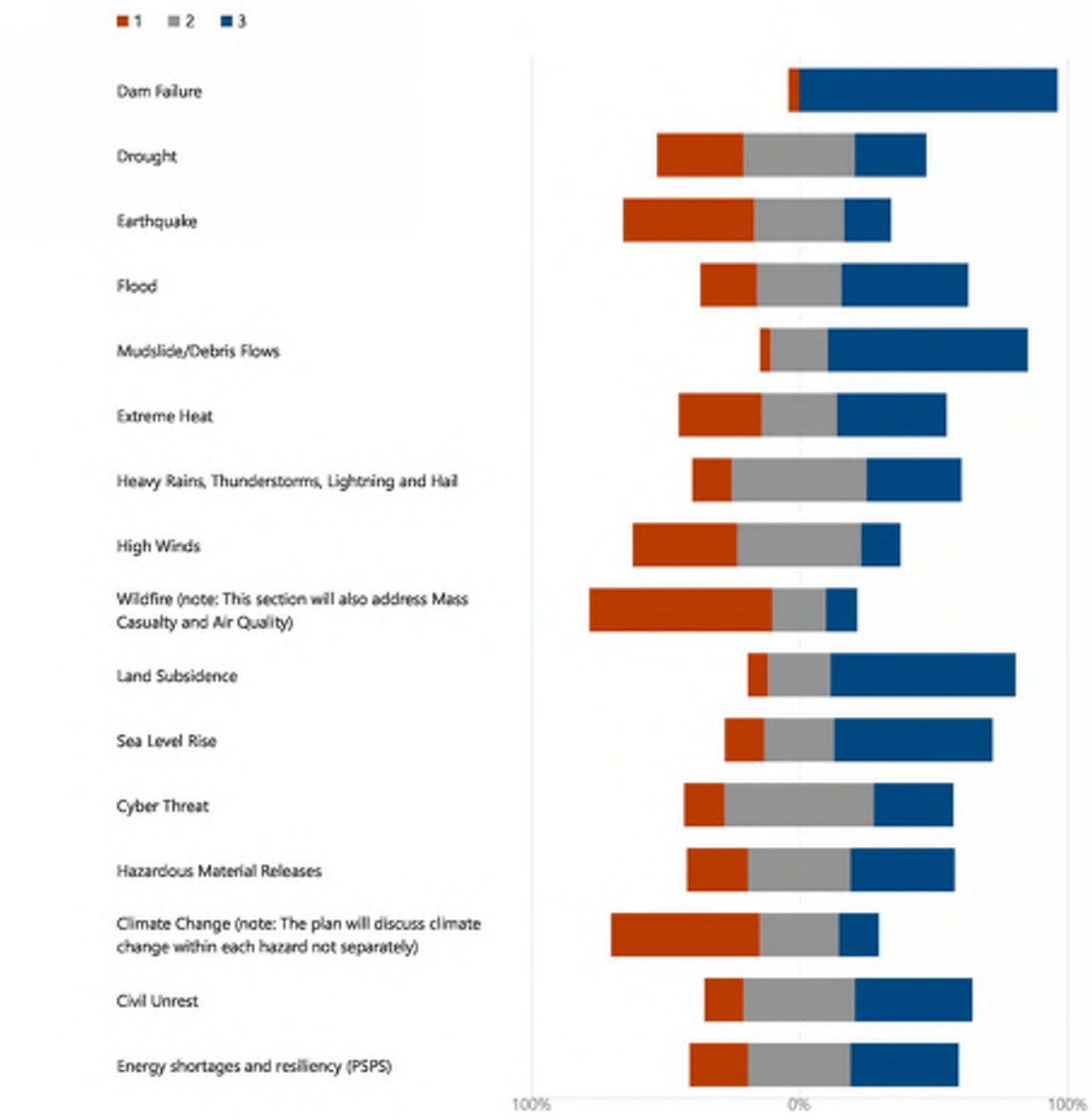


7. Do you commute outside the City for work?

Yes	21
No	117



8. The hazards addressed in the Hazard Mitigation Plan are listed below. Please choose the top 3 hazards of most concern to you. Number 1 represents highest concern.



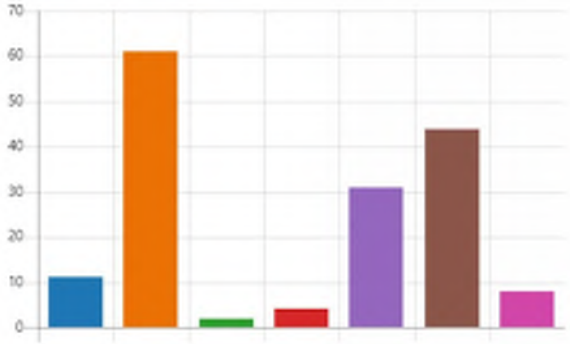
9. Is your home in an area prone to natural hazards (earthquake, flooding, wildfire etc.)?

Yes	70
No	28
Not sure	39



10. How do you know your home is located in an area prone to natural hazards?

Notified before purchase of h...	11
Personal Research	61
Social Media	2
Neighbors	4
Websites (FEMA, County, City)	31
N/A	44
Other	8



11. Do you have information on specific hazard issues/problem areas that you would like the planning committee to consider? Note where in the city it applies:

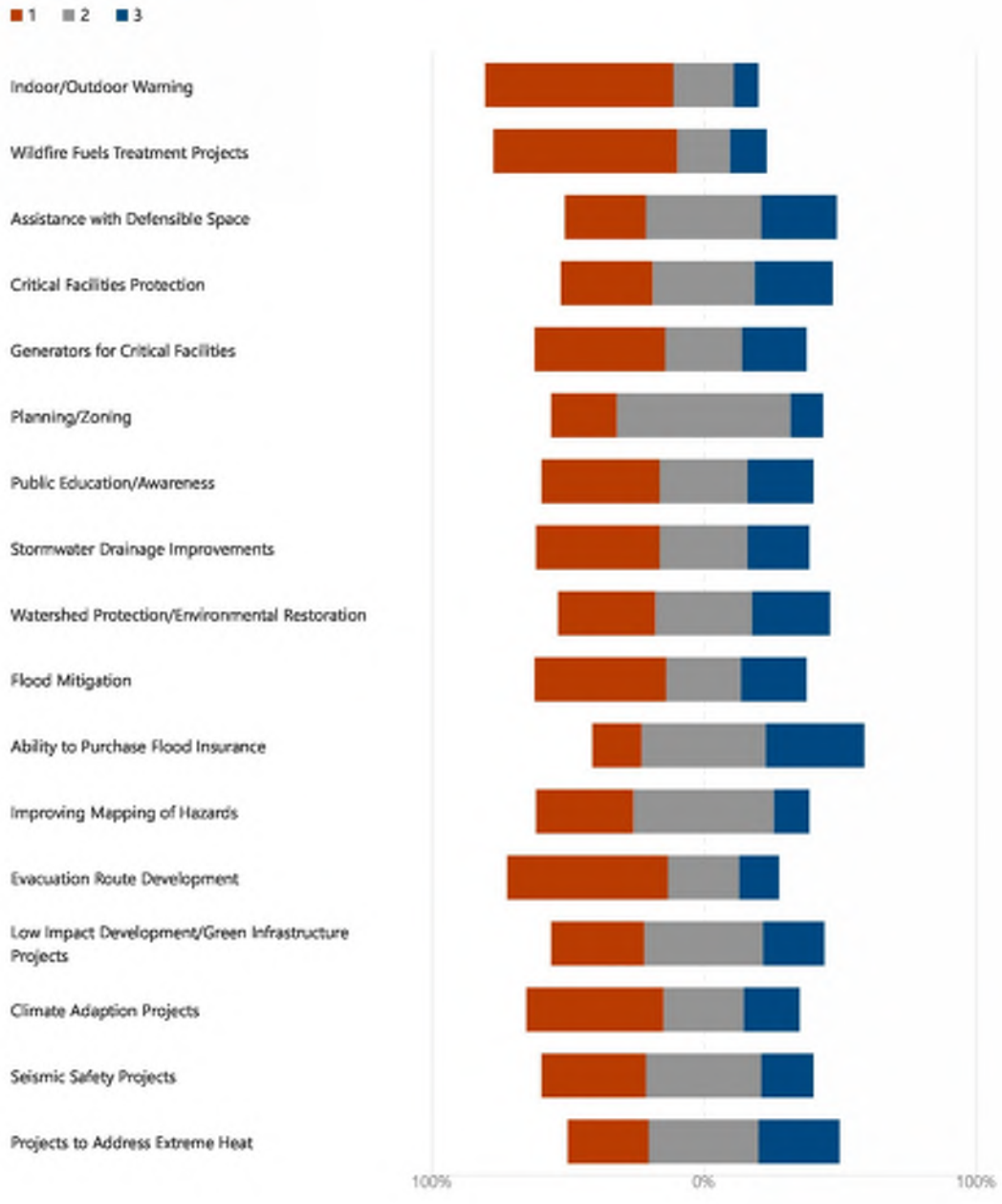
47
Responses

Latest Responses

"I would like to see CERT reinstated in Sebastopol. There will never be ...

"I live at Burbank Heights in Sebastopol. I worry a great deal about fire...

12. The following types of mitigation actions may be considered for the City. Please indicate the top 3 mitigation actions that you think should have the highest priority in the City of Sebastopol Hazard Mitigation Plan. Number 1 represents highest priority.



13. Please comment on any other pre-disaster strategies that the planning committee should consider for reducing future losses caused by disasters:

40

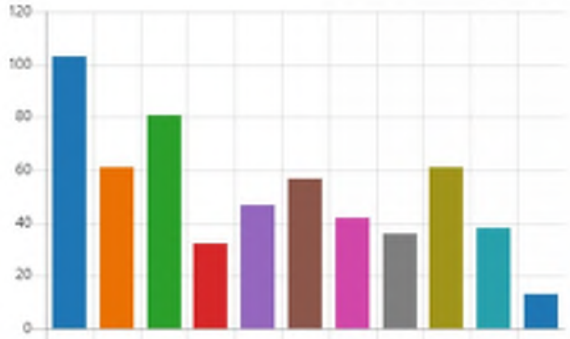
Responses

Latest Responses

"Our town has absolutely no accommodations for those who are evacu...

14. Have you taken any actions to make your home or business more disaster-resistant? If so, which of the following measures have you or your household members taken to prepare for a disaster.

Food/supply rations	103
Disaster/response training	61
Family disaster plan or emerg...	81
Purchase of supplemental ins...	32
Defensible space	47
Drought-resistant landscaping	57
Emergency generator	42
Solar Power (PV) and/or batter...	36
Bracing book shelves, water h...	61
Sesismic retrofits to home (bo...	38
Other	13



15. Are you interested in making your home, business or neighborhood more resistant to hazards?

Yes	101
No	5
Not sure	27



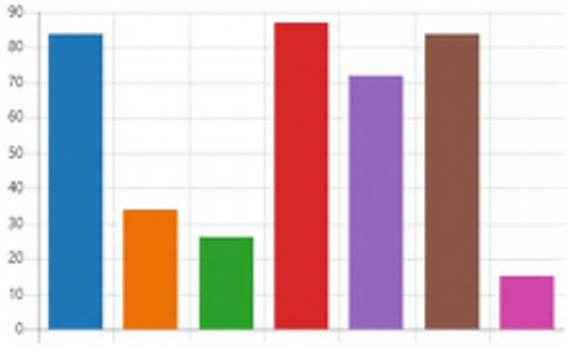
16. How much are you willing to spend to make safety improvements on your property?

$0	10
<$1,000	41
$1,000-$4,999	43
$5,000-$9,999	19
>$10,000	12

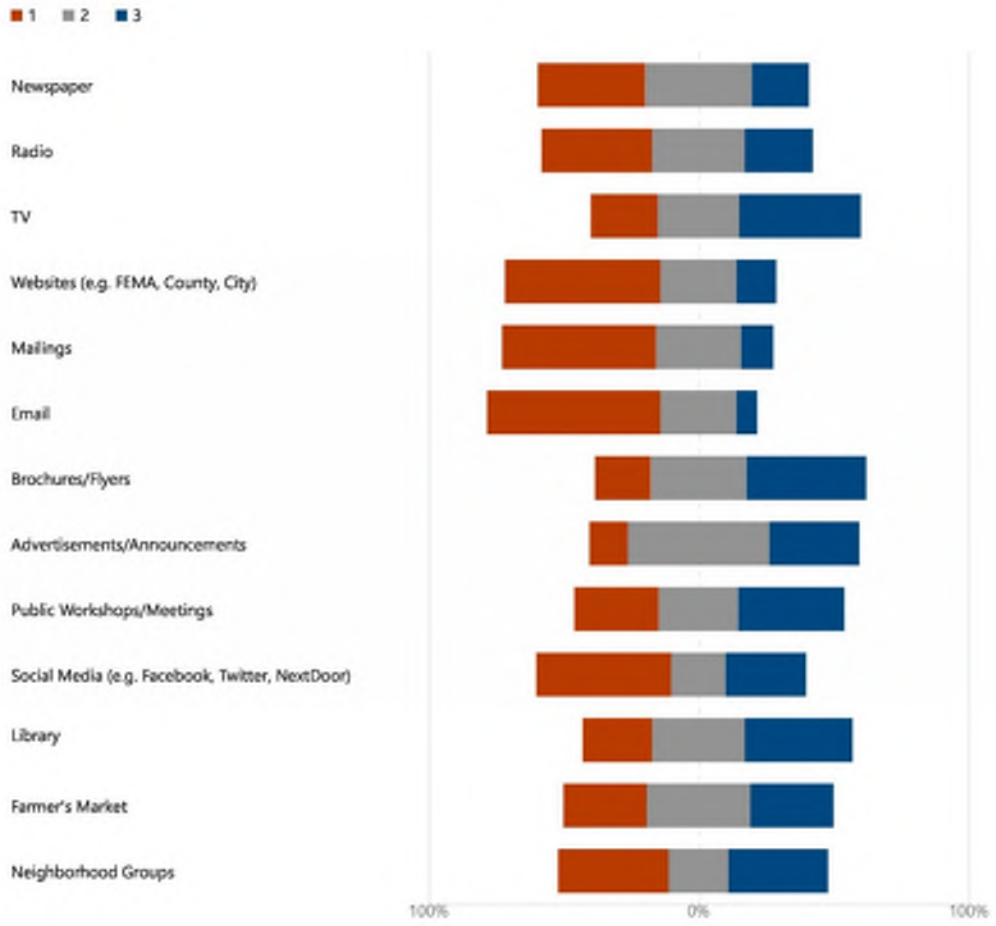


17. What other types of information would be valuable/helpful to reduce your disaster risk?

Actions homeowners can take...	84
Actions renters can take to pr...	34
Actions business owners can t...	26
Grants for upgrades/retrofits, ...	87
Information on the City's capa...	72
Information on hazards near p...	84
Other	15



18. What are the best ways to provide information about the City's Hazard Mitigation Plan and disaster preparedness? Please indicate the top 3 ways for the city to share information.



19. Optional: Provide your name and email address if you would like to be added to a distribution list for upcoming activities related to the City of Sebastopol Hazard Mitigation Plan

79
Responses

Latest Responses
"jgilbert@loba.us"
"Serena Coltrane-Briscoe serenabriscoe@yahoo.com"
"Shari Adams insidevublog@gmail.com"

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Appendix C: Mitigation Strategy contains the following documents in this order:

- Mitigation Strategy Guidance Criteria
- Mitigation Strategy HMPC #3 Meeting documentation
    - Meeting Agenda
    - Meeting Minutes
    - Meeting Presentation
- Mitigation Action Selection and Prioritization Criteria
- Example Mitigation Actions by FEMA categories with Hazards Identified in the City of Sebastopol Local Hazard Mitigation Plan
- 2021 Mitigation Action Worksheet

Mitigation Strategy Guidance Criteria: Categories of Mitigation Measures Considered

The following categories are based on the Community Rating System.

- Prevention
- Emergency Services
- Property Protection
- Natural Resource Protection
- Structural Projects
- Public Information

Alternative Mitigation Measures per Category

Prevention

Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open space preservation
- Land development regulations
- Subdivision regulations

- Floodplain development regulations
- Stormwater management
- Fuels management, fire breaks
- Building codes
  - Firewise construction
- (also see Property Protection)

Emergency Services

Emergency services protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

- Warning (floods, tornadoes, ice storms, hail storms, dam failures)
  - NOAA weather radio all hazards
  - Sirens
  - Reverse 911
- Evacuation and sheltering
- Communications
- Emergency planning
  - Activating the emergency operations room (emergency management)
  - Closing streets or bridges (police or public works)
  - Shutting off power to threatened areas (utility company)
  - Holding children at school/releasing children from school (school district)
  - Passing out sand and sandbags (public works)
  - Ordering an evacuation (mayor)
  - Opening evacuation shelters (red cross)
  - Monitoring water levels (engineering)
  - Security and other protection measures (police)
- Monitoring of conditions (dams)
- Critical facilities protection (buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)
  - Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
  - Lifeline utilities protection
  - Health and safety maintenance

Property Protection

Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented

by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

- Retrofitting/disaster proofing
  - Floods
    - Wet/dry floodproofing (barriers, shields, backflow valves)
    - Relocation
    - Acquisition
  - Tornadoes
    - Safe rooms
    - Securing roofs and foundations with fasteners and tie-downs
    - Strengthening garage doors and other large openings
  - Drought
    - Improve water supply (transport/storage/conservation)
    - Remove moisture competitive plants (tamarisk/salt cedar)
    - Water restrictions/water saver sprinklers/appliances
    - Grazing on CRP lands (no overgrazing-see noxious weeds)
    - Create incentives to consolidate/connect water services
    - Recycled wastewater on golf courses
  - Earthquakes
    - Removing masonry overhangs, bracing, and other parts
    - Tying down appliances, water heaters, bookcases, and fragile furniture so they will not fall over during a quake.
    - Installing flexible utility connections that will not break during shaking (pipelines, too)
  - Wildland fire
    - Replacing building components with fireproof materials (roofing, screening)
    - Creating "defensible space"
    - Installing spark arrestors
    - Fuels modification
  - Noxious weeds/insects
    - Mowing
    - Spraying
    - Replacement planting
    - Stop overgrazing
    - Introduce natural predators
- Insurance

Natural Resource Protection

Natural resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. In so doing, these activities enable the naturally beneficial functions of floodplains and watersheds to be better realized. These natural and beneficial floodplain functions include the following:

- Storage of floodwaters
- Absorption of flood energy
- Reduction in flood scour
- Infiltration that absorbs overland flood flow
- Groundwater recharge
- Removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- Habitat for flora and fauna
- Recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Erosion and sediment control
- Wetlands protection
- Riparian area/habitat protection
- Threatened and endangered species protection
- Fuels management
- Set-back regulations/buffers
- Best management practices-Best management practices ("BMPs") are measures that reduce nonpoint source pollutants that enter the waterways. Nonpoint source pollutants come from non-specific locations. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches and streams. BMPs can be implemented during construction and as part of a project's design to permanently address nonpoint source pollutants. There are three general categories of BMPs:
  - Avoidance-Setting construction projects back from the stream.
  - Reduction-Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
  - Cleanse-Stopping pollutants after they are en route to a stream, such as using grass drainageways that filter the water and retention and detention basins that let pollutants settle to the bottom before they are drained
- Dumping regulations
- Water use restrictions
- Weather modification

- Landscape management

Structural Projects

Structural projects have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they "stop" flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.

- They disturb the land and disrupt natural water flows, often destroying habitats.
- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

- Detention/retention structures
- Erosion and sediment control
- Basins/low-head weirs
- Channel modifications
- Culvert resizing/replacement/maintenance
- Levees and floodwalls
- Fencing (for snow, sand, wind)
- Drainage system maintenance
- Reservoirs (for flood control, water storage, recreation, agriculture)
- Diversions
- Storm sewers

Public Information

A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection

- Hazard maps and data

- Outreach projects (mailings, media, web, speaker's bureau)
- Library resources
- Real estate disclosure
- Environmental education
- Technical assistance

Climate Adaptation and Social Equity Strategies

Climate adaptation strategy guidance materials were distributed prior to and during the mitigation strategy planning session. Materials included the *California Adaptation Planning Guide (APG)*, a set of four complementary documents that provide guidance to support communities in addressing the unavoidable consequences of climate change. The documents provide a step-by-step process on adaptation strategy development. *California's Climate Adaptation Strategy: Safeguarding California Plan: 2018 Update* was also distributed prior to and during the mitigation strategy planning session. While information on climate change impacts was integrated into the LHMP Risk Assessment, the mitigation strategy planning session focused on discussing how climate change would affect major natural hazards in the City of Sebastopol Planning Area. The HMPC was then able to review potential adaptation strategies that would help them meet adaptation needs. The APG documents provide a broad sampling of different policies and programs that address climate change. Several of the adaptation example policies and programs also focus on addressing environmental justice (EJ), reducing risk in disadvantaged communities, and promoting social equity. As a result, the HMPC considered various planning tools and resources to support compliance with California Government Code Section 65302 (Senate Bill 379). Subsection (g)(4) requires all cities and counties to include climate adaptation and resiliency strategies in the safety elements of their general plans.

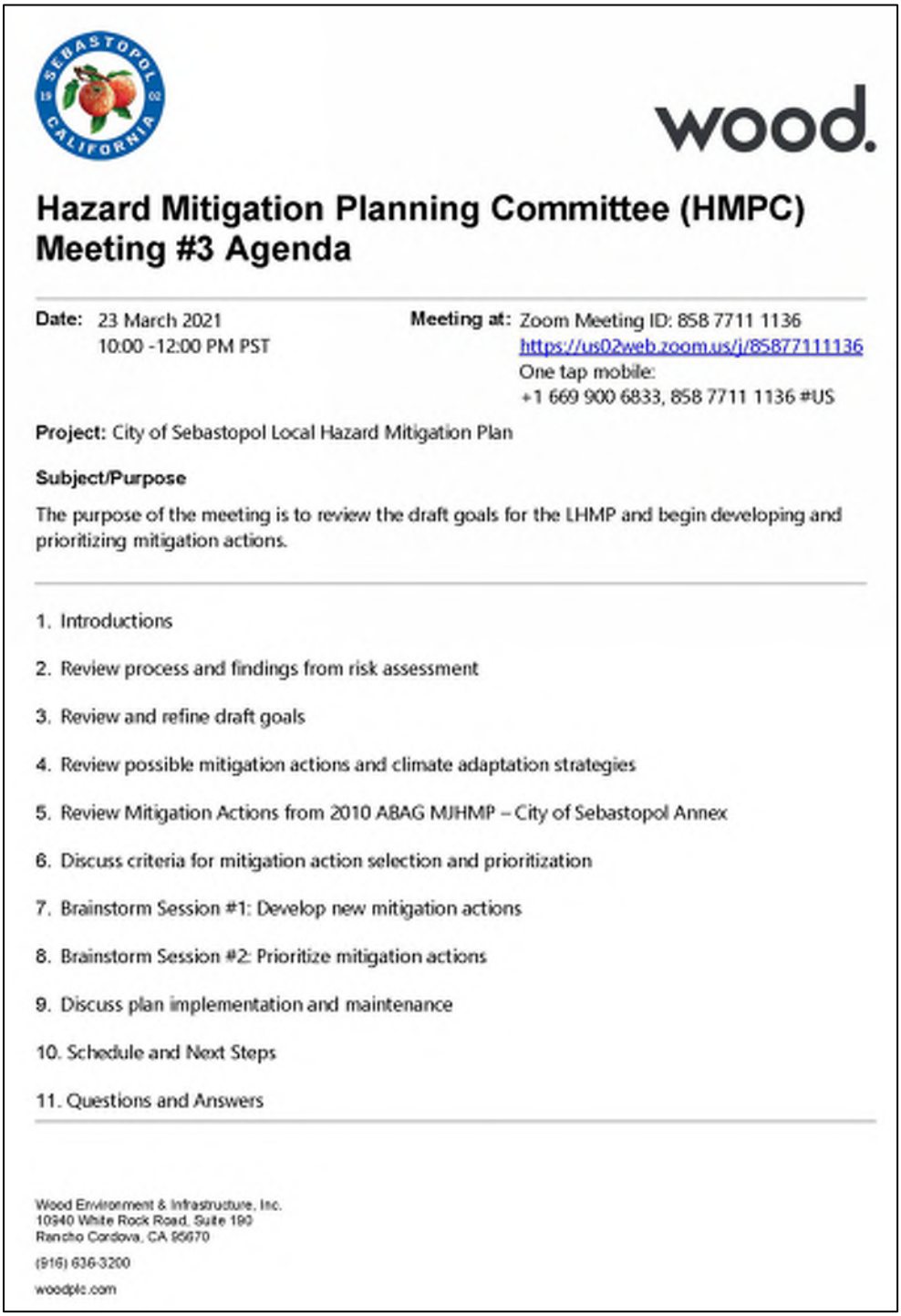
Environmental Justice and Social Equity Strategies

HMPC members reviewed the *Senate Bill 1000 Implementation Toolkit: Planning for Healthy Communities*. The toolkit helped the HMPC consider various planning resources to support compliance with California Government Code Section 65302.10 and Senate Bill 1000. Senate Bill 1000, the Planning for Healthy Communities Act, mandates that cities and counties adopt an EJ element or integrate EJ goals, objectives, and policies into other elements of their General Plan. The HMPC discussed and developed various community engagement and outreach programs during the planning sessions, as well as programs that would better assess existing demographics in the City that may influence engagement, such as language access, age, and educational attainment. The intent of the strategies is to promote collaboration with community members and maintain effective relationships with Community-Based Organizations to ensure that hazard mitigation actions are prioritized in disadvantaged and vulnerable communities in Sebastopol.

The resulting climate adaptation and social equity strategies were also considered during prioritization exercises. The policies and programs were then integrated into the mitigation strategy as specific actions tailored to fit the hazard mitigation, adaptation, and social equity needs of all of Sebastopol's residents.

Mitigation Strategy HMPC #3 Meeting documentation

Meeting Agenda



Hazard Mitigation Planning Committee (HMPC) Meeting #3 Agenda

Date: 23 March 2021
10:00 -12:00 PM PST

Meeting at: Zoom Meeting ID: 858 7711 1136
https://us02web.zoom.us/j/85877111136
One tap mobile:
+1 669 900 6833, 858 7711 1136 #US

Project: City of Sebastopol Local Hazard Mitigation Plan

Subject/Purpose

The purpose of the meeting is to review the draft goals for the LHMP and begin developing and prioritizing mitigation actions.

1. Introductions
2. Review process and findings from risk assessment
3. Review and refine draft goals
4. Review possible mitigation actions and climate adaptation strategies
5. Review Mitigation Actions from 2010 ABAG MJHMP – City of Sebastopol Annex
6. Discuss criteria for mitigation action selection and prioritization
7. Brainstorm Session #1: Develop new mitigation actions
8. Brainstorm Session #2: Prioritize mitigation actions
9. Discuss plan implementation and maintenance
10. Schedule and Next Steps
11. Questions and Answers

Wood Environment & Infrastructure, Inc.
10940 White Rock Road, Suite 190
Rancho Cordova, CA 95670
(916) 636-3200
woodplc.com

Meeting Minutes

HMPC Meeting #3 Minutes

Date/Time: Tuesday, March 23, 2021 10:00 – 12:00 PM

Location: Zoom Meeting ID: 858 7711 1136 **Project No.:** SA20170850
https://us02web.zoom.us/j/85877111136

Written By: Juliana Prosperi (Wood, Project Manager)

Present: Kari Svanstrom (City of Sebastopol, Planning Director)
Bill Braga (City of Sebastopol, Fire Chief)
Daryl Philips (City of Sebastopol, Building and Safety, Floodplain Administrator)
Jeff Brislawn (Wood, Hazard Mitigation Lead/Senior Associate)
Dante Del Prete (City of Sebastopol, Public Works Superintendent)
Kevin Kilgore (City of Sebastopol, Police Department)
Zach Douch (City of Sebastopol, Planning Commissioner/Red Cross)
Chris Anderegg (Sebastopol Community Cultural Center)
Jennie Bruneman (West Sonoma County HS District/Director of Facilities)

Not Present: Katie Davis (Sebastopol Area Senior Center)
Diane Ramirez (City of Petaluma, Project Manager)
Denise Fisher (West Sonoma County Union HS District, Facilities Supervisor)
Skip Jirrels (City of Sebastopol, Public Safety Outreach Coordinator)
Shepley Schroth-Cary (Gold Ridge Fire Protection District)
Jeff DuVall (Sonoma County, Department of Emergency Management)
Lawrence McLaughlin (City of Sebastopol City Manager)

Subject: City of Sebastopol HMPC Meeting #3

AGENDA TOPICS

This is a record of attendance and a summary of the topics discussed at the meeting:

1. Introductions
2. Review process and findings from risk assessment
3. Review and refine draft goals
4. Review possible mitigation actions and climate adaptation strategies
5. Review Mitigation Actions from 2010 ABAG MJHMP – City of Sebastopol Annex
6. Discuss criteria for mitigation action selection and prioritization
7. Brainstorm Session #1: Develop new mitigation actions
8. Brainstorm Session #2: Prioritize mitigation actions
9. Discuss plan implementation and maintenance
10. Schedule and Next Steps
11. Questions and Answers

wood.

1. Introductions

Ms. Prosperi initiated the meeting, thanked everyone one for attending, and explained the purpose of the discussion was to review the existing mitigation activities from the 2010 ABAG City of Sebastopol LHMP Annex and develop new mitigation actions. HMPC participants listed in the beginning of this meeting summary were present for the meeting.

2. Review Process and Findings from Risk Assessment

Ms. Prosperi reviewed where the team was in the planning process. She summarized the hazards addressed in HMPC Meeting #2 and some takeaways from the public survey results.

3. Review and Refine Draft Goals

Ms. Prosperi reviewed the preliminary goals drafted in the previous meeting and explained the team organized each goal by reducing hazard vulnerabilities to existing and new development, increasing resiliency and capacity in the community, and improving redundancy in the water and wastewater system. During this time the HMPC had an opportunity to revise the goals, but the group consensus was to keep the goals as written and revisit them during review of the Draft Plan. Goals are listed below:

- **Goal 1:** Minimize new development in hazard-prone areas
- **Goal 2:** Minimize hazard impacts on existing development
- **Goal 3:** Build resiliency in the community and capacity against hazards in the City
- **Goal 4:** Improve infrastructure resiliency and redundancy against disruption and interruption

Ms. Prosperi talked about objectives that could support the goals; she added they should be quantitative and measurable statements on how the City will achieve the goals, but they are optional.

4. Review Possible Mitigation Actions and Climate Adaptation Strategies

Ms. Prosperi provided an overview of types of mitigation actions we refer to as the 4 A's: alter, avert, adapt, and avoid; she also provided examples of each type. She explained that the Federal Emergency Management Agency (FEMA) wants local governments to understand mitigation alternatives and stated that FEMA categorizes mitigation ideas into four 'buckets,' and the National Flood Insurance Program (NFIP) puts these mitigation alternatives into six categories. These six categories include prevention, property protection, natural resource protection, structural projects, public information, and emergency services. Ms. Prosperi referred the HMPC to the emailed handouts on mitigation actions to guide the mitigation action brainstorm session.

wood.

Ms. Svanstrom asked about where a relocation and recreation easement type project may fall within the categories. Ms. Prosperi stated relocation of a building or land use that is not compatible with hazards stresses such as flooding would be an "avoid" project alternative, and any subsequent project to establish an easement on the property would be considered an "adapt" action. FEMA would categorize this activity as a structure or infrastructure project, which are eligible for funding. The HMPC discussed this type of project given it is similar to the Park Village mobile home property the City owns and manages.

Ms. Prosperi talked about climate adaptation and noted that there is overlap between hazard mitigation and adaptation. She reminded the group that we looked at climate change effects on the hazards in the risk assessment. She provided best practices associated with integrating climate adaptation strategies into the plan. Ms. Prosperi then reviewed mitigation action ideas with the HMPC by hazard category that were tailored for City and focused on reducing flood, earthquake, and wildfire hazards.

5. Review Mitigation Actions from 2010 ABAG MJHMP – City of Sebastopol Annex

Ms. Prosperi and the HMPC reviewed several mitigation activities from the 2005 and 2010 Association of Bay Area Governments (ABAG) MJHMP – City of Sebastopol Annex. These mitigation actions were focused on emergency preparedness, communication system improvements, seismic retrofits, and floodplain management. Ms. Prosperi stated that while many of the actions may have been completed or are no longer applicable, we will need to revisit them to provide a status update as part of the "update" of the LHMP (e.g. completed, deleted, etc.). The City also discussed a hillside slope stabilization project near Burbank Farm at 7781 Bodega Avenue as a possible new landslide/erosion mitigation project.

Action Item: Mr. Braga will review each action from the Annex and provide an update in the Mitigation Action Worksheets.

6. Discuss criteria for mitigation action selection and prioritization

Ms. Prosperi reviewed the mitigation action selection and prioritization criteria developed by FEMA: STAPLEE, which refers to social, technical, administrative, political, legal, economic, and environmental. Other criteria to consider includes life safety, high risk hazards, multiple-objective hazards, and equity. Ms. Prosperi referred to HMPC to the FEMA Mitigation Action Portfolio publication for further information: (https://www.fema.gov/sites/default/files/2020-08/fema_mitigation-action-portfolio-support-document_08-01-2020_0.pdf).

7. Brainstorm Session #1: Develop new mitigation actions

Ms. Prosperi explained the purpose of the first brainstorm session and the need for the plan to have at least one action for every hazard. She briefly summarized several suggested mitigation action ideas by hazard type. Suggested flooding actions included repetitive loss area analysis (RLAA), CRS participation, evacuation scenario planning, and participation in a regional sea level rise study. This City added they are currently participating in the FEMA flood map updates.

Suggested earthquake actions included building inspections, earthquake awareness, seismic retrofits on City buildings, upgrading remaining URM buildings. Wildfire mitigation actions included updating the zoning ordinance, implementing a city-specific Community Wildfire Protection Plan (CWPP) (home hardening, defensible space projects, fuel reduction zones). Suggested dam incident actions included participation in emergency action planning for upstream regional dams. Suggested drought actions included participation on the Groundwater Sustainability Agency (GSA) plans, added surface water storage supply, and creating additional redundancies in the water supply system in the City. Extreme heat actions included focused on designating more cooling centers for sensitive populations. High wind and extreme weather actions included establishing clearance standards for overhead utilities and hardening projects. Public health hazard actions included preparing a pandemic plan. Hazardous material incident actions suggested included evacuation planning that is tied to facility-specific incidents.

She stated that at least one action must also address each hazard and be considered mitigation, not preparedness. The group shared and discussed numerous mitigation actions during the session; the group was also encouraged to write-out their mitigation ideas in the chat room. In the interest of time, Ms. Svanstrom suggested each Department representative at the City prepare mitigation action ideas to share with the group based on their areas of expertise. She stated she can cover land use and regulation actions, the Public Works Department can cover water and wastewater systems, and the Fire Department can cover wildfire actions and evacuation planning projects already underway (e.g. evacuation scenarios, Emergency Operation Plan update, etc.). Some of the brainstorm discussion included:

- Replacement of radio repeater infrastructure.
- Implementation of Community Center flood mitigation alternatives based on the engineering study that is in progress
- Mitigation of water system vulnerabilities (e.g. establishing redundancies in conveyance of wastewater, such as sewer main in City, and improving reliability of water system zones)
- Increase capacity/resiliency of wastewater system
- Flood mitigation for infrastructure

8. Brainstorm Session #2: Prioritize Mitigation Actions

The purpose of the second exercise is to select and prioritize mitigation actions based on the set of STAPLEE criteria. Ms. Prosperi explained that once her team receives and organizes the Mitigation Action Worksheets, she will distribute a prioritization poll to the team along with a summary of mitigation actions so everyone can review and rank them.

Action Item: The HMPC needs to complete the Mitigation Action Worksheets by April 16th.

9. Discuss Plan Implementation and Maintenance

Ms. Prosperi provided an overview of key steps the HMPC will need to consider following plan adoption. She emphasized the importance of assigning a Hazard Mitigation Manager, identifying action leads to monitor and track actions and projects, and ensuring the City identifies ways to continue to engage the public.

10. Schedule and Next Steps

Ms. Prosperi expects to submit the plan to Cal OES by July 2021. Next steps will be submitting the Mitigation Action worksheets in April and scheduling a second public workshop in May.

Task	Anticipated Date
Project Kick-off Meeting	July 9, 2020
HMPC Planning Session #1	October 20, 2020
Circulate Online Public Survey	November 2, 2020 – February 1, 2021
Public Outreach Workshop #1	October 27, 2020
Prepare Hazard Identification and Risk Assessment	January 15, 2021
HMPC Planning Session #2	February 4, 2021
Finalize Goals and Objectives	March 9, 2021
HMPC Planning Session #3	March 23, 2021
Submit Mitigation Action Worksheets	April 16, 2021
Submit 1st Administrative Draft LHMP	April 30, 2021
City reviews 1st Administrative Draft LHMP	May 7, 2021
Submit Public Review Draft LHMP	May 14, 2021
Circulate Public Review Draft LHMP (30-day public review)	May 17, 2021 – June 14, 2021
Public Outreach Workshop #2	May 25, 2021
Complete FEMA Region IX Review Tool	May 28, 20201
Submit LHMP to Cal OES for review (45-day review)	June 11, 2021
Submit LHMP to FEMA for Review (45-day review)	July 26, 2021
Planning Commission Meeting #2	September 28, 2021
City Council Hearing	October 12, 2021
Project Management Close-Out Meeting	November 1, 2021

Questions and Answers

There were no additional questions at the end of the meeting. It adjourned at 12:08 p.m.

ACTION ITEMS

No.	Item	Action	Completion Date
1.	Submit HMPC Meeting #3 Minutes	(Wood)	5 April 2021
2.	Submit Mitigation Action Worksheets	(Wood)	16 April 2021

Attachment 1. Screenshot from HMPC Meeting #2; HMPC Participant Sign-In

City of Sebastopol HMPC Meeting #3
23 March 2021
Page 6

wood.

Develop Mitigation Actions: Flooding

Hazard/Problem Description: 100- and 500-year floodplains located east of City along Laguna de Santa Rosa and west of the City along Atascadero Creek.

Significance: Medium

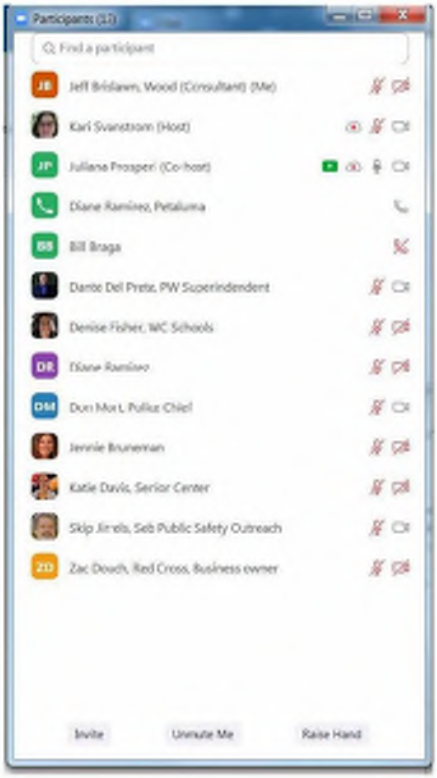
Existing Capabilities: NFIP Participation, Floodplain Ordinance, Flood Alerts, Property Acquisitions

Mitigation Ideas:

- Complete Repetitive Loss Area Analysis (RLAA)
- CRS Participation – to provide affordable flood insurance
- Complete Evacuation Scenario Planning
- Participate in Regional Sea Level Rise Study
- Implement Engineering Study Recommendations for Community Center

City of Sebastopol LHMP – HMPC Meeting #3 Mitigation Strategy





Meeting Presentation

wood.

City of Sebastopol
Local Hazard Mitigation Plan

Hazard Mitigation Planning Committee –
Meeting #3 – Mitigation Strategy

March 23, 2021 – 10:00-12:00 pm

1

Agenda

1. Introductions
2. Review of Process and Findings of Risk Assessment
3. Review and Refine Draft Goals
4. Review Possible Mitigation Actions and Climate Adaptation Strategies
5. Review Mitigation Actions from 2010 ABAG MJHMP – City of Sebastopol Annex
6. Discuss Criteria for Mitigation Action Selection and Prioritization
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9. Discuss Plan Implementation and Maintenance
10. Schedule and Next Steps
11. Questions and Answers

wood.

2

Meeting Logistics

- Please mute your mic when not speaking.
- …but please feel free to unmute when you have something to say!
- You can also use the chat log to make comments, ask questions, or provide information.
- This meeting is being recorded.
- Slides, meeting summary, and recording will be made available after the meeting.

wood.

3

Introductions

wood.

4

Introductions

- City of Sebastopol
  - Kari Svanstrom, Planning Director
  - Bill Braga, Fire Chief
  - Daryl Philips, Chief Building Official
- Wood Environment & Infrastructure Solutions, Inc.
  - Juliana Prosperi, Project Manager
  - Jeff Brislawn, Hazard Mitigation Lead/Sr Technical Advisor

wood.

5

Review of Planning Process & Findings of the Risk Assessment

wood.

6

Review of Planning Process & Risk Assessment

44 Code of Federal Regulations 201.6

- Requires local governments to have hazard mitigation plans for continued eligibility for mitigation funds, pre- and post- disaster
- Guide mitigation activities in a coordinated & economic manner
- Integrates into other existing planning mechanisms
  - General Plan Safety Element
  - Zoning Ordinance
  - Building & Construction Code – Title 15 SMC
  - Five-Year Capital Improvement Plan
  - 2010 Emergency Response Plan
  - PG&E Wildfire Safety/ Public Safety Power Shut Off
  - Laguna Wetlands Preserve Restoration and Management Plan
  - 2019 Climate Emergency Resolution
  - Flood Alert System
- Directs future development plan and build wisely
- Reduces losses
- Make communities more disaster resilient



wood.

7

Review of Planning Process and Risk Assessment

SB 379	Requires inclusion of climate change vulnerability assessment and integration of adaptation strategies in the Safety Element, encourages climate change efforts inclusion in LHMPs. These requirements are included in Government Code Section 65302 (g)(4) (2015).
SB 1000	Requires inclusion of environmental justice and equity goals and policies in the Safety Element identification of Disadvantaged Communities pursuant to Government Code Section 65302.10 (2016).
AB 2140	Links LHMPs and Safety Elements by encouraging the adoption of LHMPs into Safety Elements and by tying funding eligibility to approval of LHMPs (2006).
SB 1241	Requires Safety Element to address wildfire risks in State Responsibility Area and Very High Fire Hazard Severity Zones and includes review by State Board of Forestry and Fire Protection (2012).
AB 747 SB 99	Requires Safety Element update to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. Requirement are included in Government Code Section 65302.15 related to avoid use (2019). SB 99 requires Safety Element to identify residential developments in hazard areas that do not have at least 2 emergency evacuation routes.
Other	SB 1035 requires update to climate adaptation strategies in Safety Element at least every 8 years. AB 32 Global Warming Solutions Act, emergency management plans, funding opportunities (e.g., CalOES Hazard Mitigation Grant Program).



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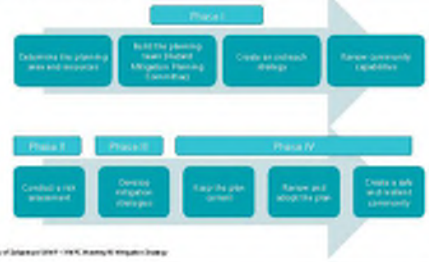
8

FEMA's 4-Phase DMA Planning Process



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9

FEMA's 9-Step Planning Process

- Task 1 **Determine the Planning Area and Resources**
- Task 2 **Build the Planning Team**
- Task 3 **Create an Outreach Strategy**
- Task 4 **Review Community Capabilities**
- Task 5 **Conduct a Risk Assessment**
- Task 6 **Develop a Mitigation Strategy**
- Task 7 Keep the Plan Current
- Task 8 Review and Adopt the Plan
- Task 9 Create a Safe and Resilient Community

wood.

10

Hazard Mitigation Planning Committee



wood.

11

Mitigation Planning Progress Milestones

- 1st HMPC Meeting on October 20, 2020
- 1st Public Workshop on October 27, 2020 with City Planning Commission
- Collected and reviewed hazard information in worksheets
- Developed a Critical Facilities GIS Database for the City
- Conducted GIS mapping and spatial analysis for the vulnerability assessment
- Completed the Risk assessment and Vulnerability Assessment
- Online Public Survey closed January 31st
- 2nd HMPC Meeting February 2nd

wood.

12

What goes into a Local Hazard Mitigation Plan?

- Section 1 – Introduction
- Section 2 – Community Profile
- Section 3 – Planning Process
- Section 4 – Risk Assessment, plus Capability Assessment
- Section 5 – Mitigation Strategy
- Section 6 – Plan Adoption
- Section 7 – Plan Implementation and Maintenance

- Appendices

wood.

13

Risk Assessment Summary

Hazard	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Flood	Significant	Likely	Critical	Medium
Earthquake	Extensive	Likely	Critical	High
Wildfire	Limited	Likely	Critical	Medium
Drought	Significant	Likely	Limited	Medium
Dam Incidents	Limited	Unlikely	Negligible	Low
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium
Severe Weather: Heavy Rain/Thunderstorm/Hail/Lightning	Extensive	Likely	Limited	Medium
Severe Weather: High Winds	Extensive	Likely	Limited	Medium
Public Health Hazards	Extensive	Likely	Critical	High
Hazardous Material Releases	Limited	Likely	Negligible	Low

wood.

14

Public Survey Results

- Closed January 31st
- 137 Responses
  - 74% live within city limits
  - 26% live within the 95472-zip code
  - 80% homeowners/20% renters
- Top Five Hazards include:
  - Wildfire (69%)
  - Climate Change (56%)
  - Earthquake (48%)
  - High Winds (39%)
  - Drought (32%)



15

City of Sebastopol LHMP Webpage



wood.

16

Review and Refine Goals and Objectives

wood.

17

Developing Goals and Objectives for the Mitigation Plan

Goals
- General guidelines that explain what you want to achieve
- Usually broad policy/vision statements

Objectives
- Define strategies or implementation steps to attain goals
- Specific and measurable

Actions
- Specific projects/activities to achieve goals & objectives



wood.

18

Preliminary Draft Goals

2010 ABAG MHMP Goal: To maintain and enhance a disaster-resistant region by reducing the potential for loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery from those disasters

New Goal 1: Minimize new development in hazard-prone areas.

New Goal 2: Minimize hazard impacts on existing development.

New Goal 3: Build resiliency in the community and capacity against hazards in the City.

New Goal 4: Improve infrastructure resiliency and redundancy against disruption and interruption.

wood.

19

Sebastopol General Plan Safety Element Goals (2016)

Goal SA 1: Minimize the risk of injury and property damage resulting from seismic and geologic hazards.

Goal SA 2: Reduce risk to human life, property, and public services associated with flood hazards.

Goal SA 3: Protect the safety of life and property by ensuring emergency preparedness.

Goal SA 4: Reduce fire hazards and maintain effective fire and emergency response services.

Goal SA 5: Maintain effective police services.

Goal SA 6: Reduce hazards associated with the transportation, use, storage and disposal of hazardous wastes and hazardous materials.

wood.

20

Review Possible Mitigation Actions and Climate Adaptation Strategies

wood.

21

Mitigation Action Categories

FEMA Mitigation Ideas Guidance
- Plans and Regulations
- Structure and Infrastructure Projects
- Natural systems protection
- Education and Awareness

Community Rating System Categories
- Prevention
- Property protection
- Natural resource protection
- Structural projects
- Emergency services
- Public Awareness and Education

—See handouts—

wood.

22

Review Mitigation Alternatives



wood.

23

Review Mitigation Alternatives

Alter the Hazard
- Prescribed burns or fuels management to reduce wildfire intensity and severity
- Draining lakes behind weakened dams
- Reservoir management



wood.

24

Review Mitigation Alternatives

- **Avert** the Hazard
  - Floodwalls
  - Retention and Debris basins
  - Drainage Improvements
  - Channels and Culverts
  - Fuel Breaks
  - Critical Facility Improvements



wood.

25

Review Mitigation Alternatives

- **Adapt to the Hazard**
  - Building Codes
  - Construction Standards
  - Land Use and Development Regulations
  - Design Standards
  - Public Information
  - Monitoring and Warning Systems
  - Evacuation Scenario and Route Planning
  - Professional Training
  - Safe Rooms



wood.

26

Review Mitigation Alternatives

- **Avoid** the Hazard
  - Acquisition
  - Relocation
  - Open Space Preservation
  - Land Use Designation
  - Natural System Protection



wood.

27

FEMA Community Lifelines



wood.

28

Climate Change Adaptation Considerations

Vulnerability Assessment

- **Exposure:** What climate change effects will impact the City?
- **Risk and Onset:** How likely are impacts and how quickly will they occur?
- **Adaptive Capacity:** What can be done?

Adaptation Strategy Development

- **Prioritize Needs:** Which vulnerabilities require action?
- **Identify Strategies:** Which strategies should be pursued?
- **Prioritize and Evaluate:** Feasible? Potential costs versus benefits?



wood.

29

Climate Change Adaptation and Resilience Strategies for LHMPs

- Measures should address both current hazards and future climate change effects
- Collaboration is key to promote complementary adaptation approaches
- Monitoring and tracking of climate change effects
- Customer education and involvement in decision-making



Example of Climate Adaptation Strategies

- **Protect:** Nature-based river protection and management practices (e.g. maintain open space buffers)
- **Accommodate:** Upgrade stormwater infrastructure and roadways near water assets to improve drainage
- **Managed Retreat:** Relocate critical facilities away high fire hazard severity zones or waterways



wood.

30

Projects Eligible for FEMA Funding – Flooding

- Property Acquisition and Conversion to Open Space
- Structure Demolition/Relocation
- Dry and Wet Flood-proofing
- Building Elevation
- Localized and Non-Localized Flood Reduction Projects
  - Detention ponds
  - Channel stabilization
  - Must reduce flood risk to existing infrastructure and not transfer the flood problem elsewhere
  - Flood loss reduction; not water quality management
- Existing Building and Infrastructure Retrofits
  - Buildings, culverts, bridges



wood.

31

Projects Eligible for FEMA Funding – Wildfire

- Defensible Space
- Hazardous Fuels Reduction Activities
  - Community level vegetation management;
  - Vegetation removal;
  - Vegetation clearing and/or thinning;
  - Fuel breaks;
  - Slash removal; and
  - Vertical clearance of tree branches
- Structural Protection through Ignition-Resistant Construction Activities



wood.

32

Projects Eligible for FEMA Funding – Other Hazards

- Landslides/ Geologic Hazards
  - Soil/slope stabilization/ protection of critical facility
  - Property Acquisition
- Utility Protection/ Infrastructure Retrofit
  - Winter Weather
  - Wildfire
  - High Winds
- Safe Room Construction, Permanent Generators
- Seismic Building/Infrastructure Retrofit
- "Climate Resilient" Actions (Aquifer Storage, Green Infrastructure)

wood.

33

Review Mitigation Actions from 2010 Association of Bay Area Governments MJHMP – City of Sebastopol Annex

wood.

34

2005 ABAG MJHMP – City of Sebastopol Annex Mitigation Actions

- Completed
- Annual Implementation
- In Progress
- Not started
- Deleted



wood.

35

2005 ABAG MJHMP –City of Sebastopol Annex Mitigation Actions

1. Inventory all soft-story structures in the jurisdiction and provided notification to property owners of the findings of those inspections.
2. Inventory all non-ductile concrete, concrete tilt-up and other suspicious buildings.
3. Inspect all critical infrastructure in the City and create a plan and funding source to correct deficiencies.
4. Ensure that police and fire department staffs have adequate radio communications systems and equipment.
5. Ensure that the back-bone radio and communications systems are current and provide adequate operational use to field responders.
6. Ensure that emergency operational plans meet SEMS and NIMS compliance and are adequate for response and recovery operations.

wood.

36

2010 ABAG MJHMP – City of Sebastopol Annex Mitigation Actions

1. Develop plans and procedures for Para Transit System response and recovery from disasters.
2. Adopt one or more of the following strategies as incentives to encourage retrofitting of privately-owned seismically vulnerable residential buildings: a) waivers or reductions of permit fees, b) below-market loans, c) local tax breaks, d) grants to cover the cost of retrofitting or of a structural analysis, e) land use and procedural requirements, or f) technical assistance.
3. Investigate and adopt appropriate financial, procedural, and land use incentives for private owners of soft-story buildings to facilitate retrofits.
4. Use the soft-story inventory to require private landowners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they may live in this type of building.

wood

37

2010 ABAG MJHMP – City of Sebastopol Annex Ongoing Actions

1. Vulnerability Assessments of City facilities and infrastructure.
2. Non-structural mitigation for building contents
3. Development of interoperable communications for first responders from cities, counties, special districts, state and federal agencies.
4. Maintain and update City's Standardized Emergency Management System Plan.
5. Participation in general mutual-aid agreements and agreements with adjoining jurisdictions for cooperative response to fires, floods, earthquakes, and other disasters.
6. Participation in FEMA's National Flood Insurance Program

wood

38

2010 ABAG MJHMP – City of Sebastopol Annex Ongoing Actions

7. Develop printed materials, utilize existing materials, conduct workshops, and/or provide outreach encouraging employees of these critical health care facilities to have family disaster plans and conduct mitigation activities in their own homes.
8. Sponsor the formation and training of a Community Emergency Response Teams (CERT) through partnerships with local businesses
9. Incorporate FEMA guidelines and suggested activities into local government plans and procedures for managing flood hazards.
10. Increase efforts to reduce landslides and erosion in existing and future development through continuing education of design professionals on mitigation strategies.
11. Conduct an inventory of existing or suspected soft-story residential, commercial, and industrial structures.
12. Continue to repair and make structural improvements to storm drains, pipelines, and/or channels to enable them to perform to their design capacity in handling water flows as part of regular maintenance activities.

wood

39

Discuss Criteria for Mitigation Action Selection and Prioritization

wood

40

Discuss Criteria for Mitigation Action Selection and Prioritization

STAPLEE

- Social
- Technical
- Administrative
- Political
- Legal
- Economic
- Environmental

Other Strategies to Consider

- Life Safety
- Addressing High Risk Hazards
- Protect Critical Facilities/Assets
- Multiple Objectives
- Equity

wood

41

Criteria for Mitigation Action Selection and Prioritization

- Draft Hazard Identification and Risk Assessment
- See handouts related to action alternatives by hazard and category
- Public Survey Results
- Sebastopol General Plan Safety Element
- Plan goals and objectives
- FEMA 'Mitigation Action Portfolio' publication https://www.fema.gov/sites/default/files/2020-03/fema_mitigation-action-portfolio-supporting-document_08-30-2019.pdf



DOLA 'Planning for Hazard' Guide https://planningforhazards.com/home

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42

Brainstorm Session #1 Develop Mitigation Actions

wood

43

Brainstorm Session #1: Develop Actions for the LHMP

Virtual Exercise #1

- **What is your Mitigation Action idea?**

- Think about the Community Needs!
- Review Guidance Handouts
  - Typical Mitigation Action Alternatives by FEMA Category
- Share action ideas in chat room
- Review each other's postings in the chat room
- Explain details on each action submitted for "funding"

wood

44

Criteria for Mitigation Action Selection and Prioritization

- Plan must have at least one action that addresses each identified hazard and must be true mitigation (not preparedness), preferably of different categories.
- Actions must be prioritized based on high-risk hazards
- Actions must have detail on implementation and administration
- Actions must have a review of benefit vs. cost
- Actions must address existing and future development
- What actions address climate change vulnerability and adaptation?
- LHMP can be referenced to meet California Government Code Section 65302.4 requirements related to General Plan





wood

45

Develop Mitigation Actions: Flooding

Hazard/Problem Description: 100- and 500-year floodplains located east of City along Laguna de Santa Rosa and west of the City along Atascadero Creek.
Significance: Medium
Existing Capabilities: NFIP Participation, Floodplain Ordinance, Flood Alerts, Property Acquisitions
Mitigation Ideas:

- Complete Repetitive Loss Area Analysis (RLAA)
- CRS Participation – to provide affordable flood insurance
- Complete Evacuation Scenario Planning
- Participate in Regional Sea Level Rise Study
- Implement Engineering Study Recommendations for Community Center





wood

46

Develop Mitigation Actions: Earthquake

Hazards/Problem Description:

- Multiple faults of concern:
  - Healdsburg-Rodgers Creek Fault
  - San Andreas Fault
- Potential for Strong Ground Shaking and Liquefaction

Significance: High
Existing Capabilities: Sebastopol General Plan, 2019 CBC, URM Ordinance
Mitigation Ideas: Conduct building inspections, earthquake awareness education, seismic retrofits of City-owned buildings, upgrade remaining URMs





wood

47

Develop Mitigation Actions: Wildfire

Hazard/Problem Description: Southern portions of the City, particularly the Fircrest Mobile Home Park area and along Robinson Road show moderate and high severity hazard areas based on fire threat data and the FHSZs mapped for LRA levels.
Significance: Medium
Existing Capabilities: Community shelters, evacuation planning underway
Mitigation Ideas: Update Zoning Ordinance (conditions for development in WUI), implement City-specific CWPP (home hardening, defensible space, fuel reduction zones, deploy evacuation exercises/shelters)





wood

48

Develop Mitigation Actions: Dam Incidents

Hazard/Problem Description: Two upstream dams of concern: Warm Springs Dam and Delta Pond Dam
Significance: Low
Existing Capabilities: High hazard dam that has an EAP in place and dam inundation mapping
Mitigation Ideas: Participate in Emergency Action Plan update planning process




wood.

49

Develop Mitigation Actions: Drought

Hazard/Problem Description: Impacts are wide-reaching and may be economic, environmental, or societal.
Significance: Medium
Existing Capabilities: Water Shortage Contingency Plan (WSCP). City relies exclusively on groundwater which may minimize vulnerability
Mitigation Ideas: Groundwater Sustainability Plan participation, Consideration of surface water supplies, water storage facility, reclaimed water feasibility study, enhanced conservation measures to reduce water consumption

wood.

50

Develop Mitigation Actions: Severe Weather: Extreme Heat

Hazard/Problem Description:
- Period when high temperatures are expected to have a significant impact on public safety.
- Extreme temperatures have an adverse impact on human health and mortality, natural ecosystems, and economic sectors

Significance: Medium
Existing Capabilities: Designated Cooling Centers in Petaluma and Santa Rosa, Public Education efforts to help sensitive populations
Mitigation Ideas: Targeted outreach to vulnerable groups, shade structures




wood.

51

Develop Mitigation Actions: Severe Weather: High Wind

Hazard/Problem Description: Wind cause potential property and critical facilities damage, loss of life
Significance: Medium
Existing Capabilities: HMPC Needed
Mitigation Ideas: Clearance standards for overhead utilities, back-up power (renewable) to City critical facilities, tree safety maintenance program, energy storage program




wood.

52

Develop Mitigation Actions: Heavy Rain, Thunderstorms, Hail, Lighting, Dense Fog

- **Hazard/Problem Description:** Heavy Rain, Thunderstorms, Hail, Lighting and Dense Fog
- **Significance:** Medium
- **Existing Capabilities:** Community Shelters
- **Mitigation Ideas:** High wind hardening




wood.

53

Develop Mitigation Actions: Public Health Hazards

Hazard/Problem Description:
- An emergency need for health care (medical) services to respond to a disaster, significant outbreak of an infectious disease, bioterrorist attack or other significant or catastrophic event.

Significance: High
Existing Capabilities: City COVID-19 Resource Webpage, Sonoma County's COVID-19 Case Data, Sebastomark Program, Weekly Newsletter
Mitigation Ideas: Pandemic Plan




wood.

54

Develop Mitigation Actions: Hazardous Materials Incidents

Hazard/Problem Description:

- Hazardous Materials, Gas Pipelines, Chemical Facilities, transportation related
- Gas transmission pipeline passes through City

Significance: Low

Existing Capabilities: CUPA, Sonoma County Operational Area HazMat Incident Response Plan

Mitigation Ideas: Evacuation Planning, Outreach and Awareness Program

wood

55

Brainstorm Session #2: Prioritize Mitigation Actions

wood

56

Brainstorm Session #2: Prioritize Mitigation Actions

Virtual Exercise #2

What are your preferred mitigation actions based on the following prioritization criteria?

- Social
- Technical
- Administrative
- Political
- Legal
- Economic
- Environmental
- Safety

wood

57

Mitigation Action Selection and Prioritization

Based on Risk

- Estimated losses
- At-risk existing facilities
- At-risk critical facilities
- At-risk cultural and natural resources

Other Opportunities

- At-risk areas slated for future development
- At-risk facilities slated for future development
- Public education
- Increased insurance coverage
- Include projects from other existing plans

wood

58

Developing Actions for the Mitigation Strategy

Take-Home Assignment

- Review Mitigation Action Worksheet
- Captures additional details of mitigation action ideas
- Complete Mitigation Action Worksheet by April 30th
- Feel free submit more than one Worksheet



wood

59

Discuss Plan Implementation and Maintenance

wood

60

Mitigation Action Selection and Prioritization

- Assign a Hazard Mitigation Manager and Individual Mitigation Action Leads
- Monitor changes in vulnerability, funding opportunities
- System for monitoring progress on achieving goals and projects
- Process to integrate and implement through other related plans
- Continue public involvement and create transparency to maintain engagement
- Revise the plan as necessary and complete update within 5 years per DMA requirement
- State vs. direct to FEMA



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61

Schedule and Next Steps

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62

When will we meet next?



wood.

63

Detailed Schedule

Task	Anticipated Date
Project Kick-off Meeting	April 8, 2021
HMPC Planning Session #1	October 20, 2021
Circulate Online Public Survey	November 2, 2021 - February 5, 2021
Public Outreach Workshop #1/Planning Commission Session	October 27, 2021
Prepare Hazard Identification and Risk Assessment	January 15, 2021
HMPC Planning Session #2	February 4, 2021
Finalize Goals and Objectives	March 8, 2021
HMPC Planning Session #3	**March 25, 2021**
Submit 1st Administrative Draft LHMP	April 30, 2021
City provides consolidated comments on 1st Administrative Draft LHMP	April 30, 2021
Submit 2nd Administrative Draft LHMP	May 7, 2021
Circulate Public Review Draft LHMP (30-day public review)	May 10 – June 9, 2021
Public Outreach Workshop #2/Planning Commission Session	May 25, 2021
Compile/Adjudicate Public Review Input	May 26, 2021
Submit LHMP to Cal OES for review (60-day review)	June 21, 2021
Submit LHMP to FEMA for Region IX (45-day review)	July 26, 2021
Planning Commission Meeting #2	September 28, 2021
City Council Meeting	October 12, 2021
Project Management Close Out Meeting	November 1, 2021

The Schedule for Planning Commission Meetings (1st and 2nd Tuesdays of each month).
The Schedule for City Council meetings (the 1st and 3rd Tuesdays of each month).

wood.

64

Schedule and Next Steps

- Complete the Mitigation Action Worksheet by April 30th
- Release Draft Mitigation Strategy for HMPC Review
- Circulate the Administrative Draft LHMP
- Post the Public Review Draft LHMP for 30-day review
  - Schedule Focus/Stakeholder Groups
  - Partner with Community Based Organizations
  - Advertisements
  - Social Media Posts
  - Design Charettes
- Schedule the 2nd Public Outreach Workshop
- Incorporate public comments
- Finalize LHMP for Cal OES review



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65

Schedule and Next Steps



The Administrative Draft LHMP is available here:
http://www.arcgis.com/home/group.html?id=[illegible]

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66



Mitigation Action Selection and Prioritization Criteria

Does the proposed action protect lives?

Does the proposed action address hazards or areas with the highest risk?

Does the proposed action protect critical facilities, infrastructure, or community assets?

Does the proposed action meet multiple objectives (multi-objective management)?

STAPLE/E

Developed by FEMA, this method of applying evaluation criteria enables the planning team to consider in a systematic way the social, technical, administrative, political, legal, economic, and environmental opportunities and constraints of implementing a particular mitigation action. For each action, the HMPC should ask, and consider the answers to, the following questions:

Social

Does the measure treat people fairly (different groups, different generations)?

Technical

Will it work? (Does it solve the problem? Is it feasible?)

Administrative

Is there capacity to implement and manage project?

Political

Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support it?

Legal

Does your organization have the authority to implement? Is it legal? Are there liability implications?

Economic

Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development? Does it reduce direct property losses or indirect economic losses?

Environmental

Does it comply with environmental regulations or have adverse environmental impacts?

Example Mitigation Actions by FEMA categories with Hazards Identified in the City of Sebastopol Local Hazard Mitigation Plan

Alternative Mitigation Actions	Floods	Earthquakes	Wildfires	Drought and Severe Weather: Extreme Heat	Dam Incidents	Severe Weather: Heavy Rain/ Lightning/ Hail	Severe Weather: Wind	Hazardous Materials
PLANS and REGULATIONS								
Building codes and enforcement	■	■	■	■		■	■	■
Comprehensive Watershed Tax	■							
Density controls	■		■		■			■
Design review standards	■	■	■					■
Easements	■		■					■
Environmental review standards	■	■	■					■
Floodplain development regulations	■				■			■
Hazard mapping	■		■		■			■
Floodplain zoning	■				■			■
Forest fire fuel reduction			■					
Housing/landlord codes				■		■		■
Slide-prone area/grading/hillside development regulations			■					
Manufactured home guidelines/regulations	■	■				■		
Minimize hazardous materials waste generation								■
Multi-Jurisdiction Cooperation within watershed	■				■			
Open space preservation	■		■		■			
Performance standards	■	■	■	■	■	■	■	
Periodically contain/remove wastes for disposal								■

Alternative Mitigation Actions	Floods	Earthquakes	Wildfires	Drought and Severe Weather: Extreme Heat	Dam Incidents	Severe Weather: Heavy Rain/ Lightning/ Hail	Severe Weather: Wind	Hazardous Materials
Pesticide/herbicide management regulations								■
Special use permits	■		■	■	■			■
Stormwater management regulations	■							■
Subdivision and development regulations	■	■	■	■	■			■
Surge protectors and lightning protection						■		
Tree Management			■			■	■	
Transfer of development rights	■		■	■				
Utility location				■		■	■	■
STRUCTURE AND INFRASTRUCTRE PROJECTS								
Acquisition of hazard prone structures	■		■	■	■			
Facility inspections/reporting	■	■		■	■			■
Construction of barriers around structures	■				■			■
Elevation of structures	■				■			
Relocation out of hazard areas	■		■	■	■			■
Structural retrofits (e.g., reinforcement, floodproofing, bracing, etc.)	■	■	■			■	■	■
Channel maintenance	■							
Dams/reservoirs (including maintenance)	■			■	■			
Isolate hazardous materials waste storage sties								■
Levees and floodwalls (including maintenance)	■							
Safe room/shelter		■		■		■	■	
Secondary containment system								■
Site reclamation/restoration/revegetation	■							

Alternative Mitigation Actions	Floods	Earthquakes	Wildfires	Drought and Severe Weather: Extreme Heat	Dam Incidents	Severe Weather: Heavy Rain/ Lightning/ Hail	Severe Weather: Wind	Hazardous Materials
Snow fences							■	
Water supply augmentation				■		■		
Debris Control	■							
Defensible Space			■					
Stream stabilization	■							
EDUCATION AND AWARENESS								
Flood Insurance	■				■			
Hazard information centers	■	■	■	■	■	■	■	■
Public education and outreach programs	■	■	■	■	■	■	■	■
Real estate disclosure	■	■	■	■	■	■	■	■
Crop Insurance		■		■		■		
Lightning detectors in public areas						■		
NATURAL SYSTEMS PROTECTION								
Best Management Practices (BMPs)	■		■	■		■		■
Forest and vegetation management	■		■	■	■	■	■	
Hydrological Monitoring	■			■	■	■		■
Sediment and erosion control regulations	■				■			■
Stream corridor restoration	■			■				
Stream dumping regulations	■							■
Urban forestry and landscape management	■		■	■		■	■	
Wetlands development regulations	■		■	■				■
EMERGENCY SERVICES								
Critical facilities protection	■	■	■	■	■	■	■	■
Emergency response services	■	■	■	■	■	■	■	■
Facility employee safety training programs	■	■	■	■	■	■	■	■

Alternative Mitigation Actions	Floods	Earthquakes	Wildfires	Drought and Severe Weather: Extreme Heat	Dam Incidents	Severe Weather: Heavy Rain/ Lightning/ Hail	Severe Weather: Wind	Hazardous Materials
Hazard threat recognition	■	■	■	■	■	■	■	■
Hazard warning systems (community sirens, NOAA weather radio)	■	■	■	■	■	■	■	■
Health and safety maintenance	■	■	■	■	■	■	■	■
Post-disaster mitigation	■	■	■	■	■	■	■	■
Evacuation planning	■		■	■	■			■

2021 Mitigation Action Worksheet

City of Sebastopol Local Hazard Mitigation Plan
New Mitigation Action Worksheet

Name of Jurisdiction/Agency: _____

Use this to record potential mitigation projects (1 page per project) identified during the planning process to include in the plan. Provide as much detail as possible and use additional pages as necessary. Complete and return to Juliana Prosperi by **April 15, 2021**.

Mitigation Project Title	
Issue/Background	
Other Alternatives	
Responsible Office	
Priority (High, Medium, Low)	
Cost Estimate	
Benefits (Avoided Losses)	
Potential Funding	
Schedule	

Prepared by: _____

Phone: _____

Email: _____

Please return worksheets by mail, email, to: Juliana Prosperi
juliana.prosperi@woodplc.com
10940 White Rock Road, Suite 190
Rancho Cordova, CA, 95670
Tel 303-503-7794
Fax 916-636-3208

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be signed by the Sebastopol City Council and added to this appendix. A model resolution is provided below:

Resolution # _____

Adopting the City of Sebastopol Local Hazard Mitigation Plan

Whereas, the City of Sebastopol recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments;

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Sebastopol fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and

Whereas, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the City of Sebastopol Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body;

Whereas, the City of Sebastopol desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the City of Sebastopol Local Hazard Mitigation Plan;

Whereas, adoption by the governing body for the City of Sebastopol, demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan.

Whereas, adoption of this legitimacies the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

Now, therefore, be it resolved, that the City of Sebastopol adopts the City of Sebastopol Local Hazard Mitigation Plan as an official plan; and

Be it further resolved, the City of Sebastopol will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000 and to establish conformance with the requirements of AB 2140.

Passed:_____
(date)

_____
Certifying Official

City of Sebastopol Local Hazard Mitigation Plan
Annual Progress Meeting Agenda

1. **Discussion on hazard events and impacts that occurred during the performance period**
2. **Review of progress on mitigation action implementation**
3. **Discussion on success stories**
4. **Recommendations for new actions/projects**
5. **Review of funding options and grant opportunities**
6. **Review of changes in plan maintenance or implementation**
7. **Review of continuing public involvement**

City of Sebastopol
Local Hazard Mitigation Plan
Annual Progress Report Template

Reporting Period:

Background: The City of Sebastopol developed a hazard mitigation plan to reduce risk from all hazards by identifying resources, information, and strategies for risk reduction. The federal Disaster Mitigation Act of 2000 requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. To prepare the plan, the City and participating stakeholders and partners organized resources, assessed risks from natural hazards within the City, developed planning goals and objectives, reviewed mitigation alternatives, and developed an action plan to address probable impacts from natural hazards. By completing this process, the City maintained compliance with the Disaster Mitigation Act, achieving eligibility for mitigation grant funding opportunities afforded under the Robert T. Stafford Act. The plan can be viewed online at: https://ci.sebastopol.ca.us/City-Government/Departments-Services/Fire/Local-Hazard-Mitigation-Plan

Summary Overview of the Plan's Progress: The performance period for the Local Hazard Mitigation Plan became effective on ____, 2021, with the final approval of the plan by FEMA. The initial performance period for this plan will be 5 years, with an anticipated update to the plan to occur before _____, 2026. The *City of Sebastopol Local Hazard Mitigation Plan* has targeted 30 hazard mitigation initiatives to be pursued during the 5-year performance period. As of the reporting period, the following overall progress can be reported:

__ out of __ initiatives (__%) reported ongoing action toward completion.

__ out of __ initiatives (__%) were reported as being complete.

__ out of __ initiatives (___%) reported no action taken.

Purpose: The purpose of this report is to provide an annual update on the implementation of the action plan identified in the *City of Sebastopol Local Hazard Mitigation Plan*. The objective is to ensure that there is a continuing and responsive planning process that will keep the hazard mitigation plan dynamic and responsive to the needs and capabilities of the City. This report discusses the following:

- Natural hazard events that have occurred within the last year
- Changes in risk exposure within the planning area (all of the City of Sebastopol)
- Mitigation success stories
- Review of the action plan
- Changes in capabilities that could impact plan implementation
- Recommendations for changes/enhancement

The Hazard Mitigation Planning Committee: The Hazard Mitigation Planning Committee (HMPC), made up of City staff, planning partners, and stakeholders within the planning area, reviewed and approved this progress report at its annual meeting held on _____, 202_. It was determined through the plan's development process that the HMPC would remain in service to oversee maintenance of the plan. At a minimum, the HMPC will provide technical review and oversight on the development of the annual progress report. It is anticipated that there will be turnover in the membership annually, which will be

documented in the progress reports. For this reporting period, the HMPC membership present at the meeting is as indicated in Table 1.

TABLE 1.
HMPC MEMBERS PRESENT

Name	Title	Jurisdiction/Department/Agency

Natural Hazard Events within the Planning Area: During the reporting period, there were _____ natural hazard events in the planning area that had a measurable impact on people or property. A summary of these events is as follows:

_____

_____

_____

Changes in Risk Exposure in the Planning Area: *(Insert brief overview of any natural hazard event in the planning area that changed the probability of occurrence or ranking of risk for the hazards addressed in the hazard mitigation plan)*

Mitigation Success Stories: *(Insert brief overview of mitigation accomplishments during the reporting period)*

Review of the Action Plan: Table 2 reviews the action plan, reporting the status of each initiative. Reviewers of this report should refer to the *City of Sebastopol Local Hazard Mitigation Plan* for more detailed descriptions of each initiative and the prioritization process.

Address the following in the "status" column of the following table:

Was any element of the initiative carried out during the reporting period?

If no action was completed, why?

Is the timeline for implementation for the initiative still appropriate?

If the initiative was completed, does it need to be changed or removed from the action plan?

TABLE 2.
ACTION PLAN MATRIX

Action No.	Action Title	Action Taken? (Yes or No)	Timeline	Priority	Comments	Status (√, O, X)
City of Sebastopol						
1	Inventory soft-story structures in the City and provide notification to property owners of the findings of those inspections					
2	Inventory all non-ductile concrete, concrete tilt-up, and other suspicious building in the City					
3	Use both the non-ductile concrete and concrete tilt-up inventory and the soft-story inventory to recommend private owners to inform existing tenants (and prospective tenants prior to signing a lease agreement) that they live in this building type					
4	Adopt incentives to encourage retrofitting of privately-owned seismically vulnerable residential buildings					
5	Hillside Slope Stabilization Project at Burbank Farm					
6	Temporary Flood Protection for the Sebastopol Community Cultural Center Main Hall					
7	Housing Replacement and Recreation Easement Project at the Park Village Property					
8	Repetitive Loss Area Analysis					
9	Consider joining Community Rating System Program					
10	Participation in the FEMA Sea Level Rise Study					
11	Sebastopol Community Cultural Center Main Hall Flood Mitigation Alternative Implementation					
12	Ives Park Calder Creek Daylighting and Stormwater Improvement and Green Infrastructure Project					

TABLE 2.
ACTION PLAN MATRIX

Action No.	Action Title	Action Taken? (Yes or No)	Timeline	Priority	Comments	Status (√, O, X)
13	Promote Wildfire-Resistant Construction Materials for New Construction in the City					
14	Develop a Tree Ordinance that requires defensible space maintenance and promotes healthy landscapes					
15	Develop a Sebastopol Community Wildfire Protection Plan					
16	Continue participation in the Groundwater Sustainability Agency and support future project-specific groundwater management projects related to the City's water system					
17	Build resiliency in the City's water conveyance system by upgrading and replacing water line infrastructure					
18	Enhance the City's local drought contingency plan to focus on additional water conservation measures					
19	Conduct a City-wide Facility Energy and Water Audit					
20	Participate in the Emergency Action Plan for Warm Springs Dam					
21	Identify locations for Sebastopol Designated Cooling Centers and including the locations in updated outreach information					
22	Upgrade emergency back-up power generation for essential areas of the public safety building					
23	PSPS Readiness & Community Outreach Preparedness Program					
24	Inspect City-owned critical facilities and create a plan that corrects deficiencies and addresses infrastructure hardening and utility					

TABLE 2.
ACTION PLAN MATRIX

Action No.	Action Title	Action Taken? (Yes or No)	Timeline	Priority	Comments	Status (√, O, X)
	undergrounding to ensure resiliency to high winds and severe weather					
25	Pandemic Preparedness and Response Plan					
26	Ensure that the Police and Fire Departments have adequate and interoperable radio communication systems and equipment to meet current technology requirements and to support first responders during response and recovery operations					
27	Ensure that emergency operational plans meet SEMS and NIMS compliance and are adequate for federal and state response and recovery					
28	Develop plans and procedures for Para-Transit system response and recovery from disasters that utilizes the Sonoma County Mutual Aid Program					
29	Update the City Emergency Operations Plan					
30	Evacuation Route Plan					

Status Legend:
✓= Project Completed
O = Action ongoing toward completion
X = No progress at this time

Changes That May Impact Implementation of the Plan: *(Insert brief overview of any significant changes in the planning area that would have a profound impact on the implementation of the plan. Specify any changes in technical, regulatory and financial capabilities identified during the plan's development)*

Recommendations for Changes or Enhancements: Based on the review of this report by the HMPC, the following recommendations will be noted for future updates or revisions to the plan:

_____

_____

_____

_____

_____

Public review notice: *The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to the governing boards of all planning partners and to local media outlets and the report is posted on the City of Sebastopol Local Hazard Mitigation Plan website. Any questions or comments regarding the contents of this report should be directed to:*

Insert Contact Info Here

Prepared by:
Wood Environment & Infrastructure Solutions, Inc.
10940 White Rock Road, Suite 190
Rancho Cordova, CA 95670











CITY OF SEBASTOPOL

ADOPTED EMERGENCY OPS PLAN

Contents

Introduction 2
Purpose 2
Preparedness Framework 3
Evacuations 4
Community Engagement 5
Access and Functional Needs (AFN) 6
Authority 6
Elected Officials 7
Public Information Officer (PIO) 8
Fire Department Operations 9
Concept of Operations 10
Activation 11
Level 3 – Monitoring 11
Level 2 – Partial Activation 11
Level 1 – Full Activation 11
Organization, Roles & Responsibilities: 12
EOC Set-Up Procedures 13
Communications and Information Flow 14
Deactivation of the EOC 15
Deactivation Process 16
Transition to Recovery 16
Final Documentation 16
Maintenance & Mitigation 16
EOP Maintenance 16
EOC Maintenance 17
Mitigation 18
Training 18
Attachments to the Emergency Operations Plan 19

Sebastopol EOC Section Checklists 20
Management Section – City Manager / EOC Director 20
Operations Section – Police 20
Planning Section – City Manager's Office 20
Logistics Section – Public Works 20
Finance / Administration Section – Finance Department 21
Deactivation 21
Maintenance 21
Threat Assessment Annex 22
Message Templates: 23
EOC Organization Chart 27

Introduction

Sebastopol is a small city in Sonoma County, California, located west of Santa Rosa and near the Pacific Coast and Russian River. Situated among low rolling hills, the city faces a variety of natural and human-caused hazards, including earthquakes, drought, wildfires, floods, and disease outbreaks.

The City of Sebastopol Emergency Operations Plan (EOP) establishes the framework for how the city prepares for, responds to, and recovers from emergencies and disasters affecting the community. It defines the organizational structure, roles, and coordination processes needed to protect life, property, and the environment. The plan supports coordination with Sonoma County and aligns with state and federal emergency systems.

Using an all-hazards approach, the EOP ensures city departments, partner agencies, and community organizations can manage resources and operations effectively under any emergency conditions.

Purpose

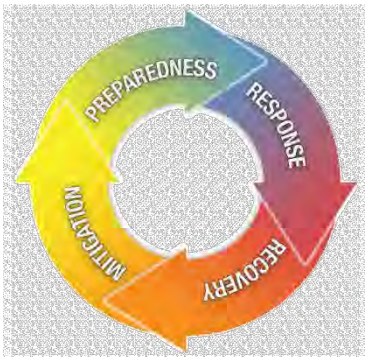
The purpose of the City of Sebastopol EOP is to establish clear authorities, responsibilities, and procedures for managing emergencies that may impact the city. The plan guides coordinated decision-making, resource allocation, and

communication among city departments and operational partners throughout all phases of an emergency—from initial response through long-term recovery.

The EOP is intended to:

- Guide the activation and management of the city's Emergency Operations Center (EOC).
- Define lines of authority and coordination among city departments and with the Sonoma County Operational Area.
- Ensure continuity of essential city functions and services during disruptive events.
- Support timely, effective, and coordinated assistance to residents, businesses, and visitors.

This plan applies to all city personnel, elected officials, and partner organizations with emergency roles or responsibilities in Sebastopol. It is all-hazards, scalable, and adaptable to emergencies of any size or origin.



Preparedness Framework

The Sebastopol EOP is modeled on the widely recognized Preparedness Wheel (Emergency Management Cycle), which demonstrates that emergency management is a continuous, year-round process, not a single phase of activity.

The cycle includes four interconnected components:

- Preparedness: Training, exercises, planning, partnerships, and readiness activities.
- Response: Immediate actions to protect life, property, and essential services.
- Recovery: Restoring services, supporting the community, rebuilding, and documenting impacts.
- Mitigation: Reducing long-term risk through hazard prevention, planning, and structural or policy improvements.

Sebastopol's EOP incorporates all phases of this cycle to ensure a comprehensive, sustainable, and adaptable emergency management program. Each part of the plan supports one or more elements of the Preparedness Wheel, reinforcing the city's commitment to continuous improvement and community resilience.

Evacuations

The City of Sebastopol is unable to predict where an emergency may occur, the impacts of that emergency, or provide predetermined routes for all types of emergencies. The methods employed as part of the emergency response, including any evacuation determined appropriate by authorities, may need to adapt based on public safety needs and the nature of the incident, including changing weather conditions and other evolving factors.

Many of the primary arterial routes to and from the city are state-owned roadways and are not under the direct control of the city. As such, the city does not have the authority to independently modify or alter these routes. The city is therefore subject to existing infrastructure limitations, which already experience congestion during routine peak travel periods. These constraints may significantly impact evacuation capacity during an emergency and have been identified as a challenge during previous incidents.

In coordination with partner agencies and stakeholders, including those with jurisdiction over state roadways, the city will implement traffic management strategies as necessary and as resources allow. This may include measures such as contraflow operations or other methods to improve traffic flow during evacuations. The effectiveness and feasibility of these measures will depend on the nature and scale of the incident, as well as available resources at the time.

Given these limitations, the city emphasizes the importance of early evacuation. Residents and visitors are strongly encouraged to evacuate early when safe to do so and not delay awaiting formal direction, as doing so may result in limited roadway access, increased congestion, and extended evacuation times. The city will incorporate this approach into its public messaging during emergencies, recognizing the constraints on infrastructure and available resources.

Residents and visitors are encouraged to plan ahead by familiarizing themselves with all available routes from their residence or any location within the city, including primary and secondary roadways.

Early evacuation reduces risk, supports orderly movement, and enhances the ability of emergency services to operate effectively. If evacuation is required, and conditions and resources permit, the Emergency Operations Center (EOC) may direct staff to implement traffic control measures to facilitate safe and efficient evacuation.

Community Engagement

Sebastopol relies on strong community partnerships to enhance preparedness, response, and short-term recovery. Organized volunteer groups, including but not limited to, Community Emergency Response Team (CERT), the Sebastopol Neighborhood Communications Unit (SCNU), and Meet Your Neighbors West County (MYNWC) groups, serve as important components of community resilience.

These groups operate under the direction of the Sebastopol Emergency Operations Center (EOC) when activated by the Director of Emergency Management/EOC. The Director of Emergency Management or designee will coordinate with designated points of contact for each organization when their involvement is required by the city for a specific emergency.

Volunteers may assist with neighborhood-level situational awareness, welfare checks, GMRS radio volunteer radio communications, duties within the confines of their organization's respective training and delivery of verified public information.

Some community organizations are structured to act independently at the neighborhood level during emergencies and may choose to self-deploy in accordance with their own organizational structure and design. While such actions may provide immediate localized assistance, these activities are not considered official deployments under this Emergency Operations Plan and are not conducted on behalf of the City of Sebastopol. Individuals and organizations acting independently are not agents, employees, or representatives of the city and operate at their own discretion and risk.

Consistent with the National Incident Management System (NIMS), all personnel and resources supporting city emergency operations shall deploy only when requested and assigned through established emergency management processes. As outlined in the National Incident Management System framework, unrequested or self-deployed resources may create additional supervisory, logistical, and safety challenges, complicate resource tracking and accountability, and interfere with access for formally requested resources.

If and when a volunteer organization or its members are requested and assigned by the EOC to support city coordinated emergency operations, they shall operate under the direction of the EOC and in accordance with

established incident management protocols. At that point, activities shall no longer be conducted independently, and all further tasking, deployment, and operational actions shall be coordinated, tracked, and managed through the EOC.

The city retains discretion regarding whether and how volunteer organizations are utilized during an emergency. Participation in city coordinated operations requires assignment through the EOC and compliance with established incident management, safety, and resource tracking protocols.

Access to operational areas, resources, or coordination functions may be limited to those personnel who are assigned, authorized, and tracked through the EOC.

All activation, tasking, resource assignments, and activity tracking for city coordinated response efforts shall occur through the EOC to ensure accountability, responder safety, and alignment with incident objectives and operational priorities.

Access and Functional Needs (AFN)

Sebastopol uses a whole-community approach to ensure individuals with AFN are supported during emergencies. AFN considerations are integrated into evacuation, sheltering, transportation, communication, and resource distribution.

City departments coordinate with social services, healthcare providers, and community organizations to identify needs and deliver accessible assistance. Public information is provided in multiple, accessible formats to ensure all residents receive critical updates, including the integration of interpreters and translators.

AFN needs are prioritized in resource allocation, and EOC staff and volunteers receive ongoing training to respond effectively and inclusively to individuals with disabilities or different levels of English proficiency.

Authority

The Director of Emergency Services (Chief of Police, or designee) has the authority to activate the EOC.

A Local Emergency may be proclaimed by the Director of Emergency Services and must be ratified by the city council within seven (7) days.

The declaration enables:

- Emergency powers
- Mutual aid requests
- Resource commandeering
- Suspension of procurement rules
- Liability protections for emergency actions

Elected Officials

Elected officials play a critical leadership role during emergencies by providing governance, policy direction, and oversight but do not perform tactical or operational functions within the Emergency Operations Center (EOC).

Consistent with the National Incident Management System (NIMS) and the California Standardized Emergency Management System (SEMS), emergency operations are conducted through a structured coordination system staffed by personnel assigned to specific roles based on training and subject matter expertise. EOC staff are responsible for collecting and sharing information, coordinating resources, and supporting operational decision-making. While elected officials provide policy guidance and oversight, they are not part of the operational EOC structure.

The Mayor, or in their absence the Vice Mayor, shall serve as the primary point of contact between the city council and the city's emergency management organization. The Mayor (or Vice Mayor) will be briefed by the City Manager or the Director of Emergency Management (Chief of Police) at intervals determined by the nature, complexity, and operational needs of the incident.

These briefings ensure elected officials remain informed and able to:

- Provide policy-level direction
- Support emergency proclamations and required governance actions
- Assist in setting priorities for response and recovery
- Assist in public information efforts

Individual council members may receive updates through established communication channels; however, direction regarding emergency operations shall flow through the City Manager and designated emergency management staff in accordance with this plan.

Elected officials may be physically present in or near the EOC when appropriate; however, their role is observational and policy-oriented. They shall not assume operational roles, direct staff, or interfere with assigned emergency management functions.

At the direction of the EOC Director or designee, elected officials may be assigned appropriate, non-operational support tasks to assist in the emergency response or recovery effort. These assignments may include activities such as supporting community resource or shelter operations, assisting with coordination of community needs, or facilitating communication with stakeholders. Any such assignments shall be clearly defined, coordinated through the EOC, and shall not conflict with established incident management (ICS) structures or operational responsibilities.

In their public-facing role, elected officials should focus on providing leadership, reassurance, and reinforcing verified public safety information. Public messaging should support community awareness, compliance with emergency directives, and recovery efforts as outlined in the Public Messaging section of this EOP.

Elected officials shall coordinate all public statements with the Public Information Officer (PIO) or EOC Director to ensure accuracy and consistency. They shall refrain from commenting on tactical or operational activities, including the actions, decisions, or performance of first responders or emergency personnel during an incident.

For safety and operational effectiveness, elected officials should not respond to active incident scenes unless coordinated through the EOC Director and shall follow the direction of on-scene personnel if present.

Public Information Officer (PIO)

The city will coordinate public information during emergencies through the Public Information Officer (PIO) function within the Emergency Operations Center (EOC) organizational structure.

The PIO is responsible for developing and disseminating accurate, timely, and consistent public information, coordinating with Sonoma County and partner agencies, managing media inquiries, and monitoring and addressing misinformation.

Public messaging may be delivered by the appropriate public safety or executive authority relevant to the incident, including but not limited to the chief of police, fire chief, or city manager. The mayor or vice mayor may also participate in coordinated public messaging efforts, provided such messaging is aligned with and supports the unified messaging established through the EOC. In all cases, messaging will be coordinated and formulated through the EOC to ensure accuracy, consistency, and alignment with verified information and operational priorities.

The PIO operates under the direction of the EOC Director (Director of Emergency Services) to support and coordinate messaging. Pursuant to Chapter 2.36 of the Sebastopol Municipal Code, the Director of Emergency Services represents the city in matters pertaining to emergencies; therefore, all public communications are coordinated through the EOC to maintain a unified message.

Elected officials may be contacted by the media or public during emergencies. To ensure accuracy and consistency, elected officials shall coordinate any public statements or media engagement with the PIO or EOC Director prior to dissemination.

Elected officials should focus their public communications on:

- Providing reassurance and leadership to the community
- Sharing verified public safety information issued through official channels
- Encouraging compliance with emergency directives and protective actions
- Supporting community resilience and recovery messaging

Elected officials shall refrain from commenting on tactical or operational activities, including the actions, decisions, or performance of first responders or emergency personnel during an incident.

All incident-specific operational information, updates, and technical details shall be coordinated through the EOC to ensure accuracy, consistency, and alignment with ongoing response efforts.

Fire Department Operations

Fire protection and emergency medical services within the City of Sebastopol are provided by the Gold Ridge Fire Protection District (GRFPD) following the

consolidation of the city's former fire department into the district. This consolidated model represents the ongoing and standard framework under which the city, Sebastopol Police Department, and GRFPD operate on a daily basis.

GRFPD is the primary agency responsible for fire suppression, emergency medical response, rescue operations, hazard mitigation, and fire-related emergency management within the city. The district operates under its own command structure and responds in accordance with established fire service protocols and mutual aid agreements.

The City of Sebastopol and its Police Department coordinate closely with GRFPD as part of routine daily operations and during emergencies. This coordination is conducted through the Incident Command System (ICS) and, when activated, the Emergency Operations Center (EOC), utilizing unified command principles where appropriate.

This well established, day-to-day operational relationship ensures seamless integration during emergency incidents, supporting effective communication, efficient resource utilization, and coordinated response efforts focused on life safety, incident stabilization, and property conservation.

Concept of Operations

Sebastopol's emergency operations focus on providing clear direction, coordination, and support during disasters and major incidents. The EOC manages citywide response efforts by maintaining situational awareness, sharing information, coordinating with partner agencies, managing mutual aid, and allocating resources.

Field operations are led by the department responsible for the incident, typically Police or Public Works. These departments handle on-scene actions, life safety, and immediate operational needs, while maintaining communication with the EOC for updates and support requests.

The EOC does not direct field tactics. Instead, it provides strategic support by:

- Monitoring overall conditions
- Coordinating resources and personnel
- Prioritizing departmental needs
- Communicating with Sonoma County and external partners

- Supporting public information and community messaging

This structure ensures field responders stay focused on operational tasks while the EOC manages broader coordination and decision-making for the city.

Activation

The Emergency Operations Center may be activated when any incident requires enhanced coordination, exceeds day-to-day departmental capacity, or has the potential to cause widespread impacts. Activation may also occur during planned events that require additional oversight, multi-department involvement, or direct coordination with Sonoma County.

Activation is authorized by the Director of Emergency Services, or designee. The primary EOC is at the Sebastopol Police Department. Should the Sebastopol Police Department be unavailable, an alternate location will be designated by the Director of Emergency Services, or designee.

Activation levels are scaled to the needs of the incident:

Level 3 – Monitoring

Used during minor incidents, weather advisories, planned events, or early signs of potential escalation. Departments maintain awareness and share information as needed. The Emergency Manager may also initiate pre-activation activities, such as checking communications systems, confirming staff availability, or reviewing initial situational information—to ensure the EOC can quickly transition to partial or full activation if conditions worsen.

Level 2 – Partial Activation

Used when multiple departments are engaged, when extended impacts are anticipated, or when coordination with Sonoma County is required. Key EOC positions are staffed physically or virtually.

Level 1 – Full Activation

Used during major emergencies that significantly impact the community. The full EOC structure is staffed, emergency declarations may be issued, and coordination expands to include county, mutual aid, utilities, NGOs, and regional partners.

The EOC may scale staffing up or down as conditions evolve. Sonoma County DEM is notified of all partial or full activations.

Organization, Roles & Responsibilities:

The city of Sebastopol organizes its emergency response and coordination efforts through a structured framework that assigns clear roles, responsibilities, and communication pathways. This structure ensures efficient information flow, unified decision-making, and effective resource management during emergencies and planned events.

When an incident requires multi-department coordination or strategic support, the EOC may be activated. The EOC is organized into functional sections, each responsible for specific aspects of emergency management. These coordinated functions support field operations led by police and public works, while the EOC provides centralized direction, situational awareness, resource prioritization, and policy guidance across the city organization.

Function	Lead Department	Key Responsibilities
EOC Management	Chief of Police / City Manager	Overall coordination, emergency declarations, and public information oversight
Operations Section	Police / Gold Ridge	Field response coordination, life safety operations, evacuation, traffic/perimeter control
Planning Section	City Manager's Office	Situation status, information analysis, resource tracking, documentation, and demobilization planning. Combined with Logistics Section.
Logistics Section	Public Works	Resource ordering, facilities support, transportation, equipment, and communications. Combined with Planning Section.
Finance / Administration	Finance Department	Cost tracking, timekeeping, contracts, procurement, and recovery documentation
Public Information	Police / City Manager / City Clerk	Public messaging, media coordination, rumor control

Function	Lead Department	Key Responsibilities
Liaison Officer	EOC Director	Coordination with Sonoma County DEM, local jurisdictions, utilities, NGOs, and partner agencies

Personnel assigned to EOC positions are expected to complete foundational Incident Command System (ICS) and National Incident Management System (NIMS) training, including ICS 100, ICS 200, IS 700, and IS 800. This ensures a baseline understanding of EOC operations, ICS/NIMS principles, and coordinated response practices, and supports eligibility for state and federal reimbursement, including through FEMA.

When needed, the city EOC interfaces with the Sonoma County EOC, which may serve as the primary hub for regional coordination, mutual aid requests, and resource support.

The city council provides overarching policy direction, ratifies or issues local emergency declarations, and guides long-term recovery priorities.

This integrated structure ensures a unified, efficient, and compliant emergency response capability for the city of Sebastopol—supporting timely decision-making, strong interagency collaboration, and effective protection of the community during emergencies and planned events.

EOC Set-Up Procedures

The City of Sebastopol maintains standardized procedures for activating, setting up, and sustaining EOC operations to ensure reliable information flow, situational awareness, and operational continuity.

Upon activation, the EOC Director or designee initiates EOC set-up to ensure the facility is operational and ready to support citywide coordination.

Key steps include:

Facility Preparation:

- Unlock and secure access points to the EOC facility.
- Ensure power, lighting, heating/cooling, and internet connectivity are functioning.
- Arrange workstations to support EOC sections (Management, Operations, Planning, Logistics, Finance/Admin).

- Set up signage identifying each section's location.

Equipment and Systems Activation:

- Power on computers, telephones, radios, projectors, and status boards.
- Confirm access to Sonoma County Web-Based Disaster Management Tool, shared drives, city communication platforms, and critical software.
- Set up printers, copiers, and charging stations for mobile devices.
- Ensure backup power systems (portable generators, UPS units) are available if needed.

Information and Status Boards:

- Prepare situation status boards for incident details, resource tracking, and significant actions.
- Display event maps, weather updates, operational periods, and organizational charts.
- Post the current EOC Action Plan, safety information, and communications directory.

Check-In and Staffing:

- Implement EOC check-in procedures for all arriving personnel.
- Assign workstations and distribute EOC vests, quick guides, and job aids.
- Conduct a quick briefing on the incident status and activation level.

These actions ensure that the EOC can rapidly transition from activation to full operational capability.

Communications and Information Flow

Reliable communication is essential for maintaining situational awareness, coordinating resources, and supporting field operations. The Sebastopol EOC uses a multi-layered communication system to ensure redundancy.

Primary Communications Systems

- City Radio Network:
  Used by Police and Public Works for operational communications and field coordination.

- City Telephones, VoIP, and Email:
  Serve as primary internal and external communication channels for EOC personnel.
- Sonoma County Web-Based Disaster Management Tool:
  Used for situation reporting, resource requests, mission tasking, and interagency coordination.

Backup and Redundant Systems

- Satellite Phone:
  Maintains communication capability during major outages or network failures.
- Field Radios:
  Portable handheld radios support communication with field supervisors if systems degrade.

Public Information and External Communications

Public messaging is coordinated through the Public Information Officer (PIO) and may include:

- City of Sebastopol website and social media channels
- Sebastopol Ready https://sebastopolready.org/
- SoCoAlert (County-managed emergency notification system)
- Nixle and community alerting platforms
- Coordination with Sonoma County Joint Information System (JIS) and local media outlets

All public communication must be coordinated through the EOC Director and PIO to ensure accuracy, consistency, and alignment with operational priorities.

Deactivation of the EOC

Deactivation of the Sebastopol EOC marks the transition from response to recovery and the return to normal city operations. The EOC Director, in coordination with Section Chiefs and the City Manager, determines when to deactivate based on:

- Stabilization of life safety threats
- Restoration of critical infrastructure
- Completion of priority objectives
- Resource availability and operational needs

Deactivation Process

Conducted in phases to maintain essential functions while scaling down.
Sections may demobilize sequentially; staff rotations adjusted accordingly.
All departments, field units, and partner agencies are notified of the schedule.
Sonoma County DEM is informed to maintain continuity of coordination.

Transition to Recovery

Planning Section documents ongoing recovery needs, final updates, and remaining actions.

Section Chiefs provide summaries of accomplishments, outstanding issues, and recommendations.

Final Documentation

All logs, action plans, and records are completed and archived.

Finance/Admin finalizes cost tracking, contracts, and documentation required for reimbursement and After-Action Reports (AARs).

Following EOC deactivation or significant incidents, the city will conduct a post-incident "hot wash" and after-action debrief to capture immediate observations and lessons learned. An After-Action Report (AAR) will be completed, where feasible, within 90 days of EOC deactivation to document performance, identify areas for improvement, and support ongoing planning, training, and reimbursement processes.

Maintenance & Mitigation

Maintaining the Sebastopol EOP and the EOC is essential to ensure both remain accurate, actionable, and reflective of current operational capabilities. Regular maintenance and mitigation efforts strengthen the city's overall preparedness and resilience.

EOP Maintenance

The EOP is a living document that evolves based on lessons learned, technological advances, and changes in laws, regulations, and city resources.

The Director of Emergency Services (Police Chief) is responsible for overseeing the review and update of the EOP at least annually or following a significant

incident or exercise. This review considers updates to departmental roles, staffing, policies, and resource availability, as well as findings from After-Action Reports (AARs), hazard assessments, and exercises.

Revisions are distributed to all city departments, key external partners, and Sonoma County DEM. Both electronic and physical copies are maintained to ensure accessibility during emergencies. Exercises, simulations, and tabletop reviews help validate the plan, test staff readiness, and identify areas for improvement.

EOC Maintenance

The EOC itself requires ongoing maintenance to always ensure operational readiness. Maintenance includes:

- Facility Readiness: Ensuring that the primary and alternate EOC sites are secure, clean, and equipped with adequate workstations, power, lighting, and environmental controls.
- Equipment Maintenance: Regular inspection and testing of radios, telephones, computers, printers, projection systems, and other critical equipment. Spare equipment and replacement supplies should be available for immediate use.
- Communications Systems: Testing of primary and backup communication systems, including the Sonoma County Web-Based Disaster Management Tool, satellite phones, radios, and auxiliary communications (ACS) equipment.
- Supplies and Logistics: Replenishment of administrative, medical, and operational supplies, including forms, personal protective equipment, office materials, and other consumables.
- Documentation and Records: Ensuring all EOC logs, SOPs, diagrams, and manuals are current, accessible, and properly organized.

Periodic drills and functional exercises are conducted to validate both the plan and EOC readiness. Maintenance activities ensure that, when activated, the EOC can immediately support multi-department coordination, resource management, and emergency operations in alignment with SEMS, NIMS, and ICS principles.

Mitigation

Mitigation activities are integral to maintenance, helping reduce future risk and strengthen community resilience. Key components include:

- Hazard Assessment and Planning: Regularly review hazards, vulnerabilities, and potential impacts to city infrastructure, public safety, and services.
- Structural and Non-Structural Measures: Maintain flood barriers, firebreaks, stormwater systems, and ensure updated land-use planning, building codes, and zoning regulations.
- Integration with Emergency Operations: Incorporate mitigation priorities into EOC planning, drills, and operational procedures to reduce vulnerabilities during incidents.
- Community Engagement and Partnerships: Collaborate with residents, businesses, utilities, NGOs, and other stakeholders to enhance public awareness, preparedness, and resilience.
- Continuous Improvement: Evaluate mitigation effectiveness after incidents or exercises, update strategies, and adjust implementation approaches based on lessons learned.

By combining maintenance and mitigation, Sebastopol ensures its EOP and EOC are not only operationally ready but also aligned with long-term risk reduction strategies, reinforcing the city's ability to respond, recover, and adapt to evolving hazards.

Training

Personnel assigned to emergency management and EOC functions will complete foundational Incident Command System (ICS) and National Incident Management System (NIMS) training, including ICS 100, ICS 200, IS 700, and IS 800, to ensure a baseline understanding of coordinated response principles and EOC operations. Staff will also participate in periodic training and exercises, including city-level and multi-agency tabletop exercises, to maintain readiness and reinforce these concepts. This EOP establishes the framework for emergency response and coordination; it is not a training document and therefore does not prescribe specific training schedules or requirements beyond these foundational expectations.

Attachments to the Emergency Operations Plan

Attachments and supporting documents referenced in this EOP are maintained as separate materials to allow for timely updates and alignment with current best practices, guidance, and operational requirements. Where appropriate, the city will utilize and refer to documents, templates, and procedures consistent with the Sonoma County Emergency Operations Plan and guidance provided by the Sonoma County Department of Emergency Management.

These materials may include, but are not limited to, templates, forms, contact lists, procedures, and reference resources. Updates to attachments and supporting documents may be made administratively, without requiring formal amendment or re-adoption of the EOP, provided such updates do not alter the core structure, authorities, or policy framework of the plan.

This approach ensures that operational tools and resources remain current, accurate, and aligned with regional practices, while preserving the stability and integrity of the EOP as the governing document.

Sebastopol EOC Section Checklists

Management Section – City Manager / EOC Director

☐ Establish overall incident objectives and priorities
☐ Approve emergency public information and press releases
☐ Issue or recommend local emergency declarations
☐ Maintain communication with city council and policy group
☐ Liaise with Sonoma County DEM, State, and other agencies
☐ Monitor Section Chiefs and ensure coordination between EOC sections
☐ Make strategic decisions and allocate resources based on operational needs

Operations Section – Police

☐ Coordinate field response operations
☐ Manage life safety, evacuation, and perimeter control
☐ Identify needs for fire suppression and rescue operations
☐ Collect field intelligence and report to Planning Section
☐ Track resource deployment and status in the field
☐ Liaise with mutual aid agencies and other responding units
☐ Ensure the safety of field personnel and citizens

Planning Section – City Manager's Office

☐ Maintain situational awareness and monitor incident status
☐ Collect and analyze data from field and EOC units
☐ Produce Situation Reports (SitReps) and Incident Action Plans (IAPs)
☐ Support demobilization planning and post-incident review
☐ Track resource availability and request additional assets as needed
☐ Document all actions, decisions, and communications
☐ Maintain maps, status boards, and other situational displays

Logistics Section – Public Works

☐ Identify and procure necessary resources and supplies
☐ Coordinate transportation, staging, and delivery of materials
☐ Ensure operational facilities are functional and staffed
☐ Maintain communications systems, computers, and IT support
☐ Provide food, water, medical support, and other personnel needs

☐ Monitor and maintain vehicles, equipment, and generators
☐ Track resource requests and confirm fulfillment with Planning Section

Finance / Administration Section – Finance Department

☐ Track personnel time and assignments
☐ Maintain financial records for incident response
☐ Process contracts, purchase orders, and vendor payments
☐ Document expenses for reimbursement and recovery
☐ Monitor cost tracking and resource allocation
☐ Track claims, liability, and compensation requests
☐ Prepare post-incident financial and administrative reports

Deactivation

The EOC will be deactivated once the incident is stabilized, field operations have concluded, and citywide coordination is no longer required.

☐ Ensure all departments and field units are demobilized safely
☐ Finalize documentation and submit reports to Planning Section
☐ Confirm cost tracking and financial documentation completed in Finance Section
☐ Notify Sonoma County EOC of deactivation
☐ Conduct post-incident briefing with all Section Chiefs and EOC staff
☐ Return EOC to standby status, securing equipment and communications

Maintenance

Ongoing maintenance ensures EOC readiness for future incidents.

☐ Inspect and test communications systems, phones, radios, and computers
☐ Maintain EOC supply caches, including office, medical, and logistics supplies
☐ Test backup generators, lighting, and environmental controls
☐ Update maps, status boards, and planning templates
☐ Review and update staff contact lists and mutual aid agreements
☐ Schedule periodic drills and tabletop exercises
☐ Conduct annual review and update of EOP and all annexes

Threat Assessment Annex

Hazard	**Primary Concerns / Notes**
Flood	River and drainage overflow; property damage, road closures, evacuation
Wildfire	Air quality, property loss, evacuation, fire suppression coordination
Severe Weather	Wind, rain, hail; infrastructure damage, transportation impacts
Hazardous Materials	Chemical spills, leaks; contamination, evacuation, specialized response
Public Health / Pandemic	Widespread illness, hospital surge, public messaging, shelter protocols
Civil Disturbance / Protest	Crowd control, law enforcement coordination, traffic and safety management
Transportation Incidents	Vehicle crashes, rail incidents, road closures, coordination of emergency services
Utility / Infrastructure Failure	Power, water, gas outages; public safety, continuity of operations
Major Earthquake	Structural damage, mass casualties, utility failures, transportation disruption
Terrorism / Civil Security Threats	Violent attacks, bombings, cyber incidents; coordination with law enforcement and emergency partners
Energy Loss / Blackout	Extended power/fuel outages; impacts on healthcare, communications, and essential services
Food & Agriculture Emergencies	Contamination, crop failure, or supply disruption affecting public health and food security

Message Templates:

This section provides standardized message templates to streamline communication during emergencies, ensuring clarity, consistency, and rapid dissemination of information to the public, media, and partner agencies.

Applicable for all hazards, including natural, technological, and human-caused events. Templates can be adapted based on incident type while maintaining core messaging for situational awareness, protective actions, and official guidance.

All-Hazard Message Template

Source	Hazard	Location	Action	Trusted link/More Information
Agency/Department	Type of Hazard Ex: Flood, Fire, Earthquake	City, Neighborhood, street and/or facility	Recommended action for safety Ex: Evacuate, Shelter in Place	Official source or hotline for more information
Example:				
City of Sebastopol PD	Flood	Laguna St. Between Main St & Bodega Ave.	Evacuate immediately	SoCoEmergency.org

Hazard-Specific Message Guidance Table

Hazard Type	Typical Location Considerations	Recommended Actions	Additional Notes
Flood	Low-lying areas, riverbanks	Evacuate, avoid travel	Monitor river levels via SoCoAlert
Wildfire	Forested or grassland areas	Shelter-in-place or evacuate as directed	Follow official evacuation instructions
Earthquake	Throughout city	Drop, Cover, Hold On;	Prepare for aftershocks and be aware of potential structural damage

Severe Weather	Storm-prone streets and roads	Stay indoors, secure property	Monitor local weather advisories
Public Health	Schools, public facilities	Follow health directives	Include links to Sonoma County Public Health
Hazardous Materials	Industrial areas, transportation routes	Evacuate or shelter-in-place as instructed	Provide info on chemical involved if known
Terrorism	Public spaces, infrastructure	Follow law enforcement instructions	Avoid speculation, confirm from official sources
Energy Loss	Citywide or localized grid outages	Conserve resources, use emergency generators	Update from utility providers
Food & Agriculture	Farms, markets, distribution centers	Follow food safety guidance	Link to USDA or State resources

Notes:

- All messages should be verified through official channels before dissemination.
- Include contact info for further instructions when possible.
- Use consistent formatting to reduce confusion during emergencies.

City Council Resolution Template:

RESOLUTION NO. XXXX-XXXX

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SEBASTOPOL

RATIFYING THE POLICE CHIEF / DIRECTOR OF EMERGENCY SERVICES

ACTIVATION OF THE EMERGENCY OPERATIONS CENTER

AND DECLARATION OF A LOCAL EMERGENCY

WHEREAS, On or about **[date]**, a condition of extreme peril to the safety of persons and property arose within the City of Sebastopol due to **[brief description of incident — e.g., severe weather, flooding, wildfire, civil disturbance, public health emergency]**; and

WHEREAS, said conditions were beyond the capacity of ordinary municipal services, personnel, equipment, and facilities; and

WHEREAS, the Police Chief / Director of Emergency Services is authorized to act as the Director of Emergency Services and to take necessary and appropriate actions during an emergency; and

WHEREAS, on **[date and time]**, the Police Chief / Director of Emergency Services determined that a local emergency existed and activated the Emergency Operations Center (EOC) to coordinate emergency response and protective actions; and

WHEREAS, the Police Chief / Director of Emergency Services further declared a local emergency and took emergency actions necessary to protect life, property, and public health; and

WHEREAS, the City of Sebastopol Emergency Operations Plan requires that such declaration be ratified by the governing body within a 7 day time period; and

WHEREAS, the city council has reviewed the circumstances and finds that the declaration and activation were necessary and appropriate under the conditions then existing.

NOW, THEREFORE, BE IT RESOLVED by the city council of the City of Sebastopol finds that:

The activation of the Emergency Operations Center (EOC) by the Police Chief / Director of Emergency Services on **[date]** is hereby ratified, confirmed, and approved; and

The declaration of a local emergency made by the Police Chief / Director of Emergency Services on **[date]** is hereby ratified and confirmed; and

The local emergency shall continue to exist until terminated by further action of the Police Chief / Director of Emergency Services, and

The Police Chief / Director of Emergency Services, City Manager, and other designated officials are authorized and directed to take all necessary actions to carry out the emergency response and recovery efforts consistent with applicable law; and

This Resolution shall be forwarded to the County and State Office of Emergency Services (CALOES) as required by law.

PASSED AND ADOPTED this ___ day of _____, 20__, by the following vote:

- AYES:
- NOES:
- ABSENT:
- ABSTAIN:

_____
Mayor / Chair

ATTEST:

_____
City Clerk / Clerk of the Board

EOC Organization Chart

