

Lincoln County Community Wildfire Protection Plan



Photos courtesy of Gary Halvorson/Oregon State Archives

July 2024

Final Report

Prepared for
Lincoln County
225 W Olive Street
Newport, OR 97365

Prepared by
The University of Oregon
Institute for Policy Research & Engagement
School of Planning, Public Policy, and Management



Institute for Policy
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About the Institute for Policy Research and Engagement



**School of Planning, Public
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The Institute for Policy Research & Engagement (IPRE) is a research center affiliated with the School of Planning, Public Policy, and Management at the University of Oregon. It is an interdisciplinary organization that assists Oregon communities by providing planning and technical assistance to help solve local issues and improve the quality of life for Oregon residents. The role of IPRE is to link the skills, expertise, and innovation of higher education with the transportation, economic development, and environmental needs of communities and regions in the State of Oregon, thereby providing service to Oregon and learning opportunities to the students involved.

1 **BEFORE THE BOARD OF COMMISSIONERS**
2 **FOR LINCOLN COUNTY, OREGON**

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In the Matter of:) **ORDER NO. 07-24-287**
Adopting Lincoln County Community)
Wildfire Protection Plan)

8 WHEREAS, Lincoln County has updated its Community Wildfire Protection Plan
9 (CWPP) which helps the community clarify and refine its priorities for the protection of life,
10 property, and critical infrastructure in the wildland-urban interface on both public and private
11 land; and

12 WHEREAS, the original CWPP was developed in 2009-2010 by the Lincoln County Fire
13 Defense Board, the Oregon Department of Forestry, the Lincoln County Department of Planning
14 and Development and the Lincoln County Sheriff’s Office of Emergency Management, with
15 assistance from Northwest Management, Inc.; and

16 WHEREAS, the CWPP was first updated in 2018; and

17 WHEREAS, the 2024 CWPP update represents a collaborative effort with the University
18 of Oregon, Oregon Department of Forestry, Lincoln County Department of Planning and
19 Development, the Lincoln County Sheriff’s Office of Emergency Management, the Oregon State
20 Fire Marshal’s Office, Oregon State University Extension, Siuslaw and Willamette National
21 Forest, Confederated Tribes of Siletz Indians, Cities of Newport and Lincoln City, and local fire
22 districts and departments; and


23 WHEREAS, the 2024 CWPP update expands on the wildfire chapter of the Lincoln
24 County Multi-Jurisdictional Natural Hazards Mitigation Plan, which was last approved by
25 FEMA in 2021 (an update to the NHMP will begin in the summer of 2024); and

26 WHEREAS, Lincoln County desires to formally adopt the 2024 updated CWPP, along
27 with its annexes, (hereinafter, the CWPP refers to both the plan and its annexes), superseding any
28 previous CWPP developed and adopted by the County;

29 NOW, THEREFORE, IT IS HEREBY ORDERED AS FOLLOWS:

Signatures of Participation by Lincoln County Fire Districts and Departments

This Community Wildfire Protection Plan and all of its components identified herein were developed in close cooperation with the participating entities listed.


By: Jamie Mason, Chief
Central Oregon Coast Fire and Rescue

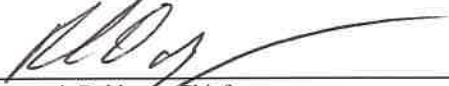
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Yachats Rural Fire Protection District

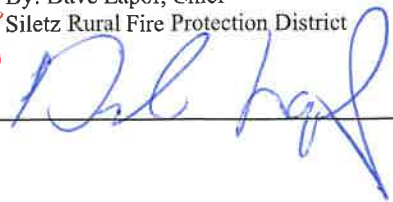
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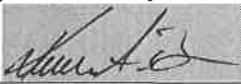
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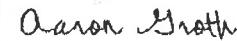
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Aaron Groth

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Table of Contents

Lincoln County Community Wildfire Protection Plan 1

Acknowledgements 2

Table of Contents 5

Forward i

Chapter 1: Introduction 1

Overview of this Plan and its Development 1

Planning Philosophy and Goals 2

State and Federal CWPP Guidelines 4

Integration with Other Local Planning Documents 5

Chapter 2: Community Engagement 12

Workshops 14

Interviews 15

Chapter 3: Planning Process 17

Documenting the Planning Process 17

Description of the Planning Process 17

The Planning Team 18

Chapter 4: Lincoln County Characteristics 22

Geography 23

Climate 23

Population and Demographics 24

Employment and Economics 33

Other Characteristics 36

Chapter 5: Risk and Preparedness Assessment 40

Wildland Fire Characteristics 41

History of Major Fires 43

Historic Fire Regime 45

Wildfire Hazard Assessment 50

Mapping Methods 50

Lincoln County's Wildland Urban Interface 55

Lincoln County Conditions 57

Overall Mitigation Activities 59

Overview of Fire Protection System 62

Chapter 6: Local Fire Department and District Profiles 64

Mapping Lincoln County 65

Fire Agency Profiles 65

Chapter 7: Strategic Planning and Recommended Actions 90

Strategic Planning Areas 91

Fire Protection Challenges and Recommended Strategies 97

Agency Roles - Wildfire Protection and Mitigation on Federal and State Land 105

Chapter 8: Mitigation Recommendations 109

Wildfire Mitigation Action Items 109

Policy and Planning Efforts 111

Fire Prevention and Education Efforts 112

Infrastructure Enhancements 113

Resource and Capacity Enhancements 116

Proposed Project Areas 118

Regional Land Management 124

Appendix A: Wildfire Mitigation Funding Opportunities 125

Appendix B: Community Outreach and Education Recommendations 126

Background 126

Framework of Community Engagement 127

Community Engagement Strategies 130

Appendix C: Community Survey 134

General Characteristics 135

Wildfire Knowledge and Preparedness 137

Demographic Information 140

Appendix D: Maps 143

Tables

| | |
|---|-----|
| Table 2.1. In-Person Workshops..... | 14 |
| Table 2.2 Summary of Stakeholder Interviews..... | 16 |
| Table 3.1. Lincoln County CWPP Steering Committee Membership..... | 19 |
| Table 3.2. Timeline of Activities: Planning Team and Steering Committee..... | 21 |
| Table 4.1. Employment and Wages by Industry..... | 34 |
| Table 4.2. Land Ownership Categories in Lincoln County..... | 36 |
| Table 4.3. Vegetative Cover Types in Lincoln County..... | 37 |
| Table 5.1. Length of Wildland Fire Season in Oregon, 2011-2022..... | 42 |
| Table 5.2. Assessment of Historic Fire Regimes in Lincoln County..... | 46 |
| Table 5.3. Assessment of Fire Regime Condition Classes in Lincoln County..... | 47 |
| Table 5.4. Summary of Ignitions on ODF-Protected Land in Lincoln County, 2000-2022..... | 48 |
| Table 5.5. Priority Area Classifications..... | 54 |
| Table 8.1. Recommendations for Policy and Planning-Related Issues..... | 111 |
| Table 8.2. Recommendations for Fire Prevention and Education Enhancement..... | 112 |
| Table 8.3. Recommendations for Infrastructure Enhancements..... | 114 |
| Table 8.4. Recommendations for Resource and Capability Enhancements..... | 117 |
| Table 8.5. Proposed Project Areas: Fire Districts/Departments..... | 119 |
| Table 8.6. Proposed Project Areas: Key Stakeholders in Lincoln County..... | 122 |
| Table A.1. State and Federal Funding Sources for Wildfire Mitigation..... | 125 |

Figures

| | |
|--|-----|
| Figure 2.1. Feedback Received from In-Person Community Workshops..... | 15 |
| Figure 4.1. Annual Area Burned in Oregon from 1984–2022..... | 24 |
| Figure 4.2. Lincoln County Population Projections, 2000-2050..... | 25 |
| Figure 4.3. Age Distribution of Lincoln County Residents..... | 26 |
| Figure 4.4. Health Insurance Coverage for Lincoln County Residents..... | 27 |
| Figure 4.5. Lincoln County by Race and Ethnicity..... | 28 |
| Figure 4.6. Owner- and Renter-Occupied Units..... | 29 |
| Figure 4.7. Lincoln County Median Household Income by Race and Ethnicity..... | 30 |
| Figure 4.8. Lincoln County Median Household Income by Housing Unit Type..... | 30 |
| Figure 4.9. Housing Unit Types in Lincoln County..... | 31 |
| Figure 4.10. Cost Burdened Households in Lincoln County by Household Type..... | 32 |
| Figure 4.11. Vehicle Availability among Lincoln County Households..... | 32 |
| Figure B.1. Wildfire Vulnerability Framework..... | 128 |
| Figure C.1. Do you live in Lincoln County?..... | 135 |
| Figure C.2. Do you own property in Lincoln County?..... | 135 |
| Figure C.3. What Lincoln County town/city do you live in or own property?..... | 136 |
| Figure C.4. Which of the following options best describes your primary home?..... | 136 |
| Figure C.5. Which option best describes your current housing arrangement?..... | 136 |
| Figure C.6. Have you or someone in your household personally been impacted by a wildfire?..... | 137 |

| | |
|---|-----|
| Figure C.7. Air Quality: Do you have a way to clean or purify the air in your home? | 137 |
| Figure C.8. Defensible Space: Which option(s) best describes the vegetation around your house?..... | 138 |
| Figure C.9. Home Hardening: Have you taken any of the following actions to reduce the risk of wildfire to your house?..... | 138 |
| Figure C.10. Emergency Preparedness: Have you taken any of the following actions to improve your wildfire preparedness?..... | 139 |
| Figure C.11. Which option best describes your level of concern about wildfire impacting... .. | 139 |
| Figure C.12. Do you live with a disability or other condition that would require assistance during an evacuation? | 140 |
| Figure C.13. Which option best describes your age? | 140 |
| Figure C.14. Do any of the following describe members of your household?..... | 140 |
| Figure C.15. How many vehicles are available to members of your household?..... | 141 |
| Figure C.16. Which describes the highest level of education that you have completed?..... | 141 |
| Figure C.17. Do you, or others in your household, have any difficulty speaking English to people for day-to-day activities such as shopping or taking the bus?.... | 141 |
| Figure C.18. Which description(s) do you identify with?..... | 142 |
| Figure C.19. Please indicate your total annual household income..... | 142 |

Maps

| | |
|--|-----|
| Map 5.1. Lincoln County Wildfire Risk..... | 51 |
| Map 6.1. Lincoln County Base Map..... | 66 |
| Map 6.2. Lincoln County Priority Wildfire Mitigation Areas..... | 67 |
| Map 6.3. Lincoln County Social Vulnerability Index..... | 68 |
| Map 6.4. Lincoln County Fire Districts..... | 69 |
| Map 6.5. Central Oregon Coast Fire and Rescue District | 70 |
| Map 6.6. Depoe Bay Rural Fire Protection District..... | 72 |
| Map 6.7. Newport Fire Department..... | 74 |
| Map 6.8. Newport Rural Fire Protection District..... | 75 |
| Map 6.9 North Lincoln Fire and Rescue District #1 | 77 |
| Map 6.10. Seal Rock Rural Fire Protection District..... | 79 |
| Map 6.11. Siletz Valley Rural Fire Protection District | 81 |
| Map 6.12. Toledo Fire Department and Rural Fire Protection District..... | 83 |
| Map 6.13. Yachats Rural Fire Protection District..... | 86 |
| Map 7.1. Strategic Planning Area 1 – Western Lincoln County..... | 92 |
| Map 7.2. Strategic Planning Area 2 – Eastern Lincoln County..... | 95 |
| Map D.1. Integrated Conditional Net Value Change | 144 |
| Map D.2. Integrated Expected Net Value Change..... | 145 |
| Map D.3. People and Property Conditional Net Value Change | 146 |
| Map D.4. Drinking Water Conditional Net Value Change..... | 147 |
| Map D.5. Timber Conditional Net Value Change..... | 148 |

Forward

Developing a Community Wildfire Protection Plan (CWPP) helps a community clarify and refine its priorities for the protection of life, property, and critical infrastructure in the wildland–urban interface on both public and private land. It also can lead community members through valuable discussions regarding management options and implications for the surrounding land base. Local fire service organizations help define issues that may place the county, communities, and/or individual homes at risk. Through the collaboration process, the CWPP Planning Committee discusses potential solutions, funding opportunities, and regulatory concerns, and then documents their resulting recommendations in the CWPP. The CWPP planning process also incorporates an element for public outreach. Public involvement in the development of the document not only facilitates public input and recommendations, but also provides an educational opportunity through interaction of local wildfire specialists and an interested public.

The incentive for communities to engage in comprehensive forest planning and prioritization was given new and unprecedented impetus with the enactment of the Healthy Forests Restoration Act (HFRA) in 2003. This legislation includes the first meaningful statutory incentives for the US Forest Service (USFS) and the Bureau of Land Management (BLM) to consider the priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects. For a community to take full advantage of this opportunity, it must first prepare a CWPP.

A countywide CWPP Planning Committee generally makes project recommendations based on the issue causing the wildfire risk, rather than focusing on individual landowners or organizations. Thus, projects are mapped and evaluated without regard for property boundaries, ownership, or current management. Once the CWPP is approved by the County Board of Commissioners, the Planning Committee will begin further refining proposed project boundaries, feasibility, and public outreach as well as seeking funding opportunities.

The first Lincoln County CWPP was developed in 2009-10 by the Lincoln County Fire Defense Board, the Oregon Department of Forestry, the Lincoln County Department of Planning and Development and the Lincoln County Sheriff's Office of Emergency Management. Northwest Management, Inc. was contracted to assist in the development of the first plan.

The CWPP should be reviewed annually and updated at least every five years. The 2017 update was a collaborative effort with Oregon Department of Forestry, Lincoln County Planning and Development Department, Lincoln County Sheriff's Office of Emergency Management, Oregon Department of the State Fire Marshall, local fire districts and departments. The University of Oregon's Institute for Policy Research and Engagement was contract to update the 2024 CWPP.

The CWPP expands on the wildfire chapter of the Lincoln County Multi-Jurisdictional Natural Hazards Mitigation Plan, which was last approved by FEMA in 2021 (an update to the NHMP

will begin in the summer of 2024). Although published as a separate document, the CWPP is considered a supplement to the wildfire chapter of the Natural Hazards Mitigation Plan.

Chapter 1: Introduction

Overview of this Plan and its Development

This update to the Community Wildfire Protection Plan (CWPP) for Lincoln County, Oregon, is the result of analyses, professional collaboration, and assessments of wildfire risks and other factors focused on reducing wildfire threats to people, structures, infrastructure, and unique ecosystems in Lincoln County. Agencies and organizations that participated in the planning process included:

- Lincoln County Fire Defense Board
 - Central Oregon Coast Fire and Rescue District
 - Depoe Bay Rural Fire Protection District
 - Newport Rural Fire Protection District
 - North Lincoln Fire and Rescue District
 - Seal Rock Rural Fire Protection District
 - Siletz Valley Rural Fire Protection District
 - Toledo Fire Department
 - Yachats Rural Fire Protection District
- Lincoln County Departments
 - Sheriff's Office – Emergency Management
 - Planning and Development
- City of Lincoln City
- City of Newport
- Confederated Tribes of Siletz Indians
- Oregon Department of Emergency Management
- Oregon Department of Forestry
- Oregon Department of the State Fire Marshall
- United States Forest Service – Siuslaw & Willamette National Forests; NW Oregon Interagency Fire
- Oregon State University Extension – Lincoln County

Planning Philosophy and Goals

The goals of the planning process include integration with the National Fire Plan, the Healthy Forests Restoration Act, Oregon Senate Bill 762, the National Cohesive Wildland Strategy, and the Disaster Mitigation Act. The plan utilizes the best and most appropriate science from all partners as well as local and regional knowledge about wildfire risks and fire behavior, while meeting the needs of residents and recognizing the significance wildfire can have to the regional economy. In addition, the planning process was guided by the following mission, vision, and goals as directed by the project Steering Committee.

The CWPP builds on and supplements the wildfire chapter of the Lincoln County Multi-Jurisdictional Natural Hazards Mitigation Plan (2020) and upon adoption should be incorporated as an element the Natural Hazards Mitigation Plan.

Mission Statement

Decrease the vulnerability of the residents, properties, tribal lands, infrastructure, businesses, and resources of Lincoln County by actively promoting awareness, preparedness, and response to the negative effects of wildland fires.

Vision Statement

Promote awareness of the countywide wildland fire hazard and propose sustainable solutions to reduce the wildfire risk.

Goals

Goal 1: Community Protection and Prevention

- Prioritize the protection of people, structures, infrastructure, cultural resources, natural resources, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economies.
- Identify, map, and evaluate:
 - Wildland Urban Interface (WUI) boundaries.
 - Evacuation routes.
 - Socially and economically vulnerable communities.
 - Hazardous fuel conditions with an emphasis on communities adjacent to forest lands, prioritize areas for hazardous fuel reduction treatments, and recommend the types and methods of treatment to protect these communities.
 - Critical infrastructure, such as transmission lines, water sources, water treatment plants, and schools.

- Strategies for private, state, federal, and tribal lands to reduce hazardous fuel conditions and lessen the life safety and property damage risks from wildfires.
- Areas of inadequate fire protection, such as gaps in district coverage, and develop solutions.
- Reduce the impact of WUI land burned and losses experienced because of wildfires where these fires threaten communities in the WUI.
- Develop an inventory and regular maintenance schedule for both public and private infrastructural components.
- Meet or exceed the requirements of the National Fire Plan and FEMA for a county level.

Goal 2: Community Advocacy

- Identify and prioritize risk mitigation and recovery actions in and around areas that have been impacted by a severe disaster, such as the 2020 Echo Mountain Fire.
- Communicate with communities about the unique challenges of wildfire prevention and suppression in the WUI.
- Provide inclusive opportunities for meaningful engagement and participation among community members, non-governmental organizations, and tribes and local, state, and federal government representatives regarding their priorities for local fire protection and forest management.
- Balance private property rights of landowners with personal safety and responsibility to their community.
- Educate residents about the importance of prescribed fire and other fuels reduction methods; partner with Oregon State University Extension service to educate residents about the benefits of fire resistance vegetation and flammability of some native vegetation.
- Address structural ignitability and recommend measures that homeowners and communities can take to reduce the ignitability of structures.
- Evaluate and advocate for regulatory measures such as building codes and road standards specifically targeted to reduce the wildland fire risk, reduce the potential for loss of life and property, and enhance future evacuations.
- Partner with fire agency awareness of wildland fire threats, vulnerabilities, and mitigation opportunities or options.
- Improve county and local fire agency eligibility for funding assistance (National Fire Plan, Healthy Forest Restoration Act, FEMA, and other sources) to reduce wildfire hazards, prepare residents for wildfire situations, and enhance fire agency response capabilities.
- Plan for post fire recovery efforts, such as, erosion control and landslide mitigation, economic impacts, and continuity of governance.

United States Government Accountability Office (GAO)

Since 1984, wildland fires have burned an average of more than 850 homes each year in the United States and, because more people are moving into fire-prone areas bordering wildlands, the number of homes at risk is likely to grow. The primary responsibility for ensuring that preventative steps are taken to protect homes lies with homeowners. Although losses from fires made up only 2 percent of all insured catastrophic losses from 1983 to 2002, fires can result in billions of dollars in damages.

GAO has assessed, among other issues: (1) measures that can help protect structures from wildland fires, (2) factors affecting use of protective measures, and (3) the role technology plays in improving firefighting agencies' ability to communicate during wildland fires.

The two most effective measures for protecting structures from wildland fires are: (1) creating and maintaining a buffer, called defensible space, from 30 to 100 feet wide around a structure, where vegetation and other flammable objects are reduced or eliminated; and (2) using fire-resistant roofs and vents. In addition to roofs and vents, other technologies – such as fire-resistant windows and building materials, chemical agents, sprinklers, and geographic information systems mapping – can help in protecting structures and communities, but they play a secondary role.

Although protective measures are available, many property owners have not adopted them because of the time or expense involved, competing concerns such as aesthetics or privacy, misperceptions about wildland fire risks, and lack of awareness of their shared responsibility for fire protection. Federal, state, and local governments, as well as other organizations, are attempting to increase property owners' use of protective measures through education, direct monetary assistance, and laws requiring such measures. In addition, some insurance companies have begun to direct property owners in high-risk areas to take protective steps.¹

State and Federal CWPP Guidelines

This Community Wildfire Protection Plan (CWPP) is compatible with FEMA requirements for a Local Hazard Mitigation Plan and adheres to the guidelines proposed in the National Fire Plan, and the Healthy Forests Restoration Act (2004). This Community Wildfire Protection Plan has been prepared in compliance with:

- The National Fire Plan: A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan (2006).
- Healthy Forests Restoration Act (2003).

¹ General Accountability Office. Technology Assessment – “Protecting Structures and Improving Communications During Wildfires.” GAO-05-380. April 2005.

- The Federal Emergency Management Agency’s guidelines for a Local Hazard Mitigation Plan as defined in 44 CFR parts 201 and 206, and as related to a wildfire mitigation plan chapter of a Local Hazard Mitigation Plan.
- National Association of State Foresters (2003) guidance on identification and prioritization of treatments between communities.
- Oregon Senate Bill 762 (2021). SB 762 created a statewide approach to a wide range of wildfire mitigation measures. The legislature directed the Building Codes Division to adopt home hardening construction standards and the Oregon Department of the State Fire Marshal to adopt defensible space code standards. These codes will be applied to locations identified as both in high hazard wildfire areas and that are in the wildland urban interface, on the statewide map developed by the Oregon Department of Forestry. The bill also funded a range of other wildfire mitigation and resilience projects throughout the state.
- The National Cohesive Wildland Strategy (NCWS) (2014). The NCWS defines and provides management direction for achieving three goals:
 - Landscape and Restoration Maintenance
 - Fire Adapted Communities
 - Fire Response

The objective of combining these complementary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Lincoln County while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

Integration with Other Local Planning Documents

During development of this Community Wildfire Protection Plan, several planning and management documents were reviewed to avoid conflicting goals and objectives. Existing programs and policies were reviewed to identify those that may weaken or enhance the mitigation objectives outlined in this document. The following sections identify and briefly describe some of the existing Lincoln County planning documents and ordinances considered during development of this plan.

Lincoln County, Multi-Jurisdictional Natural Hazards Mitigation Plan (2020)

<https://www.co.lincoln.or.us/404/Natural-Hazards-Mitigation-Plan>

The 2020 Lincoln County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP) was updated to prepare for the long-term effects of major natural hazards that pose risks to the County. Careful planning and collaboration among public agencies, private sector organizations,

and citizens within the community make it possible to create a resilient community that will benefit from long-term recovery planning efforts. The primary objectives of the Plan are to protect life and property, preserve natural areas and features, coordinate and enhance emergency services, enhance and promote public education, and promote partnerships and coordination to improve implementation. The NHMP is a planning document, not a regulatory document.

The NHMP meets FEMA’s requirements for a Local Hazard Mitigation Plan and regulations contained in 44 CFR 201 and the Disaster Mitigation Act of 2000. Local and federal approval of this NHMP ensures that the County and listed jurisdictions will (1) remain eligible for pre- and post-disaster mitigation project grants and (2) promote local mechanisms to accomplish risk reduction strategies.

The Lincoln County CWPP effectively accomplishes all short-term action items outlined in the NHMP and establishes strategies to implement the Plan’s ongoing action items. Actions items for mitigating wildland fire issues as presented in the NHMP Action Item Matrix can be found [here](#).

Lincoln County Code – Timber Conservation Zone (2013)

<https://www.co.lincoln.or.us/DocumentCenter/View/237/Chapter-1-Land-Use-Planning-Comprehensive-Plan-PDF>

Section 1.1375 of the Lincoln County Code provides Siting and Fire Protection Standards for Dwellings constructed in the Timber Conservation T-C zone. The Code standards seek to minimize the risks associated with wildfire hazards affecting the dwelling. Lincoln County Planning and Development or the Lincoln County Planning Commission may impose conditions on any dwelling approval which are deemed necessary to ensure conformance with the standards. Specifications include the use of fire-retardant roofs, slope limitations, fire breaks, yard dimensions, and spark arresters on chimneys. There are additional specifications for dwellings not located within a fire protection district. Regarding roads, the Code specifies minimum widths, surface construction, bridges, clearance, turnarounds, turnouts, and grade.

This section of the Lincoln County Code is consistent with the recommendations made in this document.

Oregon Department of Forestry – West Oregon District Mobilization Plan

The purpose of the West Oregon District Mobilization Plan is to provide critical information necessary to direct activities for wildfire and other emergencies. The Mobilization Plan details the District’s critical information including: lists of personnel, vehicle inventories, standard report forms, the District’s fire operations plan, cooperators, and inventories of available equipment and other resources. The plan also covers the District’s emergency and support services, details their radio operations, provides an extended attack plan, and discusses the District’s procedures for dealing with other incidents that may arise during a fire event. The district mobilization plan is updated annually before the start of the fire season.

The Lincoln County CWPP Planning Committee supports the West Oregon District's efforts to develop formal documentation in advance of fire events to help coordinate its response as well as the response of other fire service organizations that may aid.

Lincoln County Forestland Classification

<https://www.co.lincoln.or.us/602/Forestland-Classification-Background>

Oregon Department of Forestry's (ODF) forestland classification system originated with passage of the Forest Land Classification Act by the 1937 Oregon Legislature. Classification of lands as "forestland" essentially determined where ODF's protection responsibilities were. By the 1950's, the system had been adopted statewide with significant regional variation in interpretation and application.

Today, the wildfire protection environment, social and ecological systems, land uses, values, and overall attitudes are much different. The population has increased, and greater numbers of people are living within traditional forestlands with their fire prone fuels. This WUI covers significantly larger portions of the forest protection district than in the past and includes thousands of private dwellings. Consequently, many of the conditions pertaining to the original forestland classification system no longer apply, and ODF's fire protection program has escalated in complexity and costs.

ODF reviewed the statutes, rules, and policies that make up its forestland classification system. Review goals were to update the classification system to reflect current conditions and identify ways to improve the efficiency and consistency of its application and administration. One of the outcomes of this policy review was to emphasize the establishment of county committees that will re-examine forestland classifications of all lands in the state, including Lincoln County lands within ODF's West Oregon Protection District.

Oregon Revised Statutes (ORS) Chapter 526, the West Oregon District of ODF, and the Lincoln County Commissioners authorized formation of such a committee in the spring of 2008. The Committee chose the name Lincoln County Forestland Classification Committee (LCFCC). It has examined all lands within ODF's West Oregon Forest Protection District in Lincoln County and classified lands as "forestland" or "not forestland" according to fire risk potential, vegetation type (fire fuel), community structure, and proximity to other forestland. It is hoped that the Committee's efforts will continue to resolve issues pertaining to ODF's fire suppression role on public and private forestlands within the District. The initial work was completed in 2010 and is continually maintained by the Committee on an annual basis.

Oregon's Statewide Planning Goals and Guidelines

<https://www.oregon.gov/lcd/op/pages/goals.aspx>

Since 1973, Oregon has maintained a strong statewide program for land use planning. The foundation of that program is a set of 19 Statewide Planning Goals developed and adopted by the Oregon Land Conservation and Development Commission. The goals express the state's policies on land use and on related topics, such as citizen involvement, housing, and natural resources. Oregon's statewide goals are achieved through local comprehensive planning. State law requires each city and county to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect.

Goals 2, 3, 4, 5, 6, 7, and 14 apply directly to many of the issues discussed in this Community Wildfire Protection Plan.

Goal 2: Land Use Planning

To establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Goal 3: Agricultural Lands

Agricultural lands shall be preserved and maintained for farm use, consistent with existing and future needs for agricultural products, forest, and open space and with the state's agricultural land use policy expressed in Oregon Revised Statutes (ORS) 215.243 and 215.700.

Goal 4: Forest Lands

To conserve forest lands by maintaining the forest land base and to protect the state's forest economy by making possible economically efficient forest practices that assure the continuous growing and harvesting of forest tree species as the leading use on forest land consistent with sound management of soil, air, water, and fish and wildlife resources and to provide for recreational opportunities and agriculture.

Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces

To protect natural resources and conserve scenic and historic areas and open spaces. Local governments shall adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future generations. These resources promote a healthy environment and natural landscape that contributes to Oregon's livability.

Goal 6: Air, Water and Land Resources Quality

To maintain and improve the quality of the air, water, and land resources of the state. All waste and process discharges from future development, when combined with such discharges from existing developments shall not threaten to violate, or violate applicable state or federal environmental quality statutes, rules, and standards. With respect to the air, water and land resources of the applicable air sheds and river basins described or included in state environmental quality statutes, rules, standards and implementation plans, such discharges shall not exceed carrying capacity of such resources, considering long range needs; degrade such resources; or threaten the availability of such resources.

Goal 7: Areas Subject to Natural Hazards

To protect people and property from natural hazards. Local governments shall adopt comprehensive plans to reduce risk to people and property from natural hazards. Natural hazards for purposes of this goal are floods (coastal and riverine), landslides, earthquakes and related hazards, tsunamis, coastal erosion, and wildfires. Local governments may identify and plan for other natural hazards.

Goal 14: Urbanization

To provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

Lincoln County, Oregon Emergency Operations Plan (2020)

<https://www.co.lincoln.or.us/DocumentCenter/View/1958/Lincoln-County-Emergency-Operations-Plan-EOP---Base-Plan-PDF?bidId=>

The Lincoln County EOP is an all-hazard plan describing how Lincoln County will organize and respond to emergencies and disasters in the community. It is based on, and is compatible with, federal, State of Oregon, and other applicable laws, regulations, plans, and policies, including Presidential Policy Directive 8, the National Response Framework, and Oregon Department of Emergency Management plans.

Response to emergency or disaster conditions to maximize the safety of the public and minimize property damage is a primary responsibility of government. It is the goal of Lincoln County that responses to such conditions are conducted in the most organized, efficient, and effective manner possible. To aid in accomplishing this goal, the County has formally adopted the principles of the National Incident Management System, including the Incident Command System (ICS) and the National Response Framework.

Consisting of a basic plan, emergency support function annexes that complement the federal and State of Oregon emergency support function annexes, and incident annexes, this EOP provides a framework for coordinated response and recovery activities during a large-scale emergency. The plan describes how various agencies and organizations in Lincoln County will coordinate resources and activities with other federal, State, local, tribal, community- and faith-based organizations, and private-sector partners.

The objectives of the plan are to:

- Provide strategic and tactical procedures to support the primary responsibilities of Lincoln County during all phases of an emergency;
- Integrate multi-agency, regional, and, if applicable, tribal coordination into emergency operations through implementation of the Incident Command System/National Incident Management System (ICS/NIMS);
- Establish clear lines of authority and succession during any type of emergency;

- Define roles and responsibilities spanning various departments, agencies, divisions, and levels of management in support of critical functions;
- Outline clear guidelines and procedures for ensuring consistent and timely release of emergency public information; and
- Provide procedures and criteria for requesting and allocating essential resources to support overall emergency operations.

Oregon State Smoke Management Plan

Under the federal Clean Air Act and state laws, the Oregon Department of Forestry Fire Program is responsible for regulating forestland slash burning in the state. Controlled burning after timber harvest reduces residual fuel hazards and prepares the site for replanting by releasing nutrients and removing competing vegetation. In spring and fall, meteorologists monitor weather conditions as they coordinate hundreds of burning requests from private and public forest landowners. ODF’s implementation of the Oregon Smoke Management Plan seeks to enable landowners to manage their forests and safely reduce fire hazards while maintaining air quality in populated areas.

Confederated Tribes of Siletz Indians – Emergency Operations Plan (2022)

Not available online.

The Confederated Tribes of Siletz Indians (CTSI) Emergency Operations Plan (EOP) provides a framework for coordinated response and recovery activities during any type or size of emergency involving Tribal members or assets. The plan also provides specific information on direction, control, and escalation to guide the Tribe when receiving response assistance in support of all phases of an emergency. The EOP compliments the Oregon Emergency Operations Plan and the National Response Plan. It also identifies all Emergency Support Functions (ESF) and critical tasks needed to support a wide range of response activities.

The objectives of the plan are to:

- Provide procedures and criteria for requesting and allocating essential resources to support overall emergency operations;
- Integrate multiagency and regional coordination into emergency operations through implementation of the Incident Command System (ICS)/National Incident Management System (NIMS);
- Establish clear lines of authority and succession during any type of emergency;
- Define roles and responsibilities spanning various departments, agencies, divisions, and management levels supporting critical functions;
- Outline clear guidelines and procedures for ensuring consistent and timely release of emergency public information; and
- Provide strategic and tactical procedures to support the primary responsibilities of CTSI during all phases of an emergency.

Confederated Tribes of Siletz Indians – Multi-Hazard Mitigation Plan (2020)

<https://www.ctsi.nsn.us/wp-content/uploads/2021/03/2020MHMP-FEMA-Apprv.pdf>

The purpose of the Confederated Tribes of the Siletz Indians (CTSI) Multi-Hazard Mitigation Plan (MHMP) is to guide current and future efforts to mitigate natural hazards effectively and efficiently on all CTSI Reservation lands, in coordination with other jurisdictions as appropriate, to mitigate and respond to natural hazards that are generated off the reservation lands, and tribally owned fee lands, or that cross these boundaries.

The Confederated Tribes of Siletz Indians finds that natural hazards on the Tribal lands have a direct, serious, and substantial effect on the political integrity, economic security, health, and welfare of the Tribal lands, its members, and all persons present on Tribal lands. Further, the CTSI finds that those activities that potentially increase the frequency or severity of damages from natural hazards, if left unaddressed, could cause such damages. Accordingly, the CTSI Human Resources Department (HR), Natural Resources Department (NR) and the Planning Department helped develop this MHMP for the Siletz Tribe.

The goals of the CTSI MHMP are to:

1. Increase Tribal and community members' knowledge of natural hazards;
2. Reduce the threats to public health and safety posed by natural hazards;
3. Reduce structural damages caused by natural hazards;
4. Reduce the environmental impacts of natural hazards, mitigation actions, and future development activities;
5. Increase the effectiveness of mitigation actions; and
6. Reduce the long-term costs resulting from natural hazards and their mitigation.

Confederated Tribes of Siletz Indians – Fire Mobilization Plan (2016)

Not available online.

The Confederated Tribes of Siletz Indians places a maximum emphasis on safety, the promotion of fire prevention and suppression of all fires occurring on or adjacent to its operations and timberlands. The Tribe's 2016 Fire Mobilization Plan details its contact information, general prevention actions, and fire readiness. The Plan also contains maps and other graphical information useful for wildland fire planning.

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Chapter 2: Community Engagement

Chapter 2 includes a detailed description of community engagement activities taken in the preparation of this plan update and recommendations for future action. These include a community survey, several in-person workshops, and an array of stakeholder interviews.

Community Survey

The planning team created and distributed an online community survey in May 2023. The questions were developed to provide insight into residents' concerns about wildfire mitigation and response as well as the actions residents have taken to mitigate and prepare for wildfire. An English and Spanish version remained open for six weeks, and agencies involved in the CWPP steering committee helped to promote the survey.

Below is a list of key findings from the community survey analysis. For an in-depth explanation of the survey construction and results, refer to Appendix C: Community Survey.

- **Most participants indicated that they were concerned about wildfire impacting their personal property, neighborhoods, communities, and Lincoln County.** Respondents tended to have greater concern for the whole county than they did for their personal properties, neighborhoods, and communities.
- **Most participants have taken some basic action to protect their homes and properties.** However, **those mitigation actions are not comprehensive** – most defensible space and home hardening actions were checked by less than a quarter of all respondents.
- **Most participants have taken some steps towards emergency preparedness,** including having a to-go bag ready and creating a household evacuation plan. Still, only a third of respondents had taken any one emergency preparedness action.
- Comments received from participants generally reflected their **concern about how evacuation and response went during the 2020 Echo Mountain Fire.** Respondents desire **improved communication processes** for the community during an evacuation, specifically around how to get information if internet/phone lines are out, where to gather during an evacuation, and clearer direction from emergency officials. They also **desire improved evacuation system planning,** specifically traffic protocols on Highway 101, and for residents living with only one access road. These concerns also included extra care taken for community members who live with a disability or other condition that would require assistance during an evacuation.

Workshops

In addition to the community survey, the planning team conducted two in-person workshops in Lincoln County in May 2023. These sessions both occurred directly after Wildfire Readiness presentations by Lincoln County Emergency Manager Virginia Demaris. Each workshop included an explanation of what a CWPP is and how they help communities prepare for wildfires by mapping wildfire risk and describing wildfire mitigation actions taken by fire and forestry agencies. The team also discussed how individuals can take action to reduce wildfire risk on their properties and answered questions from attendees regarding the CWPP and wildfire mitigation. Table 2.1 provides more information on these workshops, while Figure 1 illustrates some of the feedback received from participants.

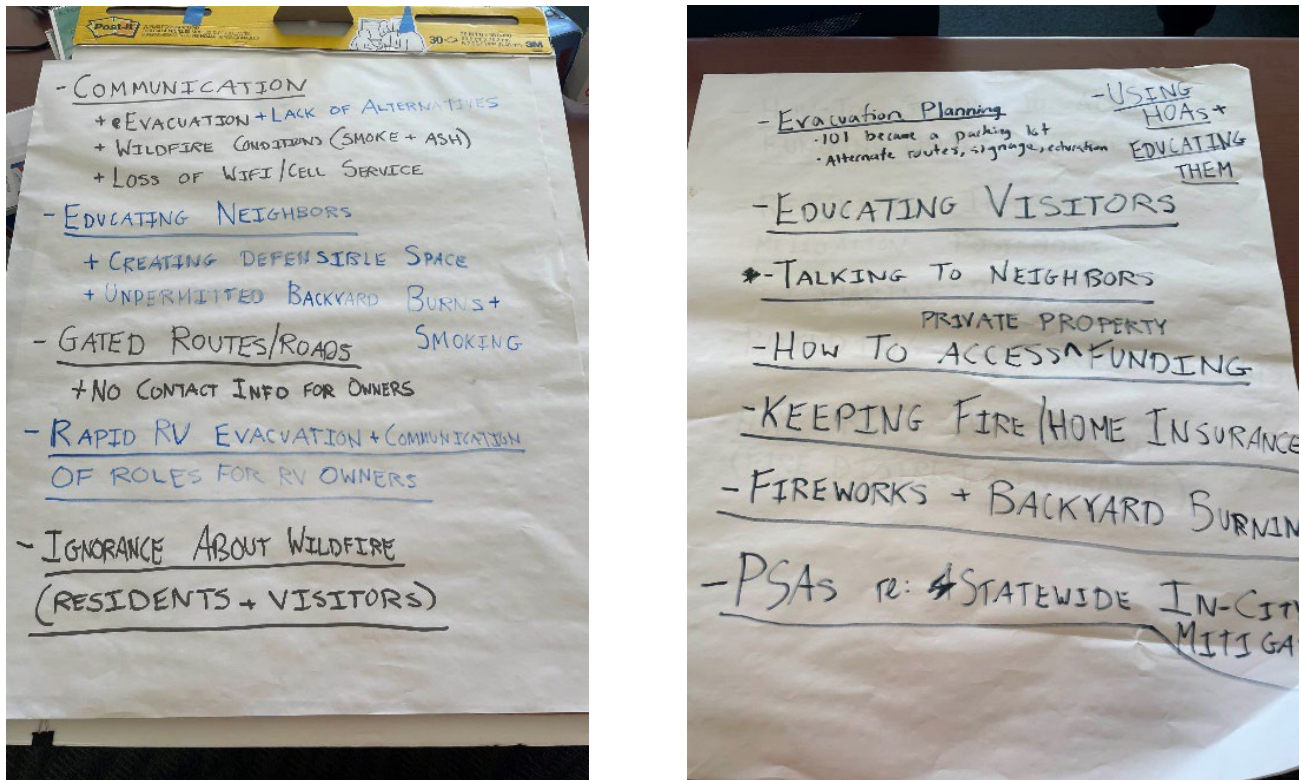
Table 2.1. In-Person Workshops

| Workshop Date | Location | Site Address | Number of Attendees |
|-----------------------------------|-----------|---|---------------------|
| Saturday, May 13, 2023; 9-11am | Depoe Bay | Neighbors for Kids 634 US 101 | 13 |
| Saturday, May 13, 2023; 2-4pm | Newport | OCCC Newport Campus 400 SE Collage Way | 3 |

The planning team also recorded a brief virtual presentation summarizing the CWPP update process, Lincoln County’s wildfire risk, and actions that residents can take to reduce their wildfire risk. This video is available along with other Wildfire Readiness presentations on the Lincoln County Emergency Management Wildfire Hazard website:

<https://www.co.lincoln.or.us/770/Hazards-Wildfire>.

Figure 2.1. Feedback Received from In-Person Community Workshops



Source: OPDR, In-Person Workshops. May 13, 2023.

Interviews

The planning team’s most significant interactions in Lincoln County were interviews with an array of stakeholders critical to completing this CWPP update. This included a February 2023 day trip to speak with survivors of the 2020 Echo Mountain fire in Otis and Rose Lodge (as well as the Cascade Relief Team at the Salmon River Grange), followed by a conversation with several members of the Siletz Valley Rural Fire Protection District in Siletz.

Table 2.2 summarizes the remainder of the interviews carried out by the planning team between February and June 2023. Many of these conversations occurred via virtual video meetings on the Zoom or Microsoft Teams platforms. The input received during these interviews is incorporated throughout the remainder of this CWPP and particularly for the following chapters:

- Chapter 4: Community Outreach and Education Recommendations
- Chapter 5: Risk and Preparedness Assessment
- Chapter 7: Strategic Planning and Recommended Actions
- Chapter 8: Mitigation Recommendations

Table 2.2 Summary of Stakeholder Interviews

| Organization | Stakeholder Type | Contact Name |
|---|--------------------------------|----------------------------------|
| Fire and Forestry Agencies | | |
| Central Oregon Coast Fire & Rescue District | Fire Agency (Local) | Jamie Mason |
| Depoe Bay FPD | Fire Agency (Local) | Tom Jackson |
| Newport Fire Department; Newport RFPD | Fire Agency (Local) | Robert Murphy |
| North Lincoln Fire & Rescue District #1 | Fire Agency (Local) | Cody Heidt |
| Seal Rock RFPD | Fire Agency (Local) | Will Ewing |
| Siletz Valley RFPD | Fire Agency (Local) | Dave Lapof |
| Toledo Fire Department; Toledo RFPD | Fire Agency (Local) | Larry Robeson |
| Yachats RFPD | Fire Agency (Local) | Frankie Petrick; Shelby Knife |
| Oregon State Fire Marshal | Fire Agency (State) | Stephanie Stafford |
| Oregon State University Extension Service – Lincoln County | Fire/Forestry Agency (State) | Aaron Groth |
| Oregon Department of Forestry | Forestry Agency (State) | Matt Thomas |
| U.S. Forest Service – NW Oregon Interagency Fire and Siuslaw/Willamette National Forests | Forestry Agency (Federal) | Chris Mushrush |
| Community Stakeholders | | |
| Confederated Tribes of Siletz Indians | Tribe | Mari Kramer; Randy Storms |
| Seal Rock Water District | Water District (Local) | Adam Denlinger |
| Southwest Lincoln County Water District | Water District (Local) | Tui Anderson |
| Central Lincoln People's Utility District | Utility (Local) | Gail Malcolm |
| Consumers Power, Inc. | Utility (Local) | Jeffery Carlson |
| Pacific Power | Utility (Regional) | Horace Ward |
| Cascade Relief Team at Salmon River Grange | Community Organization (Local) | Norma Jean |

Chapter 3: Planning Process

Documenting the Planning Process

Documentation of the planning process, including public involvement, is necessary to meet FEMA's DMA 2000 requirements (44 CFR§201.6(c)(1)). This section includes a description of the planning process used to develop the 2023 CWPP plan update, including how it was prepared, who was involved in the process, and how the involved agencies participated.

Original 2009 CWPP Plan: Vaiden Bloch, M.S., B.S. and Tera R. King, B.S. from Northwest Management Inc. were the Project Co-Managers for the original 2009 CWPP.

2018 CWPP Plan Update: The Lincoln County Fire Defense Board was the author for the update to the CWPP, completed in 2018.

Description of the Planning Process

The Lincoln County Community Wildfire Protection Plan was developed through a collaborative process involving all the organizations and agencies detailed in Chapter 1: Introduction of this document.

The IPRE planning team, in consultation with the Lincoln County Emergency Manager took the following actions to develop the 2023 Plan update:

- Collected data about current conditions and community profiles in Lincoln County including populations that are most vulnerable to wildfire risk.
- Met regularly with CWPP Steering Committee for guidance on plan development.
- Developed and distributed a survey to county residents to assess perceptions of wildfire issues and preparedness for wildfire events.
- Interviewed fire district chiefs, agency heads, tribal leaders, utility providers, and community members for recommendations and identification of priority projects for wildfire mitigation.
- Conducted public workshops to explain the importance of the CWPP and gather input from community members about concerns related to wildfire issues.

The Planning Team

The Lincoln County Emergency Manager led the 2023 CWPP update in consultation with a team from the Oregon Partnership for Disaster Resilience (OPDR). OPDR is a program coordinated by the Institute for Policy Research & Engagement (IPRE) at the University of Oregon.

IPRE uses a service-learning model to provide clients additional technical capacity through projects that provide professional development experience for graduate students enrolled in the Community and Regional Planning and Public Administration master's programs.

The team includes faculty from OPDR, students from the University of Oregon's Community and Regional Planning Master's program, staff from Lincoln County Emergency Management, and a steering committee made up of members of the county Fire Defense Board. The Fire Defense Board is chaired by Chief Tom Jackson from the Depoe Bay Rural Fire Protection District and is made up of all the local fire service organizations as well as interested state and federal fire and forestry agencies, county and city departments, and emergency management and response organizations.

The planning philosophy employed in this project included the open and free sharing of information with all interested parties. Information from federal, state, and local agencies was integrated into the database of knowledge used in this project. Meetings with the Committee were held throughout the planning process to facilitate a sharing of information both between participants and with the planning team.

Multi-Jurisdictional Participation

44 CFR §201.6(a)(3) calls for multi-jurisdictional planning in the development of hazard mitigation plans which impact multiple jurisdictions. This Community Wildfire Protection Plan impacts the following jurisdictions:

- Confederated Tribes of Siletz Indians
- Lincoln County (including unincorporated communities)
- City of Depoe Bay
- City of Lincoln City
- City of Newport
- City of Siletz
- City of Toledo
- City of Waldport
- City of Yachats
- U.S. Forest Service – Siuslaw & Willamette National Forests
- Oregon Department of Forestry
- Central Oregon Coast Fire and Rescue District
- Depoe Bay RFPD
- Newport RFPD
- North Lincoln Fire and Rescue District #1
- Seal Rock RFPD
- Siletz Valley RFPD
- Toledo Fire Department
- Yachats RFPD

These jurisdictions were represented on the Steering Committee and in public meetings either directly or through their servicing fire departments or districts. They participated in the development of hazard profiles, risk assessments, and mitigation recommendations. Virtual Steering Committee meetings held every other month were the primary venue for authenticating the planning record. However, additional input was gathered from each jurisdiction in the following ways:

- Site visits by the planning team to several fire districts and community locations where planning updates were provided and information was exchanged.
- Virtual interviews between the planning team and representatives of the participating jurisdictions to discuss the CWPP update and specific mitigation recommendations.
- Written correspondence between the planning team and each jurisdiction updating the participating representatives on the planning process, making requests for information, and facilitating feedback.

CWPP Steering Committee Members

A wide range of individuals participated in the CWPP Steering Committee meetings, volunteered time, and responded to elements of the Lincoln County Community Wildfire Protection Plan’s preparation. Table 3.1 lists the members of the Steering Committee.

Table 3.1. Lincoln County CWPP Steering Committee Membership

| Member Name | Organization |
|--|---|
| Samantha Buckley, and Susan Trachsel | Sheriff’s Office – Emergency Management |
| Onno Husing and Megan Hoff | Lincoln County Planning and Development |
| Chief Jamie Mason | Central Oregon Coast Fire and Rescue District |
| Chief Tom Jackson | Depoe Bay Rural Fire Protection District |
| Chief Robert Murphy | Newport Rural Fire Protection District |
| Chief Rob Dahlman and Cody Heidt | North Lincoln Fire and Rescue District |
| Chief Will Ewing | Seal Rock Rural Fire Protection District |
| Chief Dave Lapof | Siletz Valley Rural Fire Protection District |
| Chief Larry Robeson | Toledo Fire Department |
| Chief Frankie Petrick and Shelby Knife | Yachats Rural Fire Protection District |

| Member Name | Organization |
|--|--|
| Cassidy Boyle | City of Lincoln City |
| Del Lockwood | City of Newport |
| Randy Storms, Mari Kramer, and Ian Keene | Confederated Tribes of Siletz Indians |
| Garret Reeves, | Oregon Department of Emergency Management |
| Matt Thomas, Trask Hodgson, Charlie Redheffer, and Jacob Ruhl | Oregon Department of Forestry |
| Stephanie Stafford | Oregon Department of the State Fire Marshall |
| Chris Mushrush | United States Forest Service – Siuslaw & Willamette National Forests |
| Aaron Groth | Oregon State University Extension – Lincoln County |

Planning Team Members

The following individuals with the Oregon Partnership for Disaster Resilience were part of the CWPP planning team led by Virginia Demaris from Lincoln County Emergency Management.

- Michael Howard, Project Director
- Stuart Warren, Project Manager
- Brendan Adamczyk, Research Associate
- Elena Coleman, Research Associate
- Morgan Driggs, Research Associate
- Melina Pastos, Research Associate

Planning Team Timeline of Activities

The planning process to update the Lincoln County CWPP plan began in August 2022. Table 3.2 outlines the dates and description of activities during this process.

Table 3.2. Timeline of Activities: Planning Team and Steering Committee

| Date | Activity Type | Description | Outcome/Update |
|-------------------|-------------------------|--|---|
| 8/30/22 | Meeting (Virtual) | CWPP Planning Team (Project Kick-Off) | Introductions; reviewed project scope and deliverables |
| 10/12/22 | Meeting (In-Person) | CWPP Steering Committee (Project Kick-Off) | Reviewed project tasks & timelines and public engagement strategies |
| 12/08/22 | Meeting (Virtual) | CWPP Steering Committee (Regular Meeting) | Updated goals and guiding principles; discussed mitigation recommendations |
| 2/08/23 | Meeting (Virtual) | CWPP Planning Team (Regular Meeting) | Discussed project initiation; confirmed project timeline and deliverables |
| 2/17/23 | Site Visit | CWPP Planning Team (Day Trip to Otis and Siletz) | Interviewed 2020 Echo Mountain Fire survivors; discussed community engagement, and mitigation recommendations with Confederated Tribes of Siletz Indians and Siletz Valley RFPD |
| 4/20/23 | Meeting (Virtual) | CWPP Steering Committee (Regular Meeting) | Provided progress report; discussed community engagement |
| 4/25/23 – 6/15/23 | Deliverable | Community Survey Released to Public | Collected feedback on wildfire risk mitigation and preparedness |
| 4/25/23 – 6/15/23 | Deliverable | Stakeholder Interviews Conducted | Updated profiles and mitigation recommendations for local and state fire and forestry agencies and other key stakeholders |
| 5/13/23 | Site Visit/ Deliverable | Community Workshops Facilitated in Depoe Bay and Newport | Presented progress on CWPP; solicited further public feedback on wildfire risk mitigation and preparedness |
| 5/18/23 | Meeting (Virtual) | CWPP Steering Committee (Regular Meeting) | Discussed Strategic Planning Areas and mitigation recommendations |
| 6/15/23 | Meeting (Virtual) | CWPP Steering Committee (Regular Meeting) | Reviewed risk management maps and community survey results |
| 12/5/23 | Meeting (Virtual) | Lincoln County Evacuation Plan Steering Committee (Project Kick-off) | Presented final draft of CWPP for review and feedback |

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Chapter 4: Lincoln County Characteristics

Geography

The Pacific Ocean and the Coastal Range define Lincoln County. Five major rivers run through Lincoln County and empty into the Pacific Ocean, including the Alsea, Salmon, Siletz, Yachats, and Yaquina Rivers. The estuaries and tidal wetlands associated with these rivers vary in size and character from the Yaquina estuary (largest) to the Alsea, Siletz, Salmon, and Yachats (smallest). Minor estuaries include Depoe Bay, Big Creek, and Beaver Creek.

Headlands composed of erosion resistant volcanic materials are among the most prominent features of Lincoln County's coastline. These major landmarks are among the features first described by explorers searching for the "Northwest Passage." Headlands in Lincoln County include Yaquina Head, Cape Perpetua, and Cape Foulweather.² Between these headlands lay beaches and elevated marine sedimentary terraces upon which the greatest percentage of the County's population is located.

Lincoln County features several freshwater lakes and marshes. Devils Lake, adjacent to Lincoln City, is the largest of the coastal lakes with an approximate surface area of one square mile. It is the focus of considerable residential and recreational activity.

Climate

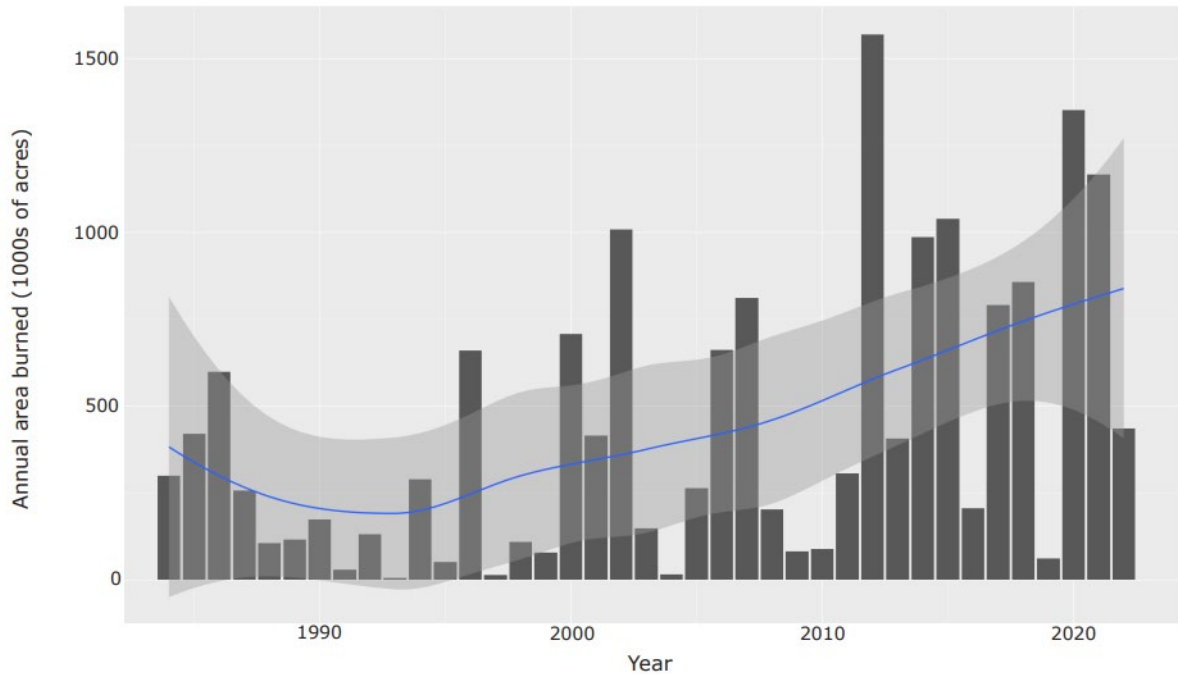
The climate of Lincoln County is characterized by wet winters, relatively dry summers, and mild maritime temperatures throughout the year. Winter storms bring heavy rains from October through March and carry wet marine air from North Pacific regions, moving from southwest to northeast. Some areas of Lincoln County are known to get as much as 130 inches of annual precipitation, which can lead to flooding.

Marine high-pressure systems are characteristic of the summer months and create northwesterly winds. Of far less frequency are the high-pressure systems that move from the interior to the ocean. These systems generally come from the east/northeast, and bring clear, dry, and either warm or cold weather depending on the season.

² Note: McKenzie River Trust purchased Cape Foulweather to transfer to the Confederated Tribes of Siletz Indians in 2021. McKenzie River Trust (2021). *Conserving Cherished Places on Oregon's Coast*. <https://mckenzie-river.org/conserving-cherished-places-on-oregons-coast/>.

Research shows that a warming climate will increase the number and intensity of wildfires.³ Over the past 35 years, the total area burned by fire each year has increased in Oregon (Figure 4.1). The frequency of large wildfires has increased in the western states, and large forest fires occur almost annually in the northwest. Over the last 40 years, the length of wildfire season has increased by 43%, and the number of days of extreme fire danger increased by 166% in the western United States. Easterly, downslope winds that drive wildfire growth are increasing while vegetation moisture content is decreasing, which raises the potential of extreme fire weather.

Figure 4.1. Annual Area Burned in Oregon from 1984–2022



Source: Eidenshink et al. (2007). *Annual area burned in Oregon from 1984-2022*. Monitoring Trends in Burn Severity. https://www.researchgate.net/figure/Annual-area-burned-in-Oregon-from-1984-2018-Fires-smaller-than-988-acres-400-ha-were_fig10_348789669. Note: Fires smaller than 988 acres (400 hectares) were omitted. Data and graph were updated in October 2022.

Oregon is becoming warmer and drier. Aridity has increased due to drought, snowpack reduction, and temperature increases. More flooding and droughts are anticipated due to increased precipitation during the wet season and decreased summer precipitation. Climate change is the leading cause of the shift in temperatures, winds, and their effects on wildfire.⁴

Population and Demographics

The following section includes background information on Lincoln County’s demographics that influence the county’s adaptive capacity to wildfire. Adaptive capacity refers to the collective

³ Oregon Climate Change Research Institute (2023). *Sixth Oregon Climate Assessment*. Oregon State University. <https://blogs.oregonstate.edu/occri/oregon-climate-assessments/>.

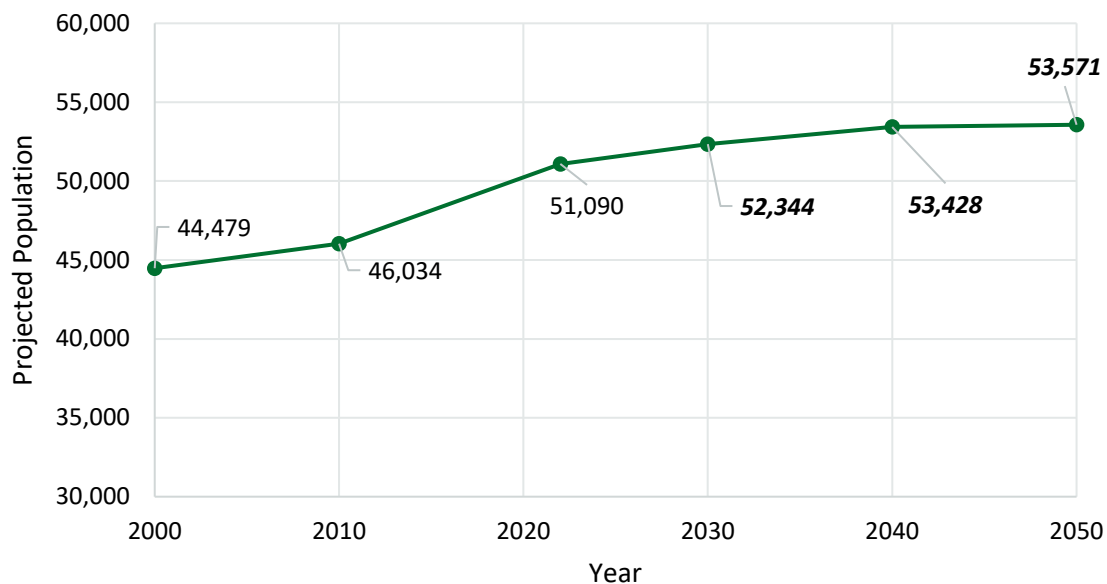
⁴ Ibid.

will, resources, and the structure of collaborative efforts that stakeholders can leverage when determining how to reduce their exposure to or impact from disturbances.⁵

Social Demographics

Lincoln County is comprised of seven cities, two census-designated places, and 25 unincorporated communities. In 2022, the population of Lincoln County totaled 51,090, with more than half of county residents living in one of five cities: Newport (10,755), Lincoln City (10,134), Toledo (3,650), Waldport (2,349), and Depoe Bay (1,566). Lincoln County’s population has increased by 15% since 2000 and 11% since 2010, as demonstrated in Figure 4.2. However, the county’s population is forecasted to increase 2% by 2030 and 4% by 2050 from 2022 levels.⁶

Figure 4.2. Lincoln County Population Projections, 2000-2050



Source: Population Research Center (2022). *2022 Certified Population Estimate, July 1; Current Forecast Summaries for All Areas; and Past Forecasts: Forecast Program Cycle 2 (2018 - 2021)*. Portland State University. Retrieved February 6, 2023, from www.pdx.edu/population-research/.

As illustrated in Figure 4.3, 17% of Lincoln County’s population is under 18, while almost half (46%) of residents are above the age of 55.⁷ Lincoln County’s 2020 NHMP notes that the age profile impacts what mitigation actions are prioritized and how hazard response is carried out. The County’s large youth population increases the importance of school and parental outreach on effective ways to teach children about fire safety and evacuation plans. In addition, both

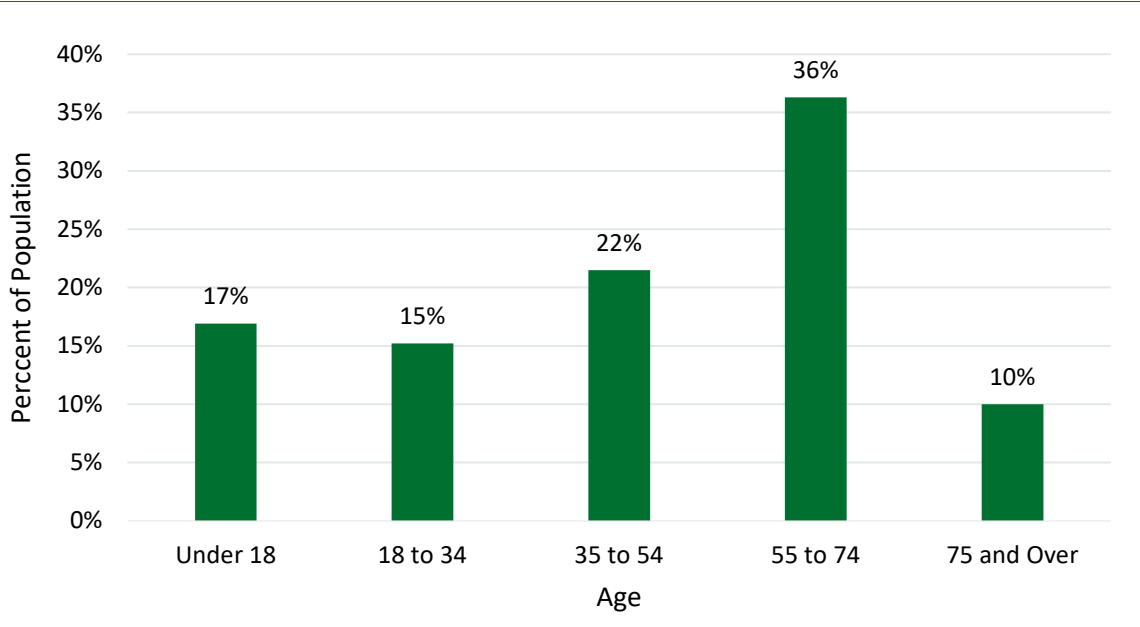
⁵ Pavaglio et al. (2018). *Incorporating Social Diversity into Wildfire Management: Proposing ‘Pathways’ for Fire Adaptation*. Society of American Foresters. <https://doi.org/10.1093/forsci/fxy005>.

⁶ Population Research Center (2021, June). *Coordinated Population Forecast, 2021 through 2071: Lincoln County*. Portland State University. Retrieved February 6, 2023, from www.pdx.edu/population-research/sites/g/files/znlhdr3261/files/2022-01/Final_Report_Lincoln.pdf.

⁷ U.S. Census Bureau (2022). *Table A01001. American Community Survey 5-Year Estimates (2017-2021)*. www.socialexplorer.com/tables/ACS2021_5yr.

younger and older populations have special needs before, during, and after wildfires, and may require assistance in completing home fire renovation projects or during evacuations due to limited mobility or health issues.⁸

Figure 4.3. Age Distribution of Lincoln County Residents



Source: U.S. Census Bureau (2022). *Table A01001. American Community Survey 5-Year Estimates (2017-2021).* www.socialexplorer.com/tables/ACS2021_5yr.

In addition to Lincoln County’s age profile, there are many potential public health impacts to consider during and after a wildfire, including smoke inhalation and injuries suffered during evacuation. As Figure 4.4 illustrates, 91% of county residents are covered by either public or private health insurance, but the remaining 9% who are not may require additional support during recovery efforts to ensure their health does not worsen.

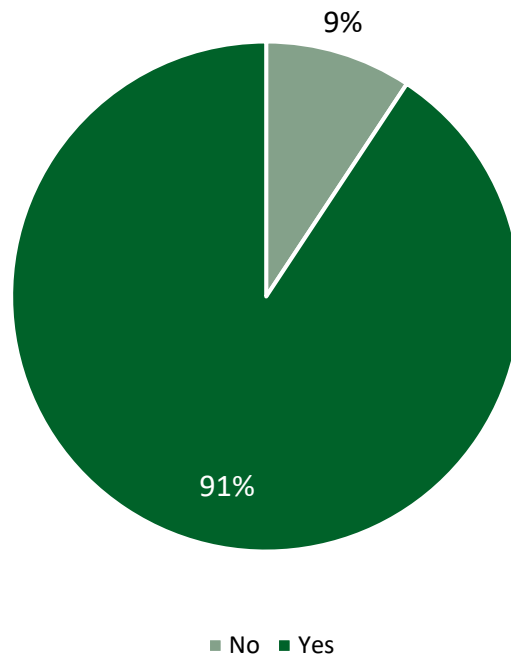
Furthermore, 76% of Lincoln County residents have internet access,⁹ significantly lower than Oregon’s statewide rate of 90%.¹⁰ Individuals who lack internet access will be harder to reach with information about wildfire mitigation efforts or burn notices and may need additional in-person contact and support during an evacuation.

⁸ Lincoln County Department of Planning and Development (2020, December). *Appendix C: Profile in Volume III – Appendices, 2020 Lincoln County Multi-Jurisdictional Natural Hazards Mitigation Plan.* <https://www.co.lincoln.or.us/404/Natural-Hazards-Mitigation-Plan>.

⁹ Population Research Center (2021, October). *2020 Census Summary Profile: Oregon and its Counties (pg. 22).* Portland State University. www.pdx.edu/population-research/sites/g/files/zndhr3261/files/2021-08/2020%20Census%20Oregon%20and%20County%20Profiles_0.pdf.

¹⁰ U.S. Census Bureau (2022). *Oregon.* QuickFacts. Retrieved February 6, 2023, from www.census.gov/quickfacts/OR.

Figure 4.4. Health Insurance Coverage for Lincoln County Residents



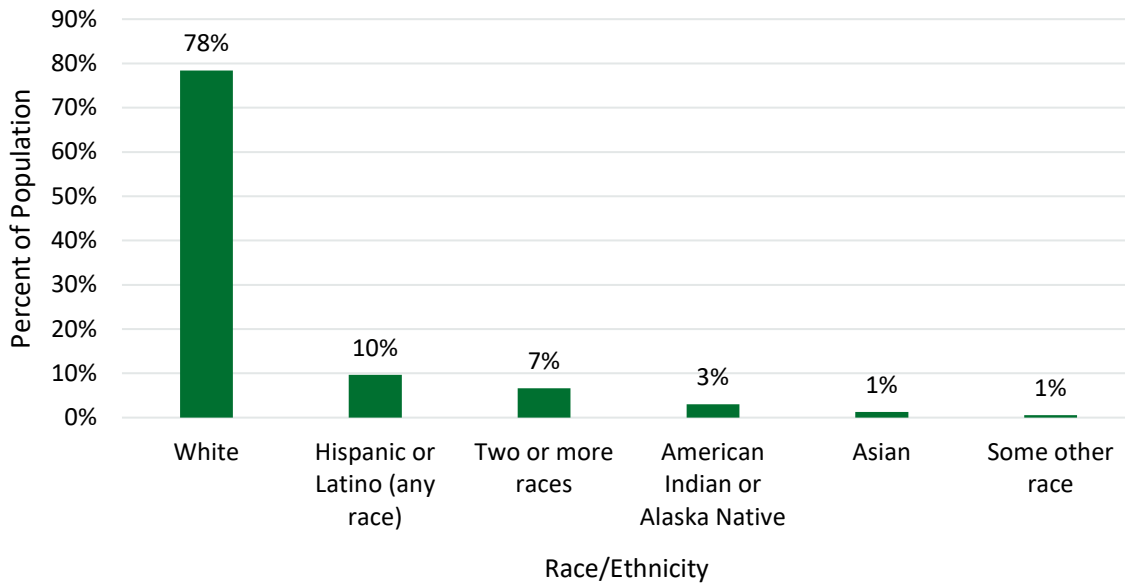
Source: U.S. Census Bureau (2022). *Table A20001*. American Community Survey 5-Year Estimates (2017-2021). www.socialexplorer.com/tables/ACS2021_5yr.

Race, Ethnicity, and Language

As Figure 4.5 indicates, Lincoln County’s population in 2020 was 78% non-Hispanic White, 10% Hispanic or Latino (any race), 3% American Indian or Alaska Native, and 1% Asian, with a further 7% identifying as two or more races. Among Oregon’s 36 counties, Lincoln County has the fifth-highest proportion of residents who identify as American Indian or Alaska Native. Only 5% of residents are foreign-born.¹¹ Particular attention will need to be paid to these minority communities of color – and specifically the American Indian or Alaska Native residents of Lincoln County, who are largely members of the federally-recognized Confederated Tribes of the Siletz Indians – during both general wildfire education efforts and when carrying out evacuation.

¹¹ Population Research Center (2021, October). *2020 Census Summary Profile: Oregon and its Counties* (pg. 22). Portland State University. www.pdx.edu/population-research/sites/g/files/znlchr3261/files/2021-08/2020%20Census%20Oregon%20and%20County%20Profiles_0.pdf.

Figure 4.5. Lincoln County by Race and Ethnicity



Source: Population Research Center (2021, October). *2020 Census Summary Profile: Oregon and its Counties* (pg. 22). Portland State University. www.pdx.edu/population-research/sites/g/files/znlchr3261/files/2021-08/2020%20Census%20Oregon%20and%20County%20Profiles_0.pdf.

Approximately 8% of the Lincoln County population speaks a language other than English and about 3% of the population is not proficient in English. The Lincoln County School District reports at least 24 languages spoken within the District other than English, including Spanish, Mam, Akateko, Kanjobal, and Nahuatl. Special attention should be given to populations who do not speak English as their primary language; while public messaging is generally provided in English and Spanish, Spanish translation of emergency alerts can be delayed by several hours. Language barriers can be a challenge when disseminating evacuation notices, hazard planning, and mitigation resources to the public, and it is less likely they will be prepared if consideration is not given to language and culturally appropriate outreach.¹²

Housing Demographics

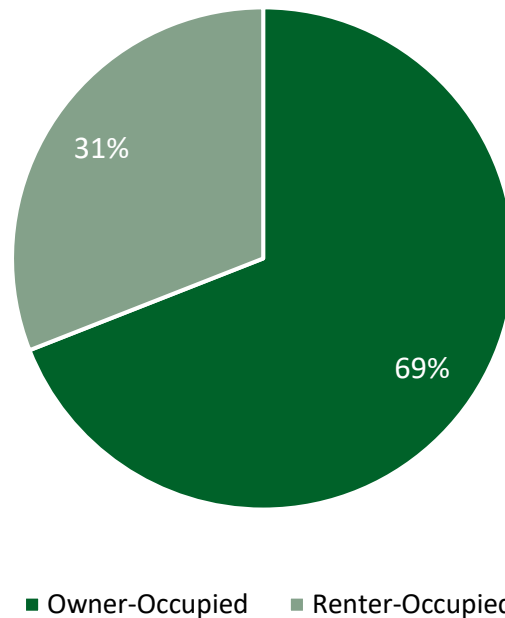
Examining Lincoln County on the household level and with a focus on housing allows for a better understanding of the adaptive capacity of Lincoln County’s population. This section summarizes key housing statistics for the county, which has approximately 32,000 total housing units.

¹² Lincoln County Department of Planning and Development (2020, December). *Appendix C: Profile in Volume III – Appendices, 2020 Lincoln County Multi-Jurisdictional Natural Hazards Mitigation Plan*. <https://www.co.lincoln.or.us/404/Natural-Hazards-Mitigation-Plan>.

Of the county’s housing units, 71% are permanently occupied while 29% are either vacant or seasonally occupied (mostly located along the coast). The average household size is 2.19 people, while the countywide population density is 51.4 people per square mile.¹³

As Figure 4.6 demonstrates, of the occupied units in Lincoln County, over two-thirds of units are owner-occupied (69%), with just under one-third (31%) of units being renter-occupied. Homeowners and renters have different needs regarding wildfire mitigation, as discussed throughout this section, but the county should consider both in wildfire planning.

Figure 4.6. Owner- and Renter-Occupied Units

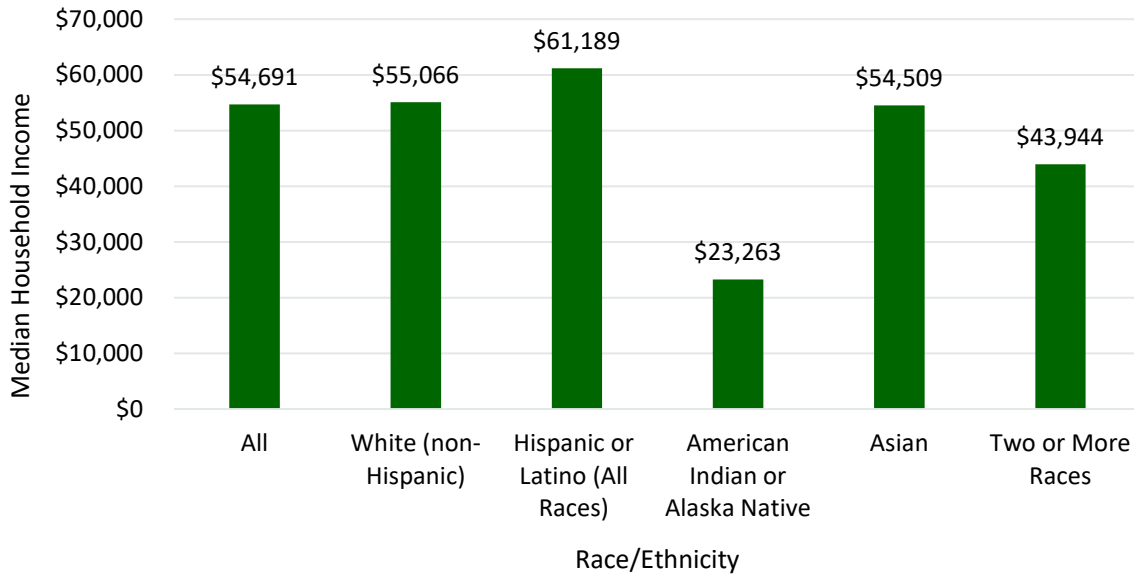


Source: U.S. Census Bureau (2022). *Table A10001 and Table A10045. American Community Survey 5-Year Estimates (2017-2021).* www.socialexplorer.com/tables/ACS2021_5yr.

Figure 4.7 shows median household income by race and ethnicity, showing that county residents who identify as American Indian or Alaska Native have lower incomes than the rest of Lincoln County’s population. These individuals may need additional support for home hardening renovations, in the event of an evacuation, and during post-fire recovery efforts. Some of this support may be provided directly by the Confederated Tribes of Siletz Indians, who offer a variety of housing options for tribal members.

¹³ Population Research Center (2021, October). *2020 Census Summary Profile: Oregon and its Counties* (pg. 22). Portland State University. www.pdx.edu/population-research/sites/g/files/znlchr3261/files/2021-08/2020%20Census%20Oregon%20and%20County%20Profiles_0.pdf.

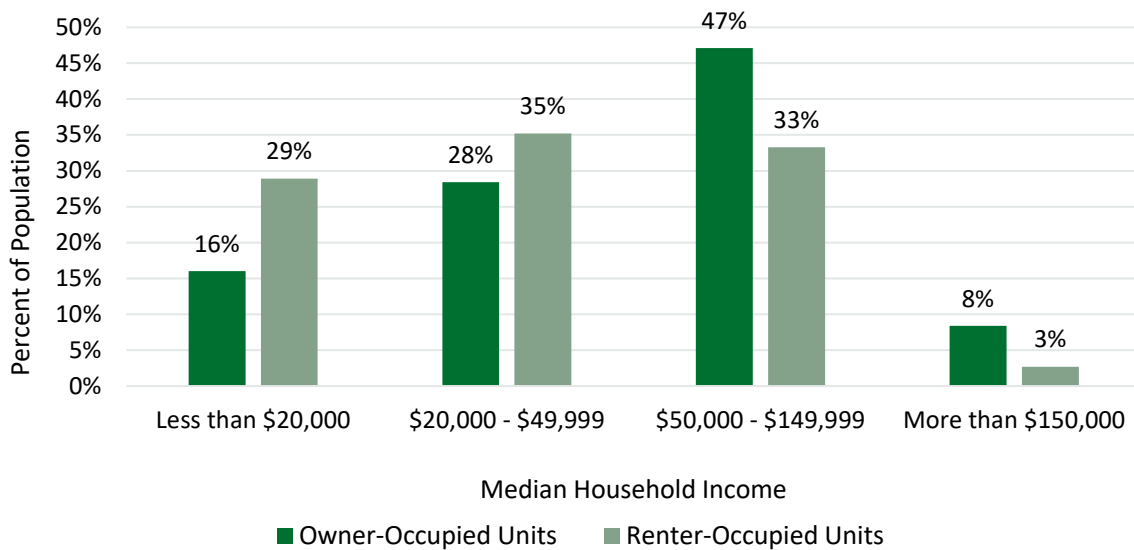
Figure 4.7. Lincoln County Median Household Income by Race and Ethnicity



Source: U.S. Census Bureau (2022). *Table A14007*. American Community Survey 5-Year Estimates (2017-2021). www.socialexplorer.com/tables/ACS2021_5yr.

Figure 4.8 breaks down median household income by housing unit type. It illustrates that nearly two-thirds of renter-occupied units (64%) and 44% of owner-occupied units are occupied by individuals and families with household incomes under \$50,000. Renter-occupied units are more likely to be occupied by individuals and families with lower household incomes than owner-occupied units. These individuals and families may also require additional support for home hardening renovations, in the event of an evacuation, and during post-fire recovery efforts.

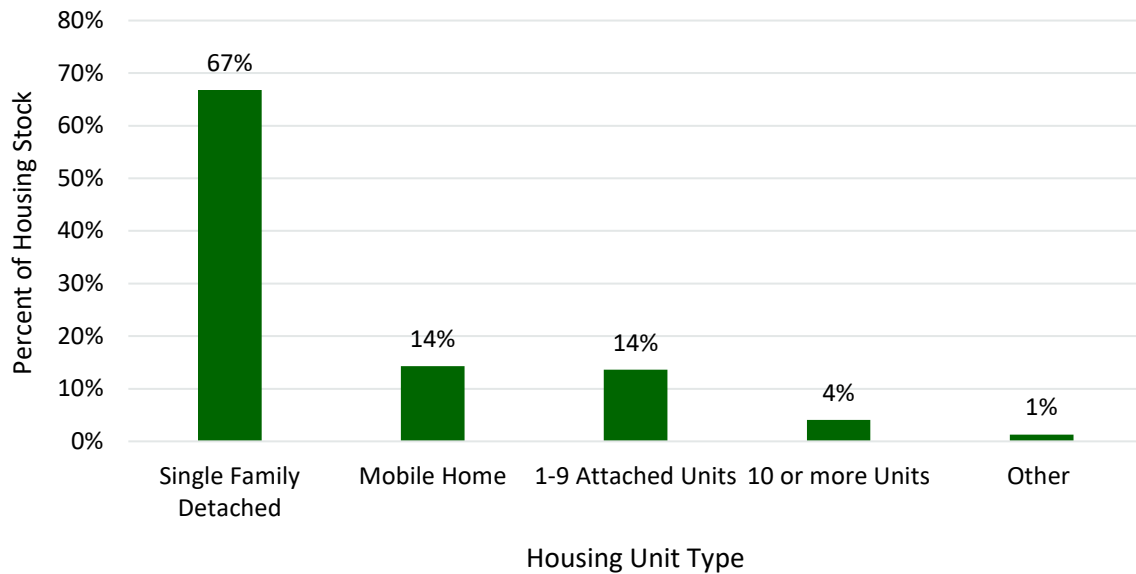
Figure 4.8. Lincoln County Median Household Income by Housing Unit Type



Source: U.S. Census Bureau (2022). *Table A14002 and Table 14003B*. American Community Survey 5-Year Estimates (2017-2021). www.socialexplorer.com/tables/ACS2021_5yr.

As shown in Figure 4.9, Lincoln County’s housing stock is comprised of about two-thirds (67%) single family detached units, followed by 14% each of buildings with 1-9 attached units and of mobile homes. The remaining stock is larger multi-family buildings with 10 or more units. Each type of housing requires different levels of support for home hardening renovations, evacuation, and post-fire recovery, as well as differing degrees of home/fire insurance coverage to cover rebuilding in the event of a wildfire.

Figure 4.9. Housing Unit Types in Lincoln County



Source: U.S. Census Bureau (2022). *Table A10053*. American Community Survey 5-Year Estimates (2017-2021). www.socialexplorer.com/tables/ACS2021_5yr.

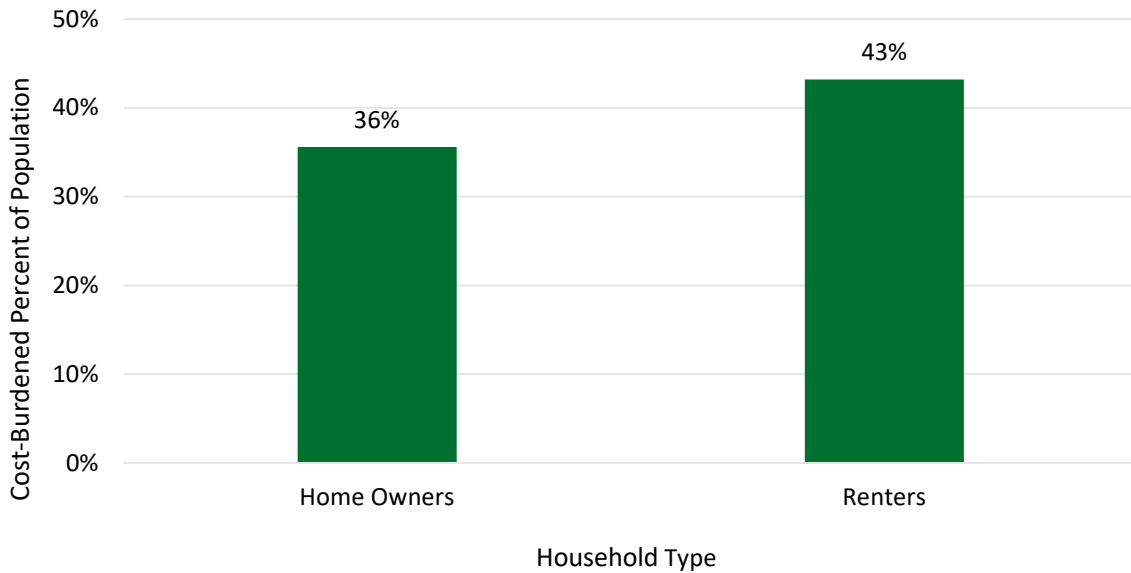
A cost-burdened individual is someone who spends more than 30% of their income on housing costs, which include both rent and mortgages.¹⁴ These individuals are more vulnerable in the face of wildfires in part because they are more likely to have less disposable income during evacuation events and fewer savings to support post-fire recovery.

Figure 4.6 shows that 36% of homeowners and 43% of renters in Lincoln County are considered cost-burdened households. Looking further at just renters, one-fifth (22%) pay between 30 and 49% of their income on rent while another one-fifth (21%) spend more than 50% of their income on rent,¹⁵ hindering their ability to carry out home hardening renovations or to easily find a new home in the event of a wildfire.

¹⁴ Oregon Statewide Housing Plan: Definitions Appendix. (2018). *Housing Cost Burden*. Oregon Housing and Community Services. <https://www.oregon.gov/ohcs/Documents/swhp/swhp-appendices-20181015.pdf>.

¹⁵ U.S. Census Bureau (2022). *Table B18002 and Table B10040*. American Community Survey 5-Year Estimates (2017-2021). www.socialexplorer.com/tables/ACS2021_5yr.

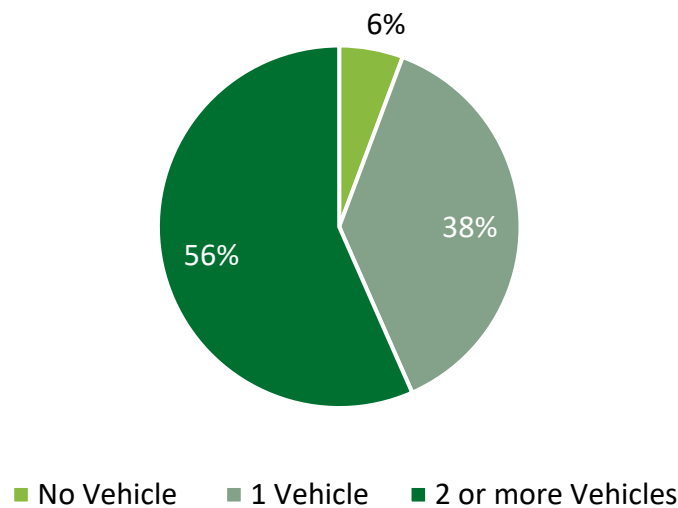
Figure 4.10. Cost Burdened Households in Lincoln County by Household Type



Source: U.S. Census Bureau (2022). *Table B18002 and B10040*. American Community Survey 5-Year Estimates (2017-2021). www.socialexplorer.com/tables/ACS2021_5yr.

Finally, when planning to mitigate the impact of wildfires, understanding a household’s ability to evacuate in the event of a wildfire is critical. As Figure 4.11 indicates, 6% of households do not have access to a vehicle, while 38% of households only have access to one vehicle. These households may need additional support in the event of an evacuation. It is important to note that this data does not include most of the unhoused population, a group for whom it is difficult to collect accurate data (especially in rural areas like the majority of Lincoln County).

Figure 4.11. Vehicle Availability among Lincoln County Households



Source: U.S. Census Bureau (2022). *Table A10030*. American Community Survey 5-Year Estimates (2017-2021). www.socialexplorer.com/tables/ACS2021_5yr.

Supporting Vulnerable Communities

Vulnerable populations include those with access and functional needs, such as seniors, disabled community members, women, children, and people living in poverty. Members of these communities often experience the impacts of natural hazards and disasters more acutely. Vulnerability is especially significant for migrant short-term workers who work in a range of industries, especially fish processing plants, throughout Lincoln County. Hazard mitigation that targets the specific needs of these groups has the potential to greatly reduce their vulnerability.

Examining the reach of hazard mitigation policies to vulnerable populations may also assist in increasing access to services and programs. FEMA’s Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural hazards identify vulnerable populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance. Ultimately, population size itself is not an indicator of vulnerability. More important is the location, composition, and capacity of the population within the community, all of which can affect the integrity of a community – and therefore, community resilience to natural hazards.

Employment and Economics

This section includes additional information about Lincoln County’s economy and statistics on tourism, a major part of the county’s economy. The county’s reliance on visitor spending is vital because a severe fire could significantly reduce tourism, negatively impacting the local economy.

Economic Context

Lincoln County’s gross domestic product is \$2.182 billion, or \$42,700 per capita.¹⁶ The county differs from the state of Oregon in three key factors: poverty, household income, and share of population in the labor force. Lincoln County’s 2021 poverty rate of 16% was higher than the statewide rate of 12%,¹⁷ while its median household income of \$54,961 was lower than Oregon’s level of \$70,084.¹⁸ Additionally, while 63% of the statewide population over the age of 16 is part of the labor force,¹⁹ only 51% of Lincoln County residents over 16 are in the labor force.²⁰

Employment

The county’s economy is based primarily on tourism, government services, and retail, with more than a quarter of the workforce employed in the tourism industry. The Confederated Tribes of

¹⁶ Population Research Center (2021, October). *2020 Census Summary Profile: Oregon and its Counties* (pg. 22). Portland State University. www.pdx.edu/population-research/sites/g/files/znlchr3261/files/2021-08/2020%20Census%20Oregon%20and%20County%20Profiles_0.pdf.

¹⁷ Ibid.

¹⁸ U.S. Census Bureau (2022). *Oregon*. QuickFacts. Retrieved February 6, 2023, from www.census.gov/quickfacts/OR.

¹⁹ Ibid.

²⁰ Population Research Center (2021, October). *2020 Census Summary Profile: Oregon and its Counties* (pg. 22). Portland State University. www.pdx.edu/population-research/sites/g/files/znlchr3261/files/2021-08/2020%20Census%20Oregon%20and%20County%20Profiles_0.pdf.

Siletz Indians’ Chinook Winds Casino in Lincoln City remains one of Lincoln County’s largest employers. Education and health services are an increasingly important sector as well.

Newport’s Yaquina Bay is home to one of the West Coast’s largest commercial fishing fleets as well as marine and oceanographic research, anchored by Oregon State University’s Hatfield Marine Science Center (HMSC). In addition to the HMSC, several state and federal agencies involved in marine research and management have a sizable presence at the HMSC complex in the South Beach area of Newport. Although the fishing industry historically played a large role in Lincoln County’s economy and still shapes local character and culture, it represents a smaller proportion of the economy today than it has in previous decades (see Table 4.1).

Additionally, as shown in Table 4.1, the industries that contribute the most to employment to Lincoln County are leisure and hospitality (4,258 jobs, or 25%); trade, transportation, and utilities, including retail (3,198 jobs; 18%); and local government (2,852 jobs; 16%). In terms of wages, private industry accounts for two-thirds (67%), while public industry accounts for one-third (33%). The sector with the highest average annual wage is the federal government (\$80,113), followed by state government (\$65,511) and manufacturing (\$64,168).

Table 4.1. Employment and Wages by Industry

| Industry | Number of Jobs | Total Industry Wages | Percent of Total Industry | Average Annual Wage |
|--|----------------|----------------------|---------------------------|---------------------|
| Total Employment | 17,340 | \$802,711,909 | 100% | \$46,293 |
| Total Private Industry | 13,008 | \$541,299,318 | 67% | \$41,613 |
| Leisure and Hospitality | 4,258 | \$124,323,917 | 23% | \$29,198 |
| Trade, Transportation, and Utilities (includes retail) | 3,198 | \$127,238,295 | 24% | \$39,787 |
| Education and Health Services | 2,089 | \$114,093,418 | 21% | \$54,616 |
| Manufacturing | 1,025 | \$65,772,710 | 12% | \$64,168 |
| Construction | 804 | \$40,137,887 | 7% | \$49,923 |
| Financial Activities | 779 | \$35,472,223 | 7% | \$45,536 |
| Other Services | 441 | \$12,975,996 | 2% | \$29,424 |
| Natural Resources and Mining (includes agriculture, fishing, and forestry) | 302 | \$15,317,282 | 3% | \$50,719 |
| Information | 112 | \$5,967,590 | 1% | \$53,282 |
| Total Public Industry | 4,332 | \$261,412,591 | 33% | \$60,345 |
| Local Government | 2,852 | \$168,122,895 | 64% | \$58,949 |
| Tribal Government | 843 | \$46,682,130 | 18% | \$55,376 |

| Industry | Number of Jobs | Total Industry Wages | Percent of Total Industry | Average Annual Wage |
|--------------------|----------------|----------------------|---------------------------|---------------------|
| Federal Government | 334 | \$26,757,629 | 10% | \$80,113 |
| State Government | 303 | \$19,849,937 | 8% | \$65,511 |

Source: Data analysis conducted by OPDR. QualityInfo.org. (2022). *Covered Employment and Wages (QCEW), Lincoln County Annual 2021*. Oregon Employment Department. Retrieved February 10, 2023, from <https://www.qualityinfo.org/ewind>.

Tourism in Lincoln County

A significant portion of Lincoln County’s economic activity – more than 25% of total GDP – is derived from the tourism industry.²¹ Due to the COVID-19 pandemic and the significant reduction in visits to the county, the county experienced reductions in visitor spending, tourism employment, and tax revenue in 2020 and 2021.

Visits dropped from 5.2 million total nights spent in the county by tourists in 2019 to 4.4 million in 2020 but rebounded almost entirely to 5.1 million total nights in 2021. Visitor spending saw a similar recovery, totaling \$605 million in 2021, a 30% increase from 2020 spending and part of a longer average annual growth trend of nearly 4% since 2003. This equated to \$204 million in earnings for county residents, supported more than 6,000 jobs, and led to over \$17 million in tax revenue for Lincoln County local governments in 2021 – all of which represented major recoveries from 2020 figures.²²

Over the past two decades, most of the spending, earnings, and employment in Lincoln County have been focused on accommodations – including hotels, motels, short-term rentals, and campgrounds – and in the food service industry. This has driven the increase in seasonally occupied homes discussed earlier in this section. In 2021, the accommodations sector accounted for nearly half of all visitor spending (43%), while food service made up about one-quarter (22%). Combined, the accommodation and food service industries comprised roughly three-quarters of earnings (78%) and of jobs (73%). The remaining sectors with significant tourism impacts are food stores, local transportation and gas, arts and entertainment, and general retail sales.²³

Lincoln County is a major tourist destination throughout Oregon and for the western United States. As a result, a severe wildfire would result in a significantly worsened economy than in other wildfire-prone regions that rely less on outside visitor spending.

²¹ Dean Runyan Associates (2022, May). *Oregon Travel Impacts: 2003-2021*. Travel Oregon. Retrieved February 11, 2023, from industry.traveloregon.com/wp-content/uploads/2022/05/OR_2021_Final.pdf.

²² Ibid.

²³ Ibid.

Other Characteristics

Land Development and Ownership

Lincoln County is designated as a rural county by the Oregon Economic Development Association. Urban areas exist predominantly along the coastline within the Highway 101 corridor, with coastal tourism greatly contributing to population growth along the ocean. Smaller rural communities and rural residential areas coincide with agricultural areas, which exist primarily along major rivers throughout the county.

The county is approximately two-thirds privately owned (407,069) and one-third publicly owned (222,867), with less than 1% tribal lands (3,862). Most of the county is made up of forestland.

Table 4.2. Land Ownership Categories in Lincoln County

| Type of Landowner | Total Acres | Percent of Total Land |
|--------------------------------------|----------------|-----------------------|
| Total | 629,936 | 100% |
| Private Lands | 407,069 | 65% |
| <i>Privately Owned</i> | <i>399,628</i> | <i>64%</i> |
| <i>Conservation Easement</i> | <i>7,441</i> | <i>1%</i> |
| Federal Lands | 194,713 | 31% |
| <i>U.S. Forest Service</i> | <i>174,020</i> | <i>28%</i> |
| <i>Bureau of Land Management</i> | <i>20,192</i> | <i>3%</i> |
| State Lands | 24,292 | 4% |
| <i>State Trust Lands</i> | <i>5,591</i> | <i>1%</i> |
| <i>Oregon Department of Forestry</i> | <i>18,701</i> | <i>3%</i> |
| Tribal Lands | 3,862 | 1% |

Source: Headwaters Economics (2018). *A Profile on Land Use*. <https://headwaterseconomics.org/apps/economic-profile-system/41041>.

Natural Resources

Vegetation

Vegetation in Lincoln County is a mix of forestland, riparian, and agricultural ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the vegetation of the area. As

Table 4.3 demonstrates, Douglas-fir/western hemlock/western red cedar forest is currently the most represented cover type in Lincoln County at 41% of the total land base, followed by mixed conifer/mixed deciduous forest at 28%.

Table 4.3. Vegetative Cover Types in Lincoln County

| Vegetative Cover | Acres | Percent |
|--|----------------|-------------|
| Douglas-fir/western hemlock/western red cedar forest | 260,718 | 41% |
| Mixed conifer/mixed deciduous forest | 180,072 | 28% |
| Grass-shrub-sapling or regenerating young forest | 101,798 | 16% |
| Sitka spruce-western hemlock maritime forest | 60,057 | 9% |
| Urban | 14,956 | 2% |
| Agriculture | 7,107 | 1% |
| Red alder forest | 5,808 | 1% |
| Open water | 4,033 | 1% |
| NWI palustrine shrub land | 953 | < 1% |
| Total | 635,502 | 100% |

Source: Analysis conducted by Lincoln County Fire Defense Board for development of 2018 Lincoln County CWPP.

Note: The total acreage in this table differs slightly from Table 4.2 due to the use of satellite data instead of land use data.

Impact of Fire on the Ecosystem

Lincoln County is a diverse ecosystem with a complex array of vegetation, wildlife, and fisheries that have developed with, and adapted to fire as a natural disturbance process. Nearly a century of wildland fire suppression coupled with past land-use practices (primarily timber harvesting and agriculture) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. As a result, some forests in Lincoln County have become more susceptible to large-scale, high-intensity fires. This poses a threat to human life and property, as well as wildlife, plant life, and other natural resources. High-intensity, stand-replacing fires have the potential to seriously damage soils, native vegetation, and fish and wildlife populations.

Rivers, Wetlands, and Estuaries

The Alsea, Salmon, Siletz, Siuslaw, Yachats, and Yaquina rivers are typical coastal streams, with their principal headwaters in the Coast Range. They flow down steep gradients until the lower reaches, where they flatten and meander through relatively narrow valleys. Each river has a broad, shallow bay at its mouth, and most have silted estuaries with tidewater extending inland. Many estuaries and coastal wetlands have been modified for agricultural production, municipal use, and other purposes. Modifications include dikes, levees, drainage ditches, and tide gates.

Most of the soils in the area are formed from sedimentary rock. They are highly productive timber soils, but are unstable, and prone to landslides. Other soils are derived from igneous rock formations. Along streams and rivers in their lower reaches, most soils formed from alluvial deposits.

Water Supply

Most of the surface water supply in this area is provided by rainfall. Only a small portion of surface water is supplied by snowmelt. As a result, there is a great deal of variability in annual flows, with flows in the winter greatly exceeding summer flows. Because of the fine-grained and relatively impermeable rock formations in the Mid-Coast, groundwater supplies are generally low. Sand dunes and alluvial deposits yield the most groundwater.

Consumptive uses of water include irrigation, mining, industrial, domestic, and municipal use. Non-consumptive uses include recreation, fish and wildlife habitat, and hydropower.

Water Quality

While water quality in the Mid-Coast Area is generally good, the 2010 303(d) statewide list evaluating water quality in Oregon's surface waters identified eighty stream segments that did not meet state standards for temperature. Several lakes and sloughs within the area did not meet state standards for aquatic weeds or algae. Segments of the Alsea River, Salmon River, Yaquina River, and Siuslaw River were placed on the list because of low dissolved oxygen levels. Several segments in the Siuslaw sub-basin and Elk Creek in the Yaquina watershed were placed on the 303(d) list for sedimentation.

There are many potential causes for the water quality problems identified in the area, including runoff from forest and agricultural lands, runoff from roads, erosion from streambanks and roadsides, waste disposal sites, discharges from wastewater treatment plants, leaking septic systems, application of wastewater on agricultural lands, and erosion from home building and development. Re-routing of runoff via road building, construction, and land surfacing (such as parking areas) can lead to excessive erosion or pollutant transport. Increased heat input due to vegetation removal, seasonal flow reduction, changes in channel shape, and floodplain alteration are also potential sources of water quality impairments.

Other water quality concerns exist in the Mid-Coast Area in addition to 303(d) listed problems. In several water bodies, lead from fishing lures has become a water quality concern. Lead inputs have been estimated to be as high as 40 pounds per river or stream mile per week in heavily fished areas of Lake Creek in the Siuslaw watershed. Some of the lead can dissolve and become bound in organic materials, eventually forming a fine layer on the creek bottom. Further investigation is underway to determine whether, if a disturbance stirs up the creek bottom, organic-bound lead can again become bio-available. Oil and fuel spills or improperly disposed petroleum products around farm buildings are a water quality concern, especially because of the high rainfall in the area and likelihood of runoff to water bodies.

Recent monitoring has identified both bacteria and dissolved oxygen problems that the DEQ indicates may lead to future listings on the 303(d) list for North and South Fork Beaver Creek in the Alsea sub basin. This important salmon stream has had dissolved oxygen values down to 1 mg/liter, which is not adequate to support aquatic life. The dissolved oxygen standard, in the area, ranges from a high of 11 mg/liter for water bodies identified as salmon spawning to a low of 8mg/liter for supporting cold water aquatic life and 6.5 mg/liter in the estuaries.

Air Quality

The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides.

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority governing air resource management. The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, the Organization for Air Quality Protection Standards (OAQPS) is responsible for setting the NAAQS standards for pollutants which are considered harmful to people and the environment. OAQPS is also responsible for ensuring these air quality standards are met, or attained (in cooperation with state, Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources.

Smoke from wildfire and prescribed fire negatively impacts communities and their airsheds. Large-scale influences include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. At a smaller scale, topography and vegetation cover also affect air movement patterns. Locally adverse conditions can result from occasional wildland fires in the summer and fall, and prescribed fire and agricultural burning in the spring and fall.

Due principally to local wind patterns, air quality in Lincoln County is generally good, rarely falling below Oregon Department of Environmental Quality standards. Emissions from motor vehicles are the primary cause of local air and noise quality degradation. Occasional intrusions of smoke from field and slash burning and the use of wood stoves also occur. Backyard burning has been banned in several communities (including Lincoln City) due to smoke complaints.

Aquatic Species and Wildlife

Many species in Lincoln County depend on aquatic habitats. Native anadromous fish include Fall Chinook salmon, Coho salmon, Chum salmon, Winter Steelhead, sea run cutthroat trout, shad, smelt, Pacific and Western River lamprey, and green and white sturgeon. Spawning and rearing grounds for these fish are found throughout the Mid-Coast Area. Agricultural runoff can also affect water quality in estuaries, which include estuarine rearing marine fishes such as Pacific herring, English sole, starry flounder, red-tailed surfperch, and ling cod as well as Dungeness crab. The Oregon Coastal Coho was listed as threatened under the Endangered Species Act on May 12, 2008. Other aquatic vertebrates in the area include seals, beaver, wood duck, hooded and common merganser, speckled dace, sculpin, Pacific tree frog, red-legged frog, western pond turtle, and Pacific giant salamander. Non-native aquatic species include nutria, shad, bass, perch, and bullfrog. Migratory waterfowl and shorebirds are seasonally abundant throughout the area.

Terrestrial species include mountain lion, black bear, Roosevelt elk, black-tailed deer, coyote, several birds of prey, and a variety of resident and neo-tropical migratory songbirds. Several of these species are of tremendous importance to the function of terrestrial or aquatic ecosystems, and significantly affect nutrient cycling, type and quality of habitats, populations of other species, and other factors.

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Chapter 5: Risk and Preparedness Assessment

Wildland Fire Characteristics

An informed discussion of fire mitigation must include an understanding of the basic concepts of fire behavior. Wildland fire behavior describes both the way fuels ignite and how fire spreads across the landscape. The three major physical components that determine fire behavior are:

1. **Climate**, weather, and atmospheric conditions during a fire event;
2. **Topography** in which the fire is burning; and
3. **Fuels** supporting the fire.

At the landscape level, both topography and weather are beyond human control. Winds, temperature, relative humidity, atmospheric instability, slope, aspect, elevation, and landforms cannot be manipulated to effectively alter fire behavior. Attempts to alter how fires burn must concentrate on fuels which support the fire, the third component of the fire environment. The best opportunity to affect how fires burn is by altering fuel loading and fuel continuity across the landscape. A brief description of the three key environmental elements follows.

Climate

Weather conditions contribute significantly to determining fire behavior. Wind, moisture, temperature, and relative humidity ultimately determine the rates at which fuels dry and vegetation cures, and whether fuel conditions become dry enough to sustain an ignition. Once conditions can sustain a fire, atmospheric stability and wind speed and direction can have a significant effect on fire behavior. Winds fan fires with oxygen, increasing the rate at which fire spreads across the landscape. Additionally, the effects of climate change have begun to become apparent in the local fire season. Trends have shown rising temperatures throughout the year, causing fire seasons to begin earlier, and last longer, with more extreme high temperatures and more extreme low humidity measurements. This shift allows fuels to cure for longer periods of time throughout the summer months and as a result, increased periods of high fire danger during the summer months occur.²⁴

Weather is the most unpredictable component governing fire behavior, constantly changing in time and across the landscape. In Lincoln County, these effects have already begun to manifest through more severe drought and east wind events – both of which lead to increased wildfire risk and intensity. Table 5.1 shows the length of Oregon’s wildfire season from 2011 to 2022.

²⁴ Oregon Climate Change Research Institute (2023). *Sixth Oregon Climate Assessment*. Oregon State University. <https://blogs.oregonstate.edu/occri/oregon-climate-assessments/>.

Table 5.1. Length of Wildland Fire Season in Oregon, 2011-2022.

| Year | Fire Season Start Date | Fire Season End Date | Length of Fire Season (Days) |
|------|------------------------|----------------------|------------------------------|
| 2022 | July 11th | November 1 | 113 |
| 2021 | May 15 | January 12 | 242 |
| 2020 | July 9 | December 3 | 177 |
| 2019 | May 25 | October 1 | 99 |
| 2018 | June 1 | October 29 | 151 |
| 2017 | June 1 | October 20 | 142 |
| 2016 | July 5 | October 4 | 91 |
| 2015 | June 16 | October 26 | 132 |
| 2014 | July 1 | October 14 | 105 |
| 2013 | July 2 | September 25 | 85 |
| 2012 | July 11 | October 16 | 97 |
| 2011 | July 11 | October 3 | 84 |

Source: Northwest Interagency Coordination Center (2023). *NWCC Annual Fire Report Archive*. <https://gacc.nifc.gov/nwcc/admin/publications.aspx>. Data compiled from Annual Reports by OPDR and Lincoln County FDB.

Topography

Fires burning in similar fuel conditions burn very differently under varying topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influence vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. North slopes tend to be cooler, wetter, and more productive for vegetative growth. These conditions can lead to heavy fuel accumulations, with high fuel moistures, later curing of fuels, and lower rates of spread. In contrast, south and west slopes tend to receive more direct sun, and thus have the highest temperatures, lowest soil and fuel moistures, and lightest fuels. The combination of light fuels and dry sites leads to fires that typically display the highest rates of spread. South and west slopes also tend to be on the windward side of mountains. Thus, these slopes tend to be “available to burn” for a significantly greater portion of the year.

Slope also plays a significant role in fire spread, by allowing preheating of fuels upslope of the burning fire. As slope increases, rate of spread and flame lengths tend to increase. Therefore, we can expect the fastest rates of spread on steep, warm south and west slopes with fuels that are exposed to the wind.

Fuels

Fuel is any material that can ignite and burn. Fuels describe any organic material, dead or alive, found in the fire environment and includes grasses, brush, branches, logs, logging slash, forest floor litter, conifer needles, and buildings. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size and shape, moisture content, and continuity and arrangement all influence fire behavior. Generally, the smaller and finer the fuels, the faster the potential rate of fire spread. Small fuels such as grass, needle litter and other fuels less than a quarter inch in diameter are most responsible for fire spread. In fact, “fine” fuels, with high surface to volume ratios, are considered the primary carriers of surface fire. This is apparent to anyone who has ever witnessed the speed at which grassfires burn. As fuel size increases, the rate of spread tends to decrease due to a decrease in the surface to volume ratio. Fires in large fuels generally burn at a slower rate but release much more energy and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control. Thus, it is much easier to control a fire burning in grass than to control a fire burning in timber.

When burning under a forest canopy, the increased intensities can lead to torching (single trees becoming completely involved) and potential development of crown fires. That is, they release much more energy. Fuels are found in combinations of types, amounts, sizes, shapes, and arrangements. It is the unique combination of these factors, along with the topography and weather, which determines how fires will burn.

The study of fire behavior recognizes the dramatic and often-unexpected effect small changes in any single component have on how fires burn. It is impossible to speak in specific terms when predicting how a fire will burn under any given set of conditions. However, through countless observations and repeated research, some of the principles that govern fire behavior have been identified and are recognized.

History of Major Fires

Significant 19th century fires in Oregon include the 1849 Siletz Fire and the 1865 Silverton Fire, which consumed 800,000 and 988,000 acres of wildland, respectively. In the 20th century, four major fires known as the Tillamook Burn occurred between 1933 and 1951, with each fire consuming between 180,000 and 240,000 acres. In 1987, the Silver Fire burned 97,000 acres. Recent major fires include the 2002 Biscuit Fire that burned nearly 500,000 total acres (about 471,000 acres in Oregon and nearly 29,000 acres in California), the 2003 B&B Complex fire that burned 90,769 acres, and the 2020 fire season in Oregon that burned 1,141,613 acres.²⁵

In recorded history, there have only been a few major fires threatening land in Lincoln County: the Siletz Fire (1849), the Tillamook Burn (1933-1951), the Big Creek Fire (1936), the Shady Lane Fire (1987), the Rockhouse Creek Fire (1987), and, most recently, the Echo Mountain Fire (2020).

²⁵ Northwest Interagency Coordination Center (2021). *Northwest Annual Fire Report 2020*. https://gacc.nifc.gov/nwcc/content/pdfs/archives/2020_NWCC_Annual_Fire_Report.pdf.

1933-1951 Tillamook Burn

The Tillamook Burn is the collective name for a series of large fires that struck at six-year intervals between 1933 and 1951, burning a total of 355,000 acres. The fires had profound environmental, economic, and social repercussions for the coastal counties of northwest Oregon. The logging industry, a mainstay of local economies, ground to a halt. Rivers were choked with debris, while seed cones –the genetic blueprint for new forests – were annihilated.

In the decades since the fires, foresters, professional tree planters, and volunteers have worked to reestablish the forest and its many resources. Oregon voters passed a constitutional amendment in 1948 authorizing \$12 million in bonds to rehabilitate the land. During this reforestation project, helicopters were used for the first time for large-scale aerial seeding. On the ground, forestry crews, prison inmates and school groups planted trees by hand. In total, more than 72 million seedlings were planted, revitalizing the burned landscape. In 1973, the Tillamook Burn area was officially renamed the Tillamook State Forest by Governor Tom McCall.

1987 Fire Season

The fire season of 1987 started three weeks earlier than normal, lasted longer than any season on record, and resulted in fires in California and Oregon that were historic in both magnitude and duration. It was the third season in a row of below-normal rainfall. Through October, six new fires were reported daily throughout the state of Oregon. The Deputy State Forester announced that ODF was closing 10.3 million acres of state-protected forestlands west of the Cascades due to the extreme fire emergency, lack of rainfall, and unseasonably high temperatures. Any entry into the forest was by permit only. A closure of this type hadn't been ordered since 1967.

These fires were the largest ever experienced in the West Oregon District and the first time the District hosted a statewide fire team. Fires burned over 194,000 acres in Oregon, with suppression costs climbing to more than \$31 million. Though most of the fires were under control by the end of October, it was, at the time, the largest firefighting effort in state history.

2020 Fire Season

The fire season of 2020 – also known as the Labor Day fires, as they occurred shortly after the holiday in September – contained the most destructive series of wildfires in state history. Combined, wildfires in eleven counties burned more than 1.2 million acres of land in Oregon, destroyed over 5,000 homes and businesses, forced 40,000 Oregonians to evacuate their homes, and claimed nine lives. These wildfires were fueled by prolonged dry conditions, severe drought, unusually high temperatures, and a series of historic wind events (including severe east winds along coastal Oregon). Together, the fires resulted in hazardous conditions across the state, including rock falls, landslides, and hundreds of thousands of hazardous trees, as well as substantial structural destruction to several state highways.²⁶

²⁶ Oregon Debris Management Task Force (2022, July). *2020 Labor Day Wildfires: Hazard Tree and Debris Removal Operations After Action Report*. Oregon Department of Transportation. <https://wildfire-auth.oregon.gov/Documents/DMTF%20After%20Action%20Report.pdf>.

2020 Echo Mountain Complex Fire

Lincoln County experienced one major fire during the 2020 fire season: the Echo Mountain Complex fire. This burn began in the Otis and Rose Lodge communities east of Lincoln City during the night of September 7, 2020. It was caused by the same conditions as fires throughout the rest of the state: prolonged dry conditions, severe drought, unusually high temperatures, and a series of historic east wind events moving through river corridors.²⁷ By the time the fire was contained on September 21, it had burned 2,552 acres, destroyed 288 homes and 399 additional structures, and caused thousands of county residents to evacuate their homes. Over 600 firefighters from Lincoln County fire agencies, neighboring county's fire agencies, the Oregon Department of Forestry (ODF), several out-of-state fire agencies, and volunteer homeowners and large forestland owners worked together to contain the fire.²⁸

After the fire, hundreds of volunteers working with a wide array of groups – ranging from Echo Mountain Fire Relief and the Cascade Relief Team at the Salmon River Grange to local businesses and hotels – jumped into action. Together, these individuals provided immediate and long-term lodging, food, resources, and logistical support to fire survivors. The #OtisStrong campaign that emerged from these actions continues to support Echo Mountain Complex fire survivors today.²⁹

The prevalence of many homes in WUI areas, along with severe power losses due to Public Safety Power Shutoffs (PSPSs) initiated by local utility companies, increased the severity of the wildfire's impact.³⁰ However, as of the completion of this 2023 CWPP update, the official cause of the Echo Mountain Complex fire remains under investigation by ODF.³¹

Historic Fire Regime

Historical variability in fire regime is a conservative indicator of ecosystem sustainability; thus, understanding the natural role of fire in ecosystems is necessary for proper fire management. Fire is one of the dominant processes in terrestrial systems that constrain vegetation patterns, habitats, and species composition. Land managers need to understand historical fire regimes, the fire return interval (frequency) and fire severity prior to settlement by Euro-Americans, to be able to define ecologically appropriate goals for an area. Many assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect ecosystems in the present and future.

²⁷ Northwest Interagency Coordination Center (2021). *Northwest Annual Fire Report 2020*. https://gacc.nifc.gov/nwcc/content/pdfs/archives/2020_NWCC_Annual_Fire_Report.pdf.

²⁸ Explore Lincoln City (2021). *Reflecting on Echo Mountain Fire*. Oregon Coast. <https://www.oregoncoast.org/blog/reflecting-on-echo-mountain-fire/>.

²⁹ Ibid.

³⁰ Oregon Office of Emergency Management (n.d.). *2020 Oregon Wildfire Spotlight*. <https://storymaps.arcgis.com/stories/6e1e42989d1b4beb809223d5430a3750>.

³¹ Oregon Department of Forestry (2023). *Fire investigations*. Retrieved November 28, 2023, from <https://www.oregon.gov/odf/fire/pages/investigations.aspx>.

Historic fire regimes are a critical component for characterizing the historical range of variability in fire-adapted ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

Table 5.2 shows the amount of acreage in each defined fire regime in Lincoln County. The historic fire regime model in Lincoln County shows that three-quarters (76%) of the county has very long fire return interval (200+ years). Large fires are not expected to occur often; however, when they do occur, fires will tend to burn very intensely and be difficult to suppress. There is a high likelihood that fires in the county will be forest stand-replacing. The transition zone between the valley bottoms and forestlands on the east side of the Coast Range historically experienced low and mixed severity fires; however, the return interval is more frequent (35 – 200 years).

Table 5.2. Assessment of Historic Fire Regimes in Lincoln County

| Description | Acreage | Percent |
|--|----------------|-------------|
| Less than 35 Year Fire Return Interval, Low and Mixed Severity | 23 | <1% |
| Less than 35 Year Fire Return Interval, Replacement Severity | 5,288 | 1% |
| 35 - 200 Year Fire Return Interval, Low and Mixed Severity | 48,248 | 8% |
| 35 - 200 Year Fire Return Interval, Replacement Severity | 77,333 | 12% |
| Greater than 200 Year Fire Return Interval, Any Severity | 481,986 | 76% |
| Water | 10,478 | 2% |
| Snow/Ice | 1 | <1% |
| Barren | 1,636 | <1% |
| Total | 635,502 | 100% |

Source: Analysis conducted by Lincoln County Fire Defense Board for development of 2018 Lincoln County CWPP.

Fire Regime Condition Class

A natural fire regime is a classification of the role fire would play across a landscape in the absence of mechanical intervention but including the influence of indigenous fire practices.³² A fire regime condition class (FRCC) is a classification of the amount of departure from this natural fire regime. The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central historical tendency. This tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and

³² LANDFIRE Program (n.d.). *Fire Regime Condition Class (FRCC)*. USDA. <https://www.landfire.gov/frcc/frcchome.php>.

mosaic pattern); fuel composition; and fire frequency, severity, and pattern. Low departure is within the historical range of variability, while moderate and high departures are outside.³³

An analysis of Fire Regime Condition Classes in Lincoln County by the Lincoln County Fire Defense Board (see Table 5.3) shows that a significant portion of the county is either moderately (44%) or severely (12%) departed from its natural fire regime and associated vegetation and fuel characteristics. In most scenarios, the more departed an area is from its natural fire regime, the higher the wildfire potential. Many of the forestland areas on the east side of the Coast Range in Lincoln County are in Condition Class II due to successful fire suppression efforts over the past 100 years. Forestlands along the western front of the Coast Range have not experienced a significant departure from the historical range of variability.

Table 5.3. Assessment of Fire Regime Condition Classes in Lincoln County

| Condition Class | Acreage | Percent |
|--------------------------------------|----------------|-------------|
| Condition Class 1 (Low Departure) | 257,385 | 40% |
| Condition Class 2 (Medium Departure) | 277,456 | 44% |
| Condition Class 3 (High Departure) | 73,789 | 12% |
| Water | 10,478 | 2% |
| Snow/Ice | 1 | <1% |
| Urban | 8,512 | 1% |
| Barren | 1,636 | <1% |
| Agriculture | 6,244 | 1% |
| Total | 635,502 | 100% |

Source: Analysis conducted by Lincoln County Fire Defense Board for development of 2018 Lincoln County CWPP.

Wildfire Ignition Profile

The Oregon Department of Forestry (ODF) maintains a statewide database of all wildfires that occur on ODF-protected lands. This does not include fires in areas covered only by local fire agencies or areas where federal agencies (i.e., the U.S. Forest Service) have fire suppression responsibility. While the Oregon Department of the State Fire Marshall does maintain a database of fires reported by local fire agencies, the Lincoln County Fire Defense Board does not consider this data reflective of wildland fire occurrences in the county due to reporting scheme differences.

Table 5.4 shows the occurrence of wildland fire ignitions in Lincoln County from 2000-2022 using the ODF statewide database. An analysis of this data indicates that during this period, Lincoln County experienced 253 fires burning a total of 3,241 acres, an average of 13 acres burned per

³³ Powell, D. C. (2016, December). Fire Regime Condition Class Queries. USDA Forest Service Pacific Northwest Region: Umatilla National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd716468.pdf.

fire. Note that the database is significantly skewed by the 2020 Echo Mountain Complex fire and the associated Kimberling Mountain ignition, which burned over 2,000 acres combined.

Table 5.4. Summary of Ignitions on ODF-Protected Land in Lincoln County, 2000-2022

| Cause | Number of Ignitions | Percent of Ignitions | Total Acres Burned | Percent of Acres Burned |
|----------------------|---------------------|----------------------|--------------------|-------------------------|
| Recreation | 95 | 38% | 41 | 1% |
| Debris Burning | 68 | 27% | 637 | 20% |
| Equipment Use | 41 | 16% | 629 | 19% |
| Miscellaneous | 20 | 8% | 8 | < 1% |
| Smoking | 16 | 6% | 42 | 1% |
| Lightning | 7 | 3% | 3 | < 1% |
| Arson | 3 | 1% | 1 | < 1% |
| Under Investigation* | 1 | < 1% | 1,879 | 58% |
| Railroad | 1 | < 1% | 1 | < 1% |
| Juveniles | 1 | < 1% | < 1 | < 1% |
| Total | 253 | 100% | 3,241 | 100% |

Source: Oregon Department of Forestry (2023). *Oregon Department of Forestry Fire History 2000-2022*. Retrieved November 29, 2023, from <https://data.oregon.gov/stories/s/ODF-Fire-History-2000-2022-Dashboard/92y3-mdk3/>. Analysis conducted by OPDR.

*Note: This fire is the 2020 Echo Mountain Complex fire. As of the completion of this 2023 CWPP update, the official cause remains under investigation by ODF.³⁴

Within the ODF protection area, 97% of the fires between 2000 and 2022 were human-caused, while 3% were lightning-caused. Most ignitions were caused by recreation, debris burning, and equipment use, though many of these fires were limited to fewer than one acre. Except for one fire still under investigation by ODF, debris burning and equipment use resulted in the most acres burned. To reduce these types of fires, local fire agencies and the Lincoln County Fire Defense Board have imposed a burn ban during ODF’s closed fire season each summer.

There are three key reasons why the county’s fire risk is higher than suggested above, especially in developing WUI areas. These all factored into the 2020 Echo Mountain Complex fire:

1. Large fires may occur infrequently, but statistically they will occur. One large fire could significantly change the statistics – as the 2020 Echo Mountain Complex fire did.
2. The level of fire hazard depends profoundly on weather patterns. A multi-year drought period would substantially increase the probability of large wildland fires in Lincoln County. For smaller vegetation areas, with grass, brush and small trees, a much shorter drought period of a few months or less would substantially increase the fire hazard.

³⁴ Oregon Department of Forestry (2023). *Fire investigations*. Retrieved November 28, 2023, from <https://www.oregon.gov/odf/fire/pages/investigations.aspx>.

3. The level of fire hazard in WUI areas is significantly higher than wildland areas due both to the greater risk to life and property because of higher population density as well as the increased probability of fires starting (since most county ignitions are human caused).

Wildfire Hazard Assessment

Wildfire risk to forest lands and homes is inseparable. Forest fires can endanger and burn homes. Fires that start as structural fires can quickly spread to the forest. Although the threat of wildfire is not as great in Lincoln County as in other parts of the state, wildfire officials are cognizant of the growing potential. One of the core elements of the CWPP is developing an understanding of the risk and potential losses to life, property, and natural resources during a wildfire to identify and implement the most effective strategies for preventing losses from fire, while allowing natural fires to take their course in shaping a more healthy and sustainable forest. This is done through a comprehensive wildfire hazard assessment map, as demonstrated by Map 5.1.

The Healthy Forests Restoration Act, the National Fire Plan, FEMA’s Disaster Mitigation Act of 2000, the National Association of State Foresters, and Oregon Department of Forestry provide guidance on conducting hazard and risk assessment for wildfire. The CWPP’s wildfire risk assessment followed the methodology of the Oregon Department of Forestry’s Quantitative Wildfire Risk Assessment (QWRE). In addition, Geographic Information Systems (GIS) was used to analyze and integrate the spatial layers of information for fire hazard, risk, location of values, and protection capabilities.

Mapping Methods

The following sections detail how the maps throughout this plan and specifically in Chapter 6: Local Fire Department and District Profiles and Appendix D: Maps were developed. This includes overall wildfire risk, social vulnerability, priority areas for mitigation, and risk to highly valued resources and assets (HVRA). These methods were developed by Michael Coughlan from the Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Overall Wildfire Risk

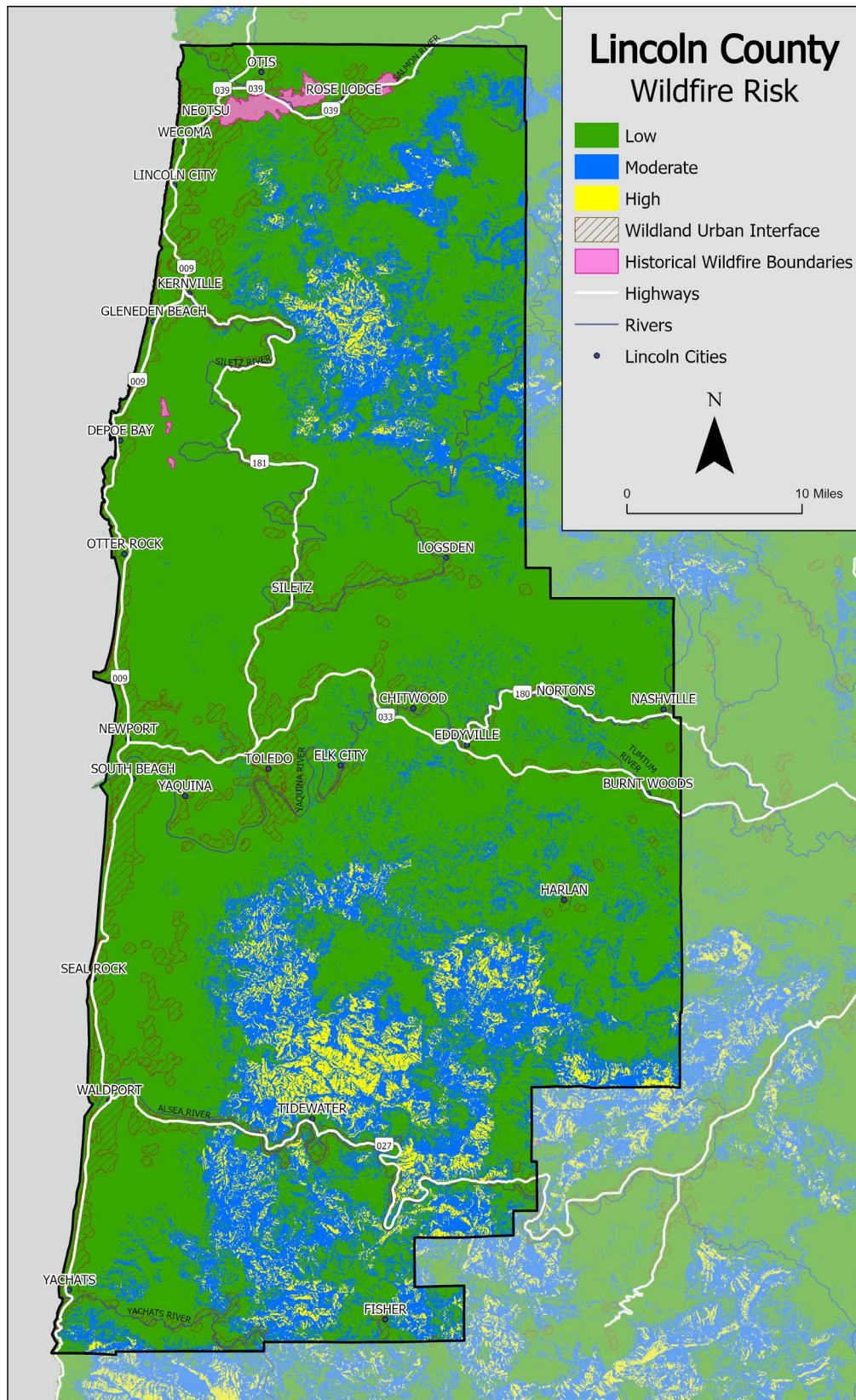
To map the overall wildfire risk for the county, we used an Oregon statewide wildfire risk map created by Oregon State University.³⁵ This wildfire risk map combines annual burn probability with a susceptibility response function based on a spatially explicit model of wildfire intensity (conditional flame length and vegetation type). This means that the data considers both the probability that a fire will occur in a given year and then, if a fire ignites in a given location, how intense we can expect that fire to be based on the vegetation present in that location. Burn probabilities were modeled using FSim³⁶, which considers regional climate patterns, vegetation types, land use and previous ignition patterns. The wildfire intensity modeling process used FlamMap³⁷ and is based on 2022 landscape conditions.

³⁵ Dunn, Christopher J. (2022). *Risk to Potential Structures in Oregon*. Unpublished data. Oregon State University.

³⁶ Missoula Fire Sciences Laboratory (2023). *FSim-Wildfire Risk Simulation Software*. U.S. Forest Service. <https://www.firelab.org/project/fsim-wildfire-risk-simulation-software>

³⁷ Missoula Fire Sciences Laboratory (2023). *FlamMap*. U.S. Forest Service. <https://www.firelab.org/project/flammap>

Map 5.1. Lincoln County Wildfire Risk



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

The resulting wildfire risk value is called expected net value change (eNVC) and can be interpreted as providing the wildfire risk to buildings or structures in any given location. Further, since the risk model assumes that a structure is always present, eNVC is more accurately described as *risk to potential structures*. The concept of risk to potential structures provides added benefit for planning since it can inform risk for planned construction.

Social Vulnerability

The overall vulnerability of people and property to wildfire is conventionally estimated using spatial distribution of the probability of exposure to wildfire hazard. The concept of social vulnerability adds depth to this estimate by accounting for how and why some people are at a disadvantage in comparison to others due to social, economic, or cultural characteristics which make them more vulnerable to harm from specific types of hazards such as wildfires.³⁸

For this CWPP, we created a composite social vulnerability index (SVI) that combined (1) the Oregon State University/Oregon Wildfire Risk Explorer 2020 Social Vulnerability Index (OSU SVI) data for Census County Sub-Divisions, Tracts, and Block Groups³⁹ with (2) free and reduced meal eligibility statistics for elementary schools within Lincoln County. The OSU SVI was created as part of the Oregon’s omnibus wildfire bill (Senate Bill 762) wildfire risk assessment and followed the SVI methodologies developed by Flanagan et al. (2011)⁴⁰ for disaster risk management and has been previously used by the Centers for Disease Control and the Agency for Toxic Substances and Disease Registry to assess social vulnerability at the national level.

We chose to modify the OSU SVI due to reliability issues inherent in the American Community Survey data used to construct the index. Because the American Community Survey variables are estimates, each variable has an associated standard error that can be used to calculate the coefficient of variation (CV) as a proxy for the reliability of the variables for each given unit of analysis (e.g. county sub-divisions, tracts, and block groups). Tabular versions of the OSU SVI data contain a reliability classification based on CV thresholds defined by McKay (2018):⁴¹ Low reliability (unreliable) are CV values over 40 percent indicating that the sampling error is large relative to the estimate, Medium reliability (use with caution) are CV values between 12 and 40 percent, and High reliability (estimate is reliable) are small CVs less than or equal to 12 percent. However, rather than presenting the reliability analysis for each variable used to calculate the SVI, the OSU SVI reliability classification reports the percentage of total indicators in the SVI that are at or above the three reliability thresholds (Low, Medium, High). A fourth reliability class accounts for situations where valid CVs could not be calculated.

³⁸ Coughlan, M. R., Ellison, A., & Cavanaugh, A. (2019). *Social Vulnerability and Wildfire in the Wildland- Urban Interface*. https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_96.pdf.

³⁹ Reilley, C. & Crandall, M. (2022). *Social Vulnerability for the State of Oregon [Data set]*. Oregon State University. <https://doi.org/10.7267/z890s265n>.

⁴⁰ Flanagan, B. E., Gregory, E. W., Hallisey, E. J., Heitgerd, J. L., & Lewis, B. (2011). A Social Vulnerability Index for Disaster Management. *Journal of Homeland Security and Emergency Management*, 8(1). <https://doi.org/10.2202/1547-7355.1792>.

⁴¹ McKay, G. (2018). *The American Community Survey: An ESRI Whitepaper*. ESRI. <http://www.esri.com/library/whitepapers/pdfs/the-american-community-survey.pdf>.

For our modified SVI, we selected block groups, tracts, and county sub-divisions with SVI values where 50 percent or greater of the contributing indicators were in the OSU SVI High or Medium reliability category. We considered sample units with fewer than 50% of indicators at high or medium reliability to be too unreliable to include in the SVI. Thus, our reliability classification eliminated sample units with SVI values that were mostly unreliable. To preserve the highest data resolution, we intersected the sample units with high and medium reliability such that we retained the SVI value of the smallest, reliable sample unit (block group, followed by tract, followed by county sub-division). The resulting layer is thus composed of all three sample units and further contains areas with no reliable SVI.

To fill in the spatial gaps, we intersected the modified OSU SVI with elementary school data on free and reduced-price meal eligibility (F&R). This data provides the percentage of total student enrollment eligible for F&R and serves as a proxy for low-income households (with school-aged children) within the school attendance catchment. While not as holistic as the OSU SVI which is informed by other parameters, it provides a reliable proxy for economically disadvantaged households. To provide a standardized metric comparable with the OSU SVI, we calculated the percentile rank of each elementary school catchment's percent F&R for the entire county.

As a final step, for each polygon created from the intersection of the modified OSU SVI and the elementary school catchments, we compared the OSU SVI with school F&R percentile rank and assigned the greater of the two values to the new composite SVI. We then classified the SVI into four categories (low, low-moderate, moderate-high, high) like the Oregon Wildfire Risk Explorer.

Priority Areas for Mitigation

Prospective priority areas for the county were mapped using a conditional classification method involving three layers: (1) Overall wildfire risk, (2) Wildland-Urban Interface (WUI) status (based on current official State of Oregon definition⁴²), and (3) Social Vulnerability. Priority rankings were developed based on coincident classifications within these three layers (Table 1), resampled at 200m² resolution. For example, priority ranking “1” included 200m² pixels with high or extreme wildfire risk, inside the WUI, and with moderate-high to high social vulnerability. At the other end of the spectrum, priority rank “12” consisted of pixels with low wildfire risk, outside of the WUI, with low to low-moderate social vulnerability. Priority rankings (Table 5.5) were further classified to provide a 5-tier priority classification (highest, high, moderate, low, lowest).

Table 5.5. Priority Area Classifications

| Priority Class | Priority Rank | Wildfire Risk | WUI | Social Vulnerability |
|----------------|---------------|---------------|---------|----------------------|
| Highest | 1 | High | Inside | Moderate-High, High |
| High | 2 | High | Inside | Low, Low-Moderate |
| High | 3 | Moderate | Inside | Moderate-High, High |
| Moderate | 4 | High | Outside | Moderate-High, High |
| Moderate | 5 | Moderate | Inside | Low, Low-Moderate |
| Moderate | 6 | High | Outside | Low, Low-Moderate |
| Moderate | 7 | Moderate | Outside | Moderate-High, High |
| Low | 8 | Moderate | Outside | Low, Low-Moderate |
| Low | 9 | Low | Inside | Moderate-High, High |
| Lowest | 10 | Low | Outside | Moderate-High, High |
| Lowest | 11 | Low | Inside | Low, Low-Moderate |
| Lowest | 12 | Low | Outside | Low, Low-Moderate |

Source: Internal classifications developed by Michael Coughlan from the Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Risk to Highly Valued Resources and Assets (HVRA)

To map specific risk to highly valued resources and assets (HVRA), we relied on the 2023 update to the Quantitative Wildfire Risk Assessment (QWRA) for the Pacific Northwest.⁴³ Burn probabilities and wildfire severity were modelled for the 2023 QWRA using processes similar to Overall Wildfire Risk. These models are then applied to HVRA to map HVRA-specific risks.

⁴² OSU Wildfire Risk Mapping (2023). *What is a Wildland-Urban Interface*. Oregon State University. <https://osuwildfireriskmap.forestry.oregonstate.edu/mapping-wildland-urban-interface>.

⁴³ Full documentation of methods for the 2023 update to the Pacific Northwest QWRA is forthcoming. For more information, see <https://storymaps.arcgis.com/stories/b4cd7ed4acf24eb592256bba5eb7ba5>.

Conditional net value change maps show the estimated change in a resource’s value if a wildfire were to occur. Thus, conditional net value change can show high loss even if the actual risk of a wildfire igniting is low. Both negative and positive effects are mapped. Expected net value change shows estimated change in the resource’s value if a wildfire were to occur weighted by the probability of a fire occurring (also known as the burn probability). Thus, even if the conditional net value change is high, expected net value change can be low, if the probability of wildfire occurring is low.

The following integrated maps are included in Appendix D: Maps:

- Map D.1. Integrated Conditional Net Value Change
- Map D.2. Integrated Expected Net Value Change
- Map D.3. People and Property Conditional Net Value Change
- Map D.4. Drinking Water Conditional Net Value Change
- Map D.5. Timber Conditional Net Value Change

HVRAs provided in the integrated maps include the following:

- People and Property
- Infrastructure
- Timber
- Drinking Water
- Agriculture
- Recreation Infrastructure
- Ecological Integrity
- Wildlife Habitat

Lincoln County’s Wildland Urban Interface

The wildland-urban interface (WUI) has gained attention through efforts targeted at wildfire mitigation; however, this analysis technique is also useful when considering other hazards because the concept looks at where people and structures are concentrated in any region.

A key component in meeting the underlying need for protection of people and structures is the protection and treatment of hazards in the wildland-urban interface. The WUI refers to areas where wildland vegetation meets urban developments or where forest fuels meet urban fuels such as houses. The WUI encompasses not only the immediate interface (areas immediately adjacent to urban development), but also the surrounding vegetation and topography.

Potential WUI Treatments

The definition and mapping of the WUI enables the creation of a planning tool to identify where structures, people, and infrastructure are in reference to each other. This analysis tool does not include a component of fuels risk. There are many reasons to map and analyze these two components separately (population density vs. fire risk analysis). Primary among these reasons is

the fact that population growth often occurs independent from changes in fire risk, fuel loading, and infrastructure development. Thus, making the definition of the WUI dependent on all of them would eliminate populated places with a perceived low level of fire risk today, which may in a year become an area at high risk due to forest health issues or other concerns.

By examining these two tools separately, a planner can see where the combination of population density overlays areas of high current fire risk and then act to reduce fuels, improve readiness, directly address factors of structural ignitability, improve initial attack success, mitigate resistance to control factors, or – more often – execute a combination of these approaches.

The WUI layer in Map 5.1 was created using data from Oregon Wildfire Risk Explorer, updated with the new WUI definition found in Oregon Administrative Rule (OAR) 629-044-1011:

1. The WUI is a geographic area comprised of tax lots or portions of tax lots that includes an average density of one structure or other human development per 40 acres and either:
 - a. Meets with wildland or vegetative fuels; or
 - b. Intermingles with wildland or vegetative fuels; or
 - c. Is an occluded geographical area.
2. The WUI also includes:
 - a. Lands identified within an urban growth boundary or unincorporated community boundary by local comprehensive plans that meet the criteria in (1)(a); or
 - b. A planned development, within the urban growth boundary or unincorporated communities, that is not identified in 1(a) but that is approved for development that meets the criteria 1(a)
3. If multiple structures or other human developments are located on a single tax lot, then the totality will be considered a single structure or other human development.
4. Each tax lot in the State of Oregon shall be assigned a wildfire risk classification in accordance with 629-044-1020.

It should not be assumed that just because an area is identified as being within the WUI, it will therefore receive treatments because of this identification alone. Nor should it be implicit that all WUI treatments will be the application of the same prescription. Instead, each location targeted for treatments must be evaluated on its own merits: factors of structural ignitability, access, resistance to control, population density, resources and capabilities of firefighting personnel, and other site-specific factors.

It should also not be assumed that WUI designation on national or state forest lands automatically equates to a treatment area. The Forest Service, Bureau of Land Management, and Oregon Department of Forestry are still obligated to manage lands under their control according to the standards and guides listed in their respective forest plans and laws. The adopted forest plan has legal precedence over the WUI designation until such a time as the forest plan is revised to reflect updated priorities.

Most treatments begin with a home evaluation, covering the implicit factors of structural ignitability (roofing, siding, deck materials) and vegetation within the treatment area of the structure. However, treatments in the low population areas of rural lands may look closely at access (two ways in and out) and communications through means other than land-based

telephones. On the other hand, a subdivision with densely packed homes surrounded by forests and dense underbrush may receive more time and effort implementing fuels treatments beyond the immediate home site to reduce the probability of a wildfire entering the subdivision.

Lincoln County Conditions

The Oregon Coast Range, bounded by the Pacific Ocean to the west and the Willamette Valley to the east, supports some of the densest forests in North America. This region is generally low elevation, with ridge systems 1,000 to 2,000 feet in elevation. Due to the ocean, these forests are warmer and more productive than the Cascade Range and central Oregon forests. In the summer, humid maritime air creates a moisture gradient from the coastal western hemlock-Sitka spruce zone – with periodic fog extending two to six miles inland – through Douglas-fir-western hemlock forests in the central zone, to the drier interior valley foothill zone of the Douglas-fir, Bigleaf maple, and Oregon oak. High leaf areas give rise to large amounts of live fuels, while the warmth and moisture leads to high decomposition rates of dead fuels. Prolonged, dry east winds play an important role in curing and drying live fuels. With continued drought, live fuels become dry enough to be a significant heat source instead of a heat sink when burning. Under these conditions, fires can be very intense, especially when fanned by warm, dry east and north winds.

Very large fires were the main disturbance agents of the Oregon Coast Range. These historic fires often burned more than 100,000 acres in a single year creating large patches that dominated the structure of the natural Coast Range landscape. Estimates of mean fire intervals in this region average in the range of 200 years with the largest intervals represented by the coastal western hemlock-Sitka spruce zone. However, once a fire occurred, the same area could re-burn at short intervals. Some portions of the Tillamook Burn burned four times in 19 years.

Land use changes including timber management, development, and fire suppression have replaced large fires as the agent of change and renewal in the coastal forest. Under the present disturbance regime, harvest rotations in managed forests have been about 45-60 years on private land and 60-70 years on government lands managed for timber.

Young, Coast Range forests may be more susceptible to fire than older forests because they revegetate rapidly to dense stands of shrubs and trees with large amounts of fine, interwoven foliage close to the ground. In contrast, pole and mature stands often have canopies elevated from surface fuels with gaps in the canopy.⁴⁴

Areas subject to wildland-urban interface (WUI) fires have very different fire hazard characteristics. The defining WUI area trait is that structures are built in areas with essentially continuous (and often high) vegetative fuel loads – areas that are subject to wildland fires. When fires occur in such areas, they tend to spread quickly and structures in these areas may become little more than additional fuel sources. The siting of homes has also changed over time. Historically, pioneering families built their homes in lowlands, close to water and the fields they intended to work. In the last several decades, rural homes have increasingly been built in

⁴⁴ Means, J. et al. (1996). *Forests of the Oregon Coast Range – Considerations for Ecological Restoration*. U.S. Forest Service. https://www.fs.usda.gov/rm/pubs_int/int_gtr341/int_gtr341_068_071.pdf.

locations chosen because of the view or other amenities. Thus, many newer homes are in locations more difficult to defend against wildland fires.

Fire risk to structures and occupants in wildland-urban interface areas is high due to high vegetative fuel loads and limited fire suppression resources compared to urban or suburban areas. Homes in wildland-urban interface areas are most commonly on wells rather than on municipal water supplies, which limits the availability of water for fire suppression. Less availability of water resources makes it more likely that a small wildland fire or a single structure fire will spread before it can be extinguished.

Fire suppression depends on two important factors: availability of fire suppression resources and access. Fire suppression resources include firefighting personnel, equipment, apparatus, and water and chemical fire suppressants. The greater the availability of these resources, the more likely it is that a fire will be contained quickly. Fire suppression also depends on access. Fires in remote areas without ground access are more difficult to fight and thus harder to contain than are fires in areas with unimproved or improved roads. Access and effective response are partially a function of land management objectives. Lands managed for natural conditions where roads have not been built or the existing roads have been obliterated, tend to have a much poorer fire suppression response than commercial forestlands where road systems are maintained.

In many areas of Lincoln County, narrow winding roads, dead end driveways, and inadequate bridges impede access by firefighting apparatus. As with water supplies, the lower availability of firefighting personnel and apparatus and longer response times increase the probability that a small wildland fire or a single structure fire will spread.

Developments in WUI areas face high fire risk because of the combination of high fire hazard (high vegetative fuel loads) and limited fire suppression capabilities. Occupants in many WUI areas also face high life safety risk, especially from large fires that may spread quickly. Life safety risk in interface areas is often exacerbated by limited numbers of roads (in the worst case only one access road) that are often narrow and winding and subject to blockage by a wildland fire.

Life safety risk in WUI areas is also increased by homeowners' reluctance to evacuate homes quickly. Instead, homeowners often try to protect their homes with whatever fire suppression resources are available. Without proper training and preparedness, such efforts generally have little effectiveness. Homeowners who delay evacuation may place their lives in jeopardy.

Developments in WUI areas face a range of risk factors. Developments that have all or most of the following attributes are at the highest level of risk:

- Location in or surrounded by heavy fuel loads with a high degree of continuity (i.e., few significant firebreaks). Wildfire risk may be particularly high if the fuel load is grass, brush, and smaller trees subject to low moisture levels in short duration drought periods.
- Steep slopes, which cause fires to spread more rapidly.
- Limited fire suppression capacity, including limited water supply capacity, limited firefighting personnel and apparatus, and long response times for fire alarms.
- Limited access for firefighting apparatus and limited evacuation routes for residents.
- Construction of structures to less than fully fire-safe practices.

- Lack of maintenance of firebreaks and defensible zones around structures.

Overall, the threat of wildland fire appears moderate for Lincoln County. However, risk should be considered moderate to high for portions of the county with high development in WUI areas, especially during periods of drought or in the event of severe east winds along river corridors. See the local fire agency maps included in Chapter 6: Local Fire Department and District Profiles as well as the strategic planning areas identified in Chapter 7: Strategic Planning and Recommended Actions for areas in Lincoln County that exhibit these characteristics.

Overall Mitigation Activities

There are many mitigation activities that can apply to all residents and all fuel types. General mitigation activities that apply to all of Lincoln County are discussed below while area-specific mitigation activities are discussed within the strategic planning area assessments.

Prevention

The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can be quite effective and can take many forms. Traditional “Smokey Bear” type campaigns that spread the message passively through signage can be effective. Interpretive signs that remind folks of the dangers of careless use of fireworks, burning when windy, and leaving unattended campfires can also be effective.

Active prevention techniques can involve mass media, radio, and the local newspapers. Fire districts in Lincoln County have contributed to the reduction in human-caused ignitions by printing a weekly “run blotter,” like a police blotter, in the paper. This briefly describes the fire response calls for the week and is followed by a “tip of the week” to help mitigate wildfire risk. The federal government and the Oregon Department of Forestry have been champions of prevention and could provide ideas for such tips. When fire conditions are high, brief public service messages could warn of the hazards of misuse of fire or any other ignition sources. The [Keep Oregon Green Association](#) has been educating the public on how to prevent wildfires since the human-caused Tillamook Burns in 1941.

Limiting Use

Areas within the Oregon Department of Forestry (ODF) Protection District boundary are also subject to public use restrictions, referred to as “Regulated Use”, during fire season in an attempt to limit or manage use of activities known to cause fires. The countywide ban on debris or “backyard” burning established by the Lincoln County Fire Defense Board during the fire season is another example of actions specifically taken to prevent wildfires.

Defensible Space

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Lincoln

County must be made aware that home defensibility starts with the homeowner. Once a fire has started and is moving toward a structure, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the building. The U.S. Forest Service’s “Living with Fire: A Guide for the Homeowner”⁴⁵ is an excellent tool for educating homeowners on the steps to take to create an effective defensible space. Residents of Lincoln County should be encouraged to work with local fire and forestry agencies within the county to complete individual home site evaluations. Home defensibility steps should be enacted based on the results of these evaluations. OSFM has a statewide defensible space program that includes free property assessments and resources: <https://oregondefensiblespace.org/>.

Evacuation

Development of community evacuation plans is necessary and critical to assure an orderly evacuation in the event of a threatening wildland fire. Designation and posting of escape routes would reduce chaos and escape times for fleeing residents. Community safety zones should also be established in the event safe evacuation is impossible and sheltering in place becomes the better option. Efforts should be made to educate homeowners through existing homeowners associations or citizen participation organizations.

Access

Also of vital importance is the accessibility of homes to emergency apparatus. The fate of a home will often be determined by the homeowner’s actions prior to the event. A few simple guidelines such as widening or pruning along driveways and creating a turnaround area for large vehicles, can greatly enhance home survivability.

Facility Maintenance

Recreational facilities near communities or in the surrounding forests such as parks or natural areas should be kept clean and maintained. In order to mitigate the risk of an escaped campfire, escape-resistant fire rings and barbeque pits should be installed and maintained. In some cases, restricting campfires during dry periods may be necessary. Surface fuel accumulations in nearby forests can also be kept to a minimum by periodically conducting pre-commercial thinning, pruning and de-limbing, and prescribed fire.

Fire District Response

Once a fire has started, how much and how large it burns is often dependent on the availability of suppression resources. In most cases, rural fire departments are the first to respond and have the best opportunity to halt the spread of wildland fire. For many districts, the ability to reach these suppression objectives is largely dependent on the availability of functional resources and trained individuals. Increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

⁴⁵ University of Nevada, Reno (1999, May). *Living with Wildfire: A Guide for the Homeowner*. Pacific Northwest Wildfire Coordinating Group. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_020876.pdf.

Development Standards

Furthermore, county policies can be revised to provide for more fire conscious techniques such as using fire resistant construction materials; improved road, driveway, and bridge standards, establishment of permanent water resources, and adoption of a WUI building code.

Fuels Reduction

Fuels reduction describes the removal of vegetation from land to reduce wildfire intensity. This takes several forms, ranging from direct manual and mechanical thinning to carefully coordinated prescribed burns.

Manual and Mechanical Thinning

Thinning decreases the quantity of fuel on or near a wildland-urban interface (WUI) because the more surface fuels (brush, branches, etc.) and ladder fuels (fuel allowing fire to climb trees) that accumulate, the hotter and faster a wildfire burns. It can be done by hand, using chainsaws and Pulaski's to cut vegetation, or mechanically, using heavier equipment to break up larger fuels like trees to decompose.⁴⁶

Prescribed Fire

This technique involves the careful use of low intensity burns to remove surface and ladder fuels close to the ground. These controlled fires, primarily carried out by professionals, support old-growth, more fire-resistant trees while mimicking the natural ecosystem cycle of small burns. Thinning is usually conducted prior to a prescribed fire to reduce the risk of the fire burning uncontrollably through a WUI.⁴⁷

Other Techniques

Two popular alternatives are chemical treatment and grazing. With chemical treatment, herbicides are used to eliminate invasive species and other potential fuels, with dead plants later removed by hand. With grazing, cattle are used to reduce grass quantities, while goats and sheep remove woody plants.⁴⁸

Indigenous Fire Practices

For millennia, North American Indigenous peoples used fire to manage land for farming, hunting, and travel while reducing the risk of severe wildfires. After a century of fire suppression from the federal government, Indigenous burning has returned in the past several decades and influences how prescribed fires are used today.⁴⁹

⁴⁶ CAL FIRE (2021). *Fuels Reduction Guide*. <https://osfm.fire.ca.gov/media/umkhhdbs/fuels-reduction-guide-final-2021-print.pdf>.

⁴⁷ Ibid.

⁴⁸ Bennett, Max et al. (2017, December). *Keeping Your Home and Property Safe from Wildfire: A Defensible Space and Fuel Reduction Guide for Homeowners and Landowners*. Oregon State University Extension Service. www.catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9184.pdf

⁴⁹ National Parks Service. (2022, February). *Indigenous Fire Practices Shape our Land*. <https://www.nps.gov/subjects/fire/indigenous-fire-practices-shape-our-land.htm>.

Overview of Fire Protection System

Oregon has a Fire Service Mobilization Plan developed by the Oregon Department of the State Fire Marshall and approved by the State Fire Defense Board as mandated by the Emergency Conflagration Act (ORS 476.510 to 476.610). The Plan provides an organized structure and operating guidelines for rapid deployment of Oregon’s fire service forces under a common command structure. The Plan also establishes operating procedures for emergencies beyond the capabilities of the local fire service resources. The following section describes the Plan in more detail.

Mutual aid agreements are made with nearby districts and the Oregon Department of Forestry to supplement resources of a fire agency or district during a time of critical need. Mutual aid is given only when equipment and resources are available.

Oregon also has a common communication channel for fire services’ use during multiple-agency responder incidents. This system is called Fire NET. It utilizes a system of mountain-top microwave base stations and a master control console to form a radio and telephone access communication network throughout the state. Mobile repeaters are deployed by OSFM incident management teams when needed.

Lincoln County has a 911 Emergency Communication System in place to link citizens with emergency response agencies. The system receives telephone requests for fire, medical or police services and dispatches those calls through a computer aided dispatch system to the appropriate agencies for response. Referenced in this arrangement is a rural addressing system that identifies home locations by address. Rural address numbers are displayed at the entrance to most home sites along access routes to assist in emergency response.

Fire agency personnel are often the first responders during emergencies. In addition to structural fire protection, they are called on during wildland fires, floods, landslides, and an array of other events.

Statewide Fire Resource Mobilization

The Department of the Oregon State Fire Marshal (OSFM) assists and supports the Oregon fire services during major emergency operations through the Emergency Conflagration Act (ORS 476.610). The Conflagration Act was developed in 1940 as a civil defense measure and can be invoked only by the Governor. Under the Act, local firefighting forces will be mobilized when the State Fire Marshal believes that a fire is causing, or may cause, undue jeopardy to life and/or property and the Act is invoked by the Governor. State funding for the use of the resources is provided when the Act is invoked.

The Emergency Conflagration Act requires the State Fire Marshal to prepare a plan for the most practical utilization of the state’s firefighting resources in time of grave fire emergency. The resulting plan, called the Oregon Fire Service Mobilization Plan provides the organizational structure and operating guidelines for mobilization and direction of fire service forces, promotes effective communication among the fire service agencies, coordinates the efforts of the

participating agencies through use of a common command structure and common terminology, and ensures prompt, accurate, and equitable apportionment of fiscal responsibility for fire suppression or other emergency response activity.

The Fire Service Mobilization Plan may be used separately from the Conflagration Act to mobilize local structural fire agencies for any emergency exceeding local mutual aid resources. However, reimbursement for responding resources is assured only when the Governor invokes the Conflagration Act, such as during the 2020 wildfire season.

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Chapter 6: Local Fire Department and District Profiles

Mapping Lincoln County

Four county-level maps are included throughout this section to provide background information regarding Lincoln County’s key characteristics, wildland fire agency coverage, priority areas for wildfire risk mitigation, and overall social vulnerability.

- Map 6.1. Lincoln County Base Map
- Map 6.2. Lincoln County Priority Wildfire Mitigation Areas
- Map 6.3. Lincoln County Social Vulnerability Index
- Map 6.4. Lincoln County Fire Districts

For a map of countywide wildfire risk, see Map 5.1. Lincoln County Wildfire Risk in the previous chapter. For additional supplemental maps pertaining to wildfire, see Appendix D: Maps.

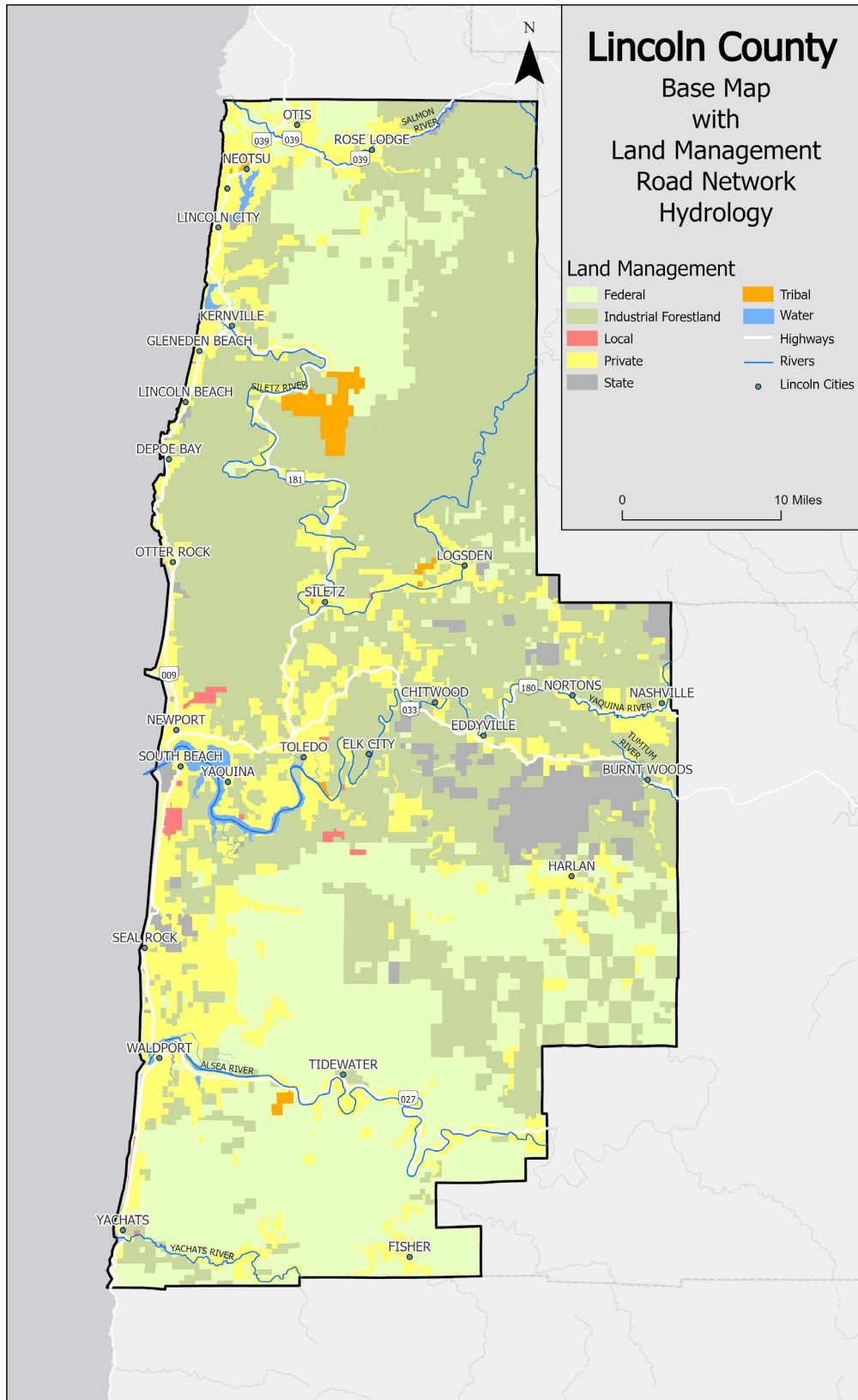
Fire Agency Profiles

The firefighting resources and capabilities information provided in the remainder of this section contain a summary of information provided by the fire chiefs or representatives of the local wildland firefighting agencies listed. Each organization confirmed the statistics and issues of concern regarding their agency via either a virtual interview or email correspondence. Each individual profile also includes a distinct map illustrating the WUI extent, social vulnerability, and wildfire risk within that agency’s jurisdiction.

Three other organizations are included in addition to the eight local fire districts within Lincoln County: the Oregon Department of Forestry’s West Oregon District; the U.S. Forest Service’s Siuslaw National Forest; and the Confederated Tribes of Siletz Indians. The profiles for these entities do not include distinct maps.

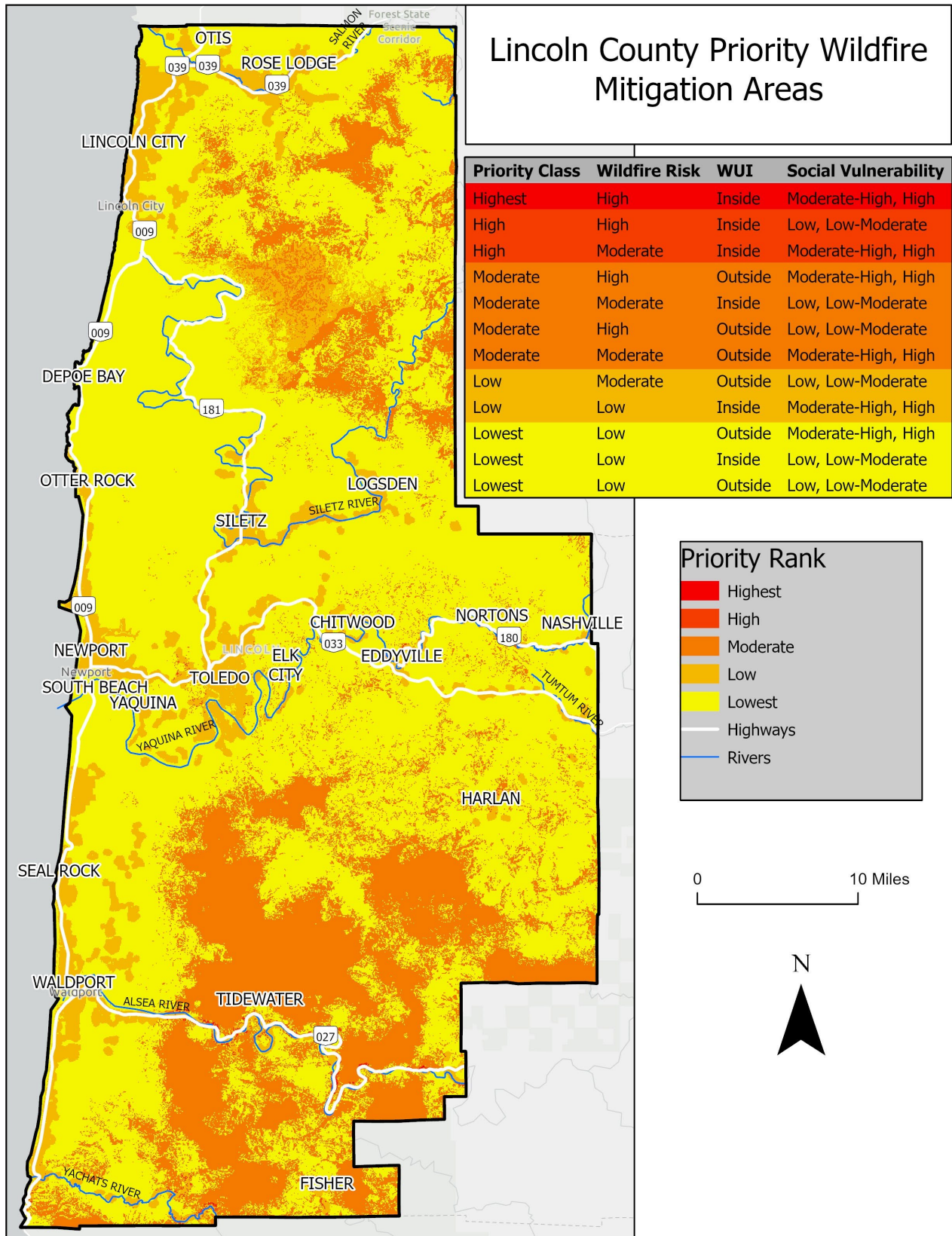
Note: While Alsea Rural Fire Protection District covers a portion of Lincoln County, it does not participate in the Lincoln County Fire Defense Board. Therefore, this district is not profiled as part of this Lincoln County Community Wildfire Protection Plan.

Map 6.1. Lincoln County Base Map



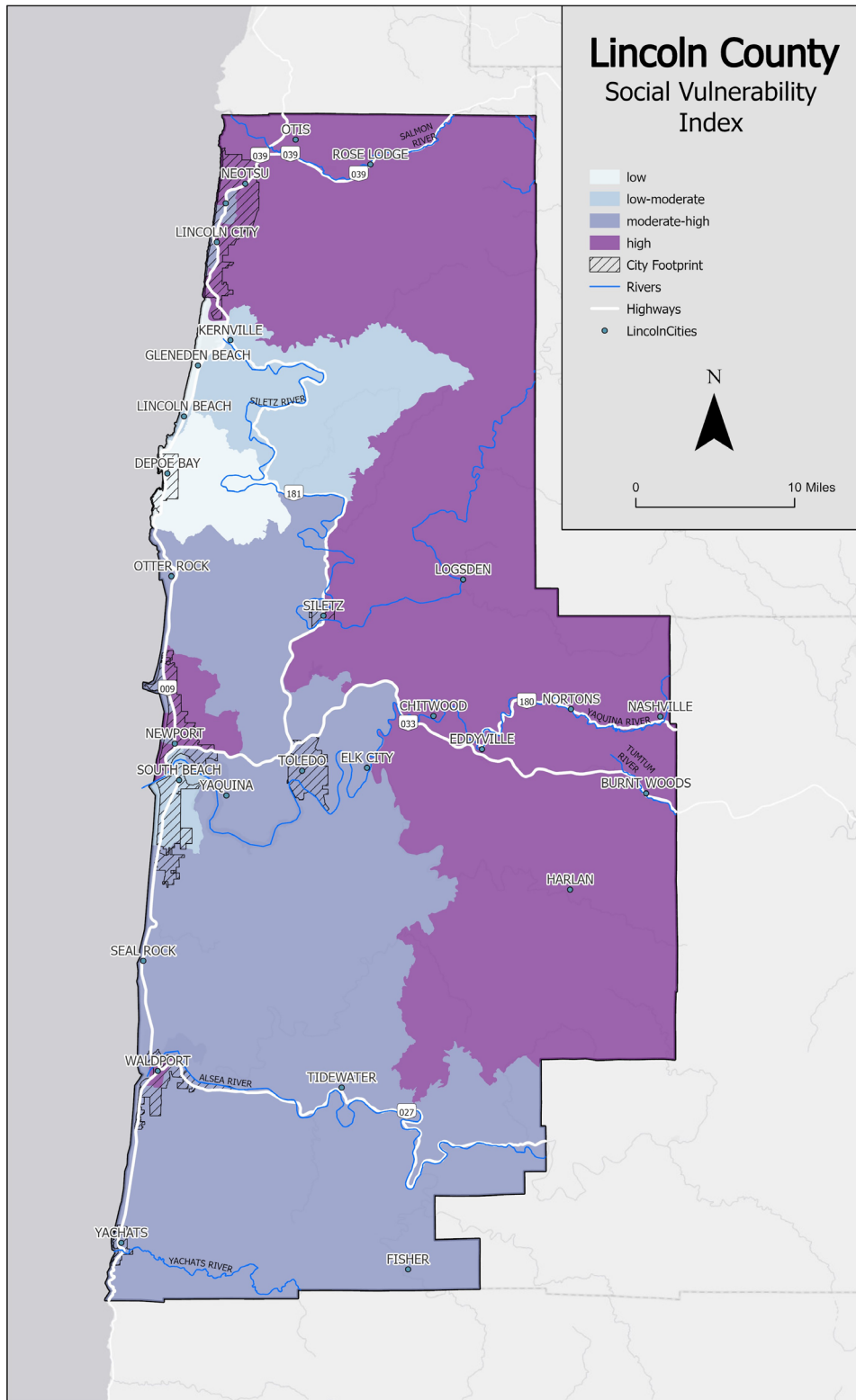
Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Map 6.2. Lincoln County Priority Wildfire Mitigation Areas



S Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

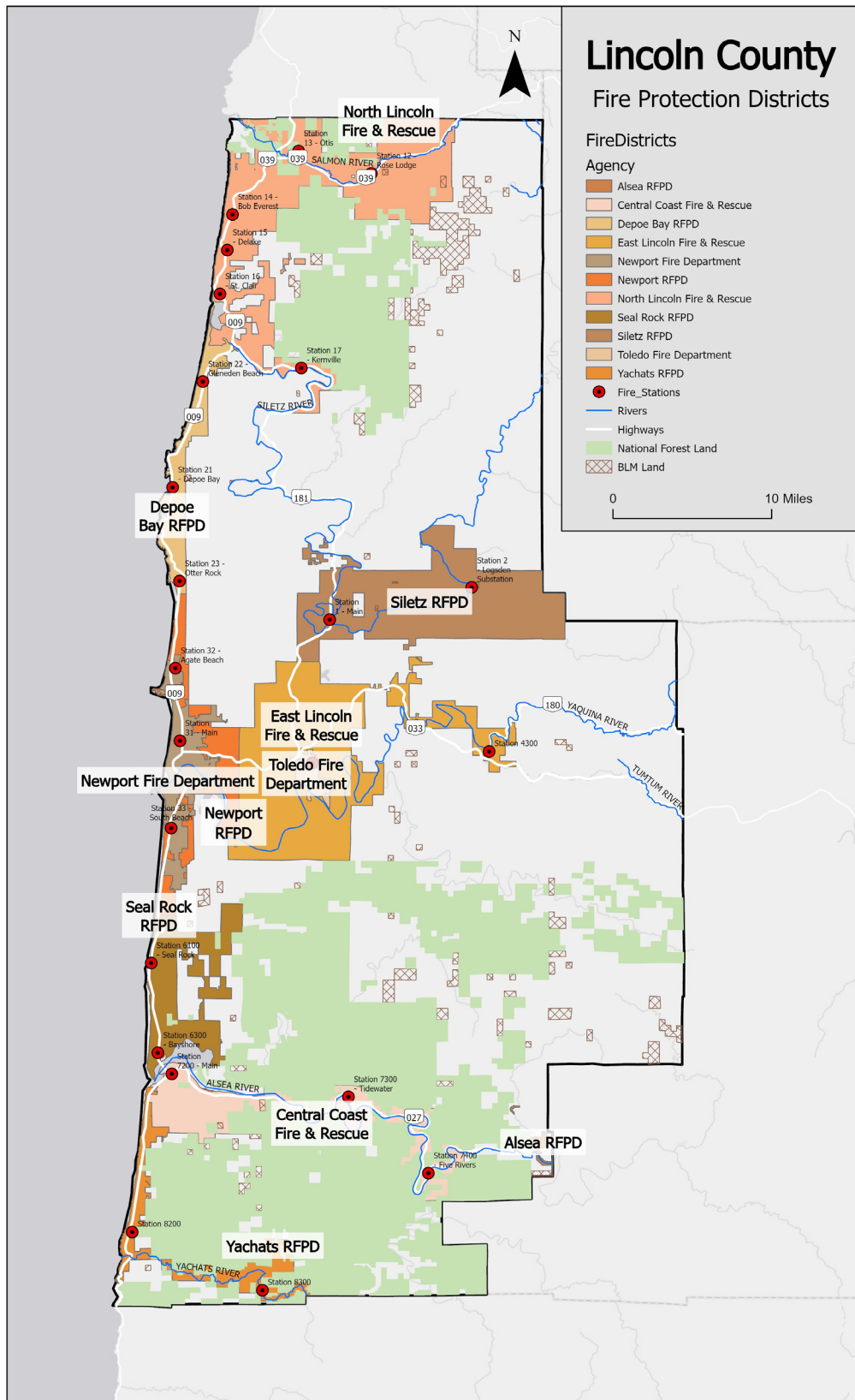
Map 6.3. Lincoln County Social Vulnerability Index



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Note: The CDC defines social vulnerability as “potential negative effects on communities caused by external stresses on human health”. This Social Vulnerability Index uses 16 U.S. Census variables to help local officials identify communities that may need support before, during, or after disasters. From <https://www.atsdr.cdc.gov/placeandhealth/svi/index.html>.

Map 6.4. Lincoln County Fire Districts



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Central Oregon Coast Fire and Rescue District



URL: <https://www.centralcoastfire.net/>.

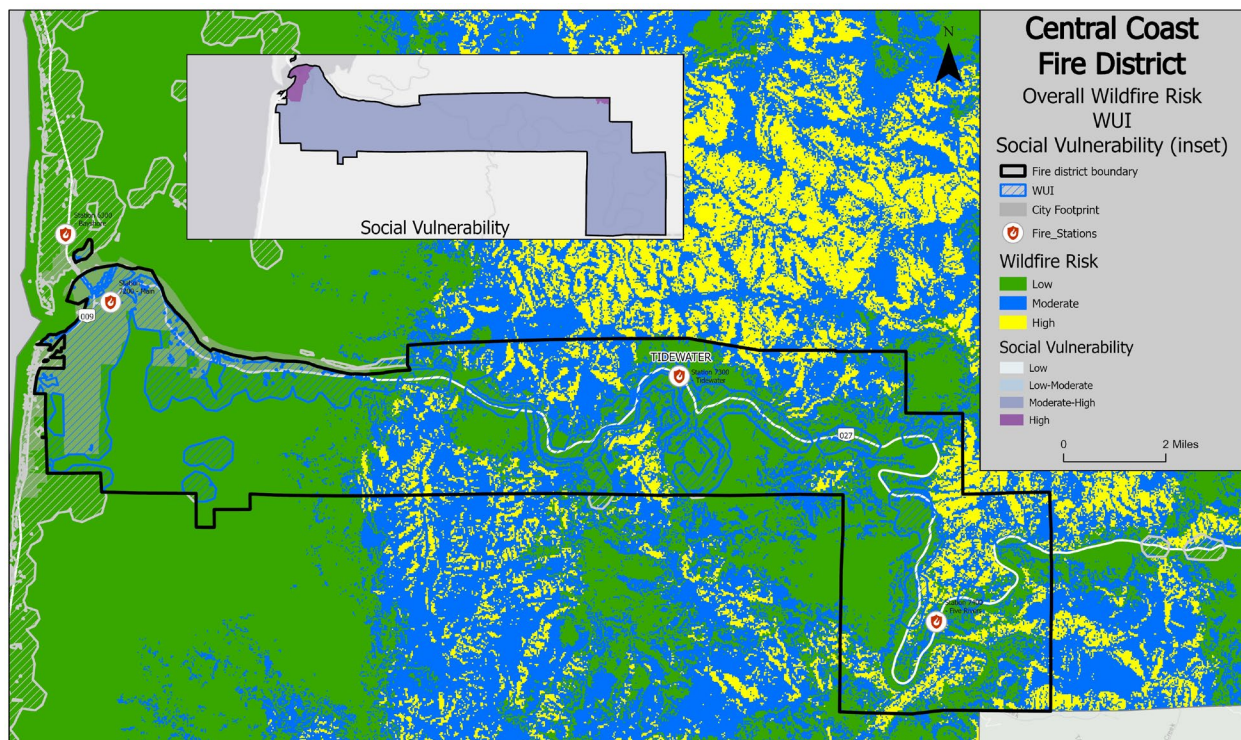
District Summary: The Central Oregon Coast Fire and Rescue District (COCFRD) includes the cities of Waldport and Tidewater with populations of 2,349 and 818 respectively. COCFRD has three fire stations located in the Alsea River corridor. The main station is in Waldport at 145 Alsea Hwy, the second station is in Tidewater, and the third station is on Highway 34 at milepost 20.3.

COCFRD responds to an average of 1,013 emergency calls per year involving fire, surf and water rescue, medical emergencies and motor vehicle crashes, to name just a few.

Issues of Concern: Residential growth continues further and further up the Highway 34 corridor. This is the main area for concern as it applies to the wildland urban interface. In general, coastal areas continue to see exponential growth, and a five-year tax levy was renewed in 2021 to fund fire and emergency medical service response. However, the tax levy was renewed at 2011 tax rates, which means the District has gone more than a decade without a raise when accounting for inflation. Since the District could not raise additional funds with the 2021 levy, future levies will need to be increased significantly to cover costs.

Cooperative Agreements: COCFRD depends very heavily on automatic and mutual aid from neighboring fire districts. The District also has working agreements with all emergency services in the county as well as the federal and state agencies.

Map 6.5. Central Oregon Coast Fire and Rescue District



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Depoe Bay Rural Fire Protection District

URL: <https://www.depoebayfire.com/>.



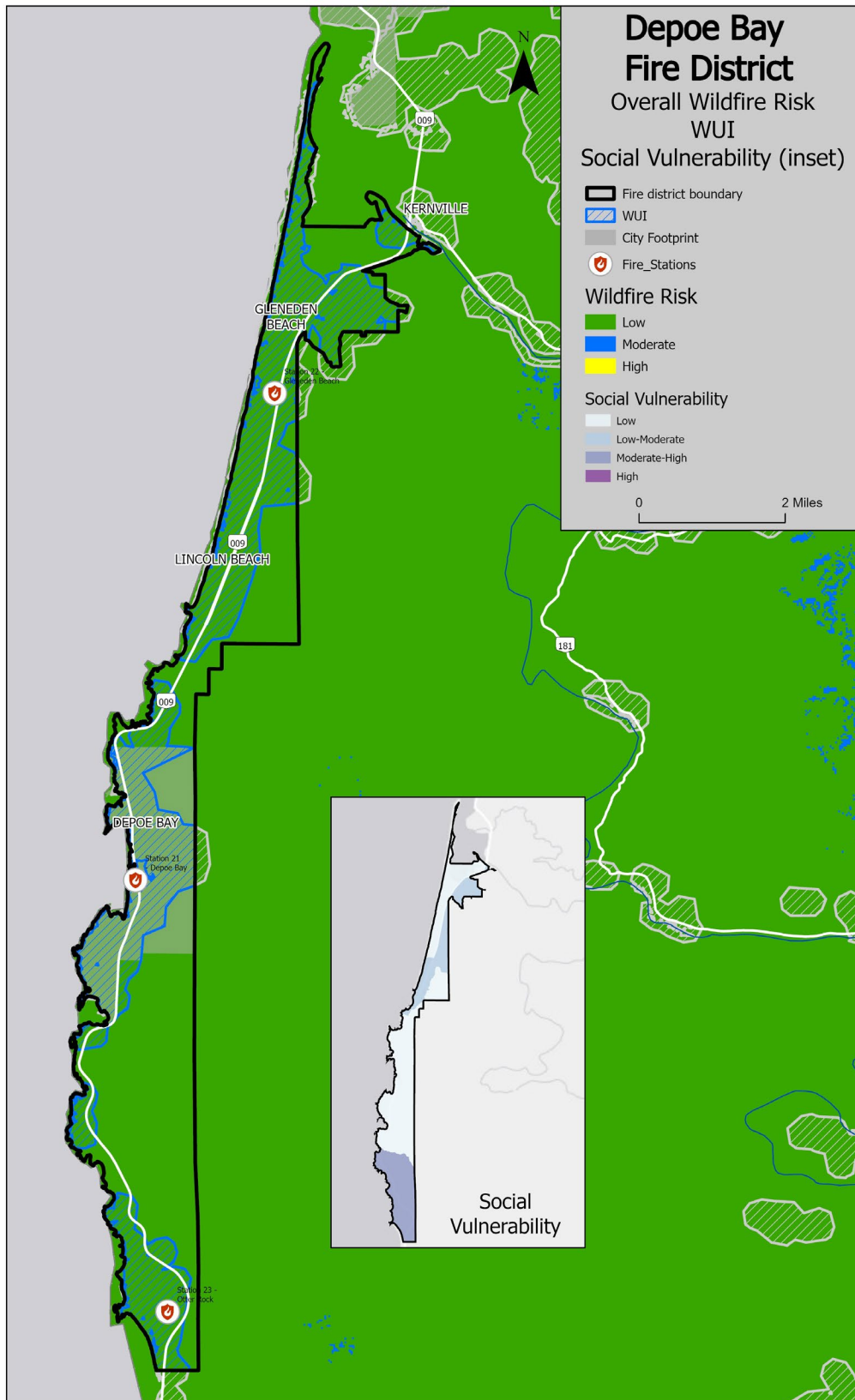
District Summary: The Depoe Bay Rural Fire Protection District (RFPD) consists of a unique thirteen square mile area of the Central Oregon Coastline including the coastal communities of Siletz Keys, Salishan, Gleneden Beach, Lincoln Beach, Boiler Bay, Depoe Bay, Morocco, and Otter Rock. The three largest cities – Depoe Bay, Gleneden Beach, and Otter Rock – have populations of 1,566, 918, and 225, respectively, and are also the locations of Depoe Bay RFPD’s three main fire stations.

The District contains rocky ocean cliffs along Oregon’s Highway 101, moderate density vacation and condominium complexes, residential and commercial construction, and rugged undeveloped terrain with only logging roads for access. Areas of note include the four multi-story commercial structures spread throughout the District that house large tourist populations during most months of the year.

Issues of Concern: District growth has accelerated within the past few years with an increase in requests for change of occupancies and large developments are in process. The District is still in the process of carrying out a vast radio update through state appropriations distributed in 2022. The District currently uses Willamette Valley Communication Center, which is located in Salem, approximately 60 miles away.

Cooperative Agreements: The Depoe Bay Fire District currently has mutual aid agreements with all local fire agencies within the county as well as the United States Forest Service, U.S. Fish and Wildlife Services, and the Coast Guard.

Map 6.6. Depoe Bay Rural Fire Protection District



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Newport Fire Department and Newport Rural Fire District



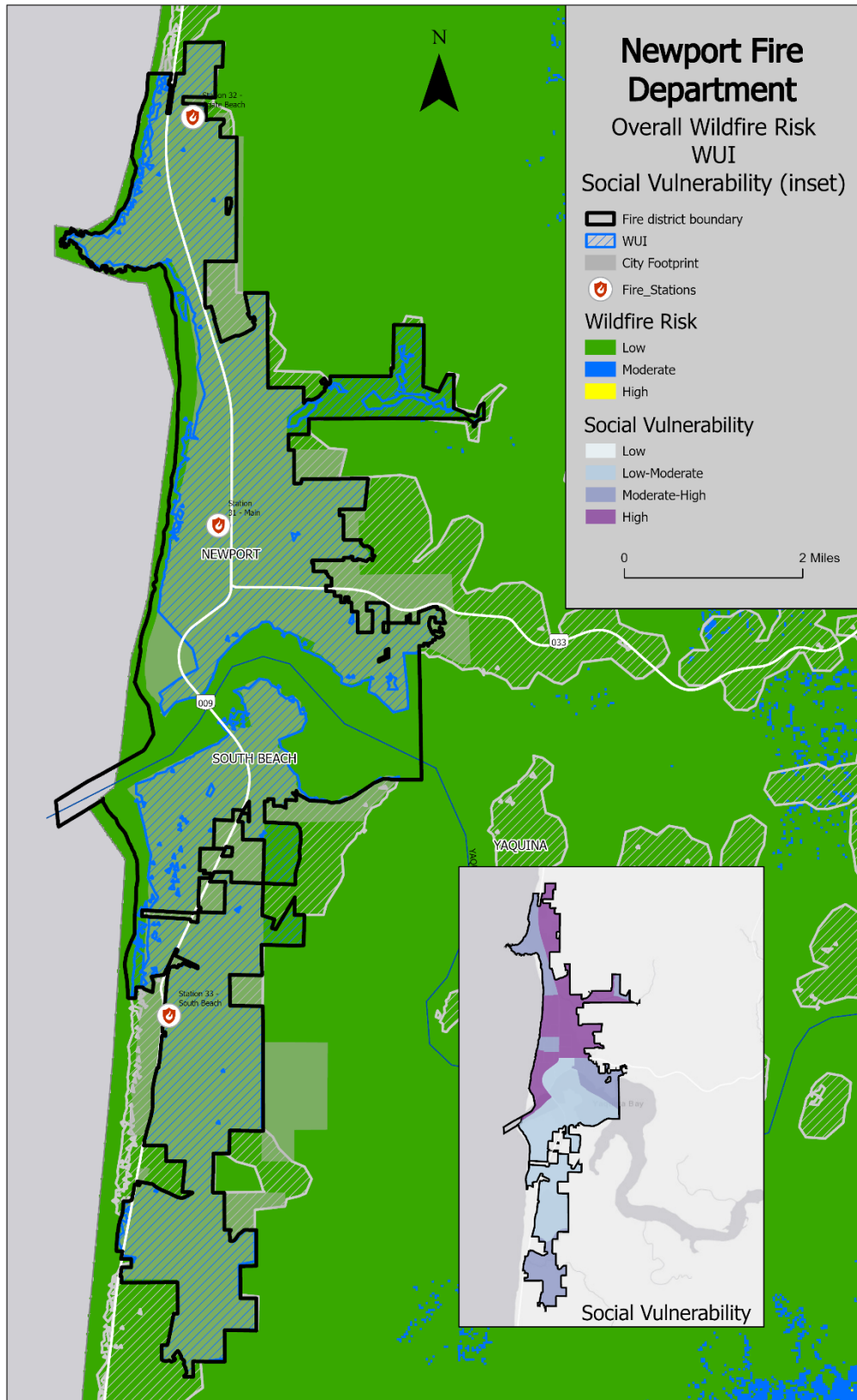
URL: <https://www.newportoregon.gov/dept/nfd/>.

District Summary: The Newport Fire Department provides fire protection, emergency medical response, ARFF responsibilities, and a variety of rescue services to a service area of about 26 square miles. The Department includes the City of Newport, which has a population of 10,200, and is the center of county government. In addition to a mix of urban and rural occupancies, the Department also includes marinas, a busy fishing fleet, fish processing plants, municipal airport, and nearly 1,500 hotel/motel rooms to support the year-round tourism industry. Newport Rural Fire District has an additional 3,500 residents living in the surrounding forestlands, which is classified as classic or occluded wildland urban interface.

Issues of Concern: The primary concerns are areas in the Rural District with poor water supply systems, narrow, non-compliant streets and driveways, non-compliant address identification and extensive response times the need for additional public education efforts directly focused on residents in the wildland urban interface areas. There is a need to utilize design to survive standards and to have strong incorporation of Firewise design standards for existing structures.

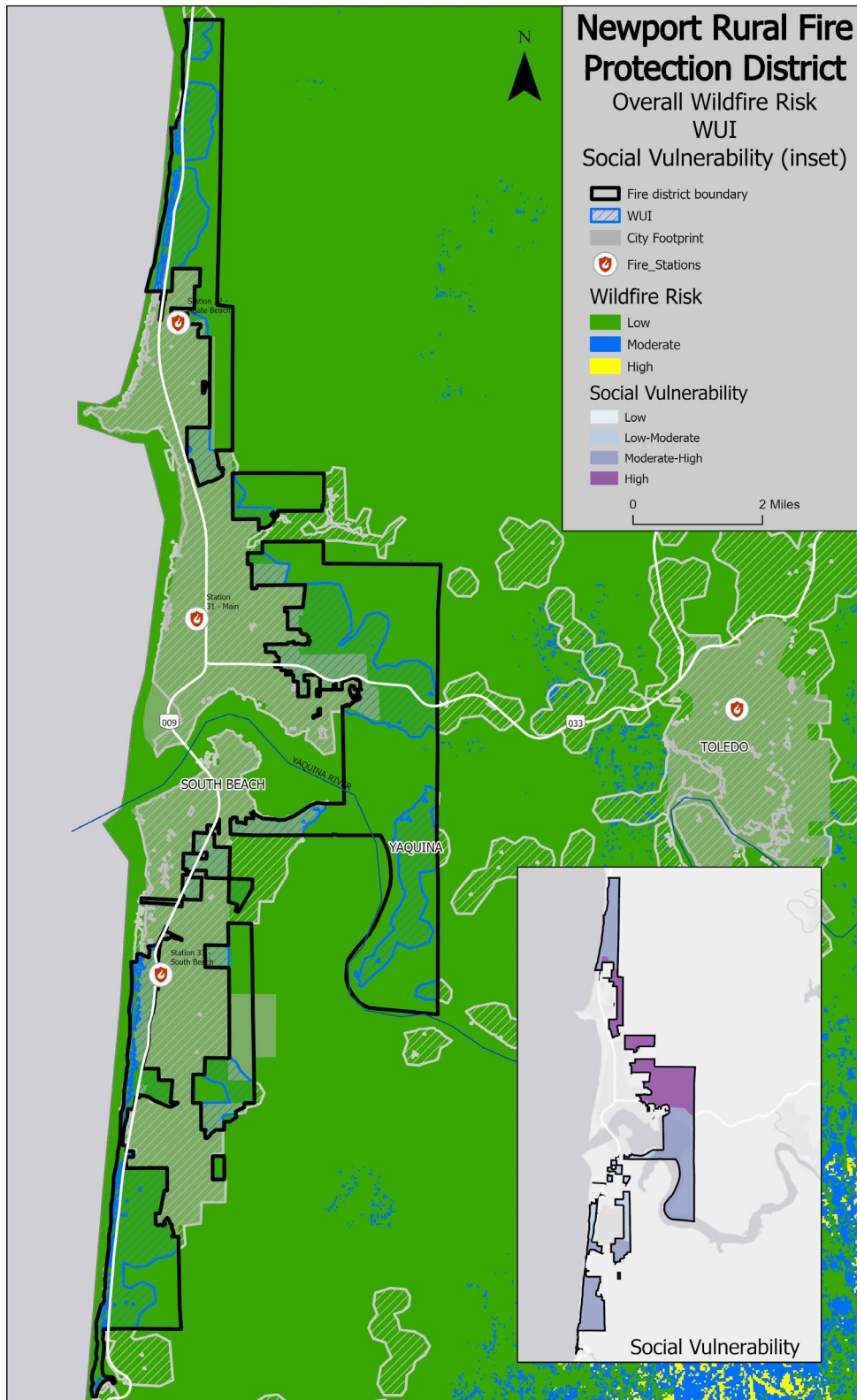
Cooperative Agreements: The Newport Fire Department and Rural Fire District participate in mutual aid agreements with all other fire districts in Lincoln County and has automatic aid agreements with Toledo Fire Department, Depoe Bay Rural Fire Protection District, and Seal Rock Rural Fire Protection District.

Map 6.7. Newport Fire Department



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Map 6.8. Newport Rural Fire Protection District



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

North Lincoln Fire and Rescue District #1

URL: <https://www.nlfr.org/>.

District Summary: North Lincoln Fire & Rescue District #1 is situated on the central coast of Oregon. The diverse 80 square-mile district is comprised of 7 miles of shoreline, 680-acre Devils Lake, the City of Lincoln City (with a population of 10,134), and outlying communities of Kernville, Neotsu, Otis, and Rose Lodge, along with State and Federal timberland.

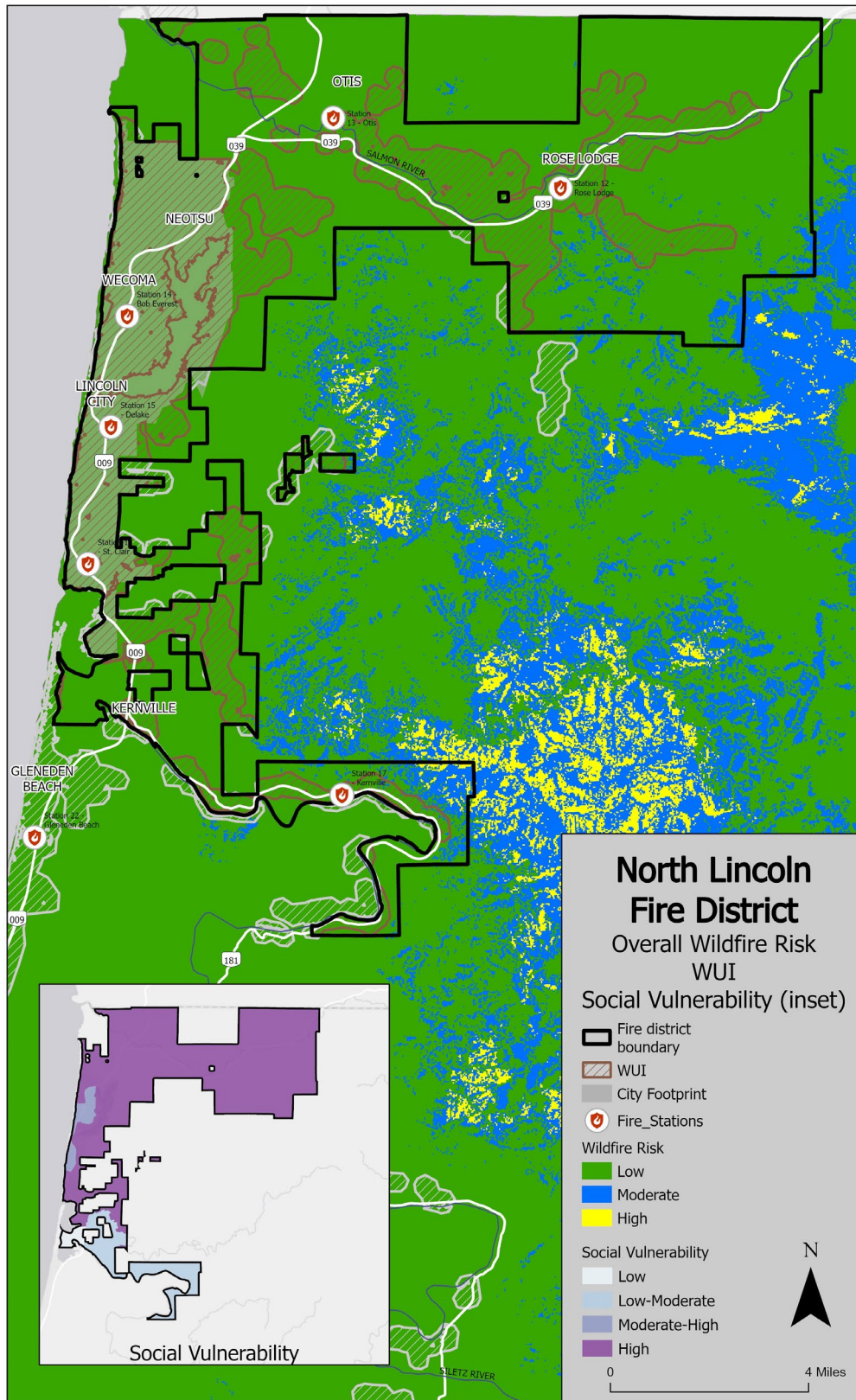


The District's coverage of north Lincoln County starts along Highway 101 north from Cascade Head, south to the Siletz River, eastward along Highway 18 to the Van Duzer Corridor, and along the Siletz River Highway #229 to milepost 9. The District is comprised of 28 career staff and 25 volunteers and staff two stations 24/7 with at least one Engine Company. The District's emergency response includes fire suppression, medical and technical rescues, water rescues, hazardous materials incidents, and it is a member of Lincoln County's Rope Rescue Team. North Lincoln Fire & Rescue's has six fire stations located strategically throughout their district: one each in Rose Lodge, Otis, and along the Siletz River, and three in Lincoln City.

Issues of Concern: Lincoln City is a major vacation destination with U.S. Highway 101 running through the city. The influx of visitors during the summer months and holiday weekends contributes to an increase in medical, MVA, and water rescue calls, and navigation is difficult due to traffic congestion. There are areas outside the city with poor water supply systems; narrow, non-compliant streets/driveways; non-compliant address identification; and extensive response times. The District is currently working to address these issues (e.g., expanding the water supply and conducting defensible space surveys) but these are still ongoing challenges. Throughout the District, there is a need to utilize design-to-survive standards and to have strong incorporation of Firewise design standards for existing structures.

Cooperative Agreements: The District participates in mutual aid agreements with all other fire districts in Lincoln County and has automatic aid agreements with neighboring Districts to the north and south along with the Confederated Tribes of Grand Ronde to the east.

Map 6.9 North Lincoln Fire and Rescue District #1



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Seal Rock Rural Fire Protection District

URL: <https://www.sealrockfire.com/>.



District Summary: The Seal Rock RFPD is a small rural all-volunteer district that protects nearly 17 square miles of mostly forest and farmland on the central Oregon coast with fire, non-transport medical and water rescue response. It is governed by a five-person elected Board of Directors and includes both the city of Seal Rock and the Bayshore community. The District’s population numbers about 4,000 year-round but swells to nearly 6,000 during the summer tourist season. The automatic aid area is about 68 square miles with a permanent population approaching 10,000. The District responds to over 500 calls each year.

The city of Seal Rock itself is an unincorporated aggregation of small businesses, including the Seal Rock Post Office, Seal Rock Water District Office, and the Seal Rock RFPD Main Station, where there is an engine and a Fastac rescue truck. The other station, the Bayshore Station, is at the south end of the district where there is an engine and water tender.

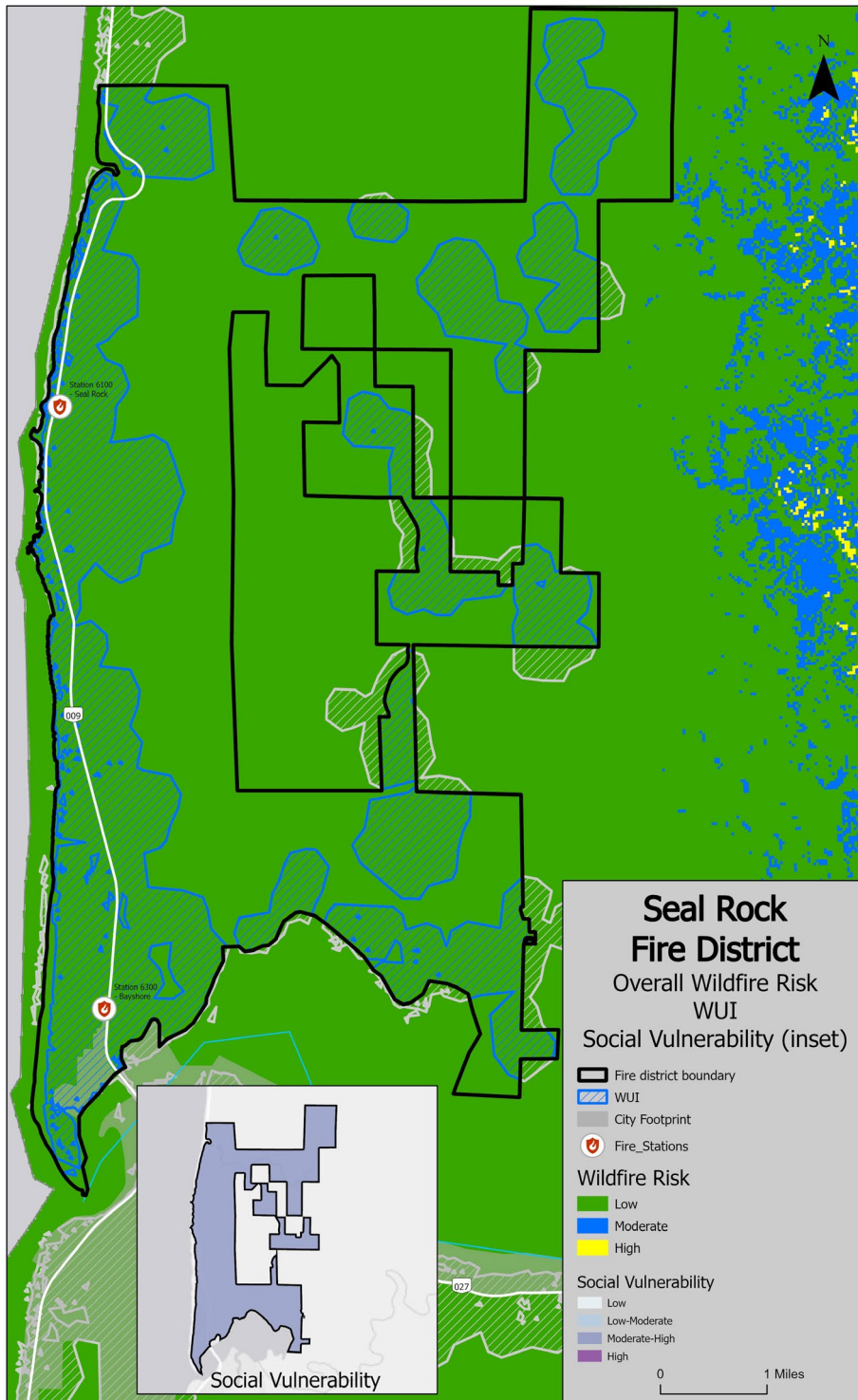
Issues of Concern: While there seems to be one or two dozen new homes built each year, overall population growth is very slow. As many as a third to a half of the homes in the District are seasonal or vacation homes. A large proportion of these are rentals.

Landline telephone service is good, including DSL availability in most areas, provided by the Pioneer Telephone Cooperative based in Philomath, Oregon. Cell coverage is spotty and unlikely to improve soon, as there has been some local resistance to the construction of new cell towers. Radio coverage is pretty good, thanks to multiple repeaters and the ongoing OWIN wireless interoperability project.

Currently, each fire district sets its own timing and degree of permitted restriction while taking into consideration the guidance of the Oregon Department of Forestry, DEQ, Oregon State Fire Marshal, and neighboring fire districts.

Cooperative Agreements: Seal Rock RFPD is a party to an automatic mutual aid agreement with Central Oregon Coast Fire and Rescue District, Depoe Bay Fire District, Newport Fire Department, Pacific West Ambulance, Toledo Fire Department, and Yachats Fire District. Seal Rock RFPD resources can also be made available to the Lincoln County Fire Chief and Lincoln County Disaster Management.

Map 6.10. Seal Rock Rural Fire Protection District



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Siletz Valley Rural Fire Protection District

URL: <https://siletzvalleyfire.specialdistrict.org/>.



District Summary: Siletz Valley Rural Fire Protection District (Siletz RFPD) encompasses 40 square miles including the City of Siletz, the Confederated Tribes of Siletz Indians (CTSI) Reservation, the unincorporated community of Logsden and surrounding rural populations. The District is predominantly defined around the Siletz River east of the coastal mountain range, resulting in warmer, more humid summers compared to the rest of Lincoln County. Siletz RFPD protects a population of approximately 3,800 permanent residents with seasonal increases of around 500 for recreational use, predominately fishing and boating. The District provides fire, EMS first response (ALS), hazmat, and various rescue services including swiftwater, vehicle, and high angle ropes through the county wide rope rescue team.

The Siletz RFPD is comprised of two career staff, serving in dual role administration and response duties. Additionally, the district averages 20 volunteer responders, 18 of which serve in full capacity roles for Fire/EMS/Rescue, while the other two are EMS rescue technicians. The District has two fire stations; the main station is located within the City of Siletz, and its substation is located seven miles east of Siletz in the community of Logsden. Its main station in Siletz also serves as an identified joint EOC for the City of Siletz and CTSI.

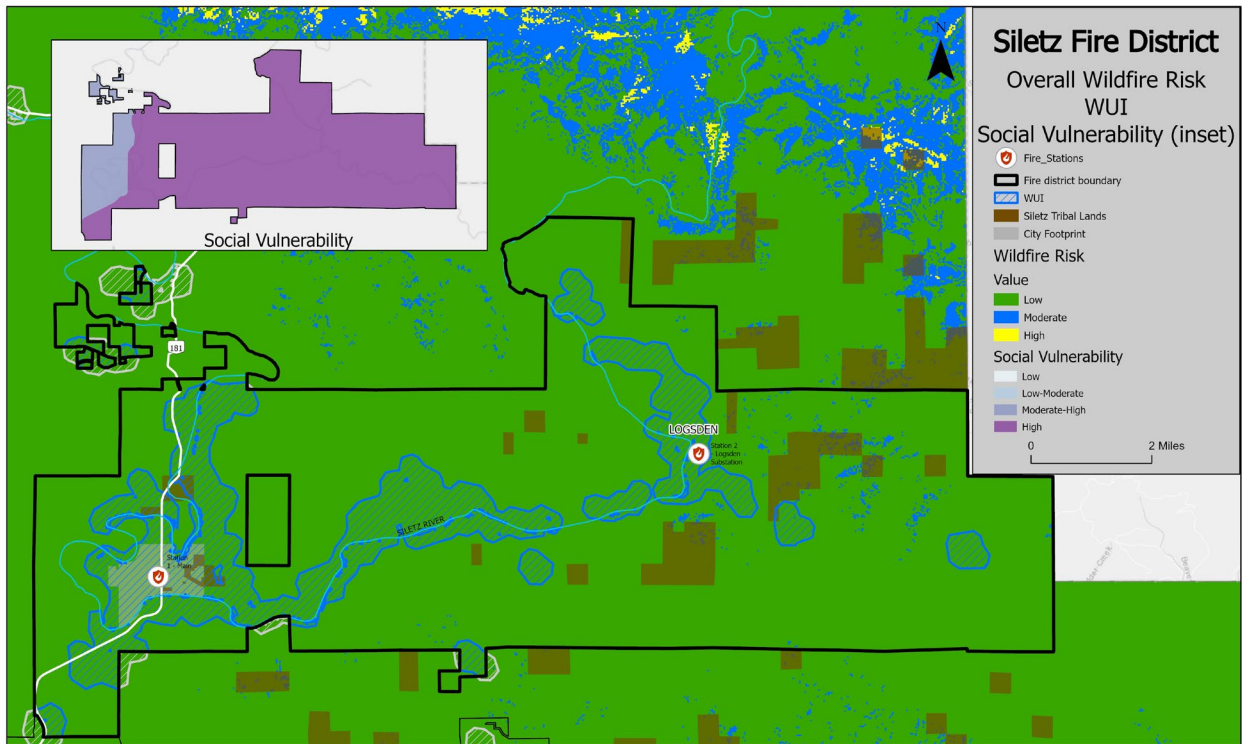
The densely populated areas are protected by hydrants, fed by two different water systems. There are eight identified drafting sites or water sources in its rural areas for rural water supply.

Issues of Concern: New construction has been predominantly limited to tax exempt properties due to zoning restrictions and access confines due to topography. Water supply is a concern in the rural protection areas. Most of the identified drafting sites do not cover areas of need and the topography limits access to the river for drafting.

Additionally, many of its rural residents reside in or near densely wooded wildland-urban interface areas with limited defensible space. Access is of great concern, with nearly a quarter of its rural population residing on gravel roads down long narrow driveways with thick vegetation and multiple homes in close proximity to one another. The substation located in Logsden is strategically placed to serve the largest rural population; however, the District has limited volunteers in this area, and as a result responses from station two are substandard.

Cooperative Agreements: Siletz RFPD has mutual aid agreements with the Oregon Department of Forestry and the other seven fire districts in Lincoln County.

Map 6.11. Siletz Valley Rural Fire Protection District



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Toledo Fire Department and Toledo Rural Fire Protection District



URL: <https://www.cityoftoledo.org/fire>.

District Summary: The Toledo District covers approximately 55 square miles, ranging from the 2.5 mile marker of Highway 20 to the 23 mile marker of Highway 20. Toledo Fire Department and Rural Protection District is an all-hazard department whose mission statement is positively outrageous service. The Department will respond to any call for assistance and responds to an average of 900 calls per year. If the call is not within the scope or experience levels of the department, the staff and volunteers will try their best to arrange a solution through the appropriate entity.

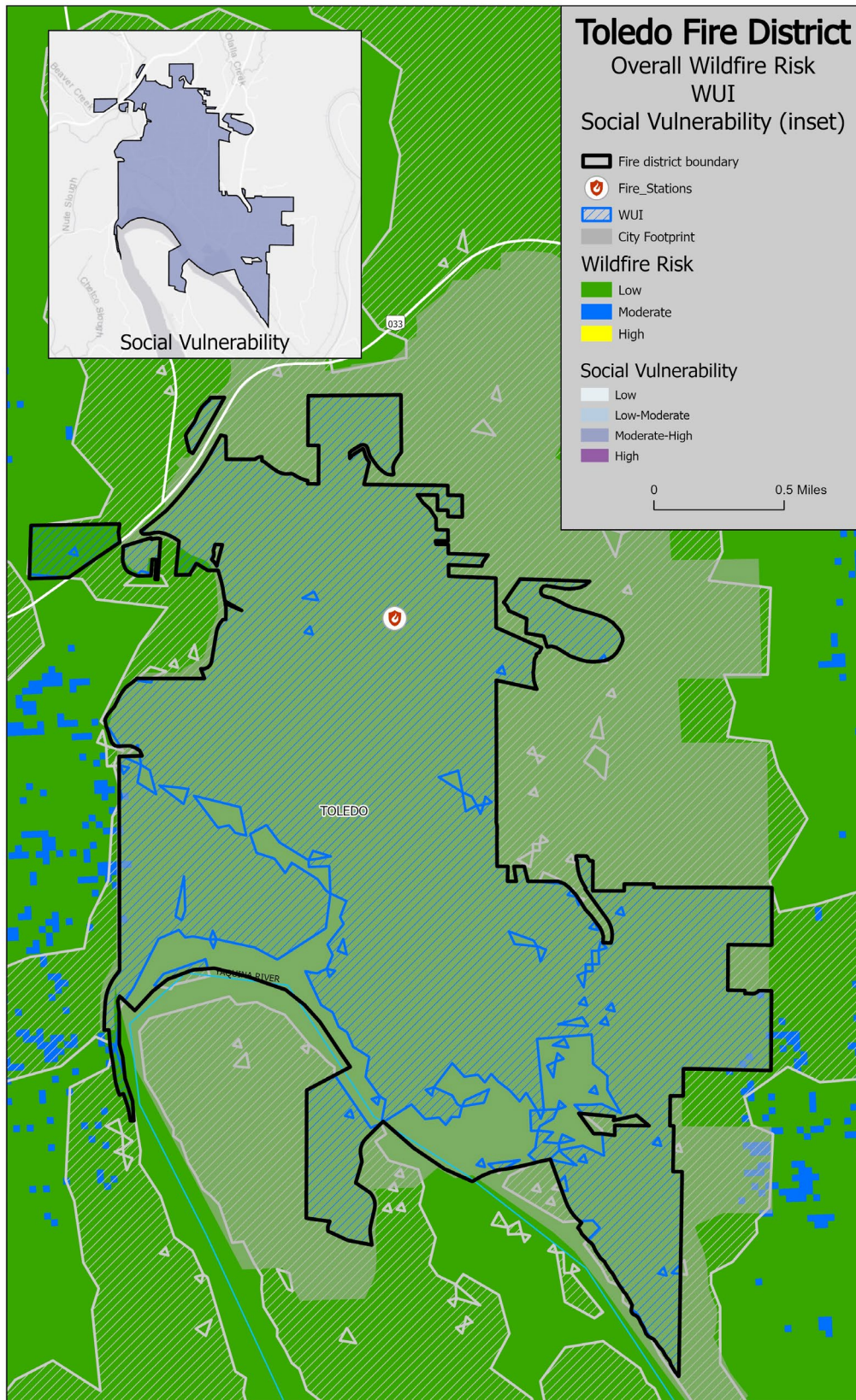
The Department is staffed mostly by volunteers with four paid staff positions that ensure that the most important aspect of emergency service is well cared for. That aspect is the approximately 35 volunteers doing the bulk of the emergency response and the 15 volunteers that provide additional administrative support. This Department has a unique philosophy that brings the word family to mind. The Department services roughly 55 square miles via three stations and 11 apparatus.

Issues of Concern: The land use limitations coupled with FEMA floodplain issues makes development in the city difficult, but construction is currently occurring throughout the city. Development in rural areas is occurring at a much faster rate than in the past. Communications are stressed, but the District has taken steps to improve radio communications. The District added in-vehicle repeaters to improve the access and range of radio communication and is also starting a small FM radio station solely in Toledo to loop emergency information and provide other updates to residents.

Additionally, the Department manages burning through a permit process and has a good compliance record, although some older residents still burn plastic and tires because they do not understand the rules. Tensions have eased as more time has passed since the permit process began and state-level Oregon Department of Environmental Quality laws have been rolled out.

Cooperative Agreements: The Toledo Fire Department and Toledo Rural Fire Protection District currently have mutual aid agreements with all fire agencies within the county.

Map 6.12. Toledo Fire Department and Rural Fire Protection District



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Yachats Rural Fire Protection District

URL: <https://www.yrfpd.org/>.



District Summary: The Yachats Rural Fire Protection District (YRFPD) was created in 1949 by residents of south Lincoln County. YRFPD covers almost 15 square miles, starting south of the City of Waldport and continuing south to Highway 101 (MP166) as well as east up the Yachats River Valley for approximately 10 miles. YRFPD is a very rural district with no industrial base except tourism, some agriculture, and limited retail and forestry. The City of Yachats (with a population of 994) is located within District boundaries and provides no financial support. The District is bordered by the Pacific Ocean to the west and federal and private forest to the east. The District’s southern border is less than a mile south of the Yachats city limit, while the northern border lies just south of the Waldport city limit.

In 2022, YRFPD responded to 938 calls for assistance. The new main station completed in 2019 is located at 2056 Hwy 101 N. in Yachats, while the north station is on Corona Court and the east station is located 7.8 miles up the Yachats River Valley.

YRFPD’s patronage consists of a year-round population of about 5,000 that grows to about 8,000 in the summer months due to tourists. The protection base consists of mostly one and two-story single- and multi-family residences, but also includes several restaurants, retail facilities, 13 motels, and the Angell Job Corps. This Job Corps facility houses about 150 to 200 youths in dormitory-style housing and provides no financial support.

YRFPD operates three pumpers, one pumper/tender, two brush trucks, and several support vehicles. Its personnel respond to emergency calls involving structure fires, beach fires, wildland fires, surf rescue, motor vehicle crashes, medical emergencies, marine mammal stranding, and other miscellaneous calls. YRFPD provides manpower to staff South Lincoln Ambulance Inc., which is the transporting agency in the area.

Issues of Concern: Significantly residential growth is expected in a very steep area within the City of Yachats in the coming years. This area is a classic WUI with homes surrounded by wildland fuels on steep terrain with limited access. The entire area between Yachats and Waldport has the same WUI dilemma and improvements are needed to provide better wildfire protection to both homes and timberlands.

Dispatch and coordination are both provided through the Willamette Valley Communications Center. YRFPD has adequate radios in all its apparatus and is now compliant with current regulations. Every firefighter has portable communication with the dispatch agency. However, the District does have areas in which communication is very sporadic due to terrain and lack of repeaters, significantly hindering the District’s ability to communicate with other agencies or dispatch during an incident.

Outside yard debris burning is permitted from October through May unless a statewide burn ban is in effect. Fire pits are permitted, and patrons can burn year-round unless a burn ban is implemented. Issuing permits and overseeing open burning is a large issue for YRFPD. The potential for problems with open burning continues as population density increases.

Along with many other Fire Districts in Oregon, the smaller industrial base caused by reduced logging and fishing has reduced the number of working-age people available for volunteer firefighter recruits. Tax limitations drastically affect the ability to hire firefighters to supplement the drawdown of volunteers.

Cooperative Agreements: South Lincoln County receives fire protection services from three small fire districts: YRFPD, Central Oregon Coast Rural Fire Protection District, and Seal Rock Rural Fire Protection District. All three districts suffer from a reduced volunteer base and rely on automatic mutual aid from each other. In addition, YRFPD has mutual aid agreement with all the other fire agencies in the county and others such as Oregon Department of Forestry, Siuslaw Fire, Western Lane Ambulance, Pacific West Ambulance, Lincoln County Sheriff's Office, Oregon State Police, U.S. Coast Guard, and the U.S. Forest Service.

Oregon Department of Forestry – West Oregon District



URL: <https://www.oregon.gov/odf/fire/pages/default.aspx>.

District Summary: The Oregon Department of Forestry’s West Oregon District, which contains three unit offices (Philomath, Dallas, and Toledo), is one of five districts within the Northwest Oregon Area. Only one office (Toledo) lies within Lincoln County.

The District provides forest fire prevention, detection, and suppression on approximately 1.1 million acres of forest land in portions of five counties (Benton, Lincoln, Polk, Tillamook, and Yamhill), 285,000 acres of which are in Lincoln County. The District contributes to a complete and coordinated forest protection system on a local and statewide basis and provides for cooperative work to public and private landowners to supplement the fire protection system; provides for environmental protection on commercial forest land through the administration of the Forest Practices Act; administers assistance programs to private forest landowners through the Private Forests Program; and intensively manages 37,672 acres of State Forest land. The Oregon Department of Forestry does not provide any structural protection.

The District accomplishes this work with a biennial budget of approximately \$10.2 million and employment of 30 seasonal staff and 26 permanent staff. In addition, the District is able to cover the majority of the service area with a five repeater radio system: Marys’ Peak, Euchre Mountain, Hebo Mountain, Prairie Peak, and Laurel Mountain.

Cooperative Agreements: The West Oregon District has mutual aid agreements with all seven rural fire protection districts in Lincoln County as well as a closest forces agreement with the Siuslaw National Forest. The District also provides suppression services on forestlands owned by the federal Bureau of Land Management and the Confederated Tribes of Siletz Indians (CTSI).

West Oregon Forest Protective Association (WOFPA): WOFPA was formed in 1962 when the former Lincoln County Fire Patrol and Polk County Fire Patrol (both of which operated as early as 1910) merged into one organization. WOFPA’s primary objectives are the protection of forest resources within its area from possible damages caused by the destructive forces of fire and/or other causes as determined by vote of the Board of Directors and the achievement of effective communications with other organizations and agencies to ensure wise policy decision affecting forest protection. Currently, the association is comprised of 34 landowner members – including CTSI – and five affiliate members.

WOFPA works closely with the West Oregon District to ensure an adequate budget is prepared to protect their members’ lands. The Association maintains a close liaison of public and private landowners and provides feedback to ODF on the protection services they provide.

U.S. Forest Service – Siuslaw National Forest

URL: <https://www.fs.usda.gov/siuslaw>.

Forest Summary: The U.S. Forest Service (USFS)'s Siuslaw National Forest is located along the Oregon Coast from Tillamook to Coos Bay and extends into the Coast Range. It is approximately 630,000 acres and spans eight different counties. There are approximately 172,000 acres of USFS land in Lincoln County, the majority of which lies within the Siuslaw National Forest. The Siuslaw National Forest has two districts: the Central Coast Ranger District and the Hebo Ranger District.



The Siuslaw Forest has a permanent and seasonal fire staff responsible for fire prevention, detection, and suppression on all wildland fire ignitions on USFS land. Crews are also responsible for hazard fuel reduction projects, prescribed burning, and ecosystem restoration projects. Fire personnel and equipment are in five locations throughout the Siuslaw National Forest (Hebo, Corvallis, Alsea, Waldport, and Mapleton) and are shared as needed across the forest. The Forest's Mobilization Plan serves to provide information necessary to direct emergency activities and effectively utilize Forest, inter-Forest, Regional, and Cooperative resources to meet fire management needs. It is updated annually and contains detailed information on personnel and available equipment.

Cooperative Agreements: The Siuslaw National Forest works closely with the federal Bureau of Land Management and the Oregon Department of Forestry and has a cooperative agreement for initial attack with both organizations.

Confederated Tribes of Siletz Indians of Oregon



URL: <https://www.ctsi.nsn.us/tribal-services/natural-resources/>.

Tribal Summary: The Confederated Tribes of Siletz Indians (CTSI) owns 9,065 acres of land in Lincoln County, of which 8,537 acres (approximately 4,657 acres fee land and 3,880 acres trust land) is in timberlands, which are managed for timber production and fish and wildlife values. The remaining 528 acres are in or near the cities of Siletz (214 acres), Toledo (72 acres), Depoe Bay (0.10 acre), and Lincoln City (242 acres). The city properties are dedicated to housing, governmental offices and facilities, cemeteries, and businesses, along with the Chinook Winds Casino Resort (casino, hotel, and golf course) and a tribal health clinic.

Issues of Concern: Continued expansion of Tribal Housing and Administrative sites (including a new clinic, transitional living center, wellness center, sprung structure gym, and elders housing) in and around the city of Siletz may affect the level of services provided by the Siletz Valley Fire Department. Additionally, the construction of new Tribal Housing in Lincoln City will be protected by the North Lincoln Fire and Rescue District, which may incur similar concerns.

The CTSI Natural Resource Department maintains a radio communication system for projects and fire-related activities. The Tribe also has emergency/disaster satellite communications.

On Trust Land, the Tribe follows the federal Bureau of Indian Affairs regulations for burn plans. On fee land, they follow Oregon Department of Forestry regulations. The Environmental Protection Agency's Federal Air Rules for Reservations also apply.

Cooperative Agreements: CTSI does not have a firefighting organization. The tribe gets firefighting protection for structures from the Siletz Valley Rural Fire Protection District.

Additionally, there is a Master Cooperative Fire Protection Agreement between the Bureau of Indian Affairs, Northwest Regional Office, and Oregon Department of Forestry. With this agreement, the Oregon Department of Forestry provides fire protection service including prevention, pre-suppression, and suppression for the CTSI federal trust timberlands – excluding structural fires. On fee forestlands, a fire protection assessment is paid and the Tribe relies on its membership in the West Oregon Forest Protective Association.

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Chapter 7: Strategic Planning and Recommended Actions

Strategic Planning Areas

Lincoln County is separated into two Strategic Planning Areas (SPA) based on differences in development and vegetation type that impact wildfire potential and response. SPA 1 encompasses the western (coastal) side of the county (see Map 7.1) while SPA 2 encompasses the eastern, more mountainous, part of the county (see Map 7.2). This section highlights the major differences between the two strategic planning areas and how these differences impact wildfire preparedness and response.

Strategic Planning Area 1 – Western Lincoln County

SPA 1 encompasses the western (coastal) side of the county extending inland as far east as Siletz and Toledo. SPA 1 is bordered on the north by Tillamook County, on the south by Lane County and on the east by SPA 2. Map 7.1 illustrates the extent of SPA 1.

Climate and Vegetation

All of SPA 1, including the coastal and inland areas, lies within the coastal fog zone. The low-lying coastal areas and waterways are influenced by the wet maritime climate that influences the vegetation growth. Sitka spruce-western hemlock and wind-swept shore pine habitats are the dominant forest cover types. Low lying coastal and inland waterways featuring saturated soils contain mixed conifer and hardwood tree species. Dense shrubs dominate the understory vegetation throughout the area on all undisturbed sites.

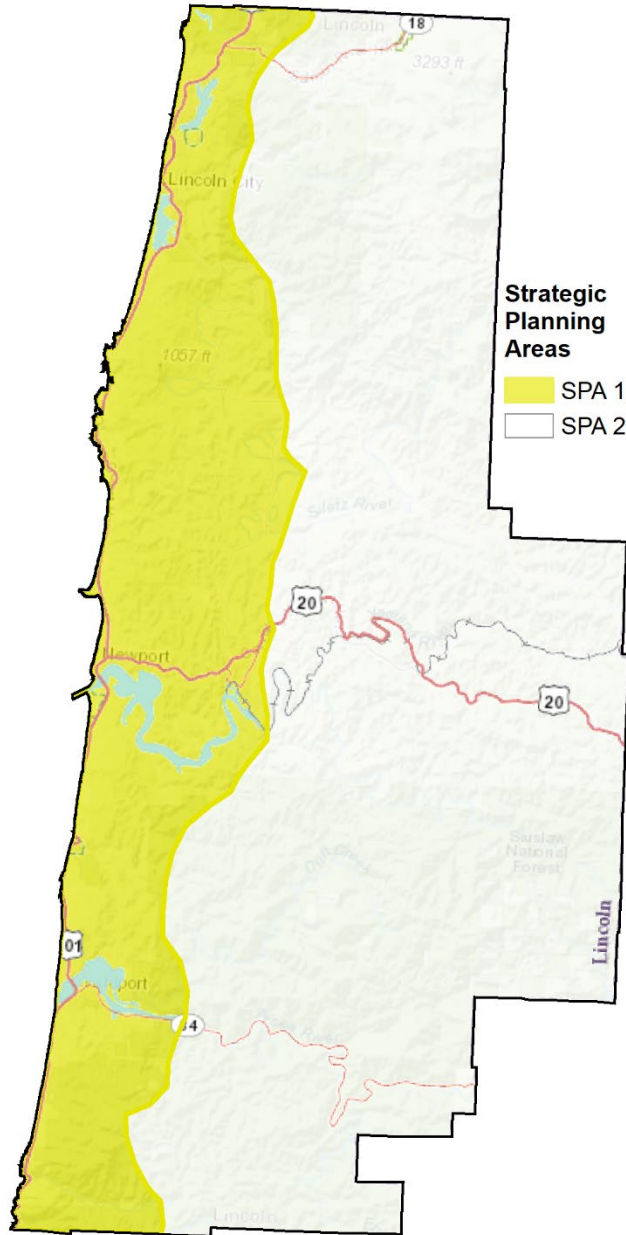
Development and Land Ownership

The bulk of Lincoln County's population lives in the Coastal Zone, with several moderate- to high-density communities scattered along the shoreline and major estuaries. Land ownership in SPA 1 is mostly privately held by citizens and timber companies with vast tracts of commercial forest land in the central portion of the SPA. Additionally, residential development is occurring along the main highway corridors, ocean front, and estuaries to the extent allowed by limited availability of zoned land. In nearly all cases, this development is adjacent to or directly in contact with wildland fuels.

To the north and south the land has a mixed ownership pattern consisting of private parcels, U.S. Forest Service (Siuslaw National Forest), and industrial and non-industrial private forest landowners. Rural subdivisions, farmsteads, and rural home sites often are developed in the woods to provide isolation and privacy. Many of these sites are within the wildland urban interface and are overgrown with natural vegetation, which while aesthetically desirable, provides little home defensible space in the event of a wildfire.

Vast expanses of forestland, coastal woodlands, and beaches provide a wide variety of recreational opportunities. The coastal area of Lincoln County is a popular recreation area experiencing heavy use especially during the summer months. Recreational activities increase the potential for ignition of a wildfire, which increases the chance of human-caused wildfire.

Map 7.1. Strategic Planning Area 1 – Western Lincoln County



Source: Insitute for Policy Research and Engagement

Ingress-Egress

The primary access in SPA 1 is Highway 101 (Coastal Highway) running north-south along the Pacific Coast, Highway 229 meandering east then south from Kernville to Siletz, Highway 18 running east-west over the coastal range between the Willamette Valley and Lincoln City,

Highway 20 running east-west over the coastal range from Corvallis to Newport, and Highway 34 running east-west between Corvallis and Waldport. All the east-west highways are primary access routes and are heavily traveled through the Coastal Range to the Oregon Coast. Highway 20 is considered a seismic corridor.

In a wildfire event, the major highways and secondary access routes are adequate to support evacuation provided they are not obstructed. Alternative access is limited in many areas due to the steep terrain and land ownership. However, there are alternate routes in some areas provided by the numerous logging and rural county roads leading from the main highways. Some of these alternative evacuation routes are known to residents, but they could lead to confusion for visitors unless the routes are well-marked and properly displayed on area maps.

Water

Residents within communities and most subdivisions in SPA 1 have access to municipal and private water systems that supply fire hydrants for fire suppression. Outside of the developed areas, residences rely on either individual or multiple-home well systems.

Wildfire Potential

Overall, the wildfire potential in SPA 1 is moderate to low on an annual basis because of the moist coastal climate that prevails throughout the year. However, given the proper conditions of sustained drying or a drought year and a significant wind event in conjunction with an ignition source, catastrophic wildfires are very probable in this region.

Moist fuel conditions are maintained during the summer months by humidity brought on by the consistent onshore flow of fog near the coast and more frequent periods of rainfall at higher elevations to the east in the mountainous areas.⁵⁰ Mild temperatures, fertile soils, and high annual precipitation in this region make it the most productive forestland in the country. Nevertheless, these conditions also create heavy wildland fuel load conditions that can, under the right circumstances, develop into a very destructive wildfire.

Fire Protection

Many residences in the forested area are accessed via unimproved, narrow roads and bridges. These roads generally lack adequate access and turn-around areas for emergency vehicles, which may limit wildfire suppression response.

Structural fire protection is provided only by the local fire agencies. In SPA 1, structural fire protection is provided by:

- **North:** North Lincoln Fire, Rescue District #1, Depoe Bay Rural Fire Protection District
- **Central:** Newport Fire District, Newport Rural Fire Protection District, Siletz Valley Rural Fire Protection District, Toledo Fire District, and Toledo Rural Fire Protection District
- **South:** Central Oregon Coast Fire and Rescue, Seal Rock Rural Fire Protection District, and Yachats Rural Fire Protection District

⁵⁰ Zybach, Bob (2003, July). *The great fires: Indian burning and catastrophic forest fire patterns of the Oregon Coast Range, 1491-1951*. Oregon State University. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/0p096972r.

The above fire agencies provide the first level of emergency response within their respective districts. The Oregon Department of Forestry has jurisdiction for wildfires on all forestland within its jurisdictional boundary including BLM lands, but not on U.S. Forest Service property. The U.S. Forest Service provides wildfire protection on its own lands. ODF and the U.S. Forest service do not provide structural fire protection. Residents who live outside of a fire protection district may not be covered for structural fire protection, but non-structural wildfire protection will be provided on forestland by the ODF. Mutual aid agreements between ODF and the various fire districts supplement wildland fire protection when needed.

Strategic Planning Area 2 – Eastern Lincoln County

SPA 2 encompasses the eastern side of Lincoln County, containing the towns of Otis, Rose Lodge, Eddyville, and Harlan. SPA 2 is bordered on the west by SPA 1, on the north by Tillamook County, on the south by Lane County, and on the east by Polk and Benton Counties. Map 7.2 illustrates the extent of SPA 2.

Climate and Vegetation

SPA 2 contains a widely dispersed rural population and vast expanses of mountainous coastal range forest that is less affected by the maritime fog climate exhibited in the coastal area. This region is mostly privately-owned industrial forestland on mountainous terrain with steep slopes and widely dissected river valleys. Evergreen and deciduous trees and shrubs are common landscape vegetation in most developed areas. This creates a semi-continuous canopy cover producing tree litter accumulations in yards and on roof tops. Given the expanse of forestland and predominance of the timber industry, SPA 2 contains the higher fire risk zones in the county. Forest cover type vegetation is predominantly Douglas-fir, western hemlock, and western red cedar with mixed hardwoods throughout most of the area on all slopes and aspects. Depressions and valley bottoms are dominated by a mix of many species of conifers and deciduous trees overtopping a heavy shrub understory.

Development and Land Ownership

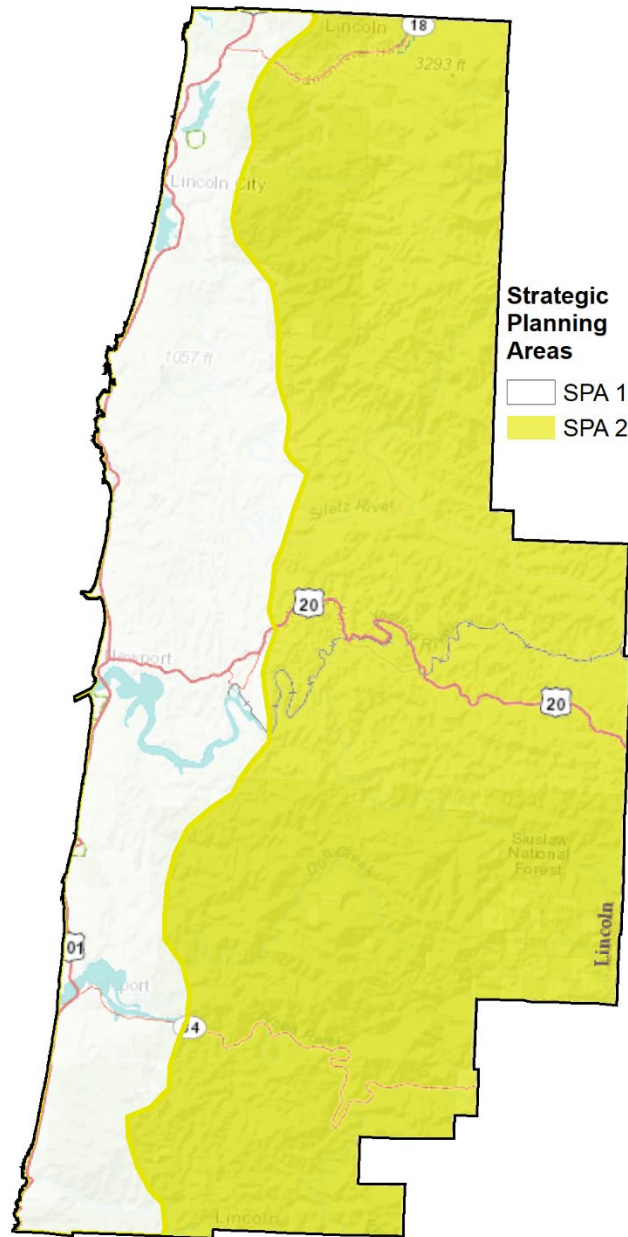
Development occurs primarily near small communities and on gentle terrain along roads and streams. Major communities in SPA 2 include Rose Lodge, Logsdon, Eddyville Harlan, Tidewater, and Fisher. Most of the population in SPA 2 resides in these communities and along the major highway corridors and river valleys nearby. Residential development is mostly adjacent or directly in contact with wildland fuels, which creates a semi-continuous canopy cover producing tree litter accumulations in yards and on roof tops. Home site development in most cases maintains the natural vegetation for aesthetic purposes and to provide privacy, which creates higher fire danger.

Most of the land in this SPA is owned by timber companies and/or timberland investors, the Confederated Tribes of Siletz Indians, and state and federal agencies. A very small portion of the total land area is held by non-industrial private owners.

Vast expanses of forestlands provide recreational opportunities including hunting, fishing, rafting, camping, off-road vehicle use, hiking, and biking. While SPA 2 sees fewer visitors than the tourist areas on the coast, these recreational uses still create increased wildfire potential. As

more areas become accessible due to development and use rises, the likelihood of a human caused wildfire will increase.

Map 7.2. Strategic Planning Area 2 – Eastern Lincoln County



Source: Insitute for Policy Research and Engagement

Ingress-Egress

Most of the primary access roads in SPA 2 run east-west following the river valleys to the ocean. Primary north-south access roads lie west of SPA 2 along the Oregon Coast. Minor north-south access in SPA 2 is possible via narrow county roads, Forest Service roads, and logging roads. Primary east-west access is provided by Highway 18 over the coastal range between the

Willamette Valley and Lincoln City, Highway 20 over the coastal range from Corvallis to Newport, and Highway 34 between Corvallis and Waldport. Highway 20 is considered a seismic corridor.

There are also a multitude of paved and graveled secondary roads crossing SPA 2 that provide alternative access. During a wildfire, these primary access routes are adequate to support evacuation provided they are not obstructed. Alternative access is limited in some areas due to the steep terrain, locked gates, and land ownership; however, there are alternate routes in many areas provided by the numerous logging and rural county roads leading from the main highways.

Water

Residents within communities and most subdivisions in SPA 2 have access to municipal and private water systems that supply fire hydrants for fire suppression. Outside of the developed areas, residences rely on either individual or multiple-home well systems.

Wildfire Potential

Overall, the wildfire potential in SPA 2 is moderate to low on an annual basis because of the moist climate that prevails throughout the year. However, SPA 2 contains several areas that are considered high risk in the county, mostly within national forest and timberlands. The prevalence of forestland and agricultural timber creates heavy wildland fuel loads that can, under the right circumstances, develop into a very destructive wildfire. Given the proper conditions of sustained drying or a drought year and a significant wind event in conjunction with an ignition source, catastrophic wildfires are very probable in this region. Recreation, agriculture, logging, and ranching activities throughout the area also increase the risk of human-caused wildfire spreading to forested areas.

Fire Protection

Many residences in the forested area are accessed via unimproved, narrow roads and bridges. These roads generally lack adequate access and turn-around areas for emergency vehicles, which may limit wildfire suppression response.

Structural fire protection is provided only by the local fire agencies. In SPA 2, structural fire protection is provided by:

- **North:** North Lincoln Fire and Rescue District #1
- **Central:** Newport Fire District, Newport Rural Fire Protection District, Siletz Valley Rural Fire Protection District, and Toledo Rural Fire Protection District
- **South:** Central Oregon Coast Fire and Rescue and Yachats Rural Fire Protection District

The Oregon Department of Forestry (ODF) has jurisdiction for wildfires on all forest land within their jurisdictional boundary including BLM lands, but not on U.S. Forest Service ownership. The U.S. Forest Service provides wildfire protection on its own lands. Residents that live outside of a fire protection district may not be covered for structural fire protection, but wildfire protection/suppression will be provided on forestland by the ODF. Mutual aid agreements between ODF and the fire district supplement wildland fire protection when needed.

Fire Protection Challenges and Recommended Strategies

This section provides an overview of the issues currently challenging Lincoln County in providing wildland fire safety to residents. Many of these issues were discussed during the steering committee process and at community workshops. The planning team and steering committee developed recommended strategies intended to begin the process of effectively mitigating these issues. Where relevant, each strategy has been connected to one or several of the mitigation recommendation action items listed in Chapter 8: Mitigation Recommendations.

Residences in the Wildland-Urban Interface

One challenge Lincoln County faces is the large number of houses in the urban/rural fringe (called the Wildland-Urban Interface, or WUI). Since the 1970s, despite statewide regulation of residential development in resource lands, a segment of Oregon's growing population has expanded further into traditional forest or resource lands, primarily along the coast and waterways. The “interface” between urban and suburban areas and the resource lands created by this expansion has produced a significant increase in threats to life and property from fires and has pushed existing fire protection systems beyond original or current design or capability. Many property owners in the WUI are not aware of the problems and threats they face, and owners have done very little to manage or offset fire hazards or risks on their own property. Furthermore, human activities increase the incidence of fire ignition and potential damage.

Limitations of Rural Fire Protection

People moving from urban to more rural areas frequently have high expectations for structural fire protection services. Often, new residents do not realize they are living outside a fire protection district or that the services provided are not the same as in an urban area. Great improvements in fire protection techniques are being made to adapt to large, rapidly spreading fires that threaten large numbers of homes in interface areas. However, the diversity and amount of equipment and the number of personnel can be substantially limited in rural areas. Fire protection may rely more on the landowner’s personal initiative to take measures to protect his or her property. Furthermore, subdivisions on steep slopes and the greater number of homes exceeding 3,000 square feet are also factors challenging fire service organizations.

Recommended Strategy (FPE 1, 5): More community engagement to help educate the public on the ramifications of living in the wildland-urban interface and rural areas.

This includes understanding landowner responsibilities to reduce the fire risk on their property and to provide safe access to their property for emergency personnel and equipment. Homeowners building in a high-fire risk area must understand how to make their properties more fire resistant using proven firesafe construction and landscaping techniques (including home hardening and defensible space). They must also have a realistic understanding of the

capability of local fire service organizations to defend their property (emergency preparedness).

Recommended Strategy (RCE 6): Lincoln County should consider creating a new full-time staff position focused on engaging the community around wildfire mitigation and overseeing implementation of the CWPP action items.

To build social capacity within Lincoln County, an ongoing community engagement process, supported by a new full-time staff member, should continue after plan adoption. Having a community wildfire coordinator would create the opportunity for year-round engagement and shift the responsibility for community engagement away from fire district personnel. An ongoing process can take various forms, such as partnering with local organizations to offer educational programming, convening monthly community partner meetings, and implementing a variety of place-based programs and policies.

Road and Bridge Standards

Fire chiefs throughout Lincoln County have identified home accessibility issues as a primary concern in many of the rural areas in the county. Many private driveways are too narrow and/or too steep and most do not have adequate turnouts, turnaround areas, or alternative escape routes. In addition, many privately maintained rural access roads have become overgrown by vegetation, effectively restricting safe access, particularly in a wildfire situation. It is the landowner's responsibility to maintain their private roads and bridges to a standard that allows for safe emergency response.

Inadequate private bridges lacking weight rating signage are also a common problem. Due to the risk of bridge failure and resulting injury to personnel and equipment damage, fire and medical service organizations will not cross bridges that may be incapable of handling the weight of emergency response apparatus.

Recommended Strategy (PP 2, 4; IE 1): Lincoln County Fire Defense Board should keep working with the Oregon Department of the State Fire Marshall to evaluate road and bridge standards.

Having a clear understanding of which roads and bridges are and are not accessible is important for wildfire response. This will support fire agencies to ensure the safety of fire personnel and could be used to inform public education to specific landowners.

Recommended Strategy (IE 1, 2): Improve public education around landowners' responsibility to maintain private roads and bridges to allow for safe emergency response access.

Residents should be made aware that they are responsible for maintaining adequate bridges, roads, and turnaround space in the case of a wildfire emergency. Residents should also communicate with their local fire district/department about upgrades they make to roads and bridges, and they should consider installing bridge weight rating signage.

Water Resources

Even though water is abundant in Lincoln County, access to this resource for fire suppression is not always available. Several fire districts involved in this planning process indicated the need to develop additional water resources in several rural areas. Developing water supply resources such as cisterns, dry hydrants, drafting sites, and/or dipping locations ahead of an incident is considered a force multiplier and can be critical for successful suppression of fires. Pre-developed water resources can be strategically located to cut refilling turnaround times in half or more, which saves valuable time for both structural and wildland fire suppression efforts.

Recommended Strategy (IE 11; RCE 1): Inventory and map existing water resources in Lincoln County and develop new water resources as identified.

Understanding the current capacity of the county to respond to wildfires is essential to knowing which areas local and state fire and forestry agencies should prioritize for upgrades.

Recommended Strategy (PP 4; RCE 1): Promote more public education for homeowners to improve water supply resources for emergency responder access.

Information should be available to homeowners about the different types of water supply resources and how to ensure they are accessible to emergency responders. Homeowners should also be encouraged to share information with fire agencies about water resources available on their property to support comprehensive mapping of water resources.

Wildland-Urban Interface Building Regulations

Lincoln County currently utilizes the Oregon Building Code as the development standard for new construction. The building code does not include regulations for new construction within wildland-urban interface areas, so new development is not required to use wildfire resistant materials or consider wildfire mitigation. However, statewide legislation to improve building codes and reduce wildfire risk (e.g., SB 762) will be implemented in the coming years, which should reduce wildfire risk in the WUI. Nonetheless, new construction within the WUI tends to increase community wildfire risk and places more demand on local fire districts/departments.

As the trend to build in the wildland-urban interface continues, many counties and communities in Oregon – such as the City of Ashland⁵¹ and Deschutes County⁵² – have begun to develop more stringent wildland-urban interface (WUI) codes for new construction that regulates the use of certain building materials (roofing, siding, vents, decking, etc.) in high fire risk areas. Codes regarding road and bridge standards, availability of water resources, proximity of vegetation, and other requirements have been adopted in communities and counties across the United States.

⁵¹ City of Ashland (2021). *Wildfire Hazard Mitigation Code (R327.4)*. <https://www.ashland.or.us/page.asp?navid=18080>.

⁵² Deschutes County (2023). *Wildfire Mitigation Proposals*. <https://www.deschutes.org/cd/page/wildfire-mitigation-proposals>.

Recommended Strategy (PP 7): Consider implementing more stringent building codes for new construction within the wildland-urban interface.

Lincoln County could consider implementing more stringent requirements for new construction within WUI areas across the county. There may be some conflicts between model uniform fire codes (the template Urban Wildland Interface Building Code) and standard development provisions (Oregon Building Code) that the county would need to consider. Forthcoming statewide legislation through SB762 may also include new requirements and/or recommendations for building codes within the WUI in Oregon.

Local jurisdictions and planning departments could also integrate these requirements into local building codes.

Debris Burning

Local debris or backyard burning has been identified as a significant and growing problem as well as the number one cause of wildfires throughout Lincoln County. Not only are some people regularly burning outside of the designated time frame, but escaped debris fires impose a very high fire risk to neighboring properties and residents. A growing portion of local fire department calls are in response to debris fires or “backyard burning” that either have escaped the landowner’s control or are causing smoke management problems. It is likely that regulating this type of burning will always be a challenge for local authorities and fire departments.

Recommended Strategy (FPE 1, 5, 7): Improve public education regarding the county and local burning regulations and permit system as well as potential risk factors.

This could include public service announcements, social media posts, and other outreach to clarify regulations of how and when burning is permitted. When fire agencies receive a call regarding unpermitted burning, agencies can use this as an opportunity to speak to the resident about burning regulations, risks, and fire mitigation actions.

Subdivision and HOA Covenants

Due to the number of highly publicized WUI fires occurring in the western states, increased levels of research, development, and marketing has made fire-resistant construction materials more accessible. However, some HOA and subdivision covenants do not allow the use of certain materials, such as fire-resistant building materials. Some covenants also have stringent appearance requirements that restrict homeowners in acting around defensible space and home hardening (e.g., they are not allowed to install wire mesh in visible areas or are required to keep certain landscaping elements). The inability of homeowners to take fire mitigation actions increases the wildfire risk in these neighborhoods and to the surrounding community. In most circumstances, fire-resistant materials closely resemble the most popular trends in construction materials and do not degrade the aesthetic value of homes.

Recommended Strategy (PP 7): Update Lincoln County development and land use codes for compliance with proposed SB762 legislation.

State legislation (SB762) proposes requirements for defensible space and home hardening standards be implemented in land use and development codes. At the time of writing this plan, SB762 was not fully implemented. However, it is recommended that Lincoln County update its development code for compliance with SB762 and include defensible space standards for both high and medium-risk areas as outlined by the risk maps in Chapter 5: Risk and Preparedness Assessment. Land use code revisions would require HOA and subdivision covenants to allow the use of fire-resistant materials and home hardening and defensible space improvements.

Recommended Strategy (FPE 5): *Increase outreach and education to HOAs and subdivisions to understand fire risk and mitigation to ensure that covenants allow/encourage residents to take action to protect their homes.*

Lincoln County and fire agencies could reach out to HOAs and distribute model covenants that promote fire mitigation practices. These agencies could also post information on high-risk materials as well as fire-resistant alternatives on their websites.

Response Plans

Although conducting home, community, and road defensible space projects is a very effective way to reduce the fire risk to communities in Lincoln County, recommended mitigation projects cannot all occur immediately, and many will take several years to complete. Therefore, the wildfire risk potential remains high in many areas and fire agencies must be prepared to respond in the case of wildfire. Understanding the landscape and specific conditions in high-risk areas as well as which fire agencies must respond to those areas is important for fire response planning. However, there are currently no written emergency response plans for specific high-risk areas in Lincoln County.

Recommended Strategy (PP 5): Develop pre-planning response plans specifying which and how local fire agencies will respond to specific areas.

These response plans should include assessments of the structures, topography, fuels, available evacuation routes, available resources, response times, communications, water resource availability, and any other factors specific to an area. All these plans should be available to the local fire departments as well as dispatch personnel.

Many Lincoln County fire departments/districts have reciprocal response agreements with other local fire departments, the Oregon Department of Forestry, and the Forest Service. These agreements should be compiled and available to all agencies so that fire response in specific areas is clear.

Lincoln County Fire Department/District Challenges

Funding

Virtually all funding for operating a fire agency is derived from property taxes. Oregon’s Measure 5 (1990) froze property tax rates, while Measure 47 (1996) and Measure 50 (1997) limit property tax increases to 3% per year regardless of growth in assessed property value. Urban Renewal Districts throughout the county impact property tax base (e.g., about 25% of the property tax base in Lincoln City is frozen). With rising costs and mandated expenditures, and strictly limited revenue growth, the ability of fire service organizations to fulfill their missions and meet public expectations is increasingly compromised.

Volunteer Firefighter Recruitment

Rural fire agencies in Lincoln County are predominantly dependent on volunteer firefighters. Each district spends a considerable amount of time and resources training and equipping each volunteer, with the hope that they will continue to volunteer their services for years to come. All volunteer-based agencies are encountering a diminishing number of new recruits. Concurrent with the aging population and increase in the number of homes built in high-risk areas, the number of capable volunteers has gone down. Many agencies have difficulty maintaining volunteers who are available during regular workday hours (8 am to 5pm).

Recommended Strategy (RCE 2): Consider establishing a program with local, state, or federal to increase the retention and recruitment of volunteer firefighters.

Local fire agencies must pursue funding and unique programs to increase volunteer figures.

Public Utility Lines

Local public utility lines traveling along roads and highways are exposed to damage from falling trees and present a real fire danger. Power and phone services throughout Lincoln County are both above and below ground, with most above ground. These utilities may be cut to some areas during a wildfire due to direct damage from flames or danger to firefighters from arcing.

Recommended Strategy (IE 3, 4, 6, 7, 8, 9): The Lincoln County Fire Defense Board should continue regular meetings with public utility providers to promote defensible space around utility lines and communicate about public safety power shutoffs (PSPSs).

All three of the utility providers in Lincoln County – Pacific Power, Central Lincoln Public Utility District, and Consumer Power, Inc. – are carrying out wildfire mitigation work. The Fire Defense Board should meet with these companies to discuss and coordinate projects.

Recommended Strategy (IE 5): Promote public awareness about PSPSs to protect against wildfire during high wind and heat events.

Continuing education regarding PSPSs and emergency preparedness helps households have a plan in place should electricity and communications be unavailable in the event of a wildfire.

Evacuation Route Planning

There are several main highways that serve as evacuation and emergency routes in Lincoln County. Additionally, many of the secondary roads in the area often serve this purpose. Due to the rural nature of much of the county, rural forest roads may provide an alternative access point into an area or could serve as a potential evacuation route if a primary route is disabled or blocked. These alternative routes are not currently mapped or officially recognized for this purpose; thus, there are no agreements with landowners for their use or maintenance. Often, well-known forest routes are gated by the landowners without notice or not maintained for extended periods.

Recommended Strategy (PP 2; IE 16): The CWPP Planning Committee should identify and map forest routes that are known to provide alternative access in specific areas.

In the summer of 2023, Lincoln County began the process for creating and updating its Evacuation Plan. That process will support more thorough mapping of alternative access routes and what jurisdictions have key access to those routes (if gated).

Recommended Strategy (IE 10): Reach out to appropriate landowners to create agreements to ensure rural roads are open and maintained for use in an evacuation situation.

Reliance on these alternative routes should be recognized and agreements should be formed with the appropriate landowners to ensure their availability during emergency events. The CWPP Planning Committee recognizes this might not be possible in many cases.

Physical Challenges in Mitigating Wildfire Risk

Nearly half of Lincoln County residents are over the age of 55.⁵³ Furthermore, 12% of community survey respondents indicated that someone in their household has a disability that impacts their mobility, and 31% have a household member with a respiratory or cardiovascular disease. These populations have challenges implementing defensible space and home hardening actions.

Recommended Strategy (FPE 2, 3, 4, 6): Create local teams to help older adults and people with disabilities to take home hardening and defensible space actions.

Creating defensible space and home hardening can be challenging for people who have diminished mobility or physical capacity. These populations will need support to take these actions on their homes. While some households may have the monetary means to pay for such services, many households in Lincoln County do not. The county could consider implementing a support team that works on a sliding scale basis to fund some of these defensible space and home hardening efforts.

Homeowner and Rental Insurance in the WUI

The 2020 Echo Mountain Fire in Otis and Rose Lodge served as a wake-up call for the threat of wildfire in Lincoln County. Many residents impacted by that wildfire are struggling to obtain permanent housing and recover financially almost three years later. In the aftermath of the wildfire, it has become evident that many homeowners and renters were underinsured, which limited their ability to recover financially and rebuild their homes, especially given the rising costs of construction and labor. Homeowners and renters are also not often aware of how the insurance works, what it covers, and the importance of the assessed value of their homes for insurance coverage.

Recommended Strategy (FPE 5): Lincoln County and Fire Departments/Districts should offer more education and resources about homeowner and rental insurance and how it relates to wildfire.

Homeowner and rental insurance is an essential aspect of both mitigating wildfire risk and recovering from wildfires. Ensuring that residents understand how their insurance works in the event of a wildfire and the importance of not being underinsured – especially for a property that lies in the WUI – should be a key focus of community engagement efforts.

Threat to Watersheds

Many of the watersheds in Lincoln County are intensively studied and managed as potable water for residents and for fish and other riparian habitats. A wildland fire can be devastating to a

⁵³ U.S. Census Bureau (2022). *Table A01001*. American Community Survey 5-Year Estimates (2017-2021). www.socialexplorer.com/tables/ACS2021_5yr.

watershed that is actively supplying potable water to a community or providing critical habitat for fish. In many cases, wildland fire and adaptive forestry are not being considered as an effective tool for managing the watershed resource.

Recommended Strategy (IE 12): Develop wildland-fire specific management plans for several critical watersheds in Lincoln County.

Watersheds in Lincoln County should be evaluated for their wildland fire potential and resiliency to fire. These areas should be managed in a way that would allow a fire to burn through the vegetation, but not destroy the ecosystem. The primary purpose of a watershed management plan is to guide watershed coordinators, resource managers, policy makers, and community organizations to restore and protect the quality of lakes, rivers, streams, and wetlands in each watershed. The Fire Defense Board should partner with organizations and agencies involved in the Lincoln Soil and Water Conservation District to promote collaborative watershed planning.⁵⁴

Agency Roles - Wildfire Protection and Mitigation on Federal and State Land

Numerous factors contribute to wildfire risk, but forest management has a significant impact on the fuel compositions in Lincoln County. The County contains extensive amounts of forest land owned by private owners as well as state and federal agencies. The ways these agencies manage and maintain forest lands should be recognized for their contributions to the reduction of wildland fire risk. This section of the CWPP outlines the roles of the Oregon Department of Forestry, Siuslaw National Forest, Lincoln County Fire Defense Board, and Oregon State University Extension in wildfire protection and mitigation in Lincoln County.

The forest management programs of the Oregon Department of Forestry and numerous industrial forestland companies in the region have led to some reduction of wildland fuels where they are closest to homes and infrastructure. Despite these efforts, there is significant room for growth in these organizations' fuels reduction programs. Forests are dynamic systems that will never be completely free from risk – managed areas will need repeated treatments to reduce the risk to acceptable levels in the long term.

Agriculture (specifically timber) is a crucial component of Lincoln County's economy. Significant portions of the wildland-urban interface area are covered in a mosaic of agricultural and timberlands. Increased biomass accumulations in these areas place them at some of the highest risk to wildland fires in Lincoln County.

⁵⁴ Lincoln Soil and Water Conservation District. (2023). *Partners*. <http://www.lincolnswcd.org/agencies--organizations.html>.

Oregon Department of Forestry

The Oregon Department of Forestry (ODF) is an active member of the Lincoln County Fire Defense Board and assists local fire departments through mutual aid agreements. ODF has jurisdiction for wildfires on all forestland within its jurisdictional boundary including BLM lands, but not on U.S. Forest Service property. ODF does not provide structural fire protection. Residents who live outside of a fire protection district may not be covered for structural fire protection, but wildfire protection will be provided on forestland by the ODF.

ODF has been involved with emergency managers to provide support during non-fire events and, for years, ODF has worked with industrial partners (industrial timber companies) to share equipment in the case of extremely large fires.

The Industrial Fire Precaution Level System

ODF implements and enforces an Industrial Fire Precaution Level (IFPL) system for all commercial forestlands.⁵⁵ The IFPL is a four-level system:

IFPL I. **Fire Season** – fire season requirements are in effect. In addition to other fire prevention measures, a Fire Watch is required at this and all higher levels unless otherwise waived.

IFPL II. **Limited Shutdown** – the following may operate only between the hours of 8 P.M. and 1 P.M.:

- Power saws except at loading sites;
- Feller-bunchers with rotary head saws;
- Cable yarding;
- Blasting;
- Welding, cutting, or grinding of metal.

IFPL III. **Restricted Shutdown** – the following is prohibited except as indicated:

- Cable yarding - except that gravity operated logging systems employing non-motorized carriages or approved motorized carriages may operate between 8 P.M. and 1 P.M. when all blocks and moving lines are suspended 10 feet above the ground except the line between the carriage and the chokers.

The following are permitted to operate between the hours of 8 P.M. and 1 P.M.:

- Power saws at loading sites;
- Loading or hauling of any product or material;
- Blasting;
- Welding, cutting, or grinding of metal;
- Any other spark emitting operation not specifically mentioned.

⁵⁵ Oregon Department of Forestry (n.d.). *Industrial Fire Precaution Levels (IFPLs) for Oregon Department of Forestry Protection west of the Cascades*. <https://www.oregon.gov/odf/fire/documents/industrial-fire-precaution-levels.pdf>.

In addition, the following are permitted to operate between the hours of 8 P.M. and 1 P.M. where mechanized equipment capable of constructing fire line is immediately available to quickly reach and effectively attack a fire start:

- Ground-based operations (tractor/skidder, feller-buncher, forwarder, or shovel logging);
- Power saws on ground-based operations;
- Rotary head saw feller-bunchers where a full time firewatch is present;
- Non-rotary head saw feller-bunchers;
- Tethered logging systems.

IFPL IV. **Complete Shutdown** – all operations are prohibited.

NOTE: *Where hauling involves transit through more than one shutdown/regulated use area, the precaution level at the woods loading site shall govern the level of haul restriction, unless otherwise prohibited by other than the IFPL system.*

ODF also implements three levels of closures that apply to public and non-industrial activities.

- **Regulated Use Closure** – regulated use closures do not restrict access but does restrict certain activities. Affected lands will often be marked with signs along with instructions and prevention reminders. Common restrictions include smoking, campfires, non-industrial use of chainsaws, use of motor vehicles, and fireworks.
- **Permit Closure** – when fire danger increases, a permit closure may be announced. Permit closures require people, including landowners, to obtain permits before entering designated forest lands.
- **Absolute Closure** – this closure prohibits all use of forested areas within a designated area. All forms of travel and all recreational activities are prohibited during an absolute closure.

Siuslaw National Forest

The Siuslaw National Forest also implements and enforces the IFPL system and fire restrictions in coordination with the Oregon Department of Forestry. The US Forest Service does not provide structural fire protection but does respond to wildfires on national forest lands. The Siuslaw National Forest is involved in fire prevention education programs for schools and the public.

Lincoln County Fire Defense Board

The Lincoln County Fire Defense Board is comprised of all the local fire chiefs within the county and includes ex-officio representatives from the Oregon Department of the State Fire Marshall and the Oregon Department of Forestry. Pursuant to the Oregon Fire Service Mobilization Plan, the Fire Defense Board is charged with the following responsibilities:

- Develop a fire service plan with provisions permitting local departments to respond with mutual aid forces upon request of other local departments in the county.
- Administer the State Fire Mobilization Plan within the county.
- Maintain response procedures for alert, transfer, and dispatch of firefighting equipment and personnel.

- Maintain liaison with other agencies capable of augmenting firefighting resources.
- Maintain inventories of firefighting equipment in the county.
- Develop dispatch plans for mobilization requests and conduct exercises as necessary to ensure efficient operations.
- Develop expedient procedures for providing and dispatching incident command overhead teams and logistical support.
- Hold regular meetings.

The Lincoln County Fire Defense Board meets regularly with representatives from other agencies in the County to coordinate prevention and response activities and issues. Those include Lincoln County Sheriff's Office – Emergency Management, Willamette Valley 911 Communication Center, and Pacific West Ambulance.

Confederated Tribes of Siletz Indians

The Confederated Tribes of Siletz Indians (CTSI) carry out a broad range of wildfire mitigation activities. They work closely with the Oregon Department of Forestry and the U.S. Forest Service regarding wildland fire protection on their forestland. For structures, the majority of which are located near the town of Siletz, they contract directly with the Siletz Valley Rural Fire Protection District for services and coverage.

In addition to these relationships, CTSI conducts defensible space and fuels reduction work for tribal members living on or near tribal land. These projects are primarily funded either by the tribe itself or through wildfire mitigation funding provided by the Oregon Department of the State Fire Marshall to all nine federally recognized tribes in Oregon.

Oregon State University Extension

The Lincoln County office of the OSU Extension Service helps reduce the risk of wildfires in Lincoln County by offering a variety of educational programs and materials to Lincoln County residents. Lincoln County residents can access OSU and other publications in both English and Spanish on such topics as Firewise landscaping, fire prevention, and fuels management via the office in Newport⁵⁶ or via their website at <https://extension.oregonstate.edu/lincoln>.

In addition, OSU Extension provides a free newsletter six times per year, which gives additional information, through articles written by OSU Extension agents and others. Issues during the spring and summer usually include articles pertaining to fire on rural properties. OSU volunteer training for its Master Gardener and Master Woodland Manager volunteer programs includes information that volunteers in turn use during their volunteer service activities to show other citizens how to reduce the risk of wildfires.

⁵⁶ The OSU Extension Service's Newport office is located at: 1211 SE Bay Blvd., Newport, OR 97365.

Chapter 8: Mitigation Recommendations

Wildfire Mitigation Action Items

Critical to implementation of this Community Wildfire Protection Plan (CWPP) is the identification of an integrated schedule of action items targeted at reducing both the number of human-caused fires and the impact of wildland fires in Lincoln County. This section of the CWPP identifies and prioritizes potential mitigation actions, including treatments that can be implemented in the county to pursue that goal. Due to the wide variety among stakeholders in Lincoln County – including both private landowners as well as fire and forestry agencies – there will likely be differing schedules of adoption and degrees of compliance for these action items.

This section is vital to the CWPP because it guides what actions Lincoln County fire and forestry agencies can use when applying for state and federal wildfire mitigation funding. Agencies can only receive Community Wildfire Defense Grant (CWDG) funding from the U.S. Forest Service for recommendations listed within this CWPP. A wide array of wildfire mitigation grants are available on both the state and federal levels. A full list of funding opportunities can be found in Appendix A: Wildfire Mitigation Funding Opportunities.

The forest and land management agencies in Lincoln County are participants in the planning process and have contributed to this plan's development. Their schedule of land treatments has been considered to improve the correlation between their planning initiatives and the efforts of Lincoln County. Key fire and forestry agencies were interviewed to inform this chapter's recommendations, including the county's fire districts and departments, water and utility districts, the U.S. Forest Service, the Oregon Department of the State Fire Marshall, and the Confederated Tribes of the Siletz Indians.

Lincoln County encourages building disaster resistance into normal day-to-day operations. Implementing activities through existing programs and resources can reduce the overall cost of a project. All risk assessments and mitigation recommendations were made based on the conditions existing during 2023. However, both the components of wildfire risk and the county's resources for mitigation are not static. It will be necessary to fine-tune this plan's recommendations regularly to adjust for changes in community risk and population density, infrastructure modifications, and other factors. This will be done through both the CWPP Steering Committee and updates to the plan conducted every five years, at a minimum.

Monitoring Progress

Lincoln County policy requires that the CWPP be reviewed at least annually at special meetings of the CWPP Steering Committee, open to the public, and involve all municipalities and jurisdictions, where action items, priorities, budgets, and modifications can be discussed.

The Lincoln County Department of Planning and Development (or other designee of the Lincoln County Commissioners, such as the Lincoln County Emergency Management Division or Lincoln County Fire Defense Board) is responsible for scheduling, publicizing, and leading meetings. During these meetings, participating jurisdictions will report on their respective projects and identify any updates to the CWPP.

Maintenance of the plan should be detailed at these meetings, documented, and attached to the plan as an amendment. Complete reevaluation of the plan will be made every five years and will include reevaluation of other Lincoln County planning documents (such as the Lincoln County NHMP), updates to the data presented in previous chapters (particularly the community risk assessments), and the addition or revision of mitigation recommendations.

Prioritization of Activities

The action items recommended in this chapter were prioritized through individual interviews, followed by a discussion with the Fire Defense Board and CWPP Steering Committee. The action items in Tables 13-16 are ranked as “High”, “Moderate”, or “Low” priorities for the county overall. The CWPP Steering Committee does not want to restrict funding to only those projects that are high priority because what may be a high priority for a specific community may not be a high priority at the county level. The flexibility to fund a variety of diverse projects based on varying criteria and importance at different levels of government is a necessity for a functional mitigation program at both the community and the county levels.

The proposed project areas listed in Table 8.5 and Table 8.6 are sorted by fire district or department (or other agency) and ranked on a 1, 2, 3 . . . hierarchical scale by each agency. This results in a set of highest priority recommendations for each jurisdiction.

Wildfire Mitigation Recommendations

As part of the implementation of wildfire mitigation in Lincoln County, a variety of forest and land management tools can be used. These include, but are not limited to, the following:

- **Prevention** (education and policy changes for WUI structures and infrastructure).
- **Limiting use** (banning certain activities, like backyard burns, during wildfire season).
- **Defensible space creation** at both the home and community levels.
- **Emergency response enhancements** (including trainings and equipment).
- **Access improvements** for emergency vehicles and first responders.
- **Fuels reduction** (including regional forest and land management recommendations for private, state, federal, and tribal landowners).

Policy and Planning Efforts

Wildfire mitigation efforts must be supported by a set of policies and regulations at the county level that maintain a solid foundation for safety and consistency. The recommendations listed in this section serve that purpose. Because these items are regulatory in nature and generally represent policy recommendations to various elected and appointed officials, they will not necessarily be accompanied by cost estimates. The Fire Defense Board and CWPP Steering Committee will need to work with the relevant decision makers to ensure these recommendations are adopted in a suitable and appropriate fashion for the county.

Table 8.1. Recommendations for Policy and Planning-Related Issues

| Action Item | State Goals Addressed (pgs. 8-9) | Responsible Organizations | Timeline |
|--|--|---|----------|
| PP 1: Incorporate the Lincoln County CWPP as a supplement to the Lincoln County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP). | Goals #2, 3, 4, 5, 10, 11, 12, 13 Priority: High | Lead: Lincoln County Planning and Development Support: CWPP Steering Committee | 2017 |
| PP 2: Continue pre-planning emergency evacuation routes with specifications for varying conditions. | Goals #2, 3 Priority: High | Lead: Lincoln County Sheriff's Office Support: Fire Defense Board; Lincoln County Emergency Management | Ongoing |
| PP 3: Proactively support alternative fuels reduction techniques such as prescribed burning and chipping as effective tools to reduce hazardous fuels in the WUI within applicable regulations. | Goals #2, 3, 4, 10 Priority: High | Lead: CWPP Steering Committee Support: Oregon Department of Forestry | Ongoing |
| PP 4: Evaluate the development of a program that will assist landowners with the certification, signage, and maintenance of private bridges and improvements to existing substandard driveways. | Goals #13 Priority: High | Lead: Fire Defense Board Support: CWPP Steering Committee; Lincoln County Public Works | Ongoing |
| PP 5: Prepare for wildfire events in high-risk areas by developing area-specific "Response Plans" to include participation by all affected jurisdictions and landowners. | Goals #2, 4, 6, 8, 9, 12 Priority: High | Lead: Lincoln County Fire Districts/Departments Support: Oregon Department of Forestry; private landowners | Ongoing |

| Action Item | State Goals Addressed (pgs. 8-9) | Responsible Organizations | Timeline |
|--|--|--|----------|
| PP 6: Consider holding meetings of the Lincoln County CWPP Steering Committee more frequently. At a minimum, this should include holding meetings twice per year. | Goals #2, 3, 4, 5, 10, 11, 12, 13 Priority: High | Lead: Fire Defense Board Support: Lincoln County Sheriff's Office | Ongoing |
| PP 7: Work with the State of Oregon to review and resolve conflicting standards in the Urban Wildland Interface Building Code and the Oregon Building Code. | Goals #4, 5, 10 Priority: Moderate | Lead: Fire Defense Board Support: Lincoln County Planning and Development | Ongoing |

Source: Lincoln County CWPP Steering Committee (2023). *Projects identified and prioritized through interviews with fire department and agency leadership.*

Fire Prevention and Education Efforts

Many of the recommendations in this section involve education to increase awareness about the actions Lincoln County residents can take to reduce community wildfire risk. These items were informed by the previous CWPP as well as in meetings with the Fire Defense Board, CWPP Steering Committee, and other key stakeholders throughout the county and from input from county residents via a survey and in-person workshops. Despite increased awareness since the 2020 Echo Mountain fire, this evidence indicates that community members have a general lack of knowledge about or interest in carrying out wildfire mitigation on their property.

Table 8.2. Recommendations for Fire Prevention and Education Enhancement

| Action Item | State Goals Addressed (pgs. 8-9) | Responsible Organizations | Timeline |
|---|--|--|----------|
| FPE 1: Implementation of youth and adult wildfire educational programs. | Goals #6, 12 Priority: Moderate | Lead: Fire Defense Board Support: OSU Extension; Oregon State Fire Marshal; CWPP Steering Committee | Ongoing |
| FPE 2: Wildfire risk assessments of homes in the wildland-urban interface. | Goals #1, 2, 4, 7 Priority: High | Lead: Lincoln County Fire Districts/Departments Support: Oregon Department of Forestry; Oregon State Fire Marshal | Ongoing |
| FPE 3: Implementation of home site defensible space treatments. | Goals #2, 4, 7, 9 Priority: High | Lead: Lincoln County Fire Districts/Departments Support: Oregon Department of Forestry; | Ongoing |

| Action Item | State Goals Addressed (pgs. 8-9) | Responsible Organizations | Timeline |
|--|---|---|----------|
| | | homeowners' associations; private landowners | |
| FPE 4: Implementation of community defensible zone treatments in rural subdivisions or housing clusters. | Goals #2, 4, 7, 9 Priority: High | Lead: Lincoln County Fire Districts/Departments Support: Oregon Department of Forestry; homeowners' associations; private landowners | Ongoing |
| FPE 5: Work with homeowners' associations (HOAs) to foster a cooperative approach to fire protection and awareness and identify mitigation needs. | Goals #2, 4, 6, 7, 9, 12 Priority: High | Lead: Lincoln County Fire Districts/Departments Support: Oregon Department of Forestry; Lincoln County Emergency Management; Lincoln County Planning and Development; HOAs; private landowners | Ongoing |
| FPE 6: Work with OSU Extension to offer Firewise landscaping clinics to assist property owners in maintaining defensible space. | Goals #4, 6, 9, 12 Priority: High | Lead: OSU Extension Support: Fire Defense Board | Ongoing |
| FPE 7: Distribute Firewise-type educational brochures with building permit applications. | Goals #2, 4, 6, 9, 12 Priority: High | Lead: Fire Defense Board Support: Lincoln County Planning and Development | Ongoing |

Source: Lincoln County CWPP Steering Committee (2023). *Projects identified and prioritized through interviews with fire department and agency leadership.*

Infrastructure Enhancements

The recommendations contained within this section refer to actions that can be taken to strengthen critical infrastructure throughout Lincoln County. Critical infrastructure refers to the communication systems (internet, cell service, and radio), transportation (road and rail networks), energy transport supply systems (gas and power lines), and water supply that service a region. These networks are, by definition, a part of the wildland-urban interface and serve a vital role in the protection of people, structures, infrastructure, and unique ecosystems. Without supporting infrastructure, a community's individuals and structures may be protected from wildfire, but the economy and way of life of residents may be lost.

Table 8.3. Recommendations for Infrastructure Enhancements

| Action Item | State Goals Addressed (pgs. 8-9) | Responsible Organizations | Timeline & Estimated Cost |
|---|--|---|---------------------------------|
| IE 1: Develop inventory, map, rate, and sign all private bridges and evacuation routes countywide. | Goals #13 Priority: High | Lead: Lincoln County Emergency Management; Lincoln County GIS Support: Lincoln County Fire Districts/Departments; private landowners | Ongoing \$25,000 |
| IE 2: Educate the public on emergency evacuation procedures and locations of approved routes. | Goals #3, 6, 13 Priority: High | Lead: Lincoln County Emergency Management Support: Fire Defense Board; CWPP Steering Committee | Ongoing \$5,000 |
| IE 3: Continue implementing fuels reduction program along Bonneville Power Administration power line corridor. | Goals #2, 4 Priority: High | Lead: Bonneville Power Administration Support: Fire Defense Board | Ongoing \$25,000 per year |
| IE 4: Continue implementing vegetation management program along Central Lincoln Public Utility District power line corridor. | Goals #2, 4 Priority: High | Lead: Central Lincoln Public Utility District Support: Fire Defense Board | Ongoing \$6 million per year |
| IE 5: Continue modernizing Central Lincoln Public Utility District substation-to-meter monitoring and communication system to streamline Public Safety Power Shutoff protocol. | Goals #2, 4 Priority: Moderate | Lead: Central Lincoln Public Utility District Support: Fire Defense Board | Ongoing |
| IE 6: Continue undergrounding lines in high-risk and other priority/targeted areas for Central Lincoln Public Utility District. | Goals #2, 4 Priority: Moderate | Lead: Central Lincoln Public Utility District Support: Fire Defense Board | Ongoing \$600,000 per year |
| IE 7: Continue implementing fuels reduction program along Consumers Power, Inc. power line corridor. | Goals #2, 4 Priority: High | Lead: Consumers Power, Inc. Support: Fire Defense Board | Ongoing \$3 million per year |
| IE 8: Continue implementing system hardening, system intelligence, and environmental intelligence programs throughout | Goals #2, 4 Priority: Moderate | Lead: Consumers Power, Inc. Support: Fire Defense Board | Ongoing |

| Action Item | State Goals Addressed (pgs. 8-9) | Responsible Organizations | Timeline & Estimated Cost |
|---|--|---|--|
| Consumers Power, Inc. infrastructure. | | | |
| IE 9: Continue implementing fuels reduction program along Pacific Power power line corridor. | Goals #2, 4 Priority: High | Lead: Pacific Power Support: Fire Defense Board | Ongoing \$15.6 million per year |
| IE 10: Coordinate with private landowners to ensure use of key boxes on gates to improve emergency response times. | Goals #6 Priority: Moderate | Lead: Lincoln County Fire Districts/Departments Support: Private landowners | Ongoing \$15,000 per year |
| IE 11: Map, develop GIS database, and provide signage for onsite water sources such as hydrants, underground storage tanks, and drafting or dipping sites on all ownerships across the county. | Goals #4, 8, 13 Priority: Moderate | Lead: Lincoln County GIS Support: Fire Defense Board; private landowners | Ongoing \$10,000 |
| IE 12: Develop wildfire protection-specific management plan, including a fuels reduction program for municipal watersheds and adjacent properties. <ul style="list-style-type: none"> • Newport Watershed • Siletz Watershed • Yachats Watersheds • Toledo/Seal Rock Watershed • Lincoln City Watershed | Goals #1, 2, 3, 4, 10, 13 Priority: Moderate | Lead: Local Watershed Councils; private landowners Support: Oregon Department of Forestry; U.S. Forest Service | Ongoing \$20,000 each |
| IE 13: Continue establishment and maintenance of access roads to keep up with growth in WUI areas. | Goals #3, 4, 5, 7, 13 Priority: High | Lead: Lincoln County Road Department Support: City Governments; Lincoln County Fire Districts/Departments | Ongoing |
| IE 14: Obtain funding for an additional Oregon Department of Forestry repeater for the coastal strip, possibly located on existing infrastructure at the Table Top or | Goals #3, 4, 10, 11, 15 Priority: High | Lead: Oregon Department of Forestry | Ongoing \$15,000 |

| Action Item | State Goals Addressed (pgs. 8-9) | Responsible Organizations | Timeline & Estimated Cost |
|---|--|--|---------------------------|
| Cape Foulweather communication sites. | | Support: City Governments; Lincoln County Fire Districts/Departments | |
| IE 15: Obtain funding for two automated smoke detection cameras to be mounted on existing structures in the north and south regions of the West Oregon District. | Goals #3, 4, 10, 11, 15 Priority: High | Lead: Oregon Department of Forestry Support: Private landowners | Ongoing \$60,000 |
| IE 16: Contact and develop agreements with landowners for the use of identified alternative emergency access routes through forested areas. | Goals #3, 8, 12, 13 Priority: Moderate | Lead: Lincoln County Emergency Management Support: Fire Defense Board; private landowners | Ongoing |

Source: Lincoln County CWPP Steering Committee (2023). *Projects identified and prioritized through interviews with fire department and agency leadership.*

Resource and Capacity Enhancements

This section contains a list of the capability improvements identified by Lincoln County’s fire districts and departments and the Lincoln County Fire Defense Board. These needs are in line with broader countywide efforts to increase Lincoln County’s ability to respond to emergencies. The implementation of each item will rely on both the efforts of individual districts and departments and a concerted effort by the Fire Defense Board to achieve equitable enhancements across all agencies. Given historic trends, individual agencies competing against their neighbors for grant funding and equipment will not result in countywide equity. Therefore, statewide organizations like the Oregon Department of Forestry and the Oregon Department of the State Fire Marshall are uniquely positioned to support agencies within both Lincoln County and adjacent counties. These organizations, along with the Fire Defense Board and CWPP Steering Committee, will support Lincoln County fire districts and departments in identifying and obtaining grant funding and equipment to meet their needs and enhance their agency capacity to respond to wildfires.

Table 8.4. Recommendations for Resource and Capability Enhancements

| Action Item | State Goals Addressed (pgs. 8-9) | Responsible Organizations | Timeline & Estimated Cost |
|--|--|--|---|
| RCE 1: Develop additional water resource sites to supplement fire suppression efforts throughout Lincoln County (see Proposed Project map). | Goals #2, 4, 13 Priority: High | Lead: Fire Defense Board Support: Lincoln County Fire Districts/Departments; private landowners | Ongoing \$20,000 to \$50,000 per project |
| RCE 2: Improve agency capabilities by establishing a program to increase the retention and recruitment of volunteer firefighters. | Goals #3, 11 Priority: High | Lead: Lincoln County Fire Districts/Departments Support: Fire Defense Board | Ongoing \$20,000 per year |
| RCE 3: Update personal protective equipment for all fire districts in Lincoln County. | Goals #3, 11 Priority: High | Lead: Lincoln County Fire Districts/Departments Support: Fire Defense Board | Ongoing \$20,000 per district |
| RCE 4: Obtain additional funding for training and necessary training equipment and supplies for all fire districts in Lincoln County. | Goals #11 Priority: High | Lead: Lincoln County Fire Districts/Departments Support: Fire Defense Board; Oregon Department of Forestry | Ongoing \$10,000 per district |
| RCE 5: Obtain funding to develop a more rigorous wildland fire training program available to all Lincoln County fire agencies through the Central Oregon Coast Training Officers Association. | Goals #3, 11 Priority: High | Lead: Central Oregon Coast Training Officers Association Support: Fire Defense Board; Lincoln County Fire Districts/Departments | Ongoing \$10,000 |
| RCE 6: Consider creating a new full-time staff position in the Emergency Management department to engage the community regarding wildfire mitigation and oversee implementation of the CWPP. | Goals #3, 11 Priority: High | Lead: Lincoln County Sheriff's Office | 3 Years \$50,000+ per year |

Source: Lincoln County CWPP Steering Committee (2023). *Projects identified and prioritized through interviews with fire department and agency leadership.*

Proposed Project Areas

The following wildfire mitigation project areas in Lincoln County were identified by the CWPP Steering Committee as having multiple factors contributing to community wildfire risk to residents, homes, infrastructure, and the ecosystem. Treatments within each project area are site specific, but include homeowner education, creation of defensible space around structures, fuels reduction, enhancements to water access, and access corridor improvements. All work on private property will be performed with the consent of, and in cooperation with, the property owners. Defensible space projects may include commercial or pre-commercial thinning, pruning, brush removal, chipping, prescribed burning, installation of greenbelts or shaded fuel breaks, and general forest health improvements. Note that identified project areas have not been field-verified; thus, the boundaries and specific prescriptions for the actual project area may be revised upon further research and development of the project.

Note that the tables within this section – beginning on the following page – are separated by the type of agency that would be leading the project: Table 8.5 contains mitigation projects from all of Lincoln County’s eight fire districts and departments (FDs), rural fire protection districts (RFPDs), and fire and rescue districts (F&R), while Table 8.6 contains mitigation projects from other key stakeholders within the county.

Each project is assigned both an ID number (to match the project to its corresponding location in the map) and a priority ranking for use in seeking future grant funding. For the fire districts and departments, the ID number also includes their Fire Department Identifiers (FDIDs).⁵⁷

⁵⁷ Oregon State Fire Marshal (2023). *Fire Agency Contact Information*. Oregon State Police. Retrieved June 6, 2023, from <https://www.oregon.gov/osp/programs/sfm/Pages/Fire-Agency-Contact-List.aspx>.

Table 8.5. Proposed Project Areas: Fire Districts/Departments

| ID Number | Fire District/ Department | Project Name | Project Type | Number of Structures/ Acres | Priority Ranking |
|-----------|---|---|--|-----------------------------|------------------|
| 392-1 | Central Oregon Coast F&R District | Tidewater Fire Station | Access Improvement; Water Resource | 2 structures | 1 |
| 92-1 | Depoe Bay RFPD | National Wildlife Refuges (Big Whale Cove and Siletz Bay) | Fuels Reduction | | 1 |
| 92-2 | | Whale Cove | Access Improvement; Defensible Space | 348 structures; 180 acres | 2 |
| 92-3 | | Inn at Otter Crest | Access Improvement; Defensible Space; Water Resource | 31 structures; 35 acres | 3 |
| 92-4 | | Salishan Hills | Access Improvement; Fuels Reduction | 165 structures; 207 acres | 4 |
| 92-4 | | Seagrove Subdivision | Access Improvement; Fuels Reduction | 159 structures; 48 acres | 5 |
| 259-1 | | Newport RFPD | Water Supply for Newport FD | Water Resource | |
| 259-2 | Decreasing Wildfire Risk in WUI Neighborhoods | | Defensible Space; Fuels Reduction; Home Hardening | | 2 |
| 259-3 | Acquiring Fire Boat | | Equipment | | 3 |
| 259-4 | 100 th Street Water Supply | | Water Resource | | 4 |
| 368-1 | North Lincoln F&R District | Otis Station Water Supply | Water Resource | | 1 |
| 368-2 | | State Fish Hatchery | Water Resource | | 2 |

| ID Number | Fire District/ Department | Project Name | Project Type | Number of Structures/ Acres | Priority Ranking |
|-----------|---------------------------|--|--------------------------------------|-----------------------------|------------------|
| | | Pump Station | | | |
| 368-3 | | Panther Creek: Residential | Access Improvement; Defensible Space | 746 structures; 469 acres | 3 |
| 368-4 | | Panther Creek: Landscape | Fuels Reduction | 39 acres | 4 |
| 368-5 | | Otis Area | Access Improvement; Defensible Space | 189 structures; 356 acres | 5 |
| 368-6 | | Slick Rock Road | Access Improvement; Defensible Space | 229 structures; 403 acres | 6 |
| 368-7 | | Three Rocks Road | Access Improvement; Defensible Space | 8 structures; 196 acres | 7 |
| 368-8 | | Sitka Center & Cascade Head | Access Improvement; Defensible Space | | 8 |
| 368-9 | | Siletz River Highway | Access Improvement; Defensible Space | 69 structures; 114 acres | 9 |
| 368-10 | | Oregon Department of Transportation Pond Improvement | | | 10 |
| 330-1 | Seal Rock RFPD | Volunteer-Led Fuels Reduction Study | Fuels Reduction; Education | | 1 |
| 337-1 | Siletz RFPD | Logsdan Area: Firewise Neighborhood | Education | | 1 |
| 337-2 | | Logsdan Area: Water | Water Resource | 1 structure | 2 |

| ID Number | Fire District/ Department | Project Name | Project Type | Number of Structures/ Acres | Priority Ranking |
|-----------|---------------------------|------------------------------|---|--------------------------------------|------------------|
| 337-3 | | Logsden Area: Risk Reduction | Defensible Space; Fuels Reduction; Home Hardening | 30 structures | 3 |
| 377-1 | Toledo FD | New Station in Eddyville | Infrastructure | 1 structure | 1 |
| 377-2 | | Olalla Road | Defensible Space; Fuels Reduction | 92 structures; 739 acres | 2 |
| 377-3 | | Mossy Creek Road | Fuels Reduction; Education | | 3 |
| 377-4 | | Thornton Creek Road | Access Improvement; Defensible Space; Fuels Reduction | 34 structures; 427 acres | 4 |
| 377-5 | | Sturdevant Place | Fuels Reduction; Education | | 5 |
| 377-6 | | Hidden Valley Road | Fuels Reduction; Education | | 6 |
| 418-1 | | Yachats RFPD | Highway 101 Maintenance | Defensible Space; Fuels Reduction | |
| 418-2 | Water Supply Hydrant | | Develop Water Resource | | 2 |

Source: Lincoln County CWPP Steering Committee (2023). *Projects identified and prioritized through interviews with fire department and agency leadership.*

Table 8.6. Proposed Project Areas: Key Stakeholders in Lincoln County

| ID Number | Key Stakeholder | Project Name | Project Type | Number of Structures/ Acres | Priority Ranking |
|-------------|---|---|--|---------------------------------|------------------|
| CTSI-1 | Confederated Tribes of Siletz Indians | Protecting Residential Properties | Defensible Space | | 1 |
| CTSI-2 | | Securing Tribal Infrastructure | Defensible Space; Fuels Reduction | | 2 |
| ODF-1 | Oregon Department of Forestry | Panther Creek | Defensible Space; Fuels Reduction | | 1 |
| ODF-2 | | Eckman Creek | Defensible Space; Fuels Reduction | | 2 |
| ODF-3 | | Upper Yaquina | Defensible Space; Fuels Reduction; Education | | 3 |
| ODF-4 | | Highway 229 Corridor | Defensible Space; Fuels Reduction; Education | | 4 |
| ODF-5 | | Southwest Lincoln County | Defensible Space; Fuels Reduction; Education | | 5 |
| ODF-6 | | Harlan and Elk City | Defensible Space; Fuels Reduction | 34 structures; 271 acres | 6 |
| SWLCW PUD-1 | Southwest Lincoln County Water Public Utility District | Hazard Tree Clearing for Emergency Water Basins | Fuels Reduction | 3 structures | 1 |
| SWLCW PUD-2 | | Fire Hydrant Replacement | Water Resource | 53 structures (\$6,000 each) | 2 |

| ID Number | Key Stakeholder | Project Name | Project Type | Number of Structures/ Acres | Priority Ranking |
|-----------|--|---|----------------|---------------------------------|------------------|
| CLPUD-1 | Central Lincoln Public Utility District | Building Resiliency in North Lincoln County | Infrastructure | 1000+ structures; 100+ acres | 1 |

Source: Lincoln County CWPP Steering Committee (2023). *Projects identified and prioritized through interviews with fire department and agency leadership.*

Regional Land Management

Wildfires will continue to ignite and burn depending on the weather conditions and other factors enumerated previously in this plan. Active land management that modifies fuels, promotes healthy forestland conditions, and promotes the use of natural resources (consumptive and non-consumptive) will ensure that these lands have value to society and the local region. The Oregon Department of Forestry, U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Land Management, industrial forestland owners, private forestland owners, and all agricultural landowners in the region should be encouraged to actively manage their wildland-urban interface lands in a manner consistent with reducing fuels and risks in this zone.

The recommendations listed in previous sections for the Oregon Department of Forestry and the Confederated Tribes of Siletz Indians help identify where some of the land management agencies and the major tribal entity in Lincoln County have planned, current, or proposed fuel reduction projects. Knowing what agency projects are planned can help other regional or local agencies prioritize their own fuels reduction projects. Conducting simultaneous fuels reduction projects on adjacent forestland properties is not only encouraged but can also help cut down on overall mitigation costs.

Note that there are no planned, current, or proposed fuels reductions projects on U.S. Forest Service-managed land within Lincoln County as of the time of this CWPP, including the portion of the Siuslaw National Forest located within the county. While the U.S. Forest Service is conducting these and other types of risk reduction projects elsewhere in Oregon, they are prioritizing mitigation in higher risk areas of the state rather than on federal lands in Lincoln County.

Appendix A: Wildfire Mitigation Funding Opportunities

Funding Wildfire Mitigation Projects

There is a wide array of state and federal funding opportunities for Lincoln County and local fire agencies to conduct wildfire mitigation. These grants are usually offered by state and federal land management or emergency preparedness agencies. Eligibility for funding varies based on several factors, including wildfire risk, historic wildfire occurrences, and social vulnerability. Table A.1 shows the most reliable funding sources available to entities with a completed CWPP.

Table A.1. State and Federal Funding Sources for Wildfire Mitigation

| Funding Opportunity | Administering Organization | Link |
|--|----------------------------|---|
| Federal Opportunities | | |
| Community Wildfire Defense Grant (CWDG) | USFS | https://www.fs.usda.gov/managing-land/fire/grants |
| Hazard Mitigation Grant Program (HMGP) | FEMA | https://www.fema.gov/sites/default/files/documents/fema_funded-wildfire-mitigation-activities.pdf |
| Building Resilient Infrastructure and Communities (BRIC) | FEMA | https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities |
| Fire Management Assistance Grant (FMAG) | FEMA | https://www.fema.gov/assistance/public/fire-management-assistance |
| State Opportunities | | |
| Small Forestland Grant Program | ODF | https://www.oregon.gov/odf/pages/small-forestland-grant-program.aspx |
| Community Wildfire Risk Reduction Grant | OSFM | https://www.oregon.gov/osfm/wildfire/pages/investments-for-oregon.aspx |

Determining Grant Eligibility

The main method for demonstrating eligibility for the above mitigation grants is this CWPP itself. However, communities seeking to apply for the CWDG should use the [Wildfire Risk to Communities tool](#) to determine potential eligibility, while those seeking to apply for FEMA grants should rely upon the [Resilience Analysis and Planning Tool \(RAPT\)](#). Note that these websites are not the sole determinant of whether a community is eligible for a grant; the maps and data contained within this CWPP can be used to demonstrate risk in lieu of these national tools.

Appendix B: Community Outreach and Education Recommendations

As the potential fire risk in the wildland-urban interface (WUI) increases, fire service agencies cannot be solely responsible for wildfire mitigation. Promoting wildfire resiliency requires individual and community action. This appendix outlines why community engagement is important to wildfire planning and provides recommendations for ongoing engagement. The recommendations shared in this appendix are meant to supplement the wildfire engagement work currently being conducted by Lincoln County fire and forestry agencies.

Many of the county's fire departments and districts are actively working with state and federal fire and forestry agencies on public education and homeowner responsibility by visiting neighborhoods and schools. They hand-deliver informative brochures and educate homeowners about taking action to protect their properties. Lincoln County Emergency Management also offers public education about wildfire risk, mitigation actions, and general emergency preparedness – these in-person events are hosted mostly in April and May but also available online throughout the year. Some fire agencies have more capacity than others to conduct outreach. It is important that the CWPP Steering Committee continue meeting regularly to promote resource-sharing and community engagement. These meetings will also support Lincoln County to brainstorm ideas that best reflect their community needs and concerns about wildfires.

Background

Research indicates that community engagement in wildfire planning is the most effective way to enhance their adaptive capacity to a changing wildfire landscape.⁵⁸ Collaboration, social learning,

⁵⁸ Edgeley, C. M., Paveglio, T. B., & Williams, D. R. (2020). Support for regulatory and voluntary approaches to wildfire adaptation among unincorporated wildland-urban interface communities—ScienceDirect. *Land Use Policy*, 91(February 2020). <https://doi.org/10.1016/j.landusepol.2019.104394>.

Meléndez, J. W., & Parker, B. (2019). Learning in Participatory Planning Processes: Taking Advantage of Concepts and Theories Across Disciplines. *Planning Theory & Practice*, 20(1), 137–144.

Paveglio, T. B. et al. (2018). Incorporating Social Diversity into Wildfire Management: Proposing “Pathways” for Fire Adaptation. *Forest Science*, 64(5), 515–532. <https://doi.org/10.1093/forsci/fxy005>.

and shared understanding improve a community’s overall social capacity and therefore their adaptive capacity to wildfire.⁵⁹

As set forth in the Healthy Forest Restoration Act of 2003 (HFRA), a Community Wildfire Protection Plan (CWPP) must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.⁶⁰ In addition to the requirements of the HFRA, community involvement is also a requirement of Oregon’s statewide land use planning program. Goal 1 calls for “the opportunity for [residents] to be involved in all phases of the planning process.”⁶¹

Intentional and ongoing community engagement will allow Lincoln County to better understand community needs and better inform policies and action items. The process of developing a CWPP can help a community define priorities to protect life, property, and infrastructure.

Community engagement is an ongoing process that does not end once the CWPP has been adopted. The CWPP provides direction for fire officials, but ongoing education and engagement enhance the effectiveness of the plan for the entire community. Lincoln County will continue to raise awareness of wildfire prevention and resiliency through continuing education campaigns and community programs. This combination of ongoing engagement and executing the action items within the CWPP will help Lincoln County to realize the full potential of becoming a more fire-resilient community.

Framework of Community Engagement

Community engagement has long been viewed as a tool to inform the community. While engagement does lend itself well to informing, opportunities for dialog and collaboration must be built into the engagement. The project team recommends creating a robust, year-round engagement strategy that both informs and engages the community.

Promoting Social Capital

Continuing engagement after the adoption of the CWPP will foster the development of social capital.⁶² Creating and enhancing social capital will promote cooperation, shared learning, and understanding.⁶³ Through cooperation, a cross-jurisdictional approach will streamline wildfire prevention, response, and recovery. Additionally, shared learning provides local knowledge of

⁵⁹ Brummel, R. et al. (2010). *Social learning in policy-mandated collaboration: community wildfire protection planning in the eastern United States*. University of Newcastle upon Tyne, ISSN 0964-0568, DOI 10.1080/09640568.

⁶⁰ Society of American Foresters (2004). *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities*. <https://www.forestsandrangelands.gov/documents/resources/communities/cwpphandbook.pdf>.

⁶¹ Oregon Department of Land Conservation and Development. (2022). *Goal 1: Citizen Involvement*. <https://www.oregon.gov/lcd/OP/Pages/Goal-1.aspx>.

⁶² Social capital is the value that comes from social networks, or groupings of people, which allows individuals to achieve things they couldn’t on their own.

⁶³ Palsa, E. et al. (2022). Engagement in local and collaborative wildfire risk mitigation planning across the western U.S. – Evaluating participation and diversity in Community Wildfire Protection Plans. *PLoS One* 17(2): e0263757.

the land and community culture that will better inform prevention, response, and recovery efforts. Additionally, shared learning helps to generate consensus and lead to local buy-in of recommended actions and best practices.

Figure 30 illustrates the range of vulnerabilities at risk during a wildfire. The outer wedges represent the respective components of wildfire hazard potential and adaptive capacity, though the size of the wedges does not correspond to any weighting of importance. While wildfire hazard potential is more visible – e.g., in the number of acres burned – adaptive capacity impacts are often longer lasting and can impact an entire community.

Figure B.1. Wildfire Vulnerability Framework



Source: Davies, I. et al. (2018, November 2). The unequal vulnerability of communities of color to wildfire. *PLoS ONE* 13(11): e0205825. <https://doi.org/10.1371/journal.pone.0205825>.

Trauma-Informed Engagement

Before beginning a community engagement effort, Lincoln County should make use of trauma informed principles. Trauma is associated with the impact of chronic adversity across a community from factors such as structural violence and community violence, or the threat of or loss from community violence. At the community level, trauma can manifest itself as symptoms in the sociocultural environment, the physical/built environment, and the economic environment. In the context of the CWPP, natural disasters, like wildfire, can be a traumatizing event. After a natural disaster, the two most common adverse mental health outcomes are depression and post-traumatic stress disorder. The scale of trauma is dependent on the degree of disaster exposure and pre-existing vulnerabilities.⁶⁴

Due to the Echo Mountain Complex fire in 2020, lives were upended as hundreds of structures were lost, resulting in the loss of homes, security, and wealth, leaving a lasting impact on Lincoln County. Many residents in Otis and Rose Lodge are still experiencing the devastating impacts of the fire and still have not recovered their housing. Even residents who did not have to evacuate were affected, as wildfire smoke was prevalent, reaching over 500 AQI in some places and going beyond the upper threshold for hazardous air.⁶⁵

It is important for Lincoln County to recognize the collective trauma everyone in the county has undergone and be aware of county communication. To be successful, the county must understand the ongoing impact of trauma on community members' lives and aim to appropriately address their specific needs to avoid re-traumatization.

An Ongoing Process

For the CWPP to be the most successful, Lincoln County should prioritize community engagement as an ongoing process. Before starting any new process, Lincoln County should consider the following questions.

- What is the purpose of this participation process?
- What is the outcome?
- How will decisions be made / feedback be used?
- Who is the community?

Answering these questions will allow the county to communicate clearly with the public and ensure transparency in the process. This form of participation will build public trust and increase the community's agency in the process.

⁶⁴ Davies, I. et al. (2018, November 2). The unequal vulnerability of communities of color to wildfire. *PLoS ONE* 13(11): e0205825. <https://doi.org/10.1371/journal.pone.0205825>.

⁶⁵ Samayoa, M. (2020, September 15). *Oregon's air is so hazardous it's breaking records*. Oregon Public Broadcast. <https://www.opb.org/article/2020/09/15/oregons-air-is-so-hazardous-its-breaking-records/>.

Community Engagement Strategies

The following are a collection of recommended engagement approaches for Lincoln County Emergency Management, the Lincoln County Fire Defense Board, and local fire agencies.

Community Wildfire Coordinator

The planning team recommends creating a new full-time staff position focused on engaging the community around wildfire mitigation and overseeing the implementation of the CWPP action items. Having a community wildfire coordinator would create the opportunity for year-round engagement and shift the responsibility for community engagement away from fire district personnel. This position would help the county to build social capacity around wildfire after plan adoption. An ongoing process can take various forms, such as partnering with local organizations to offer educational programming, convening monthly community partner meetings, and implementing a variety of place-based programs and policies.

Lincoln County CWPP Steering Committee

The CWPP steering committee should continue meeting on a quarterly basis. The primary function of these meetings would be to provide space for each organization to share an update on their work. They also will provide the space for collaboration and ideation, keep everyone in contact, and make Lincoln County eligible for additional funding and partnerships. Partners can decide which meeting format, online or in-person, is conducive to attendance and participation. Lincoln County Emergency Management can serve as the convener and provide materials in advance of the meetings. The project team recommends creating a shared Google Document (or other shared document platform) to house a live agenda, allowing participants to fill in their updates in advance. This will save time, provide structure to the meeting, and serve as a communal resource. Additionally, some meetings should be held in person to enhance community learning. More meaningful connections can be made by viewing areas for wildfire mitigation in-person, enhancing partner buy-in.

Partnering with Community Organizations

There are a variety of community benefit organizations operating within the county that could serve as partners. By working with community partners, Lincoln County can leverage its network to reach more residents. Partnering for public events also allows the county to be more accessible and distribute information through additional channels.

Local schools also present a unique partnership for explaining wildfire hazards, mitigation, and emergency preparedness to students and young people.

Underserved communities experience a higher risk of wildfire and lower adaptive capacity, so it is essential to focus engagement efforts on those communities.⁶⁶ Connecting with community organizations and groups that already work with specific populations will help to promote education and foster increased wildfire resilience.

Partnership with organizations and groups that work with these specific communities will help the county to better understand those populations' needs, challenges, and concerns. This, in turn, will allow the county to better respond to those challenges, create educational materials that are more conducive to those populations, and create more opportunities for communities to engage in wildfire mitigation. The CWPP planning team identified four culturally specific communities for increased community outreach and engagement: the Confederated Tribe of Siletz Indians, Spanish speakers, Mam speakers, and communities of color.

To be as inclusive and accessible as possible, Lincoln County should also ensure that all wildfire promotional and education materials are available in other languages. This will increase awareness and education about wildfire for non-English speakers, especially if this information can be distributed in collaboration with culturally specific organizations.

One challenge identified by the Steering Committee is the lack of multilingual fire department staff and volunteers. Promoting partnerships with language-specific cultural groups may create opportunities to offer wildfire education in other languages.

Firewise Communities

The national Firewise recognition program, administered by the National Fire Protection Association, provides a collaborative framework to help neighborhoods in a geographic area get organized, find direction, and take action to increase the ignition resistance of their homes and community and to reduce wildfire risks at the local level (National Fire Protection Association). It is a place-based program that is organized and executed by neighbors. Any community with a minimum of eight dwelling units to a maximum of 2,500 dwelling units can apply (National Fire Protection Association). As of 2023, two Firewise communities exist in Lincoln County - in **Logsdan and Salishan Hills**. **These communities are working with local fire agencies to carry out fuels reduction and defensible space projects that lower their wildfire risk.**

To become a Firewise community, communities must complete a community wildfire risk assessment that identifies areas of success and improvement. They then create a three-year action plan stating actions neighbors can complete. Firewise communities must complete wildfire risk reduction actions to remain in the program.

Firewise serves as another avenue for generating social capital as neighbors collaborate and act together. For the program to be the most impactful, Lincoln County needs a county-wide effort.

⁶⁶ Davies, I. et al. (2018, November 2). The unequal vulnerability of communities of color to wildfire. *PLoS ONE* 13(11): e0205825. <https://doi.org/10.1371/journal.pone.0205825>.

Volunteers

One challenge identified in the planning team’s research and community survey is that older adults comprise a significant portion of Lincoln County’s population. A significant number of community survey respondents indicated that they have disabilities that may impact their mobility. Creating defensible space and home hardening can be challenging for people who have diminished mobility or physical capacity. These populations will need support to take these actions around their homes. While some households may have the monetary means to pay for such services, many households in Lincoln County do not. The county could consider implementing a support team that works on a sliding scale basis to fund some of these defensible space and home hardening efforts.

When to Engage the Community

Typically, from November-March, when there is snow and rain, wildfire conditions are not visibly present to the community, creating a temporary disconnect between the topic of wildfire risk and motivating individuals to act. During the summer, when smoke is visible, residents are more likely to engage in wildfire-related material, making it an opportune time to conduct high-priority engagement. Specific programming should be planned for these months to reinforce the importance of acting year-round to prepare for wildfire season.

Fire district staff are often unavailable for engagement efforts during wildfire season, however. The project team believes that a community wildfire coordinator would create the opportunity for year-round engagement and shift the responsibility for community engagement away from fire district personnel.

Outreach Recommendations

Developing mechanisms to increase public awareness regarding wildfire risks and promoting “do it yourself” mitigation actions is a primary goal of the CWPP Planning Committee as well as many of the individual organizations participating on the Committee.

Lincoln County should consider promoting wildfire education and outreach by:

- **Increasing the number of public service announcements about wildfire risk, mitigation, and response.** This should include all types of media including radio, television, press releases, newspapers (online and printed), social media posts, and mailings.
- **Attending and tabling at local community events throughout the year.** Such events might include farmer’s markets, cultural events, festivals, art fairs, school events, religious gatherings, recreational gatherings, etc.
- **Creating and posting educational materials.** Printed materials might include information about actions residents can take to mitigate wildfire, prepare for emergencies, how to get involved in outreach efforts, emergency notifications, etc. These types of materials could be distributed at community events and posted at local businesses (e.g. hotels, restaurants, commercial businesses, etc.) Materials should be available in different languages.

Topics for Education/Outreach

Based on input from the steering committee and results of the community survey, Lincoln County should prioritize the following education topics.

- Ramifications of living in the WUI and understanding landowner responsibilities to reduce fire risk and allow safe access for emergency responders and equipment:
 - Local fire organizations may not have capacity/resources/infrastructure to defend rural WUI homes
 - Home hardening actions
 - Defensible space actions
 - Installing safe access and turnarounds for emergency response
 - Installing water access for emergency response
 - What renters can do to mitigate wildfire
- Emergency preparedness
 - Understanding the emergency alert system
 - How to create an evacuation plan for your household
 - Packing a “to-go” bag
- Improve education about the county’s burning regulations and permit system
 - Improve education on risk factors around debris and backyard burning

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Appendix C: Community Survey

The following figures illustrate the array of data collected as part of the 2023 Lincoln County Community Survey. This virtual survey was developed by OPDR, administered using Qualtrics, and distributed to county residents by the OPDR planning team in May and June 2023.

A total of 377 responses were received as part of this survey. Since not all questions were answered by all respondents, not every figure adds up to the full number of potential responses (377). All analysis was conducted by OPDR.

General Characteristics

Figure C.1. Do you live in Lincoln County?



Figure C.2. Do you own property in Lincoln County?

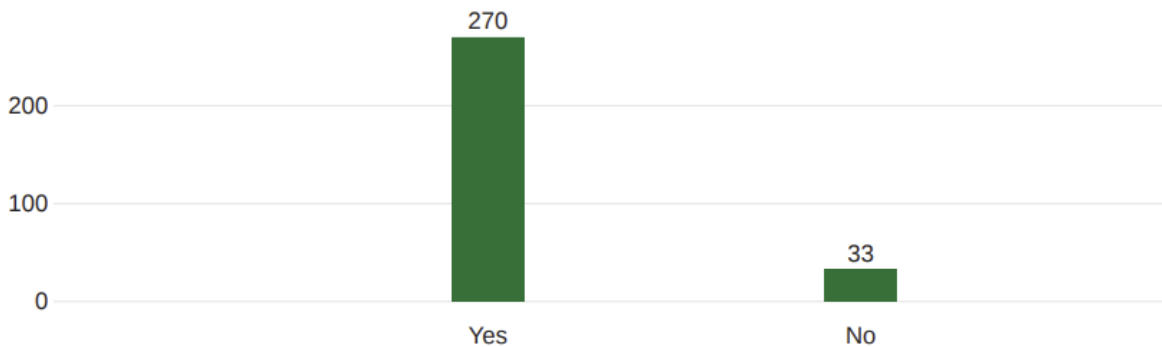


Figure C.3. What Lincoln County town/city do you live in or own property?

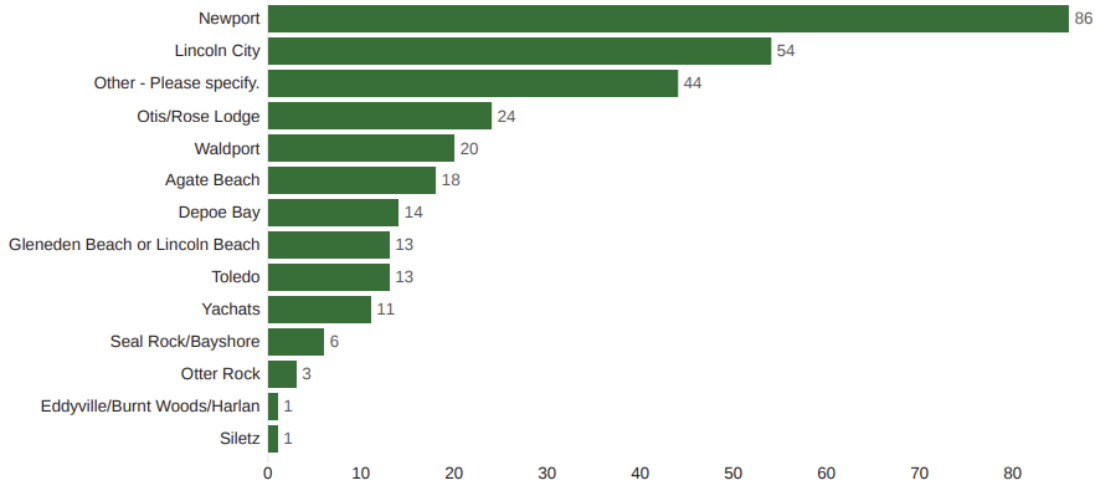


Figure C.4. Which of the following options best describes your primary home?

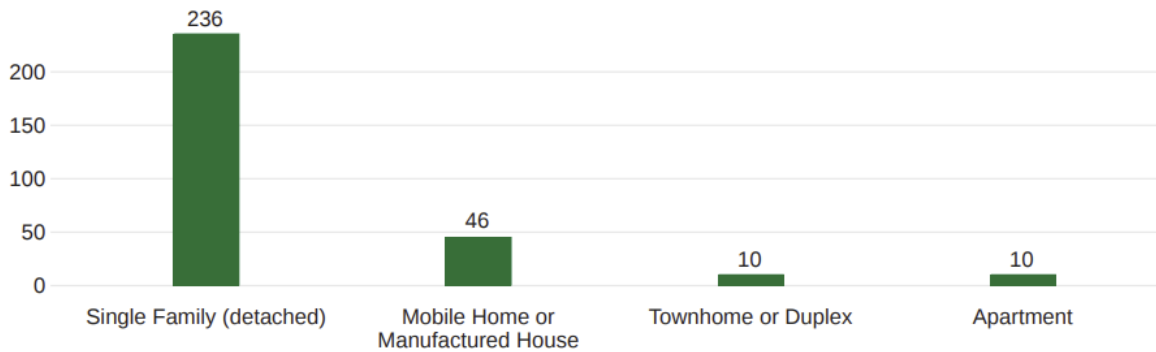
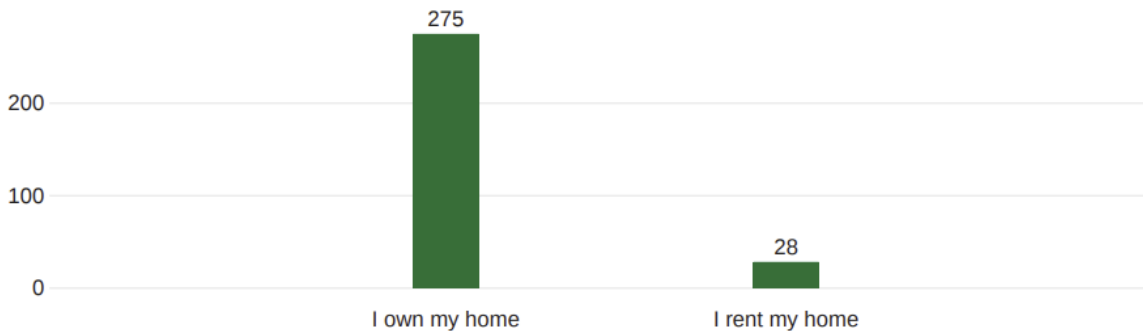


Figure C.5. Which option best describes your current housing arrangement?



Wildfire Knowledge and Preparedness

Figure C.6. Have you or someone in your household personally been impacted by a wildfire? Please select all that apply.

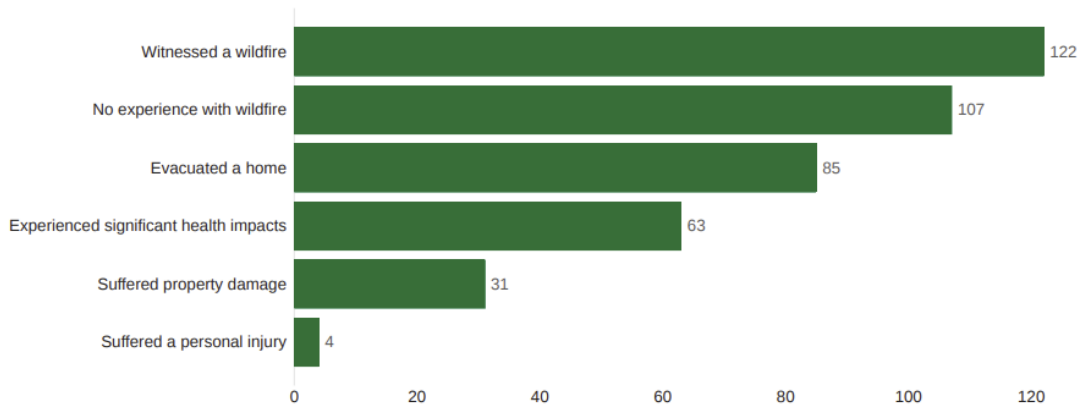


Figure C.7. Air Quality: Do you have a way to clean or purify the air in your home? (e.g., use of air filters in heating/cooling system, stand-alone air purifiers, etc.).

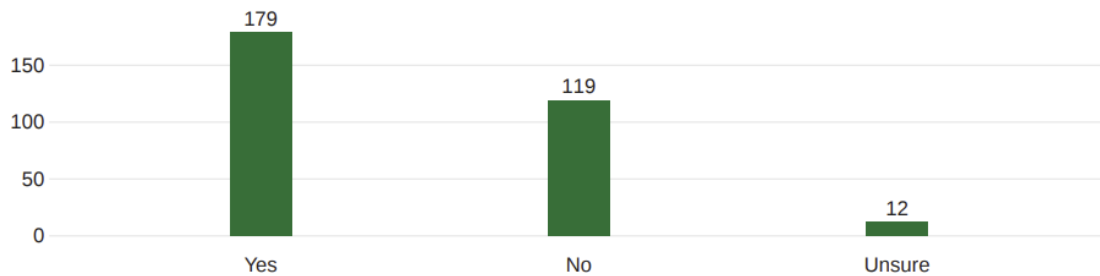


Figure C.8. Defensible Space: Which option(s) best describes the vegetation around your house? Please select all that apply.

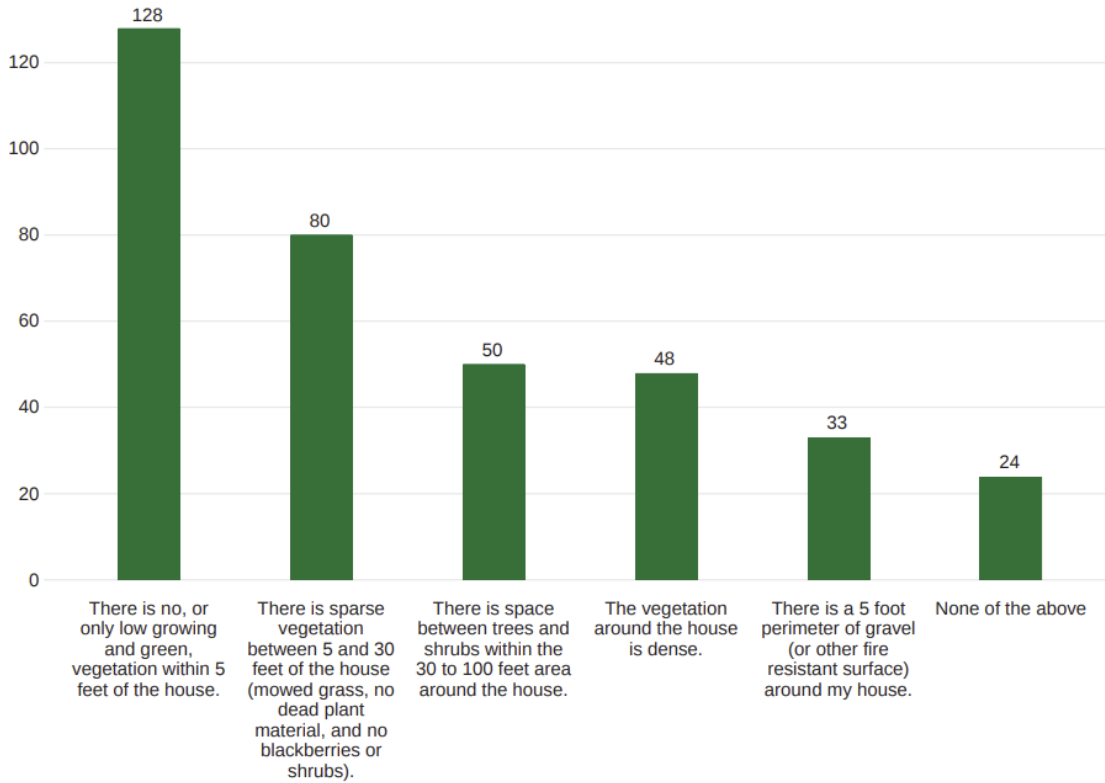


Figure C.9. Home Hardening: Have you taken any of the following actions to reduce the risk of wildfire to your house? Please select all that apply.

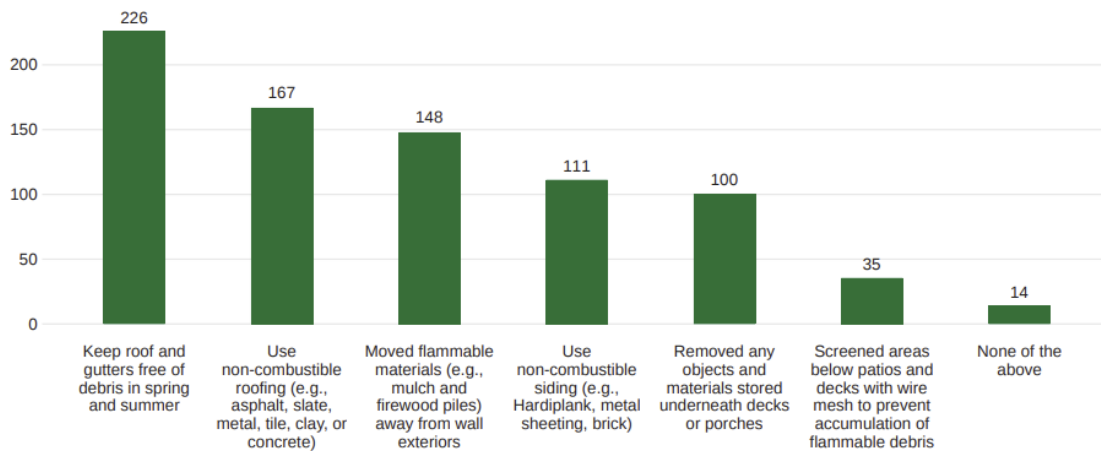


Figure C.10. Emergency Preparedness: Have you taken any of the following actions to improve your wildfire preparedness? Please select all that apply.

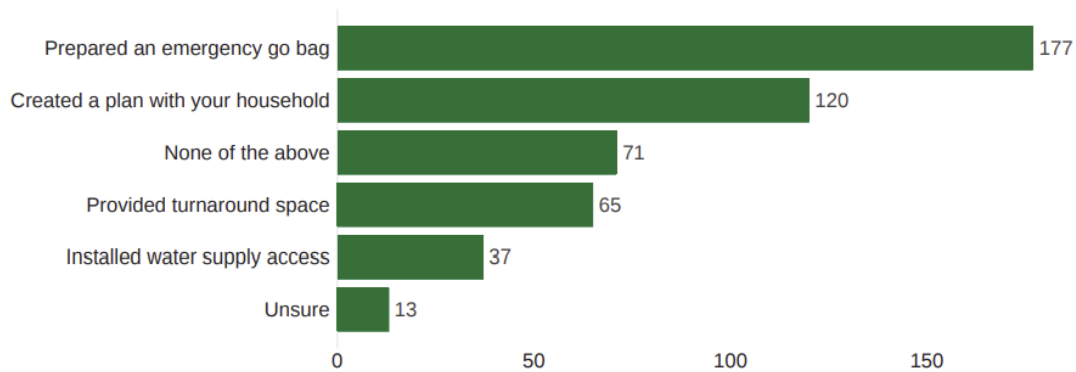


Figure C.11. Which option best describes your level of concern about wildfire impacting...

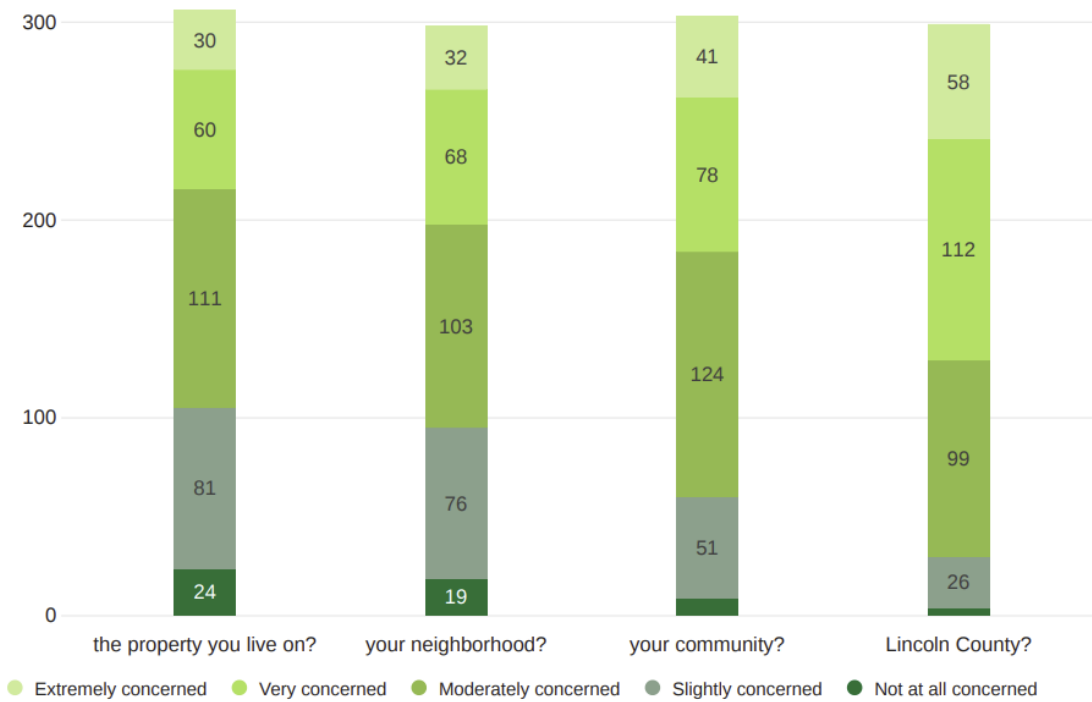
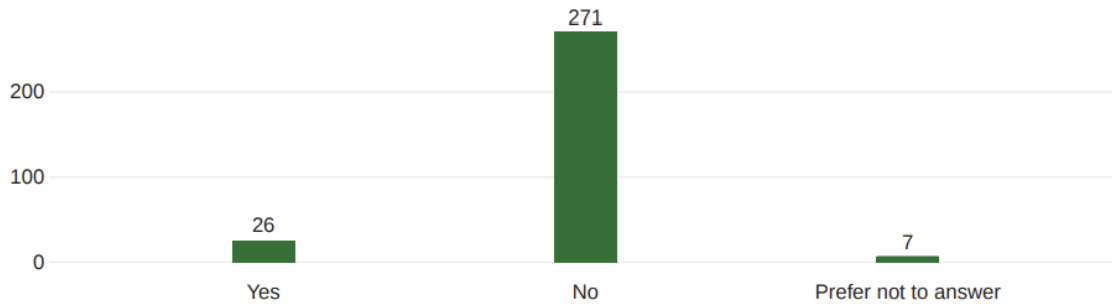


Figure C.12. Do you live with a disability or other condition that would require assistance during an evacuation?



Demographic Information

Figure C.13. Which option best describes your age?

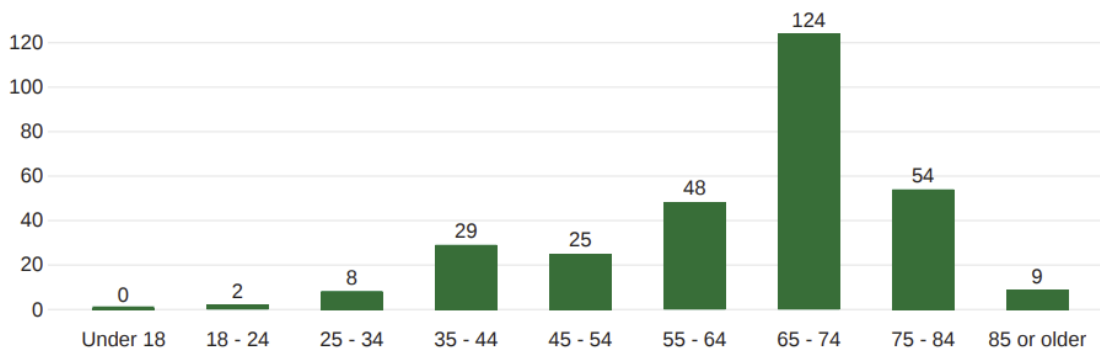


Figure C.14. Do any of the following describe members of your household (including yourself)? Please select all that apply.

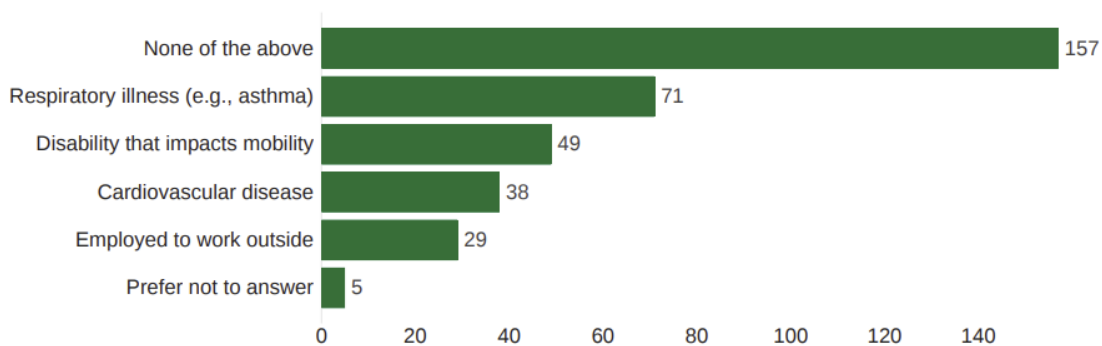


Figure C.15. How many vehicles are available to members of your household?

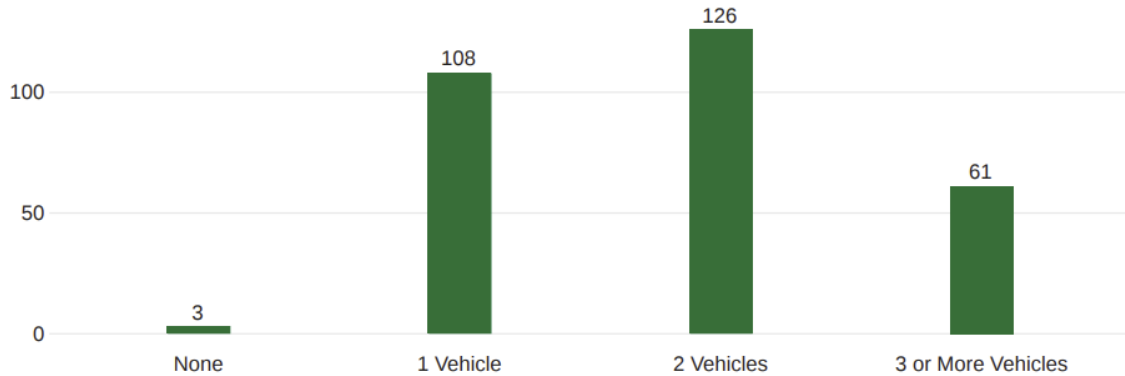


Figure C.16. Which describes the highest level of education that you have completed?

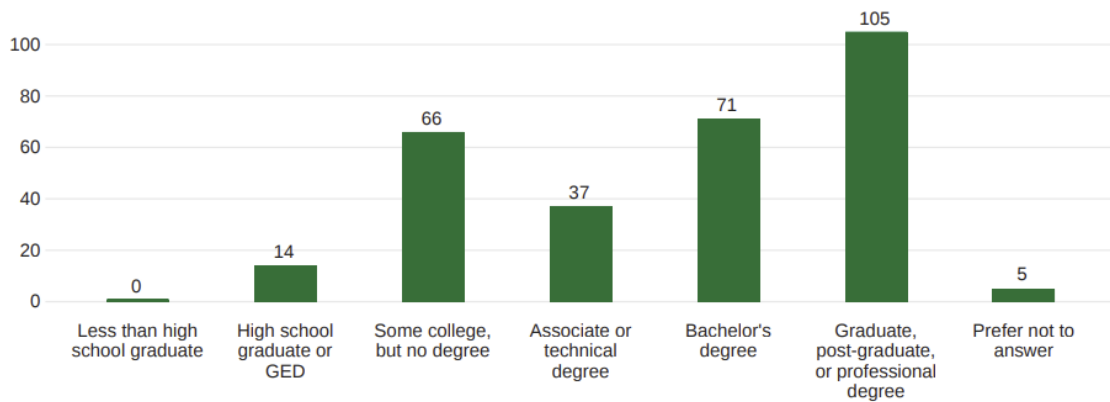


Figure C.17. Do you, or others in your household, have any difficulty speaking English to people for day-to-day activities such as shopping or taking the bus?

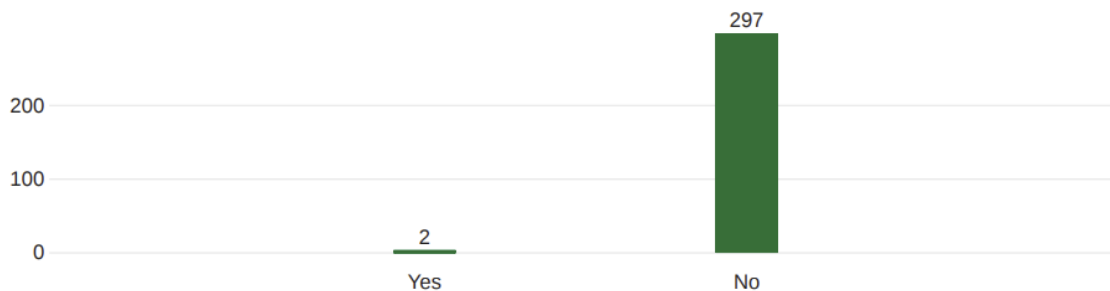


Figure C.18. Which description(s) do you identify with? Please select all that apply. We recognize these options may not encompass your full racial/ethnic identity.

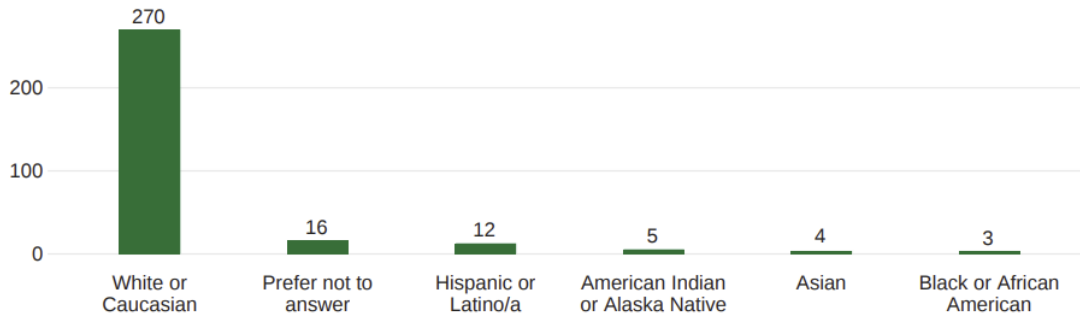
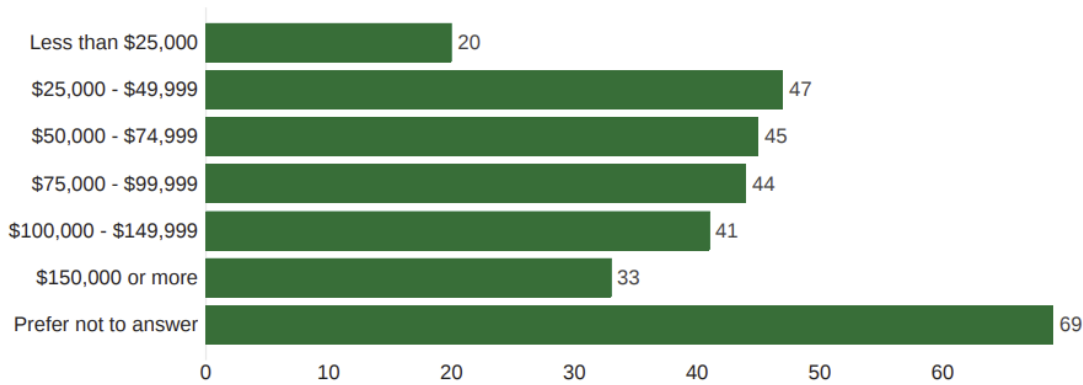


Figure C.19. Please indicate your total annual household income.



Appendix D: Maps

The following Lincoln County maps are attached as part of Appendix D:

Map D.1. Integrated Conditional Net Value Change

Map D.2. Integrated Expected Net Value Change

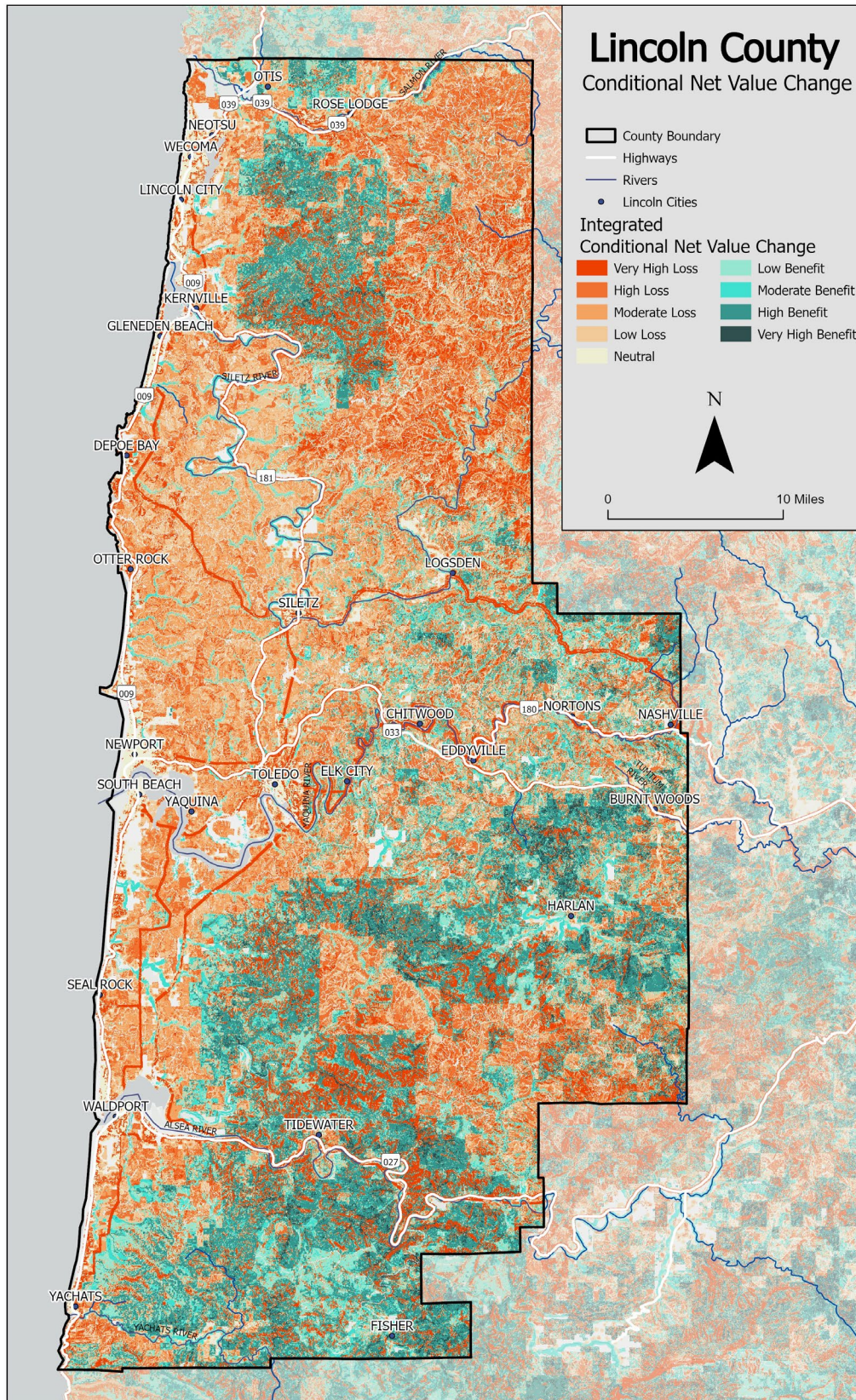
Map D.3. People and Property Conditional Net Value Change

Map D.4. Drinking Water Conditional Net Value Change

Map D.5. Timber Conditional Net Value Change

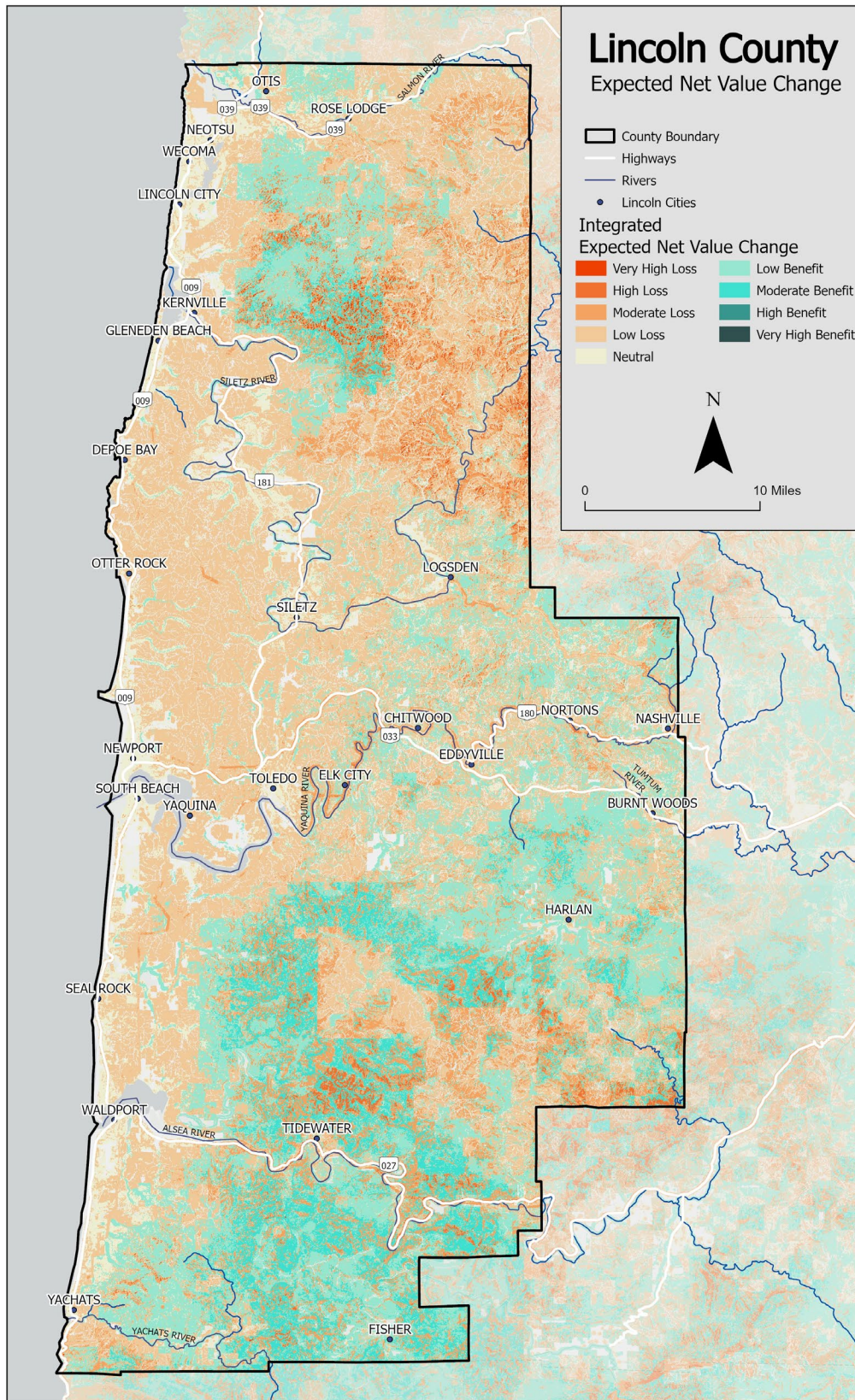
Note: Conditional net value change maps show the estimated change in a resource's value if a wildfire were to occur. Thus, **conditional net value change** can show high loss even if the actual risk of a wildfire igniting is low. Both negative and positive effects are mapped. **Expected net value change** shows estimated change in the resource's value if a wildfire were to occur weighted by the probability of a fire occurring (the burn probability). Thus even if the conditional net value change is high, expected net value change can be low, if the probability of wildfire occurring is low.

Map D.1. Integrated Conditional Net Value Change



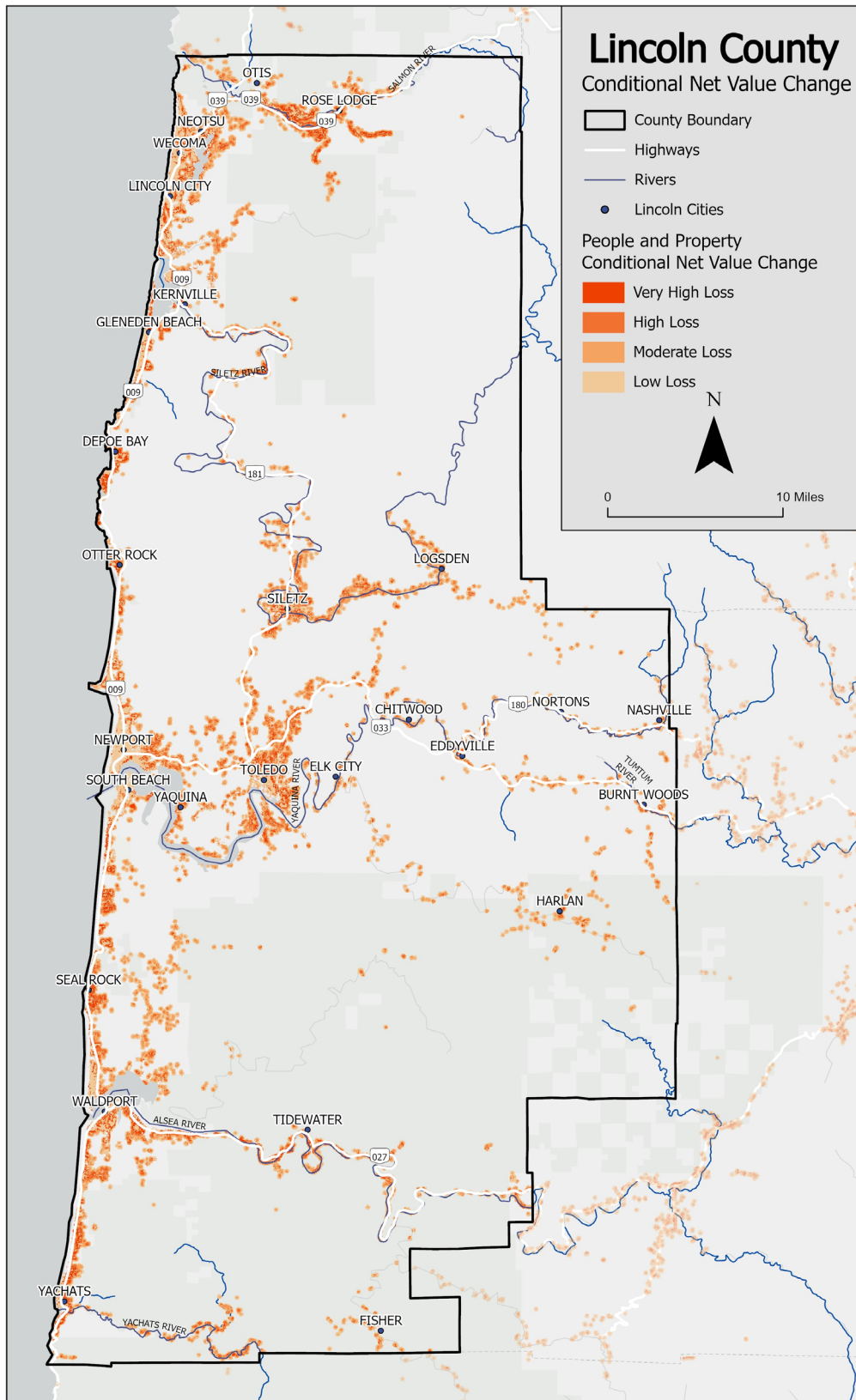
Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Map D.2. Integrated Expected Net Value Change



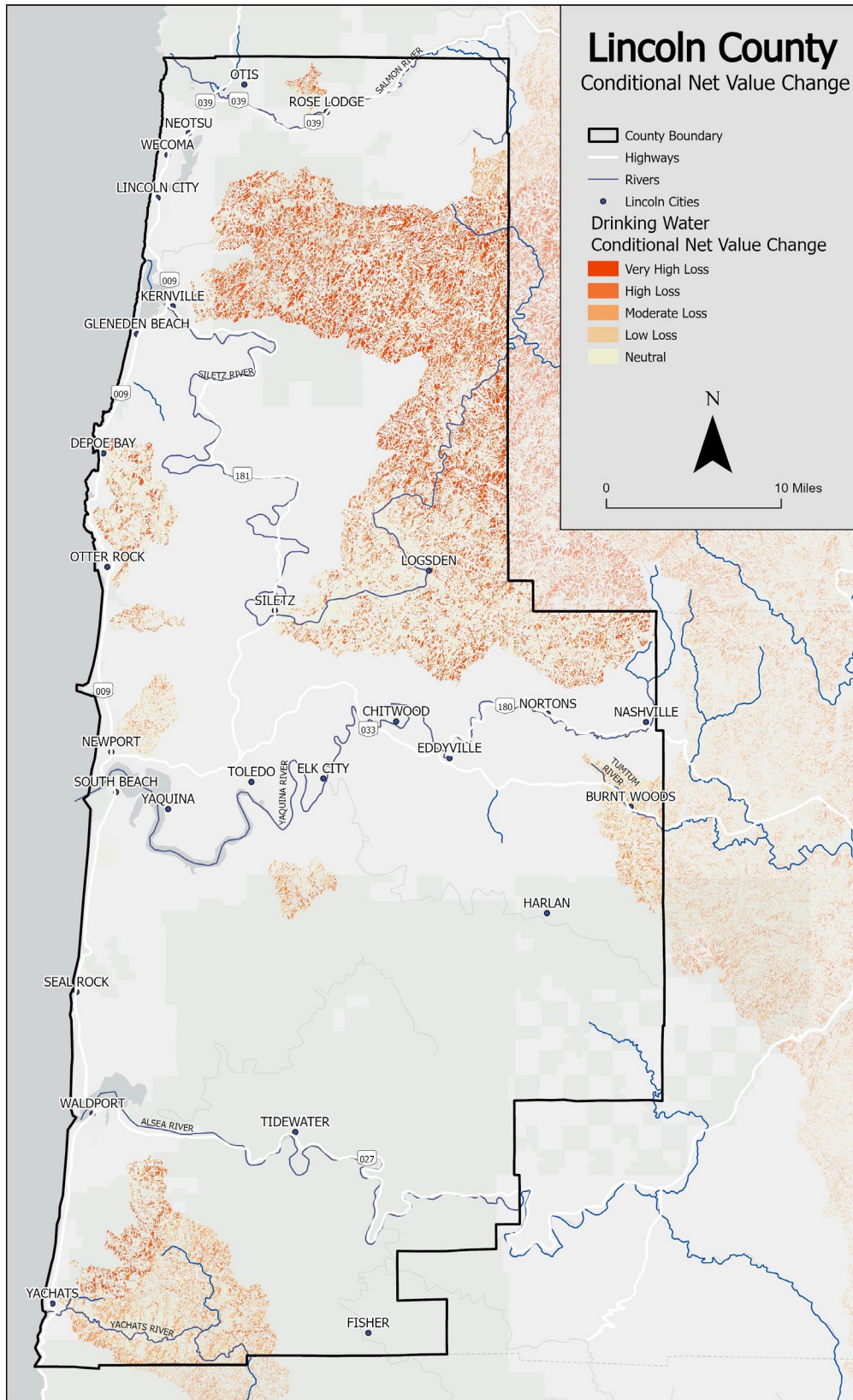
Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Map D.3. People and Property Conditional Net Value Change



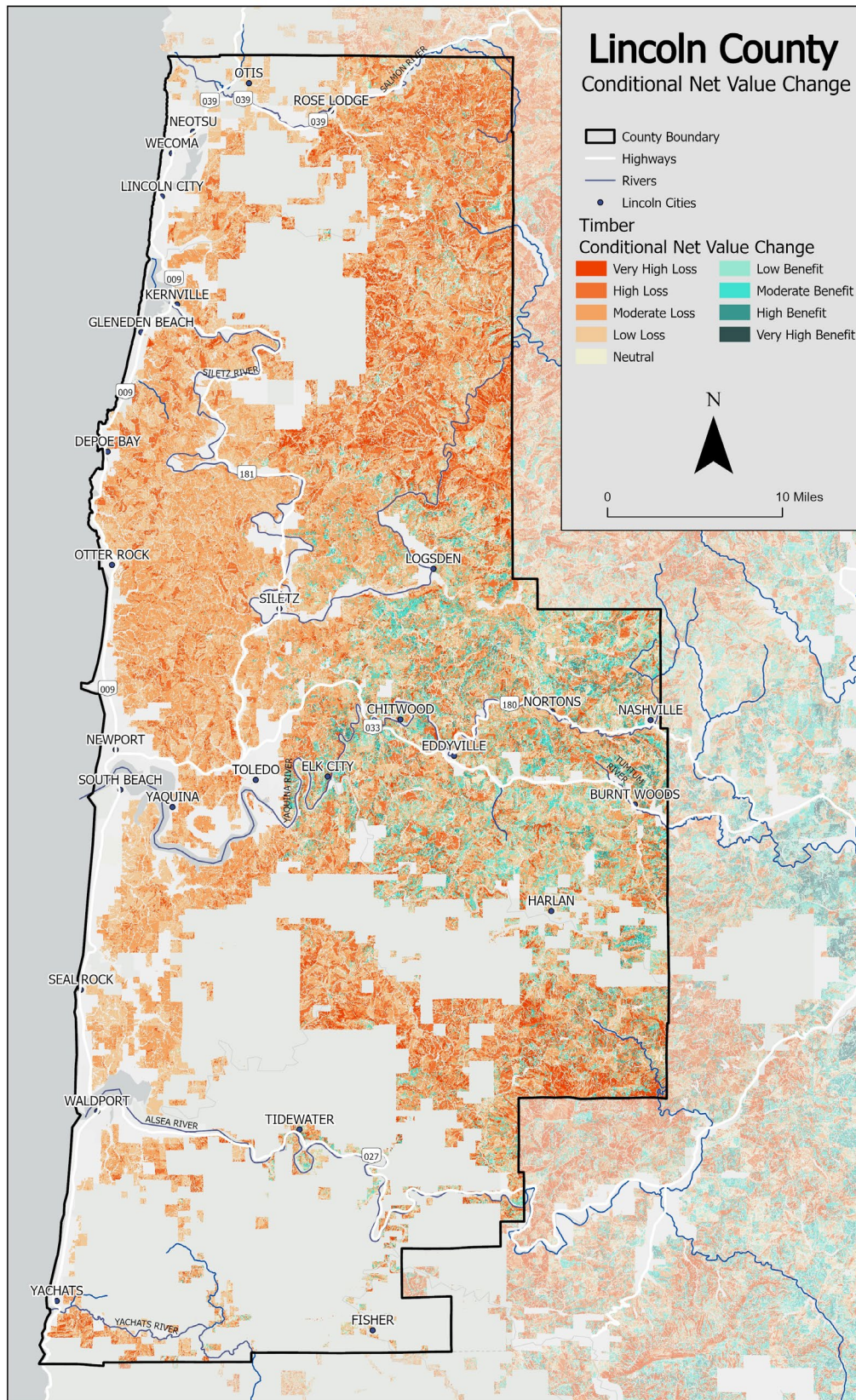
Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Map D.4. Drinking Water Conditional Net Value Change



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.

Map D.5. Timber Conditional Net Value Change



Source: Map developed by Institute for Resilient Organizations, Communities, and Environments at the University of Oregon.