Redwood Region RISE

CALIFORNIA JOBS FIRST

Regional Plan Part 1

Latest revision: May 2025

California's Redwood Region
Tribal Lands, Del Norte, Humboldt, Lake, and Mendocino Counties

NORTH EDGE Business Financing & Community Development

CCRP California Center for Rural Policy

Cal Poly Humboldt.

A Product of Redwood Region RISE
The California Center for Rural Policy at Cal Poly Humboldt

Acknowledgments

This report was made possible by funding from the Regional Investment Initiative and in-kind support from Cal Poly Humboldt.

The California Center for Rural Policy (CCRP) would specifically like to thank:

- Redwood Region RISE Collaborative Members and Redwood Region community members who generously gave their time and energy to provide input to this report.
- Collaborators who contributed to the report, especially our convening partner, North Edge Financing, formerly known as AEDC, as well as Community Outreach and Engagement Lead North Coast Opportunities (NCO), and True North Organizing Network (TNON).
- ThinkPlace US and Ursula Bischoff, Bischoff Consulting.
- Contributors Chico State Enterprises and Sierra Business Council.
- CCRP Staff: Dawn Arledge, Rhiannon Crimmins, Nino Dzotsenidze, Leoni Fohr, Alisha Hammer, Amanda Peçanha Hickey, Schuyler Kirsch, Sydney Lyons, David Narum, Nick Ortiz, and student researchers Giovanni Calabrese and Andreas Christoforidis.
- Redwood Region RISE Photography from Amy Kumler.
- Dr. Tom Jackson, Jr., President, Cal Poly Humboldt.
- Connie Stewart, Executive Director of Initiatives, Cal Poly Humboldt.
- Cal Poly Humboldt Sponsored Programs Foundation.

As of April 2025, the U.S. Economic Development administration has formally accepted Redwood Region RISE's Regional Plan Part 2, alongside the other 12 Jobs First regional plans, as Comprehensive Economic Development Strategies, allowing communities across California to accelerate local economic investment.

CCRP. (2025). Redwood Region Regional Plan Part 1
California Center for Rural Policy at Cal Poly Humboldt

CCRP California Center for Rural Policy | Cal Poly Humboldt.

The California Center for Rural Policy at Cal Poly Humboldt is a research and policy center committed to informing policy, building community, and promoting the health and well-being of rural people and environments.

ccrp.humboldt.edu

Executive Summary

This report provides a baseline snapshot of the current state of the Redwood Region's economy, key industries, labor force characteristics, climate resilience, and public health issues that impact communities' well-being. Throughout the report, key metrics are highlighted to enable tracking of the region's progress towards creation of an inclusive, climate-forward economy. The plan serves as the foundation for a community-driven Regional Roadmap aimed at guiding equitable and sustainable economic growth and resilience. Building from this knowledge, Regional Plan Part 2 (est. release August 2024) will include development strategies and recommend investments to advance strategic goals for growing sustainable industries and aligning workforce strategies with thriving wage opportunities in those industries.

California Jobs First and Redwood Region RISE (RRRISE)

In September 2021, California Governor Gavin Newsom enacted Senate Bill 162, establishing the $600 million California Jobs First Regional Investment Initiative. This initiative is designed to foster the creation of high-quality, accessible employment opportunities and enhance regional resilience against climate change and other global disruptions affecting California's diverse economies.

The Regional Investment Initiative facilitated the formation of Jobs First Collaboratives across 13 regions in California, including the Redwood Region Resilient, Inclusive, Sustainable Economy (RRRISE) which encompasses Tribal Lands and the counties of Humboldt, Mendocino, Lake, and Del Norte. The Collaborative includes a broad spectrum of partners encompassing labor, business, local government, education, environmental justice, and community organizations.

Anchoring the Redwood Region RISE Collaborative's efforts are the Arcata Economic Development Corporation (AEDC) and the California Center for Rural Policy (CCRP) at Cal Poly Humboldt, along with planning phase outreach partners North Coast Opportunities (NCO) and True North Organizing Network (TNON). Currently, the Collaborative has signed partnership letters with over 130 members and has engaged with more than 1,000 residents. The Collaborative's aim is to create a region characterized by stable employment, accessible healthcare, and a thriving natural environment. Specifically, RRRISE is tasked with developing a regional roadmap to guide investment into sectors and industries that prioritize equity, sustainability, access to quality jobs, and economic competitiveness and resilience.

RRRISE's Approach

Throughout the process of convening the Collaborative and preparing it's Regional Roadmap, RRRISE employed an ethos of "meeting communities where they are." To do so, it engaged hundreds of community members through listening sessions, surveys, and various community events in order to identify local priorities and challenges and foster a collective vision for equitable regional development.

The following principles guide the Collaborative's work: 1) honor the wisdom of individuals who have been marginalized in economic development planning; 2) create and allow space for individuals with lived experience to drive prioritization of investment; and 3) encourage and accept nontraditional approaches within the economic development planning sphere.

Regional Plan Part 1 Findings

Economic and Social Challenges

The remote and rural Redwood Region covers 6% of California's landmass, extending 320 miles from Lake County to Del Norte's northern border. Renowned for its natural resources and diverse landscapes, the region has a population of 323,952 residents, including a significant Hispanic/Latino population and 33 Tribal Nations.

The Redwood Region faces significant economic challenges, including the decline of such traditional industries as timber and fishing, and the collapse of the cannabis market. Rising living costs, scarce affordable housing, and limited training opportunities exacerbate these challenges, particularly for remote rural areas and communities of color. Due to a lack of diversification, the region is also grappling with an aging population, youth exodus, labor shortages, and economic vulnerabilities.

Historic rural disinvestment patterns have had a significant impact on the region, and capacity and infrastructure challenges emerged as themes throughout conversations with residents and community leaders. The lack of organizations and professionals to carry forward the work and the sizable burden of updating critical infrastructure in a region with few incorporated municipalities, diffuse rural and remote populations, and historic disinvestment constitutes a major challenge that inhibits progress on economic development initiatives. Concerns over grid capacity, utility rates, and service coverage are growing more dire and urgent.

Aligned Goals and Strategies

Existing comprehensive economic development strategies (CEDS) speak to growing business opportunities, jobs, and development projects in the Blue Economy, Green Economy, Tourism, and Renewable Energy sectors. Whereas all plans emphasize support for small businesses and entrepreneurs, the focus of those recently completed in Del Norte and Mendocino Counties was also on building capacity and resilience of rural and Tribal communities, in particular through investments in broadband and transportation. The region is therefore currently investing in digital equity, offshore wind initiatives, and youth career pathways to foster future economic growth, among other shared visions for prosperity.

Health Disparities

The Redwood Region exhibits significant health disparities, with elevated mortality rates resulting from high smoking rates, substance abuse, and mental health issues. These disparities are driven by socioeconomic determinants such as poverty, limited education, and environmental hazards. Addressing these issues requires a multifaceted approach targeting at-risk populations, including people of color, LGBTQIA2S+ individuals, those with disabilities, and isolated older adults.

Priority Sectors for Economic Growth

There is a high degree of alignment and agreement across the region on key sectors and opportunities for growth, documented through review of existing CEDS, previous industry cluster analysis, and of surveys and listening sessions conducted with members of a wide range of relevant organizations. Based on these research activities, RRRISE identified four priority sectors for economic growth:

- Arts, Culture, and Tourism
- Health and Caregiving
- Renewable and Resilient Energy
- Working Lands and Blue Economy

These sectors draw on historic strengths (particularly with respect to natural resources and tourism), comparative advantage, and clear market signals indicating directions for sustainable and inclusive growth. Cross cutting industries like construction trades are highlighted as high potential areas for investment.

Labor Market Analysis

The labor market analysis for the Redwood Region revealed shifts from traditional industries to healthcare, government, and services, highlighting the need for specialized training in high-demand fields. The region faces challenges in career awareness, training alignment, support services, and K-12 preparation. Addressing these challenges requires expanding earn-and-learn models, employability skills training, flexible training programs, and digital literacy upskilling.

Input From Priority Communities

Direct feedback from priority communities calls attention to their need for stable jobs with livable wages, relevant skill-development opportunities, sufficient community resources to meet basic housing, transportation, child/family care and healthcare needs, and meaningful work structured in ways that fulfill the reasons they choose to live and work in the region—despite sometimes facing and enduring significant challenges. People in priority communities spoke about the impacts of trauma, violence, discrimination and exclusion, and the importance of connection, social safety, the experience of being valued, and the desire to simply meet basic needs while being able to choose a career path structured so as to honor the many reasons they call the region home.

Strengths, Weaknesses, Opportunities, and Threats

The Collaborative's SWOT analysis provides detailed context and understanding of the drivers behind the data, which were derived from hundreds of listening sessions and participatory research exercises. Highlighted are the region's strengths—traditional knowledge and indigenous cultures, entrepreneurial spirit, and connection to land and natural resources. Challenges include low capacity, geographically isolated communities, and infrastructure constraints. Opportunities lie in diversifying into renewable energy, investing in infrastructure, and developing robust career pathways through university-industry partnerships.

Looking to the Future

The Redwood Region must transition to regenerative natural resource management, make considerable investments in infrastructure, and address social determinants of health in order to enhance resilience. Empowering Tribal Nations, building local capacity, bridging social capital, and piloting community wealth-building strategies will be transformative. Leveraging new sources of capital will catalyze this Regional Roadmap, unlocking the Redwood Region's potential for an inclusive and sustainable future.

Summary of the Region's Strengths, Weaknesses, Opportunities, and Threats

Strengths

- The remaining stands of globally significant, old-growth redwood forest are predominantly located in their namesake region—sequestering millions of tons of carbon while drawing over a million visitors to the region each year.
- The original inhabitants of the region still live on their ancestral lands, preserving thousands of years of traditional knowledge and best ecological practice with respect to land and forest management.
- Land ethic: The region's unique social history continues to foster a culture of deep connection to and reverence for its lands and waters. The region excels at eco-innovation and has a strong sustainability ethos.
- The region possesses two- and four-year universities that are proactively engaged in creating pathways for young residents to realize career aspirations and in providing re-training initiatives.

Weaknesses

- An economy composed largely of non-tradable sectors, not (yet) driven by major, globally competitive industries. Historic reliance on sale of primary commodities.
- Small private sector (esp. Del Norte).
- Low diversification makes the region vulnerable to boom-and-bust cycles.
- Prevalence of historic and childhood trauma, high incidence of mental health issues and related disabilities, insufficient care facilities and behavioral health workforce. Social isolation and alienation; remote and disconnected communities. Poor mental health outcomes disproportionately impacting disinvested communities.
- High attrition rate from the workforce at prime age; high disability rate at prime age, likely related to the above.
- The region experiences high levels of poverty, driven in part by low labor force participation and low wages. Exacerbating poverty is the region's high cost of living and scarcity of critical, enabling services (e.g., healthcare and housing). High rates of poverty disproportionately impact disinvested communities, including people of color, people with disabilities, and LGBTQIA2S+ individuals.
- Institutions exhibit chronic low capacity, lack of key institutional partners to advance economic development initiatives, and nascent or absent collaboration on key issues facing the region due to lack of capacity.
- Aging, obsolete infrastructure creates vulnerabilities in water delivery, transportation, energy, communications, and other crucial systems. Degraded waste sites jeopardize drinking water and fisheries.
- The housing crisis is severe on the North Coast. Outdated stock is associated with high incidences of lead poisoning in children.

Opportunities

- Restoring forest health is a major job-creation opportunity for the region, climate-adaptation opportunity for the state, and carbon-sequestration opportunity for the world. Natural resource and ecosystem restoration careers are thus a major opportunity.
- A recent feasibility study found three call areas along the Redwood Region to be viable for offshore wind development, which is already underway in Humboldt Bay.
- Regionally, a unified focus on four key areas for economic development and diversification: Arts, Culture, and Tourism; Health and Caregiving; Renewable and Resilient Energy; and Working Lands and Blue Economy. Construction needs in these sectors coupled with urgent needs for infrastructure updates and housing development drive the promise of building- and trades-based industries in the priority clusters.
- The region's need for medical professionals presents an economic development opportunity with the promise to deliver thriving wage careers for Redwood Region residents.

Threats

- Catastrophic wildfires have enormous economic, health, and social impacts with impacted inland jurisdictions perpetually in "recovery mode." Wildfires play a major role in and are potentially the leading regional source of greenhouse gas emissions.
- Sea level rise puts key coastal assets at risk. Extreme heat events are predicted to become more frequent and severe in inland areas. The area's fog belt may decline.
- Natural disasters: Communities in the region are also frequently recovering from earthquakes and tsunamis. Flooding is an issue.
- The rising cost of essentials and rising incomes in urban areas push young people and skilled workers out of the region.
- A shifting regulatory environment and burdensome regulations hinder infrastructure development. Public funding opportunities are delivered inaccessibly, perpetuating cycles of disinvestment.
- Artificial intelligence and automation put lower wage workers in various fields at risk of displacement.

CONTENTS

CONTENTS

FIGURES

FIGURES

FIGURES

Acronyms

Acronym	Definition
AB	Assembly Bill
ACE	Adverse Childhood Experiences
ACS	American Community Survey
ADU	Accessory Dwelling Unit
AEDC	Arcata Economic Development Corporation
AI	Artificial Intelligence
AIAN	American Indian and Alaska Native
BARHII	Bay Area Regional Health Inequities Initiative
BIPOC	Black, Indigenous, and People of Color
BLL	Blood Lead Levels
CalEPA	California Environmental Protection Agency
CARB	California Air Resources Board
CBO	Community-based Organization
CCC	California Community College
CCRP	California Center for Rural Policy
CDC	Centers for Disease Control and Prevention
CDFI	Community Development Finance Institutions
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CEDS	Comprehensive Economic Development Strategy
CERF	Community Economic Resilience Fund

Acronyms

Acronym	Definition
CHIS	California Health Information Survey
CHRR	County Health Rankings & Roadmaps
CoC	Continuum of Care
CORE	Climate & Community Resilience
CPH	Cal Poly Humboldt
CR	College of the Redwoods
CSU	California State University
CTE	Career Technical Education
DUI	Driving Under the Influence
EDA	Economic Development Agency
EDC	Economic Development Corporation
EDD	Economic Development District
EDD	Employment Development Department
EDDI	Evaporation Demand Drought Index
EDF	Economic Development Finance
EDFC	Economic Development & Financing Corporation
EIE	Environmental Insights Explorer
EV	Electric Vehicle
FAA AIP	Federal Aviation Administration's Airport Improvement Program
FAIR	Fair Access to Insurance Requirement
GHG	Greenhouse Gases

Acronyms

Acronym	Definition
HAF+WRCF	Humboldt Area Foundation and Wild Rivers Community Foundation
HCWDB	Humboldt County Workforce Development Board
HHS	Health and Human Services
HML	Humboldt, Mendocino, and Lake Counties
HPSA	Health Provider Shortage Area
HUD	Department of Housing and Urban Development
ICLEI	Local Governments for Sustainability
IRR	Index of Relative Rurality
LQ	Location Quotient
LUST	Leaking Underground Storage Tank
LVN	Licensed Vocational Nurse
MBF	Mile Board Feet
MHI	Median Household Income
MMIWG2	Missing and Murdered Indigenous Women, Girls, and Two-Spirit People
NAICS	North American Industry Classification System
NCIRWMP	North Coast Integrated Regional Water Management Plan
NCRP	North Coast Resource Partnership
NorCal	Northern California
NoRTEC	Northern Rural Training and Employment Consortium
PIT	Point-In Time

Acronyms

Acronym	Definition
PUMA	Public Use Microdata Area
PUMS	Public Use Microdata Sample
QCEW	Quarterly Census of Employment and Wages
RII	Regional Investment Initiative
RISE	Resilient, Inclusive, and Sustainable Economy
RN	Registered Nurse
RRE	Renewable and Resilient Energy
RREDC	Redwood Region Economic Development Commission
RRRISE	Redwood Region Resilient, Inclusive, and Sustainable Economy
SBA	Small Business Administration
SBDC	Small Business Development Center
SMEDD	Sonoma Mendocino Economic Development District
SWOT	Strengths, Weaknesses, Opportunities, and Threats
SWRCB	State Water Resources Control Board
TIMS	Traffic Incident Management System
USDA	United State Department of Agriculture
USGS	United States Geological Survey
WANB	Workforce Alliance of the North Bay
WCC	Woodland Community College
WIOA	Workforce Innovation and Opportunity Act

Introduction

In September 2021, California Governor Gavin Newsom signed Senate Bill 162 into law, establishing the $600 million California Jobs First's Regional Investment Initiative (then known as Community Economic Resilience Fund [CERF]) program. The aim of the Regional Investment Initiative (RII) is creating high-quality, accessible jobs and helping build resilience to the effects of climate change and other global disruptions impacting the state's diverse regional economies. The RII investment supported the creation of Jobs First Collaboratives in 13 regions across California.

Redwood Region RISE (RRRISE) comprises Tribal Lands and the counties of Humboldt, Mendocino, Lake, and Del Norte, with representation from a wide variety of community partners including labor, business, local government, education, environmental justice, community organizations, and more. The Collaboratives are tasked with developing regional roadmaps, including sector strategies and recommended investments for their respective regions.[1]

Regional Plan Part 1 provides a baseline snapshot of the current state of the region's economy, including key industries, labor force characteristics, climate resilience, and public health issues that impact communities' well-being. Throughout the report, key metrics are highlighted to provide focal areas to enable the region to track its progress towards creating an inclusive, climate-forward economy.

The report is structured as follows:

Introduction	Description of Redwood Region's California Jobs First Collaborative: Redwood Region RISE.
Overview of the Region	Review of the region's economic history and diverse communities: This chapter includes information on historic disinvestment in the region and descriptions of the key assets and strengths that may be leveraged for inclusive growth.
Partner Mapping	A snapshot of the region's "people power": Institutions and organizations positioned to influence the creation of an inclusive economy. This chapter was co-authored with Bischoff Consulting.
Economic Analysis	Key indicators of macroeconomic health including basic information on growth, productivity, and inequality, and importantly, socioeconomic conditions in the region. Chico State Enterprises contributed to this chapter.

[1] See Press Release, 3/8/2024 "California Jobs First: State Launches First of its Kind Council to Create Thousands of More Jobs Across all Regions" [Office of Governor Gavin Newsom, ref].

Climate Analysis	Climate projections and their implications for communities across the region. Sources of greenhouse gas emissions and environmental contaminants. This chapter highlights areas of vulnerability as well as opportunities for adaptation and building resilience. This chapter was co-authored by the Sierra Business Council.
Public Health Analysis	Overview of health disparities, proximate risk factors, and their economic and environmental drivers.
Industry Cluster Analysis	Information on the industries currently driving the economy and their prospects for delivering job growth, living wages, and productivity into the future. Chico State Enterprises and Professor Robert Eyler of Sonoma State University provided data and guidance for this chapter.
Labor Market Analysis	An in-depth look at the region's current labor force, with consideration for living and family-sustaining wage jobs, opportunities for priority populations, and training needs.
Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis	This chapter details the region's strengths, weaknesses, opportunities, and threats. The analysis, along with the baseline metrics included throughout, prepares the Collaborative to create sector and community development strategies in Part 2 of the Regional Roadmap (forthcoming, August 2024).

A Note on Data and Methodology

The California Center for Rural Policy (CCRP), Convener for Redwood Region RISE, is a community-based participatory research center at Cal Poly Humboldt. Committed to research and policy that can be used to improve the lives of rural people in California, the Center specializes in participatory and mixed methods approaches. Its methods are tailored to the study of rural populations, environments, and their interactions. CCRP utilized a mixed methods approach to create the report. Both quantitative and qualitative data sources were utilized.

CCRP used a variety of public data sources to prepare this report. Figure I.1 offers an overview of primary data sources. Detailed information on specific data sources and methodological notes can be found accompanying each data visualization and in Figure I.1. The research team worked with the Collaborative's outreach and engagement partners to conduct 144 listening sessions with professionals from organizations in California Jobs First key partner groups—labor, economic development agencies, community-based organizations, workforce entities and more—as well as with residents from priority communities who have experienced economic marginalization and barriers to employment (355 individuals, interviewed by 22 partner organizations including outreach leads).

Outreach and engagement partners North Coast Opportunities (NCO) and True North Organizing Network's (TNON) assisted with research efforts, conducting listening sessions with communities of color, federally and non-federally recognized Tribal Nations, immigrants, individuals with disabilities, LGBTQIA2S+ communities, and other underrepresented groups across the region. Qualitative data from these efforts appear throughout the report, but especially in the Partner Mapping and SWOT chapters. Data from listening sessions were analyzed using qualitative data processing software ATLAS.ti.

Figure I.1. Key Data Sources

Economic and Labor Market Data	Public Health Data	Environmental Data
♦ U.S. Census Bureau American Community Survey (ACS) ♦ IMPLAN ♦ The California Employment Development Department (EDD) Industry and Occupation Projections ♦ Bureau of Labor Statistics (BLS)	♦ The California Health Information Survey (CHIS) ♦ County Health Rankings & Roadmaps (CHRR) Analytic and Trends Data ♦ The California Department of Public Health (CDPH) County Health Status Profiles ♦ Kidsdata.org	♦ CalEnviroScreen 4.0 ♦ California Air Resources Board (CARB)

Potential Data Limitations in Rural Areas

Small sample sizes and high statistical uncertainty: Small sample sizes in rural areas often produce higher levels of statistical uncertainty—a challenge that is exacerbated with subsets of populations such as disinvested communities.[2] Importantly, the inability to detect disparities between two groups in rural data sources with high uncertainty does not confirm the absence of such disparities.

Response bias: Differences may occur between populations that respond to surveys and those that do not, leading to nonresponse bias.[3] Furthermore, factors like limited broadband access could similarly affect survey responses across various instruments. Therefore, publicly available data sources might have gaps or inaccuracies that do not fully capture or fairly represent reality.

[2] In many of the data visualizations presented throughout the body of this report and its appendices, this statistical uncertainty is represented by horizontal bars (i.e., confidence intervals) that represent the level of confidence associated with a statistical estimate. Larger confidence intervals indicate greater uncertainty about an estimate. Estimates that describe populations that represent a smaller share of the overall population generally have lower confidence levels.

[3] "Response bias" occurs when survey (or interview) respondents provide inaccurate or false answers. "Nonresponse bias" occurs when respondents and nonrespondents of a survey or interview differ in an area relevant to the research at hand, leading to biased results. Nonresponse can happen because people are either not willing or not able to participate in the data-gathering exercise. Although methodological approaches can correct for this type of potential bias (the Census Bureau applies such methods), these methods are imperfect and, in extreme cases, can lead to unreliable estimates. For instance, during the pandemic in 2020, factors such as socioeconomic status were found to significantly influence the probability of nonresponse in the American Community Survey, leading the Census Bureau to withhold one-year 2020 data.

Redwood Region RISE

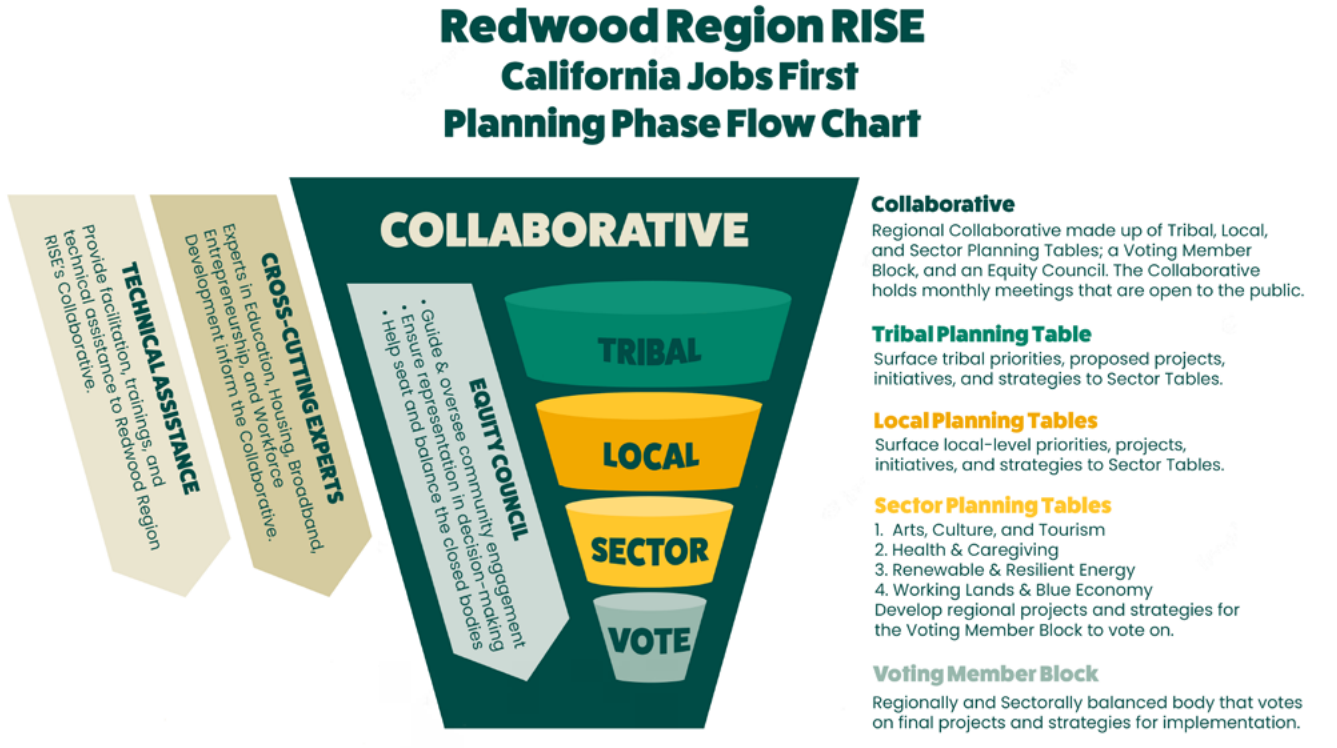
Redwood Region Resilient Inclusive Sustainable Economy (RRRISE) is the name of the Redwood Region's California Jobs First Regional Investment Initiative. Throughout the report, the designations "RRRISE" and "the Collaborative" are used interchangeably to refer to this region's initiative.

Redwood Region RISE launched in February 2023, committing to lead an inclusive, diverse, transparent, and accountable regional planning process and to include and honor community voices that do not always participate in or benefit from economic development planning processes. The following principles guide the Collaborative's work: 1) honor the wisdom of individuals who have in the past been marginalized in economic development planning; 2) create and allow space for individuals with lived experience to drive the prioritization of investments; and 3) encourage and accept nontraditional approaches within the economic development planning sphere.

Collaborative Governance

With guidance from a governance task force formed by the Collaborative for this purpose, RISE created a governance structure with five primary bodies focused both on decision-making and planning in Phase 1.

Figure I.2 Redwood Region RISE Planning Phase Flow Chart



The **Tribal Planning Table** is open to all Tribal residents in the Redwood Region and was created in April 2023 following consultation with Tribal Councils across the region. Thirteen Tribal Nations attend intermittent meetings whose focus is surfacing the diverse range of Tribal priorities, economic development strategies, and proposed projects and investments, in addition to liaising with other Tribal partners in the region and preparing for the Tribal Funding Opportunity. Tribal Planning Table priorities are brought up to the Sector Planning Tables and reported back to the broader Collaborative.

Local Planning Tables were created to give the individual counties in RRRISE space to discuss sub-regional priorities, provide local support to communities as they develop projects and plans, and align regional efforts with local CEDS processes.

Sector Tables represent the region's key industries: 1) Arts, Culture, and Tourism; 2) Health and Caregiving; 3) Renewable and Resilient Energy; and 4) Working Lands and Blue Economy. Each Sector Table is led by one or more Sector Coordinators working with 20-50 members. The Sector Tables develop strategies that are informed by data research, reflective of community priorities, and aligned with California Jobs First goals.

Serving as the **Executive Body** is a regionally balanced, community-endorsed Voting Block with up to 44 representatives from 11 required partner groups. All federally and non-federally recognized Tribes in the region may become members. The **Voting Block** is the primary decision-making body of the Collaborative and is responsible for organizational development and guidance in decision-making.

Voting Block Community Endorsement Process

After four months of outreach, engagement, and partner mapping, RRRISE launched a process for seating its Voting Member Block. Dedicated seats were apportioned; one for each partner category in each county, and then every Tribe was invited to sign on as a voting member. The outreach and engagement team did additional presentations at Tribal Councils across the region to make those nations aware of the opportunity to participate as decision makers.

The Collaborative assisted in identifying organizations that had not yet been mapped or contacted to be added as prospective candidates in each category. Once the crowdsourced inventory of organizations in each category was as complete as possible, the convening team created endorsement forms for each subregion and circulated these to the subregion's interest holders. Partners were permitted to forward the form's link to their constituents, who could endorse for their respective communities, and forms were available on the Redwood RISE site as well. Over 600 individuals were directly invited to endorse an organization in each category to represent their subregion.

Once organizations were identified, the Convening team onboarded members to the Voting Block. Several seats were not able to be identified due to the small numbers of organizations in the region and capacity constraints. The roster was sent to the Equity Council for review and recommendation in December 2023.

Up to 24 nominated **Equity Council** members representing priority communities act as an advisory group to the Collaborative. Led by a chair and co-chair, the Council has been meeting independently and reporting to the Collaborative every month since November 2023. Often referred to as Redwood Region RISE's "moral compass," the Equity Council guides and oversees the community-engagement process, ensures representation in decision-making, helps seat and balance the Collaborative's formal bodies, and provides general guidance on embedding equity best practices across the Collaborative's work.

The RRRISE Planning Phases:

1. Setting the table for broad-based, community-driven planning and socializing regional data. Identifying key regional priorities.
2. Formally seating the Collaborative's governing bodies.
3. Organizational development, including development of bylaws, charters, work plans, and strategy.
4. Consensus building and approval of the Regional Roadmap.

Phase 1

Since its launch in February 2023, the Collaborative has met monthly to share updates, discuss progress, and provide opportunities to learn from each other. A staple at these meetings are "Data Walks" intended to guide the Collaborative's understanding of the region, allow the community to ground-truth quantitative findings, encourage community dialogue, and inform strategic regional thinking within and beyond California Jobs First.

Phase 2

In May 2023, the Collaborative convened a Task Force to explore governance models and create a structure for itself. This Task Force established five primary bodies: a Voting Member Block (executive leadership council of the Collaborative); an Equity Council; a Tribal Planning Table; Local Planning Tables; and four Sector Planning tables.[4] The Task Force also identified a cadre of experts to focus on cross-cutting issues like housing, entrepreneurship, and broadband.

Phase 3

Between April-June 2024, the Collaborative established processes and procedures to ensure effective decision-making, accountability, and strategic alignment. This phase involved the development of bylaws and work plans; helping define roles, responsibilities, and operational procedures for Collaborative participants.

Phase 4

In Summer 2024, the Collaborative will be engaged in strategy-formation exercises to further articulate a 10-year vision for inclusive economic growth and diversification in the region. This work will be documented in Regional Plan Part 2, forthcoming. Together, Regional Plan Part 1 and Regional Plan Part 2 form the Regional Roadmap for RRRISE.

The Collaborative will continue to facilitate inclusive discussions, workshops, and feedback sessions to gather input, address concerns, and build a shared vision for the future. By actively involving affected parties in the decision-making process, the Collaborative aims to create a ground-truthed Regional Roadmap with broad-based support that can serve as a unifying framework for action and investment in the region in the years ahead.

[4] Chapter 2 Partner Mapping describes how these were identified.

Chapter 1

Redwood Region Overview

This chapter offers a brief history of the Redwood Region's economic development, including discussion of the impact of resource extraction, boom-and-bust cycles, and the legacy of disinvestment in certain communities.

Key Takeaways

- The Redwood Coast Region's economic history is characterized by commodity boom-and-bust cycles and a lack of economic diversification. While there is a need to move beyond resource extraction and exportation of primary commodities, the region's comparative advantage remains its natural resources and productive landscapes.
- One of the most rural and remote regions of the state, the region is also culturally diverse and home to the state's largest Indigenous communities, which continue to reside on their ancestral lands. Younger generations are becoming more diverse, and there is a growing Latinx community. The region is aging; the median age is seven years older than California's median. While the population of the region is declining, most town centers have gained residents in recent years, straining housing availability.
- Over 95% of the region qualifies as "disinvested" by California Jobs First criteria.
- The region possesses many assets that position it to be a leader in sustainable development, including suitability for offshore wind development, sustainable forestry, indigenous-led ecosystem initiatives, and historic strength in local food production and regenerative agriculture.

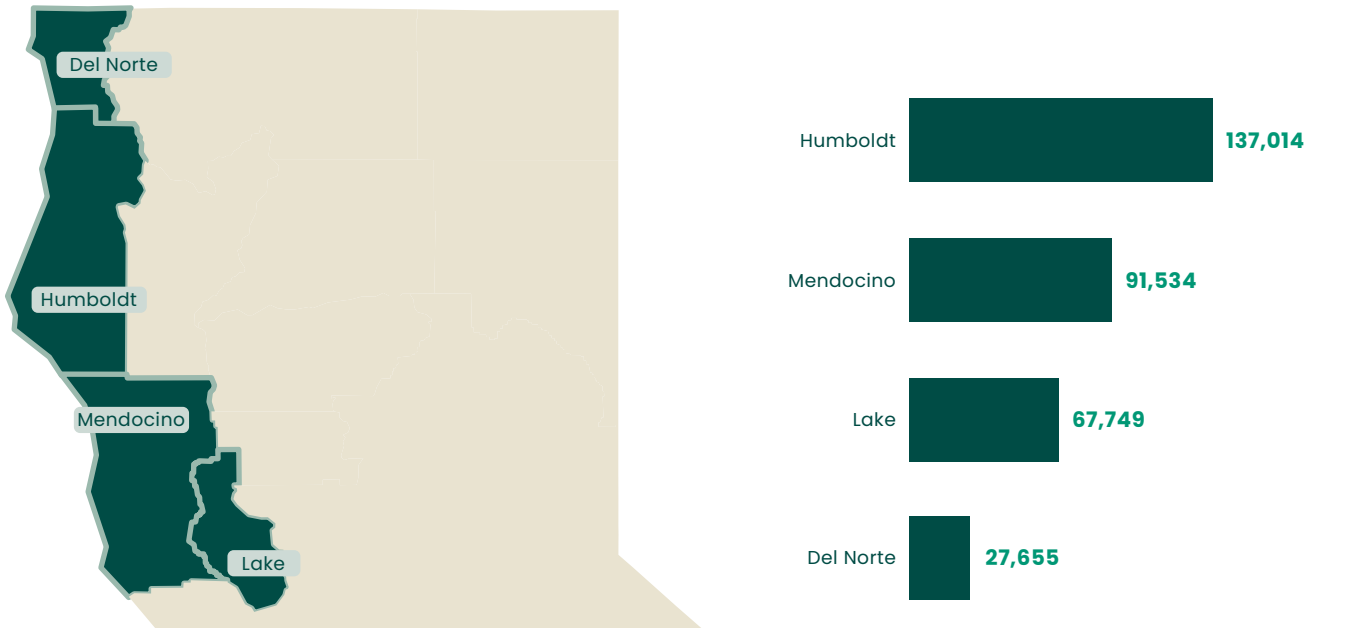
Key Metrics

- Demographics - age, race, and ethnicity of the region's residents: Tracking the region's demographic composition with respect to median age and racial and ethnic distributions, including changes over time enables population trends, such as aging and shifts in diversity, to inform inclusive economic development strategies and ensure equitable representation in the Collaborative's efforts.
- Percentage of census tracts determined to be disinvested under California Jobs First criteria: Assessment of the proportion of the region classified as disinvested is based on the program's definition, which includes such factors as median household income, poverty rates, and unemployment levels. This metric is used to prioritize areas for targeted investment and support and to measure progress in reducing economic disparities across the region.

Brief Economic and Social History of the Redwood Coast

The Redwood Coast contains some of the most rural and remote areas in California. Beginning 100 miles north of San Francisco and extending to the Oregon border, the region includes Tribal Lands and four counties (Mendocino, Lake, Humboldt, and Del Norte), covering approximately 6% of the state's total landmass (U.S. Census Bureau, n.d.). The four-county region—including Tribal Lands—has 323,952 residents, accounting for less than 1% of the state's total population (U.S. Census Bureau, 2024).

Figure 1.1 Redwood Coast Region and Population (2017-2021)

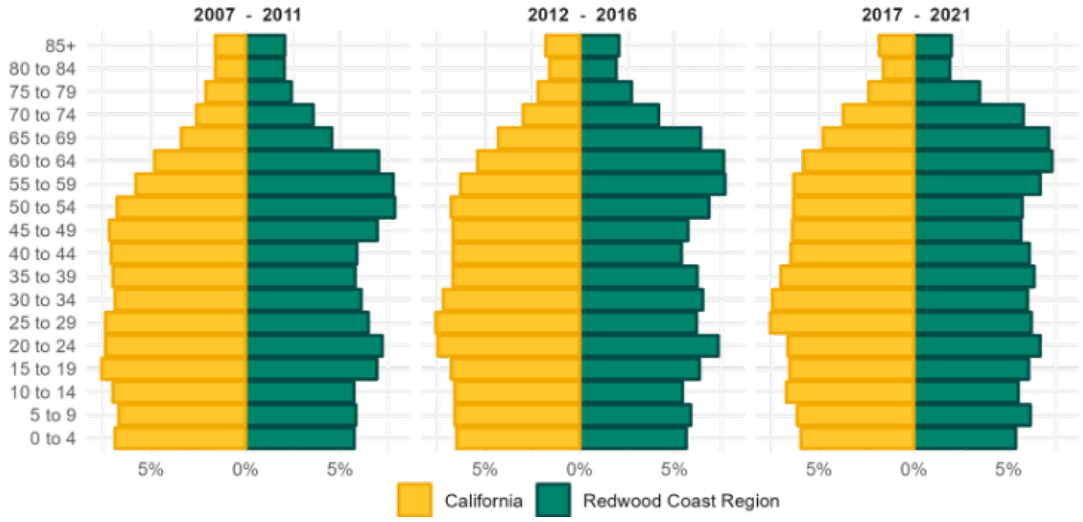


Note. Data sourced from the ACS.

The Redwood Region is the ancestral land of several Indigenous cultures, including (but not limited to) those of the Hoopa, Karuk, Miwok, Pomo, Tolowa, Wappo, Wiyot, and Yurok. Presently, 33 federally and non-federally recognized Tribes reside in the region. The region's population is largely white and non-Hispanic (67.7%). Hispanic or Latino individuals make up 19% of the region's population, while the American Indian and Alaska Native (AIAN) population represents approximately 2.4% of the region's total population, higher than the statewide percentage of AIAN residents. On the whole, the region's population is aging—the median age is 41 years, compared to the state median of 37 years (see Figure 1.2).

European settlers arriving for the California Gold Rush in the mid-19th century forced displacement, acculturation, genocide, and other atrocities on Indigenous peoples, the legacy of which is still felt in the region today. Colonizers established the extractive industries that to this day comprise a mainstay of the region's economy. During the initial wave of settlers, the timber and logging industries grew to prominence, particularly in Mendocino, Humboldt, and Del Norte counties, thanks to the abundance of redwoods, or "red gold," in the area (Del Norte County Historical Society, 2021; Humboldt County Historical Society, n.d.). Commercial fishing and canneries were established in coastal areas and rivers in Humboldt, Del Norte, and Mendocino counties (Del Norte County Historical Society, 2021b; Humboldt County Historical Society, n.d.). Agricultural industries were established soon after.

Figure 1.2 Age Distribution (2007-2021)



Note. Data sourced from the American Community Survey.

By the 1960s, wine making had become a successful industry in Lake County (Lake County, California, 2020), while the dairy and livestock industries performed well in Humboldt County (Humboldt County Historical Society, n.d.). Home to California's largest freshwater lake, Clear Lake, Lake County's economy has historically been based on tourism and recreation ("Lake County Cannabis Equity Assessment," 2020). Tourism also became a prominent industry in the other counties as early as the late 19th century (Humboldt County Historical Society, n.d.; Lake County, California, 2020; Lake County, California, 2022).

Towards the mid-20th century, timber and fishing industries had diminished considerably due to resource depletion and unsustainable management (Pomeroy et al., 2010; Del Norte County Historical Society, 2021b). The logging and timber industries began their long decline due in part to the post-war housing boom, export of timber products, and subsequent destruction of over 90% of the region's redwood forests (ibid.). The rise of countercultural movements in the 1960s brought newcomers from urban California and other parts of the nation to the region. Known as "Back to the Landers," these new migrants introduced a novel agricultural product into the region—cannabis. Illicit cannabis cultivation became a lucrative business and a new major industry across much of the region, though not without concerted (albeit largely ineffective) efforts to thwart growing operations dedicated to it by state and federal authorities (University of Oxford, 2019). Cannabis cultivation and sale for medicinal use was legalized in 1996, with recreational and business use legalized statewide in 2016.[5] Once thought to be a six-billion-dollar market, firms flooding the market caused a collapse in the commodity's price, and the industry is now in substantial financial decline across the region (Department of Cannabis Control - State of California, n.d.; Jaeger, 2024).

[5] Click here to learn more.

Disinvestment in the Region

> *"California's inland and more rural regions have less exposure to the knowledge and technology industries that have powered California's economy over the past decades. Their economies are less diversified than those of coastal regions and many currently lack the economic drivers to create quality jobs at scale for residents. Inland and rural regions are at once most impacted by climate change and environmental pollution and most vulnerable to potential job losses from measures designed to address climate change and improve environmental quality."*
>
> **-Little Hoover Commission Report, 2022**

California Jobs First's Regional Investment Initiative emphasizes inclusive planning to ensure equitable outcomes for "disinvested communities," which face many challenges resulting from inequitable land-use and zoning policies, exclusionary economic development processes, underinvestment, and a lack of meaningful engagement in planning and policy decisions (among other reasons). The program promotes the active engagement of residents and community leaders of disinvested communities in its economic development planning efforts. The program is also structured to help ensure that these communities enjoy ongoing benefits from future investments. California Jobs First defines "disinvested communities" as any of the following:

- Census tracts identified as "disadvantaged" by the California Environmental Protection Agency.
- Census tracts with median household incomes at or below 80% of the statewide median income or at or below the threshold designated as low-income by the Department of Housing and Community Development's list of state income limits pursuant to Section 50093 of the California Health and Safety Code.
- "High poverty area" and "High unemployment area" as designated by the California Governor's Office of Business and Economic Development California Competes Tax Credit Program.
- California Native American Tribes as defined by the Native American Heritage Commission (NAHC) Tribal Consultation Policy.

Figure 1.3 below shows low-income and disadvantaged communities within the region as defined by the California Jobs First Program.

Figure 1.3 Low-Income or Disadvantaged Communities as Designated by California Jobs First[6]

According to California Jobs First's definition, over 95% of the Redwood Coast Region constitutes a "disinvested" community.

Given the generalized nature of spatial disinvestment, the Collaborative elevated specific economic barriers in creating its own definition- conceptualizing "disinvested communities" in the region as those who face a confluence of relatively severe and often interconnected hardships including, but not limited to, poverty, disability, lack of access to household or community resources, and/or lack of economic or educational opportunities. RRRISE recognizes the experiences of BIPOC communities; Indian Country, including non-federally recognized Tribes; New American communities (new arrivals and/or non-native English speakers); and youth and the elderly and seeks to better understand and respond to the profound and difficult impacts of the widespread trauma and disability experienced by members of these groups.

[6] *Data sourced from the California Energy Commission via the California Open Data Portal. Data are defined as follows: "This layer shows census tracts that meet the following definitions: Census tracts with median household incomes at or below 80 percent of the statewide median income or at or below the threshold designated as low income by the Department of Housing and Community Development's list of state income limits adopted under Health and Safety Code section 50093 and/or census tracts receiving the highest 25% of overall scores in CalEnviroScreen 4.0 or census tracts lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative population burden scores or Census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0 or Lands under the control of federally recognized Tribes."*

Based on a combination of CEDS data from each of the four counties, information from the California Climate Investments Priority Populations (2023), and the outreach and engagement team's knowledge from working with underserved communities, the team generated a preliminary list of priority communities. This list was further defined by the RRRISE Equity Council to ensure voices from marginalized, underserved, and underheard groups were not overlooked.

Where possible, Redwood Region RISE uses quantitative data to define and describe the priorities mentioned above. However, the region's small and distinctly rural population leads to correspondingly small sample sizes in public datasets that can obscure the impacts of disinvestment on priority communities. Thus, relying solely on quantitative data to identify these effects is not feasible. In response, RRRISE has adopted an approach distinct from other, less-rural regions of the state, by integrating qualitative data with quantitative measures to ensure the accurate representation and inclusion of these communities.

Within the region, deeply rural communities are thus designated as priority communities and so named as areas of persistent disinvestment. Many of these communities are unincorporated and rely on cooperative relationships with county governments for service delivery. In listening sessions, members of those communities frequently described this dynamic as a source of powerlessness. Other barriers to economic empowerment cited by priority communities include a lack of adequate workforce-development initiatives, insufficient wraparound services, a lack of technical support for entrepreneurs (particularly for Native Americans, New Americans, and entrepreneurs of color).

> "[Workforce initiatives need to understand] barriers like transportation, childcare, housing…understand the holistic approach that is needed. It takes working with regional partners, and looking at larger problems."

The Redwood Region Today

The agricultural and timber industries continue to be major drivers of the region's economy. Lake and Mendocino Counties are significant producers of wine and horticultural products, whereas Mendocino, Del Norte, and Humboldt Counties retain primacy in timber production. Tourism, hospitality, and recreation industries are abundantly represented across the region as well (California EDD, Labor Market Information Division [n.d.]; California Employment Development Department [EDD], n.d.; Stenger, 2018; Del Norte County Historical Society, 2021b; Submitted, 2022).

Given the region's reliance on agriculture and timber-based commodities and their associated boom-and-bust cycles, Collaborative members support planning efforts to diversify local economies and increase economic activity and economic resilience. While past economic development efforts were focused more broadly on business attraction, their more recent emphasis has been the targeted leveraging of existing and emerging assets and industry sectors.[7]

[7] e.g., Humboldt County's "Targets of Opportunity" cluster-focused model of economic development (https://www.gohumco.com/173/Comprehensive-Economic-Development-Strat)

Since the economic downturn of 1998-2000, more focus has been paid to forming partnerships and enacting policies better suited to the region's comparative advantages. The aim of these initiatives has been to diversify services and firm types within industries having existing strong foundations. However, challenges persist and include a lack of regional coordination on economic strategies, rising costs, missed opportunities to grow firms capable of accessing lucrative markets in nearby urban areas, and failure of key sectors to adapt to changing regulations and market conditions.

With an aging population and a relative decline in natural resource-based industries, healthcare and public sector jobs are gaining in prominence. Healthcare and government employment combined currently constitute nearly one-third of the region's workforce and represent the bulk of the higher wage opportunities available to residents of the region. Concurrent with this shift, populations have decreased in its more rural areas while municipalities have experienced growth, exerting additional pressure on a strained housing market ("California Jobs First: Equity Indicators for the Redwood Coast Region," 2024). The Economic Analysis and Labor Market Analysis chapters of this report discuss the dynamics of these in depth.

Overview of Regional Assets and Opportunities

Asset-based community development is an evidence-based approach involving identification and leveraging of the assets needed for resilient and equitable economic growth. Assets specific to the growth of key sectors are discussed in depth in the Industry Cluster Analysis and Regional Plan Part 2 (forthcoming). At a high level, the community assets listed below are recognized[8] as key to the region's employment opportunities, ability to innovate, and provision of services to its communities and thus contribute significantly and/or uniquely to its residents' overall well-being.

Natural Resources

- Globally significant redwood forests, including Redwood National and State Parks,[9] which draw almost 5 million visitors annually in addition to providing other benefits (habitat, agroforestry, carbon sequestration, the historic presence of large- and medium-scale timber operations such as Green Diamond and the Mendocino Redwood Company[10]).

[8] This non-exhaustive list of community assets was derived from the findings of the listening campaign, which included 144 leaders and community members.

[9] The Redwood Region is home to Redwood National and State Parks, which protect nearly 39,000 acres of old-growth redwood forests (National Park Service, 2021).

[10] Mendocino Redwood Co. has over 228,000 acres of forest holdings and one mill located in Ukiah. Green Diamond Co.'s local holdings, called the California Timberlands, constitute 397,000 acres, a mill at Korbel, and a chip company at Humboldt Bay.

- The longest stretch of coastline of any California Jobs First Region, at 379 contiguous miles in total. Three of the region's areas—Noyo Harbor (Mendocino),[11] Humboldt Bay, and Crescent City (Del Norte)—host the region's fishing industry, which remains driven by small and family-run businesses. Preliminary studies deemed all three ports to be feasible locations for offshore wind development, and Humboldt Bay is the first area in the state to execute a lease for development.[12] Additionally, the region is a state leader in aquaculture; for example, Humboldt Bay is the largest producer of oysters in California.[13] The Port of Humboldt Bay is the only deep-water port between San Francisco and Coos Bay, Oregon.[14]

- Lake County is home to one of the largest geothermal areas in the world. Sustained through an innovative use of wastewater injection, the Geysers (Calpine) produce sufficient clean power for all of San Francisco.[15]

- Part of the region's blue economy, Clear Lake (Lake County) is the largest natural lake in California and thus provides a valuable regional tourism and recreation destination. The USGS is currently conducting hydrologic (primarily nutrient loading) research on the lake to improve water quality and fish habitat (the Clear Lake Hitch fish species).[16]

"I don't think I would want to live anywhere else."

Physical Assets

- Local businesses: In addition to myriad small- and medium-sized enterprises across all sectors, the region boasts many farms, wineries, micro-breweries, and artisanal food producers. Mendocino (which has over 550 vineyards)[17] and Lake counties' wine industries, for example, provide a significant source of employment and tourism dollars.

- Former mill sites: Consolidation and decline in milling activities has freed former mill sites for redevelopment opportunities. Several sites have undergone remediation and are currently being readied for redevelopment, including the Georgia Mill site in Fort Bragg (Mendocino County) and the Samoa Pulp Mill site on the Samoa Peninsula (Humboldt County).

[11] The Noyo Ocean Collective, a California Jobs First pilot project grantee, capitalizes on marine science, sustainability initiatives, and traditional fishing activities to ensure a thriving harbor.

[12] The federal government recently awarded $426 million to the Humboldt Bay Harbor, Recreation, and Conservation District for the design, permitting, and construction of the Humboldt Bay Offshore Wind Heavy Lift Marine Terminal on the Samoa Peninsula at site of a former pulp mill site. This grant was announced shortly after the District committed to a "Green Terminal" strategy, i.e., the development of a heavy lift terminal powered primarily by electricity to protect air quality and public health while reducing greenhouse gas emissions, noise, and the threat of fuel spills. The District's commitment to design a green terminal enables provision of offshore wind energy unaccompanied by a potentially fossil fuel-leaking port in Humboldt Bay.

[13] [Ref].

[14] Humboldt Bay Harbor, Recreation & Conservation District. (2021) https://humboldtbay.org/port.

[15] [Ref].

[16] [Ref].

[17] See Mendocino County Wine Region.

"I fell in love with the place. I fell in love with the community, just the natural beauty, the slow pace."

Key Institutions

- The region hosts three community college networks: College of the Redwoods (Humboldt and Del Norte Counties), Mendocino College (Mendocino and Lake County), and a Woodland Community College Campus in Lake County. Humboldt State University announced its transition to Cal Poly Humboldt and became the state's third polytechnic university in 2023, a development anticipated to increase the region's entrepreneurial and innovation capacity.
- A network of hospitals and clinics, some in rural and remote parts of the region, are working to address persistent issues of access and ongoing health disparities.
- Several Community Development Finance Institutions (CDFIs) and three major NorCAL SBA affiliates[18] serve the needs of entrepreneurs, small businesses, special districts, and rural jurisdictions that could otherwise struggle to access financing.

Cultural Strengths

- The region's original peoples lead key ecological and economic justice initiatives. The region is one of the first to have federal park land returned to indigenous stewardship and hosts the first Indigenous Marine Protected Area in the nation. Tribes are the key initiators of economic and housing development projects in disinvested areas (both Tribally and non-Tribally held) and several Tribes are top employers in the region.
- Increasingly, resources are being mobilized to strengthen identity-based and human dignity organizations serving the interests of the region's priority, diverse populations.[19] Organizations aligned with the Collaborative are involved in fiscally sponsoring and funding such groups as they emerge.
- The region's historic and cultural landmarks, which include Tribal cultural centers and historic districts such as those of Eureka, Ukiah, and Fort Bragg, showcase the region's unique heritage, and efforts to revitalize small town main streets are growing the region's existing strength in tourism.

Asset-mapping specific to the region's priority sectors is currently underway in the Collaborative's Sector Tables.

[18] West Business Center, Lake County EDC, and NorCal SBDC all serve on the RRRISE Voting Block.

[19] Organizations identified include Centro Del Pueblo, Latinonet, Black Humboldt, Queer Humboldt, Ukiah Veccinos en Accion, Latinos United of Lake County, and Humboldt Asians and Pacific Islanders in Solidarity.

Chapter 2

Partner Mapping

This chapter assesses the Redwood Region's readiness for the California Jobs First initiative by examining the landscape of existing organizations, partnerships, and strategic plans aimed at fostering inclusive and sustainable growth in the region. Highlighted are opportunities for strategic partnerships and capacity-building to unlock the region's potential equitably and sustainably. The chapter also provides an overview of the initiative's first-year outreach efforts to engage key partners and communities in the Collaborative and describes how ongoing partner-mapping informs outreach and engagement activities. Finally, it outlines the next steps needed to strengthen the Collaborative's capacity to pursue its vision of shared prosperity in the region.

Key Takeaways

- **Capacity Constraints:** Economic development in the region is diffuse and characterized by low capacity, with few orthodox development organizations. That leaders often wear many hats due to funding and person-hour constraints hinders the region from pursuing opportunities and expending program funds. The region has few community organizing, identity-based human dignity groups, or environmental justice-specific organizations. Capacity constraints are the primary factor limiting coordination with disinvested communities and creation of an effective California Jobs First Collaborative.
- **Tribal Involvement and Priorities:** The region's 33 federally and non-federally recognized Tribes are leaders in creating opportunities for disinvested communities, sustainable natural resource management, green industries, renewable energy, housing, and in the arts, culture, and tourism sectors. However, Tribal rights holders are often not consulted sufficiently early in key planning decisions, hampering collaboration.
- **Strong Alignment of Strategies and Focal Areas:** Across counties and Tribes, plans emphasize traditional industries like agriculture, forestry, fishing, and manufacturing as well as emerging areas such as tourism, renewable energy, and specialty foods. Plans also highlight critical (physical) infrastructure gaps like those in broadband, water, and transportation that require investment to support further economic growth. Developing a skilled workforce is a common priority across economic development plans.
- **Need for Funding and Technical Support:** Organizations and leaders in the region would benefit greatly from structured, accessible mechanisms for identifying funding opportunities, as well as technical and grant writing support. Partners also recommend creation of a regional economic development entity.

Key Metrics

- **Number of Cross-Sectoral and Regional Partnerships:** Tracking the formation of new working groups, partnerships, and initiatives that bring together diverse partners from across the region and monitoring the retention of partners over time and the development of long-term collaborations or agreements that demonstrate the resilience of partnerships.
- **Number of New Organizations, Advocacy Groups, and Regional Initiatives:** Assess the creation of new entities that seek to address gaps in representation and support inclusive, sustainable economic development in the region.
- **Formation of EDA Economic Development Districts:** Monitor the establishment of new Economic Development Districts (EDDs) in the region, thereby enhancing access to funding opportunities and supporting regional planning efforts.
- **Self-Reported Assessment of Barriers to Collaboration:** Regularly obtain feedback from partners describing the challenges they face in engaging with the Collaborative, such as capacity constraints, resource limitations, and competing priorities.

Community Readiness for California Jobs First

Consistent with the experiences of rural areas nationwide, systematic economic-development efforts in the region are diffuse and characterized by low capacity and few orthodox development organizations. No regional economic-development organizations and few initiatives cover the California Jobs First-designated region Tribal Lands and the counties of Del Norte, Humboldt, Lake, and Mendocino. Leaders often wear many hats, and funding and person-hour constraints have created capacity traps that hinder the region from pursuing opportunities and expending program funds even when they have been successfully secured.[20]

To adequately assess community readiness to participate in a regional effort, engage with potential partners, and assemble the Collaborative, partner mapping was the essential first step in building RRRISE. Alongside the listening campaign, researchers conducted an initial survey to understand: 1) the current work of public-sector and community-based organizations in the region; 2) communities' desire and capacity to engage in a regional and inclusive economic development planning endeavor; 3) members' perceptions of opportunities and challenges in their areas of focus; and 4) existing partnerships. Through this and the work of the North Coast Opportunities (NCO) and the True North Organizing Network (TNON) Outreach and Engagement teams to identify organizations at the local level, the convening team assembled a comprehensive Partner Directory of interest holders within the partner categories named as essential by the California Jobs First program:

1. California Native American Tribes
2. Community organizers and community members
3. Disinvested communities
4. Economic development agencies

[20] This was a persistent theme voiced by participants in the RRRISE listening campaign.

5. Education and training providers
6. Employers, businesses, and business associations
7. Environmental justice organizations
8. Government agencies
9. Grassroots and community-based organizations
10. Labor organizations
11. Philanthropic organizations
12. Worker centers and workforce development entities
13. Other regional interest holders capable of contributing to the success of the project.

Members can opt into a public Partner Directory which is updated and shared monthly through RRRISE's various newsletters and is publicly available on RRRISE's website.

Attributes of Collaborative Partners

Following its official launch in February 2023, the RRRISE Convening Team administered the first of two surveys (open until August 2023). The 93 respondents who participated in the first survey represents the initiative's core support in Year One. Sixty-eight percent (68%) of respondents in that initial survey indicated that their work was directly related to economic development. Forty-five percent (45%) of all respondents identified as a community member as opposed to a representative of an organization.

When asked why they were interested in participating in RRRISE, most respondents (71%) cited "concern about economic development, business opportunities, and the future of the region." Sixty-eight percent (68%) indicated that their work was directly related to economic development. A majority (60%) described themselves as "concerned about equity," and 52% reported that they were "concerned about the environment." About half of all respondents expressed interest in playing an active role in the Collaborative, and Figure 2.1 lists the specific types of roles. Another 30% offered to provide input if asked or other types of support during the Collaborative's launch.

Figure 2.1 Desired Role in Collaborative (First Partner Survey Results)

Type of Participation	Percentage
Help the group fairly identify projects/initiatives for funding	57%
Help make sure the process is aligned with existing plans/initiatives	47%
Help reach out to communities and groups often overlooked in planning	47%
Help make sure plans/projects are beneficial to the environment	36%
Help make sure plans/projects are beneficial to workers	35%
Help the Collaborative function as a group	30%
Help with data collection and analysis	23%

N = 88 for all percentages

The initiative's membership is representative considering the populations of each sub region. Continuous emphasis on outreach is necessary, however, particularly in the two smaller counties of Lake and Del Norte, to ensure them an equal voice within the Collaborative (see Figures 2.2 and 2.3). Nonetheless, Humboldt County contains far more organizations in each of the partner categories than do Lake and Del Norte, and harnessing the much-needed people power of these organizations while ensuring equity for smaller counties and Tribal communities constitutes an ongoing challenge.

Figure 2.2 Regional balance of RRRISE Partners (11/2023)

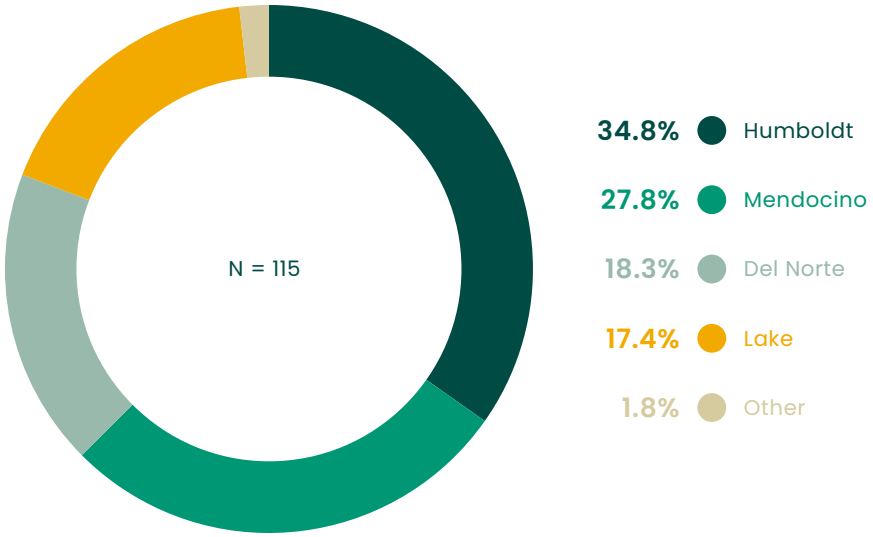
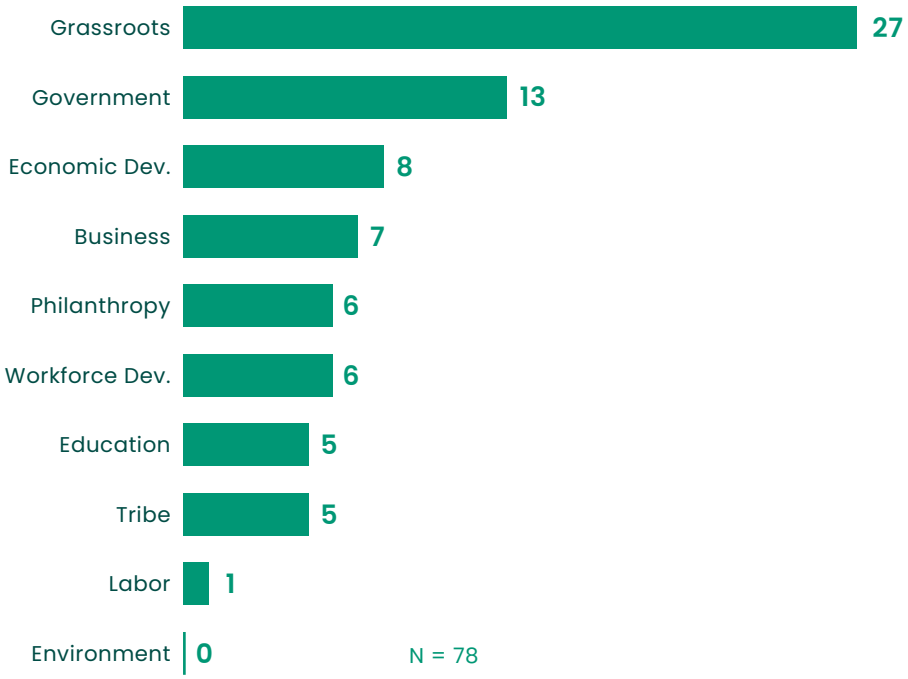
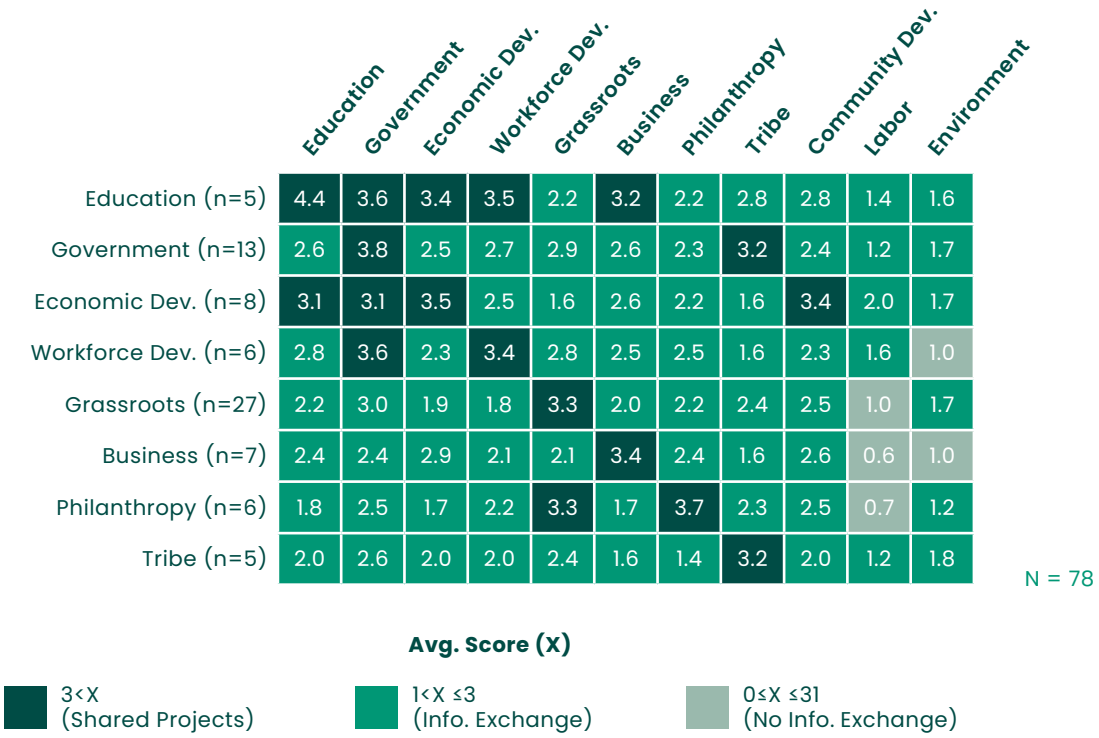


Figure 2.3 Sectoral Balance of RISE Partners (11/2023)



Launched in September of 2023 and garnering 124 responses, a second survey focused specifically on the existing partnerships in the region and the capacity of partners to engage in RRRISE and regional economic development efforts. Figure 2.4 shows the level of cross-sector activity and connectedness amongst the region's organization types. Those in government, workforce development, education, and economic development had high reported levels of partnering activity.

Figure 2.4 Strength of Connections Among Organizational Types



As Figures 2.5 and 2.6 show, many survey respondents in the second survey represented small organizations. While one-quarter of these respondents stated that they did not know their organization's annual operating budget, nearly a third (31.6 %) reported their organization's annual budget as less than $500,000. More than half (57%) of respondents worked in organizations with 10 or fewer staff, and nearly three-quarters (73%) in organizations with 25 or fewer staff.

Figure 2.5 Annual Budget of Organizations

	Percentage (%)	Frequency (n)
$0 - $100,000	14	10
$100,000 - $500,000	18	14
$500,000 - $2 million	18	14
$2 million - $5 million	9	7
$5 million - $10 million	4	3
Over $10 million	12	9
Respondent unsure	25	19

N = 76

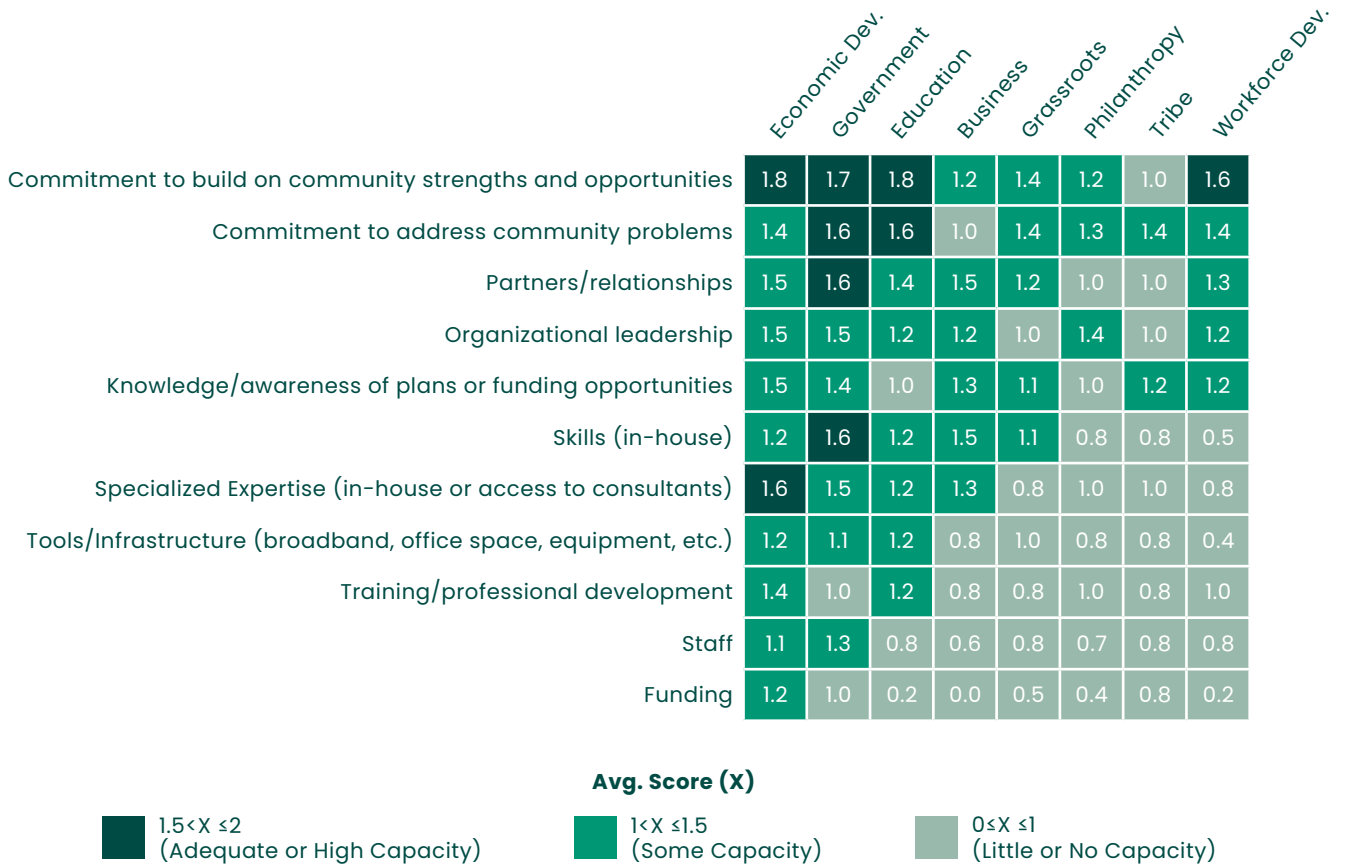
Figure 2.6 Employed Full Time Staff

	Percentage (%)	Frequency (n)
0 - 5 staff members	42	32
6 - 10 staff members	16	12
11 - 25 staff members	16	12
26 - 100 staff members	13	10
More than 100 staff members	13	11

N = 77

Consistent with findings from the listening campaign, organizations involved with RRRISE report struggling with capacity to participate in economic planning initiatives, among other challenges. Training, staffing, and funding are the primary obstacles to full involvement in such initiatives.

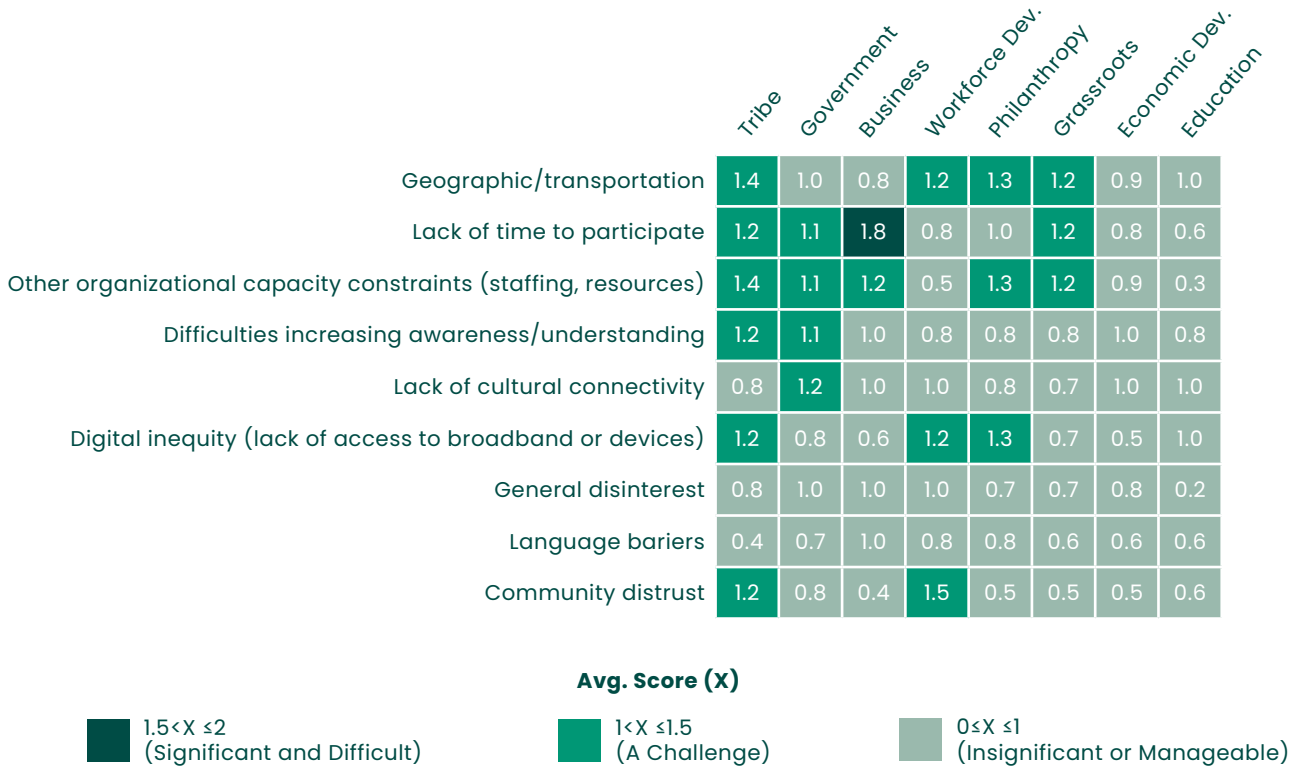
Figure 2.7 Capacity of Partner Organizations



N = 78. Scoring is based on the average score based on the following point system: Little or No Capacity = 0 points; Some Capacity = 1 point; and Adequate or High Capacity = 2 points.

Unsurprisingly, respondents cited lack of time and capacity as the largest barriers for organizations to take part in such efforts as RISE and local economic planning, tribes and Government organizations both reported experiencing the highest numbers of barriers (see Figure 2.8).

Figure 2.8 Barriers Experienced by Partner Organizations



N = 78. Scoring based on the average score based on the following point system: Insignificant or Manageable = 0 points; A Challenge (but manageable) = 1 point; Significant and Difficult = 2 points.

In summary, the results of the surveys and also the listening sessions indicate that partners see high value in regional cooperation and efforts to break down silos but view low capacity and other resource constraints as limiting their participation in these.

Overview of Outreach and Engagement Efforts

RISE's Outreach and Engagement Team, comprised of North Coast Opportunities (a community action agency based in Mendocino) and True North Organizing Network (a community organizing group based in Del Norte and Humboldt) used a variety of methods to identify and build relationships with interest holders in the required partner categories, priority populations, and the public at large (see Figure 2.9).

Figure 2.9 Outreach and Engagement Strategies

In addition to the two surveys, RRRISE's listening campaign was its primary method of identifying partners, hearing their concerns, connecting them to roles in the Collaborative, and identifying the barriers, workforce and other, and the opportunities facing disinvested communities. These are shown in Figure 2.10 below.

Figure 2.10 Redwood Region RISE Planning Phase: Breakdown of Outreach and Engagement Activities

Outreach/Engagement Activity	Interest Holder Representatives	Level of Engagement to Date *(please note that some groups are represented in multiple categories)*
Listening Sessions	Business/Workforce Agencies, CBOs, Economic Development Agencies, Environmental Justice Organizations, Government Agencies, Labor, Workforce partners, Tribal Nations.	144
	Priority Communities	355
	Total Listening Sessions:	499

Outreach/Engagement Activity	Interest Holder Representatives	Level of Engagement to Date *(please note that some groups are represented in multiple categories)*
Surveys	1 - Initiative Launch Survey	93
	2 - Partner Mapping Survey	124
Data Walks (virtual)	Collaborative, public at large	11 virtual Data Walks 1,102 total attendance
Pop-Up Data Walks (in-person)	Priority Communities in Tribal Lands and Humboldt, Lake, and Mendocino Counties; public at large	12 pop-up Data Walks 250 total attendance
Collaborative Meetings	All Collaborative Meetings	14 meetings (including 2 in-person gatherings) 1,448 total attendance
	Equity Council Meetings	11 meetings 139 total attendance
	Tribal Planning Table Meetings in Tribal Lands and Del Norte, Humboldt, Lake, and Mendocino Counties	5 meetings, 1 webinar 62 total attendance
	Local Table Meetings/Webinars in Tribal Lands and Del Norte, Humboldt, Lake, and Mendocino Counties; public at large	25 meetings/webinars 296 total attendance
	Sector Planning Tables	21 meetings 343 total attendance
	Voting Member Block	All Collaborative meetings + 2 working sessions Total attendance in working sessions: 67
	Economic Development Finance Working Group	7 meetings/webinars 146 total attendance
Community Events	Priority Communities, Community-based Organizations, Grassroots Organizations in Tribal Lands and Del Norte, Humboldt, Lake, and Mendocino Counties; public at large	30 events 600 total attendance

**Total attendance= duplicated counts of participants.*

In order to better reach priority communities, amplify their voices, and secure their participation in the Collaborative, the outreach and engagement team recruited CBOs to administer listening sessions. Tribes received grants to support their participation in RISE (see Figure 2.11)

Figure 2.11 Tribal Recipients of Grants for RISE Participation

Themes from these sessions with priority communities emphasized the need for stable employment, challenges with transportation and childcare and general cost of living in the region. A summary of these findings is published in a separate report, the RRRISE Community Insights Report.

Environmental Scan: Organizations and Assets Serving Economic and Community Development Interests

This section provides a brief characterization of each partner group's presence in the region and its current level of engagement with the project based on RRRISE's database of organizations and businesses and listening-session findings. Figure 2.12 below shows the number of existing entities within each of the key partner categories, their engagement via digital communication, and their level of involvement in Redwood Region RISE's Collaborative.

Figure 2.12 Redwood Region RISE: Existing Entities and Engagement to Date

Partner Category	Number of existing entities	Collaborative Participation
California Native American Tribes	33 Federally and non-federally recognized Tribal Nations have been identified.	Eight Tribes serve as voting members at the time of writing. Thirteen Tribal Nations engage with and serve on our Tribal Planning Table, and two are actively engaged on our Equity Council.
Community Leaders and Members	323,952 residents	Approx. 600 community members and leaders have engaged with Redwood Region RISE's efforts through 30 community events. A cumulative number of 1,448 residents participated in at least one Collaborative meeting, 296 attended local (county-level) meetings, and 250 community members and leaders participated in pop-up Data Walks.
Disinvested ("Priority") Communities	The Collaborative has identified these priority communities.[21]	27 members of the Equity Council represent priority communities and four seats on the Voting Member Block.
Economic Development Districts (EDDs) and Economic Development Agencies (EDAs)	One EDD (SMEDD, in Mendocino). One EDA in each county, one Tribal EDA identified. Two additional CDFIs play significant roles.	One CDFI (AEDC) serves as RISE's Fiscal Agent. The other organizations—RREDC, EDFC, Lake EDC, Del Norte Economic Development Corp.—are all voting members.
Education and Training Providers	Three Community Colleges(Mendocino, College of the Redwoods) and one four-year college (Cal Poly Humboldt).	Mendocino Community College (MCC), College of the Redwoods (CR), and Cal Poly Humboldt (CPH) have seats on the Voting Block.
Employers, Businesses, and Business Associations	19 Chambers of Commerce active in the region, two SBDCs, numerous trade associations.	Five Small Business Association-funded partners are seated on the RRRISE Voting Member Block. Three other business organizations have signed partnership agreement letters and are actively engaged as advisors and outreach partners.
Environmental Justice Organizations	No organizations identify as explicitly environmental justice oriented. However, two—EPIC and Northcoast Environmental Center—frequently serve in that capacity.	The Grassroots Institute and Tribal EcoRestoration Alliance (TERA) both serve on the Voting Block. Both EPIC and Northcoast Environmental Center have signed partnership letters. Climate Action Mendocino serves on the Renewable and Resilient Energy table.
Government Agencies	Two councils of governments, two county economic development leads involved, representatives from 14 incorporated municipalities and other county level staff also participate.	Four government agencies serve as voting members, and several sit on (or lead) Sector Planning Tables.
Grassroots and Community-based Organizations	Unknown	Sixteen community-based organizations received mini grants to conduct proposed outreach activities to further engage priority communities especially difficult to reach in the region. Four designated seats for CBOs are filled on the Voting Block, and others also represent priority communities there.

[21] [REF]

Partner Category	Number of existing entities	Collaborative Participation
Labor Organizations	The three key labor organizations in the economic development space in the region are: LiUNA, Machine Operators 3, and the North Bay Labor Council.	All three federated labor organizations have signed partnership agreements with Redwood Region RISE, LiUNA is a voting member.
Philanthropic Organizations	Two: Humboldt Area Foundation/ Wild Rivers Community Foundation; Community Foundation of Mendocino	Both HAF+WRCF and the Community Foundation of Mendocino (CFM) are voting members.
Worker Centers and Workforce Development Entities	The Region has three workforce development boards: NoRTEC, HCWDB, and WANB.	All three entities are voting members. Three corresponding worker centers (SMART, the Job Market, and CareerPoint) have participated in Collaborative discussions.

1 California Native American Tribes

The Redwood Region's 33 Federally and non-federally recognized Tribes are leaders on economic development, investment, and innovation within the region, particularly with respect to creating opportunities for disinvested communities in natural-resource management, green industries, renewable energy, and housing and in the arts, culture, and tourism sectors. All are invited to become voting members of the Collaborative. At the time of writing, eight nations are voting members of RRRISE,[22] and thirteen are involved with the Collaborative's Tribal Planning Table and Sector Tables. Additionally, NCO released a Tribal Engagement Grant Opportunity that offered up to $28,000 to the region's Tribal governments to enable their participation in the California Jobs First Planning Phase. Five Tribal Governments received a total of $140,000 in these grants.

Economic development capacity and the strategies available to Tribes are highly dependent on their specific histories of land struggles and long-fought battles for sovereignty and recognition. For instance, the inability to collateralize Tribally held land is a frequent barrier to accessing conventional financing, one of the many barriers Tribes contend with. Landless Tribes have also had to work creatively to create economic development initiatives, one example being the energy sovereignty program currently under development by the Scotts Valley Band of Pomo Indians. Cultural resurgence movements have helped federally unrecognized Tribes like the Wailaki establish themselves as key interest holders in, for example, expanding the use of beneficial cultural burning practices for forest management in southern Humboldt and Northern Mendocino Counties.

Tribal planning stresses the intersection of traditional knowledge and cultural values with meeting the needs of Tribal residents/relatives and landscapes and with adapting and responding to the climate crisis. Tribal plans therefore incorporate threats to traditional foods, livelihoods, and important cultural practices and the need to protect fish, game, wild and cultivated crops, and the landscapes that nurture them (see, for example, Hoopa Valley Tribe CEDS). Commonly held goals therefore include updating critical infrastructure (particularly for water); expanding clean energy programs; stabilizing and

[22] Bear River Band of the Rohnerville Rancheria, Blue Lake Rancheria, Elk Valley Rancheria, Hoopa Valley Tribe, Middletown Rancheria of the Pomo Indians, Round Valley Tribes, and Yurok Tribe.

expanding key services, including assistance to families and housing; and protecting the Tribe's financial position. Plans also highlight workforce development and Tribes' priority sectors. For example, tourism development is a strong area of investment for the Yurok Tribe.

2 Community Members, The Public at Large

RRRISE has, from its inception, prioritized broad-based participation, including community members and investing in informing the general public as its efforts evolved. From February 2023-May 2024, over 1,000 community members signed up to receive RRRISE newsletters, which have an average open rate and click rates of 57% and 15%, respectively. The Spanish language newsletters have an open rate of 90% and a click rate of 6.5%. In February 2023-May 2024, over 2,350 unique visitors visited the RRRISE homepage to obtain information and identify resources. Between its launch in March 2024 and May 2024, RRRISE's Spanish language homepage was visited 104 times, with an average engagement time of 5 minutes and 36 seconds.

3 Disinvested ("Priority") Communities

In January 2024, RISE announced the Community-based Organization (CBO) Outreach Mini Grant Opportunity, which offers up to $10,000 to CBOs in the Redwood Region to support outreach activities. The Equity Council selected 16 CBOs to engage members of priority communities including those of communities of color, Tribal citizens, individuals with disabilities, monolingual Spanish and Hmong speakers, unhoused individuals, and youth. The True North Organizing Network focused its outreach efforts on Hmong, Latinx and monolingual Spanish-speaking, youth, and LGBTQIA2S+ community leaders. In the time period January 2024-May 2024, the focus of outreach and engagement activities throughout the region was identification of communities' local priorities, which were then used to inform SWOT analyses.

4 Economic Development Districts (EDDs) and Economic Development Agencies

Community Development Finance Institutions (CDFIs) active in the region are the Redwood Region Economic Development Commission (RREDC), which serves Del Norte and Humboldt; the Arcata Economic Development Corporation (AEDC), which is RRRISE's fiscal agent; Lake EDC; and the Mendocino-based EDFC.

Mendocino and Sonoma Counties formed the Sonoma Mendocino Economic Development District (SMEDD), the only EDD district in the region, which prepares a CEDS document for the two-county district. Interest holders from SMEDD sit on the Equity Council and also assist in administering the Economic Development Finance Working Group.[23]

[23] The Economic Development Finance (EDF) Working Group is embarking on an education- and capacity-building process aimed at empowering its participants by: 1) enhancing their existing expertise in EDF and 2) equipping them with the tools to more effectively pursue state and federal funds, philanthropy, and other sources of revenue so as to increase project viability. The EDF Working Group's main deliverables include: 1) assessment of existing levels of use of EDF tools within the region; 2) development of a partner engagement and training plan; 3) creation of a regional EDF database and funding matrix; and 4) development of a cross-sector capital analysis plan to further enhance the integration and utilization of EDF tools within the region. The EDF Working Group has two phases, with Phase 1 running from January to June 2024 and Phase 2 from July to December 2024.

5 Education and Training Providers

The Redwood Region has three community colleges and one campus of the California State University system: Mendocino Community College (MCC, serving Mendocino and Lake Counties), College of the Redwoods (CR, serving Humboldt and Del Norte counties), and Cal Poly Humboldt. A voting member, MCC is actively involved in RRRISE. CR and Cal Poly Humboldt are actively engaged with each other and with RRRISE. The Regional Convener, the California Center for Rural Policy (CCRP), is a part of the Cal Poly Humboldt campus.

6 Employers, Businesses, and Business Associations

Small Business Association-funded partners represented on RRRISE's Voting Member Block (representing the needs of small businesses and entrepreneurs within the region) include: North Coast SBDC (serving Del Norte and Humboldt), West Business Development Center, and Lake County Economic Development Corporation. A total of 19 chambers of commerce are active in the region, two of which, those of Del Norte and Lake County, serve on the Voting Member Block. In addition, advocates from the Small Business Majority, the Eureka Chamber Foundation, and Rotary District 5130 have signed partnership agreement letters and are actively engaged as advisors and in reaching out to businesses.

Major employers engaged with RRRISE include, among others, representatives from clinics and hospitals in the Health and Caregiving sector, and Tribal Nations, who participate in multiple target sectors. Private firms involved in offshore wind development and energy generation have been engaged via the Renewable and Resilient Energy table. The sector most represented amongst businesses engaged is the Working Lands and Blue Economy Table, to which 38 businesses actively contribute and which represents dairy and livestock farms, major timber producers, family fishing operations, and others.

Outreach and engagement efforts with local chambers of commerce and Rotary Clubs have helped expand the reach of the initiative in the local business community. In total, 10 businesses are receiving communications or are involved in some way with the Collaborative. The convening team distributed succinct outreach materials tailored to businesses and employers that included a QR code to a short online survey aimed at better understanding their needs as employers and identifying how RRRISE could prioritize those needs in its planning processes. As noted in Chapter 3, the vast majority of business activity in the region is driven by small and micro businesses and self-employment. However, since active engagement in long-term visioning and planning processes is typically not compatible with the schedules of busy entrepreneurs, the initiative relies on partnerships with business advocates and outreach events to engage them.

Other notable characteristics of the region's business environment include limited foreign direct investment when compared to that of the state overall (GO-Biz 2023), particularly for greenfield investments. Exceptions include activities in the Port of Humboldt Bay, which will host the forthcoming Nordic Aquafarms project (still in the permitting stage, which is expected to be completed in 2024) and which has courted foreign and multinational companies interested in developing a land base for offshore wind industry activities. Also located in the Arcata Bottom near Humboldt Bay, Sun Valley Floral Farms is one of the region's major employers. At the time of writing, this anchor institution is at risk of closure.

7 Environmental Justice Organizations

"What is Environmental Justice?" Collaborative members frequently ask. According to the EPA:

Environmental justice means the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment so that people:

> *are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and*

> *have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices.*

Whereas this term appears to have more resonance in urban areas, communities on the North Coast tend to focus on environmental issues at large, about which the region has a long and storied history (see Climate Analysis chapter). That said, several environmental organizations are involved in environmental justice work, including the Environmental Protection Information Center (EPIC) and the Northcoast Environmental Resource Center (NERC), both based in Humboldt. Both organizations have furnished partnership agreement letters to the Collaborative, and NERC serves in its Voting Block. Grassroots Institute in Mendocino and Climate Action Mendocino serve on the Voting Block and Renewable and Resilient Energy Sector Table, respectively. From Lake County, the Tribal EcoRestoration Alliance also serves as a Collaborative voting member.

8 Government Agencies

Many of the region's jurisdictions struggle to consistently fund and retain capacity for economic development planning; the primary focus of planning departments is often such daily tasks as permitting. For instance, not until 2023 did Mendocino County create its first dedicated position for an economic development manager, and many economic development activities in Del Norte County are led by the city manager's office of Crescent City. Figure 3.12 describes the major players in economic development planning in the region, their capacities and roles, and their current engagement in the RRRISE process. Among the 14 incorporated municipalities in the region, 11 have some economic development capacity.

As seen in Figure 2.12, RRRISE engages Tribal, county, municipal, and special jurisdictions and works closely with county entities and municipal staff on economic development issues within and beyond their municipal borders. For example, staff from Crescent City and the City of Fort Bragg hold leadership roles as RRRISE voting members and Sector Table Coordinators.

9 Grassroots and community-based organizations

Community-based organizations are represented in RRRISE's Voting Member Block, Sector Tables, and Equity Council and are involved locally or more peripherally through monthly check-in meetings and receipt of updates from the Collaborative. Currently, two CBO seats on the voting block belonging to organizations that declined to participate are vacant, and two seats are filled by representatives of True North Organizing Network (representing Del Norte County) and North Coast Indian Development Corporation, a regional, Tribal-serving organization, occupy two other seats.

10 Labor Organizations

The regional narratives on unionization that emerged from the listening campaign are complex. As government services are a primary sector of the economy, public sector unions are more prevalent in the region. Some of the largest public sector unions subscribing to RRRISE are the California Teachers Association (CTA); California Nurses Association (CNA); SEIU Local 1021; AFSCME Council 57 (Local 1684); the Building and Construction Trades Council along with fourteen union affiliates; and various local police, sheriff, and firefighter unions.

Organization of private sector unions is often characterized as having declined along with the decline of the logging industry. Within the region, the most prominent participants in discussions concerning large-scale projects eligible for Project Labor Agreements are federated union representatives. The three most prominent in the region's economic development are LiUNA, Machine Operators 3, and the North Bay Labor Council, and all have signed partnership agreements with Redwood Region RISE. The Collaborative is committed to strengthening labor representation in the area in the future.

11 Philanthropic Organizations

Community foundations active in the Redwood Region include (but are not limited to) HAF+WRCF, the result of the merger of the Wild Rivers Community Foundation and the Humboldt Area Foundation, and the Community Foundation of Mendocino. HAF+WRCF, which serves Del Norte, Humboldt, Siskiyou, Trinity, and parts of Curry County (Oregon), plays a key role in building capacity across the region through such initiatives as the 10-year Building Healthy Communities initiative. Funded by the California Endowment, the initiative was convened by HAF+WRCF and helped incubate a key RRRISE partner, the True North Organizing Network. The foundation's current project portfolio includes the Climate and Community Resilience (CORE) Hub (convening parties around offshore wind development and the creation of community benefits agreements), the Native Cultures Fund, and other regranting programs. In total, the merged foundation manages $106 million in assets.

The Community Foundation of Mendocino funds an array of activities related to economic development, disaster preparedness and relief, poverty alleviation, and youth development, among other areas, and manages $46 million in assets. Both HAF+WRCF and the Community Foundation of Mendocino are voting members of the Collaborative.

12 Worker Centers and Workforce Development Entities

Workforce development planning entities in the Redwood Region include: 1) the Northern Rural Training and Employment Consortium (NoRTEC), which serves Del Norte County (along with Butte, Lassen, Modoc, Nevada, Plumas, Shasta, Sierra, Siskiyou, Tehama, and Trinity Counties). NoRTEC is a special district organized under a joint powers agreement to provide workforce development services across an 11-county region; 2) the Humboldt County Workforce Development Board (HCWDB), an independent board appointed by the Humboldt County Board of Supervisors responsible for strategic planning, policy development, and oversight of the county's workforce innovation system; and 3) the Workforce Alliance of the North Bay (WANB); which serves Lake, Marin, Mendocino, and Napa Counties. WANB is a joint powers agency formed by the four counties to coordinate regional workforce development activities and administer Workforce Innovation and Opportunity Act (WIOA) funds. Regional Job Centers include: NORTEC's SMART workforce center, HCWDB's Job Market, and WANB's CareerPoint. All of these organizations have been involved in the Collaborative, particularly in conversations about regional job quality and job access.

13 Regional Initiatives

In May 2022, the California Regional K-16 Education Collaboratives Grant Program provided an $18 million grant (out of $108 million provided statewide) for the Redwood Coast K-16 Education Collaborative, convened by Cal Poly Humboldt. This program is part of a statewide strategy to enhance regional economies by strengthening education-to-career pathways and ensuring that education, vocational, and workforce programs work in partnership to provide broader access for all to educational and employment opportunities in their own communities. The Redwood Coast program seeks to develop a robust college-going culture in the region by building career pathways for education and health care, increasing participation in and completion of A-G courses, and improving retention rates in higher education, especially for Native American and socioeconomically disadvantaged students.[24]

Another regional initiative, the North Coast Resource Partnership (NCRP), covers the Redwood Coast Region and parts of key watersheds extending into surrounding counties. NCRP is a "coalition of Tribes and counties working together on integrated regional planning and project implementation to enhance working and natural lands, build infrastructure, local economies, and community health in the north coast of California." Growing from the North Coast Integrated Regional Water Management Plan (NCIRWMP) and beginning in 2004, NCRP's focus is clean drinking water, watershed health, energy independence, climate adaptation, and economic vitality, with a special emphasis on disinvested communities.[25]

[24] https://now.humboldt.edu/news/18-million-cradle-career-collaborative-north-coast; 2) https://www.gov.ca.gov/2022/05/26/california-distributes-108-6-million-to-create-regional-education-to-career-pipelines/

[25] https://northcoastresourcepartnership.org/about/

Although the California Jobs First initiative cites the High Road Training (HRT) Partnerships initiative as a priority, only a few active partnerships were recognized by Collaborative members, all in Humboldt County. During listening sessions, except for those from workforce development organizations, few understood the concept "high road". The initiative's key activities, such as industry-led workforce efforts, are present in the region but not consolidated within the framework provided by HRT Partnerships as prescribed.[26] Given that many of the region's key employment sectors are public or are thinly traded, industry-led workforce development initiatives located there may receive less emphasis compared to those in other regions of the state that host globally competitive industries. These other regions therefore often attract high levels of investment, both foreign and domestic, and have large workforce needs. As a result, industry-driven workforce development efforts may be less prevalent in the Redwood Region than in these other regions.

Overview of Current Economic Development Plans and Strategies

To further inform the analysis of existing plans, the RRRISE Convening Team invited economic development planners to participate in listening sessions, which identified challenges the planners experienced in completing, updating, and implementing CEDS and other plans. Many precipitated and/or exacerbated by the pandemic continue to negatively impact progress. These challenges include:

- A historical lack of planning with respect to infrastructure and/or the consequent impact on resources (staff, time, financial resources) characteristic of rural, remote areas.
- Reallocation of personnel and funds during and following natural disasters and the pandemic, which contributed to a lack of continuity and an inability to carry out long-term planning, which is therefore always in recovery mode.
- Staff and committee/board member turnover, leaving key positions vacant and thereby stalling progress and limiting outreach and community engagement.
- Lack of funding.
- Lack of data.
- The need to prioritize mandates to complete plans covering different topics and jurisdictional boundaries to maintain funding.
- Community resistance to planned strategies and projects, which result in project challenges, delays, and cancellations.
- Rapid shifts in the economic development landscape due to policy changes, climate impacts, and emerging new opportunities (e.g., legalization of cannabis, wildfires, storm and flooding devastation, and offshore wind).

[26] See https://cwdb.ca.gov/initiatives/high-road-training-partnerships/

More recent plans (2018 and onwards) show a sharper focus on blue-economy, green-economy, and creative-economy opportunities compared to older plans (see Figure 2.13). Emerging opportunities like offshore wind energy development and cannabis legalization are shaping new economic priorities. Climate impacts like wildfires and storms have caused climate adaptation and resilience strategies to figure more prominently in recent Tribal and regional plans. More recent plans highlight strategies for building capacity and resilience of rural and Tribal communities through direct investment in regional partners. Positively, collaborations seem to be increasing over time; e.g., counties are working together on trial projects and other regional initiatives.

Figure 2.13 Redwood Region Strategic Economic Development Plans (2014-2023)

Document Type	Plan Title	Approximate Date Produced
Comprehensive Economic Development Strategies (CEDS)	County of Del Norte	2019
	Crescent City Economic Development Strategic Action Plan	2021
	Humboldt County CEDS	2018-2023
	Lake County CEDS	2016
	Mendocino and Sonoma Counties CEDS	2022
	MOVE2030: Community plan	March 2021
	MOVE2030: Economic Resiliency plan	March 2021
Tribal CEDS	Blue Lake Rancheria CEDS	2019
	Hoopa Valley Tribe	2016-2020
	Karuk Tribe Comprehensive Economic Development Strategy	2021
	Wiyot Tribe Strategic Plan 2020-2024	2019
	Yurok CEDS	2017
Transportation Plans	Caltrans District 1	2021
	Del Norte Regional Transportation Plan	2020
	GHD-County of Humboldt, Planning Department	2021
	Humboldt County Transit Development Plan (2023-2028)	2023
	Lake County Regional Transportation plan/Active Transportation Plan	2022
	Lake County Transit Development Plan - 2023 Update	2023
	Mendocino County Transit Development Plan	2022

Document Type	Plan Title	Approximate Date Produced
Climate Strategy Documents	Blue Lake Rancheria Climate Adaptation Plan	2023
	Hoopa Valley Tribe Strategic Energy Plan	2016
	Humboldt Regional Climate Action Plan	2021 (draft)
	Karuk Climate Adaptation Plan	2019
	Yurok Tribe Climate Change Adaptation Plan	2014
Workforce Development Reports	Del Norte County Labor Market Profile and Industry Sector Analysis	2019
	Lake County Labor Market Analysis & Strategy	2023
	Mendocino County Labor Market Analysis & Strategy	2023

County CEDS documents reviewed for this study offer a snapshot of current economic development priorities. As Figure 2.14 shows, RRRISE counties share a focus on industries with deep, historical roots across the region, including arts and culture, tourism, agriculture, forestry, fishing, and manufacturing. Recent updates to plans sharpen their focus on these traditional areas of industry under the banners of Blue, Green, and Creative economies. Counties also share a focus on education, research and development, and small business innovation and entrepreneurship. Climate adaptation plans were identified for four Tribes in the northern part of the region, and 10 Tribes from the southern half of the region participated in a listening session with the CalEPA Office of Environmental Hazard Assessment on climate impacts and priorities for their cultures which were also reviewed.

Figure 2.14 Redwood Region Industries in County Plans (2018-2025)

Industries in County Plans			
Del Norte CEDS 2019-2024	Humboldt CEDS 2018-2023	Lake EDS 2019-2025	Mendocino CEDS 2022-2025
♦ Transportation, Technology, Tourism ♦ Agriculture, including Forestry and Fishing ♦ Manufacturing, Medicine ♦ Education, Environment ♦ Small Business and Sovereign Nation (DNATL) Success	♦ Tourism/Arts, Culture ♦ Alternative Agriculture / Forest Products ♦ Specialty Food, Flowers & Beverages ♦ Niche Manufacturing ♦ Diversified Health Care ♦ Construction ♦ Investment Support Services ♦ Management & Innovation Services	♦ Tourism ♦ Agricultural Supply Chain ♦ University & Research Institution Science ♦ Advanced Entrepreneurs: Engineering, Aerospace, Graphic Design/ Arts	♦ Tourism, Arts ♦ Creatives (tech) ♦ Green Economy: specialty food and beverage, biomass, water storage ♦ Blue Economy: ocean-related fisheries and food production

In summary, there is a high degree of alignment across plans and strategies in the region. Tribes and counties' goals speak to expanding and growing business opportunities, jobs, and development projects in the blue economy, green economy, tourism, and renewable energy sectors. All plans emphasize support for small businesses and entrepreneurs. Plans recently completed in Del Norte and Mendocino Counties also focus on building the capacity and resilience of rural and Tribal communities, through investments in broadband and transportation in particular. While core industries continue to be important, economic priorities are also evolving to adapt to emerging opportunities and challenges, and recurring themes of these priorities are overcoming capacity constraints through collaboration and strategic investment.

Projects

Some projects in the CEDS and other plans are no longer current or are not described in sufficient detail to support meaningful comparisons/analysis. During the proposal development phase (July 2022) and through the first partner survey (March-April 2023), the RRRISE Convening Team invited partners to share important and promising projects. Listening sessions and local planning table meetings have also involved discussion of projects.

Recognizing that an analysis of existing plans would be unlikely to generate actionable information and responding to RRRISE partners' eagerness to learn about projects across the region, CCRP launched an online form to create an inventory of projects ranging in maturity from early-stage ideas to those close to or ready for implementation. The intent was to capture and share information that could help seed partnerships and to begin categorization of projects for regional consideration. During the November 28, 2023, meeting, CCRP gathered input from the RRRISE Collaborative to improve the online form, and the project inventory began sharing information in January 2024. RRRISE Sector Tables are in place to catalyze partnerships, develop regional strategies, and propose regional projects.

A comparison of counties' CEDS shows strong alignment across goals and strategies. Plans embrace new and emerging industry areas. Some counties are collaborating on trails and recreation projects, and all four are currently participating in the recently awarded K-16 Education Collaborative focused on education and health career pathways. Plans cite critical infrastructure and talent needs as areas for economic development. Proposed projects are scaled and tailored to local areas, and budgets and significant policy and funding challenges hamper implementation of plans and projects.

Chapter 3

Economic Analysis

This chapter delves into the region's economic well-being, cost of living, and industry composition. It prioritizes findings related to equity, sustainability, job quality and access, and economic competitiveness and resilience, and its focus is on macroeconomic conditions, broad trends, and the impacts of these trends on communities. Additional, in-depth information on key industries and the workforce can be found in the Industry Cluster and Labor Analysis chapters, respectively.

Key Takeaways

- The Redwood Region has suffered from California's differential development, and opportunities for high road development have stalled there as Bay Area economies have taken off. Over the past decade, GDP growth has been comparatively low. Median income across the region is low, and poverty rates are significantly higher than in the state at large.
- Working families in the region suffer a "coastal cost of living with rural America wages." Cost of living as a proportion of wages is significantly higher than in the rest of the state.
- In particular, this uneven development burdens the region's residents of color, who are disproportionately represented amongst the working poor and who experience poverty rates up to double those of their peer residents of color in the rest of California.

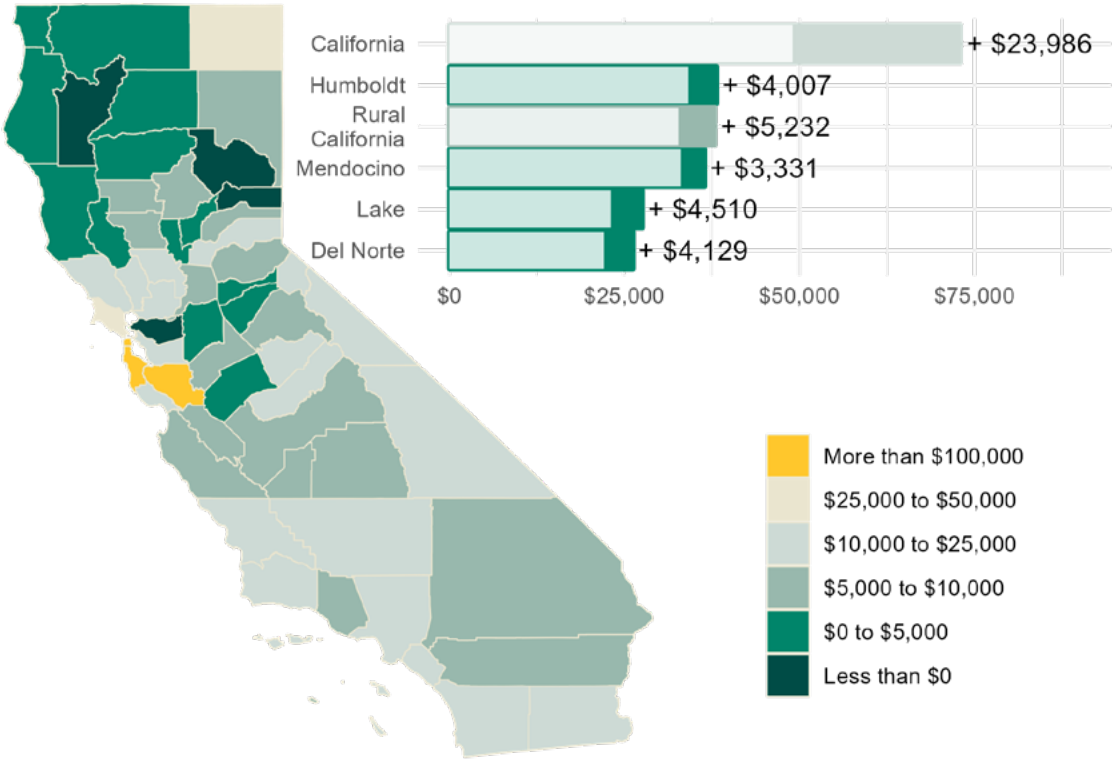
Key Metrics

- **Median income, poverty rates, and GDP per capita as indicators of overall well-being:** Tracking these metrics allows assessment of the region's economic health and identification of disparities among different communities. Monitoring these changes over time can enable progress towards inclusive growth.
- **Percentage of total employment by industry as an indicator of diversification:** Analysis of employment distribution across sectors can help gauge the region's economic diversity and resilience.
- **Ratio of income to expenses for a family with two median earners and two children (i.e., the "Medians"):** Examining the proportion of income spent on essential expenses allows assessment of the financial strain experienced by typical working families in the region.
- **Housing affordability and availability:** Monitoring housing costs, vacancy rates, and the supply of affordable housing allows identification of barriers to economic stability and growth.

Economic Well-Being and Cost of Living

Much of California's rural and northernmost counties have had an economic trajectory wholly distinct from that of the rest of the state. Since 2001, statewide economic output per capita[27] has increased by an average of $23,986 in inflation-adjusted terms (see Figure 3.1). Much of this growth is concentrated in three Bay Area counties—San Francisco, San Mateo, and Santa Clara—each of which has experienced a doubling of economic output in the past two decades, far exceeding the growth experienced by any other California county. Statewide, output in counties other than these three increased by $19,307 on average, indicating that strong economic growth was also widespread across the state during the 2001-2021 period. California's most rural counties,[28] on the other hand, have experienced much slower growth on average, increasing by just $5,232 since 2001. Among these, the Redwood Region experienced growth on par with other rural California counties, ranging from an increase of $4,510 in Lake to $3,331 in Mendocino. On average, per capita output in the Redwood Region was 62% of the statewide average in 2001 and is now 47% of the statewide average, indicating that the region has fallen even further behind.

Figure 3.1 Change in Economic Output Measured by Real Gross Domestic Product (GDP) per Capita (2001-2021)

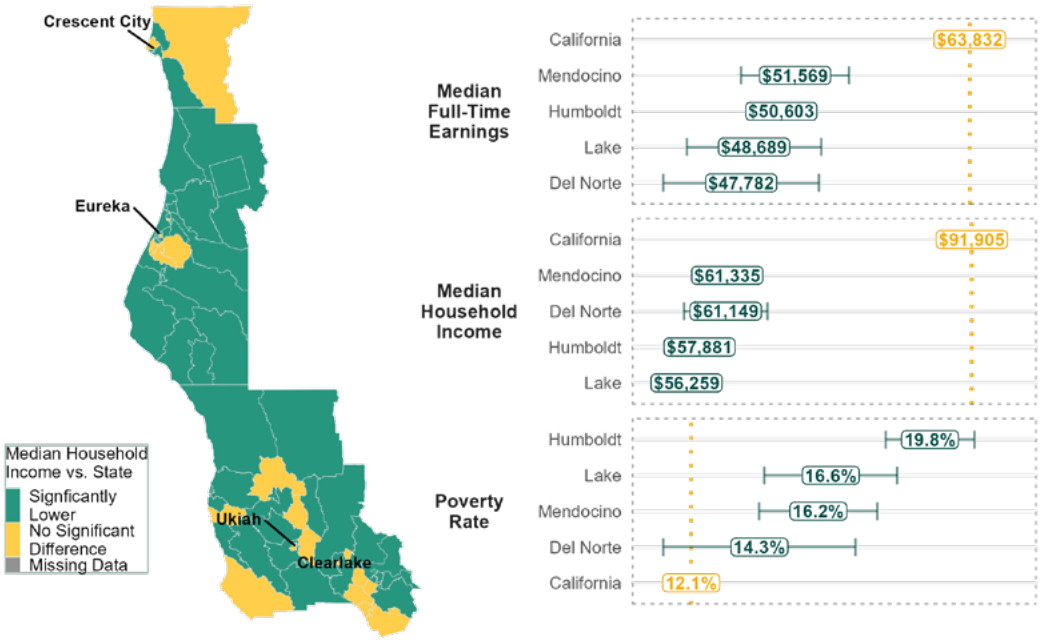


Note. GDP data sourced from the Bureau of Economic Analysis. Population estimates for 2001 and 2021 were sourced from the California Department of Finance, Table E-2.

[27] Economic output is the total market value of all goods and services produced in a region during a period of time.

[28] These counties are defined with an Index of Relative Rurality (IRR) greater than 0.5. This includes the four Redwood Region counties and 14 other counties.

Figure 3.2 Indicators of Economic Well-being (2018-2022)



Note. Data sourced from the American Community Survey.

Economic Well-Being

As shown in Figures 3.2 & 3.3, the Redwood Region's median full-time earnings and household income are lower than in the rest of the state, and its poverty rate higher. The region's overall relatively poorer economic well-being can be attributed to several factors. The region's economy is more reliant on such industries as tourism, agriculture, and forestry, which typically offer lower-wage jobs compared to sectors like technology, healthcare, or professional services that are more prevalent in other parts of the state (see the Industry Cluster Analysis). In addition, the Redwood Region has relatively few large employers or corporations that typically offer higher salaries and more comprehensive benefits packages (see Figure 3.12).

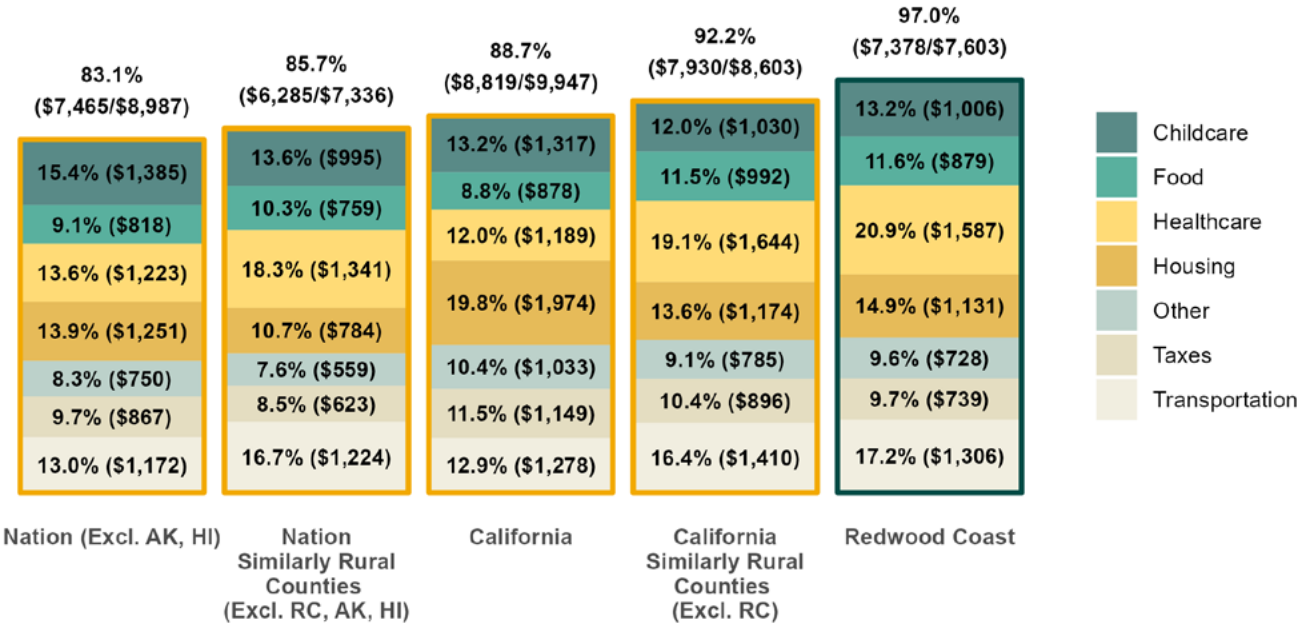
Cost of Living

Compared to the other counties throughout California, those that make up the Redwood Region are, on average, more expensive places to live.[29] Thus, whereas the region's household earnings are typical of those in similar rural areas throughout the United States, the cost of living is substantially higher. The figure below shows the ratio of estimated household expenditures to income for a hypothetical family of two full-time working adults[30] and two children. In the Redwood Region, this hypothetical family—the "Medians"—has a monthly income of $7,603 and total estimated expenses of $7,378, 97.0% of their income. This leaves the Medians with very little income for wealth accumulation or unexpected expenses. Compared to similar families in other rural areas of the country, the Medians spend a much more substantial proportion of their income on food, healthcare, housing, taxes, and transportation. If the Medians were to move to a typical United States county with a level of rurality similar to that of the Redwood Region (see "Nation Similarly Rural Counties" in the figure), their income would fall slightly from $7,603 to $7,336, but their estimated cost of living would decline substantially, from $7,378 to $6,285.

[29] The Redwood Coast has a cost-of-living index (COLI) of 129. This is calculated by measuring the consumer expenditure amounts for six major categories: grocery items, housing, utilities, transportation, health care, and miscellaneous goods and services. This measure provides a baseline for understanding to what extent regional costs are related to those of other regions and of the nation as a whole. A cost-of-living index above 100 indicates that living in that region is relatively more expensive than elsewhere, whereas a COLA at or below the baseline of 100 indicates a lower cost of living there.

[30] Total household income assumes two median full-time incomes and no other cash or in-kind income.

Figure 3.3 Monthly Cost of Living for a Family of Two Full-Time Working Adults and Two Children as a Ratio of Labor Income (2017-2021)



Note. Data sourced from the Economic Policy Institute's Family Budget Calculator, the American Community Survey, and the Index of Relative Rurality (IRR). See footnote for the methodology used.[31]

"People that I grew up with are trying to find a cheaper place to live ."

Housing Availability and Affordability

Housing costs in the Redwood Region are lower than the statewide averages but substantially higher than for similar rural areas nationwide. Moreover, because of the region's lower wages and income, affordability is substantially worse compared to that of similar rural regions. Moreover, a related indicator below suggests that some segments of the population may be more severely impacted by affordability than others. Statewide, 44.8% of renters spend more than 35% of their household income on housing expenses, while regional figures (i.e., in Humboldt) reach 54.0%.[32]

In addition, both the quantity and quality of the available housing are problematic. As shown in Figure 3.4 on the next page, rental vacancy rates are lower than the statewide average, indicating far more competition for renters. Much of the region's housing supply is older and in need of repair.

[31] The Index of Relative Rurality (IRR) ranks all counties in the United States from 0 (most least rural) to 1 (most rural). Rural comparison regions "Nation Similarly Rural Counties" and "California Similarly Rural Counties" include counties in the nation or state that have an IRR that is at least as high as the lowest IRR and no higher than the maximum IRR in the Redwood Region. Regional averages were calculated as a population-weighted average of the county-level data using American Community Survey's (ACS) five year estimates (2017 - 2021). Median full-time earnings sourced from ACS five year estimates. Rurality measured by the Index of Relative Rurality (IRR). "California 0.5 ≤ IRR ≤ 0.53" includes Amador, Calaveras, Glenn, San Benito, Tehama, and Tuolumne counties. Five counties were not included in the national estimates due to missing data. "Other" is short for "Other Necessities."

[32] Humboldt's figure is likely distorted by the presence of Cal Poly Humboldt's student population.

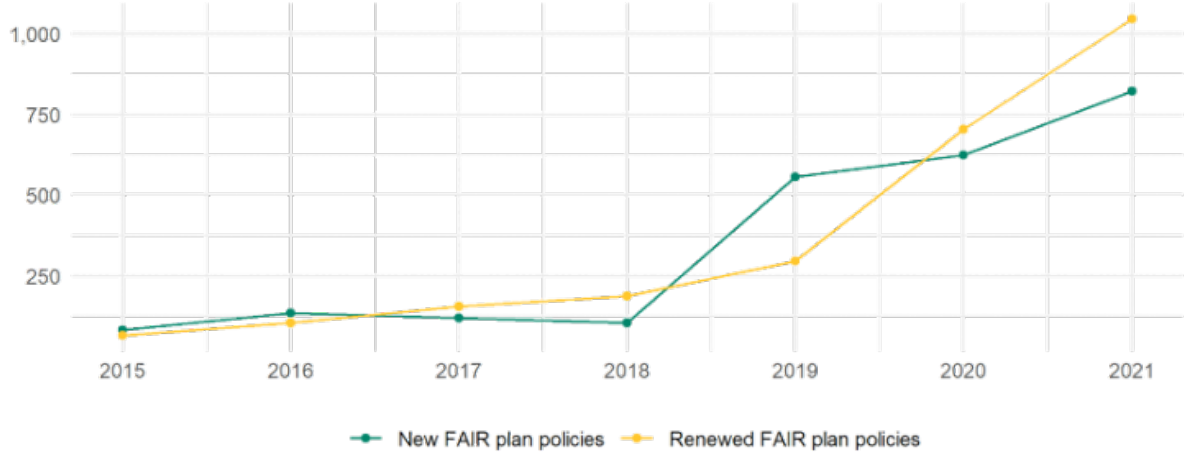
Figure 3.4 Regional Housing Data

County name	Median House Value	Housing Units	Occupied Housing Units	% Occupied Housing Units	Home Owner Vacancy Rate	Vacant Housing Units	% Vacant Housing Units	Median Monthly Rent	Rental Vacancy Rate
Del Norte	S237,700	11,093	9,531	85.9%	1.5%	1,562	14.I%	$999	1.1%
Humboldt	$344,800	62,137	53,729	86.5%	1.0%	8,408	13.5%	SI,079	2.9%
Lake	S260,600	34,309	26,307	76.7%	1.7%	8,002	23.3%	$1,116	2.8%
Mendocino	$417,100	41 ,276	34,183	82.8%	1.4%	7,093	17.2%	SI,176	2.3%
Region-Wide	$315,050	148,815	123,750	82.9%	1.4%	25,065	17%	$1,093	2.3%
California	$573,200	14.34 M	13.22M	92.2%	1.0%	1.11M	7.8%	$1,698	3.9%

Source: Lightcast™ (2022)

Exacerbating the housing crisis, wildfires have destroyed thousands of structures throughout the region, particularly in Lake (which lost 60% of its housing stock in the 2015/16 fire season) and Mendocino Counties and in Tribal Lands. Additional, widespread effects of these wildfires are increases in home insurance costs and availability, increasing the total housing costs of both homeowners and of renters, who will ultimately shoulder much or all of this additional cost through higher rents. Since 2018, there has been a sharp increase in the number of residents in Lake and Mendocino counties forced into higher cost, last-resort FAIR plans (see Figure 3.5).[33]

Figure 3.5 Number of New and Renewed Fair Access to Insurance Requirement (FAIR) Plan Policies in Lake County by Year



Note. Data sourced from the California Department of Insurance.

Also lacking are sufficient numbers of skilled trades workers to construct the number of housing units needed to satisfy demand or replace those lost to wildfires. However, this lack of skilled trades workers also presents an opportunity to develop high-wage jobs that meet a genuine economic need for the region. In particular, Employment Development Department (EDD) projections show carpentry to be one of the most in-demand occupations in the region through 2030.

[33] Fair Access to Insurance Requirement (FAIR) plans are state-mandated property insurance plans for individuals and businesses unable to secure insurance in the standard, voluntary market(Fair Access to Insurance Requirements [FAIR] Plans, n.d.).

There are limited sites available in the region suitable for housing development, a statewide challenge. In 2019, Governor Newsom took several actions to make state and local public lands available for affordable housing development, including the following:

- Making Executive Order N-06-19 making excess state land available for affordable housing .
- Connecting affordable-housing developers to local surplus land and strengthening enforcement of the Surplus Lands Act (AB 1486, Ting, 2019).
- Requiring cities and counties to inventory and report surplus and excess local public lands for inclusion in a statewide inventory (AB 1255, Robert Rivas, 2019).[34]

Only two counties in the region have sites identified in the inventory—Humboldt County (14 sites) and Lake County (27 sites). The current status of housing development on these sites is unknown.

Digital Access and Broadband Development

Compared to the rest of California, significantly more households in the Redwood Region lack internet access in the home (see Figure 3.6). In some communities, particularly those in the most remote areas of the region, about one-third of households lack access to home internet. Across the U.S., only 65% of Tribal populations have broadband access compared to 98 percent (both Tribal and non-Tribal populations) in urban areas (UCLA, 2022). Broadband services can be critical to the health, well-being, and economic development of communities, and so a lack of equitable access presents a serious human rights issue. Of particular importance for all communities in the Redwood Region is access to telehealth services, a much more time- and cost-effective way for people living in remote areas to consult a healthcare professional, especially in non-emergent circumstances.

Broadband is a necessary infrastructure component for the region's regions to utilize telehealth and capitalize on other emerging opportunities to build health and wealth. Figure 3.6 below displays the region's broadband access compared to that of the rest of the state. Efforts to improve the region's broadband infrastructure are already underway, however. Phase 1 of the state's Broadband Middle-Mile Network will add 581 miles to the network that are within the Redwood Region, and Phase 2 will add an additional 110 miles to the region.

Case Study

Tribal Broadband Efforts Case Study
Hoopa Valley, CA: Connecting a Community Through Resilience and Innovation

In the heart of California's Redwood Region, the Hoopa Valley Tribe has been working tirelessly to bridge the digital divide and empower its community through improved internet access. Despite the challenges posed by the rugged terrain and limited infrastructure, the Tribe has shown remarkable resilience and innovation in their pursuit of connectivity.

The launch of Acorn Wireless in 2021, a Tribally-owned and operated internet service, marked a significant milestone in the Tribe's journey towards digital equity. Under the leadership of Linnea

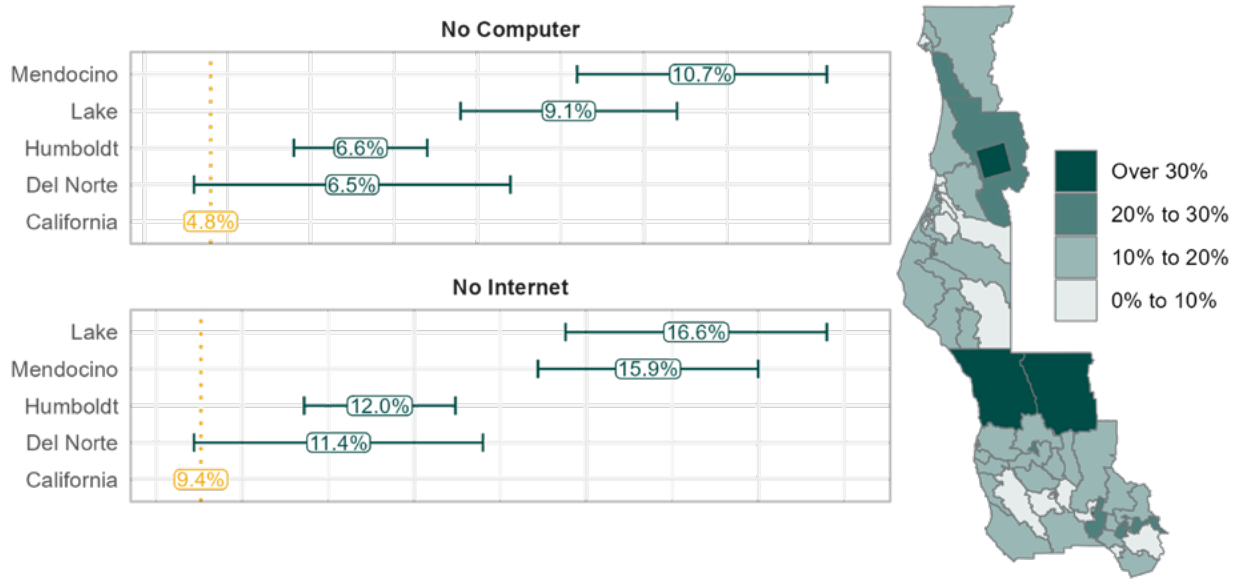
[34] For more information on State policies with respect to housing site development see https://www.hcd.ca.gov/planning-and-community-development/public-lands-affordable-housing-development

Jackson, general manager of the Hoopa Valley Public Utilities District, the service has already made a tangible impact on the lives of many residents. From tribal elders like Marcellene Norton, who can now attend online council meetings and share important information with the community via Facebook, to youth leaders like Danielle Frank, who rely on internet access to coordinate climate action and salmon-restoration efforts, Acorn Wireless has opened up new opportunities for civic engagement and community development.

However, the Hoopa Valley Tribe's aspirations extend far beyond the current reach of Acorn Wireless. With the recent influx of $65 million in federal funding, the tribe is set to embark on a transformative expansion of their internet infrastructure. The introduction of fiber optic cables directly to homes, coupled with the expansion of the wireless network, will bring reliable, high-speed internet to 1,000 households, 64 businesses, and 19 community institutions. Moreover, the Tribe's commitment to digital literacy and education, exemplified by their participation in the Digital Navigator Corps program, ensures that all members of the community will be equipped with the skills and knowledge to fully harness the power of connectivity. As the Hoopa Valley Tribe continues to navigate the challenges and opportunities of the digital age, their story serves as an inspiring example of how communities can come together to build a more connected, resilient, and empowered future.[35]

[35] REF

Figure 3.6 Householders Without Internet Access (2017-2021)



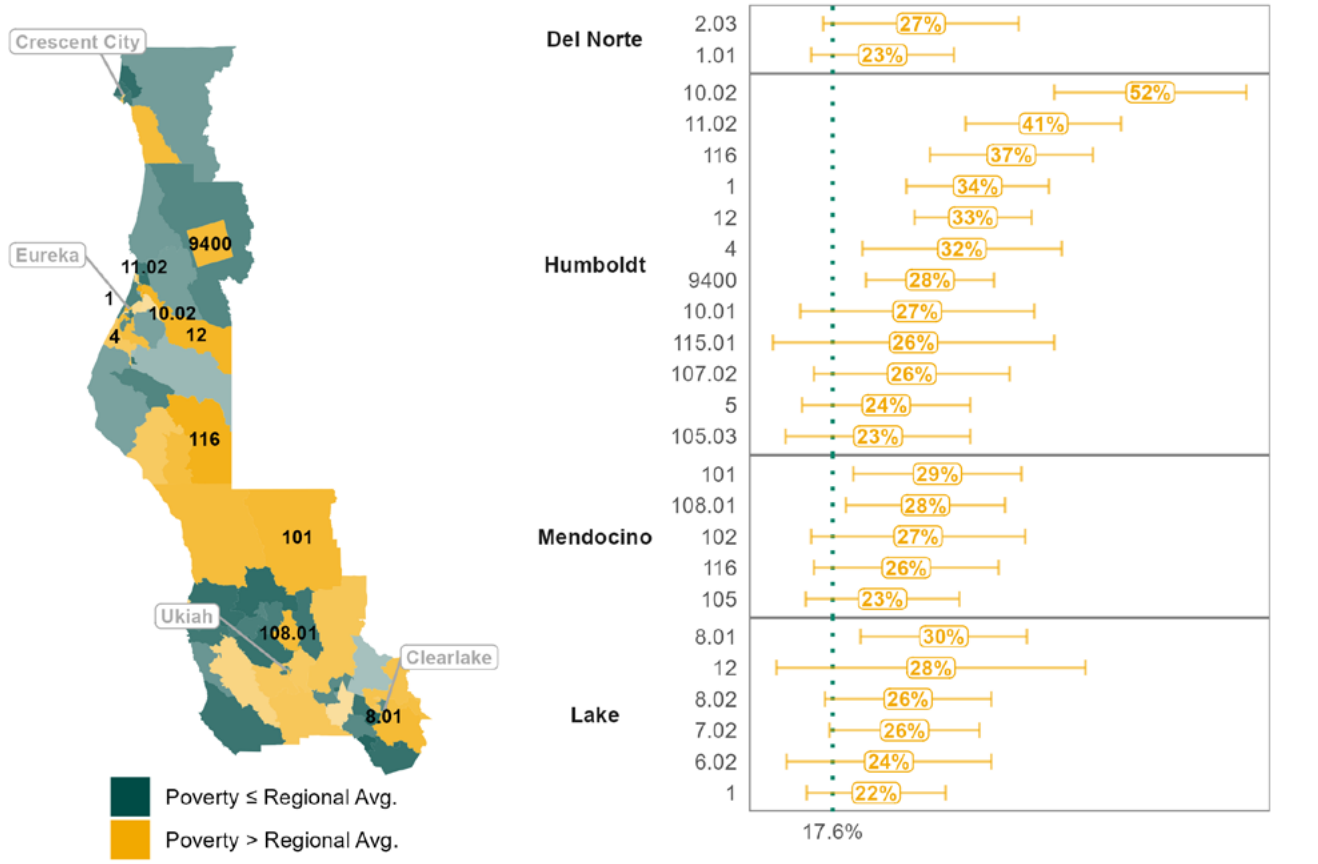
Note. Data sourced from the American Community Survey (ACS). Map indicates percentage of households lacking any form of internet subscription.

Unequal Development in the Region

While California Jobs First criteria characterize the entire region as disinvested , patterns of inequity and uneven development are observable across the region, driven by a multitude of factors including disenfranchisement and marginalization of communities of color; deep rurality and barriers to accessing services; decline in unionized industries; lack of traded sectors; flight of skilled labor to higher wage, more urban areas south of the region; a legacy of natural disasters (e.g., the low-income coastal areas); and ever-increasing climatic risks (i.e., the disinvested inland areas); and departure of land-based industries and a subsequent lack of remediation of brownfield sites created by those former industries. There are, however, positive departures from the experiences of the rest of rural and inland California. The unemployment rate in the Redwood Region more closely mirrors that of the nation at large, as does educational attainment. Despite this, the proportion of families struggling under the burden of a high cost of living and comparably low wages is higher than in the rest of coastal California (Little Hoover Commission, 2022).

Figures 3.7 and 3.8 present key indicators of economic well-being, allowing comparison to state and regional averages: household income, poverty rates, and earnings by census tract. Consistent across these analyses is the role rurality has played in historic disinvestment. The areas of the region most affected are a swath of northern Humboldt County extending from the Humboldt Bay inland, the parts of Del Norte County south of Crescent City, Southern Humboldt, and Northern Mendocino County through eastern Lake County, and these comprise potential areas of new investment for RRRISE.

Figure 3.7 Intraregional Variation in Poverty Rates (2018-2022)



Note. Data sourced from the American Community Survey. Tracts labeled on the left panel have a poverty rate significantly[36] higher than the regional average (17.6%). The right panel displays the top 25 highest poverty rate tracts in the region. Horizontal bars represent the 95% confidence intervals, and the dotted vertical line represents the regional average.[37]

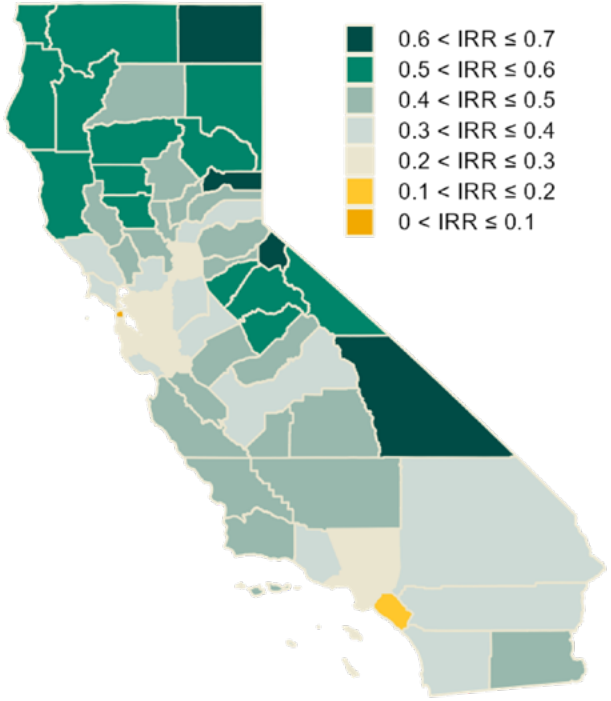
While deep rurality and isolation is a root cause of many economic challenges, it is also a source of regional strength due to its role in the land-based sectors of forestry, agriculture, and tourism and recreation. Figure 3.8 displays the exceptionally rural areas of the region. The region has only 14 incorporated municipalities, a paucity that has implications for economic development (see the SWOT analysis in Chapter 8). While the presence of renowned conservation areas are a boon to the region's tourism and recreation sector, counties like Del Norte must also contend with a smaller tax base as a result of having more land under conservation status.

[36] This only accounts for the margin of error on tract level data. A confidence interval for the aggregated regional average cannot be generated.

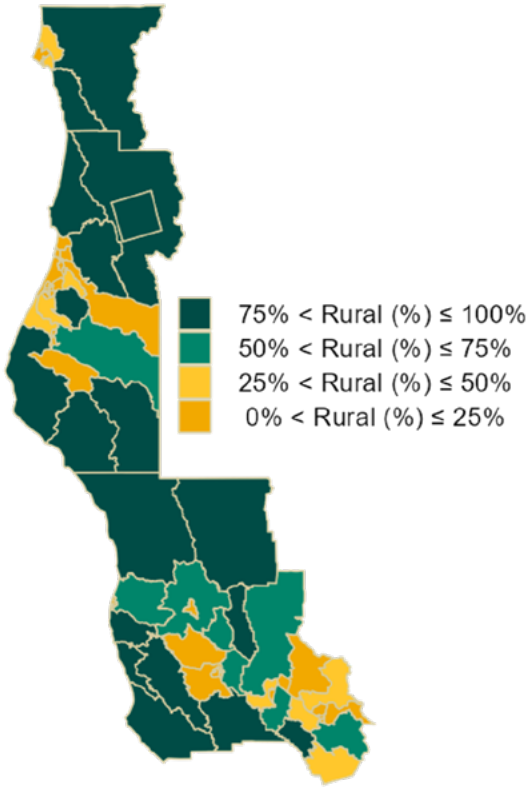
[37] The regional average was calculated by taking the population-weighted average of the four counties comprising the Redwood Region.

Figure 3.8 Measures of Rurality (2010)

Index of Relative Rurality (IRR)



Census Population Designated "Rural"



Note. Left Panel: IRR scale ranges from 1 (most rural) to 0 (least rural). Data sourced from Kim and Waldorf's 2018 data set titled "The Index of Relative Rurality (IRR): US County Data for 2000 and 2010." Right Panel: Data sourced from 2010 Decennial Census variables P002001 - P002006.

Diverse Communities and Economic Opportunity

Inequality in the Redwood Region may appear less pronounced than in the rest of California, as evidenced by a lower Gini coefficient (see Figure. 3.9).[38] However, this seemingly positive indicator is not a consequence of a thriving middle class but rather a reflection of the failure of higher wage industries to establish a strong presence in the area. The resulting lack of high-paying jobs has had a particularly detrimental impact on communities of color, including Black, Latinx, and Indigenous residents, who face significant disparities in income, employment, and overall economic well-being.

According to the Equity Atlas (2024), which analyzed Redwood Region data from the American Community Survey (ACS) and the Integrated Public Use Microdata Series (IPUMS), people of color are more likely to reside in high-poverty census tracts compared to their white counterparts. They are also more likely to earn less than a living wage, defined as $15 per hour, and are overrepresented in low-wage occupations and sectors. Analysis of the data revealed that people of color in the region earn less than their white peers at every education level ("California Jobs First: Equity Indicators for the Redwood Coast Region," 2024), indicating that factors beyond educational attainment contribute to these income disparities.

[38] Ranging from 0 to 1, the Gini coefficient is a measure of income or wealth inequality within a population. Values close to 0 indicate less income inequality or less dispersion in the distribution of wealth within an area, whereas values closer to 1 indicate greater inequality in wealth.

The factors driving these disparities stem from a multitude of causes, including disenfranchisement and marginalization of communities of color, deep rurality and barriers to accessing services, the decline in unionized industries, lack of traded sectors, flight of skilled labor to higher wage urban areas, and the legacy of natural disasters and increasing climate-associated risks. These have contributed to uneven development across the region, with areas like northern Humboldt, Del Norte south of Crescent City, Southern Humboldt, Northern Mendocino County, and eastern Lake County experiencing particularly high levels of disinvestment.

Moreover, high poverty rates, unemployment, and negative health outcomes are prevalent in many tribal communities in the Redwood Region. For instance, poverty rates on the reservations of the Yurok, Hoopa Valley, and Round Valley Tribes reach 40%, while unemployment rates can go as high as 80% during the winter months (Abinanti et al., 2020). These social problems can be traced to the early days of colonization, which disrupted and destroyed tribal economies while stealing Tribal lands. Poverty and related social issues are a fundamental backdrop of the Missing and Murdered Indigenous Women, Girls, and Two-Spirit People (MMIWG2) crisis, a pattern observed in other regions as well. Tribal communities in the Redwood Region also face continued threats to their safety and well-being in the context of the crisis involving MMIWG2—with California having the fifth highest incidence in the United States (Abinanti et al., 2020).

Figure 3.9 Disaggregated Poverty Rates (2018-2022)

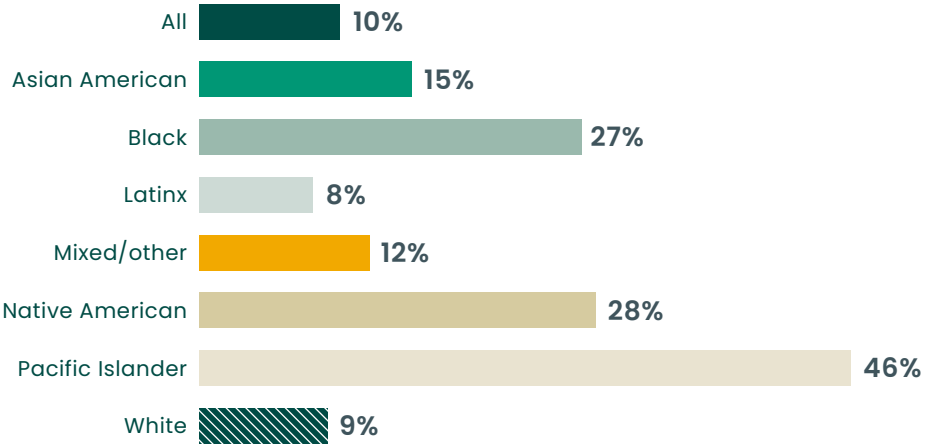
	CA	Humboldt	Mendocino	Lake	Del Norte	
Black	19%	41%	33%	32%	50%	Race/Ethnicity
AIAN	16%	29%	24%	43%	17%	
Hispanic or Latino	15%	24%	22%	17%	20%	
Two or more races	12%	22%	21%	19%	19%	
Asian	10%	34%	15%	9%	~14%	
White, not Hispanic or Latino	9%	18%	13%	15%	12%	
Female	13%	21%	17%	18%	16%	Sex
Male	11%	19%	16%	15%	13%	
Under 5 years	16%	20%	28%	20%	16%	Age Range
Under 18 years	16%	20%	21%	21%	17%	
18 to 34 years	13%	30%	19%	18%	16%	
5 to 17 years	16%	21%	18%	21%	18%	
35 to 64 years	10%	17%	14%	18%	15%	
65 years and over	11%	12%	13%	10%	9%	
Less than high school	20%	34%	25%	26%	17%	Educational Attainment (25+)
High school or equivalent	13%	20%	18%	20%	16%	
Some college	10%	17%	13%	14%	11%	
BA or higher	5%	9%	8%	5%	8%	
Unemployed	24%	34%	33%	30%	11%	Work (16+)
Did not work	21%	29%	25%	24%	24%	
Worked part-time	13%	25%	14%	16%	11%	
Worked full-time	2%	4%	3%	2%	2%	

> 3X CA Avg. > 2X CA Avg. > CA Avg. ≤ CA Avg.

Note. Data sourced from the American Community Survey (ACS). (~) denotes statistically unstable estimates.15

Poverty rates for individuals of color within the region are two or sometimes even three times the California average (see Figure 3.10). Labor force participation is also a key factor that seems to impact individual well-being in the region to a greater degree than in the rest of the state. Under local economic conditions, workers working part-time are especially vulnerable.

Figure 3.10 Ethnic Composition of High Poverty Areas, from PolicyLink's Equity Atlas



Source: National Equity Atlas analysis of 2020 American Community Survey 5-year Summary File. Universe includes all people.

Note: Data represent the percentage of the population living in high-priority neighborhoods, defined as census tracts with a poverty rate of 30 percent or higher. Data represent a 2016 through 2020 average.

As can be seen in Figure 3.10, many of the areas of concentrated poverty are distant from employment and educational opportunities. These are Crescent City, the Humboldt Bay area, Ukiah, and town centers in Lake County and along the Mendocino Coast. Analysis of high-poverty census tracts in the region revealed the extent of the disparity, with 91% of residents identifying as an ethnicity other than white and so contrasting with the overall population, which is closer to 70% Caucasian.

Industry Composition and Trends

The two largest industries by employment numbers are administrative government and health care and social assistance. These two sectors employ nearly one-third of the Redwood Region's workers, and both represent a much larger proportion of regional employment than of the state averages. Both industries pay higher than average wages and employ much larger proportions of the region's workforce compared to state-level trends. Except for construction trades, no other sectors have these qualities, highlighting the importance of government employment in supporting the region's wages.

Moreover, other high-wage industries are sharply underrepresented (in terms of employment) in the Redwood Region. Almost all occupations across industries have substantial wage gaps in comparison to state averages, with the starkest gaps among high-skilled workers and occupations. Depressed wages are a problem in most of the region's industries and occupations. Industry and workforce dynamics are discussed in greater depth in Chapters 6 and 7.

Major Employers and Economic Drivers

The vast majority (72%) of businesses in the region are small, with fewer than employees (See Figure 3.11). Notably, the region's top employers tend to be government administrative services or ones in related areas and to be focused primarily on education and health. The Region's Tribal nations and their enterprises are major economic forces within the region. The remainder of its its top employers are in the key sectors of construction trades, agriculture, and tourism and recreation, which are discussed more fully later in this report. Figure 3.11 and 3.12 provide information on the major employers in the Region, by sales and number of employees:

Figure 3.11 Number of Businesses by Size Category, Redwood Region Counties (Third Quarter, 2022)

Counties	Number and Percent of Businesses Categorized by Size (Number of Employees)											
	Total	%	0-4	%	5-9	%	10-19	%	20-49	%	50-99	%
Del Norte	784	5%	505	5%	94	6%	86	7%	59	7%	29	12%
Humboldt	6,217	43%	4,280	41%	808	48%	597	49%	380	48%	101	43%
Lake	3,156	22%	2,596	25%	245	15%	158	13%	105	13%	33	14%
Mendocino	4,268	30%	3,004	29%	542	32%	369	30%	244	31%	74	31%
Totals	14,425		10,385		1,689		1,210		788		237	
% of Region			72.0%		11.7%		8.4%		5.5%		1.6%	

Source: https://labormarketinfo.edd.ca.gov/LMID/Size_of_Business_Data.html/. Firms with more than 100 employees not included.

Figure 3.12 Major Employers in the Redwood Region

Top 10 Employers, by Number of Employees	Employees (Single Site)	NAICS 2022 Code	NAICS 2022 Description
Sun Valley Floral Group, LLC	750	339999	All other Miscellaneous Manufacturing
Blue Lake Casino	370	321150	American Indian and Alaska Native Tribal Governments
Humboldt County Office of Education	370	611110	Elementary and Secondary Schools
Shannon Ranches, Inc.	250	541611	Administrative Management and General Management Consulting Services
Harwood Products	230	321918	Other Millwork (including Flooring)
Robinson Rancheria Citizens Council	200	921140	Executive and Legislative Offices, Combined
Little River Inn, Inc.	176	721191	Bed-and-Breakfast Inns
Running Creek Casino	170	721120	Casino Hotels
The Eureka Hotel Company	150	721110	Hotels (except Casino Hotels) and Motels
Kokatat, Inc.	150	315250	Cut and Sew Apparel Manufacturing (except Contractors)

Source: Dunn & Bradstreet, 2023

Top 10 Employers, by Sales	Sales (USD)	NAICS 2022 Code	NAICS 2022 Description
Adventist Health Clearlake Hospital	$143,237,060	622110	General Medical and Surgical Hospitals
Family Tree Service, Inc.	$73,566,132	561730	Landscaping Services
Dunco Builders	$64,838,943	236116	New Multifamily Housing Construction
Adventist Health Mendocino Coast	$56,567,120	622110	General Medical ans Surgical Hospitals
Humboldt County Office of Education	$53,835,949	611110	Elementary and Secondary Schools
Sun Valley Floral Group, LLC	$46,942,200	339999	All Other Miscellaneous Manufacturing
Lake County Tribal Health Consortium, Inc.	$39,633,663	621210	Offices of Dentists
Humboldt State University Sponsored Programs Foundation	$36,742,966	611710	Educational Support Services
Northwood Auto Plaza, Inc.	$33,200,943	441110	New Car Dealers
Harwood Products	$24,414,322	321918	Other Millwork (including Flooring)

Source: Dunn & Bradstreet, 2023

Economic Shocks and Shifts—Sources of Disparity and of Resilience

The region has experienced major shocks and shifts over the past decades from natural disasters (droughts, landslides, flooding, earthquakes, catastrophic wildfires, and the 2011 Fukushima-related tsunami), economic disruptions (the 2008 recession), policy changes (e.g., Proposition 64, cannabis legalization), and events like the COVID-19 pandemic. These are discussed below.

Natural Disasters

Among the natural disasters affecting the region, wildfires tend to have the largest impact. The 2018 Mendocino Complex Fire burned 459,123 acres, destroyed 280 structures, and caused over $267 million in damages (CAL FIRE, n.d.), and the 2020 August Complex Fire, which affected Mendocino, Humboldt, and Lake counties, burned over 1 million acres and destroyed 935 structures (CAL FIRE, n.d.-b).

The 2008 Recession

This was accompanied by 1) a significant decline in home prices and a slowdown in new housing construction; 2) job losses in construction-related industries such as lumber and building materials; 3) a sharp rise in unemployment rates, which remained high for several years after the recession ended; and 4) a decline in tax revenues leading to budget shortfalls and cuts in public services.

Policy Changes

Cannabis legalization significantly affected the economies of Humboldt and Mendocino Counties as a result of Proposition 64.[39] This decline is indicative of the challenges faced by the local cannabis

[39] Humboldt County, once the epicenter of cannabis cultivation in California's renowned Emerald Triangle, has seen a sizable decrease in cannabis business applications since 2018. In April 2024, the county had 1,068 legal marijuana farms, with an additional 400 applications in the pipeline and 657 that have since been denied. The number of new applications submitted in the past two years, however, plummeted to five, contrasting sharply with the approximately 2,000 applications received in 2016.

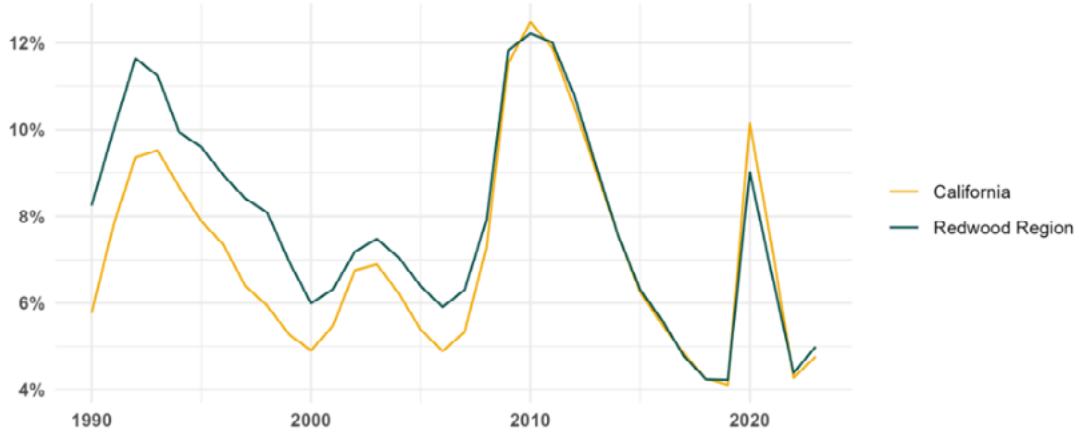
industry, with hundreds of farmers grappling with falling wholesale prices and overproduction, leading many to abandon the (legal) cultivation and marketing altogether (Schroyer, 2024). See the Industry Cluster analysis in Chapter 6.

COVID-19

The pandemic has also had a significant impact on the region, as the closure of businesses and the decline in the tourism and service sectors (among others) also led to job losses and economic hardship. In the four counties making up the Redwood Region, total employment went from 132,970 in February 2020 to 113,120 in April 2020 (Labor Market Information, EDD), a 14.9 percent drop.[40]

Except for influxes of capital, economic disruptions negatively affect employment in most regions of the U.S., and the Redwood Region is no exception. For example, Figures 3.13 and 3.14 below clearly show the impact of the COVID-19 pandemic on regional employment, which dropped almost 15% in just a few months.

Figure 3.13 Redwood Region Unemployment Rate (1990-2023)



Note. Data sourced from the Employment Development Department.

Figure 3.14 Change in Total Employment by County (February 2020-April 2020)

	Humboldt	Lake	Mendocino	Del Norte	Total
	(000)	(000)	(000)	(000)	(000)
February 2020	59.8	27.5	36.7	9.0	133.0
April 2020	50.4	23.7	31.0	8.0	113.1
Change	9.4	3.8	5.7	1.0	19.9
% Change	15.7%	13.7%	15.4%	11.5%	14.9%

[40] Nationally, the number of active business owners in the U.S. dropped by 3.3 million (22%) between February and April 2020, with losses across nearly all industries. The pandemic had a disproportionate impact on minority-owned businesses, with African-American businesses experiencing a 41% drop in activity, Latinx businesses falling by 32%, Asian businesses dropping by 26%, and immigrant-owned businesses declining by 36%. Female-owned businesses also saw a significant 25% drop in activity (Fairlie, R. W. (2020).

Effects of Disruptions

Disinvested communities in California's Redwood Region are particularly vulnerable to economic disruptions, in part due to significant health disparities and the behavioral risk factors prevalent among them (e.g., elevated rates of tobacco use, substance abuse, and mental health challenges). Such disparities can hinder a region's ability to adapt and recover from economic adversities, particularly when accompanied by inadequate healthcare systems, a shortage of mental health providers, and resulting treatment needs that go unmet, further exacerbating the Redwood Region's vulnerability to economic disruptions (see the Public Health analysis).

Case Study

The Role of Cultural Institutions in Response and Recovery: The Middletown Art Center

The Middletown Art Center (MAC) in Lake County, California, has emerged as a beacon of resilience and community support in the face of repeated wildfire disasters. The MAC has assumed a crucial role in helping the region recover from the devastating effects of the Valley Fire in 2015 and from subsequent wildfires. Despite personal losses suffered by many of the MAC's board members and artists, it has remained a strong presence in the county. After the Valley Fire, the MAC provided free art classes, workshops, and events aimed at helping residents process their emotions and find solace in creative expression. The MAC has also partnered with other organizations to offer yoga and meditation classes, PTSD workshops, and insurance assistance, becoming a hub for community restoration and development.

The MAC's impact extends throughout the entire region, and it has become a gathering place for various community groups and events, such as the Valley Fire Phoenix Rising initiative, whose focus is rebuilding through affordable housing, green design, and local micro-businesses. Supporting the Center's growth and initiatives have been such local organizations as the Lake Area Rotary Club Fire Relief Fund and the #LakeCountyRising Valley Fire Relief Fund. As the MAC continues to expand its reach and programming, it serves as a powerful example of how arts and culture can play a vital role in economic development and community resilience in the face of adversity.[41]

The pandemic, for example, has been found associated with increased risk factors for adverse childhood experiences (ACEs) and toxic stress, leading to loss of family members, social isolation, economic decline, family stressors, mental health issues, substance abuse, and work and school disruptions to work and school. These challenges have further compounded the economic and social difficulties faced by families already struggling with poverty, food insecurity, housing instability, and limited access to quality health care, education, and other resources (Humboldt County Community Health Improvement Plan 2022-2027, DHHS, 2023). The region's housing shortage and affordability crisis further compound the effects of these vulnerabilities, (California Department of Housing and Community Development, 2018). California's Housing Future: Challenges and Opportunities, Final Statewide Housing Assessment 2025), increasing the likelihood of outmigration to more affordable regions and enhancing the risk of displacement from eviction and/or foreclosure.

While beneficial for economic development and job creation, economic opportunities of sufficient scale (like offshore wind) have the potential to place additional burdens on already limited healthcare options and housing stock, critical infrastructure, and available workforce (e.g., construction) and could cause increased displacement and unintended, ripple effects (e.g., higher cost of living, workforce supply for key industries, etc.) throughout the region, disproportionately impacting disinvested communities. Humboldt and Del Norte County interest holders have expressed concerns about the potential worsening of the housing crisis due to the development of offshore wind projects in the region. Residents in these counties already face significant housing burdens, spending approximately 39% and 38% of their income on housing, respectively. While the job opportunities brought by offshore wind development could provide economic benefits to the region, the anticipated influx of workers is likely to put an additional strain on the already stressed housing market and community services across Humboldt, Del Norte, and neighboring counties. Furthermore, the increased activities associated with offshore wind could also place pressure on essential community resources, including healthcare services, transportation infrastructure, wastewater systems, and other aging public infrastructure (HCD, 2018; HCDHSS, 2022[42]; SERC, 2022[43]).

[41] Source: Karlamangla, 2024; Fire Adapted Communities Learning Network, 2021

[42] Department of Housing and Community Development. (February 2018). California's Housing Future: Challenges and Opportunities, Final Statewide Housing Assessment 2025; https://www.hcd.ca.gov/policy-research/plansreports/docs/sha_final_combined.pdf; Humboldt County Department of Health & Human Services, Public Health. (2018). 2018 Humboldt County Community Health Assessment; https://humboldtgov.org/DocumentCenter/View/71701/2018-Community-Health-Assessment-pdf.

[43] Jacobson, A., J. Zoellick, R. Anilkumar, Z. Alva, C. Chamberlin, A. Cooperman, G. Chapman, A. Daneshpooy, P. Duffy, W. Musial, A. Mustafa, A. Younes. (2022). Transmission Alternatives for California North Coast Offshore Wind, Volume 1: Executive Summary. Cal Poly Humboldt, Arcata, CA: Schatz Energy Research Center. schatzcenter.org/publications/

The region's existing electricity transmission and distribution, water treatment, broadband, and other critical infrastructure weaknesses and gaps exacerbate existing economic inequities, including lack of access to housing and healthcare and decreased openings for jobs having upward mobility potential and paying a "livable" wage. Potential disruptions to food supply chains and job losses lead to increased food insecurity, while limited access to technology and crucial information, services, and remote work opportunities (in both business-as-usual and disruptive times) also increases food and other forms of insecurity, widening the opportunity gap even further (North Coast Resource Partnership, 2018).

Economic Development Opportunities

In addition to the threats they pose, economic disruptions can present new economic development opportunities that help communities reimagine their priorities and discover public sector activities that they may have previously ignored, including: 1) the development of trust in and the creation of new partnerships and relationships with disinvested populations that have historically been excluded from policy and planning processes and 2) the development of new priorities and ideas to improve equitable access to public resources.

Case Study

Lessons in Resilience, Blue Lake Rancheria's Toma Resilience Campus

The Blue Lake Rancheria's (BLR) Toma Resilience Campus, a 15,000 square-foot facility designed to serve as a business incubator and workforce development hub (currently under construction as of Summer 2024), is designed to address the concerns of infrastructure shortages and promote regional resilience in the face of economic and environmental challenges. As a facility with a regional focus, BLR anticipates that the facility's programming will impact thousands of regional residents.

The Resilience Business Incubator (RBI), housed within the Toma, will support entrepreneurs from underrepresented groups and provide workforce development opportunities for underserved populations across the Redwood Region. By offering entrepreneurship courses, startup assistance, skills training and certifications, job placement assistance, and ongoing coordination with regional economic, education, workforce, and community-based organizations, the RBI will foster a regional economy with increased resilience and sustainability.

The facility features a wide range of amenities in addition to the business incubator, including office space, training facilities, a digital design and fabrication lab, and a commercial teaching kitchen. These facilities enable the campus to focus on developing entrepreneurial and adaptive workforce skills that address current and emerging hiring needs in sustainable agriculture, smart technology, clean energy, light manufacturing, disaster preparedness, and production of other resilience-related products and services. By fostering innovation and collaboration in these critical areas, the Toma is designed to strengthen the region's ability to adapt and thrive in the face of disruption and change.

Furthermore, the Toma Resilience Campus will serve as an integral component of a regional innovation ecosystem developed in partnership with Cal Poly Humboldt, College of the

Redwoods, and multiple partners from across the region, state, and nation. This collaborative approach will ensure that the campus can leverage the expertise and resources of its partners to create a comprehensive support system for regional residents, entrepreneurs and businesses, and communities (Tribal and non-Tribal), ultimately increasing the resilience and sustainability of the Redwood Region's economy.[44]

California Energy Commission

CEDS documents from across the region highlight specific opportunities that generally fall within three categories: industries, infrastructure, and skills, and the following summary provides a high-level overview of these strategies appearing in two or more of the plans.

Industry Strategies

The primary focus of industry strategies is to diversify local industries and foster the growth of industries that can provide living-wage jobs. These can be achieved through several key initiatives:

[44] Source: BLR Business Incubator Feasibility Study, 2018, Agnew Beck Consultants

- Developing niche brands of tourism, such as culinary, cultural, eco-, and experiential tourism, to attract a diverse range of visitors and create new job opportunities.
- Expanding the cultivation, processing, distribution, and sales of specialty foods to bolster the local economy and create additional employment options.
- Supporting sustainable agricultural, forestry, and fishery products, while developing new forest industry, biomass, and timber products.
- Expanding programs that apply traditional ecological knowledge and that preserve aquatic resources, traditional diets, and wildfire management.
- Investing in fire mitigation and safety practices to protect local communities and businesses.
- Growing technology-based firms across industries, increasing and supporting light manufacturing, fostering the growth of healthcare enterprises, and investing in the development of renewable energy.

Infrastructure Strategies

Ensuring that suppliers, residents, and visitors can easily access resources and opportunities throughout the region is the primary goal of infrastructure strategies. Key components of this objective include:

- Investing in harbor/port infrastructure to facilitate the efficient movement of goods and people.
- Developing and preserving water resources, including storage, management, and wastewater treatment, to support local industries and communities.
- Investing in airports and expanding and constructing emergency routes to improve connectivity and safety within the region.
- Expanding highways and roads to accommodate supply chain routes, commuters, and visitors.
- Developing regional multi-modal and active transit options, as well as enhancing public transportation options, to facilitate access to employment opportunities and services.
- Delivering broadband to rural communities to ensure that all residents have access to online resources and opportunities.
- Establishing community hubs that provide such community benefits as education, work, recreation, and disaster preparedness.
- Increasing the availability of ADUs, workforce housing, and affordable housing by addressing permitting and zoning issues.

Skills Strategies

Ensuring that businesses and residents are prepared and resourced to participate in the local economy is the primary focus of skills strategies. Key initiatives in this area include:

- Upskilling the workforce in the skills needed for the blue, green, and creative economies.
- Investing in ocean/marine science education and other high-demand career paths to ensure that the local workforce is well-prepared for emerging job opportunities.
- Training on cooperative development and ownership to empower local residents to take a more active role in the local economy.
- Supporting business entrepreneurship and fostering a thriving small business environment to contribute to economic growth and job creation.
- Developing research and lab space to grow emerging industries and attract new businesses.
- Increasing childcare affordability and availability to enable parents to participate in the workforce.
- Developing quality messaging, outreach, and marketing to promote local businesses and attract new investment to the region.

Introducing Key Sectors

The RRRISE Convening team worked closely with the Collaborative to identify key sectors to prioritize in the region's economic development and diversification strategies. The process used to do so was as follows:

1. Review previous Industry Cluster analyses, such as the EDD's "Targets of Opportunity" report (November 2021), exploring industry clusters in Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity counties. The RRRISE convening team consulted the authors of that report to understand the methodology and any challenges that arose during report preparation.
2. Receive qualitative input from the Collaborative during listening sessions during which participants identified opportunities and threats on the horizon from the perspective of key drivers in the region and industry strengths. The ATLAS.ti software program was used to identify themes and nodes of regional interest in different industry sectors.
3. Map and survey partners to identify key industries by the "people power" needed to develop them. Collaborative members (107 in total) responded to a survey querying them as to the key issues needed for economic development. What emerged were 10 priority areas that received strong agreement and corresponded with previous assessments.
4. Analyze publicly available quantitative data to obtain the findings reported in Chapter 6 .

The result was the ultimate articulation of key RRRISE focal areas, which are as follows:

Priority Sectors	
Cluster	Related Industries
Arts, Culture, and Tourism	Performing Arts; Museum, Historical Sites, etc; Scenic and Sightseeing Transportation; Food Services and Drinking Places; Accommodation; Transit and Transportation; Motion Picture and Sound Recording; Amusement, Gambling, and Recreation.
Health and Caregiving	Hospitals; Social Assistance; Ambulatory Health Care Services; Nursery and Residential Care Facilities; Health and Personal Care Stores.
Renewable and Resilient Energy	Construction; Repair and Maintenance; Utilities.
Working Lands and Blue Economy	Leather and Allied Products Manufacturing; Beverage Manufacturing, Fishing, Hunting Trapping; Animal Production and Aquaculture; Food Manufacturing; Textile Mills; Crop Production; Wood Products Manufacturing; Support Activities for Agriculture; Furniture and Related Products Manufacturing; Forestry and Logging; Building Materials and Garden Equipment.
Cross-Cutting Issues and Sector Enablers	
Housing Broadband Entrepreneurship Education and Training Health and Caregiving[45]	

Workforce development is so central to the California Jobs First initiative that it is mainstreamed throughout Collaborative consideration of these sectors and enablers. This report references the four priority sectors that drive the sector strategies to be developed and reported on in *Regional Plan Part 2*.

[45] In Regional Plan Part 2, development strategies for the health and caregiving sectors include both sector growth strategies and expanding access and addressing social determinants of health.

Chapter 4

Climate Analysis

This chapter provides an overview of key climate and environmental issues in the region and the related impacts on people and communities. Included are insights into anticipated climate impacts and potential sources of resilience. The analyses below: 1) review the sources of environmental pollutants and contaminants; 2) assess the burden of these pollutants and contaminants on communities throughout the region; and 3) describe how existing environmental inequities intersect with the projected impacts of climate change. Highlighted throughout this chapter are the drivers and impacts of the two major climate-related risks the area faces: sea level rise on the coast and wildfire in inland areas. Also addressed are environmental issues related to current and former industries including energy generation, forestry, and agricultural production. The chapter concludes with a discussion of environmental activism and leadership in the region.

Key Takeaways

- **Critical environmental risk factors** across the region include the potential for ground- or surface-water contamination, wildfires, and lead exposure to young children. While the region enjoys better air quality than the rest of the state, its largest industrial emitters are located in low-income areas.
- **Sea level rise** is a critical climate impact for the region, which has the longest coastline of any California Jobs First region. Humboldt Bay is one of the highest risk areas on the California coast and yet is slated for more redevelopment activities elsewhere in the region, at the time of writing.
- **Wildfire** is a major driver of economic losses and has been a public health disaster for inland communities. Moreover, communities with incomes well below the state median feel its worst impacts. In recent years, Lake County, in particular, has suffered the worst of these, but Del Norte and Humboldt have the highest risk projections in the region.Wildfire thus constitutes a critical risk to industries in the working lands sector.
- **Investment in infrastructure** for water delivery and waste disposal is a crucial environmental justice issue for the region.
- Jurisdictions in the region have **significant data gaps** concerning GHG emissions (e.g., only one outdated GHG inventory was available for the region). Jurisdictions should prioritize creating GHG emissions inventories to better direct clean energy projects and other emissions-reduction efforts.

Key Metrics[46]

- **Percent of waterways impaired and number of groundwater threats present in the region:** Track the extent of water pollution and groundwater contamination to prioritize areas for remediation and protection.
- **Dollars invested in water infrastructure improvements in disinvested communities and those hosting waste sites:** Monitor investments in water systems to ensure equitable access to safe, clean water and measure progress in addressing disparities.
- **Number and scale of climate adaptation initiatives along the coast, especially in Crescent City, Humboldt Bay, and the Mendocino Coast:** Assess the region's preparedness for sea-level rise and other coastal impacts by tracking the implementation of adaptation measures.
- **Greenhouse gas emissions by sector and per capita:** Measure the region's contribution to climate change and identify high-emitting sectors for targeted emissions-reduction strategies.

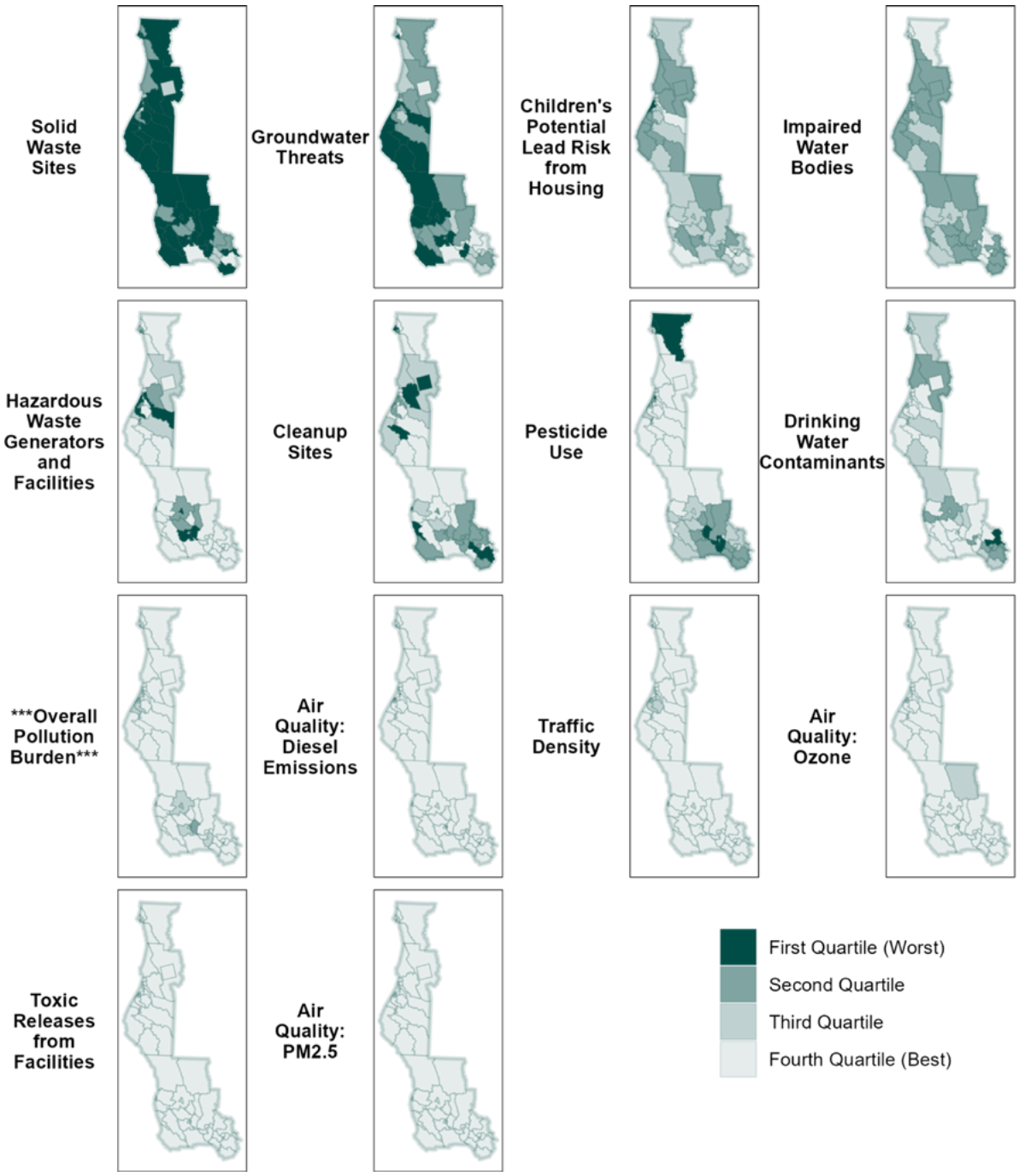
Environmental Risks for Communities

This section provides an overview of the burden of air and water pollution, toxic and hazardous waste, major sources of greenhouse gas (GHG) emissions, and the impacts of all these on diverse and/or disinvested communities.

The region's overall pollution burden is low compared to other regions in the state (see "Overall Pollution Burden" in Figure 4.1). Nevertheless, certain types of pollutants or environmental risks are elevated, and communities in the region face differential risks, including (among others): 1) water resource impacts from a variety of sources (e.g., drinking water and fish contamination), including solid waste sites, nonpoint-source groundwater pollution, hazardous waste generators, and cleanup sites and 2) lead poisoning of children. And, despite low levels of human-caused air pollution, wildfires continue to pose a critical risk to air quality, health, and prosperity within the region.

[46] Data sources for select metrics have yet to be identified by RRRISE.

Figure 4.1 CalEnviroScreen 4.0 Indicators (2023)



Note. Data sourced from CalEnviroScreen 4.0. Each census tract is ranked compared to all other census tracts in the state. Those in the first quartile (dark emerald) are among the worst 25% of census tracts within the state, whereas those in the fourth quartile are among the best 25%.

Water Quality and Hazardous Waste Sites

Although most of the region has levels of drinking water contamination ("Drinking Water Contaminants" in Figure 4.1) comparable to state trends, the region's water bodies ("Impaired Water Bodies" in Figure 4.1) are more likely to be polluted than those used to compute statewide trends, indicating the seriousness of the potential threat to drinking water quality within the region. In particular, runoff and surface materials picked up and carried by moving bodies constitute a critical

source of water pollution in the region, and so agricultural activities, erosion from timber harvesting, construction, and roadways can all contribute to surface pollution that ultimately accumulates in water bodies.

The region's substantial cannabis industry has also had an impact on the local environment. Water contamination, streamflow reductions due to water diversions, and poisoning of wildlife have been linked to the region's cannabis producers (Carah et al., 2015). Additionally, hundreds of sites in the region, including cleanup sites and underground storage tanks, are potentially putting groundwater sources and water quality at risk. Nonetheless, at present, most of the region has above-average groundwater threat levels compared to state trends.

Across the region, over 36,000 miles of rivers and streams are considered impaired due to pollutants (CalEnviroscreen 4.0). Fifty-eight river and stream locations have tested positively for at least one pollutant that is over the safe threshold mandated by the California Water Boards. Of the recorded locations, 67% have sedimentation listed as a pollutant, 66% have heightened water temperature, and 45% have aluminum. It is unclear what the source of the elevated rates of aluminum is. Other listed pollutants include indicator bacteria, mercury, copper, and dissolved oxygen. Sediment can create shallower waterways, increasing the risk of flooding, harming ecosystems and habitats, reducing water clarity, and increasing the cost of drinking water processing, among other serious impacts. Increasing water temperatures in streams and rivers impact wildlife and can lead to reduced biodiversity. Aluminum is a naturally occurring element in nature, but large amounts in high doses can lead to adverse health effects.[47]

Contaminated surface waters[48] pose a particular risk to public health as the region's drinking water comes primarily from these sources. High levels of pollutants such as mercury can lead to fishing advisories, potentially impacting recreational activities and fishing-related industries and constituting threats to priority sectors (discussed below). Among the many lakes, reservoirs, harbors, and estuaries in the region, eight bodies of water comprising over 63,000 acres are listed as polluted; three-quarters of these water bodies are contaminated by mercury, which increases mercury levels in fish. This contamination can lead to advisories for eating fish caught locally and so interrupt fishing-related recreation and economic activities, such as tourism. Further, many of the region's indigenous cultures depend on fishing and are thus disproportionately threatened by this type of contamination. Rivers and streams are primarily impacted by elevated levels of sediment and aluminum. Accumulated sediment can result in shallow water bodies, increasing the risk of flooding, and elevated levels can increase the cost of processing drinking water from these sources.

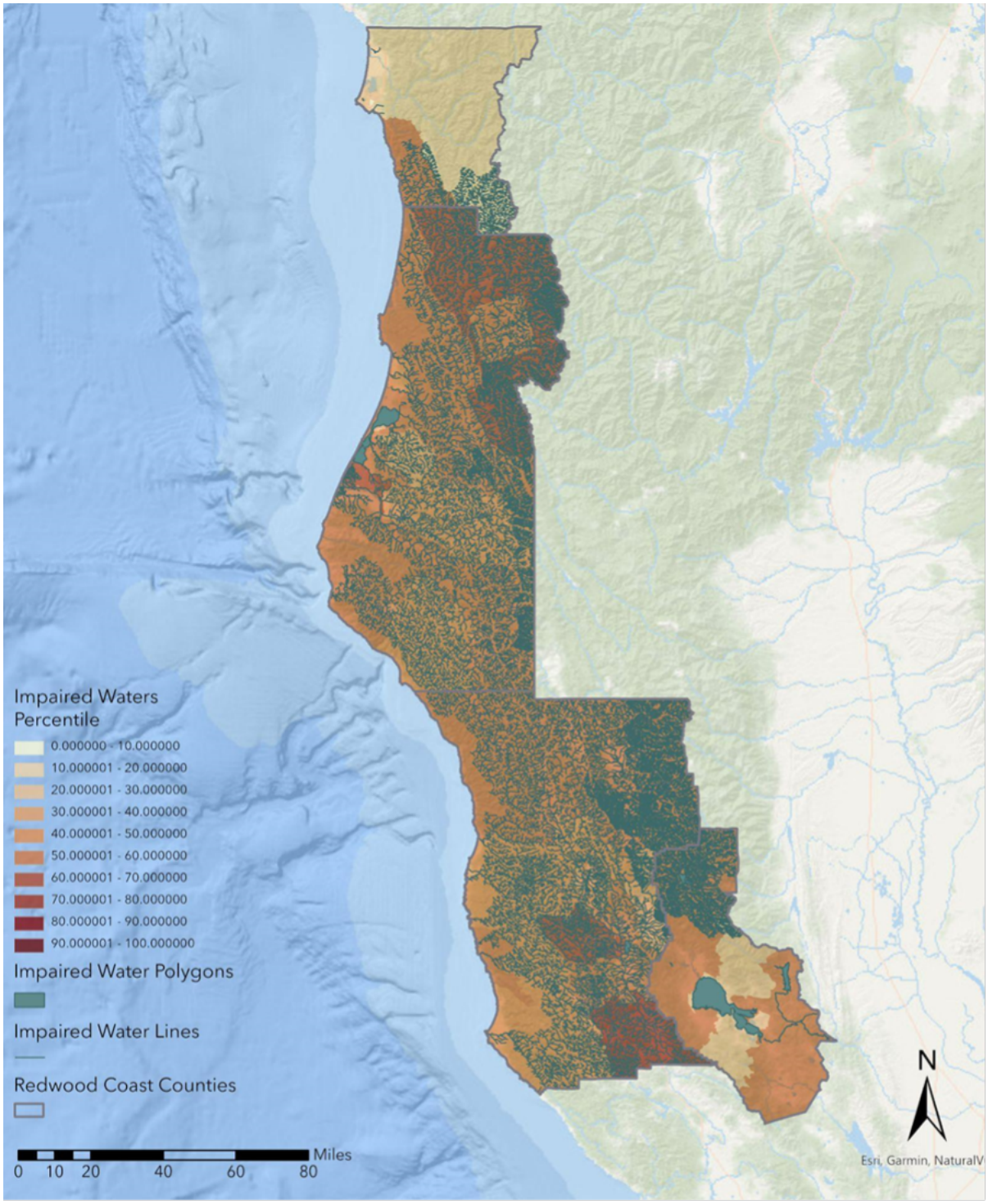
Over 11 miles of coastal and bay shoreline across 16 beaches in Humboldt and Mendocino Counties are considered to be impaired (see Figure 4.2). No coastline in Del Norte County is listed as impaired, as of this report. Each of these locations has been found to be polluted by indicator bacteria, which are surrogates used to measure the potential presence of fecal material and pathogens in waterways. As the source of most indicator bacteria is feces or other types of waste produced by humans and warm-blooded animals (e.g., birds and mammals), indicator bacteria contaminate food sources caught or collected from contaminated waters and can then lead to illness in humans and pets.[49]

[47] https://www.waterboards.ca.gov/northcoast/water_issues/programs/

[48] Impaired groundwater can affect drinking water and soil and lead to adverse health impacts. The State Water Resources Control Board (SWRCB) hosts a GeoTracker Database that oversees and tracks projects at cleanup sites that can affect purity of groundwater. It also hosts the California Integrated Water Quality System Project, which tracks information about environmental impacts, manages permits, tracks inspections, and manages enforcement activities.

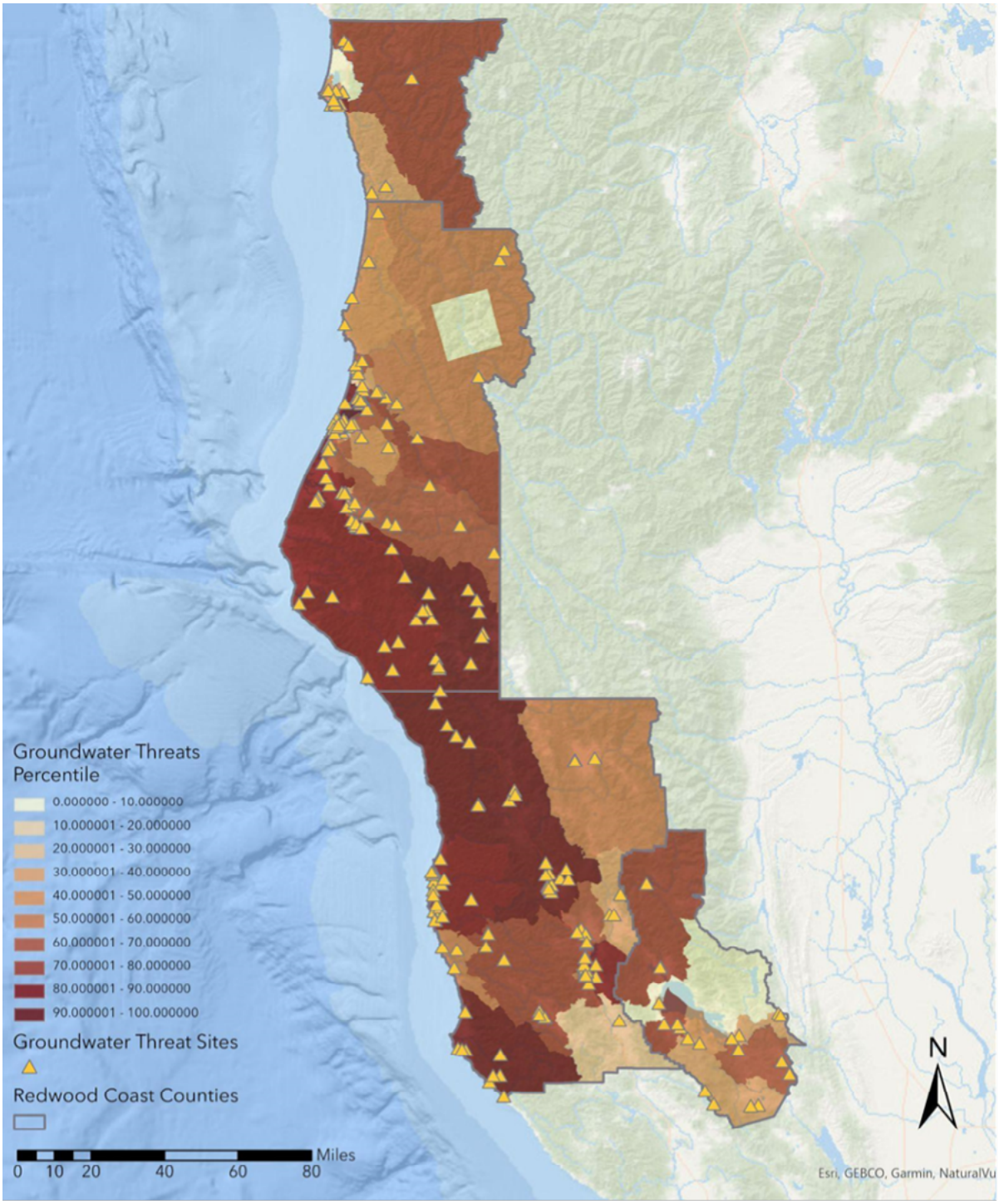
[49] [REF]

Figure 4.2 Impaired Waterways Map



Source: CalEnviroScreen Indicator Maps: Groundwater Threats, requested July 2023.

Figure 4.3 Groundwater Threats



Source: CalEnviroScreen Indicator Maps: Groundwater Threats, requested July 2023.

Hazardous Waste

Although the region's numbers of hazardous waste generators and facilities are fewer than statewide trends, populated areas surrounding Ukiah and near Humboldt Bay appear to have higher levels of these than other areas of the region. While most regional areas have fewer hazardous waste generators compared to similar areas in the state, the region's severe wildfires constitute a particular hazard, increasing risk of exposure to contaminants for first responders and members of the public. While overall Cleanup Sites are less common region-wide, the location of such sites is uneven, with most located in lower income areas. Those living near these sites are at greater risk of harm. Areas around Eureka and east on the 36 corridor, and neighborhoods near Ukiah are particularly vulnerable. See Figure 4.3 above.

Approximately 270 locations across the region have led to common soil and groundwater pollutant leaks and so have threatened the safety of drinking water or exposed people to contaminated soil and air. Of these sites, 30% are land disposal sites, 40% are Cleanup Program sites, and the remaining sites consist of leaking underground storage tanks (LUSTs) and military cleanup sites. Common groundwater pollutants are gasoline and diesel fuels near gas stations, as well as substances like pesticides and heavy metals that leak from landfills or burn sites. Land and groundwater that has been contaminated can take years or decades to clean up, leading to water shut-offs, mandatory bottled water deliveries to impacted communities, and public health concerns should exposure go undetected.

Air Pollution

The Redwood Coast region has five mandatory air pollution reporting facilities.[50] These are all located in census tracts with a median household income (MHI) far below the state's median household income of $84,097 and the national median of $69,000. Two of these facilities are within the Humboldt Bay region and may be at risk of sea level rise or flooding events, possibly leading to pollution of the Bay and ocean waters that could pose a risk to ecosystems and public health. Two of these facilities are located on tracts with MHI's below $40,000.

Among non-natural sources, waste disposal and farming operations are the largest emitters of organic gasses. Industry, namely mineral processes, is the largest stationary source of particulate matter. Dust blown from unpaved rural roads constitutes another major source of particulate matter; this is to be expected in rural areas and can be mitigated through paving. Residential use of wood fires for heating and managed burns are also major contributors to overall air pollution. The use of natural gas for heating and cooking is one of the largest area wide pollution sources in the region, suggesting that the region could therefore benefit from residential energy retrofits.

Within the region, wildfires are by far the single most significant contributor to overall air pollution. Of non-natural sources, the dust stirred up along the region's rural unpaved roads contribute substantially to particulate matter emissions. Residential fuel use, particularly wood fires, as well as managed burns are also major contributors to overall air pollution. While indicators of overall air pollution are low relative to state trends, wildfires are a more critical risk for the region compared to

[50] *Major source facilities* are facilities that emit, or have the potential to emit, 100 tons per year or more of any air pollutant, 10 tons per year of any single hazardous air pollutant (HAP), or 25 tons per year of any combination of HAPs. These are considered major sources of pollution and must therefore obtain a Title V permit to operate. Facilities with Title V permits must submit annual compliance certifications and semi-annual monitoring reports to the NCUAQMD detailing the facility's compliance with permit conditions, emission limits, and other applicable air quality regulations.

the state as a whole. Wildfire smoke has been shown to cause respiratory illnesses among sensitive populations and outdoor workers. Moreover, it limits the tourism and recreation industry that fuels many local economies in the summer months.

Lead Exposure in Children

Exposure to lead through lead-based paint in older housing is the most significant source of lead poisoning in children. Children's estimated risk of exposure to lead from housing is elevated in many areas of the region, particularly in the Humboldt Bay area and the more urbanized areas of Del Norte and Mendocino Counties. Moreover, children five and younger in Humboldt and Lake Counties have been found to have elevated blood lead levels compared to the state average (6.7% and 3.3%, respectively, compared to 1.9% statewide).

Greenhouse Gas (GHG) Emissions

Data Limitations

As a community-level GHG emissions inventory was available for Humboldt County only and was more than five years old, the data it contained was scaled using demographic changes and emission trends to obtain an estimate of 2020's emissions. Due to the limitations of this methodology, only findings related to emissions from the Residential, Nonresidential, and transportation sectors are discussed below. Local emissions from the Solid Waste and Water and Wastewater sectors can increase emission totals by varying proportions depending on the presence of treatment plants, landfills, and other sites that emit GHG within a jurisdiction's boundary. These sectors have been omitted from the following analysis due to restraints on normalizing these values.

GHG emission estimates for Del Norte, Lake, and Mendocino Counties were available through Google Environmental Insights Explorer (Google EIE). The methodology used by Google EIE differs from that used by the Sierra Business Council and from that of most consulting firms performing local and regional emissions inventories.[51] Given the lack of available GHG inventories in the Redwood Coast CERF region, utilizing Google EIE provided estimates of regional emission totals and allowed by-sector identification of estimated emission sources. However, due to extensive reliance on estimates in the analysis, the county and regional totals shown below are not exact. Further, the calculation methods and tools used do not align with GHG emission inventory best practices. Therefore, all GHG emissions shown in Figure 4.4 are provided for illustrative purposes only. It is highly recommended that jurisdictions complete comprehensive emissions inventories in order to properly engage in climate action planning. For jurisdictions interested in having a GHG inventory developed, resources are available from CARB, ICLEI, Redwood Coast Energy Authority, and the Schatz Energy Research Center.

[51] Google EIE methodology can be found here.

Figure 4.4 Emissions by Sector

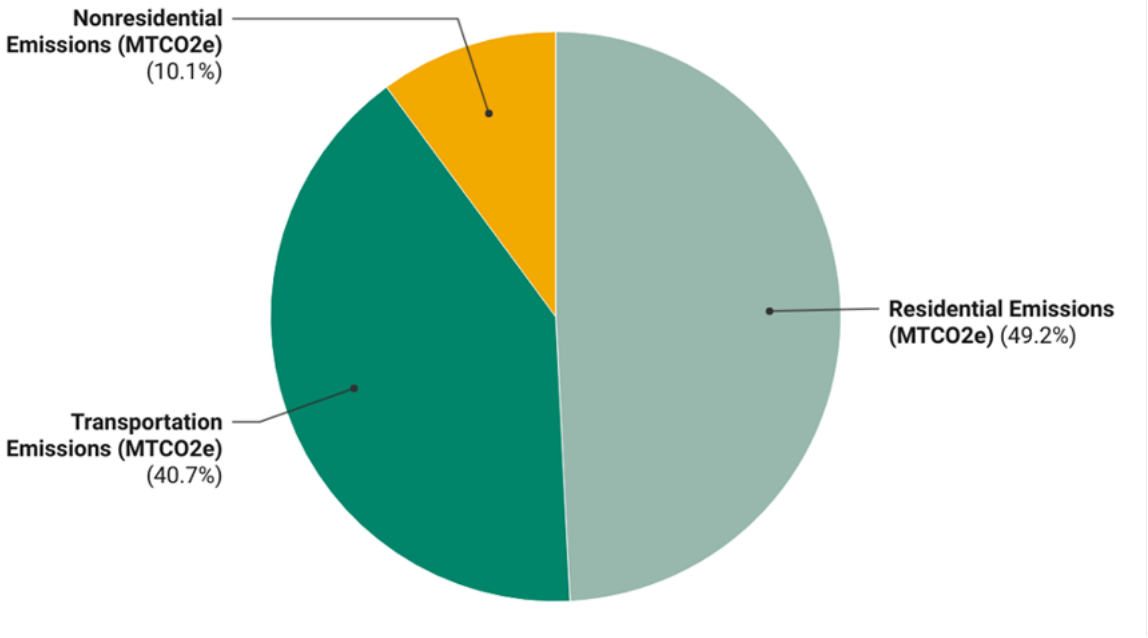


Chart: Sierra Business Council
Source: Local Greenhouse Gas Inventories where available (scaled to 2020 when necessary, Google Environment Insights. Created with Datawrapper)

In California, the Transportation sector is the largest contributor to GHG emissions, and many rural California regions mirror this trend. While the Redwood Coast regional analysis shows the residential sector as the largest contributor to GHG emissions, it should be noted that emissions data from Google EIE tend to show lower proportions of emissions from transportation than do standard-method GHG emission inventories.

Transportation is still heavily reliant on the burning of fossil fuels (e.g., gasoline and diesel), which release large amounts of greenhouse gasses to the atmosphere. In rural areas like the Redwood Region, it is unsurprising that the transportation sector is the source of the vast majority of emissions due to residents' needing to travel further distances to town centers for work and to reach such providers of typical services as schools, grocery stores, and healthcare providers. Rural areas with economies based on natural and working land industries may see even larger percentages of emissions associated with the transportation sector due to the increased use of off-road vehicles and equipment (e.g., farm machinery). Rural regions are also slower to adopt new technologies like electric vehicles (EVs); this may be due in part to local resistance, but is more likely attributable to the lack of EV infrastructure and funding to support a transition, as well as residents' individual cost barriers and cultural resistance to change.

Residential building is typically the second-largest GHG-emission sector in rural regions, owing to their reliance on natural gas and propane as primary fuel sources for home heating. As California begins to mandate cleaner energy sources and a transition to electrification, the region must have access to energy efficiency resources, clean energy workforce development, and funding

opportunities. Additionally, the region's larger energy providers must be able to provide a reliable transmission and distribution infrastructure to ensure that power outages will not disproportionately affect rural communities, where extreme weather conditions have led to the present-day reliance on natural gas and propane for heating and cooking.

Significant Stationary Sources of GHG Emissions

The California Air Resources Board (CARB) requires facilities emitting 10,000 or more metric tons of carbon dioxide equivalent (MTCO2e) to submit annual reports. Only Lake and Humboldt Counties have facilities that meet or exceed these mandatory reporting thresholds for 2020 (see Figure 4.5).[52]

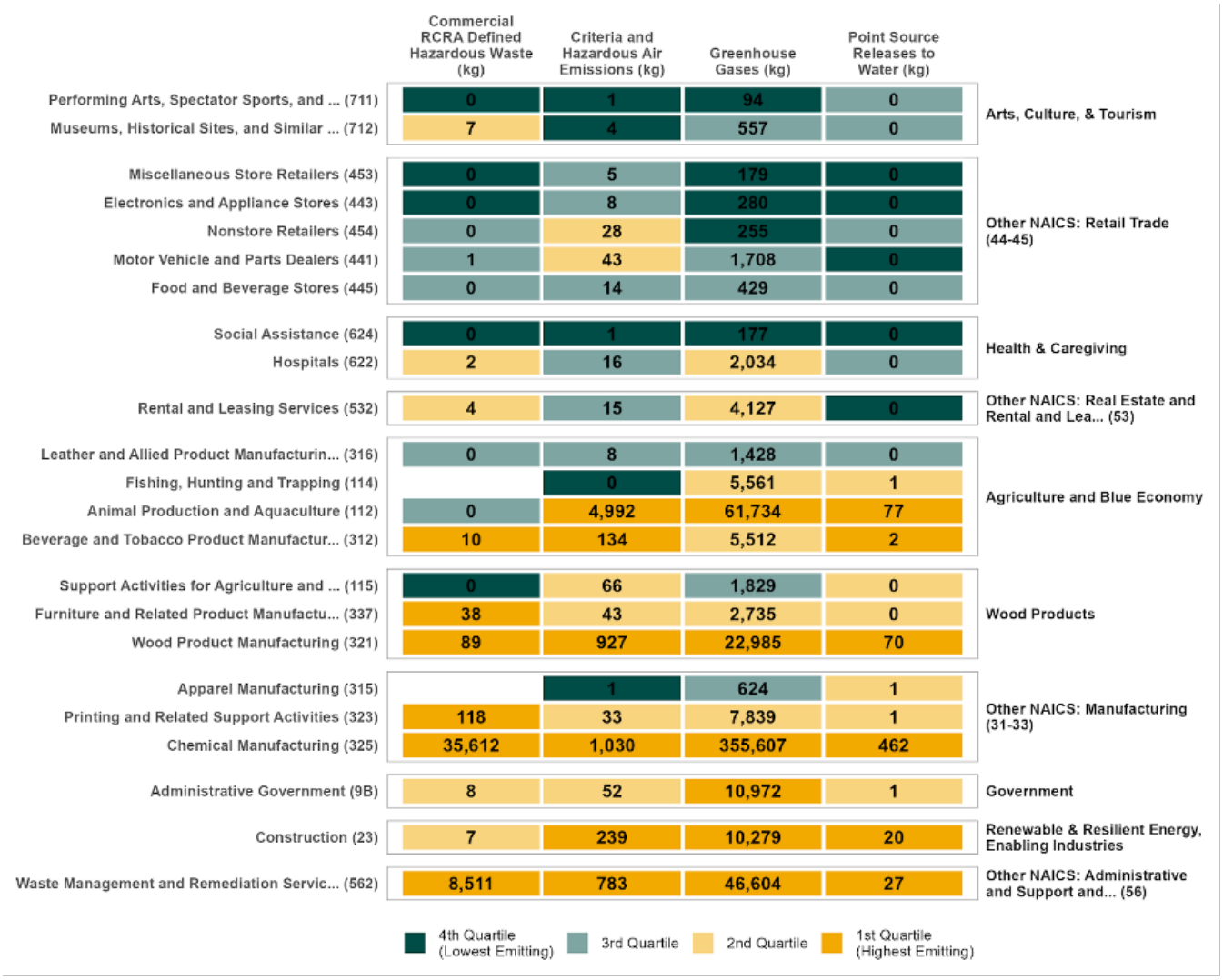
Figure 4.5 CARB Mandatory Reporting Facilities in the Redwood Region (2020)

County	City	Source Name	Emissions (MTC02e)	Year	NAICS	Sector
Lake	Middletown	Calpine - Geysers Power Company, LLC - Geothermal	210,004	2020	221116	Electricity Generation
Humboldt	Samoa	DG Fairhaven Power LLC	16,128	2020	221117	Electricity Generation
Humboldt	Scotia	Humboldt Sawmill Company	295,562	2020	221116	Cogeneration
Humboldt	Eureka	PG&E Humboldt Bay Generating Station	227,214	2020	221112	Electricity Generation
Humboldt	Arcata	The Sun Valley Group	11,532	2020	111,422	Other Combustion Source

Major gaps exist in data related to the region's greenhouse gas emission, highlighting the need for the region to conduct a comprehensive emissions inventory. Available data show that residential energy use, followed by transportation, are the two largest anthropogenic emitters of GHGs in the Redwood Region. However, the largest overall source of GHG in the region is likely to be wildfires. Among the target sectors, data from the Industry Cluster and Labor Market Analysis suggest that, relative to economic value added, the Working Lands and Blue Economy industries have the highest output of greenhouse gas emissions among the RRRISE target industry sectors.

[52] GHG emissions data for facilities emitting over 25,000 metric tons of CO2 equivalents are subject to independent third-party verification by a CARB-accredited verifier. The following facilities were identified using CARB's Pollution Mapping Tool

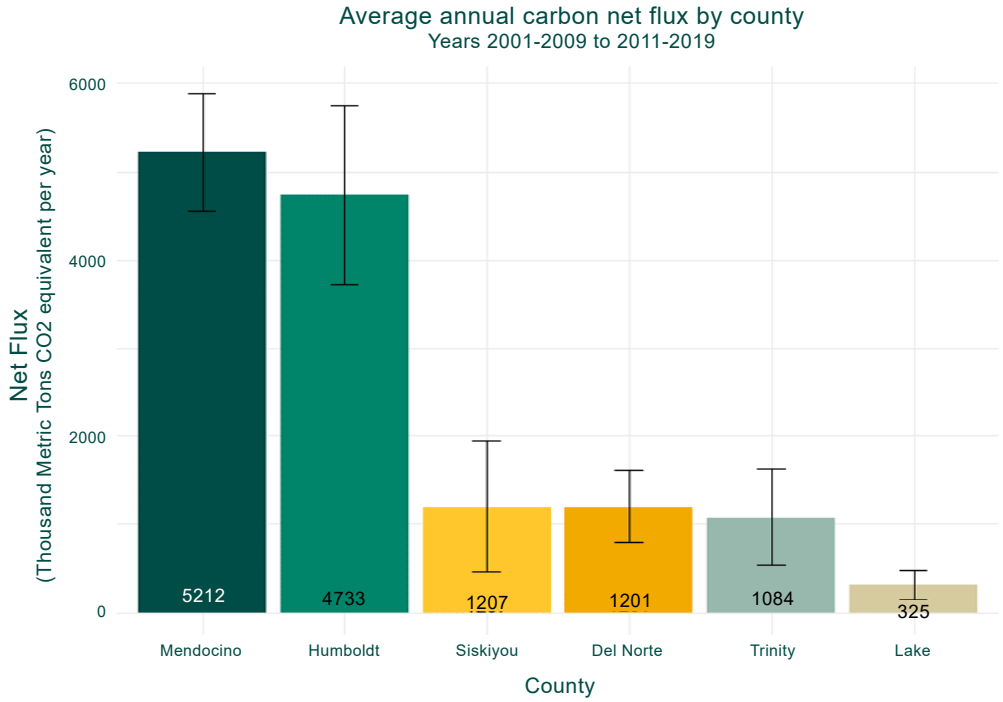
Figure 4.6 Major Sources of GHG Emissions, Air, Water, and Hazardous Waste from Potential Growth Clusters, Emissions (kg) per Job



Note. Data sourced from IMPLAN.

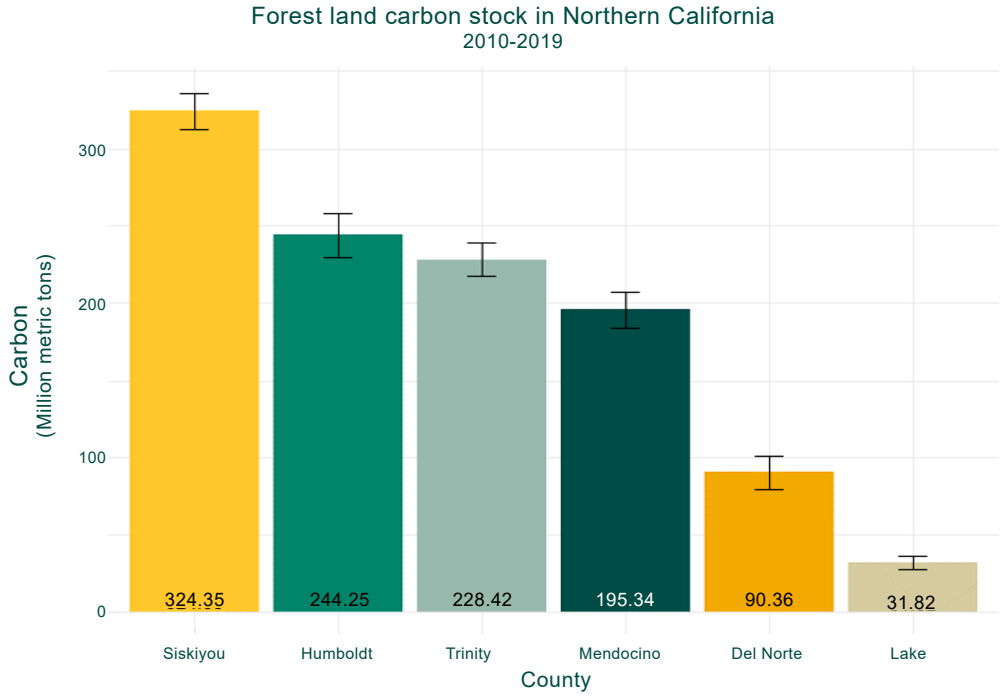
However, the IMPLAN data is sourced from the Environmental Protection Agency (EPA) for their USEEIO Version 2.0 model. This model uses the U.S EPA GHG and Sinks: 1990-2016 data; specifically the Land Use, Land-use Change, and Forestry data. This data does not account for storage of carbon in timber lands, or substitution emissions. The graphs below show more on carbon sequestration and rates in Northern California.

Figure 4.7 Average Annual Carbon Net Flux by County (Years 2001-2009 to 2011-2019)



Note. Data sourced from the California Board of Forestry and Fire Protection. Graph shows the net total carbon sequestration rates per county for all forest pools, including growth, harvest, and mortality. Lines represent the standard error.

Figure 4.8 Forest Land Carbon Stock in Northern California (2010-2019)



Note. Data sourced from the California Board of Forestry and Fire Protection. Graph shows the total rate of carbon in forest land. This combines the carbon in live trees, dead trees, and understory vegetation that are aboveground and belowground, as well as down wood, the forest floor, and soil. Lines represent standard error.

Current and Anticipated Impacts of Climate Change on the Redwood Coast

Analysis of the impacts of climate change on the Redwood Coast was based on evaluation of the following climate indicators to enable future projections:

1. **Annual Cooling Degree Days:** Annual Cooling Degree Days represents the sum of the number of degrees that each day's average temperature is above 65°F (18°C) over the course of a year. The measure is used to estimate the energy demand required for cooling buildings and is an indicator of the degree of cooling needed in a given location based on temperature.
2. **Extreme Heat Days** are an indicator used to measure the annual number of days when a county's daily maximum temperature surpasses a specific threshold, which is typically set at the 98th percentile temperature for that county based on historical data (meaning that the threshold temperature was exceeded on only 2% of days during a historical baseline period). Comparing the number of extreme heat days in a given year or period to that of the historical baseline allows the effect of climate change on the frequency and severity of extreme heat events in a region to be assessed.
3. **Warm Nights** refer to the annual number of nights when the minimum temperature remains above a predetermined threshold, usually the 98th percentile for the county based on historical data. Even in regions with cooler nights and even in summer, tracking changes in nighttime temperatures is crucial for understanding the potential impacts of climate change on the economy and on public health planning.
4. **Annual Average Precipitation:** Measured in inches, this indicator measures the average precipitation per year at the county level; precipitation is measured as liquid or solid water and is averaged over the county's area.
5. **Area Burned:** Measured in hectares, this indicator measures how many acres will burn due to wildfire. This indicator cannot predict where a fire is likely to occur but can enable an overall assessment of how wildfire will affect the local economy, public health, and the health of local ecosystems.

Heat

Recent high-impact wildfires and droughts have been linked to extremes in the Evaporation Demand Drought Index (EDDI).[53] The likelihood of extreme wildfire is based on two-week periods of elevated evaporative demand during the summer and autumn. When the two-week EDDI is above the 95th percentile, it can be used as a proxy for high fire danger days. For the Redwood Region, the historical baseline is approximately five days per season that have a two-week EDDI above the 95th percentile. All models for both the near future and the mid-century show an increase in extreme EDDI days, indicating more high fire danger days. The mid-century model shows a consistent increase of over 400% (nearly five times the historical baseline) across the entire region, with Del Norte and Humboldt having more extreme EDDI days than the more southern counties in the region.

[53] *Evaporative demand* can be thought of as how "thirsty" the atmosphere is and how much moisture evaporates over a period of time. Increasing air temperature is the leading cause of increased evaporative demand for inland regions, whereas humidity has more of an overall influence on coastal regions (Sierra Business Council).

Wildfires

These factors are expected to increase atmospheric evaporation, leading to drier conditions and increased wildfire risk. Across the region, summertime high fire-risk days and total wildfire area burned are expected to increase markedly by midcentury, exacerbating an already heightened risk to health, life, and property. Total wildfire burn area is expected to rise between 29% in Lake County and to increase as much as 213% in Del Norte County. Statewide, wildfires were the second largest contributor to GHG emissions in 2020, offsetting previous efforts to reduce GHG emissions (Jerrett et al., 2022).

Sea Level Rise

Coastal communities in Del Norte, Humboldt, and Mendocino counties are projected to experience varying impacts of sea level rise. Coastlines such as areas around Crescent City that have low slopes are particularly vulnerable, where even a small level of sea level rise can result in a substantial loss of shoreline. Crescent City will likely see a sea level rise of up to six inches by 2050. Even with extensive global GHG emissions reduction, most projections view the rise through 2050 as inevitable due to legacy emissions. Consequently, beaches with low gradients, like Crescent Beach, could see nearly 100 feet of shoreline lost to sea level rise by 2060.[54]

The land around Humboldt Bay is subsiding (sinking), possibly amplifying the relative rate of sea level rise in the area. The North Spit is expected to experience the most significant sea level rise in the Redwood Coast region and is considered one of the most high-risk tidal ranges along the West Coast. The coastal dune habitat along the North Spit could increase coastal resilience in the region if it is restored and maintained. On Mendocino's shores, Arena Cove can expect to see up to a foot of sea level rise by 2050, possibly leading to a loss of shoreline near the Point Arena Pier and causing erosion along the sea cliffs. Loss of shoreline in the Arena Cove area would lead to limited public and commercial access, and the Mendocino coastline with its gentle slopes could see over 100 feet of shoreline lost by 2060.

The Coastal Act, which was adopted by the California Coastal Commission (the Commission) in 1976, requires 61 cities and 15 counties in California to prepare Local Coastal Programs (LCPs) that are meant to govern land development, use, and resources in the coastal zone inland of the mean high tide (California Coastal Commission: Sea Level Rise Policy Guidance, 2024). Recently, a new bill was passed that requires local governments to have updated sea level rise adaptation plans in their LCPs by 2034. The purpose of having sea level rise adaptation plans in LCPs is to promote sustainable economic growth while also taking into account public safety and protecting coastal resources, such as recreation areas or coastal habitats. However, as of this report only three out of fourteen LCPs in the North Coast Region have been updated to discuss sea level rise and climate change. Those LCPs are from the City of Crescent City, the City of Eureka, and the Humboldt Bay Area Plan. Each document provides guidance on sea level rise hazards, based on current climate change analysis, and guidelines for how local infrastructure should consider future sea level rise when building near the coast (City of Eureka Coastal Land Use Plan, 2023; Crescent City Harbor: Coastal Land Use Plan, 2020; Humboldt Bay Area plan, 2022). The other eleven LCPs do not discuss sea level rise or climate change, and this could potentially lead to critical loss of infrastructure and coastal resources.

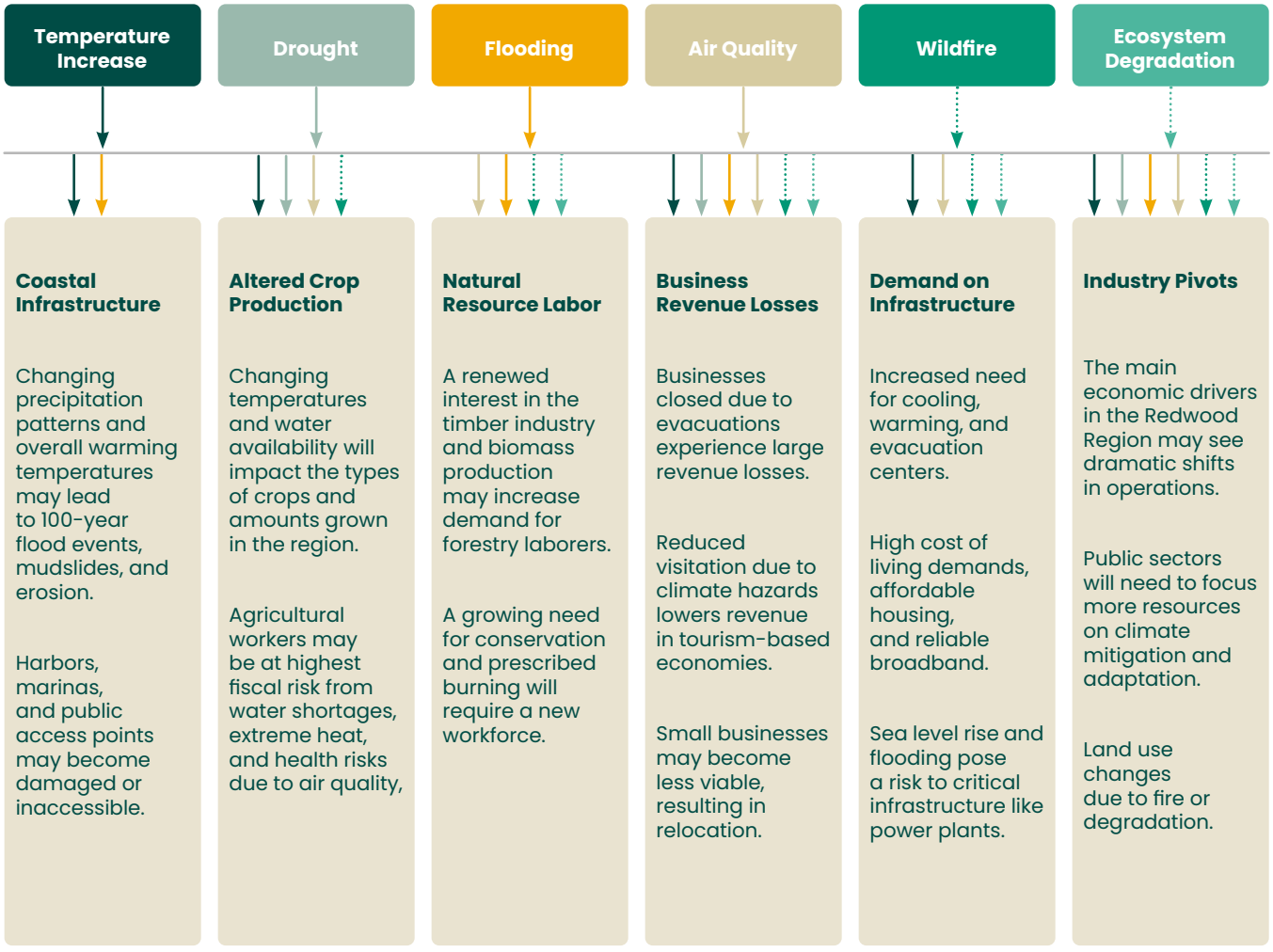
[54] It is typically assumed that one inch of sea level rise will cause about 100 inches of shoreline loss, depending on beach slope; https://science.nasa.gov/earth/climate-change/cant-see-sea-level-rise-youre-looking-in-the-wrong-place/

Landslides

An intensity of rainfall during wet seasons will increase the likelihood of flooding and landslides within the region. Landslides threaten residents and housing, as well as critical infrastructure, including but not limited to transportation networks, water and sanitation systems, and communication networks. Landslides can negatively affect the habitats of local wildlife. For example, elevated sediment deposits due to landslides may accumulate in streams or rivers. These deposits can degrade spawning habitats for fish and reduce the diversity of their food source (California Energy Commission et al., n.d.), a potential threat to the Working Lands and Blue Economy sector.

Figure 4.9 below provides a summary of the effects climate change can have on the region over the near to long term.

Figure 4.9 Economic Risks and Losses Related to Climate Change on the Redwood Coast



Additional impacts on the region's targeted industries include:

Arts, Culture, and Tourism

- Degradation of culturally important landmarks, sites, and infrastructure.
- Flooding, wildfires, and algae blooms may decrease tourism.

Health and Caregiving

- Increased need for healthcare during extreme events (e.g., wildfires, floods, heat).

Renewable and Resilient Energy

- Increased need for building cooling during heat waves.
- Need for reliable energy sources during heat waves, wildfires, and storms.
- Sea level rise-caused damage to infrastructure.

Working Lands and Blue Economy

- Changing weather patterns impact agricultural and natural resource productivity. Droughts impact crop production and wildfire poses risk to all land-based industries (including ash damage to vineyards).
- Sea level rise and algae blooms may disrupt maritime industries.

Impacts on Disinvested Communities

Redwood Region communities are especially vulnerable to climate change due to geography and environment, lack of resources and essential services, and underrepresentation of at-risk populations. These sparsely populated communities tend to be defined by low-tech, outdoor and service-based jobs, and traditional values, where people of color, people with disabilities, and families in poverty are present but often exist as hidden populations. These data constraints have led to less state and federal funding (disinvestment) and greater disparities in levels of climate change adaptation planning.

The populations shown in Figure 4.10 may see the most impacts from climate change hazards. Young children, seniors, and people with disabilities are at higher risk of physical impacts from climate change due to their reduced physical and (in some cases) mental capacities, owing to age, illness, or isolation; many may be reliant on caregivers and medical equipment. Power outages can cause great physical stress on communities reliant on air conditioning, refrigeration of medicines, electrically powered medical equipment, and other powered products. Additionally, these groups are less likely to be able to evacuate without assistance.[55]

People experiencing poverty and those unable to work are more likely to face economic barriers to climate adaptation from, for example, inadequate shelter or lack of mobility during extreme weather events. Growing populations of under-resourced groups in the Redwood Region can lead to lowered community resilience, an increased need for climate planning, and increased social services.

[55] https://www.epa.gov/climateimpacts/climate-change-and-human-health-whos-most-risk

Most of the impacts felt by climate hazards will be similar across vulnerable populations (see Figure 4.10).

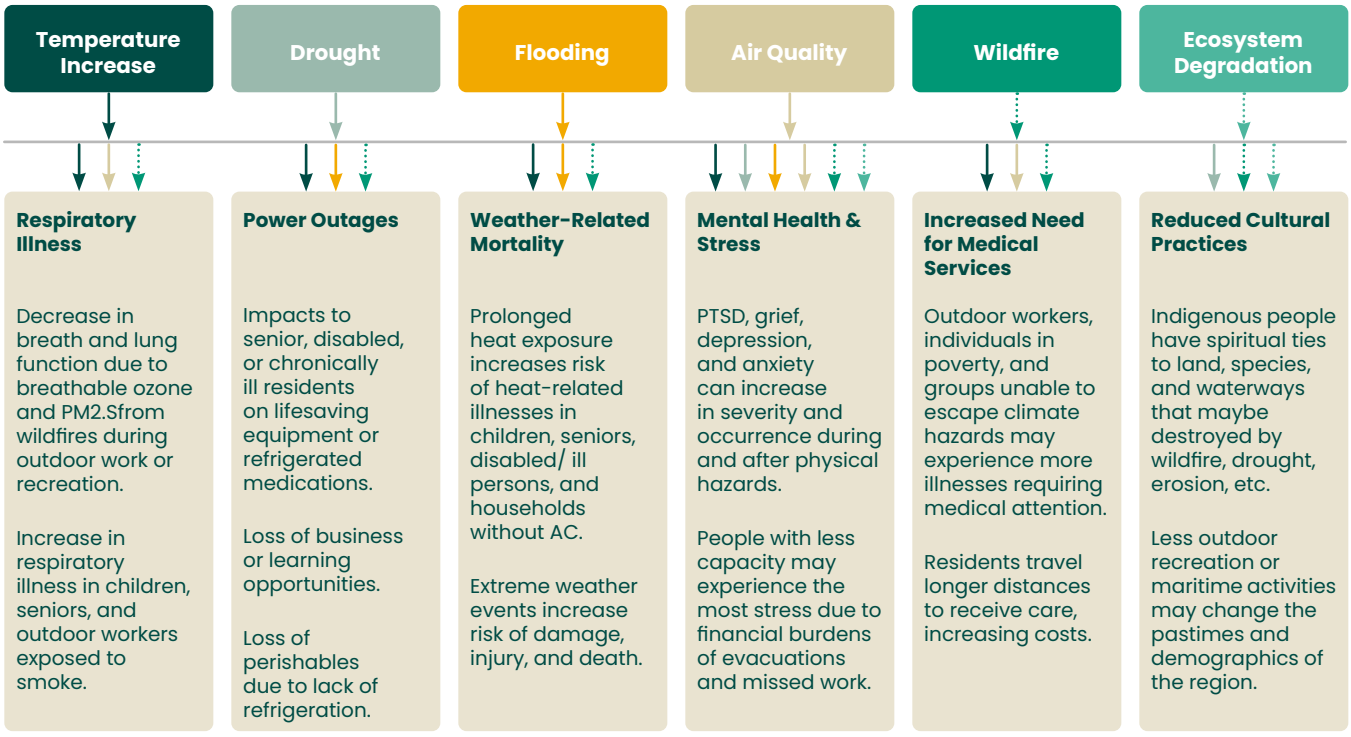
Figure 4.10 Populations at Risk of Adverse Impacts from Climate Change

Population	Number of People	Percent of Total Population	Critical Risks
Under 5	17,421	5.4%	Extreme heat, air quality
Over 65	65,563	32.9%	Extreme heat, air quality, reduced evacuation ability
People of color	79,956	64.6%	Extreme heat, air quality
People in poverty	56,819	17.8%	Extreme heat, air quality, reduced evacuation ability, water shortages (i.e., dry wells), extreme precipitation events
Nonworking people (aged 16-64)	58,611	29.4%	Extreme heat, air quality, reduced evacuation ability, water shortages (i.e., dry wells)
Households with no car	8,104	6.6%	Extreme heat, air quality, reduced evacuation ability, water shortages (i.e., dry wells), extreme precipitation events
People with disabilities	58,697	18.4%	Extreme heat, air quality, reduced evacuation ability, power outages
People without health insurance	25,042	7.9%	Extreme heat, air quality

Various Total Populations were used based on population type. For example, the percent of households with no car is based on the total number of households in the Redwood Coast Region and not the total population.

Table: Sierra Business Council. Source: US Department of Commerce. 2022. Census Bureau, American Community Survey Office, Washington, D.C. Created with Datawrapper.

Figure 4.11 Climate Impacts on Vulnerable Populations



Tribal populations within the region disproportionately face several climate-related threats, including food and water insecurity, limited access to traditional foods, and loss of culturally vital plant, fungi, and wildlife (Bull Bennett, et al.). Impacts on freshwater resources are a particular concern for Tribal communities that depend on them for drinking water, fisheries, and cultural activities. In addition, climate impacts to culturally significant species and habitats can detrimentally affect social and cultural components to Tribal communities (California Energy Commission et al., n.d.).

Environmental Leadership in the Region

The Redwood Region's original inhabitants have a long history over many millennia of living resiliently and sustainably in the lands and on the coastlines of the Redwood Region. As noted elsewhere in this report, many of the region's Tribes are now regional leaders in innovative environmental restoration and resilient living. In addition, both Tribal and non-Tribal leaders are working to re-integrate "traditional ecological knowledge" into environmental management practices that are often based solely in Western models of science and ecological understanding. The environmental leadership provided by the Redwood Region's Tribes has been transformative, showcasing the power of integrating indigenous knowledge and values into today's restoration and conservation efforts.

The Klamath River Restoration Agreement, a historic accord signed in 2010 by the Yurok, Karuk, and Klamath Tribes and federal and state agencies, has succeeded in removing four dams on the Klamath River. The project is working to restore salmon runs, improve water quality, and further showcase the Tribes' commitment to watershed and bioregional health. The Yurok Tribe has also been a leader in sustainable forestry practices, developing a forest management plan that prioritizes the long-term health of their ancestral lands while providing economic opportunities for the Tribe (*Environmental Department, Yurok Tribe*, n.d.). The Hoopa Valley Tribe has implemented a carbon sequestration project, utilizing their forestlands to absorb and store atmospheric carbon dioxide (*Hoopa Valley Land Management, Tribal EPA/Realty*, n.d.). Scotts Valley Tribe is currently developing an innovative biomass to energy project, among other renewable energy and sustainability initiatives.

Tribes have been instrumental in promoting environmental education and cultural preservation. The Round Valley Indian Tribes have established the Eel River restoration project, which engages Tribal youth in hands-on environmental restoration work while teaching them about their cultural heritage (*Education — ERRP*, n.d.). The Yurok have been at the forefront of efforts to reintroduce the critically endangered California condor to the Redwood Region, with the first birds released in 2022 as part of the Yurok Condor Restoration Program.[56]

The Blue Lake Rancheria (BLR), a federally recognized Tribe in Humboldt County, has emerged as a leader in renewable energy and community resilience through its development of the Blue Lake Rancheria community-scale microgrid. The microgrid, which was commissioned in 2017, is a state-of-the-art, low-carbon energy system that integrates solar photovoltaic (PV) panels, battery storage, and advanced control systems to provide reliable, sustainable power to the Tribe's critical infrastructure (*Blue Lake Rancheria Microgrid – Schatz Energy Research Center*, n.d.).

In addition to the region's indigenous populations, the region also has a post-settlement history of environmental leadership and activism—stemming in no small part from the region's natural beauty, which has inspired generations of individuals and organizations located there to champion

[56] REF

conservation efforts. From the early days of the Save the Redwoods League to the "back-to-the-landers" movement in the 1960s and 1970s, which saw an influx of environmentally conscious individuals seeking to live off the grid and in harmony with nature, to the present-day initiatives aimed at protecting the region's unique biodiversity, the Redwood Region has been at the forefront of progressive environmental stewardship.

Several notable organizations have played pivotal roles in shaping the environmental landscape of the Redwood Region. In Humboldt County, the Environmental Protection Information Center (*EPIC*), founded in 1977, has been a stalwart defender of the region's ancient forests, working tirelessly to protect old-growth redwoods and advocate for sustainable forestry practices (*EPIC: Environmental Protection Information Center,* n.d.). Similarly, the North Coast Environmental Center, established in 1971, has been instrumental in promoting environmental education, monitoring water quality, and engaging in conservation efforts throughout the region (*History | NEC*, n.d.). These organizations, along with numerous other grassroots groups and community-based organizations (CBOs), have been integral to the preservation of the Redwood Region's natural heritage.

Lake County has been a leader in sustainable agriculture, with a thriving organic farming community and innovative programs like Lake County Farmers' Finest, which promotes locally grown produce and supports small-scale farmers (*Lake County Farmers' Finest*, n.d.). Mendocino County has a long history of environmental activism, with organizations like the Mendocino Land Trust working to protect the county's unique coastal and inland ecosystems through land conservation, habitat restoration, and public access initiatives. Additionally, the county has been a leader in the development of sustainable forestry practices, with the Mendocino Redwood Company implementing selective harvesting and restoration forestry techniques that prioritize the long-term health of the forest ecosystem (*Our Story | Humboldt Sawmill*, n.d.).

The Redwood Region has benefited from the presence of educational institutions that prioritize environmental studies and sustainability. College of the Redwoods (CR), Mendocino College (MCC), and Cal Poly Humboldt (CPH) have all developed robust programs and initiatives focused on environmental education (science, engineering, planning and policy, etc.), research, and community engagement. From cutting-edge research in such areas as sustainable forestry and clean energy to innovative community outreach programs, these educational institutions continue to play a crucial role in shaping the future of environmental leadership in the Redwood Region (*Environmental Science & Management*, n.d.).

Chapter 5

Public Health Analysis

This chapter explores the social determinants of health and the disparities experienced by the region's communities, drawing connections to the economic and environmental factors that influence health outcomes.

Key Takeaways

- The Redwood Coast region experiences higher age-adjusted mortalities than the state as a whole across most causes of death, especially unintentional injuries, all forms of cancer, drug-induced deaths, chronic lower respiratory disease, lung cancer, chronic liver disease and cirrhosis, suicide, motor vehicle traffic crashes, coronary heart disease, prostate cancer, and firearm-related deaths. The proximate risk factors for these are smoking, substance use, and poor mental health. These issues particularly affect specific populations in the region—people of color, people over the age of 50, and lesbian, gay, and bisexual individuals.
- Complex and interrelated social and community factors are observed with respect to disability rates, high reported Adverse Childhood Experiences (ACEs), poverty and attrition from the workforce, lower educational attainment, loneliness and isolation, and other factors that are pervasive and disproportionately impacting priority communities.[57]

Key Metrics

- **Age-adjusted mortality rates:** Compare mortality rates for major causes of death in the region to state averages to identify areas of concern and track progress over time.
- **Prevalence of proximate risk factors:** Monitor rates of smoking, substance use, poor mental health, and other key risk factors that contribute to the region's high mortality rates.
- **Socioeconomic disparities:** Track poverty rates, educational attainment, and other social determinants of health by race, ethnicity, and geography to identify communities facing disproportionate barriers to health and well-being.
- **Healthcare access barriers:** Assess the prevalence of health professional shortages, delays in accessing care, and unmet health needs, particularly among low-income and mentally ill populations.

[57] The outreach and engagement team's Insights Report offers qualitative insights into the relationship between these phenomena. Participants highlighted socioeconomic factors but also a desire for greater community cohesiveness, better relationships, and social belonging.

Conceptual Framework

The conceptual framework discussed in this section was inspired by the Bay Area Regional Health Inequities Initiative (BARHII) framework, which posits a flow from upstream factors such as social, living environment, and institutional inequities to such downstream factors as health behaviors, diseases, and ultimately mortality rates (BARHII).

To maintain focus on the most salient health determinants, this chapter works backwards from these upstream disparities in health outcomes, looking first at regional disparities in mortality rates, diseases, and disabilities to identify where disparities exist between the region and state averages, such as those in lung cancer rates. This analysis yielded a set of health outcomes for which a significant adverse disparity exists between the region and the state. Identifying these enabled a focused approach to identifying immediate or "proximate" downstream factors contribute to these disparities, such as health behaviors like tobacco use.

The analysis then moves further upstream to identify deeper factors (i.e., institutional, economic, and/or social ones) that may contribute to disparities in proximate risk factors, the role of poverty in tobacco use, for instance. It considers the potential for direct relationships between health and these deeper factors, e.g., that between poverty and chronic stress. Because of the complexity of such factors, focus is maintained on those commonly raised in the region's community health assessments. Lastly, the report examines health consequences from environmental factors, such as wildfires.

Wherever possible, data sources that include all four counties were sought and used. The California Health Information Survey (CHIS) data include only Humboldt, Mendocino, and Lake counties (referred to in these visualizations as HML). Del Norte is aggregated with a broader seven-county California region, so inclusion of Del Norte would unfortunately substantially skew the data for the region.

Health Disparities on the Redwood Coast

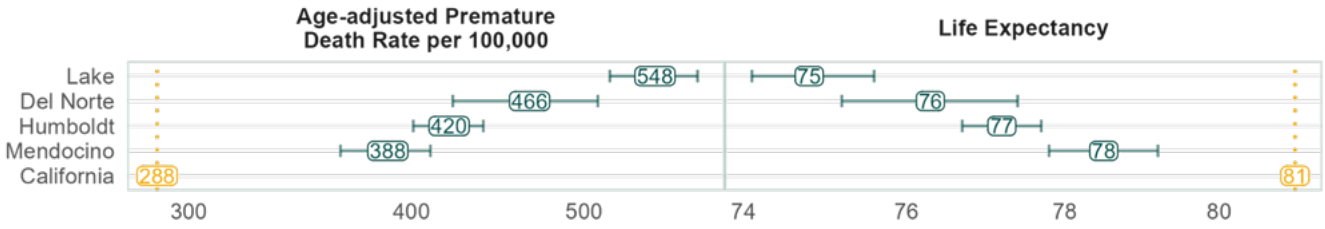
Life expectancy is a fundamental metric that reflects a broad spectrum of health factors, indicating the cumulative influence of wide-ranging health determinants. Disparities in life expectancy, therefore, serve as a good starting point for uncovering signals of disparities in health determinants between geographies and populations. Across the region, life expectancy at birth is significantly lower, and age-adjusted premature deaths per 100,000 significantly higher, than the statewide average. Figure 5.1 provides regional premature death and life expectancy rates by county, and Figure 5.2 displays a breakdown of these rates by race and ethnicity.[58]

Additional data indicate that premature death is elevated among AIAN communities in the Redwood Coast region compared to the overall state total (County Health Rankings and Roadmaps, 2023), signaling significantly higher age-adjusted premature death among white populations, given their size compared to the state average, as well as the overall state total. Additionally, Asian populations experience rates of premature death largely consistent with the overall state average, but significantly higher than the state averages for their respective population sizes. On the other hand, the region's Hispanic population experiences rates of premature death and life expectancy consistent with or

[58] Defined as the number of deaths occurring before age 75 per 100,000 population.

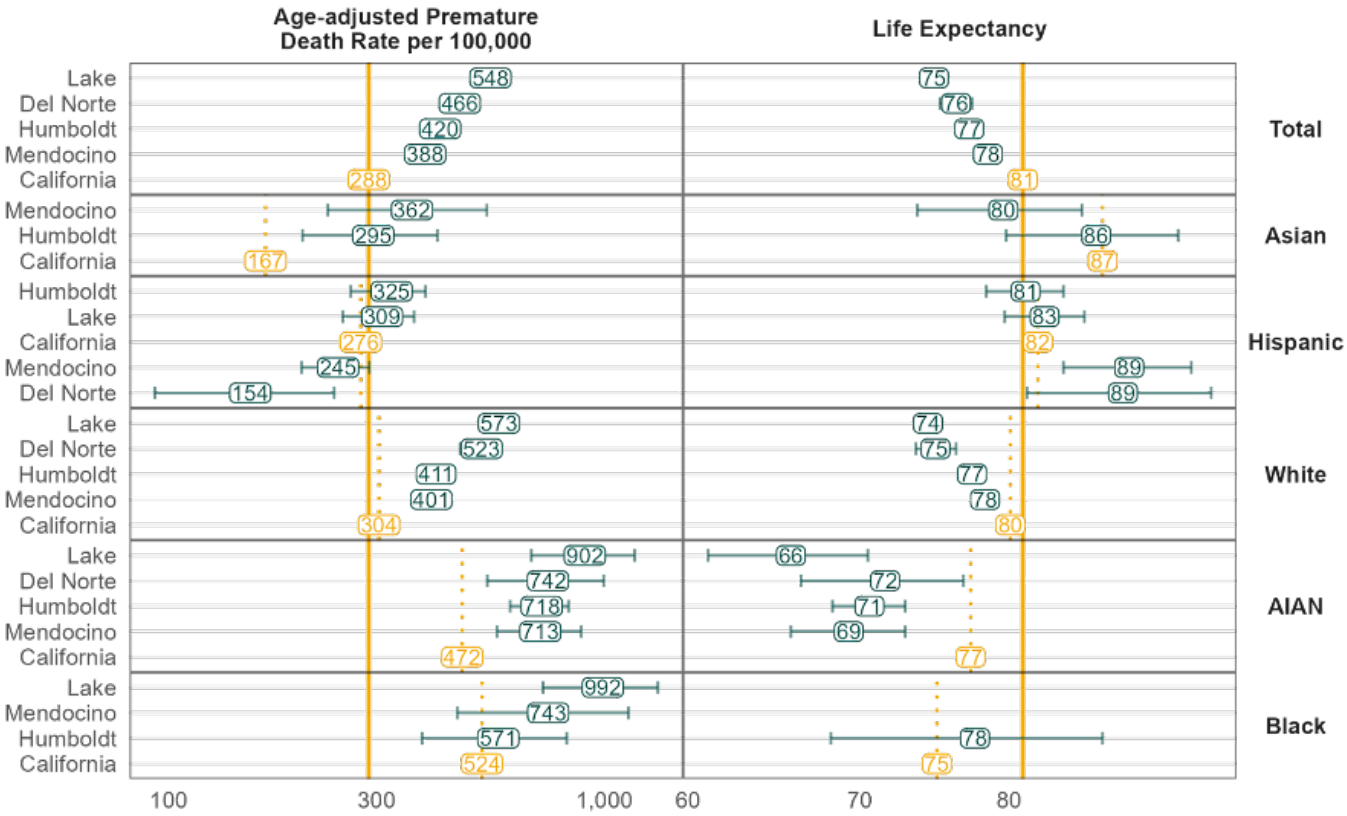
superior to both the state average for this population and the overall state population. Disaggregating mortality rates by cause of death allows for a targeted examination of the determinants of health that specifically contribute to the elevated rates of premature death and lower life expectancy within the region.

Figure 5.1 Premature Death and Life Expectancy (2018-2020)



Note. Data sourced from CHRR.

Figure 5.2 Premature Death and Life Expectancy by Race and Ethnicity (2018-2020)



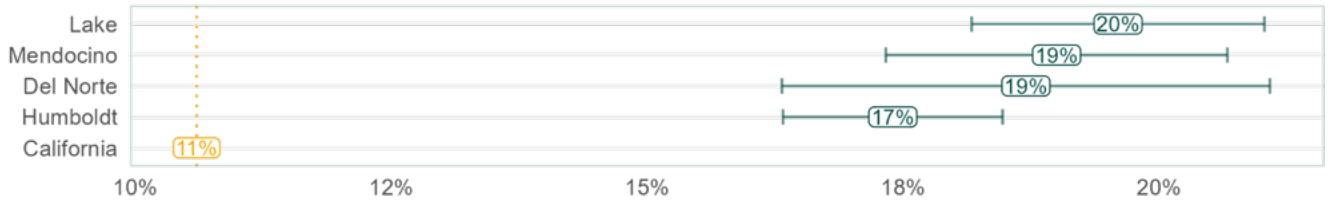
Note. Data sourced from the County Health Rankings & Roadmaps.

The data show a clear regional pattern of substantially higher death rates than those for the state as whole in several categories, including unintentional injuries, all cancer types, drug-induced deaths, chronic lower respiratory disease, lung cancer, chronic liver disease and cirrhosis, suicide, motor vehicle traffic crashes, coronary heart disease, prostate cancer,[59] and firearm-related deaths (California Department of Public Health (CDPH), 2022).

[59] Per 100,000 males.

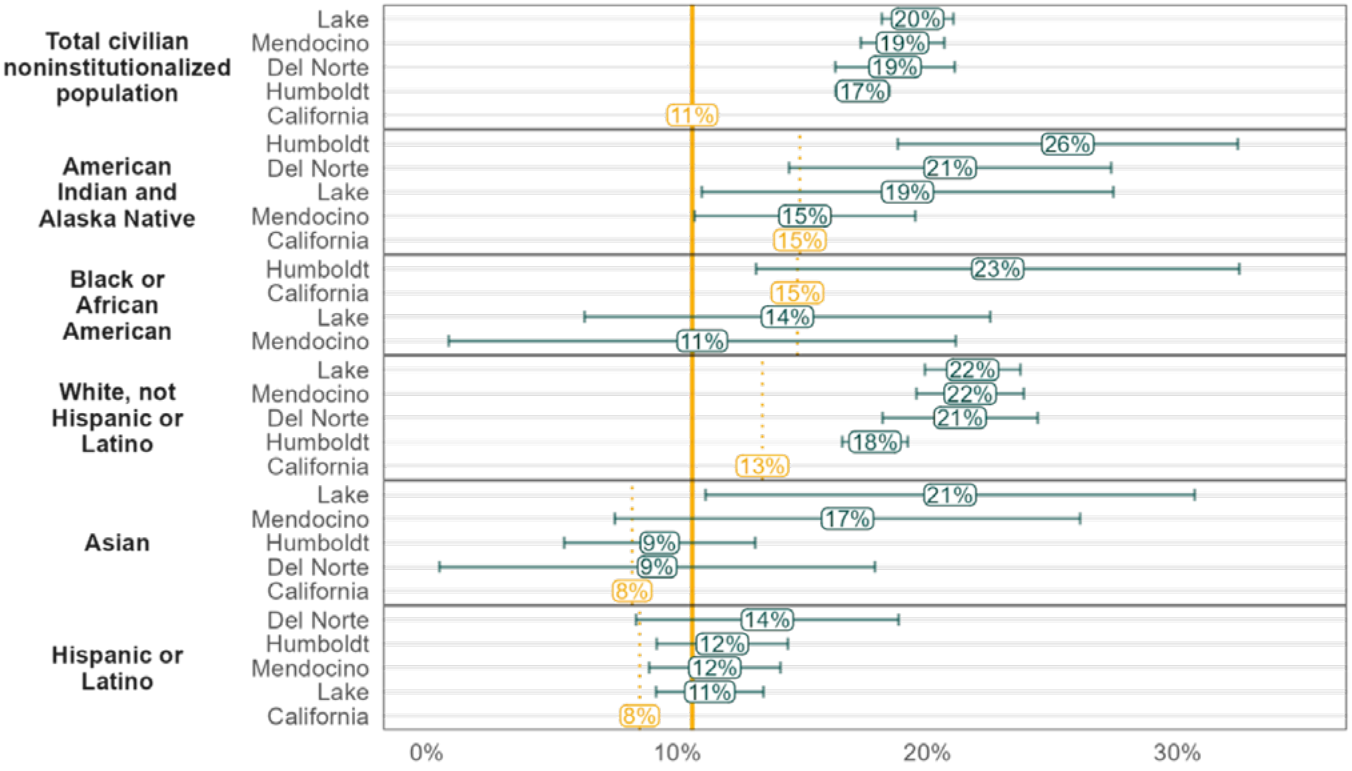
Disability and chronic illness: The data[60] reveal moderately elevated rates of asthma, heart disease, and obesity in the region, although these data do not include Del Norte (CHIS).[61] Conversely, rates of diabetes and high blood pressure are similar to or lower than the state averages. As shown in Figure 5.3, disability[62] rates for the region are higher than those for the state. While the aging population is a contributing factor, even individuals aged 18 to 34 are experiencing disability rates significantly higher than the state average, suggesting that factors beyond the aging population play a role in the region's elevated disability rates. The next section further explores potential factors contributing to this phenomenon.[63]

Figure 5.3 Disability Rates (2017-2021)



Note. Data sourced from the U.S. Census Bureau (2022).

Figure 5.4 Disability Rates by Race or Ethnicity (2017-2021)



Note. Data sourced from the ACS. Missing data or estimates with confidence intervals that include zero are excluded from the visualization.

[60] County-level morbidity data are relatively limited when compared to mortality data, highlighting data gaps in understanding health disparities in rural areas. To address these limitations, both CHIS and CDC PLACES datasets are employed to identify signals of health disparity.

[61] All CHIS data include only Humboldt, Mendocino, and Lake counties.

[62] Including both physical and mental health disabilities.

[63] Appendix C presents disability rates by race and ethnicity.

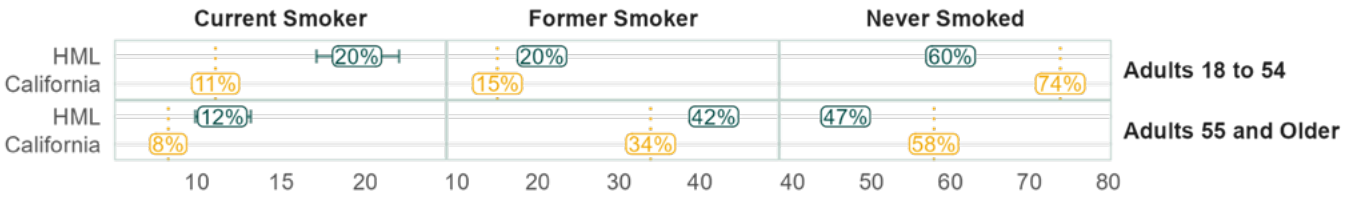
It is important to consider differences in disability rates and other health factors by race or ethnicity in the context of age, as differences in a population's age structure can strongly influence differences between the disability rates of populations. Consistent with national and state trends, Latino households are substantially younger compared to the general population. On the other hand, the non-Hispanic, white community is substantially older compared to the general population (CHIS). Therefore, a greater level of age-related disparities in health outcomes would be expected for the non-Hispanic white population whereas a lower level of such disparities would be expected for the Hispanic population.

Proximate Risk Factors

This section explores the potential factors contributing to the health disparities between the region's Redwood Coast region and the state, as identified in the previous sections. A more comprehensive analysis of the underlying factors (e.g., poverty) potentially related to these proximate risk factors are explored in the following section.

Smoking: As shown in the previous section, evidence demonstrates higher mortality rates among the region's residents from cancer, lung cancer, chronic lower respiratory disease, and heart disease than the state averages. One explanation could be the significantly and substantially higher smoking rates across the region shown in Figure 5.5. Notably, the proportion of current smokers among adults aged 18 to 54 in the Redwood Coast region (labeled as HML in the figure) is nearly double the state average (CHIS). This striking disparity indicates that smoking may play a crucial role in explaining and addressing the region's elevated rates of cancer, lung cancer, and respiratory illnesses.

Figure 5.5 Smoking Rates (2011-2022)



Note. Data sourced from the CHIS.

Heart Disease: The primary risk factors for heart disease include high blood pressure, high low-density lipoprotein (LDL) cholesterol, diabetes, unhealthy diet, physical inactivity, obesity, smoking, and exposure to secondhand smoke (CDC, 2022). The available evidence indicates that rates of high blood pressure, high cholesterol, and diabetes in the region are comparable or superior to state averages. Additionally, although limited in scope, that data suggest that diets in Humboldt, Mendocino, and Lake (HML) counties are on par with or, in some cases, healthier than the statewide average, and indicators of physical activity in these counties are similar or superior to statewide averages (CHIS).[64] While the data for Del Norte are more limited, they suggest that food access in Del Norte is more limited and rates of physical inactivity are somewhat higher there than in the rest of the region. However, while diet and exercise may be contributing factors for Del Norte County, the data suggest that obesity and smoking play a key role in the prevalence of heart disease regionwide.

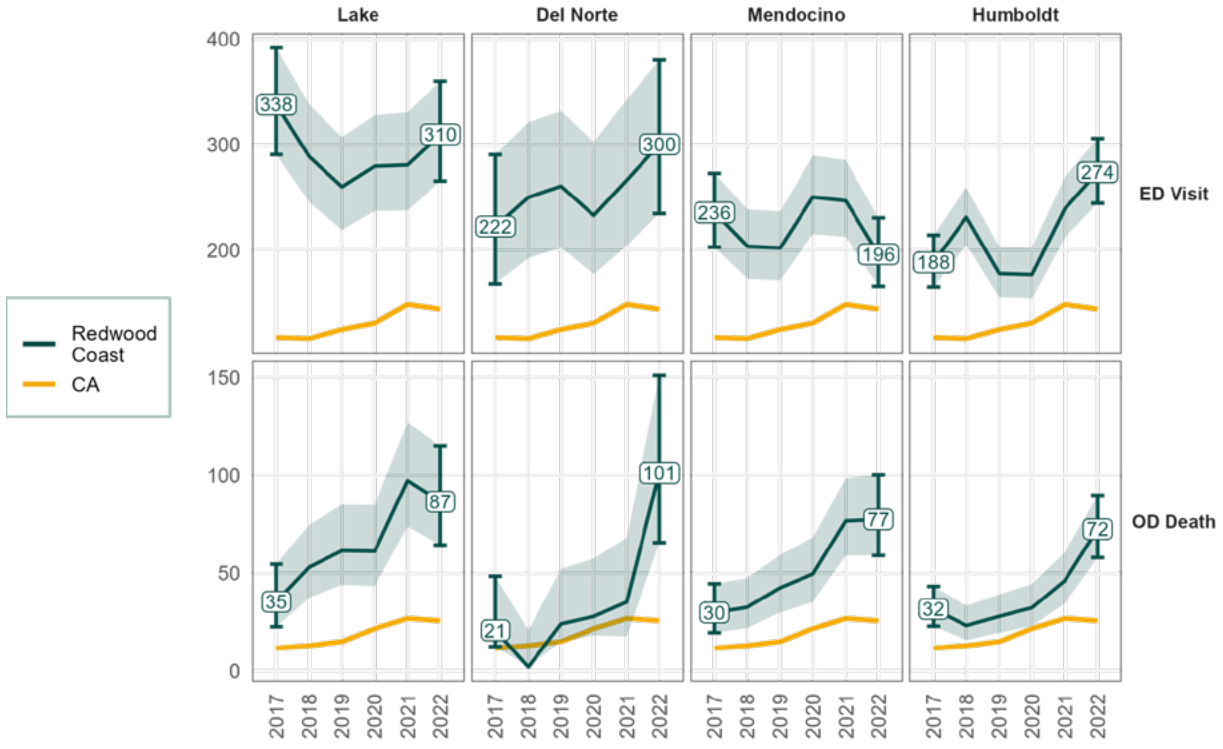
[64] Data for Del Norte are more limited, but the available data do not rule out diet and physical inactivity as contributing factors to the disparity in heart disease between Del Norte and the state.

Mental Health and Substance Use: As previously identified, the region exhibits elevated rates of accidental (i.e., unintentional) injuries, drug-induced deaths, motor vehicle accidents, liver disease, suicides, and firearm-related deaths. The analysis presented below suggests that these disparities in health outcomes align closely with the heightened prevalence of mental health challenges and substance use-related issues within the region, challenges that may also help to explain the elevated rates of disability also observed there.

The category of unintentional injuries includes unintentional poisoning and drug overdose, alcohol poisoning, motor vehicle accidents, and other unintentional injuries. Nationally, unintentional poisoning, including drug overdoses, has emerged as the leading cause of death within the unintentional injury category, a trend that began in the mid-1990s. However, since the mid-1990s and continuing to the present, unintentional poisoning deaths, particularly from drug overdoses, have risen sharply. As of 2021, nationwide data indicate that poisoning accounted for more than half of all unintentional injury deaths, followed by motor vehicle accidents (CDC).[65] Consequently, the region's elevated rates of drug-induced and motor vehicle deaths likely contribute substantially to the higher prevalence of unintentional injury deaths within the region.

As shown in Figure 5.6 below, drug-induced deaths began rising sharply in the Redwood Coast region starting around 2018, which the fentanyl epidemic has exacerbated in recent years. Statewide, fentanyl deaths began rising exponentially starting around 2017 and now account for over half of statewide overdose deaths. Similarly, fentanyl deaths have also increased exponentially in the Redwood Coast region and now account for roughly half of all drug overdose deaths.

Figure 5.6 Age-Adjusted Drug Overdose Rate per 100,000 (2017-2022)



Note. Data sourced from the CDPH's "California Overdose Surveillance Dashboard." Shaded regions and bars represent confidence intervals. Confidence intervals were provided by the data source. ED=Emergency Department. OD=Overdose

[65] A 2019 report for Humboldt County reported findings that indicate a similar trend, with the largest component being overdose, followed by motor vehicle crash injury deaths (County of Humboldt, Department of Health and Human Services, 2019). Also, according to this report, most of the disparity between the region's unintentional injury mortality rate and that of the state is attributable to these two causes of death.

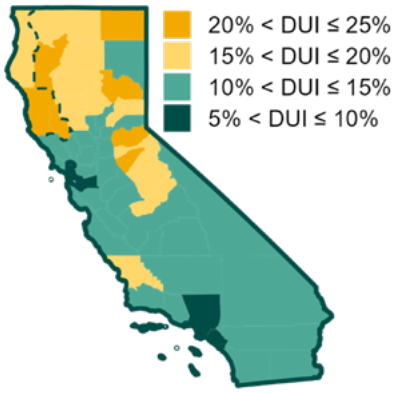
Rates of liver disease mortality have increased in recent years statewide; in the Redwood Coast region, this increase is occurring faster than in the state as a whole in all but Humboldt County, highlighting the urgency of addressing this worsening trend.[66] Multiple data sources collectively point to higher rates of excessive drinking in the region compared to the state (CHIS; CHRR). Although CHIS data related to binge drinking are somewhat limited, at least one heavy drinking variable in the CHIS data indicates high rates of binge drinking.[67]

Motor vehicle mortality rates are sharply elevated across the region. Traffic safety ranking data from the California Office of Traffic Safety point to several factors possibly contributing to the region's elevated rates of motor vehicle traffic fatalities. According to these data, Redwood Coast individuals have a higher risk of being involved in pedestrian, hit-and-run, nighttime, and alcohol-involved fatal and injury-causing traffic accidents than do those elsewhere in the region.

Two additional data sources highlight the role of substance use in traffic safety in the region (TIMS; CHRR). As shown in Figure 5.7, crashes within the region in which the driver was driving under the influence (DUI) account for a greater proportion of all vehicle crashes (including those without injury) compared to those in the majority of the state.

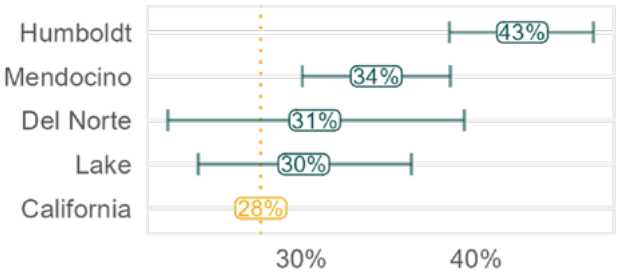
Figure 5.7 Car Crashes or Deaths Involving Alcohol Use

Drug and/or Alcohol DUI as a Percent of All Crashes (2012 - 2021)



Note. Data sourced from TIMS. Includes both alcohol and drug DUIs.

Percent of Driving Deaths Involving Alcohol (2016 - 2020)



Note. Data sourced from CHRR.

While other factors such as infrastructure and climate contribute to the region's elevated motor vehicle crash fatalities, substance use appears to play a critical role in the region's elevated motor vehicle deaths and—along with drug-induced deaths—and in its unintentional injury deaths.[68,69]

[66] The 2019-2021 CDPH data release compared to the 2017-2019.

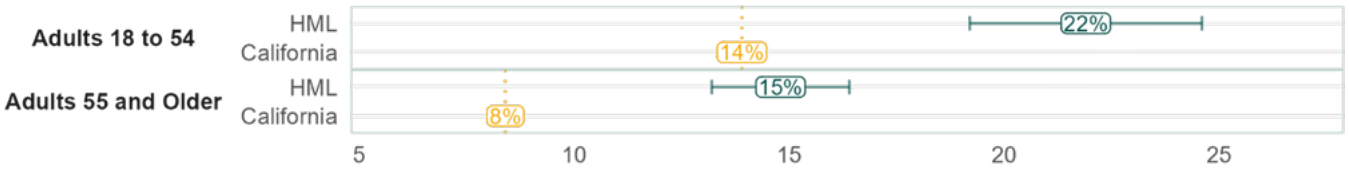
[67] Adult binge drinking data from CHIS is limited to only a few years. Data collected between 2021 and 2022 on recent binge drinking show rates consistent with state averages but with wide confidence intervals reflecting the limited duration of data collection. CHIS data collected between 2011 and 2015 show higher rates of binge drinking in the past year.

[68] Another factor not captured in the data reported above but particularly salient in the rural Redwood Coast context, is emergency medical service (EMS) response time which are significantly associated with motor vehicle mortality rates (Byrne et al., 2019). Research indicates a 1.46 times greater risk of mortality for an EMS response time of 12 or more minutes compared to seven or fewer. A national study found that the median EMS response time is six minutes in urban and suburban regions and 13 minutes in rural areas. This study also found that 10% of EMS response times were 26 minutes or longer in rural areas (Carr et al., 2017).

[69] Motor vehicle deaths are included in unintentional injury deaths.

Suicidal Ideation: Data from multiple sources strongly signal higher risk factors for suicide in the Redwood Coast (Figure 5.8). Both youth and adults located there are more likely to report having considered suicide than in the state as a whole, and youth in the region are more likely to have reported feelings of sadness.

Figure 5.8 Answers to the Question *"Have you ever seriously thought about committing suicide?"* (2011-2022)



Note. Data sourced from CHIS.

Amongst the leading causes of illness and death, poor mental health and substance use appear to play either a direct or an indirect role in contributing to many of the disparities in health outcomes observed in the region. Along with tobacco use as discussed previously, substance use and mental health factors appear to strongly influence those health outcomes displaying the greatest disparities between the Redwood Coast and the state.

Impacts of Disinvestment on Community Health

Homelessness: While the data presented below indicate an elevated level of homelessness in the Redwood Coast, important to acknowledge is that following and measuring homelessness is a complex task, leading to limitations and uncertainties in these figures. Nevertheless, these indicators suggest an elevated homelessness rate across the region compared to the rest of California (*HUD.gov / U.S. Department of Housing And Urban Development (HUD)*, n.d.); KidsData, 2023).

As shown in Figures 5.9 and 5.10 below, homeless point-in-time (PIT) data[70] from the Department of Housing and Urban Development (HUD) reveal that homelessness on a per capita basis in the region exceeds the state average.[71] These data do not include Del Norte; however, a 2023 report from the NorCal Continuum of Care (CoC) region found 694 homeless people in Del Norte, producing a rate of 2,525 per 100,000 population. Similarly, an alternative data source indicates a greater proportion of youth homelessness among public school students across the region (KidsData, 2023).

[70] PIT data is gathered by counting how many people are experiencing homelessness on a given day.

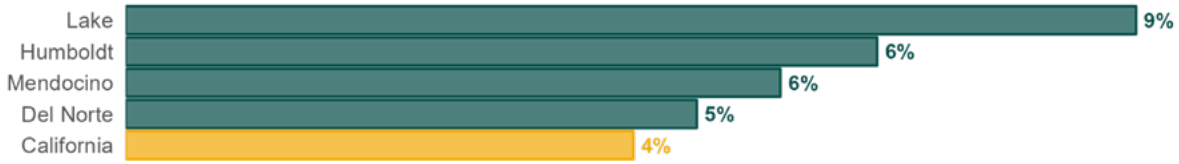
[71] HUD compiles reported homeless counts gathered by regional participants of the Continuum of Care (CoC) program throughout the U.S. During a 24-hour period in the first ten days of January each year, CoC participants conduct a Point-in-Time (PIT) count of homeless people in their respective regions. These counts include both sheltered homeless as well as people living in areas not meant for habitation.

See Appendix I for a comparison of all Continuums of Care in California. Humboldt and Mendocino CoCs have the highest rates in the state.

Figure 5.9 Total Counted Homeless per 100,000 Population by Continuum of Care (2016-2020)[72]

Note. Data sourced from the U.S. Department of Housing and Urban Development's datasets on Point-in-Time (PIT) estimates, a count of sheltered and unsheltered individuals experiencing homelessness. Data are five-year averages from 2016 to 2020. Rates calculated by the author are five-year estimates using population data from the U.S. Census Bureau (2022) for 2016-2020. Population estimates are summed for each CoC service area by county.

Figure 5.10 Homeless Public School Children (2011-2014 and 2016-2018)



Note. Data sourced from Kidsdata.org. Defined as the percentage of public school students recorded as being homeless at any point during the school year. Data for 2015 are not available.

Poverty: Economic conditions strongly influence health disparities. Poverty is linked to lower life expectancy and increases in health risks related to obesity, smoking, substance use, and chronic stress (Healthy People, 2030). People living in poverty are also more likely to burn wood for residential heating and live on or near unpaved roads, exposing them to dust from these sources, which are leading causes of air pollution (see Chapter 4) and can exacerbate health conditions.

Poverty rates for all ages are sharply higher in the Redwood Coast region compared to those for the state as a whole. People in the Black, Hispanic or Latino, and AIAN communities specifically are more likely to live in poverty than state averages (U.S. Census Bureau, 2022). Figure 5.11 below shows detailed, disaggregated data on poverty.

[72] The 2021 data, which show a dubious decline in measured homelessness, are deliberately excluded. These data are not comparable to prior-year estimates due the the effects of COVID restrictions. Many shelters, for example, reduced capacity in response to CDC COVID-19 guidelines, thereby also reducing the headcount of sheltered homeless (U.S. Department of Housing and Urban Development).

Figure 5.11 Disaggregated Poverty Rates (2017-2021)

	CA	Humboldt	Lake	Del Norte	Mendocino	
5 to 17 years	16%	22%	23%	28%	19%	Age Range
Under 18 years	16%	22%	22%	25%	19%	
18 to 34 years	13%	31%	18%	18%	21%	
Under 5 years	16%	20%	18%	16%	20%	
35 to 64 years	10%	17%	17%	17%	13%	
65 years and over	10%	11%	10%	9%	13%	
Less than high school	20%	32%	26%	21%	25%	Educational Attainment (25+)
High school or equivalent	13%	20%	20%	15%	17%	
Some college	9%	17%	14%	12%	13%	
BA or higher	5%	10%	5%	8%	7%	
Black	19%	43%	35%	39%	36%	Race/Ethnicity
AIAN	17%	37%	38%	26%	22%	
Asian	10%	32%	18%	47%	~12%	
Two or more races	12%	24%	21%	22%	20%	
Hispanic or Latino	16%	24%	16%	21%	22%	
White, not Hispanic or Latino	9%	17%	15%	13%	12%	
Female	13%	21%	18%	19%	17%	Sex
Male	11%	19%	15%	16%	15%	
Unemployed	24%	32%	33%	14%	34%	Work (16+)
Did not work	21%	30%	23%	26%	25%	
Worked part-time	13%	25%	17%	14%	14%	
Worked full-time	2%	4%	2%	2%	4%	

> 3X CA Avg. > 2X CA Avg. > CA Avg. ≤ CA Avg.

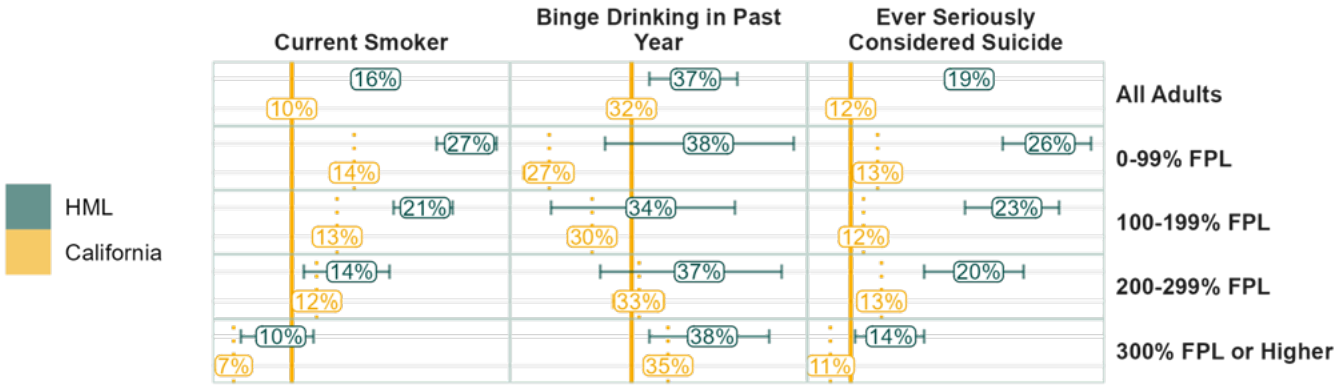
Note. Data sourced from the U.S. Census Bureau (2022). (~) denotes a statistically unstable estimate.[73]

Poverty in the Redwood Coast appears to be strongly connected with two proximate risk factors, smoking and suicide ideation (CHIS). Nearly 27% people living below the poverty line in the region are current smokers compared to just 15% statewide. Similarly, 26% of people living below the federal poverty level (FPL) have seriously considered suicide.

Statewide, recent binge drinking is *positively* associated with income (see Figure 5.12), a finding that is not uncommon of studies linking socioeconomic status to heavy drinking (Collins, 2016). Regionally, those with incomes above the poverty line have rates of binge drinking consistent with state rates. However, those below the poverty line have rates of binge drinking that are significantly higher compared to those in the same income bracket statewide. For smoking and suicidal ideation, those with low or moderate incomes are at much greater risk in the region.

[73] For these data, an estimate is determined to be statistically unstable if it is not significantly higher than 0 or significantly lower than 100%.

Figure 5.12 Proximate Risk Factors by Income Range (2011 - 2021, Binge Drinking 2011-2015)



Note. Data sourced from the CHIS. FPL refers to the federal poverty line.

Educational Access and Outcomes: Target objectives for improving educational access include improving high school graduation rates, increasing college enrollment, and improving math and reading proficiencies in K-12 students ("Education Access and Quality"). In the Redwood Coast, gaps in educational attainment begin early, with K-12 students lagging behind their statewide peers on reading and math proficiency. Regional high school graduation rates are on par with the state rate, but high school graduates in the region are much less prepared for college admission compared to the state average. Across the Redwood Coast region, high school graduates complete the course requirements for admission to the University of California (UC) or California State University (CSU) systems (i.e., "A–G courses") at roughly half the rate of their statewide counterparts (Kidsdata. 2023). Correspondingly, all Redwood Coast counties lag behind in four-year degree attainment. Therefore, while the region fares relatively well in terms of high school graduation rates, it appears that the educational system faces challenges in preparing high school graduates for college.[74]

With respect to the region's health challenges, educational attainment appears to be strongly associated with tobacco use.[75] Both in the region and across the state, smoking rates decrease significantly as educational attainment increases; however, this relationship is particularly strong in the Redwood Coast, where one in four individuals with less than a four-year college degree is a current smoker, compared to just 14% statewide (CHIS).

Social Isolation: A recent report by the U.S. Surgeon General brought national attention to the health impacts of social isolation and loneliness, raising the issue as urgent and requiring 'immediate awareness and action.' The report documents the health risks of social isolation and loneliness, including a wide range of physical and mental health outcomes encompassing cardiovascular disease, hypertension, diabetes, infectious disease, cognitive decline, depression, and anxiety (U.S. Surgeon General, 2023).[76, 77]

[74] Another contributing factor for the gap in higher educational attainment may be a comparative lack of four-year colleges and universities that are geographically accessible for much of the population in the region. Only Humboldt County is home to a public four-year university.

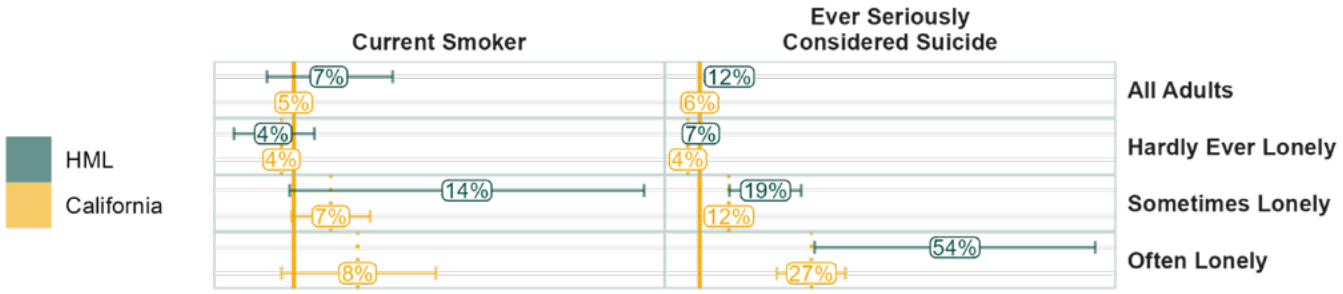
[75] Alcohol use and suicide ideation do not exhibit clear relationships with educational attainment. Rates of both appear to be *lower* among those with less than a high school education.

[76] The Surgeon General defines **social isolation** as "Objectively having few social relationships, social roles, group memberships, and infrequent social interaction. (2023)".

[77] The Surgeon General defines **loneliness** as "A subjective distressing experience that results from perceived isolation or inadequate meaningful connections, where inadequate refers to the discrepancy or unmet need between an individual's preferred and actual experience (2023)".

Data on loneliness at the local level is scarce. However, statewide data from CHIS indicate that significantly fewer adults over the age of 65 report themselves as hardly ever feeling lonely compared to the state average, suggesting that the experience of loneliness among the elderly population is more prevalent in the HML region. Older adults who experience loneliness are at higher risk of smoking and suicide ideation (CHIS) (see Figure 5.13). Over half of Redwood Coast seniors who report often feeling lonely also report having seriously considered suicide and at a significantly and substantially higher rate than those who report only sometimes or hardly ever feeling lonely. Therefore, older Redwood Coast residents who indicate that they often feel lonely appear to be at high risk for one of the region's most elevated causes of death.

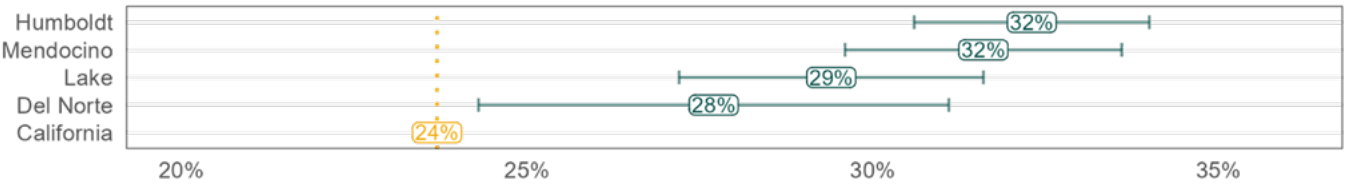
Figure 5.13 Proximate Risk Factors by Loneliness, Age 65+ (2019-2020)



Note. Data sourced from the CHIS. Smoking data not available for the "Often Lonely" category.

Significantly more householders live alone in the Redwood Coast, indicating greater levels of social isolation within the household context (Figure 5.14). Isolation is a critical risk factor for suicide, particularly among men who are almost four times more likely to commit suicide than women (CDC, 2023).

Figure 5.14 Householders Living Alone, Percent of Households (2017-2021)



Note. Data sourced from the U.S. Census Bureau (2022).

Adverse childhood experiences (ACEs) involve abuse and neglect, as well as dysfunction in the household including mental illness, problematic substance use, violence against mothers, or imprisonment of a household member (Felitti et al., 1998). People who have multiple ACEs are at far greater risk than people with one or no ACEs for poor health outcomes or behaviors, including all proximate risk factors identified in this report (i.e., tobacco use, substance abuse, and mental health challenges). For example, an individual with one ACE is approximately 1.3 times more likely to have ever injected drugs, whereas, for an individual with four or more ACEs, this likelihood rises to 10.3 times compared to someone with no ACEs (Felitti et al., 1998).

The proportion of adults with four or more ACEs is significantly and substantially higher in the Redwood Coast compared to the state average, while the proportion of adults with zero ACEs is significantly lower (CHIS). Recent data reveal that rates of domestic violence and child abuse are elevated across the region, indicating that the region's youth are at risk for ACEs (Kidsdata, 2020). However, no substantive, large-scale study has been done on the region to confirm these results.

Statewide, smoking, recent binge drinking, and suicide ideation are positively associated with ACEs. Regional estimates, while subject to more statistical variation, indicate a similar trend (CHIS). In particular, 45% of Redwood Coast adults with four or more ACEs have seriously contemplated suicide during their lives compared to just 11% of Redwood Coast adults with no ACEs and 6% of California adults with no ACEs. Therefore, Redwood Coast residents indicating multiple ACEs are at high risk for one of the region's most elevated causes of death.

Food and Nutrition: A healthy diet composed of limited portions of the necessary food groups is associated with lower all-cause mortality, cardiovascular disease, obesity, diabetes, and breast and colorectal cancer (*Healthy People 2030* initiative). Thus, barriers that prevent access to a healthy diet such as poverty, high prices, or transportation may have an adverse influence on these health outcomes.

> "Lack of fresh food impacts wellness in a place where accessible medical treatment is already a challenge."

Rates of heart disease are elevated across HML counties along with somewhat elevated rates of breast cancer and colorectal cancer[78] (CDPH, 2022). Conversely, however, rates of diabetes are consistent with or lower than state averages across Humboldt, Mendocino, and Lake Counties. Health planning documents for Humboldt, Del Norte, and Lake County report food-related health issues. In particular, a 2019 Del Norte Community Health Assessment found high rates of food insecurity in Del Norte, disproportionately impacting children (Freedman et al., 2019).

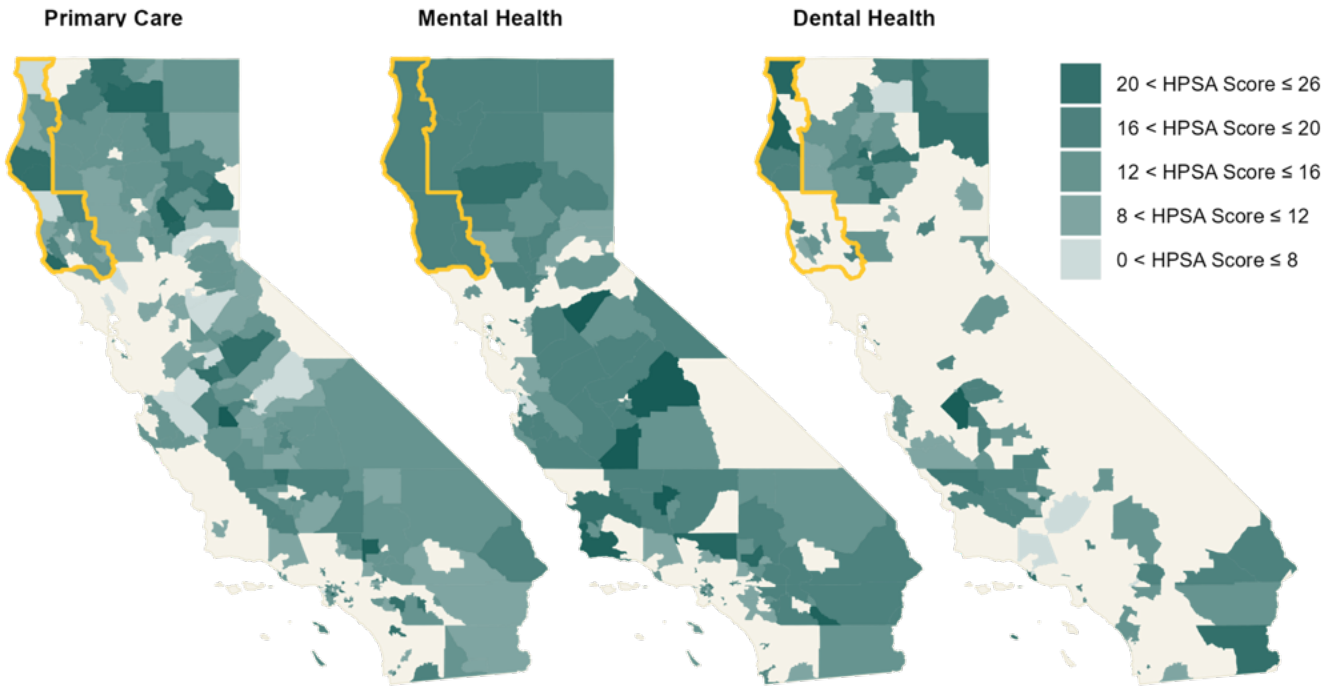
Unfortunately, available data strongly suggest that Del Norte is most impacted by food insecurity in the Redwood Coast, and yet CHIS data is not available for Del Norte County to further assess this county's most vulnerable populations. The data that are available for HML indicate that dietary factors in the region appear to be strongly influenced by household income (CHIS). Consistent with statewide trends, higher income households are more likely to have local access to fresh produce and are therefore less likely to have recently consumed soda and fast food.

For the HML counties, CHIS data suggest dietary outcomes are consistent with or superior to state averages across income strata, at least within the limited contexts of fast food, soda, and fresh produce. Therefore, the available data suggest that food insecurity and dietary risks are greatest in Del Norte County and among low-income households regionwide.

[78] The most recent CDPH data release shows a lower rate of age-adjusted heart disease mortality in Del Norte County, however, the 2017-2019 data release shows higher rates in Del Norte. Moreover, CDC PLACES data suggest higher rates of heart disease in Del Norte County.

Health Access and Barriers: The majority of the Redwood Coast is a designated Health Provider Shortage Area (HPSA), which are regions or populations identified by the U.S. Department of Health and Human Services (HHS) as having a shortage of primary care, mental health, or dental health providers.[79] Almost all of the region is a Primary Care HPSA, the entirety of the region is a Mental Health HPSA, and a substantial share is a Dental Health HPSA. See Figure 5.16 below for details.

Figure 5.15 Health Professional Shortage Areas and Scores (2023)[80]



Note. Beige areas are not HPSAs. Blue areas are HPSAs, with darker hues indicating higher HPSA scores (or greater need). The Redwood Coast region is outlined in gold. Data sourced from the Health Resources and Service Administration's data on shortage areas, measuring HPSA areas in primary care, dental health, and mental health.

In contrast to the state population, a significantly larger proportion of the Redwood Coast population has recently experienced delays in accessing primary healthcare. All income brackets experience higher rates of delayed care compared to corresponding income groups statewide (CHIS). However, those with lower incomes clearly experience increased delays, indicating a disproportionate effect. Moreover, those with incomes below the federal poverty line (FPL) are significantly more likely to have delayed a prescription compared to the same income category statewide, while those with higher income levels do not share this experience. Delayed care may also be a factor in the region's elevated age-adjusted mortalities due to prostate cancer, breast cancer, and colorectal cancers. For all three, delayed care is associated with higher mortality (Hanna et al., 2020; Chan et al., 2021).

[79] These HPSAs are assigned scores, which range from 0 to 25 for primary care and mental health and from 0 to 26 for dental health, with higher scores indicating greater need. Factors considered in determining the score include the provider-to-population ratio, poverty rate, travel time to the nearest point of care outside of the region, and other factors relevant to the health field (Health Resources & Services Administration). HPSA scores for primary care also take into account indicators of infant health. Dental health scores take into account water fluoridation status. Mental health scores take into account the percentages of the population over 65 and under 18, alcohol abuse prevalence, and substance abuse prevalence.

[80] See national level maps created by the data provider located here: https://data.hrsa.gov/maps/map-gallery.

Furthermore, CHIS data reveal a stark unmet need for care for those with mental health challenges. Among adults who have seriously considered suicide at some point in their lives, 42.5% (± 5.0%) have delayed care in the past 12 months compared to just 16.4% (± 2.4%) of HML adults, who have never considered suicide.

Equity Considerations and At-Risk Populations

Redwood Coast communities are vulnerable due to their geographic location and environment, lack of resources and healthcare services, and low representation of at-risk populations (see Chapter 4) both in data and decision-making spaces. At-risk populations, such as people with disabilities and people living in poverty, are often not represented and can exist as hidden populations. A lack of accurate diversity representation can lead to a lack of federal or state funding and increase the disparities seen in planning.

Figure 5.16 below offers a visual comparison of health outcomes and factors across demographics. Each column illustrates the differences between two populations. For example, the first column contrasts the health factors of people of color with those of the white population. Gold shades denote adverse disparities for the primary population relative to the reference group. A specific observation reveals that, in the HML region, 26% of people of color live below the poverty line in contrast to 16% of the white population.[81] These data display several notable trends that further highlight populations at risk in the HML region:

- People of color show higher rates of fair or poor health, higher poverty levels, lower educational attainment, higher ACEs, and more limited access to nutritious foods than their white peers. Based on other data, people of color in Del Norte County experience higher rates of poverty and higher rates of lack of health insurance than whites (U.S. Census Bureau, 2022).

- Lesbian, gay, and bisexual communities within the HML region face numerous disparities: increased smoking and heavy alcohol consumption, suicidal thoughts, higher poverty rates, elevated ACEs rates, domestic violence, deferred medical care, and adverse weather-related health impacts. Alarmingly, half of this community has seriously contemplated suicide.

- People with disabilities in the region experience higher rates of poor health, increased smoking, suicidal thoughts, poverty, decreased educational attainment, living alone, restricted access to healthy food, and deferred medical care.

- The 55+ demographic in the region tends to live solitarily. As expected, a higher percentage report fair or poor health, but this group generally exhibits fewer risk factors. The health trends of the veteran population resemble these patterns, possibly due to a significant age overlap in the two groups within the region.[82]

[81] Non-white Hispanics are included in the people-of-color category and white Hispanics are included in the white group.

[82] In the HML region 16.8% of adults 55 and older have served in the military compared to just 4.4% for adults 18 to 54 (2011 - 2022 CHIS data).

Figure 5.16 Comparative Analysis of Demographic Disparities in Health Factors (2011-2022)

	People of Color vs. White	Homosexual or Bisexual vs. Heterosexual	Disabled vs. Non-Disabled	Veteran vs. Non-Veteran	55+ vs. Younger	
Fair or Poor Health Status	21/16%	18/19%	41/9%*	27/19%*	22/13%*	Redwood Coast
Current Smoker	16/16%	19/14%	27/15%*	17/16%	12/20%*	
Binge Drinking	17/17%	22/16%	29/42%*	17/17%	10/22%*	
Suicide Ideation	17/19%	49/18%*	21/11%*	20/19%	15/22%*	
Below FPL	26/16%*	25/16%	24/15%*	11/18%*	12/21%*	
Less than BA	79/65%*	57/66%	80/63%*	68/67%	64/69%	
3+ ACEs	53/44%	60/43%*		40/46%	36/52%*	
Violence by Intimate Partner	~2/2%	~6/1%			~1/2%	
Lives Alone	14/19%*	20/18%	29/14%*	28/17%*	27/12%*	
Lower Access to Fruits/Veggies	16/12%	~9/13%	17/10%*	11/13%	12/13%	
Delayed Care in Past 12 Months	14/19%*	32/20%*	25/15%*	17/22%	16/19%	
Health Impacted by Ext. Weather	~7/15%	21/13%		10/14%	12/16%	
Fair or Poor Health Status	18/14%*	19/18%	41/12%*	18/19%	25/12%*	California
Current Smoker	10/10%	13/8%*	17/11%*	11/10%	8/11%*	
Binge Drinking	16/20%*	28/18%*	25/35%*	16/19%*	10/24%*	
Suicide Ideation	11/13%*	35/12%*	15/6%*	12/12%	8/14%*	
Below FPL	21/14%*	16/15%	24/14%*	6/16%*	12/18%*	
Less than BA	65/59%*	57/60%*	75/60%*	60/62%*	62/61%	
3+ ACEs	32/34%*	52/31%*		36/33%	27/37%*	
Violence by Intimate Partner	3/2%*	4/2%*		2/3%	1/3%*	
Lives Alone	9/13%*	15/11%*	17/10%*	18/11%*	20/7%*	
Lower Access to Fruits/Veggies	15/10%*	13/12%	16/10%*	10/12%	10/12%*	
Delayed Care in Past 12 Months	11/14%*	25/15%*	21/11%*	11/16%*	12/13%*	
Health Impacted by Ext. Weather	5/8%*	14/6%*		6/7%	6/7%*	

Ratio (R): R ≤ 0.5 (Lower Risk); 0.5 < R ≤ 1; 1 < R ≤ 1.5; 1.5 < R ≤ 3; 3 ≤ R (Higher Risk)

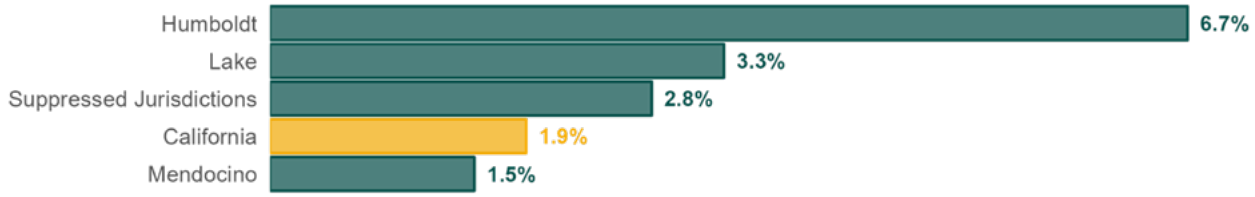
Note. Data sourced from the CHIS. (*) denote statistically significant differences and (~) denote unstable estimates. An estimate may be simultaneously unstable and significantly different. Missing values are not shown. Years are selected based on all available years from 2011 to the present. Binge drinking represents either "Binge Drinking in Past Month" or "Binge Drinking in Past Year" depending on data availability.

Climate and Environments Impacts on Community Health

Environmental pollutants can contribute to respiratory disease, heart disease, and some cancers (*Healthy People 2030* initiative, "Environmental Health"). CalEnviroScreen 4.0 data (see page 78 in the Climate Analysis) indicate that, overall, the region's pollution burden is lower than statewide estimates. However, certain environmental risks are elevated in some areas of the region, including children's lead risk as well as presence of drinking water contaminants.

Critical to note is that the CalEnviroScreen 4.0 variable "Children's Lead Risk from Housing" does not directly measure lead exposure and instead infers a level of risk based on the incidence of child poverty and age of housing structures.[83] An additional data source shown in Figure 5.17 indicates that blood lead levels (BLL) among children aged five and under are elevated in Humboldt and Lake counties. Moreover, Humboldt's BLL levels are the second highest in the state.[84] The CalEnviroScreen 4.0 data cited above suggest that the epicenter of lead risk in Humboldt County is in the Arcata-Eureka-Fortuna region.

Figure 5.17 Blood Lead Levels, Children 5 and Under



Note. Data sourced from CDPH. Suppressed jurisdictions include Alpine, Amador, Calaveras, Colusa, Del Norte, Glenn, Inyo, Lassen, Mariposa, Modoc, Mono, Plumas, Sierra, Siskiyou, Trinity, Tuolumne, and Yuba.

Water Quality: Impaired waterways are a major issue in the region (see Chapter 4). Fifty-eight river and stream locations have tested positive for at least one pollutant that is over the relevant safe threshold mandated by the California Water Boards. Each of these locations is polluted by indicator bacteria, surrogates used to measure the potential presence of fecal material and pathogens. Among the many of the region's lakes, reservoirs, harbors, and estuaries, eight bodies of water are listed as polluted, and three-quarters of these are contaminated with mercury, which therefore increases levels of mercury found in fish species in the region. These compromised aquatic species and contaminated groundwaters constitute a public health threat throughout the region.

Wildfires: In contrast to man-made pollutants, wildfires and corresponding health risks have, in recent years, been far more severe in the state's northern region than the rest of the state. Smoke from wildfires can impair lung function, contributing to bronchitis, asthma, and heart failure, and the region's substantial elderly population are particularly vulnerable to these effects (United States Environmental Agency, 2023). Wildfires are the region's largest single natural contributor to air pollution, even surpassing contributions made by cars and farm equipment (see Chapter 4). Consequently, these fires may exacerbate the region's disproportionately high levels of asthma and respiratory illness.

Recent high-impact wildfires and droughts have been linked to extremes in the Evaporation Demand Drought Index (EDDI), which is how much water the atmosphere needs and thus how much moisture evaporates over a period of time. Rising air temperatures are the leading cause of increased evaporative demand for inland regions, whereas humidity is more noticeable in n coastal areas, including the HML region. The EDDI's historical baseline is approximately five days per season with a two-week EDDI above the 95th percentile (see Chapter 4). Based on historical data, current models

[83] Exposure to lead-based paint in older homes is the most significant source of lead poisoning in children (*Experience*, n.d.).

[84] Second to Nevada County.

predict an increase in high fire danger-risk days likely leading to an increased risk of wildfires in the area, which, in turn, could increase rates of asthma and respiratory illness, as well as premature death.

Although not necessarily specific to wildfires, weather-related events do appear to have had an outsized impact on the health of the region compared to the state as a whole. Between 2019 and 2022, approximately 78% of Redwood Coast residents experienced extreme weather events compared to just 42% of California residents. Significantly and substantially more residents in the region experience adverse mental and physical health impacts due to recent extreme weather-related events compared to the state as a whole (CHIS).

RRRISE and Public Health

As evidenced by listening sessions across the region, there is widespread recognition of the relationship between public health and healthcare systems, and the overall wellbeing of Redwood Coast communities in the RRRISE Collaborative. Acknowledging some of these sobering trends on the health of the region's communities, and the role that professional shortages in healthcare fields can play in this (among other factors) contributed to Health and Caregiving being elevated as a priority sector for the initiative. Strategies that seek to address social determinants of health, for example, will be detailed in Regional Plan Part 2.

Chapter 6

Industry Cluster Analysis

This chapter identifies key industry clusters with the potential for sustainable growth and family-sustaining careers, such as the Arts, Culture, and Tourism; Health and Caregiving; Renewable and Resilient Energy; and Working Lands and Blue Economy sectors.[85] These industry clusters will drive the regional strategy detailed in the forthcoming Part 2 of this report. Figure 6.1 below shows the specific industries within the clusters and their individual projected growth.

Key Takeaways

The Redwood Region's economic landscape is defined by four key industry clusters, each contributing uniquely to its growth, sustainability, and potential for development of family-sustaining careers:

- **Arts, Culture, and Tourism:** The region's natural wonders and cultural events attract visitors, making this cluster a vital driver of the local economy. Despite recent disruptions, the cluster shows resilience and potential for growth, especially in creating jobs compatible with meeting low-carbon goals. Projections indicate that the cluster will grow much faster than average. However, translating this growth into family-sustaining jobs remains a challenge.
- **Health and Caregiving:** This cluster addresses the region's critical health and social care needs and is expected to grow faster than average. It aligns with regional strategic goals such as minimizing greenhouse gas emissions and offering numerous family-sustaining jobs. The primary challenge lies in attracting, training, and retaining skilled professionals to meet growing demands for healthcare and caregiving.
- **Renewable and Resilient Energy:** The development of utility-scale wind energy, particularly offshore, offers substantial economic and employment potential, aligning with the region's environmental goals and supporting related industries. Abundant opportunities also exist for smaller scale programs focused on energy efficiency and distributed renewables (i.e., residential-, commercial-, and community-scale projects). These industries have the highest projected job growth in occupations paying the highest wages. The region's challenge is building out career pathways and smoothing labor shortages due to industry transfers (i.e., building construction trades).
- **Working Lands and Blue Economy:** The sector's strengths include that it is a traded cluster that is highly diversified. Its weaknesses are GHG emissions in certain of its industries and the need for higher wages and worker protections in certain of its value-chain segments. Dominated by wine grapes in Lake and Mendocino, diverse livestock in the north, and significant aquaculture in Humboldt Bay. Forestry and Wood Products remains the region's most concentrated sector with a high location quotient. Despite the volatile price fluctuations this sector frequently experiences, it is defined by stable timber production and increasing market values. The sector's priority is the innovation needed to increase incomes and opportunities while meeting the challenges of transitioning to sustainable forest management.

[85] In this report and other Collaborative documents, industries referring to a specific NAICS-defined industry code are capitalized, as are the region's identified industry clusters.

Key Metrics

- **Percentage of occupations that pay a family-sustaining wage:** Calculate the proportion of jobs in each industry cluster that provide wages sufficient to support a family of four. A higher percentage indicates better job quality and economic opportunity within the cluster.
- **Job-to-job multiplier:** Estimate the impact of job growth in each cluster on total employment across all industries. A higher multiplier suggests greater potential for the cluster to drive broad-based economic growth and job creation.
- **Location quotient and market share:** Assess the relative concentration and competitiveness of each cluster in the region compared to state and national benchmarks. Higher values indicate specialized strengths and potential for export-oriented growth.
- **Pollution emissions per job:** Measure the environmental impact of each cluster by calculating greenhouse gas emissions and other pollutants per job. Lower emissions per job indicate a more sustainable industry mix and so can guide efforts to promote cleaner, greener economic development.
- **Labor force demographics:** Measure indicators (age, race, educational status, etc.) that gauge opportunities for disinvested communities in these key industries .

Methodology

The industry clusters reported on here were identified using the following methodology:

1 Identification of Specialized and Resilient Industries

Industries labeled “Specialized and Resilient” in this report are ones that have shown competitive advantage through specialization and resilience against secular trends. For detailed criteria on identification of these industries, refer to the “Detailed Methodology” section of the Appendix.

2 Evaluation of Industry Performance

Evaluation of Industry Performance: Industries were selected based on their potential to support family-sustaining careers and their alignment with environmental policies. Such factors as employment stability, wage levels, and environmental impact were considered.

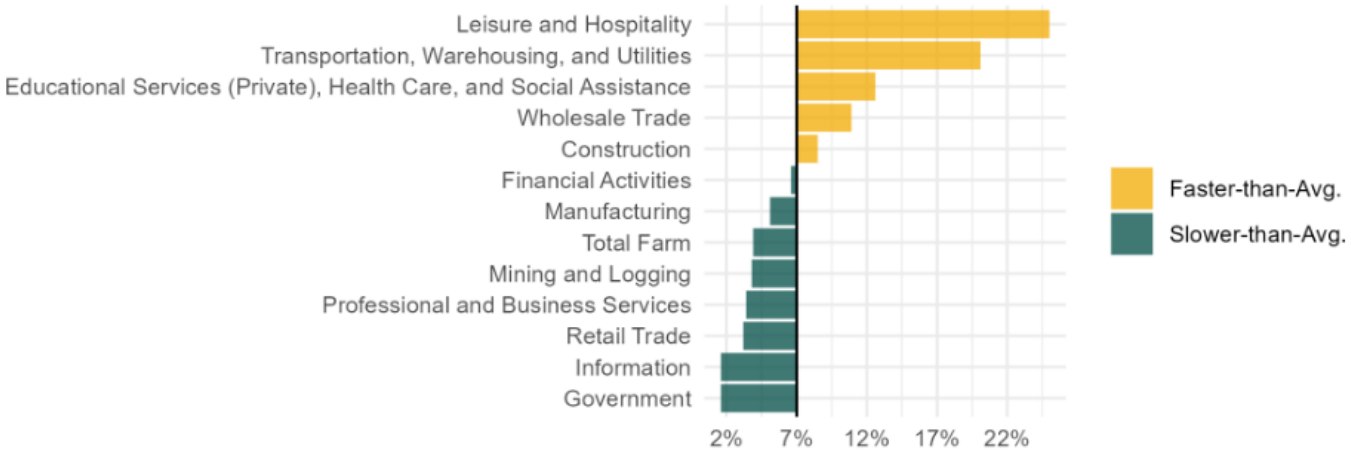
3 Analysis of Industry Cluster Outlook

This analysis of regional clusters assessed market trends, industry projections, industry-specific assets, resources, innovation, and policy trends. Its aim was also to evaluate the clusters’ ability to maintain or enhance market power through competitive advantages such as access to unique or scarce resources (e.g., redwoods, ocean resources, grasslands) and product differentiation (e.g., premium grass-fed livestock, wine, cannabis). Special focus was given to industries that can command premium prices through differentiated or unique products rather than competing solely on cost cutting and lower prices.

Overall Potential Job Growth for Major Industry Sectors, Redwood Region

Environmental pollutants can contribute to respiratory disease, heart disease, and some cancers (Healthy People 2030 initiative, "Environmental Health"). CalEnviroScreen 4.0 data (see page 78 in the Climate Analysis) indicate that, overall, the region's pollution burden is lower than statewide estimates. However, certain environmental risks are elevated in some areas of the region, including children's lead risk as well as presence of drinking water contaminants.

Figure 6.1 Potential Rate of Job Growth for Major Economic Sectors (2020-2030)



Note. Data sourced from California Employment Development Department (EDD). Overall employment growth is projected to be 7%.

Figure 6.2 below illustrates the results of the analysis for existing identified industry clusters.

While all industry clusters include multiple specialized and resilient industries (denoted below by *), **Agriculture and Blue Economy** emerges as a particularly strong cluster, except for Crop Production, all industries in this cluster-maintained employment or experienced employment growth over the past decade and most industries either maintained a high LQ or substantially increased in specialization. The **Renewable and Resilient Energy** Sector does not appear in this figure due to methodological issues but is addressed later in the chapter.

Figure 6.2 Employment Trends and Location Quotients, Identified Industry Clusters

Note. Data sourced from IMPLAN.

Agriculture and Blue Economy

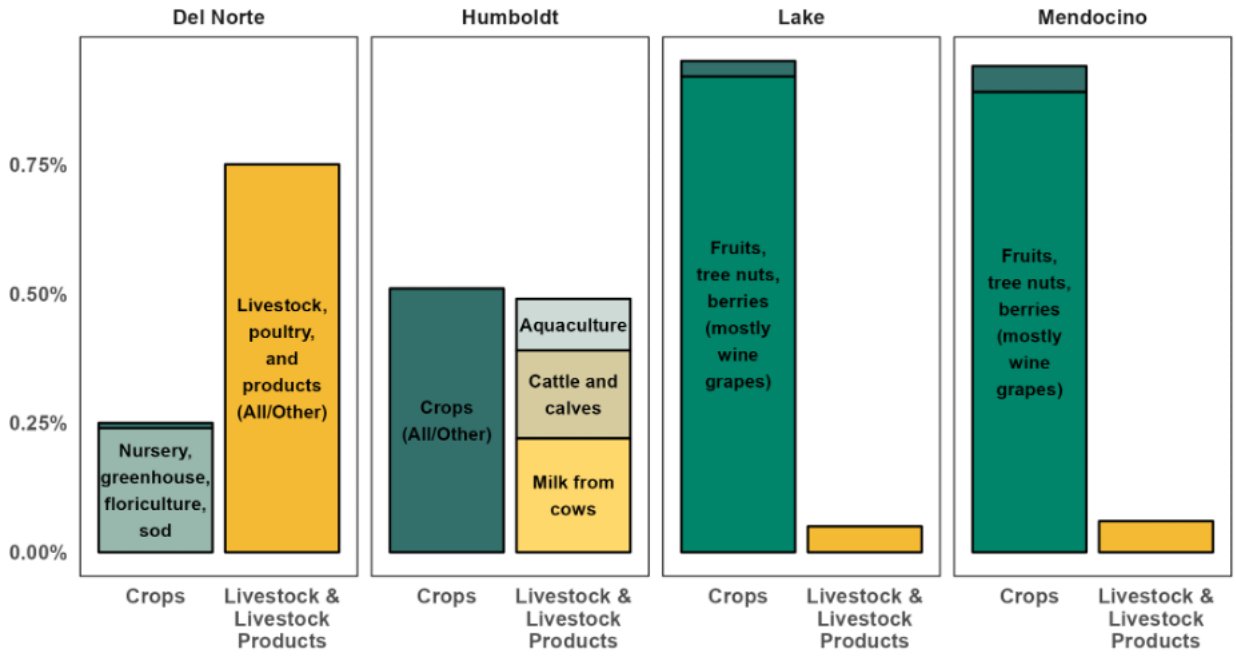
Major commodities traded within the Redwood Region's Agriculture and Blue Economy sectoral cluster[86] include livestock (e.g., beef and dairy), wine grapes and wine, cannabis, Dungeness crabs, and oysters. In Lake and Mendocino, wine grapes are the dominant agricultural commodity, whereasthe northern counties specialize somewhat in livestock production and are more diversified than the southern counties. For example, by market value, about one-quarter of Del Norte's agricultural output consists of nursery products (e.g., plants for landscaping, flowers, sod).

The region's aquaculture, which consists almost entirely of oyster farming, constitutes a substantial portion of Humboldt's agricultural output, amounting to $17.4 million in market value or 12% of statewide aquaculture production by market value. In the three coastal counties, commercial fishing—by market value, almost entirely Dungeness crabs —remains a key industry as well, with an annual market value of approximately $37.4 million[87] and accounts for nearly 80% of the state's Dungeness crab landings. See Figure 6.3 for a by-county agricultural and aquacultural breakdown for the region.

[86] *Blue Economy* refers to the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystems and encompasses fisheries, aquaculture, coastal tourism, marine biotechnology, offshore renewable energy, seabed mining, and maritime transport.

[87] Year-to-year fish landings are highly volatile. This is the average of 2019 through 2023.

Figure 6.3 Intraregional Agriculture Specialization, Percent of Total Market Value Produced



Note. Data sourced from USDA Census of Agriculture County Profiles. Does not include commercial fishing. The 2022 data include hemp production.

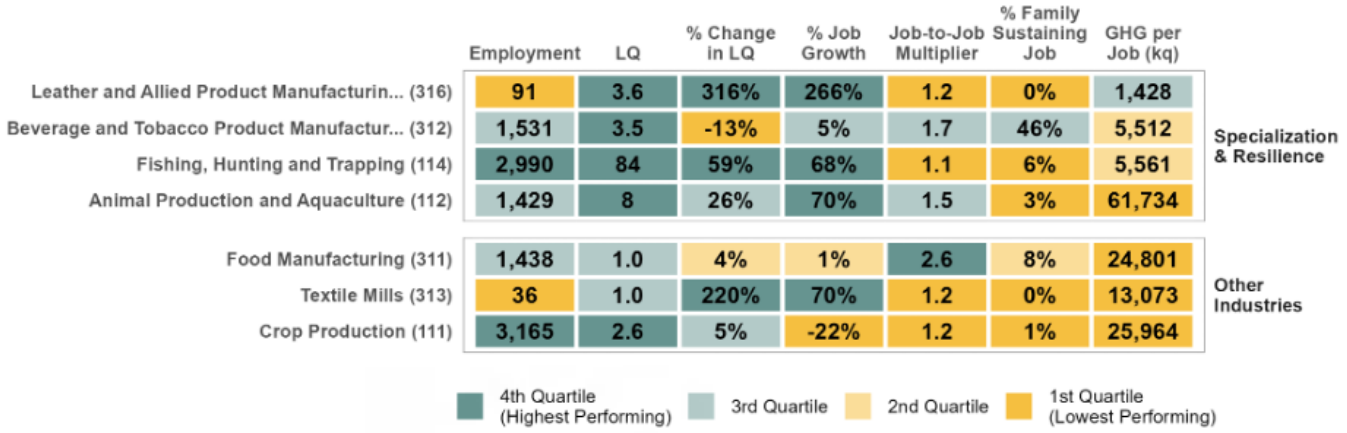
Cluster Performance and Alignment with RRRISE Goals

Agriculture and the Blue Economy represent key areas of regional employment specialization as shown by their sector LQs[88] and job growth (see Figure 6.4 below). Notably, the Fishing, Hunting, and trapping sectors (NAICS code 114) along with Animal Production and Aquaculture (NAICS code 112) have experienced significant increases in employment and specialization. Additionally, the region shows emerging potential in leather goods manufacturing (NAICS code 316), likely benefiting from its connections to the livestock industry. However, compared to other industries, these sectors face significant challenges, including lower wages and higher environmental impacts.[89]

[88] Location quotient (LQ)—defined at the beginning of this chapter—indicates the relative level of employment in an industry. An LQ > 1 for an area indicates that proportionately more workers there are employed in a given industry than in the state as a whole. An LQ > 1.25 is generally considered to indicate an industry with potential specialization.

[89] See "GHG Emissions, Air, Water, and Hazardous Waste" in the Appendix for a more comprehensive range of environmental impacts. Despite the environmental concerns identified, there are opportunities for more sustainable production practices. For example, aquaculture has a relatively lower greenhouse gas impact than other animal protein sources (Ritchie & Roser, 2024). The impact of organic versus industrial farming on greenhouse gas emissions remains ambiguous overall (Ritchie & Roser, 2024). However, in fruit production, organic methods tend to have a lower impact. In Lake and Mendocino counties, where fruit farming is prevalent, organic farming methods are employed at more than double the rate of the state average (Census of Agriculture - 2022 Census Publications - State and County Profiles - California, n.d.).

Figure 6.4 Agriculture and Blue Economy Cluster Performance



Note. Data source from IMPLAN. Author's calculations. 2022 data with 2013 growth comparison. NAICS codes shown in parentheses. Employment figures include proprietors and may differ substantially from QCEW data which include only employees.

Overall Cluster Outlook

Data from the California Employment Development Department (EDD) project positive but slower than average employment growth in the agricultural sector.[90] The outlook for employment growth is not encouraging, as employment in Crop Production has declined substantially over the past decade (see Figure 6.4 above, NAICS 111). In Lake County, for example, only eight acres could be identified as dedicated to food production.[91]

Consistent with national trends, farmers in the region are aging. According to the latest Census of Agriculture, 46% percent of Redwood Region farmers are 65 years or older (*USDA - National Agricultural Statistics Service - Census of Agriculture*, n.d.). Groups in the region, for example the Del Norte Community Food Council and the Humboldt-based North Coast Growers Alliance, have programming to assist new farmers and farmers of color to acquire farmland and establish businesses.

Despite these issues, the Agriculture and Blue Economy cluster still includes opportunities for development, growth, and innovation within certain commodities.

Livestock and Related Products Outlook

Farm product prices, including those for livestock, have shown long-term deflationary trends. However, in recent years, the COVID-19 pandemic and the war in Ukraine, a major grain producer, have disrupted these trends,[92] leading to a significant rise in farm product prices, particularly in livestock. As a potential indication of this impact, Del Norte farms—heavily concentrated in livestock production—have experienced an increase in farm net cash flow relative to 2017 as the market value of the county's production slightly out-paced the rise in farm production expenses.

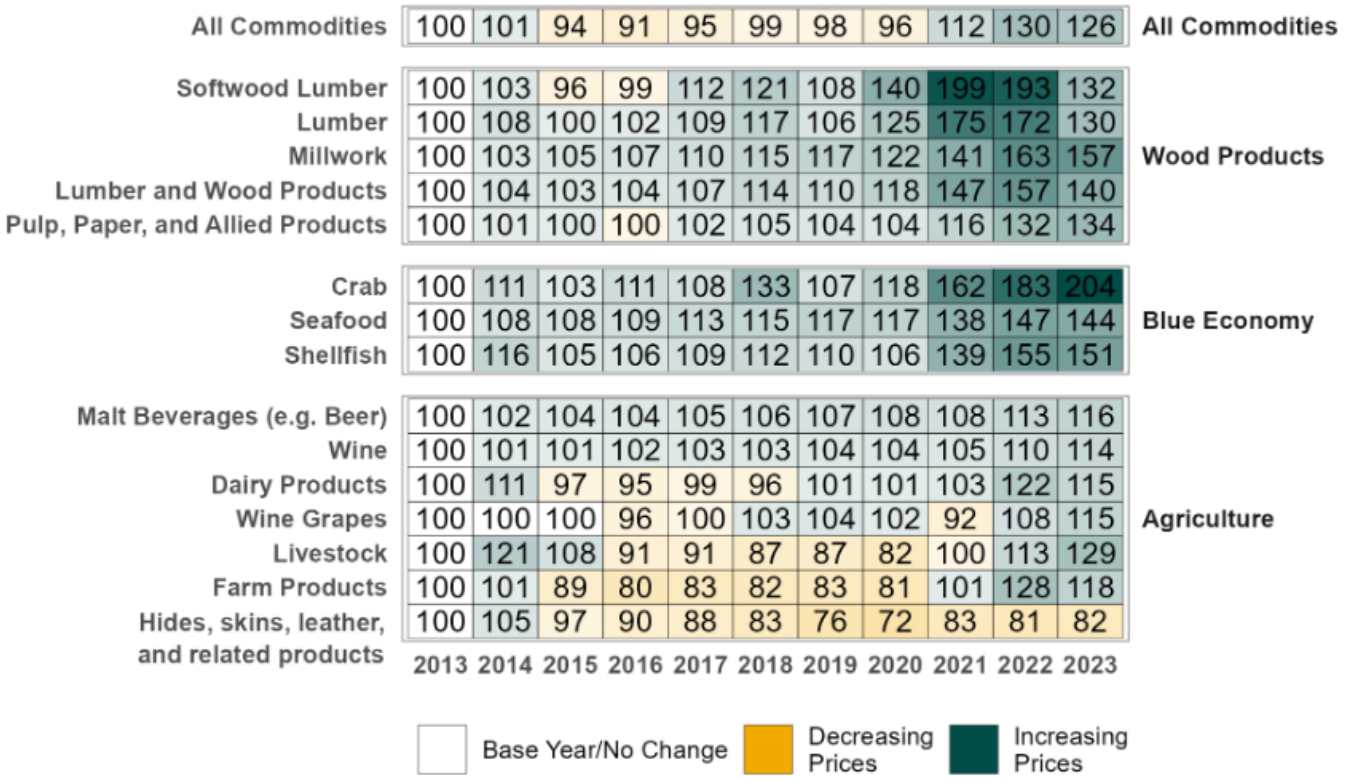
[90] See "Potential Job Growth for Major Industry Sectors, Redwood Region" in the Appendix.

[91] RRRISE Collaborative Meeting 4/30/24 which hosted an expert panel on food security and regional food systems.

[92] According to the USDA, Ukraine produces 4.3% of world wheat output, 3.5% of corn output, 6.8% of barley and nearly a third of world sunflower output (Foreign Agricultural Service & U.S. DEPARTMENT OF AGRICULTURE, 2022).

Like other commodity industries, the outlook for Livestock and Related Products depends largely on global and national commodity price trends (see Figure 6.5). The industry's growth potential will largely depend on whether agricultural commodity prices revert to their previous deflationary patterns.

Figure 6.5 U.S. Commodity Market Price Signals, Producer Price Index Adjusted to 2013 = 100



Note. Data sourced from FRED.

Vineyards and Wineries Outlook

Recent trends in global wine consumption have shifted from volume-driven growth to value-driven growth, a shift often referred to as "premiumisation." This trend particularly benefits producers of premium wines (*WEP:Wine Economics and Policy:12, 1, 2023*, 2023). In Napa County, for instance, crop report data indicate that red wine grape prices increased by 24.6% ($7,707 vs. $6,187 per ton) and white wine prices increased by 27.6% ($3,323 vs. $3,220 per ton) from 2017 to 2022. In comparison, Lake County red wine grape prices increased just 4.1% ($2,209 vs. $2,121 per ton) and white increased by 7.6% ($1,321 vs. $1,228) during the same period. Price growth is similarly muted in Mendocino, but the crop report data are not comparable to these other sources—available reports for Mendocino indicate that overall wine grape prices there increased by 5.8% ($1,794 vs. $1,696 per ton) from 2017 to 2021 (California Department of Food and Agriculture, n.d.).

These modest price increases indicate that the region's two wine-producing counties have experienced difficulty passing rising production costs on to consumers in recent years.[93] In the vineyard-dominated Mendocino and Lake Counties, average farm production expenses during this period increased 41% and 22% in Lake and Mendocino counties, respectively, while the market value of products sold in Lake

[93] See "All Commodities" in Commodity Market Trends in the Industry Cluster Appendix.

increased by 8% and decreased by 4% in Mendocino. Consequently, farm cash income fell sharply in both counties to just $6,819 per farm in Mendocino and was net-negative in Lake.[94]

The outlook for the wine industry in Mendocino and Lake Counties is challenging due to modest price increases that have not kept pace with rising production costs. Vineyards may need to adopt strategies such as raising prices, producing higher-value wines, and improving operational efficiencies to sustain and grow in the competitive market.

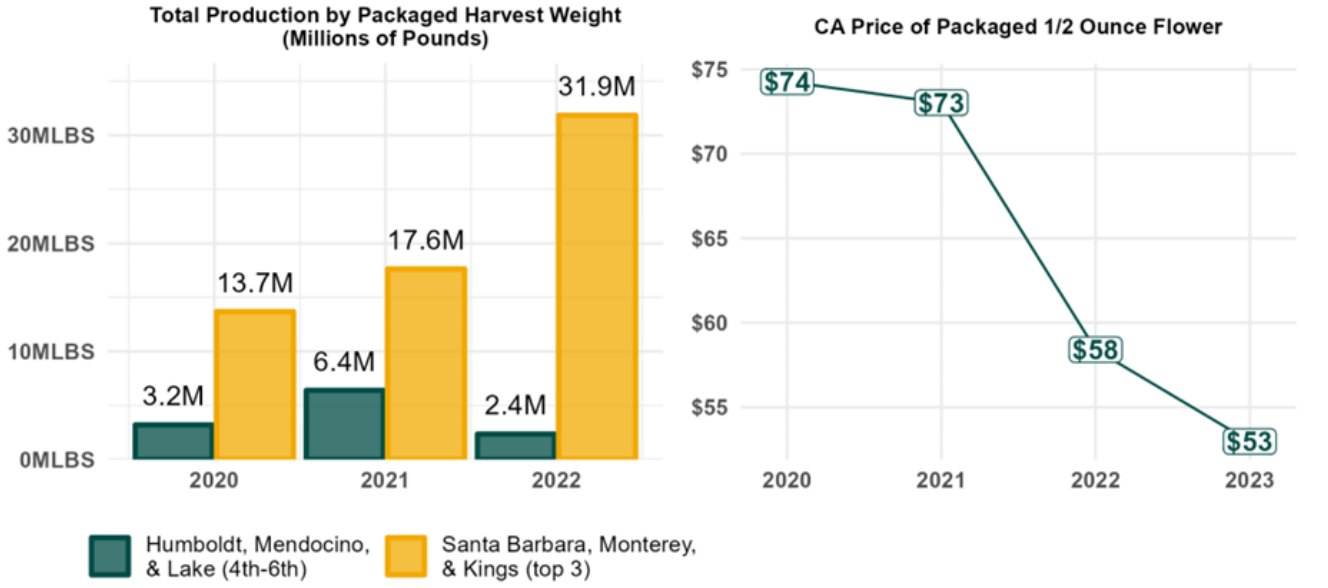
While low wages are generally a challenge for the Agriculture and Blue Economy cluster industries, the wine industry appears to be an important exception to this rule. As shown above, nearly half (46%) of Beverage and Tobacco Product Manufacturing (NAICS 312)[95] occupations are family-sustaining.

Cannabis Outlook

Following statewide legalization of cannabis in 2016, counties and cities not historically known as cannabis cultivators began to embrace the new legal industry. Santa Barbara, with its streamlined regulatory approach and proximity to markets (Mozingo, 2019), has now become the largest legal producer in the state followed by Monterey and Kings Counties (Department of Cannabis Control - State of California, n.d.-a). As shown in Figure 6.6 below, rising production, especially from these new producers, has eclipsed legal production in the legacy "Emerald Triangle" region, flooding the market and sharply lowering prices.

Historically, in the Emerald Triangle growers benefitted from the region's remoteness and challenging terrain, which limited law enforcement activities. However, with the change in the legal landscape, these geographical factors no longer offer a competitive edge, and legacy growers in the Emerald Triangle now must compete with large-scale, efficient producers from other regions. To remain viable, these traditional growers may need to focus on enhancing product quality and customer experience, capitalizing on the region's unique legacy and brand recognition.

Figure 6.6 Redwood Region Cannabis Production and Statewide Prices



Note. Data sourced from the California Department of Cannabis Control Harvest Report (https://cannabis.ca.gov/resources/data-dashboard/harvest-report/)

[95] The NAICS title of this industry is being adhered to, this industry reflects the wine and beer industry in the region not tobacco production. According to the USDA, there are no tobacco farms in the state. This is predominantly wine production.

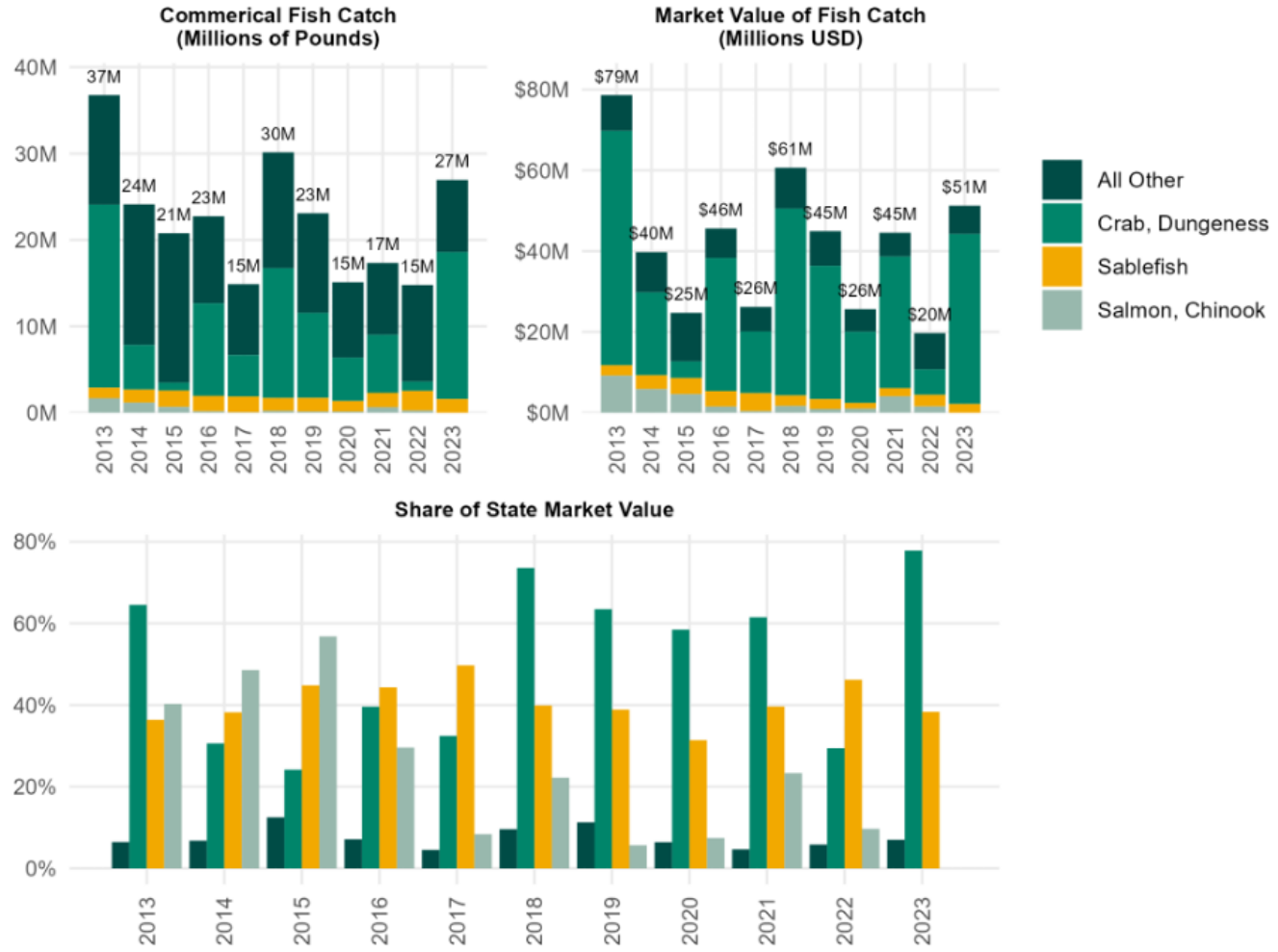
[94] See Farm Cash Flows and Income in the Industry Cluster Appendix.

Commercial Fishing Outlook

Nationwide, seafood product prices have been on an upward trend for a decade, defying the deflationary forces impacting other commodities. Specifically, crab prices have seen a substantial increase, doubling since 2013.[96] In California, the Redwood Region's commercial fisheries play a pivotal role, accounting for nearly 80% of the state's market value for Dungeness crab as of 2023 (see Figure 6.7).

Commercial fishing, like other industries based on natural resource extraction, faces significant ecological limits that restrict the volume of fish that can be harvested. Despite these constraints, the increasing prices of seafood and the dominant market position in the Dungeness crab sector suggest that commercial fishing will remain a crucial component of both the regional economy and employment landscape for the foreseeable future.

Figure 6.7 Redwood Region Commercial Fish Landings and Market Value



Note. Data sourced from California Department of Fish and Wildlife (CDFW). Data drawn from a custom query and figures may differ slightly from those presented on the CDFW Data Explorer page. See CDFW data disclaimer.[97]
https://wildlife.ca.gov/Conservation/Marine/Data-Management-Research/MFDE/Custom-Queries

[96] See Commodity Market Trends in the Appendix.

[97] CDFW Data Disclaimer: "CDFW collects data from various sources for fisheries management purposes, and data may be modified at any time to improve accuracy and as new data are acquired. CDFW may provide data upon request under a formal agreement. Data are provided as-is and in good faith, but CDFW does not endorse any particular analytical methods, interpretations, or conclusions based upon the data it provides. Unless otherwise stated, use of CDFW's data does not constitute CDFW's professional advice or formal recommendation of any given analysis. CDFW recommends users consult with CDFW prior to data use regarding known limitations of certain data sets. The MFDE is not intended to be used for management purposes, and CDFW requests to be contacted if state or federal partners need data for management reasons" (*MFDE*: *Custom Queries*, n.d.).

However, the prospects for stable, several phenomena challenge quality employment in commercial fishing: year-to-year volatility in production and relatively low wages (as illustrated in Figure 6.7). Moreover, the crab season is restricted to the period from December 1 to July 15 (Fisheries, n.d.), and the season is typically prone to such disruptions as delayed openings and early closures, further impacting the industry's stability and predictability (*CDFW News | CDFW Closes Commercial Dungeness Crab Fishery and Restricts Recreational Crab Traps in the Central Management Area, Limits Commercial Fishing to Inside 30-Fathoms in Northern Management Area to Protect Whales From Entanglement*, n.d.; "California's Commercial Dungeness Crab Fishing Season Further Delayed," 2023). Consolidated purchasing and distribution (rendering local boats as price takers rather than price makers) and lack of necessary harbor infrastructure are two issues local fisherfolk elevated as disabling for their industry (see SWOT analysis).

Aquaculture Outlook

A substantial rise in seafood prices, particularly shellfish,[98] has also contributed to a more promising market outlook for fish farming in regions equipped with the necessary resources.

Humboldt Bay is one of just a handful of areas along the California coast permitted to cultivate shellfish for safe human consumption[99] (Department of Public Health, n.d.) and offers unique natural advantages that enhance its suitability for aquaculture. Similar to wine, oysters—even within the same species—acquire a unique flavor based on their harvesting environment, creating a natural product differentiation. These factors, combined with institutional regulations, establish Humboldt Bay as a competitive player in the oyster market due to its natural and regulatory barriers to entry. It is currently the number one producer of oysters in California (see page 31).

Industry data provide further support for a positive outlook. A 2016 survey conducted among aquaculture farms in Humboldt Bay revealed a generally optimistic view on future prospects, with expectations of a 47.5% increase in employment and a 34.2% increase in cultivation area by the end of 2022 (Richmond et al., 2018). Although historical data on the industry is incomplete, findings indicate that the market value of production stood at $9.8 million in 2016. More recent figures from the USDA in 2022 estimate the market value at approximately $17.4 million, indicating potential growth in line with earlier projections (*Census of Agriculture - 2022 Census Publications - State and County Profiles - California*, n.d.).

Wood Products

Timber continues to be a key commodity in Del Norte, Humboldt, and Mendocino Counties (see Figure 6.8). Although the importance of timber to the regional economy has declined over the past decades, recent years have seen a stabilization in production levels. Concurrently, there has been a significant increase in the market value of this production[100]—nearly doubling the region's share of the overall market value of lumber produced in California.

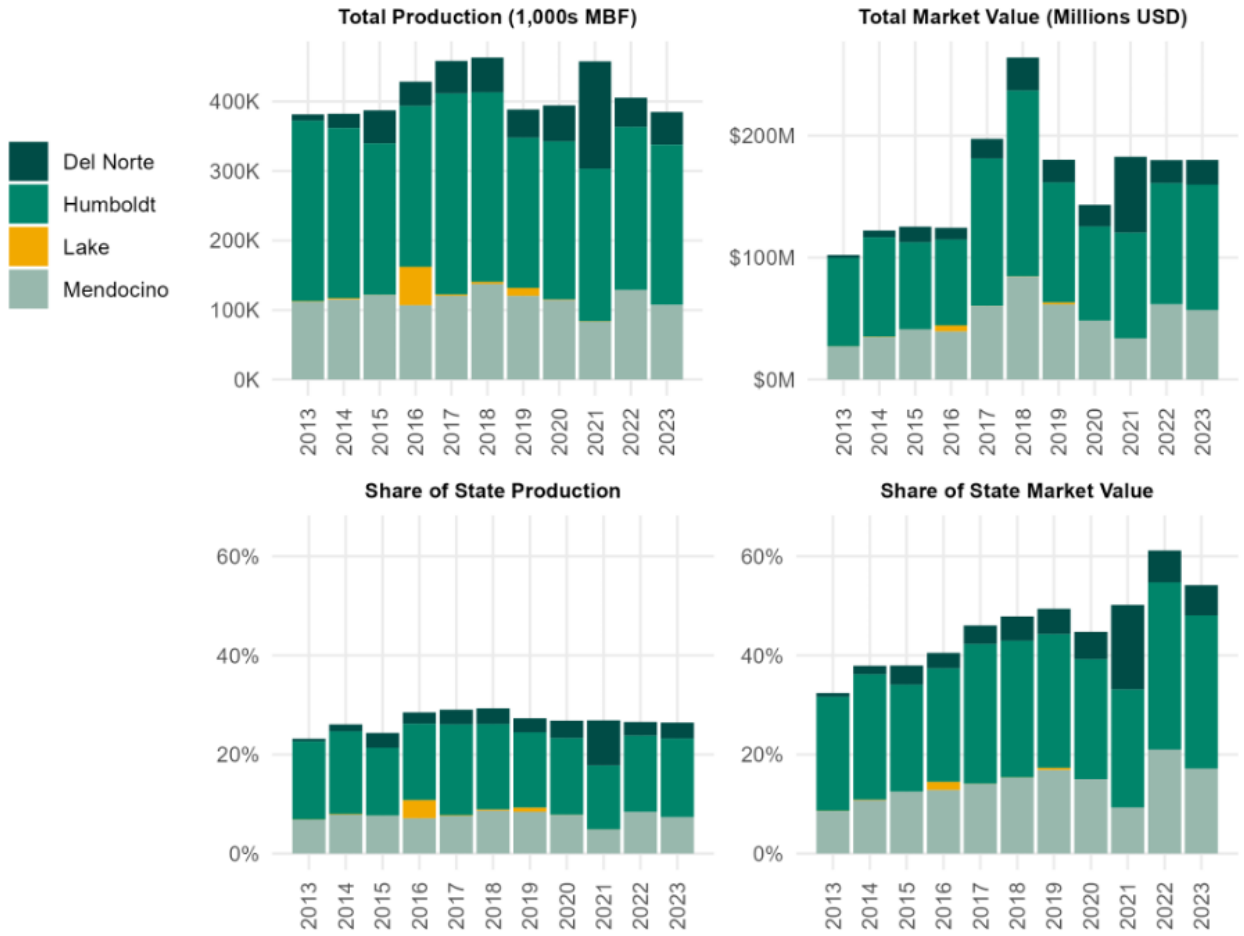
[98] See "Commodity Market Trends" in the Appendix.

[99] These areas include Humboldt Bay, Tomales Bay, Morro Bay, and the Santa Barbara Channel,which are "conditionally approved" and Agua Hedionda Lagoon near San Diego, which is "conditionally restricted" by the California Department of Public Health. In Humboldt Bay the following companies are approved by the CDPH: Aqua Rodeo Farms, Hog Island Oyster Company, Humboldt Bay Oyster Company, North Bay Shellfish LLC, and Pacific Shellfish Humboldt LLC.

[100] See lumber in "Commodity Market Trends" in the Industry Cluster Appendix.

Stable production levels and consistency in proportion of production by volume in relation to state figures, coupled with a marked increase in market value share, suggest that the value of the Redwood Region's definitive commodity has appreciated relative to other timber materials produced in the state. As shown below (see Figure 6.8, bottom right), in 2013, the Redwood Region produced about 32% of statewide lumber market value; by 2023, this had increased to 54%.

Figure 6.8 Redwood Region Lumber Production and Market Value



Note. Data sourced from the California Department of Tax and Fee Administration. MBF stands for one thousand board feet. A board foot is a 12 by 12 by 1 inch volume of lumber. These MBF figures are "net," referring to the usable volume of lumber produced after removal of waste and defects.[101]

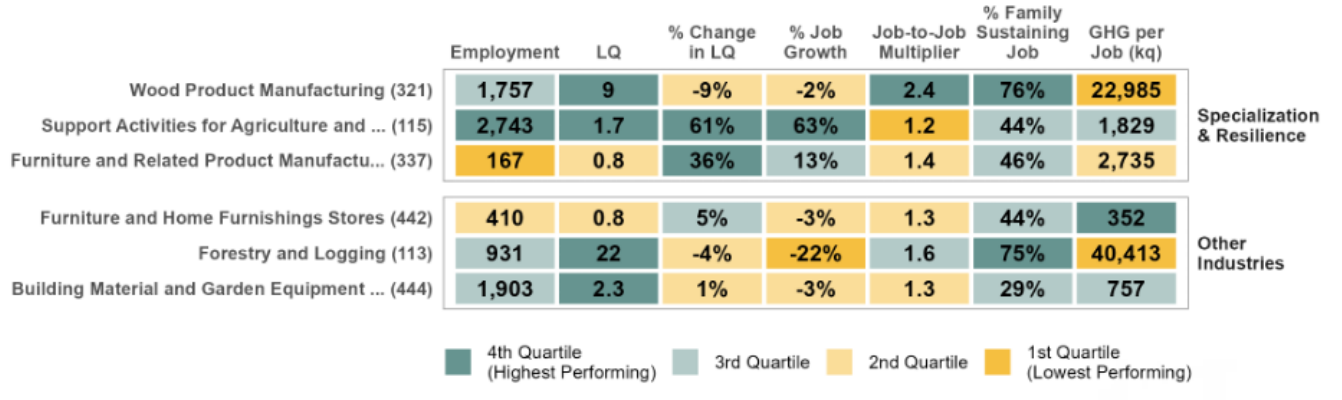
Cluster Performance and Alignment with RRRISE Goals

The Wood Products cluster maintains a high level of employment specialization, as illustrated in Figure 6.9 below. Despite a surge in market value, employment in core sectors like Forestry and Logging is experiencing long-term stagnation or decline. Conversely, industries higher up the value chain, such as Wood Products Manufacturing, show more resilience to these trends. The price of value-added lumber products has steadily increased over the past decade.[102] These products maintained their appreciated value in 2023, even as general lumber prices declined from their peak in 2021.

[101] REF

[102] REF

Figure 6.9 Wood Products Cluster Performance



Note. Data source from IMPLAN. Author's calculations. 2022 data with 2013 growth comparison. NAICS codes shown in parentheses. Employment figures include proprietors and may differ substantially from QCEW data, which include only employees.

The cluster supports numerous family-sustaining jobs; however, aligning with environmental goals is a challenge. The Wood Products Manufacturing industry, for instance, is associated with high levels of greenhouse gas (GHG) emissions per job and increased air pollution.[103]

Cluster Outlook

The EDD forecasts below-average employment growth in the Mining and Logging sector.[104] Coupled with employment declines in most Wood Products industries, the overall growth outlook for the cluster appears uncertain. Despite these challenges, redwood stands out for its valuable properties, such as rot and insect resistance (*The Redwoods of Coast and Sierra*, n.d.), offering substantial market advantages. The region's growing dominance in the California lumber market and near monopoly on redwood—a valuable, differentiated, and appreciating resource—provide market power and competitive edge. These factors are promising for the industry's continued contribution to economic activity and family-sustaining employment in the region. The challenge for the industry is preserving these family-sustaining occupations while aligning with environmental rules and policies.

Notable Policies and Impacts

Prop 64 - Cannabis Legalization. Prop 64 formalized the industry but resulted in greater competition from regions with competitive advantage, subsequent market flooding, and exit from the industry of an estimated 80% of firms from the Emerald Triangle.[105] Cultivating appellations and niche marketing is a strategy the remaining North Coast growers are pursuing to stay competitive, a strategy supported by recent legislation (SB-185) that requires California county of origin to be accurately reported in cannabis labeling.

[103] See GHG Emissions, Air, Water, and Hazardous Waste from Potential Growth Clusters in the Industry Cluster Appendix.

[104] See Potential Job Growth for Major Industry Sectors, Redwood Region in the Industry Cluster Appendix.

[105] Interview with Humboldt Growers Alliance, June 15, 2023.

Clean Air Resources Board (CARB) (*Medium- and Heavy-Duty Diesel Regulations | California Air Resources Board*, n.d.) restrictions on heavy-duty diesel vehicles are impacting the logging industry. Companies report bottlenecks in trucking as companies exited the market or limited service.[106]

After over 150 years, regulations banning the indigenous forest management practice known as cultural burning have been overturned. Passed in 2021, SB-332 protects those who provide prescribed fire-burning services against liability for the cost of fire suppression or a prescribed burn, provided all conditions are met (Stone et al., 2021). Further enabling private landowners to partake in beneficial management practices, AB-1867[107] allows landowners to sell timber produced from their land due to fire prevention activities (Elizabeth, 2016).

Governance of shared waterways and marine resources naturally impacts the region's fisherfolk, including unpredictable season openings and closings for different species, as highlighted above. Port redevelopment and offshore wind will also impact those operators, and efforts are currently underway to consult with fisherfolk on project plans.

Arts, Culture, and Tourism

Cluster Overview

Tourism has been a significant industry for the region since the mid-19th century, whereas the contributions of Art and Culture have only more recently been recognized as providing synergistic growth and diversification opportunities. Historically, many industries within the sector deliver lower wages, may lack in typical employee safety nets and upward mobility, and are often defined by gig and seasonal work (Yang et al., 2021). With this important caveat in mind, the Arts, Culture, and Tourism industry cluster is a key economic sector in the region, drawing significant visitor numbers and revenue. Encompassing agritourism, the Redwoods and coastal attractions, seasonal festivals and heritage sites celebrating indigenous and other local cultures, the cluster has both well-established regional assets and capacity and potential for further development. Annually, the area's state and national parks attract approximately 5 million visitors.[108] Overall, visitors generate about $1.3 billion in spending (Dean Runyan Associates, 2023)—about $4,081 per Redwood Region resident, exceeding the statewide equivalent of $3,433.[109] See Figure 6.10 below.

Cluster Performance and Alignment with RRRISE Goals

Arts, Culture, and Tourism, shows signs of employment specialization and resilience in two industries, including **Museums, Historical Sites, and Similar Institutions** (NAICS 712)[110] and **Performing Arts, Spectator Sports, and Related Industries** (NAICS 711). These industries have a minimal carbon footprint, but support few family-sustaining occupations.

[106] REF

[107] REF

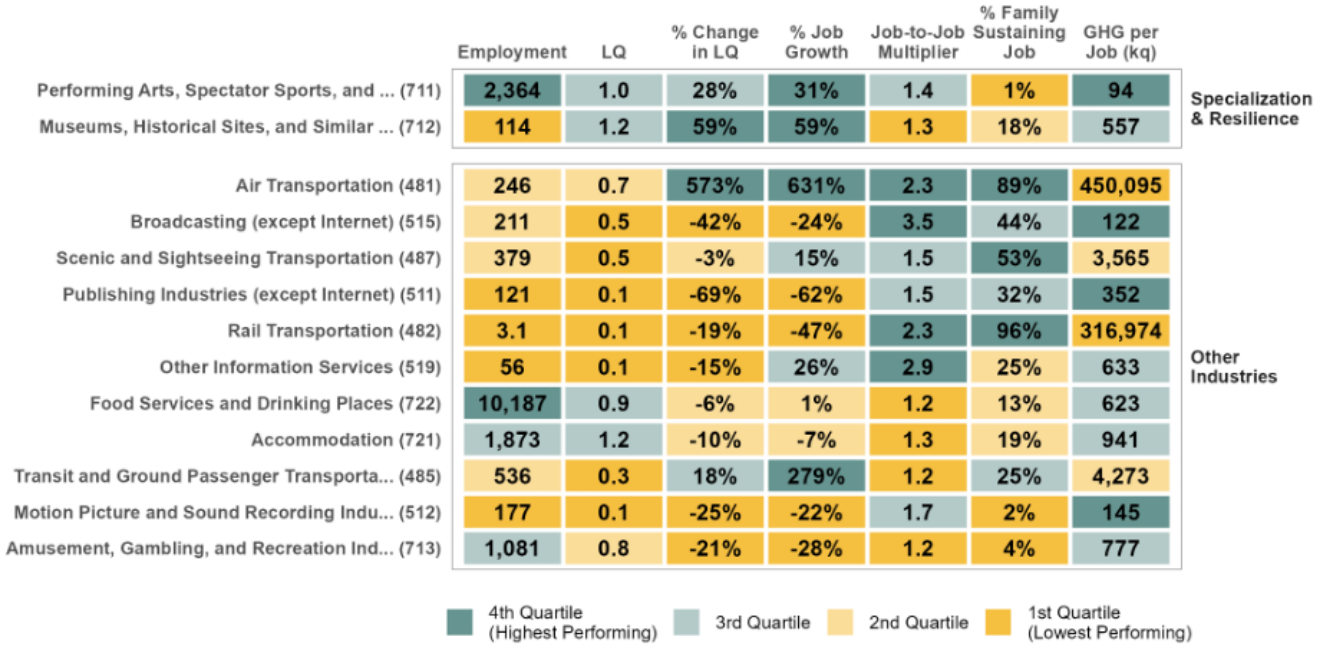
[108] In 2023 for instance 409,105 people visited Redwood National Park (Stats Report Viewer, n.d.) and 4,536,826 people visited the Redwood Region's state parks in fiscal year 2018/19 (the most recent year available) (Parks, n.d.).

[109] Based on Department of Finance 2022 Redwood Region population of 318,561, state population of 39,146,273 (California, n.d.), and state total spending of $134,391 million.

[110] NAICS codes are included in parentheses when industry name is abbreviated in visualizations.

Scenic and Sightseeing Transportation (NAICS 487) appears underdeveloped, given the region's numerous natural attractions, with a location quotient of just 0.5. This industry supports a high proportion of family-sustaining occupations, with a relatively moderate climate impact.

Figure 6.10 Arts, Culture, and Tourism Industries Performance



Note. Data source from IMPLAN. Author's calculations. 2022 data with 2013 growth comparison. NAICS codes shown in parentheses. Employment figures include proprietors and may differ substantially from QCEW data, which include only employees.

Cluster Outlook

While the COVID-19 pandemic, inflation, and other shocks may have temporarily disrupted these industries (*COVID-19's Pandemic's Impact on the Arts: Research Update May 12, 2022*, 2022), the outlook for this cluster looks strong (*Economic Impact*, n.d.). From 2013 through 2022, traveler spending to the region has increased 27.1%, and industry earnings have increased 70.4%—outpacing the equivalent statewide figures of 20.3% and 53.6% (Dean Runyan Associates, 2023). Furthermore, the EDD projects that Redwood Region Leisure and Hospitality sector employment will grow faster than any other sector through 2030.[111] A challenge for the cluster is translating this growth into family-sustaining occupations.

> *"The creative sectors do not share a cohesive workforce infrastructure and employer-worker arrangements vary from one industry to another, which has created large obstacles for policy making. Many individuals do not practice their art or creative pursuits as their primary, wage-earning job. Yet many counts of the workforce focus only on those employed full-time by organizations"*
>
> **-(2023 Otis College Report on the Creative Economy, 2023).**

[111] See projection in the Appendix.

Industry-Specific Assets

Most current and proposed local and state investments in the sector are concentrated in eco-tourism. Currently under development, the Great Redwoods Trail,[112] for example, is an example of a highly anticipated asset. Cal Poly Humboldt and College of the Redwoods also bring in and produce young professionals in the arts, culture, and tourism sector.

Agri-tourism in the cannabis, winery, and brewery industries, as well additional agricultural industries such as dairy, attract and serve tourists and provide a boost to local and regional economies, creating cross-cutting opportunities with the Working Lands sector.[113] The region possesses nine destination marketing organizations.[114] Embedded in community, the arts and culture workforce is well-suited to exploring, developing, and implementing new strategies rooted in community-building and cross-sector collaboration to address some of the most profound social, economic, and environmental challenges in the region.[115]

Notable Policies and Impacts

State and philanthropic arts funding for rural arts and artists—especially BIPOC-centered organizations—lags significantly behind urban arts organizations and individuals on a per capita basis in the Redwood Region, significantly impacting equitable access to arts and culture (Carnwath, 2022). Also important to recognize is the relationship between rural and urban areas, with many of the "best and brightest" driven to leave their rural regions to pursue job opportunities elsewhere. However, the risks of gentrification and rising costs loom when a rural community is able to attract new tourists, residents, and businesses (Moskowitz, 2017).

Renewable and Resilient Energy, Enabling Industries

The region aspires to develop a **Renewable and Resilient Energy (RRE)** industry cluster primarily centered around energy efficiency and renewable energy. Industries supporting such an industry include Utilities,[116] Construction,[117] and Repair and Maintenance,[118] among others.

Cluster Performance and Alignment with RRRISE Goals

As shown in Figure 6.11, these industries support a high proportion of family-sustaining occupations. Therefore, additional economic activity in these industries is likely to continue to foster and promote family-sustaining occupations.

[112] The Great Redwood Trail will be a 307-mile multi-use rail-to-trail project connecting San Francisco to the Humboldt Bay via the Eel River Canyon. Preliminary impact studies project total annual benefits of over $102,000,000 from the trail.

[113] See, for example, Del Norte County's Agritourism strategy.

[114] According to Visit California, notable attractions include Clear Lake in Lake County and Glass Beach (MacKerricher State Park), Mendocino Coast Botanical Gardens, Redwood National Park, Point Arena Lighthouse, and the Skunk Train in Mendocino County.

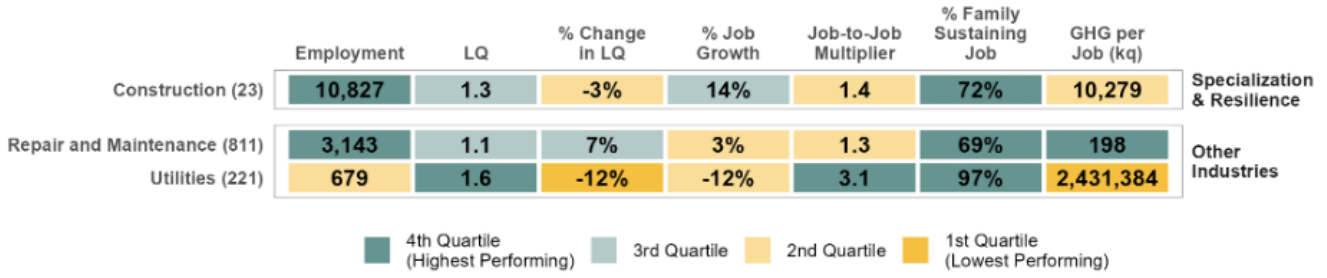
[115] REF

[116] Such as NAICS code 221115 Wind Electric Power Generation

[117] Such as NAICS code 237130 Power and Communication Line and Related Structures

[118] Such as NAICS code 811310 Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance

Figure 6.11 RRE Enabling Industries Performance



Note. Data sourced from IMPLAN. Author's calculations. 2022 data with 2013 growth comparison. NAICS codes shown in parentheses. Employment figures include proprietors and may differ substantially from QCEW data, which include only employees.

RRE Potential

The Redwood Region has great potential for developing its RRE sector, as both energy efficiency and renewable energy investments in it offer significant potential for job creation and economic development. Energy efficiency investments are often labor intensive and so tend to create more jobs per dollar invested than do renewable energy projects. Moreover, energy efficiency jobs are often cross-sectoral and local (in industries like construction, manufacturing, and installation/maintenance).[119] Further, from an economic development standpoint, energy efficiency provides ongoing energy cost savings for households and businesses and frees up dollars that can be spent in local economies. Efficiency also has the benefit of added resilience: For example, reducing total energy demand can mitigate energy price volatility and supply disruptions.

Renewable energy investments also generate jobs in construction, manufacturing, and operations, although at a somewhat lower labor intensity than does energy efficiency.[120] However, renewable energy can provide significant boosts to local economies as an export industry, especially in rural areas such as the Redwood Region, with strong renewable resources that can be sold outside the region (see the discussion below). Both efficiency and renewables offer opportunities for building local supply chains and spurring innovation as these industries grow. As such, a transition strategy (as is being developed by the RRE Sector Table) that prioritizes both energy efficiency and renewable energy based on regional strengths can maximize overall job creation and economic development while accelerating the shift to a clean, resilient energy system.

[119] Garrett-Peltier, H. (2017). Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model. *Economic Modelling*, 61, , 439–447. http://dx.doi.org/10.1016/j.econmod.2016.11.012.

[120] Laitner, J. A. , Stephen O. A., Gabrielle B. D., & Kristen N. T. (2021). Investing in US energy efficiency and infrastructure creates more nationally-distributed jobs while saving money and protecting the climate. Washington DC and Paris, France: The Institute for Governance & Sustainable Development (IGSD); and Tucson, AZ: Economic and Human Dimensions Research Associates. https://theresourceimperative.com/wp-content/uploads/2021/03/Energy-Efficiency-Upgrades-Protecting-the-Climate-Creating-Jobs.pdf

The offshore wind industry has high potential to contribute to the Redwood Region's economic growth, GHG emissions reduction, and climate goals. Preliminary economic modeling shows significant (yet highly uncertain) potential impacts statewide (modeling of regional impacts is currently being conducted).[121] Estimates of Humboldt offshore wind job creation potential are difficult to pin down at present; the Schatz Energy Research Center at Cal Poly Humboldt is currently working on IMPLAN models to do so. Actual jobs and job creation estimates per GW (gigawatt) from studies across the nation use different job calculation procedures or models (IMPLAN, JEDI) based upon different assumptions, and on-site, construction stage, supply chain, and induced job numbers are often aggregated. Offshore wind also presents opportunities for innovation and industry-specific asset development, and policy trends support renewable energy growth and job creation. As the industry grows over the next 10-20 years, further innovations in design, materials, and construction techniques are expected to drive down costs and improve technologies and operational efficiency.

Notable Policies and Impacts

Recent California legislation has created a supportive policy environment[122] for both energy efficiency and renewable energy, particularly with respect to offshore wind and transmission infrastructure development. In October 2015, California adopted SB 350, the Clean Energy and Pollution Reduction Act of 2015,[123] which established a 2030 greenhouse gas reduction target, increased the state's renewable energy requirement to 50 percent, and mandated a doubling of energy efficiency. SB-1020, the Clean Energy, Jobs, and Affordability Act of 2022, sets ambitious targets for renewable energy with the goal of creating new jobs in the sector. SB-100, the California Renewables Portfolio Standard Program, mandates that, by 2045, 100% of the state's electricity come from renewable and zero-carbon sources. AB-525, the Offshore Energy Project, requires the state to develop a strategic plan for offshore wind development, while AB-2316 directs the Public Utilities Commission to consider development of offshore wind and the necessary transmission infrastructure.

Case Study

Offshore Wind in Humboldt County: Balancing High-Road Job Creation and Local Economic Resilience

The proposed offshore wind project[124] in Humboldt County, California, has the potential to create hundreds of high-quality, family-supporting jobs. The project's commitments to local hiring, workforce training, and labor standards could set a new bar for high-road economic development in the Redwood Region. As the industry grows, it could create a multiplier effect throughout local and regional economies, supporting job creation and small business growth in sectors like Construction, Transportation, Hospitality, and Services (among others). The proposed scale of the offshore wind project also presents challenges for Humboldt County's existing industries and employers, however. An influx of new, high-paying jobs in the wind

[121] For example, the construction phase for offshore wind is predicted to generate between $330 million and $2.5 billion in economic output in California and to create between 1,600 and 13,000 new jobs in California, depending on the scale of the projects and the transmission pathways chosen. Annual operations could contribute an additional $3.2 million to $117 million in economic output, creating 26 to 960 new jobs in California (Hackett et al., 2020; Schatz Energy Research Center et al., 2024).

[122] See here for overview.

[123] [REF]

[124] [REF]

industry could make it harder for other sectors to attract and retain workers, particularly those that have historically struggled to offer competitive wages and benefits. Small businesses and non-profit organizations may find it especially difficult to compete for talent in a tighter labor market.

One example of efforts to ensure that the benefits of the offshore wind project are shared broadly is the Redwood Region Climate and Community Resilience (CORE) Hub program.[125] A key aspect of the CORE Hub's work is facilitating community engagement and dialogue to inform decision-making and ensure tangible and beneficial outcomes from the wind project, including providing resources for historically underrepresented and marginalized communities to participate in the development process. The program also focuses on providing trusted expert input, data, and analysis to help local communities make informed decisions.

[125] [REF]

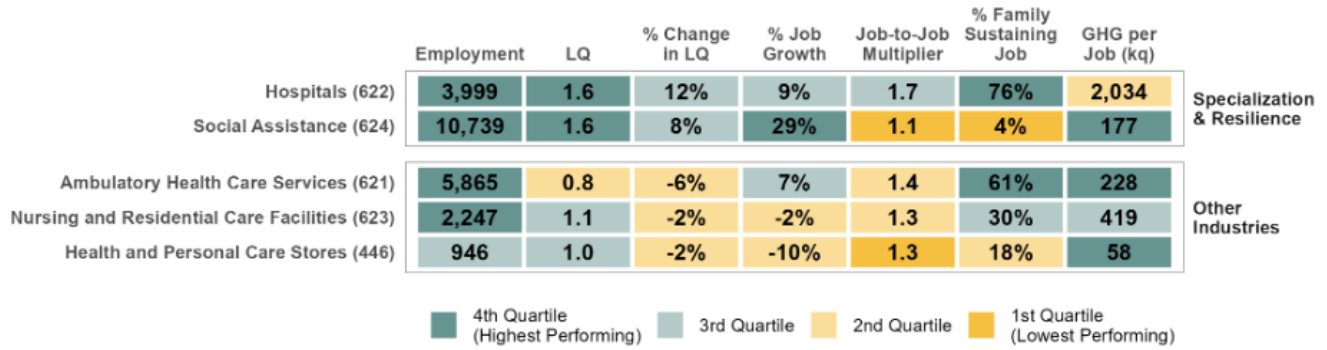
Health and Caregiving

Unlike traded sectors driven by market demand, the primary challenge for the Health and Caregiving cluster lies in attracting and retaining skilled workers to fulfill the region's health and social care needs. As discussed in the Public Health Analysis, the region faces health provider shortages and, as discussed in the Labor Market Analysis, the projected need for caregivers and health professionals is exceptional.

Cluster Performance and Alignment with RRRISE Goals

The cluster aligns well with High Road objectives, featuring minimal to moderate greenhouse gas (GHG) emissions and supporting industries that offer a significant number of family-sustaining jobs. However, the wages in the Social Assistance sector, which includes essential services like childcare, remain low. See Figure 6.12 below.

Figure 6.12 Health and Caregiving Industries Performance



Note. Data sourced from IMPLAN. Author's calculations. 2022 data with 2013 growth comparison. NAICS codes shown in parentheses. Employment figures include proprietors and may differ substantially from QCEW data, which include only employees.

Outlook

The employment growth outlook for these industries is projected to be faster than average,[126] reflecting in large part the evolving needs of an aging population. The primary constraint on sector employment growth seems to be the region's capacity to attract and train skilled providers. These workforce development challenges are explored in-depth in the Labor Market Analysis.

Industry-Specific Assets

The Healthcare and Caregiving cluster includes a wide range of industries and services dedicated to promoting, maintaining, and restoring the health and well-being of community members. Within the RRRISE region, a variety of ways exist by which to characterize these sectors: 1) the breadth of their industry concentrations and capacities for employment, 2) the ways in which the industries do or do not meet the basic infrastructure needs that lead to economically prosperous communities, and

[126] As shown in Potential Job Growth for Major Industry Sectors, Redwood Region in the Appendix, employment in the Educational Services (Private), Health Care, and Social Assistance sector is projected to grow faster than average.

3) their impact on health outcomes and health inequities in the region.[127] The Health and Caregiving Sector encompasses several industries across the Redwood Region Rise region: ambulatory and acute medical care, behavioral health care, dental care, allied medical care, caregiving, and social care sectors. The region has durable organizations and collaboratives that actively seek solution-oriented approaches while trying to continually adjust to population needs and economic challenges.

Notable Policies and Impacts

At the state level, Health in All Policies (HiAP) provides a framework for change in healthcare systems. Specifically, it ensures that local, state, and federal governments make and implement decisions that have neutral or beneficial impacts on the determinants of health. Adoption of HiAP is anticipated to promote mainstreaming of SDOH approaches across the region's healthcare system. Additionally, the Department of Health Care Access and Information (HCAI) provides state-level recommendations to address workforce challenges in the healthcare space. Its focus is on behavioral health, nursing, allied health, and oral health. Many of these policy endorsements support scholarships and stipends for students with prioritization given to underserved and underrepresented communities and to an increase in pathway programs and new training sites.

The Workforce for Healthy California Initiative commits funding across programs to increase number of providers, provide additional training, and increase cultural competency. To identify investment avenues that will have the greatest and most lasting impact, HCAI uses a workforce model to understand the region's by-specialty and by-region care gap.

Summary of Cluster Alignment with RRRISE Goals and Outlook

In the context of high-road job creation, industry, government, labor, education, and community partners must collaborate on workforce and economic development strategies. Initiatives to upskill local residents for future jobs and efforts to boost job quality and career opportunities across all sectors are becoming increasingly important. Proactive planning, community-driven problem-solving, and a commitment to high-road principles will help the region better leverage economic drivers. Figure 6.13 on the next page provides a summary of the region's cluster analysis.

[127] In considering Schroeder's Social Determinants of Health (a framework that suggests that health disparities and outcomes are shaped not only by access to healthcare services but also by broader social, economic, and environmental factors) it makes sense to employ an aligned approach to these complementary industry sectors.

Figure 6.13 Industry Cluster Analysis Summary

	Wages	Climate & Environmental Impact	Outlook
Agriculture and Blue Economy	Low	High	Stable
Wood Products	High	High	Stable
Arts, Culture, & Tourism	Low	Low	Growth
Renewable & Resilient Energy	Potential for High Wages	Potential for Low Impact	Development Opportunity
Health & Caregiving	High	Low	Growth

Chapter 7

Labor Market Analysis

This chapter provides a snapshot of labor and workforce dynamics in the region. It discusses occupations, wages, the impacts of recent economic and technological developments and their effects on the labor market. Also discussed are projected labor trends in existing key industries and common barriers that limit access to high-quality jobs and relevant training programs and apprenticeships. Key industry standards for workers are touched on as relevant.

Key Takeaways

- The Redwood Region has experienced significant job losses in legacy industries (forestry, agriculture, manufacturing). Populations typically associated with these legacy industries—men and workers with lower educational attainment—exhibit low prime age labor force participation compared to state averages.
- Workers in the region struggle to gain career momentum. Wages for young workers and those with low levels of education match state averages. However, wages among more educated and experienced workers are suppressed, reflecting a trend common in rural areas across California.
- Current shortages and projected labor market needs clearly signal an ongoing demand for family-sustaining employment in healthcare, teaching, and skilled trades including electricians, plumbers, carpenters, and automotive service technicians. Demand for a number of occupations that are critical to all Redwood Region industry clusters is projected to be strong, including management, truck driving, and accounting.
- Most family-sustaining job growth is in occupations that do not require a bachelor's degree, and so relevant training programs are available locally. However, in many cases, completion rates from these programs do not keep pace with the demand for workers in those program's areas. Graduation rates from nursing, counseling and psychology, teacher credentialing, and skilled trades programs do not appear to be sufficient to meet the current or projected needs.
- High school graduates across the region are less prepared for secondary training compared to state averages, indicating a critical barrier to success in postsecondary training programs.

Key Metrics

- **Prime-age labor force participation rate by race and age:** Track the proportion of working-age adults (age 25-54) who are employed or actively seeking work, disaggregated by demographic characteristics. This indicator is less influenced by differences in the age distribution between regions or changes over time.
- **Percentage of jobs that pay a family-sustaining or living wage:** Assess the quality of employment opportunities by calculating the share of jobs that provide wages sufficient to support a family or individual. Based on the MIT Living Wage Calculator, the minimum wage sufficient to support a family of two working adults (full-time) and two children is at least $27.49.[128]
- **Living Wage:** Also based on the MIT Living Wage Calculator, a wage sufficient to support a single adult (working full-time) with no children equals at least $21.78.
- **Projected job openings and growth rates by occupation:** Analyze long-term labor market projections to identify high-demand occupations and guide workforce development priorities.
- **High school graduation rates and college readiness:** Monitor educational outcomes and preparedness for postsecondary training to ensure sufficient supply of skilled workers.

Major Trends in the Labor Market

Decline in Legacy Industries and the Rise of Healthcare and Social Assistance

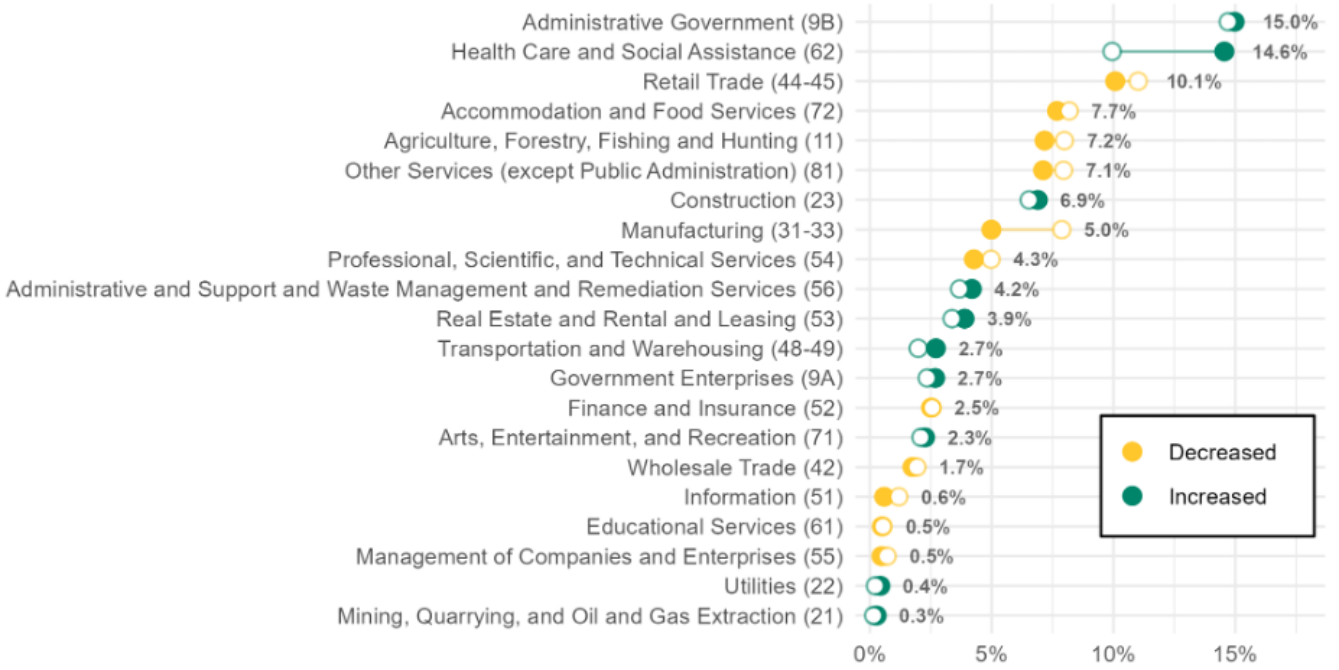
Like many rural areas in the United States, the Redwood Region's economy was historically concentrated in land-based sectors like agriculture, forestry, logging, and government services. Workers in these rural regions, who typically have lower levels of educational attainment, face greater challenges when displaced from their jobs due to the area's lack of diversity in employment opportunities compared to urban areas (Dumont, 2024).

Regional data reflect these trends in the Redwood Region, demonstrating a decline in employment in manufacturing and natural resource-based industries over the last few decades. Simultaneously, there has been a notable increase in employment concentration within the Health and Social Assistance sector. This sector employs the largest number of workers (21%) in the region. Nearly 60% of workers are concentrated in health care, retail, public administration, and educational services. Essential industries have faced significant pressure due to the COVID-19 pandemic (Policy Link, 2024).

See Figure 7.1 for shifts in areas of employment within the region over the two preceding decades.

[128] This is the population-weighted average of the four counties.

Figure 7.1 Employment Concentration and Change Since 2001 (2001, 2022)

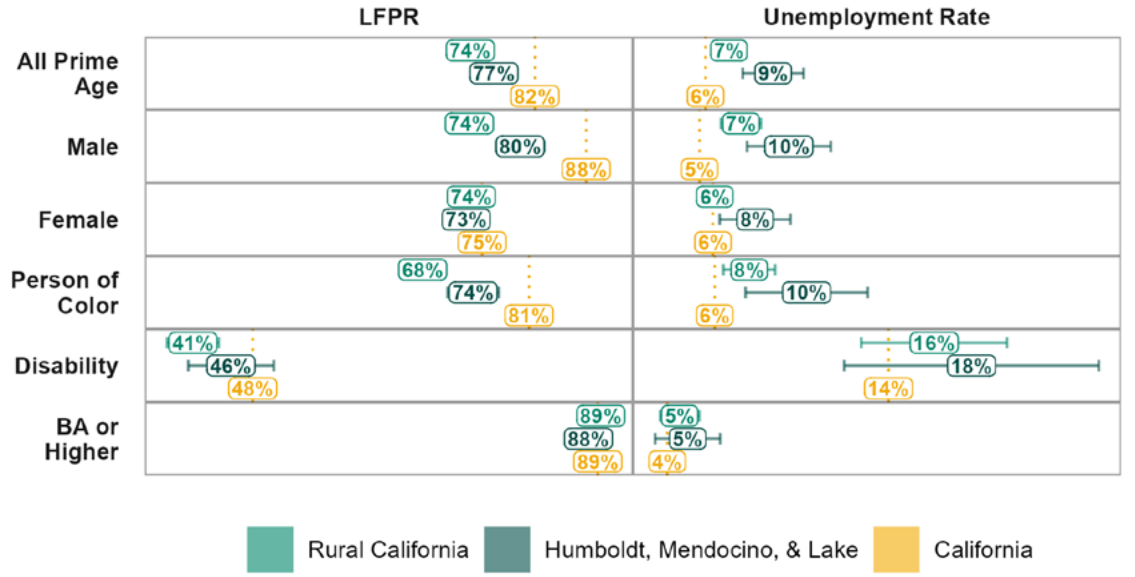


Note. Data sourced from IMPLAN.[129]

These employment shifts in the Redwood Region have had varying impacts on different groups of workers. Traditionally, the declining sectors such as Manufacturing and Resource Extraction have predominantly employed men without bachelor's degrees. In contrast, the growing Health and Social Assistance sectors tend to employ more women and more individuals holding bachelor's degrees. Consequently, the region's employment shifts have disproportionately displaced men and those with lower educational attainment. Data from the Redwood Region, and rural California as a whole, show that men experience significantly lower labor force participation rates, whereas individuals with a bachelor's degree or higher maintain employment rates that align with state averages. Despite this, women in the Region still have lower labor force participation than men.

[129] North American Industry Classification System (NAICS) code in parentheses. Solid points indicate current value.

Figure 7.2 Labor Force Participation Rate (LFPR) and Unemployment Rate, Prime Age Adults[130]



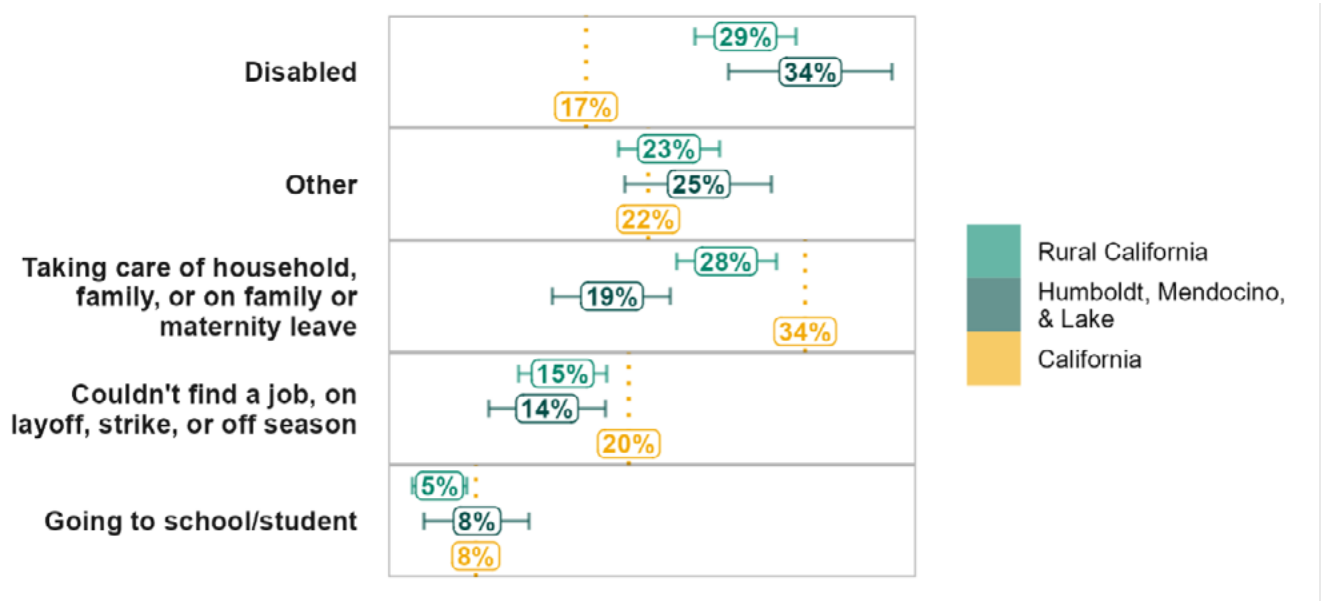
Note. Data sourced from Census PUMS. Five-year estimates 2017-2021. Rural California is defined as all California counties with an Index of Relative Rurality (IRR) of at least 0.50 (Waldorf & Kim, 2018).[131]

Health and disability factors significantly complicate these workforce challenges in the Redwood Region, where, as discussed in the Public Health Analysis, rates of disability are far higher than state averages, including among young adults. As shown in Figure 7.3, a substantial proportion of prime-age adults who are unemployed or out of the labor force cite disability as their main reason for not working. Furthermore, among younger adults, substance use and mental health issues are the predominant causes of these disabilities, suggesting that workforce challenges are intertwined with a growing public health crisis (*Symptoms Matter—Leading Causes of Disability*, n.d.).

[130] Prime age adults include adults aged 25 to 54.

[131] These include Alpine, Amador, Calaveras, Colusa, Del Norte, Glenn, Humboldt, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Plumas, San Benito, Sierra, Siskiyou, Tehama, Trinity, and Tuolumne Counties. Lake County has the lowest IRR in the region (i.e., is the least rural) and so represents the low threshold for the Rural California comparison group.

Figure 7.3 Main Reason Not Working, Prime Age Adults



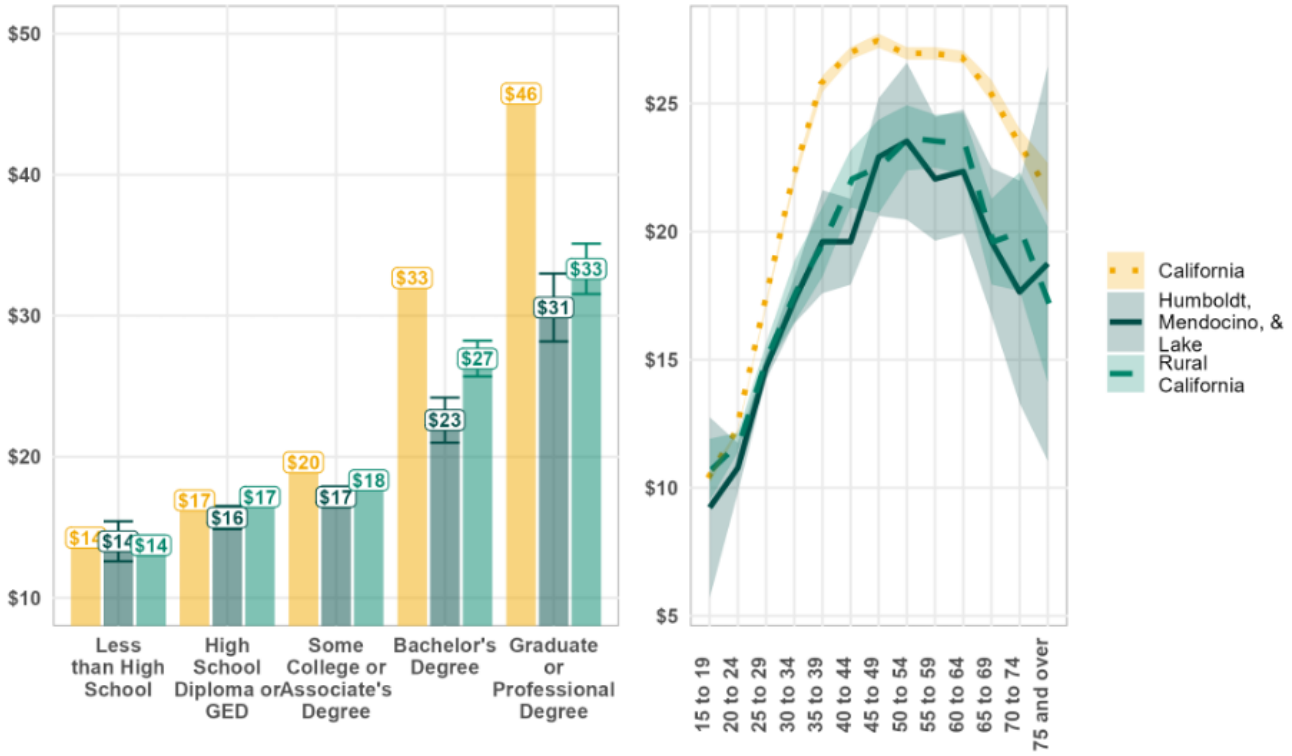
Note. Data sourced from California Health Information Survey. Data years include 2011-2022.[132]

Failure to Gain Career Momentum

Jobs are available in the Redwood Region, but career progression is elusive for many workers. Young workers and those with low levels of education earn wages comparable to state averages. However, workers with more experience or further education experience significant wage gaps, suggesting that the region's labor market does not adequately reward accrued experience or education. These trends are typical of other rural areas in California. See Figure 7.4 for hourly wage by education and age.

[132] To define a rural California comparison, Public Use Microdata Areas (PUMA) selected have at least one county with an Index of Relative Rurality (IRR) that is at least as high (≥ 0.5) as the IRR for the Redwood Region county with the lowest IRR (0.5 in Lake County). California counties covered by these PUMAs include Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, Tuolumne, Colusa, Glenn, Tehama, Trinity, Humboldt, Lake, Mendocino, Monterey (South & East only), Del Norte, Lassen, Modoc, Plumas, Siskiyou, San Benito, Nevada, and Sierra. Due to differences in geographic aggregation between the CHIS and Census PUMS data, Monterey County, which does not meet our threshold of rurality of 0.5, is excluded in the Rural California comparison in CHIS data.

Figure 7.4 Hourly Wage by Education and Age



Note. Data sourced from Census PUMS data 2017-21 5-year estimates. Bars on the left panel and shared region on the right panel represent 95% confidence intervals. See footnote for detailed methodology.[133]

Wage Disparities and Equity Considerations

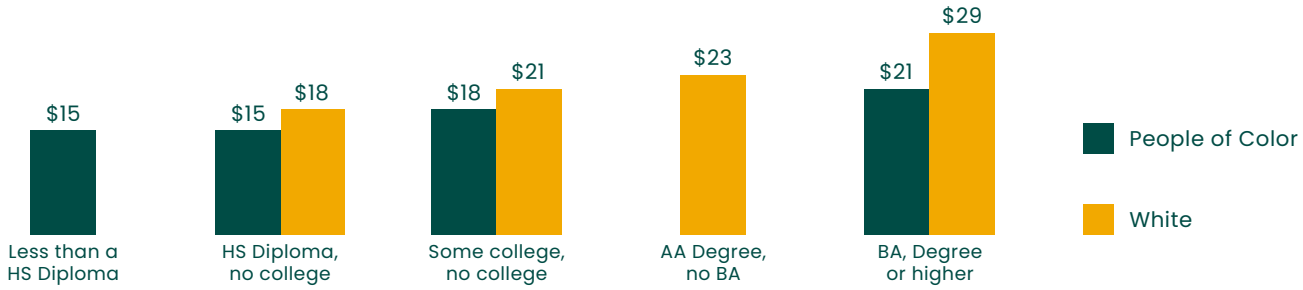
People of color are highly represented in lower-paying industries like agriculture (44%), retail trade (32%), and durable manufacturing (32%). They are underrepresented in higher-paying sectors like information (20%), professional services (15%), and finance, insurance, and real estate (21%).

Since 1980, the median wage in the region has dropped by 16 percent. Although data constraints limit historical comparisons for Latinx and Native American workers, wages for white workers have fallen by 12 percent. The wage disparity between Latinx and white workers is notable, with the median hourly wage for Latinx workers being just 73 percent of that for white workers. Over the last 40 years, earnings growth has predominantly benefited the top 10% of earners while declining sharply for the bottom half of workers.

The National Equity Index from PolicyLink provides targeted data analysis on wage disparities and inequities in the Redwood Coast's labor market and is the source of Figure 7.5.

[133] Hourly wages were calculated from the estimated number of weeks worked, average number of hours worked per week, and labor income. Outliers were then removed by excluding all nonpositive hourly rates and all hourly rates outside an acceptable interval. To determine this interval, the log of the hourly rates was taken to convert the distribution into an approximately normal distribution. The first and third quartiles (Q1 and Q3) were then determined to calculate the interquartile range (IQR = Q3 - Q1) of this distribution. All observations for which the log hourly rate was below Q1 - 1.5I * IQR or above Q3 + 1.5 * IQR were excluded.

Figure 7.5 Median Wage by Race/Ethnicity and Educational Attainment 2020



Source: National Equity Atlas analysis of 5-year American Community Survey microdata from IPUM USA. Universe includes civilian non institional full-time wage and salary ages 25 through 64 years. Note: Data for 2020 represent a 2016 through 2020 average. Values are in 2020 dollars.
Note: There is not enough data to display on median wages for Asian American workers with less than a high school diploma, nor Black, Native American, and Pacific Islander workers at any level of education.

Workers At Risk of Displacement

Worker displacement refers to an involuntary loss of employment due to an employer's downsizing or closure (OECD, 2016). By analyzing shifting trends in industry and job growth, this section identifies groups of workers within the region who may be at risk of displacement over the coming decade.

Nearly two-thirds of projected jobs[134] to be created over this period are predicted to come from two sectors: Education Services (Private), Health and Social Assistance, and Leisure and Hospitality[135] (see below). Both sectors employ predominantly women; aside from this, however, the sectors diverge across race, age, education, and income. The former workforce earns more income, skews toward white, is older, and has more education than the latter, who tend to earn a lower wage, are younger, have lower levels of educational attainment, and are more likely to be persons of color.

The remaining third of projected job openings are divided among 11 sectors. Although the proportion of total jobs created within these sectors is smaller than in the top two sectors, Transportation, Warehousing, and Utilities; Construction; Other Services[136]; and Wholesale Trade are projected to experience faster than average job growth rates. Therefore, workers in these fields appear to be at lower risk of displacement. The outlook for skilled trades and construction occupations is especially strong, and many of these occupations pay living wages and require only some postsecondary training.

The remaining sectors (see Manufacturing through Information in Figure 7.6) are expected to experience slower than average job growth rates and so account for a small proportion of overall jobs created. These slower growing fields include a mix of both industries having more highly educated workers and those with lower levels of educational attainment.

Workers in many Manufacturing; Total Farm, Mining, and Logging; and Retail Trade are already experiencing displacement (see the Crop Production and Forestry and Logging Industry Cluster Analysis), and these projections suggest an ongoing poor outlook for job growth in these industries. Such

[134] Including living wage and below living wage jobs. See next section for projected living wage occupations.

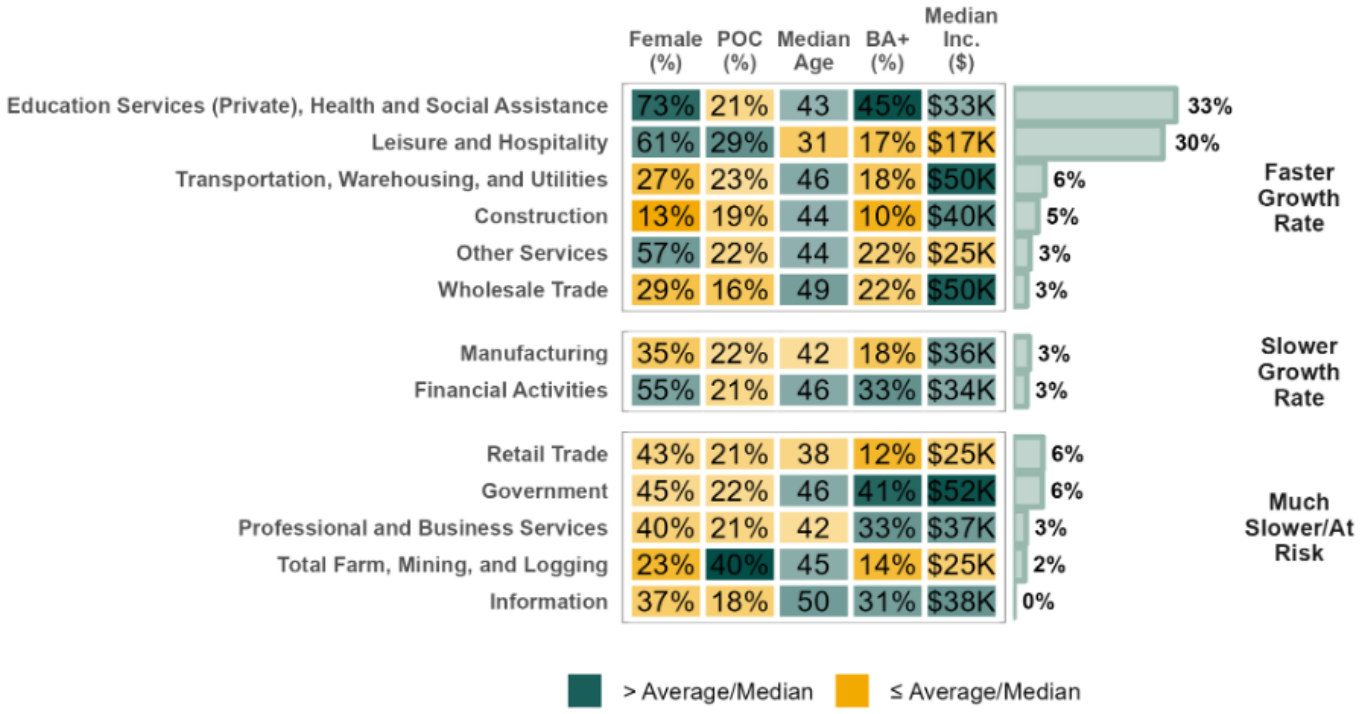
[135] As defined by the EDD. NAICS codes included in each.

[136] This includes NAICS code 81. This is defined as follows: "Establishments in this sector are primarily engaged in activities such as equipment and machinery repairing, promoting or administering religious activities, grantmaking, advocacy, and providing drycleaning and laundry services, personal care services, death care services, pet care (except veterinary) services, photofinishing services, temporary parking services, and dating services. Private households that engage in employing workers on or about the premises in activities primarily concerned with the operation of the household are included in this sector." (*North American Industry Classification System (NAICS) U.S. Census Bureau*, n.d.)

displacement is likely to disproportionately impact men, persons of color (within the Total Farm, Mining, and Logging sector), and individuals characterized by lower levels of educational attainment.

More highly educated workforces also appear to be at risk of displacement. Job growth in knowledge-based industries including Financial Activities, Government,[137] Professional and Business Services, and Information is projected to be minimal.[138] A compounding risk factor for these industries is the potential impact from current and future developments in generative artificial intelligence (AI). Roughly 16% of the United States workforce now regularly uses AI in the workplace (Brooks, 2023) and, as with many new technologies, the risk of displacement is a central topic of research and debate. A recent study found that many knowledge occupations are highly exposed to AI automation risk and displacement—particularly workers in legal and administrative[139] professions—whereas workers in trades, construction, outdoor and manual work, healthcare fields, and food services are expected to be relatively insulated from AI displacement (Hatzius et al., 2023). Workers in several of these at-risk fields skew older, compounding the potential workforce development challenge.

Figure 7.6 Workforce Demographics (Left) and Percent Breakdown of All Projected Jobs Created (Right) from 2020-2030



Note. Projection data sourced from EDD. Demographic data sourced from Census PUMS data 2017-21 5-year estimates. Demographic data do not include Del Norte.[140] Job growth does not sum to 100% due to rounding. Median income includes labor income only.[141] Bars illustrate the total percentage of all jobs created in each sector. Growth rates (see classification on the right) categorize sectors based on their percentage job growth rate.[142]

[137] As discussed in the next section, teachers and firefighters appear to be an important exception.

[138] See Potential Growth for Major Industry Sectors, Redwood Region, in the Industry Cluster Appendix.

[139] Legal and office and administrative support occupations are particularly exposed. Architecture and engineering occupations also have some exposure.

[140] Census PUMS data aggregate Del Norte with several other counties outside the Redwood Region.

[141] Includes both part-time and full-time workers. Does not include workers who report no labor income. These are approximate estimates only. Please see the wage data in the following section for more precise wage estimates.

[142] Larger sectors can account for a sizable portion of job openings even if the job growth rate is slow.

Barriers to Workforce Participation

Identifying workforce barriers was a key goal of the 355 listening sessions the RRRISE outreach and engagement team conducted with residents. The primary barriers identified were:

Transportation: Given the remoteness of the region's communities, residents stated that travel time between places is long, a particular difficulty for people with disabilities or people who rely on public transportation. The lack of public transportation limits the places residents can go. For residents who manage their own transportation, the cost of gas can be prohibitively expensive, and roads are frequently closed due to extreme weather events, such as wildfires.

Health: Many residents live more than 10 miles from a grocery store, limiting access to healthy foods. Access to healthcare providers, for both physical and mental health, is scarce in the Redwood Coast, as is healthcare education.

Childcare: Across the region, as many as seven in 10 children do not have access to a licensed childcare provider. Residents who cannot find licensed child care often leave children with family members or sometimes bring their children with them to work, limiting the parents' opportunities at work.

Cost of Living: Residents reported difficulties affording their bills and rent and having to rely on credit cards. As mentioned previously, affordability concerns impact transportation and nutrition for families as well.

Working Culture and Job Access: Residents stated that many jobs have less than favorable working conditions, citing favoritism and bullying by supervisors. Residents who are non-native English speakers or who do not speak English reported difficulties navigating the workplace. Few workforce-preparation or career-exploration programs are available for residents, and many feel that, without some means of seeing what jobs are available, they miss out on job opportunities.

Educational opportunities are also a workforce barrier. Many jobs in the area require a college degree that residents do not have, but the jobs are such that these residents could learn on the job and be successful. Residents are typically unable to commit to a college degree because they have to support their families or cannot afford to attend college, thus limiting their career opportunities. Online schooling is an option, but many people in the region do not have access to a computer or the internet.

Residents' experiences navigating the workforce in the region are summarized in a report from outreach partners that is available on the RISE website.

Projected Workforce Development Needs in High-Growth Living Wage and Family-Sustaining Occupations

By examining all sources of job growth, regardless of wage and training requirements, the previous section identified the region's workers who are at risk of displacement. This section's objective is identifying living-wage occupation workforce-development opportunities that both support the development of living wage and family-sustaining careers and serve the workforce-development needs of the region's key industry clusters.

In the examination of job growth projections by occupation based on the EDD data that follows, the focus is solely on occupations that offer at least a living wage and that necessitate some form of postsecondary education or graduation from an apprenticeship program; in other words, occupations aligned with High Road priorities that have workforce-development requirements.[143] Figure 7.7 below shows projections for openings in living wage jobs requiring postsecondary education or training.

Labor market projections from the EDD overwhelmingly speak to an ongoing need for skilled healthcare workers in the Redwood Region (see Health & Caregiving below). Key among these are family-sustaining, skilled health occupations that require only a few years of training, including registered nurses (RN)[144] and licensed vocational nurses (LVN). Living wage opportunities exist in Medical, Nursing, and Dental sector assisting roles. The outlook is also strong for health-management occupation professionals having higher levels of education.

There is also significant need and opportunity for occupations that span the region's key industry clusters (see Cross-Cutting Occupations below) particularly the management, truck driving, and accounting occupations, for which workforce development is critical to all Redwood Region industry clusters.

Another high-need area—although not tied specifically to any industry cluster—is for education professionals (see "Other in Figure 7.7 below). Among living wage occupations and across all grade levels, those in teaching are projected to have the highest number of openings. Compared to their statewide counterparts, the region's high school students are less prepared for college, and an education workforce sufficient in number and quality is critical to address that challenge.[145]

Finally, skilled trades occupations critical to the Wood Products cluster, Construction, and the future development of a Renewable and Resilient Industry cluster are expected to be particularly strong. Demand for carpenters, electricians, plumbers, and automotive service technicians is expected to be high. Moreover, potential future development within wind energy will require workforce development in some skilled-trades occupations not discussed below. According to the Bureau of Labor Statistics, over one-third of workers in the Wind Electric Power Generation (NAICS 221115) industry are Wind Turbine Service Technicians (SOC 49-9081), a family-sustaining[146] career that requires non-degree postsecondary training (*Occupational Employment and Wage Statistics*, n.d.).

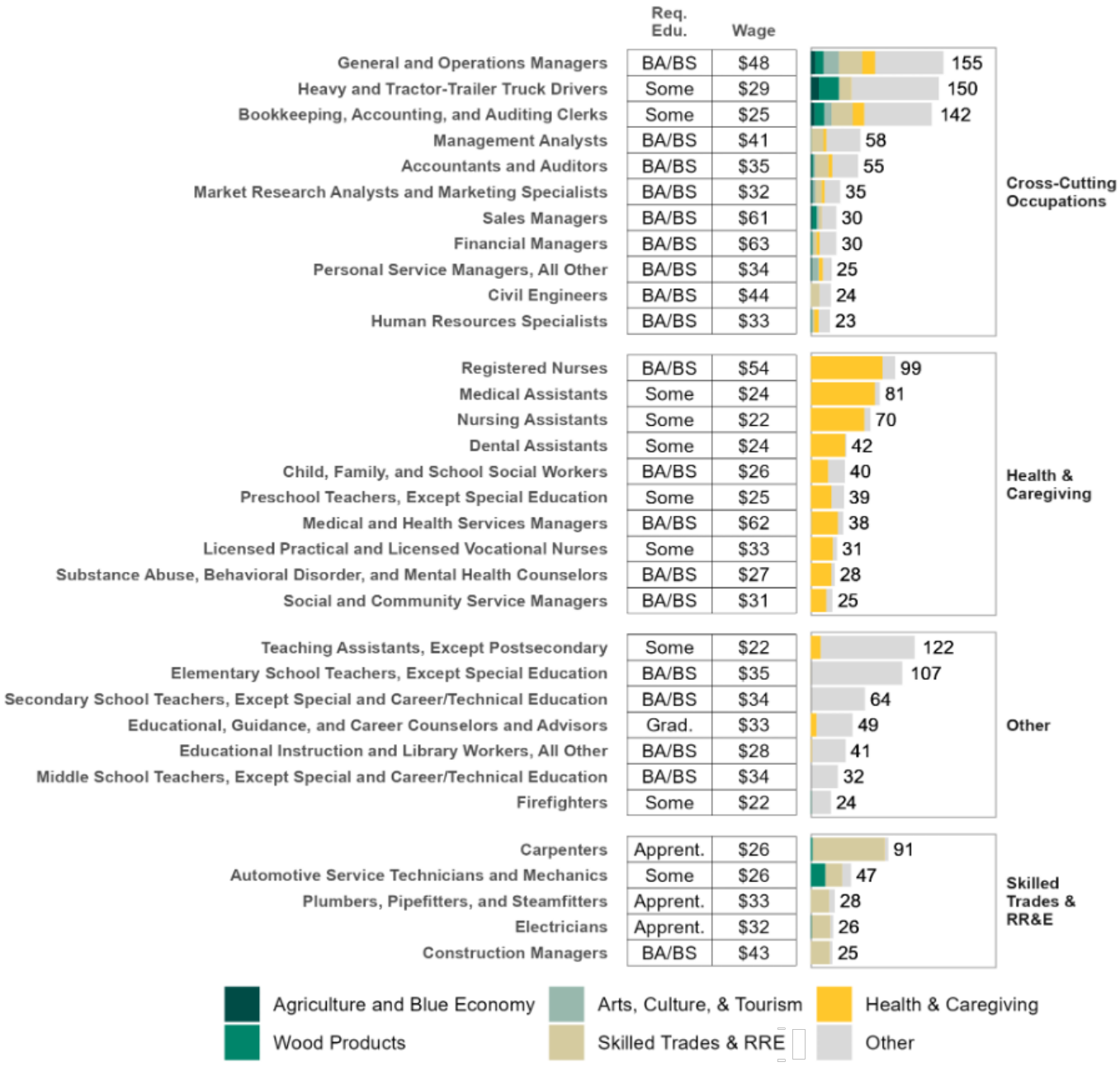
[143] If a job does not pay a living wage, then it is not a High Road priority. If a job requires on-the-job training only, then the workforce-development need for this job is minimal.

[144] The EDD dataset used in this analysis states that a bachelor's degree is an RN job requirement; however, this is not accurate.

[145] See Educational Outcomes and Barriers in the Industry Cluster Analysis Appendix.

[146] In California, the average hourly wage is $45.35.

Figure 7.7 Top Projected Living Wage Openings Requiring Postsecondary Education or Training, Projected Openings per Year[147]



Note. Labor market projections (total amounts) sourced from the California EDD. Component breakdowns based on IMPLAN data.[148] Wages sourced from IMPLAN. 2020 to 2030 projections. Only occupations paying living wages are shown.

[147] All occupations with 250 or more projected openings through 2020 to 2030 that require any amount of postsecondary education (e.g., certificate, Associate's degree, bachelor's degree) or apprenticeship.

[148] The percent of each occupation employed in a cluster was calculated. This percentage breakdown was then applied to the total projected openings for each occupation to obtain an estimate of the level of exposure each cluster has to the total level of projected openings. For instance, 11.5 % of the General and Operations Managers positions are employed in the Arts, Culture, & Tourism industries. Occupations not concentrated in a key industry cluster (the "Other" category) constitute less than 75% of employment in Other and so are defined as cross-cutting.

Potential Gaps in Local Education and Training

Skilled Health Occupations

For some skilled health occupations, local graduation rates appear nearly sufficient to supply the job openings projected over the near term. Over the past five academic years, the region has produced an average of 89 registered nurses (RNs) annually, slightly below the projected need of 99 RNs per year. Additionally, the region graduates an average of 31 licensed vocational nurses (LVNs) each year, precisely meeting the forecasted demand for this profession. However, data from the California Department of Healthcare Services indicate nurse shortage areas throughout the region (*Registered Nurse Shortage Areas in California - Registered Nurse Shortage Areas - California Health and Human Services Open Data Portal*, n.d.),[149] suggesting that other factors may be impacting the supply and demand for nurses.

For other occupations, there are gaps, the most obvious among these being the lack of regional training opportunities for medical doctors, psychiatrists, dentists, pharmacists, physician assistants, and nurse practitioners, which forces reliance on professionals relocating from outside the region.[150] As discussed in the Public Health Analysis section, the region has a shortage of primary, mental, and dental health.

Training gaps are also evident in other skilled health occupations, even those for which training programs are available. For example, community colleges (CR and MC) have been graduating an average of 21 dental assistants annually, which constitutes only half of the 42 openings projected per year.

The entire region is a mental health provider shortage area, underscoring the urgent need for more professionals in this field. According to a recent report, the region's behavioral health workforce currently comprises 1,900 professionals, approximately 950 individuals short of what is needed to adequately address the mental health and substance use demands of the region (Cal Poly Humboldt, 2023). From 2022 to 2027, the Redwood Region is projected to require an additional 485 mental and behavioral health professionals annually to replace retiring workers and to address unmet needs. In addition, the report identified an annual demand for 85 marriage and family therapists, 31 mental health and substance use social workers, and 15 psychologists.

However, based on current graduation rates from Cal Poly Humboldt (CPH), the supply of new professionals will not meet this demand. Over the past year, CPH graduated an average of 50 students in Social Work, 11 in Counseling Psychology, and eight in School Psychology at the master's level, clearly demonstrating that the region's educational output is insufficient to close the significant gap in the mental health workforce.

Cross-Cutting Occupations

The region's community colleges and Cal Poly Humboldt provide a comparatively high number of locally trained graduates in business and related disciplines, providing the educational opportunities required for the Bookkeeping/Accounting and General and Operations Managers occupations.

[149] These areas include the Crescent City/Bertsch-Oceanview (medium severity), Eureka/McKinleyville (low severity), Fort Bragg/Caspar (medium severity), and Clearlake/Hidden Valley Lake (high severity) areas.

[150] Nurse practitioners and physician assistants can perform some of the duties of a medical doctor such as diagnosis, referrals, and writing prescriptions (Medical Board of California, n.d.; Professional, n.d.). Therefore, a local training opportunity for either nurse practitioners or physician assistants may alleviate some of the shortage.

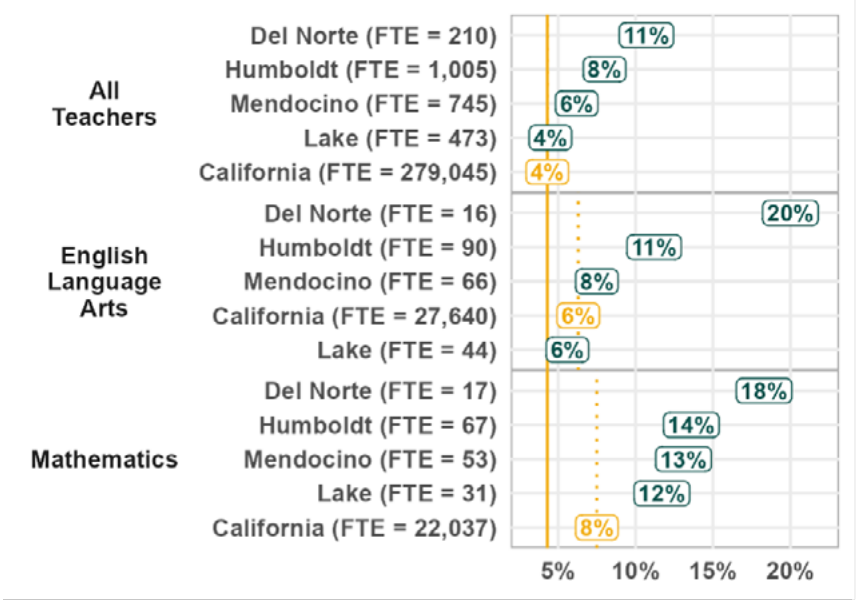
Education

The region shows significant gaps in teacher preparation, with projections indicating the need for 203 new teachers annually across the elementary, middle, and high school levels. However, Cal Poly Humboldt (CPH) graduates an average of 96 teaching credentialed students yearly (including both masters and BA programs).[152] Important to note is that CPH's teaching program includes online students, enabling it to serve candidates across the state and complicating direct regional impact assessments.

According to Teach California, there is a high demand for teachers in specialized fields such as Special Education, Mathematics, Science, Bilingual, and Career Technical Education (*High-Need Subject Areas*, n.d.). Despite this demand, credentialing output is low: In the past five years, the region has averaged 24.8 graduates per year in Special Education, but only 4 in Mathematics, 7.2 in Science, and a mere 0.2 in Career Technical Education (*Credentials Granted by Academic Year*, n.d.). These statistics underscore the pressing need for targeted improvements in teacher training programs to better align with both regional and state needs.

The deficiencies described above force local school districts to compromise, often hiring under-qualified teachers to fill gaps. As shown in Figure 7.8 below, teacher subject matter expertise falls below state averages across the region, particularly for mathematics. As discussed in the Labor Market Analysis Appendix, the region's K-12 achievement in mathematics and reading lag state averages, and the region's high school graduates are far less prepared for UC/CSU admission compared to state averages. The lack of teacher preparation may play a role in these outcomes.

Figure 7.8 Out-of-Field Teachers[151]



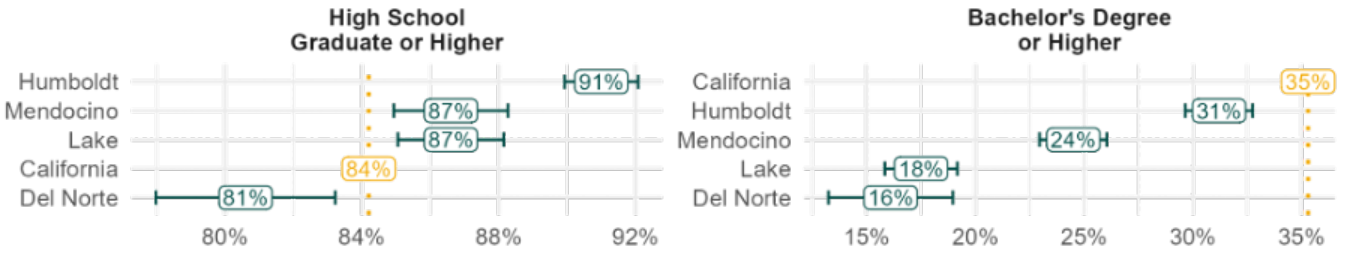
Note. Data sourced from the California Department of Education (California Department of Education, n.d.).

[151] Average 2018-19 through 2022/23 academic years.

[152] An out-of-field teacher is defined as: "someone who has a credential but has not yet demonstrated subject matter competence in the subject area(s) or for the student population associated with the assignment" (*Teaching AMO Definitions*, n.d.).

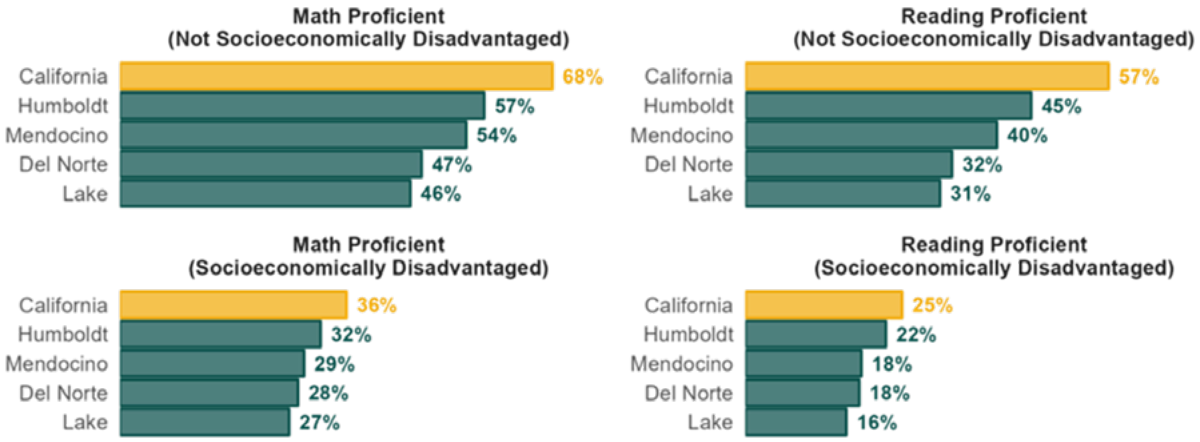
Correspondingly, except for Del Norte,[153] the adult population has achieved high school graduation rates that are on par with or even exceed the state average. However, all Redwood Region counties lag behind in four-year degree attainment (see Figure 7.9 below). Therefore, while the region has comparable rates of high school graduation, the educational system apparently faces challenges in adequately preparing high school graduates for college.[154]

Figure 7.9 Educational Attainment, Population 25 Years or Older (2017-2021)



Note. Data sourced from the ACS.
As shown below, in the Redwood Region, gaps in educational attainment start early, with K-12 students lagging behind their statewide peers on reading and math proficiency.

Figure 7.10 K-12 Math and Reading Proficiency by Socioeconomic Status (2017-2019)



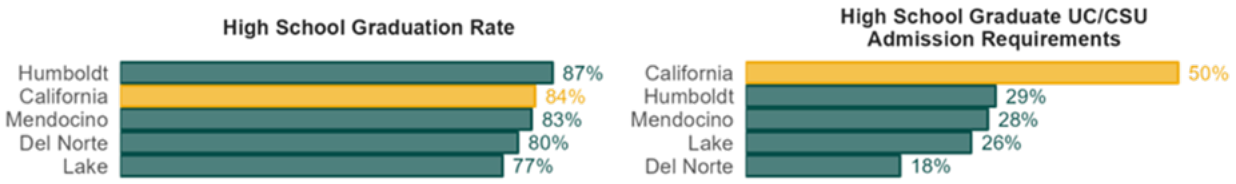
Note. Data sourced from Kidsdata.org. Includes grades 3, 4, 5, 6, 7, 8, and 11. Based on California Assessment of Student Performance and Progress's "Smarter Balanced Summative Assessment."

In the Redwood Region, high school graduation rates are on par with the state rate, but high school graduates in the region are much less prepared for college admission compared to the state average. Across the region, high school graduates complete the course requirements for admission to the University of California (UC) or California State University (CSU) systems (i.e., "A–G requirements") at roughly half the rate of their statewide counterparts.

[153] The Pelican Bay State Prison population likely skews Del Norte's figure substantially.

[154] Another contributing factor for the gap in higher educational attainment may be a comparative lack of four-year colleges and universities that are geographically accessible for much of the region's population. Only Humboldt County is home to a public four-year university.

Figure 7.11 High School Graduation Rates and College Preparedness (2017-2021)



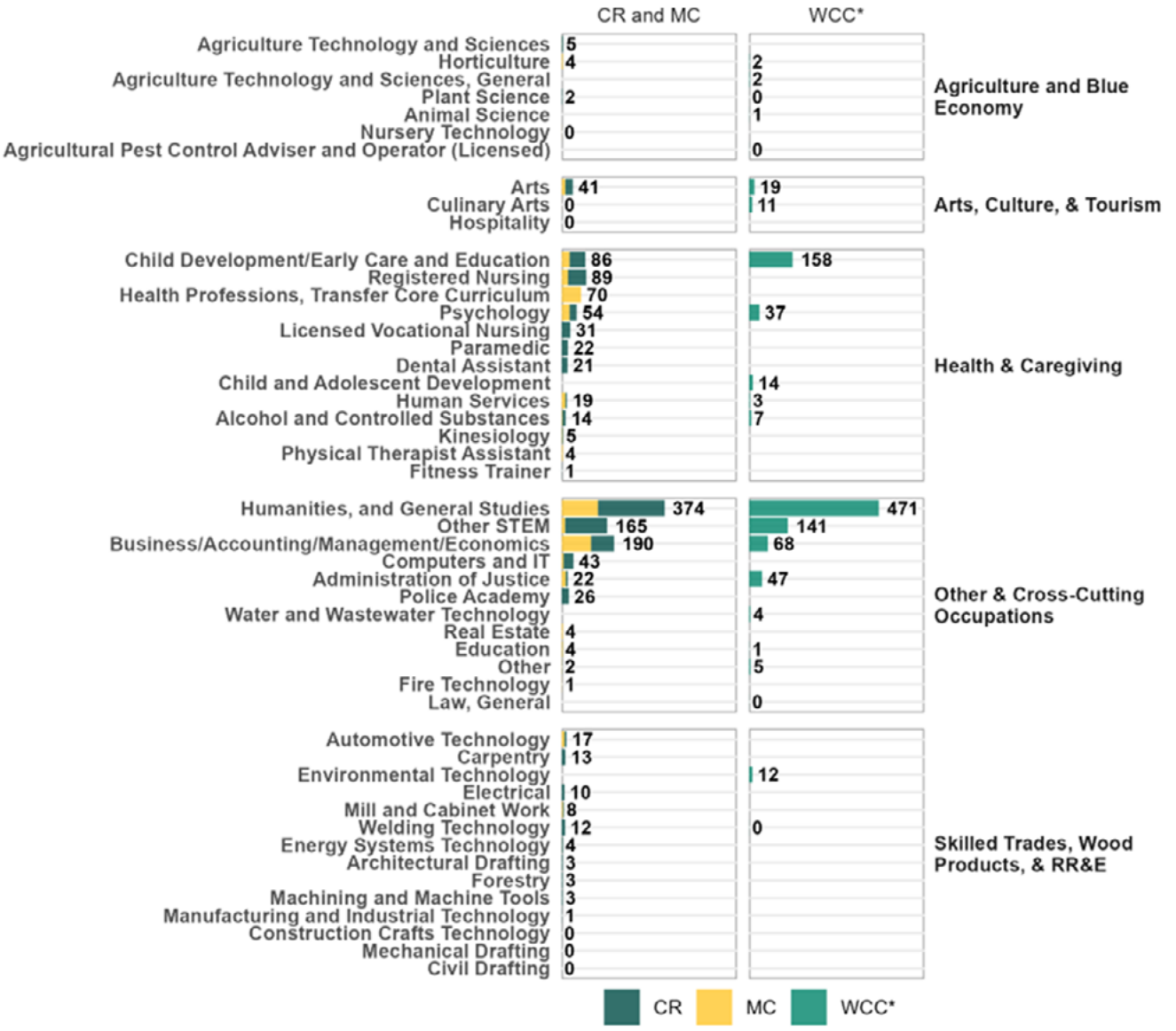
Note. Data sourced from Kidsdata.org.[155]

Skilled Trades

Training for skilled trades in the region's community colleges seems to be insufficient. The number of community college graduates who obtain certificates or degrees in skilled trades is notably low, and annual graduation rates do not meet the employment opportunities forecasted in these fields (see Figures 7.12 and 7.13 below). For example, the EDD projects an annual need for 91 carpenters, and yet, over the past five years, only an average of 13 students have graduated from the region's community colleges with carpentry qualifications. Similar shortages are observable in other trades such as those of automotive service technicians and electricians, suggesting a significant gap between available training capacity of community colleges and labor market demands for these skilled sectors.

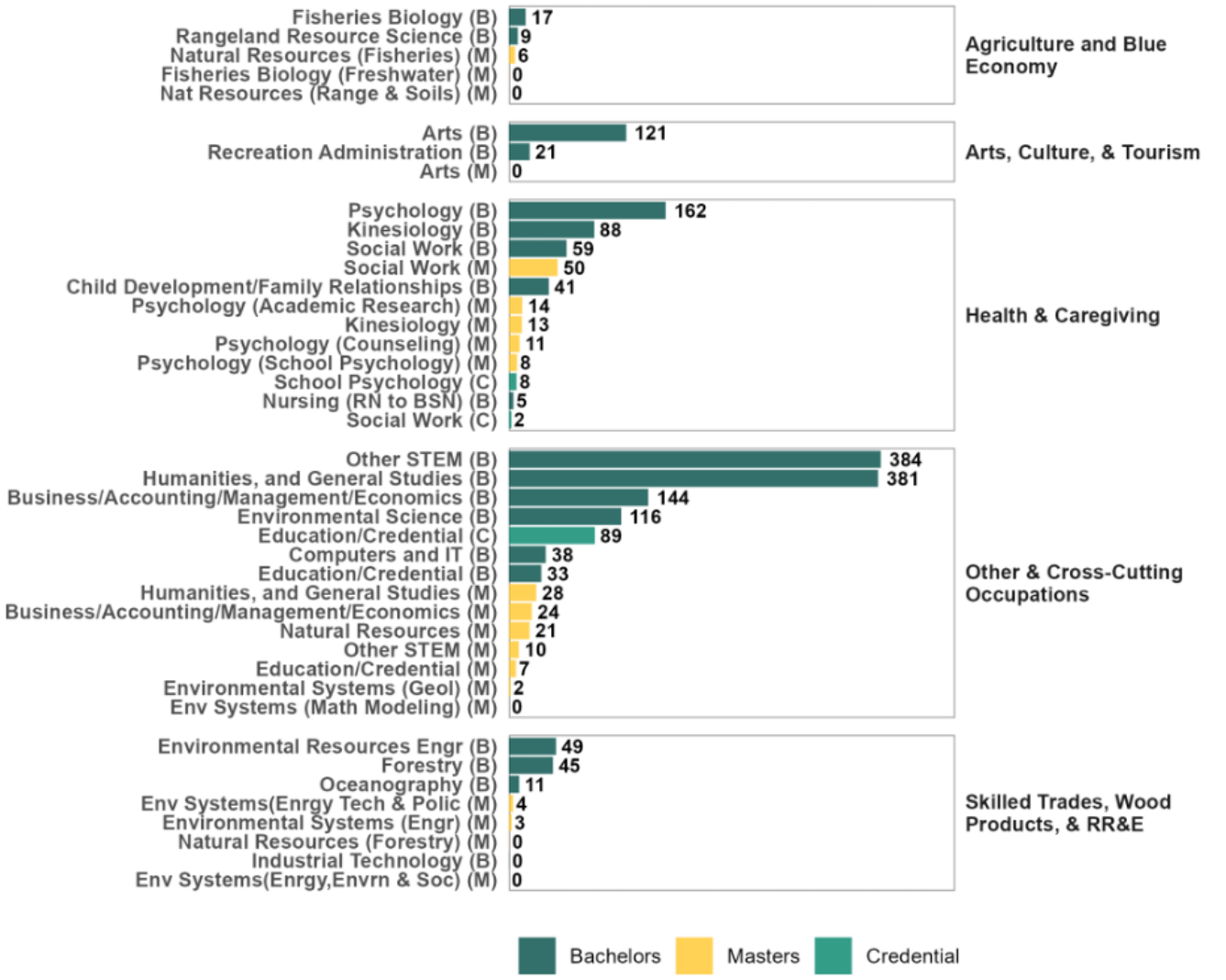
[155] Admission requirements data including only 2017-2019. Percentages are annual averages. High school graduation rate is defined as the percentage of public school students from the graduating class who receive a high school diploma. Admission requirements is defined as the percentage of high school graduates who complete all courses required for UC/CSU admission with a grade of "C" or better.

Figure 7.12 Mendocino College (MC), College of the Redwoods (CR), and Woodland Community College (WCC) Average Program Completion per Year from Academic Years 18/19 to 22/23



Note. Data sourced from California Community Colleges Chancellor's Office, Data Mart. Woodland Community College serves both Lake and Colusa campuses. WCC data therefore includes graduates from outside the Redwood Region.

Figure 7.13 Cal Poly Humboldt Average Program Completion per Year from Academic Years 18/19 to 22/23



Note. Data sourced Cal Poly Humboldt Institutional Research.

Barriers to Success

Region wide, students are less academically prepared for college compared to statewide averages. Less than a third of Redwood Region high school graduates complete the admission requirements for admission to the UC or CSU system, and regional students' test scores in reading and math proficiency lag behind state averages. Not only do these barriers impact the region's ability to grow its own workforce of skilled university graduates, but they also affect its production of skilled trades and health occupation workers for occupations that do not require a university degree. A 2016 study found that students admitted to California Community Colleges (CCC) that were placed in remedial courses had only about a 16% chance of earning a certificate or associate degree within six years (Cuellar Mejia et al., 2016), indicating that low reading and math proficiency among the region's high school students has critical implications for its ability to train skilled workers in the trades and health occupations. Addressing the teacher shortage is thus a key step in preparing the next generation of workers.

Industry-Specific Labor Standards that Meet High-Road Priorities

Due to an economy centered around natural resources and outdoor recreation, protection from extreme weather is a key labor standard across many of the region's industries. As the climate crisis progresses, policies concerning extreme heat days and climate events that impact infrastructure and health will be key to protecting these workers. The Climate Analysis section (Chapter 4) provides information about the climate change.

Arts, Culture, and Tourism

The California Travel Association (CalTravel) promotes responsible and sustainable tourism practices, including fair labor standards (CalTravel, n.d.). The Actors' Equity Association (AEA) represents actors and stage managers in the theater industry and advocates for fair wages and safe working conditions (Actors' Equity Association, n.d.). OSHA has specific safety standards for the entertainment industry, including guidelines for stage and set construction, electrical safety, and fall protection (OSHA, n.d.). The California Department of Industrial Relations has additional labor standards for the entertainment industry, including minimum wage requirements and overtime pay (California Department of Industrial Relations, n.d.).

Health and Caregiving

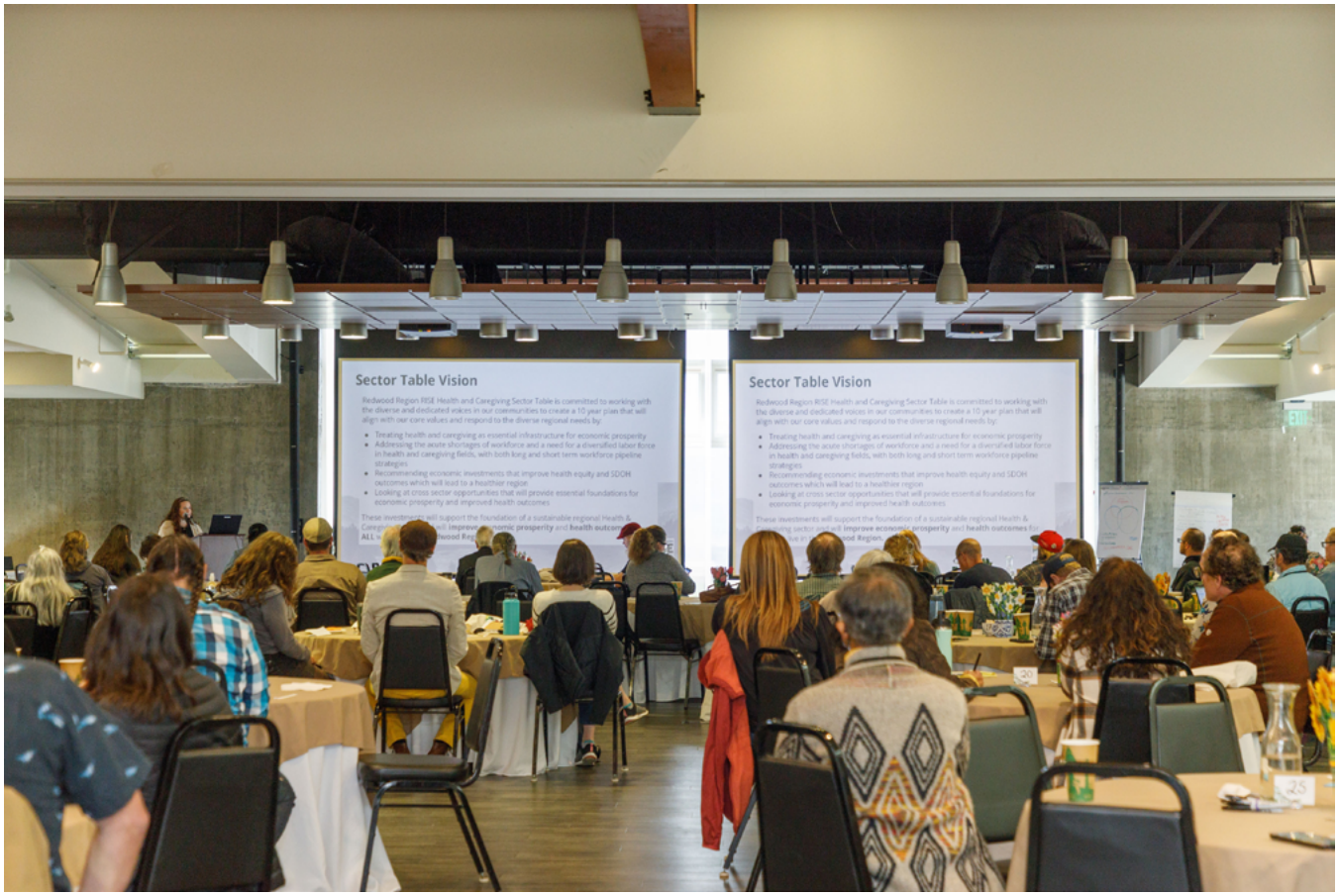
The California Hospital Association (CHA) promotes high-quality, safe, and equitable healthcare, including fair labor practices for healthcare workers (California Hospital Association, n.d.). The Service Employees International Union (SEIU) represents healthcare workers and advocates for fair wages, safe working conditions, and opportunities for advancement (SEIU, n.d.). OSHA has specific safety standards for the healthcare industry, including guidelines for bloodborne pathogens, personal protective equipment, and safe patient handling (OSHA, n.d.). The California Department of Public Health (CDPH) has additional regulations for healthcare facilities, including staffing requirements and infection control practices (California Department of Public Health, n.d.). SB-525 established a $25 minimum wage for healthcare workers (signed into law October 2023).

Renewable and Resilient Energy

The American Clean Power Association (ACP) promotes responsible development and operation of renewable energy projects, including worker safety and training standards (American Clean Power Association, n.d.). The International Brotherhood of Electrical Workers (IBEW) represents workers in the renewable energy sector and advocates for fair wages, safe working conditions, and training opportunities (IBEW, n.d.). OSHA and Cal/OSHA have specific safety standards for the renewable energy industry, including guidelines for wind energy, solar energy, and energy storage systems (OSHA, n.d.; Cal/OSHA, n.d.).

Working Lands and Blue Economy

Labor standards in the Working Lands and Blue Economy sector are influenced primarily by the California Farm Bureau Federation, which promotes safe and sustainable agricultural practices, and the United Farm Workers (UFW), which advocates for fair wages, safe working conditions, and access to healthcare for agricultural workers (California Farm Bureau Federation, n.d.; United Farm Workers, n.d.). Cal/OSHA has specific safety standards for agricultural operations, including heat illness prevention, pesticide safety, and equipment safety (Cal/OSHA, n.d.). The California Agricultural Labor Relations Act (ALRA) provides collective bargaining rights for agricultural workers (California Agricultural Labor Relations Board, n.d.). In the Forestry sector, the American Wood Council (AWC) promotes sustainable forestry practices and worker safety (American Wood Council, n.d.), while the International Association of Machinists and Aerospace Workers (IAM) represents workers and advocates for fair wages and safe working conditions (IAMAW, n.d.) in those areas. OSHA and Cal/OSHA have specific safety standards for the Wood Products industry (OSHA, n.d.; Cal/OSHA, n.d.).



Chapter 8

SWOT Analysis

This chapter synthesizes the findings from the previous chapters and community engagement efforts to identify the region's strengths, weaknesses, opportunities, and threats across various forms of capital (human, intellectual, social, physical, natural, and financial).

SWOT Methodology

The RRRISE research team utilized a mixed-methods approach to assess the region's strengths, weaknesses, opportunities, and threats (SWOT). Employing a "concurrent nested approach" in this analysis, Collaborative members sought to ground-truth quantitative data via feedback from community members obtained during data walks. In addition, they conducted semi-structured interviews ("listening sessions"), a participatory SWOT exercise, and the aforementioned two rounds of surveying.

In total, SWOT data sources used for this analysis are:

1. **Participatory SWOT exercise with Redwood Region RISE Collaborative members:** 50 members participated in person (Ukiah Conference Center, 9/16/23) and 71 other participants via Zoom.

2. **Listening Campaign:** 144 participants[156] engaged in semi-structured, multipurpose conversations focused on key priorities, challenges, opportunities, partnerships, and interest in engaging with California Jobs First. Participants were from a broad range of organizations and sectors. In semi-structured interviews ranging in length from 30 minutes to two hours, conversations gauged perspectives on strengths, weaknesses, opportunities, and threats, focusing on topics driven by respondents' interests and priorities.

3. **Surveys:** Two surveys were conducted in 2023, one during March-June 2023 (n=107) and the other during July 2023-May 2024 (n=161) that sampled from both Collaborative partners and the broader community, querying respondents on their priorities, challenges, and aspirations for the Collaborative. (Results from these surveys are reviewed in depth in the Partner Mapping report.)

4. Data found in other sections of Regional Plan Part 1 were synthesized and ground-truthed via community data walks (see Figure 8.1).

To better understand causal relationships and to ground-truth early quantitative findings, the RRRISE Collaborative held virtual monthly data walks and presentations, 11 in total, exploring the themes presented in Figure 8.1 below.

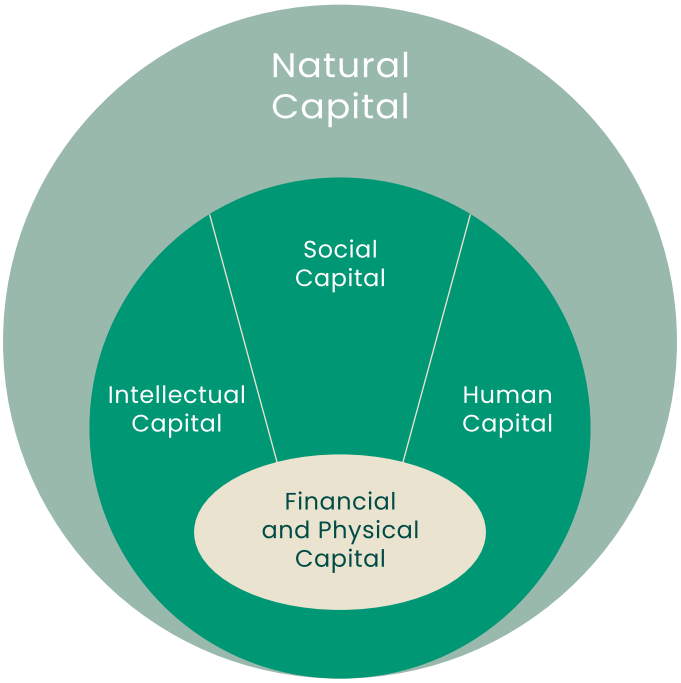
[156] An additional 355 listening sessions were completed with community residents; however this work was not completed in time for the SWOT analysis. See the Insights Report for more information.

Figure 8.1 Monthly Data Walks and Presentations

Data Walk/Presentation Theme	Collaborative Attendees
1. Demographic trends	73
2. Economic development inequities in the region	56
3. Public health	57
4. Employment and childcare data	112
5. Industry cluster and labor market analyses	87
6. Climate vulnerability and adaptation	107
7. Data review & Participatory SWOT	117 (50 in-person/ 67 over Zoom)
8. Workforce barriers and participation	107
9. Regional Summary and Barriers to Thriving	144 (in-person)
Other Presentations and Trainings	
Centering equity in economic development planning	117
Tribal ecorestoration	123
Cradle to career pathways	119

To provide structure to the analysis, RRRISE researchers used a composite framework loosely derived from different versions of the popular Five Capitals framework (Figure 8.2).[157]

Figure 8.2 Five Capitals Framework for Sustainability



[157] See, for example, Maack, M. and Davidsdottir, B. (2015). Five Capital impact assessment: Appraisal framework based on theory of sustainable well-being, *Renewable and Sustainable Energy Reviews*, Volume *50*, 2015, Pages 1338-1351, ISSN 1364-0321, https://doi.org/10.1016/j.rser.2015.04.132.

The Region's Strengths, Weaknesses, Opportunities, and Threats

Human and Intellectual Capital

Community members celebrate the independent spirit of the North Coast, noting the cultural richness, "scrappiness," and deep connection to the land and environment. However, an aging population, brain drain, lack of opportunity for youth, and skilled workforce shortages were pain points brought forward in listening sessions. Better channels to connect young and marginalized people to their aspirations are all desired. In particular, creating opportunities for fulfilling careers in environmental fields is seen as a way to celebrate the traditional ecological knowledge held in the region by tribal cultures, diversify away from natural resource extraction, and uplift eco-innovation, which is a strength of local educational institutions and entrepreneurs.

Figure 8.3 SWOT Analysis - Human and Intellectual Capital

Strengths

- Independent, resilient, "scrappy," self-reliant, innovative, "out-of-the-box" thinkers and doers.
- With a deep connection to the land, young people desire to work outdoors and live in a way that protects the environment.
- The original stewards of these lands are still here. There is great interest in applying traditional ecological knowledge to strategies to address climate and environmental threats. Many cultures call the region home, bringing their traditional ways of living and doing to bear on economic development strategies across sectors.
- Two community colleges and Cal Poly Humboldt, which create higher education opportunities for residents, are currently expanding their offerings across the region.

Weaknesses

- Labor shortages and skills gaps create bottlenecks and limit opportunity for the region as a whole. This is most apparent in the health and caregiving fields but is also seen in skilled trades and professional services across various industries.
- The region encompasses some of the most troubling mental health outcomes in the state. Generational, historic, and childhood trauma are startlingly prevalent. Correspondingly, mental health issues including substance use, depression, suicidal ideation, and anxiety abound.
- These mental health issues are associated with cognitive disabilities, workplace attrition, low income, social alienation, housing instability, and other, interrelated challenges.

Opportunities

- Recently established Cal Poly Humboldt has the potential to be a major force in driving innovation in key sectors within the region, particularly those related to sustainable, science- and technology-based industries.
- There is a historic and growing emphasis on "grow your own" workforce strategies and establishing CTE and other career pathways for young people. Major investments in cradle-to-career programs have been made since 2021.
- Expanding broadband access and grid connections could bolster opportunities for remote workers.

Threats

- Rising cost of living, housing scarcity, lack of training opportunities, and low incomes continue to squeeze working families and drive young people to seek opportunity elsewhere.
- Competition from urban regions exacerbates local struggles to maintain workforce in health-related fields especially (i.e., "Brain Drain").

"We need to address two things: the shortage of educated individuals and the scarcity of positions that don't require extensive education."

Workforce Shortages and Skills Gaps

Workforce shortages are prevalent in the region. Exacerbating these is a lack of access to training within the area. Higher education attainment lags behind the rest of the state, contributing to an unprepared workforce having few advanced skills (though high school graduation rates are higher than state averages). Those with the highest education and in the highest skilled occupations face the widest wage gap.

"I feel like in some ways there could have been a mentor or something like that, like to meet with you and see how you're doing and see if you need help or what you need help to further you in your career."

"All the [employment] support came from people I know and less from any kind of system."

"I'm in the under-employment tango."

With respect to prospective industries such as offshore wind and aquaculture development, preliminary data analysis indicates that labor shortages for occupations like electricians and construction workers number in the 1,000s. Listening session participants often emphasized "grow your own" workforce strategies that would enrich and expand training opportunities existing within the region rather than increasing access to external programs, which are viewed as a source of attrition of regional workers, particularly in the trades occupations.

"When they are doing their training they can make more money in places like Santa Rosa, so they don't come back."

Medical and Caregiving Occupations. Shortages of medical personnel in virtually every specialization and profession within the region are acute—primary care, specialists, behavioral health, dental, and more. While pathway approaches are being created and strengthened, the struggle to retain recruits is problematic. A recent report on the region's behavioral health workforce noted that 1,900 individuals are currently employed, 950 short of the number required to meet the region's mental health and substance use treatment needs.[158] Additionally, 990 behavioral health workers are anticipated to leave the field in the next five years via retirement, career change, or outmigration. The region produces an average of 89 registered nurses (RNs) annually, slightly below the projected 99 RNs needed per year. However, an average of 31 licensed vocational nurses (LVNs) do graduate each year, meeting the forecasted demand. Community colleges (CR and MC) graduate an average of 21 dental assistants annually, which is only half of the 42 openings projected per year, indicating a significant gap in training. From 2022 to 2027, the Redwood Region is projected to require an additional 485 mental and behavioral health professionals annually to replace retiring workers and address unmet needs. Current graduation rates from Cal Poly Humboldt are insufficient to meet

[158] 2023 North Coast Behavioral Health Workforce Needs Assessment.

this demand, with an average of 50 students in social work, 11 in counseling psychology, and eight in school psychology at the master's level (See Chapter 7, Labor Market Analysis).

> "I took a major pay cut because they were only hiring entry level… I decided it was worth it because I had no other option besides leaving here. So, I took a $20,000 pay cut…"

In the Redwood Coast, the scarcity of accessible childcare has become an acute concern for many families, posing significant challenges for parents balancing work and caregiving responsibilities. Approximately six out of 10 do not have access to certified childcare facilities due to the lack of available space. This situation is more pronounced in Lake and Mendocino Counties, with seven out of 10 children lacking access. Residents have spoken out about their difficulty finding a licensed provider and have reported that, if they cannot find childcare, they leave their children with a relative or bring them with them to work.

Career Technical Education and Career Pathways. Over and over, Collaborative members expressed anxiety that the region is not a place of opportunity for young people. Participants in listening sessions noted insufficiencies in skills building, career technical education, and workforce development in high schools that cause local educational institutions to not adequately prepare students for the workforce, especially industries of the future.

> "There needs to be more work readiness… A lot of high schools around here don't have those programs that really uplift kids to have trade skills that they want to go into."

Projections indicate a need for 203 new teachers annually across elementary, middle, and high school levels, but Cal Poly Humboldt graduates an average of only 96 teaching-credentialed students yearly. In Del Norte County, 100% of newly hired teachers are teaching at least one subject without the necessary certification, while in Mendocino County, the figure is 48%, significantly higher than the state average of 34% (from the Labor Market analysis).

The region's demand for teachers in specialized fields such as special education, mathematics, science, bilingual, and career technical education is high. However, credentialing output is low, with an average of 24.8 graduates per year in special education, 4 in mathematics, 7.2 in science, and only 0.2 in career technical education over the past five years.

Alongside critical labor shortages, these trends signal an opportunity for the region. Expanding career technical education (CTE) was a recurring theme offered by residents, and some momentum is growing to establish K-16 and other cradle-to-career programs in the region. Increasing trade and vocational training opportunities and apprenticeships are seen as a two-pronged strategy aimed at retaining young people in the area. Partners from building trades careers noted that, in the past, local high schools had hands-on learning opportunities in the local high schools, and many have the infrastructure necessary to revive that curriculum. However, respondents from both Del Norte and Humboldt Counties noted that finding instructors to teach CTE classes caused high schools to abandon these programs. Tribal members expressed support for creating training centers, especially for heavy equipment operators. (One such center is proposed for the Orick area with the Yurok Nation in the lead.)

"I would hope for a community center with classes so people could learn... including life skills."

The region's community colleges may need more training capacity for skilled trades. For example, the EDD projects an annual need for 91 carpenters, but, over the past five years, an average of only 13 students have graduated with carpentry qualifications from the region's community colleges (sourced from the Labor Market Analysis above).

Innovation and Technology

"If you have tech innovations developed and applied locally it helps support the local workforce, and if they can be exported then it helps the economy grow."

Figure 8.4 Innovation Index Ranking Among Similarly Rural U.S. Counties

	Del Norte	Lake	Mendocino	Humboldt	
Headline Innovation Index	670	323	192(T)	102	Headline Innovation Index
Business Dynamics	536(T)	132	394	170	Establishment Dynamics
	652(T)	170	312(T)	196(T)	Business Dynamics
	719(T)	265	229	278(T)	Establishment Formation
Business Profile	183	288(T)	6(T)	219	Proprietorship
	434(T)	507	22(T)	65(T)	Business Profile
	463	463	83	83	Venture Capital Dollar Measures
	463	463	116	122(T)	Venture Capital Count Measures
	526	526	230	228(T)	Foreign Direct Investment Attractiveness
Economic Well-Being	353(T)	89	82(T)	265(T)	Compensation
	340	401	435(T)	176(T)	Residential Internet Connectivity
	643	543	402	352(T)	Economic Well-Being
Employment and Productivity	362(T)	171	152(T)	261	GDP
	542(T)	172(T)	209	226(T)	Patents
	522(T)	257	251(T)	232(T)	Employment and Productivity
	70	666	87	790(T)	Industry Cluster Performance
	770(T)	635	428	317(T)	Industry Performance
Human Capital and Knowledge Creation	446(T)	135	131	5	Educational Attainment
	580(T)	259(T)	426	77	Human Capital and Knowledge Creation
	761	764	250(T)	186(T)	STEM Education and Occupations
	660(T)	518(T)	626	335(T)	Knowledge Creation and Technology Diffusion

Note. Data sourced from StatsAmerica. For each indicator, the Redwood Region is ranked out of 805 U.S. counties with similar Indices of Relative Rurality (IRRs) compared to that of the Redwood Region.[159]

[159] This includes counties with 0.5 ≤ IRR ≤ 0.53. [REF]

In 2023, the region's only four-year university became the state's third polytechnic—Cal Poly Humboldt. Residents associated this development with possible upskilling of the region's workforce and also with attracting "new minds" to it. Many Collaborative members wanted to see Cal Poly, particularly its applied science departments, create more positions for students in the community, through, for instance, hands-on learning and apprenticeships. Participants also suggested creation of opportunities to create stronger pathways for students connecting Mendocino College, College of the Redwoods, and Cal Poly Humboldt to emerging industries. They also expressed optimism about the University's expansion, the new opportunities to commercialize ideas that will result from research conducted there, and possible leveraging of its innovation engine to benefit the region as a whole. The Education Services, Health and Social Assistance, and Leisure and Hospitality sectors are expected to account for nearly two-thirds of projected job growth over the current decade (see the Labor Market Analysis section).

Mental Health and Well-Being, Soft Skills Development

The mental health and well-being of the region's residents are both a product of the area's shortfalls in providers, workforce, training and a cause. Among both economic development planners and community members, concern is mounting about a potential epidemic of mental health issues and their comorbidities, which can result in disability and attrition from the workforce. Shortages of providers and facilities to provide intervention and care are barriers to better outcomes within the region. According to Collaborative members, other issues which inhibit residents from accessing the supports they need include: siloed provider networks, transportation barriers, fear of the stigma attached to pursuing mental healthcare within small communities, and complexity when trying to navigate a fragmented system of care.

> "One field that is lacking in support is mental health. My studies were heavily impacted by mental health."

Workforce development partners among the interviewees noted the need for a holistic approach to overcome the barriers community members face in their working lives. The essential strategy is to "get people into jobs, and then make sure that they progress up to a livable wage," but, as one respondent noted, disruptions like COVID and wildfires make this linear progression difficult for everyone.

> "[Workforce Initiatives need to understand] barriers like transportation, childcare, housing…understand the holistic approach that is needed. It takes working with regional partners, and looking at larger problems."

Because such a large segment of the workforce has been employed in an industry (cannabis)[160] that was illicit and so retains some informality in its working culture, capable workers struggle to "punch a clock" and work under conventional rules and norms. Another issue impacting workers' soft skill set is trauma; in particular, providers noted the need for assistance with issues like managing workday stress and interpersonal issues. As the data reveal, the region has low prime-age labor force participation, which is attributed to these factors (Figure 7.2).

[160] No reliable employment data are available for the cannabis industry (see Industry Cluster Analysis), but the effects of its recent collapse are easily seen in the communities who rely on it, as detailed in this article featuring an RRRISE Equity Council member: https://calmatters.org/economy/2023/02/emerald-triangle-cannabis-workers/

Regional disability rates are significantly higher than the state averages, affecting even young adults. Among prime-age adults who are unemployed or out of the labor force, a substantial proportion cite disability as their main reason for not working (Labor Market Analysis).

Opportunities and Barriers for Remote Workers. Despite a preference for "grow your own" approaches, there is widespread acknowledgment of the challenges that an aging and diminishing population poses. With its scenic landscapes and abundance of outdoor recreation opportunities, the region could attract and retain more skilled young people if opportunities for remote work were facilitated. The workforce-development strategy of the region's economic development partners is three pronged: "Build, Attract, Retain." Increased investment in broadband infrastructure could help achieve this and would also bolster digitally based economic activities and entrepreneurship in general. A Lake County participant noted that, despite destruction from catastrophic wildfire (2015-17), the county's residents are still experiencing in-migration from urban areas, a source of optimism. Many in the region believe that the favorable climate, clean coastal air, and access to abundant water will recommend this destination to climate migrants.

Social and Relational Capital

Figure 8.5 SWOT Analysis - Social and Relational Capital

Strengths

- Innovative social programs: These combat disconnection and disinvestment with connection, belonging, and resources.
- A human-centered perspective on economic well-being: Economic development practitioners prioritize the needs of people—housing, healthcare, purpose, and opportunity—as opposed to hyper focusing on standard economic indicators.
- Appetite for regional partnerships
- Strong and engaged community colleges: These aid in finding innovative ways to expand workforce training opportunities.

Weaknesses

- Negative perceptions of working culture: These include observations of low quality and unsustained cooperation, lack of a collective vision, fear of success and a "dream small" mentality, egos, grudges, scarcity mindset, and mistrust. A fear of failure causes professionals to not take the risks needed to progress with respect to key issues.
- Few young professionals to "pass the torch to": This leads to a lack of diversity in the public sector's current leadership.

Opportunities

- Better partnerships to strengthen training offerings, including offering apprenticeships: In particular, these are needed in natural resource careers.
- Community benefit agreements
- Community motivation to enhance B2B activity, create business incubators, and provide general support to entrepreneurs and small local businesses.

Threats

- Brain Drain.
- Lack of resourcing to support nascent partnerships and to provide support to networks and collaborations.

"The lack of institutions to do this work. That is our primary [economic development] problem."

"People want to work with each other and are invested in the community"

"What I've been doing just kind of on my own... working with people who are only Spanish speaking... It's hard [for them] to navigate the system."

Working Culture

Surprisingly, during the participatory SWOT research sessions, Collaborative members frequently emphasized the region's lack of capacity and the impact this has on its working culture, particularly in the public sector and economic development space. Cultural and organizational barriers mentioned frequently included: lack of capacity to engage in sustained, quality cooperation and collaboration, a "dream small" mentality, a scarcity mindset, mistrust and personality conflicts that disrupt collaborative efforts. The most frequently cited issue for organizations was lack of capacity, but working in silos, duplicative economic development efforts, and insufficient depth of experience in economic development were also mentioned. Relatedly, participants noted a dearth of energized leadership and a lack of succession plans to empower young up-and-comers. One of the consequences of this is a lack of professionals to "pass the torch on to." According to listening session participants, capacity constraints impact collaboration and innovation. RRRISE was seen by many as an opportunity to work regionally to overcome these challenges.

"It's difficult to get agencies to pivot or try something new, even if it's to their benefit."

Corroborating these concerns, the region's census response rate is low (a 75% response rate compared to the national median of 81%), a metric the *Opportunity Atlas* associates with strength of social capital strength.[161]

Partnerships. Enhanced collaboration between economic development agencies and establishing and strengthening cross-industry partnerships are potential sources of opportunities.

"We assume that NGOs have those connections to the community and business, but we often find that our non profit organizations are very siloed..."

[161] https://www.opportunityatlas.org/

Survey results provide additional context for the region's organizations and their growth capacity. Those key findings include:

- Most organizations are small (42% report having 0-5 staff members) and work at the county level.
- Although many organizations serve priority communities, relatively few work with non-federally recognized Tribes, unions, or the Hmong community.
- Few organizations explicitly work on environmental justice, and there is relatively little union presence. Therefore, few partnerships are reported with these types of organizations.
- The predominant partner category within the Collaborative consists of grassroots and community-based organizations (34%).
- At present, RRRISE's reach includes over 900 organizations and individuals in the region.

Capacity Constraints are a persistent theme for the region. Lack of economic development planning capacity impacts jurisdictions across the region; "everyone is spread really thin," was heard repeatedly. Good initiatives struggle to secure capital, navigate pre-development, and move into implementation. In particular, organizations that can provide support to convene desirable collaborations that break down silos are lacking. This relative lack of professional organizations in the region not only inhibits innovation and growth across sectors and industries but also most likely impacts the ability of leaders from disinvested and marginalized groups to attain leadership positions and influence outcomes.

> "In a rural community, capacity is a huge issue. We hear this all the time from city and Tribal planners... most organizations are treading water, we can't keep up with the current workload."

The Transportation, Warehousing, and Utilities; Construction; Other Services; and Wholesale Trade sectors are projected to experience faster-than-average job growth rates, suggesting a lowered risk of displacement for workers in these fields. Manufacturing; The Total Farm, Mining, and Logging; and Retail Trade sectors are expected to experience slower-than-average job growth rates, disproportionately impacting men, persons of color, and individuals with low levels of educational attainment (Labor Market Analysis).

Challenges identified in economic planning include the historical lack of planning infrastructure in rural areas, the need to reallocate resources after disasters, staff turnover, lack of funding and data, the need to prioritize mandates, community resistance, and rapid shifts in the economic development landscape due to policy changes and external factors like climate impacts and emerging opportunities (e.g., legalization of cannabis, wildfire, storm and flooding devastation, and offshore wind).

Tribal Collaboration. Greater collaboration between tribal nations and non-tribal jurisdictions is seen as a catalyst for positive development. However, much more needs to be done to create partnerships that can function beneficially for tribal collaborators. (See *Partner Mapping Analysis* for an in-depth treatment of this topic.)

Social Connection and Support. In conversations with residents from across the region, connection with one another appeared as the source of both the region's greatest opportunities and its greatest weaknesses. Interviewees mentioned isolation and social alienation repeatedly, and the need for better connections, especially across generations, was a recurring theme. Participants also noted the development of some excellent supportive programs that are implementing innovative solutions to these social issues: the workforce development program "BUILD"[162] in Lake County, which offers training in construction trades; Second Chance re-entry and support; Community Schools; child care expansion activities; and others. These support re-connection, fresh starts, and overcoming the barriers that working families within the region face. In another example, the family resource center in Humboldt County is hosting the region's first Guaranteed Income pilot, one of the few rural pilots in the nation. Social assistance is a promising sector named in the accompanying *Industry Cluster Analysis* report.

"What I enjoy most is to see the relationships that I'm building with a community – to see how I'm helping the community."

These issues are of heightened importance to priority communities. Direct feedback from these communities calls attention to their struggles in obtaining stable jobs offering sufficient pay to cover expenses, relevant skill-development opportunities, resources within their communities that meet basic needs of housing, transportation, child/family care and healthcare, and meaningful work structured in ways that fulfill the reasons they choose to live and work in this region—despite, at times, experiencing enduring and significant challenges and hardships. People in priority communities spoke, on one hand, about the impacts of trauma, violence, discrimination, and exclusion, and, on the other, of the importance of connection, social safety, and being valued. They also expressed a desire to be able to simply meet basic needs while selecting career paths that allow them to honor the many reasons they call this region home.

"I love what I do, but I need to be able to support myself at the end of the day and living paycheck to paycheck is not great."

Physical Capital

In disheartening interviews, residents consistently described road networks, water and sewerage connections, and the energy and communications infrastructure as "crumbling or absent." Lack of housing is the primary constraint cited with respect to economic and workforce development.

[162] [REF]

Figure 8.6 SWOT Analysis - Physical Capital

Strengths

- Renowned Blue Lake Rancheria microgrid initiative: This is inspiring similar projects across the region.
- West Coast leader on offshore wind development: The region's example is motivating additional infrastructure development along the coast and in transmission corridors in other regions.

Weaknesses

- A vast, rural, and remote region: Providing adequate network infrastructure coverage has inherent difficulties.
- Severe housing crisis: Several counties have the highest ratio of unhoused-to-housed residents in the state.
- Permitting: Obtaining permits for almost anything takes years.
- Critically outdated water delivery infrastructure: In particular, this challenges the region's small, remote, rural, and unincorporated communities. Few financial solutions are in sight to invest in upgrades.
- Inadequate grid: The current grid can no longer support economic development or housing construction initiatives. Delayed and denied hookups, fires caused by deferred maintenance, and rate hikes result in the region losing faith in provider PG&E.
- Underperforming solid waste sites and groundwater contamination threats indicate need for infrastructure investments in these areas.

Opportunities

- Funding to improve broadband
- Coverage and wireless access: Jurisdictions are receiving funding to do so, and many tribal areas, which need connectivity the most, are undertaking major investments in this infrastructure now.
- Synergistic development of better electrical transmission, broadband, and transportation infrastructure: The potential to do all three concurrently along key corridors, improving access for rural and remote communities.

Threats

- Climate risks: Available scarce resources are used to rebuild and recover from shocks instead of proactively addressing deficits, significantly delaying or postponing indefinitely infrastructure development.

Broadband Access limits other key opportunities, like the ability to deliver online training to entrepreneurs and workers or to attract remote workers. Respondents provided two examples. Many believe that attracting more remote workers to the region may help stabilize the pattern of economic boom and bust; however, at present, much work needs to be done to upgrade the electricity supply, deliver broadband infrastructure, and create housing to accommodate these workers. Several major resources are being launched to address this constraint. For example, Yurok TelecomCorporation has received a large grant to improve cell phone reception in the area, and five new towers will be built. The Tribe owns their airspace, and so providers wanting to expand their reach can use Tribal broadband capacity, expanding services to the community.

> "There is synergy with broadband. People haven't necessarily made connections between broadband and offshore—internet is a power hog—all the surplus wind power from offshore wind and expanded broadband is going to make this area an attractive place."

Transportation. Delayed and deferred maintenance is an issue for the region's transportation infrastructure. Road construction is a priority frequently mentioned in Del Norte and adjacent Tribal areas. One partner, associating this challenge with workforce development issues, noted that his organization sends apprentices away for training, and these apprentices often do not return to fill critical positions (*"We don't have training facilities, so when people go to train, they don't come back."*). Tribal communities experience the vulnerability of limited road infrastructure (*"We are so easily cut off from the world."*). In Del Norte County, The Last Chance Grade project was a major source of anxiety. Areas with only one way in and out can become "islands," especially concerning in the wake of natural disasters such as road closures due to landslides, fire, and flooding. Unpaved roads are also a significant contributor to airborne particulate matter and so present an opportunity to improve air quality (Climate Analysis).

> "I live really rural, so it would require a lot of drive time to be in person [for training]. And so… you're investing in the gas, you're investing your time in that total drive time. I think that can really pose a challenge for some of our rural entrepreneurs."

Airports in Arcata and Crescent City provide crucial connectivity to the outside and the potential development opportunities that accompany it. This critical piece of the region's infrastructure is due for runway rebuilds; an upgrade to modern, energy-efficient lighting; and safe, upgraded fuel-storage facilities. Current funding for these airports by the state is constrained, and Federal Aviation Administration's Airport Improvement Program (FAA AIP) funding will not cover the cost of all the upgrades needed.

Listening sessions and transit plans throughout the region stressed the need for enhanced public transit options. More frequent availability, extended hours, increased destinations, and Sunday service would benefit the communities they serve. Particular concern was expressed for youth, elderly, and disabled residents.

To help achieve California's carbon-neutral goals, infrastructure supporting improved access for pedestrians and cyclists should be considered as roads and highways are improved. In feedback to the Caltrans interactive map, over 75% of commenters mentioned being uncomfortable walking or biking because of heavy traffic or high vehicle speeds (Caltrans, 2021).

Water Delivery and Sewerage. Residents in numerous jurisdictions across the region mentioned good water infrastructure as a major issue. Some complained of high rates, others that low revenue resulted in a lack of funds to update water and sewer infrastructure in their small communities, a primary concern in Orick, which, like many other smaller and unincorporated communities, is worried about the risks of aged water infrastructure and the inability to fund wastewater treatment

facilities and leach fields (Climate Analysis). Special service districts attempt to maintain this crucial infrastructure but struggle, and, some residents reported, federal and county entities do not sufficiently meet obligations to maintain critical water infrastructure, e.g., levees to prevent flooding. That so much of the housing constructed in commodity boom towns was built informally is now creating problems—under current regulations, siting and layout make it impossible in certain locations to upgrade infrastructure to a system for which Humboldt County can issue a permit, which costs an exorbitant near $30,000 to acquire, reported one community leader.

> "Even the roads to get here sometimes, depending on the weather, half of them are closed."

> "Driving 2 hours to get to school is definitely tough… it's become an obstacle, even now, where it's like, some days, I just don't want to go, but I know I have to."

Constraints related to the rural and remote geography. Participants noted vulnerabilities related to limited infrastructure (*"just one way in and out"*); distance to major airports; difficulty in providing services in places with low population density; the aforementioned lack of broadband; distance to markets; lack of public transit infrastructure or of transportation for moving goods and high costs associated with doing so; and crumbling water infrastructure. Isolation creates other undesirable social and economic outcomes. In general, outdated and dangerous infrastructure was a very prevalent theme of discussions with residents from across the region. Transportation corridors are threatened by fires, landslides, and other climate-related threats. The Last Chance Grade in Del Norte County is one of the more startling road sections at risk from these.

> "Housing has been really transient. I would bounce around a lot to friends, house-sitting/couch surfing."

Housing as a limiting factor to economic growth. Across all industries and sectors, workforce housing was cited as the primary constraint to growth and well-being in the region. Medical fields are particularly impacted; participants frequently mentioned that difficulty recruiting and retaining medical professionals is due in large part to lack of housing. The Education sector and more prospective industries like offshore wind were also frequently mentioned as constrained by lack of housing, which impacts large employers and small firms alike. Currently, housing and broadband are major barriers to attracting skilled workforce from outside the area in crucial fields like education and health. Housing costs continue to increase and not enough housing is being produced to keep pace with demand. While, overall, California's housing stock has increased by 7% since 2010, the Redwood Region has had only a 1.3% growth in stock (Industry Cluster Analysis). Aging housing stock is associated with a heightened risk of lead poisoning in children, and emissions could be reduced by addressing residential wood burning (Public Health Analysis and Climate Analysis, respectively).

"There's only so much developable land – could be a good time to try something at scale. We have teachers every year who accept jobs and turn them down because they can't find housing. This touches the medical field as well – anyone who tries to recruit anyone out of the area. Building homes creates jobs for builders and subcontractors but the trick is keeping them affordable in the long term..."

Housing Development Constraints and Challenges. Interviewees attributed housing constraints to a host of factors. Single-family zoning, zoning restrictions specific to coastal communities, and the complexities of the permitting process were all cited as challenges. There are few large developers (*"most everything is built by DANCO"*). The prevalence of unincorporated rural communities contributes to this; counties are not as well positioned as municipalities to build housing. Northcoast municipalities are exploring annexing adjacent land as a strategy to get more units built on outlying areas. Many have made concerted efforts to incentivize owners to create an extra unit or two using ADU policies, or by subdividing slightly larger city lots. Listening session participants estimated that the time it consumed in getting a housing development project through local permitting can be between two and five years and at an exorbitant cost to the developer that imposes additional limits on financing as commercial capital will not fund these non-value-generating predevelopment activities. Orthodox approaches that focus on subsidizing the homeowner (to whom the cost burdens are then transferred) do not systematically address this issue. Urban concerns dominate housing policy in the state and so do not adequately address the constraints faced in rural areas, including the increased burden rural developers face when creating infrastructure "from scratch," a key difference from their urban counterparts.

As in many parts of arid California, the climate crisis is exacerbating the housing crisis in the Redwood Region. Lake County, where 60% of the housing stock was lost in catastrophic wildfires in 2016, is a stark example.

"The valley fire was eight years ago—we are only NOW getting a couple of new houses up. We lost almost 2,000 homes."

Many factors have delayed rebuilding, one being changes in regulations and replacement of older construction. Many families in Lake County were told that they had to revamp existing septic and sewerage connections in order to rebuild, creating delays and substantial added costs. Advocates there expressed the need for more funding dedicated to fire mitigation and home-hardening programs and sought to partner with local community colleges to add a workforce curriculum around fire-adapted, affordable housing construction techniques.

Municipalities there and across the region are focusing on big housing construction pushes and finding new ways to overcome such constraints. Notably, the region's northern Tribal Nations have succeeded in breaking down some barriers to producing housing—investing in tribal-led construction firms, creating land trust models for building affordable housing, and taking advantage of a different regulatory environment to build housing on tribal lands. Much more is needed, however, respondents noted.

The Housing Crisis in the Redwood Region. The region is disproportionately struck by California's homelessness crisis, with the highest ratios of unhoused-to-housed residents in the state. Neighborhood issues arising from encampments are a major concern with which municipalities and health and human service agencies must contend. One innovative environmental justice organization is framing this issue as such and thus helping to advocate for the dignity for those experiencing homelessness by providing basic waste management services, while also organizing clean-ups around encampments, many of which are located in conservation or other natural areas.

> "How do we make [housing] so that no one has to turn a profit [on the investment], people can just have a place to live?"
>
> "How do you create home ownership opportunities to establish roots, equity, and wealth?"

Recognizing that many housing policy prescriptions can be used to address the issue in urban contexts as well as rural ones, Redwood Region housing advocates are exploring innovative solutions applicable in both contexts. Thus, there is increasing interest in land trust models of housing development that can help low-income working families build wealth in addition to stabilizing their housing. Creating cooperatives and subsequently developing mobile home parks is one method of interest that could benefit many community members in the region. The Wiyot Tribe has initiated community land bank model housing developments in Mendocino County and may do so elsewhere in the region. Research participants in Del Norte expressed interest in both land trust models and restricted deeds as a way to maintain housing affordability while providing home-ownership opportunities.

The Natural Environment

The region's beautiful, unique, and often pristine natural landscapes are a source of pride and its primary strength. With a diversity of ecosystems and clean air, its environmental setting offers communities everything they need for economic well-being and physical, mental, and spiritual health.

Figure 8.7 SWOT Analysis - The Natural Environment

Strengths

- Resurgence of cultural burns and indigenous management practices. Localities have mobilized fire-prevention initiatives and increased training opportunities for land-management and ecosystem-restoration careers.
- Diverse climates and ecosystems, including a year-round growing season, enable production of a wide range of crops and horticultural products.
- Natural beauty of the region draws millions of visitors each year as it enables a wide range of outdoor recreational opportunities.
- The area is an ideal setting for research in the areas of natural and life sciences and marine biology.
- Oldest and largest lake in the state is located in Lake County. The region also has unique ecosystems and volcanic activity.
- The region is well positioned for renewable energy development.

Weaknesses

The region contains:

- Scars of the extractive economy, including disinvestment in certain areas.
- Remote areas easily cut off from the rest of the state.
- Historic marginalization, which has put priority populations at higher risk for suffering the negative impacts of the climate crisis.

Opportunities

- Ecotourism, recreational trails, agritourism.
- Expansion of regenerative agricultural activities.
- Dam removal, which is anticipated to increase salmon populations and which would increase recreational fishing opportunities and restore access to traditional diets for indigenous communities.

Threats

- Sea level rise in Humboldt Bay (Sierra Business Council, p. 43), which will destroy housing and infrastructure, displace communities, and cause economic loss.
- Risk to coastal areas under sea level rise projections. Particularly threatened is Humboldt Bay.
- Risk of wildfire and extreme heat in inland areas.
- Current and future impacts of climate change, which threaten native communities' access to traditional food sources such as fish, game, and wild and cultivated crops and which will impact the area's cultural, economic, and community health.

Legacy of Extractive Industries. The abundant natural resources within the Redwood Region provided the basis for its economic prosperity. Although extensive logging significantly diminished forested areas, the ecosystems have been resilient, providing some of the highest quality wildlife habitats in California. Over time, the extraction industries have waned, with government and social services now employing the majority of the region's workforce. Thus, despite a surge in visitations and growth in the service industry, the Redwood Region remains economically weaker than most other coastal regions in California.

Impacts of Climate Crisis. Throughout the region, various climate hazards are anticipated to impact key economic drivers. Rising temperatures are expected to reduce agricultural productivity, and increasing surface water temperatures may lead to tourism disruptions caused by harmful algae blooms. Endangered fish populations are likely to decrease fishing opportunities. Altered precipitation patterns may result in prolonged dry spells and extreme precipitation events, leading to water shortages for crops and pasture land. Severe storms could induce flooding, infrastructure damage, and the ruin of agricultural lands. Very frequently mentioned are the impacts of climate change the region is facing: lack of adequate water and increased wildfire risk. The knock-on effects this will have include limited access to electricity, large economic losses to business, inability to insure properties, loss of housing stock, and more. Sea level rise threatens the coastal infrastructure and Blue Economy. The region is also prone to non-climate-related disasters: Proximity to fault lines opens the region to the possibility of destructive earthquakes and tsunamis.

The heightened risk of wildfires, coupled with recent wildfire activity, has inflicted enormous economic losses on the agriculture industry. Additionally, the historic redwood forests along the region's inland boundary face the looming threat of wildfires, further jeopardizing the area's economic landscape. Sea level rise in Humboldt Bay could lead to flooding and erosion, leading in turn to severe infrastructure damage and possible public health concerns. Sea level rise projections indicate that communities around Humboldt Bay could be inundated, not only displacing residents and causing personal financial injury but also lowering home values, reducing the tax base, and so increasing poverty in the region. Public infrastructure like roads, water pipes, electricity towers, and wastewater treatment plants are within the inundation zone.

Research participants in both eastern Humboldt County and Mendocino County mentioned the positive development of local fire safe councils, and positive collaborations with CAL FIRE (the California Department of Forestry and Fire Protection). In addition, Lake was the first county in the region to create a climate resilience officer position. Thus, serious efforts aimed at climate adaptation and resilience planning are underway.

Financial Capital

The listening campaign revealed that the focus of local institutions was lack of resources and the barriers that prevented their attainment, whereas individuals and their advocates emphasized the lack of appropriate job opportunities and the high and rising cost of living, with the purchase of such essentials as housing, medical care, and childcare posing significant financial hardship. Thus, people remain in the Redwood Region because of their love for its land and communities, but at the sacrifice of building durable wealth and pursuing upward mobility.

Figure 8.8 SWOT Analysis - Financial Capital

Strengths

- Lower income inequality than the rest of the state.

Weaknesses

- Low income across all ethnic groups and household types compared to the rest of the state.
- Congruent with the rest of the state, people of color earn less than their white counterparts.
- Institutions struggle to obtain the capacity to pursue strategic funding opportunities.
- Jurisdictions have too small tax bases and too large financial burdens to consistently maintain basic services and infrastructure.

Opportunities

- The region's one four-year university is a Tribal-serving, Hispanic-serving institution. Strengthening pathways in secondary education to help bridge students of color into training opportunities. Working to make institutions of higher education more inclusive and reduce other barriers to students of color.

Threats

- Macroeconomic policies continue to drive up inflation, particularly with respect to food and fuel.
- Public funding opportunities are offered in ways that are often inaccessible to rural regions and Tribal communities, perpetuating cycles of disinvestment.

Public Investment and Institutional Development

Respondents of public sector institutions were quick to bring up the following challenges and barriers the region faces in accessing funding:

1

Projects' Lack of Shovel Readiness: The primary reasons cited for this were either lack of planning:

> "We got $2.6 million to do this [wastewater infrastructure project], but we were supposed to be shovel ready and we didn't even have a plan."

Or failure to set aside adequate funding:

> "The approach to funding should change—the county or state should reinvest tax money by making the decision about funding at the beginning of projects."

The necessary sequence of predevelopment activities seems to be incongruent with risk-averse funding processes. Thus, if a project is needed and approved, public entities should set aside the funds while pre-development takes place so that the project can be started immediately and carried through to its completion without significant interruption. Tribal partners also cited challenges with respect to shovel readiness of projects.

2

Funding Technical Assistance and Basic Support of Partnerships: As one example, a resident of Willow Creek celebrated the work of local fire-resilience groups but questioned whether these would be able to continue because the funding needed to adequately support these partnerships would be available.

3

High County Budgets: As a consequence, few counties have the capacity to issue the grants that would provide consistent funding for economic development initiatives or would maintain staffing to carry out the work. One government respondent lamented,

> "We are focused on keeping the lights on."

4

Large swaths of land under state and federal conservation status impacts the tax base. This is particularly an issue in Del Norte County.

5

Being Reactive Instead of Proactive With Respect to Funding Opportunities.

> "[Our county] is simply reacting to federal and state funding opportunities, e.g., we need a bridge, so let's apply for this grant to do that."

6

Capacity Traps: Institutions struggle to obtain funds and fund staff hours in order to pursue funds and hire the staff needed to do so. Representatives of special districts in rural and remote areas noted that resource barriers sometimes prevent their applying for or receiving grants. For instance, their requests for funding to obtain resources needed to upgrade infrastructure have been declined because they failed to demonstrate sufficient financial stability to maintain the new infrastructure were they to be awarded funding. These cycles of disinvestment and low capacity play out in different ways across all counties and Tribal lands within the region.

However, due to rural disinvestment, the region is eligible for many tranches of state and federal funding because of the region's income data and other socioeconomic factors. Innovative ideas community members put forward include establishing a regional public bank and providing technical assistance to communities to form collaboratives and promote worker ownership.

Private Investment

Many communities, firms, and individuals in the Redwood Region do not have ready access to capital. "Banking deserts" (rural areas with relatively few financial service institutions) in the

region make it more difficult for individuals and local businesses to obtain conventional startup or expansion loans. According to research (e.g., Tolbert et al., 2014), the prevalence of independent local banks within a community or region is positively associated with increased business formation, higher wage and income levels, and lower poverty rates there. Addressing financial inclusion and asset-building through programs that provide increased access to financial services (e.g., affordable loans, credit counseling, and investment opportunities) is thus a key priority of the Collaborative, as are investments that leverage local, regional, state, federal, and philanthropic dollars to maximize economic benefits and further the inclusive vision and plan for Redwood Region economic vitality established in the regional roadmap.

Household Income and Wealth

Listening sessions with residents and service providers across the region emphasized the same point: Working people are being squeezed out of the local economy, and the data support this perception; with wages far lower than in the rest of the state and the increasing cost of essentials, a family of four with two adults working full time will, on average, spend 97% of their income to cover the basic essentials of housing, food, healthcare, and childcare. That of other, comparable areas is only 92% (see Figure 3.3).

Target Industries SWOT Analysis

The Redwood Region is characterized by a relatively diverse economic base spread across the four counties and Tribal Lands constituting the region. A quantitative analysis of economic performance, environmental impact, and available resources identified 11 key industries as potential targets for job and wage growth. Additionally, a survey of 97 Collaborative and community members and review of previous industry cluster studies (published in 2022) led to the creation of four broad groups that form the Collaborative's thematic working groups.

Arts, Culture, and Tourism

Health and Caregiving

Resilient and Renewable Energy

Working Lands and Blue Economy

A review of regional (county and Tribal) Comprehensive Economic Development Strategy (CEDS) documents confirms the importance of these sectors across the Redwood Region (with regional variability owing to geography, population, and other factors). Such targeted sectors, or industry "clusters," are characterized by:

1. Increased innovation activity and knowledge "spillover"
2. More specialized (and educated) labor pools
3. Lower transaction costs (communication, transportation, coordination, etc.)
4. Stronger networks of specialized suppliers and service providers (Porter, 1998)

Industry clusters tend to perform better in "thick" labor markets (i.e., markets having many buyers and sellers of labor), have more skilled workers in nonroutine jobs (i.e., a more educated workforce), and better occupational matching (i.e., matching skill sets to employer needs), leading to increased worker productivity. A focus on these sectors lends itself well to targeted workforce development programming that addresses industry-defined skill needs and provides public sector industry support.

The targeted-sector approach includes (but is not limited to) the following limitations:

1. The potential for reduced industry diversity (by focusing on specific sectors at the exclusion of others, such as emerging markets)
2. The potential for groupthink (at the expense of innovation)
3. Barriers to entry for new firms (through an anti-competitive blocking effect)
4. Increased fragility (less resilience) owing to reliance on more unitary sectors (Donahue et al., 2018)

A less diverse economic base can be more vulnerable to economic downturns, as evidenced by the exclusion of industries pertaining to offshore wind development within the cluster analysis.

The Education Services, Health and Social Assistance, and Leisure and Hospitality sectors are expected to account for nearly two-thirds of projected job growth over the current decade, while the Manufacturing, Total Farm, Mining, and Logging, and Retail Trade sectors are expected to experience slower than average job growth rates, disproportionately impacting men, persons of color, and individuals with lower levels of educational attainment.

Arts, Culture, and Tourism

Creative Placemaking Initiatives: Several rural, remote, Tribal, and unincorporated communities are in fact the gateways to the region for visitors arriving from the North, South, and East. Given that these are some of the most disinvested parts of not only the region but the entire state, there is a strong call to invest in upgrading tourism infrastructure in those specific communities. Better relationships with State and National Parks, including strategic placement of visitors centers and other park infrastructure, was frequently brought up in those communities. For many coastal communities, tourism became the backbone of the local economy once fisheries went into decline (highlighted by respondents from Mendocino but relevant in Del Norte and Humboldt as well).

Downtowns across the region bear the scars of a long history of commodity boom and bust cycles and natural disasters. In Crescent City, the capital city of Del Norte which was destroyed by a tsunami in 1964 and then subsequently built back within a year- planning practitioners, business advocates and others noted the need for creative placemaking which would uplift the community and draw visitors. The perception of downtown areas lacking charm is a challenge for marketing. That city's plans for revitalizing its waterfront areas highlights how more can be done to celebrate the region's original stewards by promoting education of indigenous cultures. Working together with the Tolowa Dee-ni Nation and other local Tribes, the City has created a plan for an interpretive trail that centers those cultures. Tribal collaborators note how allowing Tribal people to tell their stories makes a difference in the community. The acknowledgment, collaboration, and celebration is a hopeful indication of more Tribal inclusion in planning. Tribal members indicated that they hope to see more representatives on commissions, committees, and other forms of government led work moving forward.

Arts and Culture are a Source of Healing and Resilience: The Arts and Culture sector was highlighted by community members as a key enabler for helping youth thrive. Given the region's troubling statistics

with respect to mental health, substance use, and other well-being issues associated with isolation and alienation- the arts provide a powerful avenue to expression, connection, and belonging especially for young people. Additionally, the institutions in the sector have played a key role in establishing and/or fiscally sponsoring other organizations and initiatives that celebrate cultural identities- for Latinos, Indigenous community members, and other peoples of color. Arts advocacy groups across the region play a key part in making these special communities visible and celebrated on the North Coast.

Capitalizing on the Region's Rich Cultural History: Cultural heritage is an incredible and immeasurable strength of the region. There are aspects of the region's history that could be better celebrated and might help draw new visitors. One example, the aesthetic culture of the Back to the Land movement. As those artists are now aging and many unable to continue living off grid as they did when they arrived in the 1960s and 70s, some investors from the Bay Area have started to acquire these architecturally unique eco-homes and preserve them as B&Bs and retreats- ***"while telling the story of that movement intentionally"*** (in Mendocino). ***"Artists create that rising value [that draws people to the region]. And we need population coming in, we're not replacing ourselves."*** A popular idea from partners in the Arts and Culture sector is the creation of a regional Cultural Plan or Arts and Culture "trail"- a central brand that can make all the richness here more visible in one cohesive informational product.

Agricultural and Eco-Tourism Development: There is a recognition of the region's potential for agricultural tourism. Alexandre Family farm located in Del Norte County is a leader in the regenerative agriculture movement. In Southern Humboldt and Northern Mendocino, industry advocates have helped create cannabis centered agri-tourism opportunities and marketing campaigns to support them. Collaborative marketing initiatives, including shared efforts with neighboring counties and funding from Visit California, were mentioned as desirable. Recreational, multi-use trail development is also embraced by the region, with the Great Redwood Trail on its way and Del Norte County planning other opportunities to draw in hikers, bikers, equestrians, and others.

Hospitality as a Key Industry: In areas where traditional industries like logging and fishing have declined, tourism and hospitality are identified as the economic drivers that took their place. Tourism revenue, including Transient Occupancy Tax (TOT), contributes substantially to local economies. This was highlighted especially in communities on the Mendocino Coast. The seasonal nature of tourism can be a pain point, and jurisdictions are exploring strategies to focus on year-round productive activities and attractions. With respect to resilience in the face of shocks, COVID-19 posed challenges, it also brought opportunities, with increased tourism after restrictions lessened. The development of attractions like the Redwood Skywalk, for example, contributed positively to local tourism. There are budding career pathway programs for helping connect youth to opportunities in this industry, for example the "E3" Pathway Program in Del Norte.

Projects and Initiatives Highlighted by the Community

From CEDS and Tribal strategic plans, listening sessions, local table meetings, and surveys:

- Crescent City Harbor Revitalization
- Lake County Tourism Improvement District
- Redwood Experience Center

Health and Caregiving

Medically Underserved Region: To put it simply- ***"there is no medical care around here."*** People from all walks of life find themselves in the position of having to travel long distances to see a specialist- though of course this creates significant barriers for transportation limited and time and resource poor families. Community members elevated how senior populations who often have increased medical needs are particularly burdened by having to drive upwards of three hours to see a doctor. Being a medically underserved area was one of the most frequently mentioned weaknesses of the region. In addition to the acute shortage of providers; community members also noted the quality of care available leaves something to be desired, high turnover in medical staff and especially a lack of specialists. The cost of care, when one can access it, is also a huge barrier. One participant posited that Del Norte is one of the most expensive places in the country to give birth. The proportion of fixed income residents, and those on Medicaid and Medicare, have implications for reimbursement rates and the business models used by healthcare providers.

Behavioral and mental health (especially for youth), and trauma (particularly historical) was emphasized across all counties and tribal lands- substance use, lack of medical providers for these issues, and adverse childhood experiences came up repeatedly. The opioid epidemic is acute in the region.

> "I do think some counseling... just talking to someone a little bit more... At 18 years old, my best friend had committed suicide."

For those suffering from substance use disorder, or are in the tough position of having a child in need of behavioral healthcare, many have to go outside the area to find in-patient facilities. There is fear that funding for important youth programming is drying up as a result of the all but collapse of the cannabis industry (Prop 64 funding).

Medical and Public Health Innovations: Positively, respondents observed a growing movement in the region around Blue Zones (areas of the world where people routinely live to old age and chronic disease rates are low) and the health drivers that create them. Another cultural strength which relates to health and well-being for residents is the presence of strong mutual aid networks. Practitioners expressed that expanding telehealth could be an opportunity to improve access to services and the region already has several mobile providers who can meet folks where they are at to provide care.

Leadership on Economic Development Constraints: Leaders in the healthcare industry are taking on the housing crisis; exploring innovative solutions to alleviating this constraint to recruiting necessary personnel. Destination healthcare, for things like LASIK surgery for example, could offer a boon to rural communities who have clinics in place- Southern Humboldt respondents emphasized this potential.

Critical Need for Child and Elder Care: The lack of childcare providers remains a huge barrier for working families. At its worst in Humboldt County, childcare as a proportion of median earnings reached 37%. There is also a lack of therapists and service providers to support families with kids that have special needs, as highlighted in the behavioral health workforce statistics above.

Projects and Initiatives Highlighted by the Community

From CEDS and Tribal strategic plans, listening sessions, local table meetings, and surveys:

- Supportive housing developments for people with disabilities
- Support to childcare businesses and providers in Humboldt County
- Housing initiatives for medical staff

Renewable and Resilient Energy

High Potential for Renewable Energy Development: Lake County is one of only three sites worldwide where tapping into geothermal energy is relatively easy since it is so close to the surface. The coastal counties all host good sites for offshore wind development.[162]

Development of offshore wind in Humboldt Bay is much anticipated—"the biggest in the country!" However, listening session participants also frequently expressed pessimism, noting that the project will require years before being operational and that "cultural viewpoints" could block its completion. For instance, a respondent from a labor organization noted that the wind project will only begin hiring laborers in six years. ***"A huge challenge will be patience, hanging in there until things get off the ground,"*** one environmental activist commented. Another concern is sustainability of jobs after completion of major construction.

Also of interest to participants were the types of opportunities that will be afforded to local laborers (who are still majority non-union) during the port-redevelopment phase. From frequent mentions during listening sessions, the companies involved in this—Crowley, Vineyard Offshore—are already notable presences in the local community.

Another, more prospective project mentioned is a "hydrogen highway" for the Redwood Region. Defined as a chain of hydrogen-equipped filling stations and other infrastructure along a road or highway that would allow travel by hydrogen vehicles, this could be aligned with fleet conversion for transport within the region. A respondent commented that biomass-to-hydrogen conversion has become a more commercially viable technology than in the past and that there are successful hydrogen fuel projects in other parts of the country and worldwide. The concept underlying this technology is still in the preliminary feasibility stage, but Tribal planners throughout the region have expressed interest in it. Facilities could be co-located near forestry operations/mills where biomass is produced. A feasibility study commissioned by the Sonoma County and Mendocino County Economic Development District (SMEDD) is currently being conducted to explore a trucking route from Eureka to Oakland supported by hydrogen fueling.

Dissatisfaction With the Public Utility PG&E is resounding. Deferred maintenance of PG&E's above-ground infrastructure continues to constitute a dangerous fire risk. The utility's inability to promptly install electricity hookups to new residences and businesses is a major constraint reported throughout the region. However, the utility's infrastructure problems requiring resolution are

[162] Schatz Energy Center Offshore Wind Feasibility Study: https://schatzcenter.org/2019/07/oswstudy2/

significantly larger. During listening sessions, participants in Del Norte spoke of the large number of households that had been without electricity for 10 or more days in the wake of fires and so had to rely on emergency diesel generators. Inland communities wonder if the grid has the capacity to cool critical institutions during the heat waves projected to come.

> "We need PG&E to do their job better – removing and installing electrical drops is frustrating—a big problem for the county if we're ever going to meet housing and other goals. PG&E is a huge problem."

Energy Sovereignty Initiatives: Driven by concerns about the conventional grid, a project of major interest to the region is Blue Lake Rancheria's microgrid. Tribal partners and participants from rural and remote areas of the region alluded to this repeatedly. The Redwood Coast Airport Microgrid "the first 100% renewable energy, front-of-meter, multi-customer microgrid" was launched in 2022.

At present, electrical transmission capacity and connection to transportation corridors for wind energy generation are inadequate. Moreover, one partner noted that, in order for the local benefit of the wind energy project to be sustainable beyond construction of its infrastructure, the opportunity exists to synergistically expand both electrical and broadband access, facilitating establishment of new businesses along rural corridors and in places like Round Valley. The three corridors the state has already identified are the road from Fairhaven to Kneeland and the route down highway 36, along the 299, and then through southern Humboldt along the 101.

Energy provision in Lake County differs from that in the rest of the region; the grid there is sectioned, and, although supported by megawatt diesel generators similar to those used in Del Norte and other parts of the region, transmission lines are not all under threat. An important aspect of Lake County's Energy sector is geothermal energy coming from the geysers (by Calpine Corporation). Although the infrastructure was established for this in the 1970s or 1980s, addressing other environmental issues has a higher priority. The county receives funding through the "Full Circle Project," which injects secondarily treated wastewater into the steam fields of the geysers to generate that is delivered in partnership with Calpine Corporation, Northern California Power Authority, and now Open Energy. While saving on tertiary treatment of wastewater, this also results in 10 million gallons of water leaving the Clear Lake watershed basin, which supplements wastewater use. The community is unclear, over time, what impact this will have on the lake.

Projects and Initiatives Highlighted by the Community

From CEDS and Tribal strategic plans, listening sessions, local table meetings, and surveys:

- Energy careers curriculum, solar arrays on brownfield redevelopment sites in Hoopa
- Blue Lake Rancheria Microgrid
- Fort Bragg Oneka Seawater Desalination Pilot Study
- Toma Resilience Campus
- Offshore wind development

Working Lands and Blue Economy

Favorable Climate and Potential for Regenerative Agriculture. The most often mentioned strengths and sources of opportunities for the region lie in its natural beauty and abundant natural resources. Listening session participants noted the high potential for innovation in the Agriculture sector and Blue Economy. In particular, the wine industry, horticulture farms, regenerative livestock-production models, and local food economies are strong. The region is blessed with a climate that allows for year-round crop production. Its varied ecosystems and microbiomes therefore provide diverse opportunities, including expansion of regenerative agricultural practices on the grasslands. Advocates note that the region currently has more organic matter in its soil than 90% of the state, and great potential exists to continue sequestering carbon in the grasslands and building organic matter into the soil. The region therefore anticipates opportunities to further develop manufacturing industries linked to this sector.

Nature-Based Solutions and Ecosystem Restoration. The region contains opportunities to invest in sustainable infrastructure and nature-based solutions—wetlands, forest restoration, and innovations like the Arcata Marsh were given as examples. Partnering with the Redwoods National and State Parks to train a workforce in land- and resource-management careers is another opportunity contributors mentioned. For example, a heavy equipment regional training center has been proposed for Orick, a small and struggling rural community close to the Redwoods National and State Parks. There is potential for further developing science- and research-based industries along the coast and limnology research in Lake County. With respect to prospective industries like offshore wind and aquaculture development, preliminary data analyses indicate that labor shortages for such occupations as electricians and construction workers could number as high as a thousand or more workers- further indication of growing opportunities for thriving wage careers in the trades.

Case Study

Developing Blue Economy Initiatives in Mendocino County

The Noyo Harbor District in Mendocino County, in collaboration with West Business Development Center (West Center), was awarded a $3.2 million California Jobs First Pilot grant to revitalize the harbor and enhance its role in the California Blue Economy. The harbor, an important commercial and recreational fishing port in Mendocino County, has been a significant economic and cultural asset for over 72 years. The revitalization project, aligned with the 2019 Community Sustainability Plan, focuses on three key goals:

1. **Installation of a New Ice House:** An energy-efficient, environmentally sustainable ice-making facility will be built to support 80 commercial fishing vessels, benefiting over 300 jobs. This facility, housed in portable containers powered by solar energy, is expected to boost the harbor's fleet and economic viability.
2. **Marine-Based Business Training Program:** This program aims to equip small business owners and entrepreneurs in the marine sector with skills and opportunities for growth, fostering peer-to-peer learning and community partnerships.

3. **Community Fish Market Incubator:** Designed to enhance direct sales from fishing vessels to the community, this market will serve as an incubator for fleet members to apply new skills and improve customer engagement. The project includes a comprehensive marketing and branding strategy to ensure its sustainability beyond the initial two-year funding period.

Overall, the grant supports significant infrastructure improvements and economic development initiatives, positioning Noyo Harbor as a vital player in the regional and state economy. The Harbor District is also a key partner in the Noyo Ocean Collective, which is currently working on an aquaculture feasibility study.

Cultures United by a Love of the Land. Cultural factors contribute greatly to the region's strength. Community members expressed appreciation that the original stewards of the land still live here and that their traditional knowledge and practices are alive and can be used to more sustainably manage the forests and lands. The region's Tribal governments and nations are nationally and internationally recognized for their work to protect and restore its lands, forests, and rivers. Elevating their expertise as leaders in Redwood Region RISE thus constitutes an opportunity area for the Collaborative. The dam removal occurring on the Klamath river and other river-restoration work that may bolster the salmon populations provides an incredible opportunity tapping into this expertise, as are application of indigenous forest-management techniques e.g., cultural burns, which are addressed below.

Traditional Ecological Knowledge. Reducing the forests' fuel load and developing commercial uses for the resulting biomass constitutes a major climate-resilient, economic and workforce-development opportunity. Specifically, communities adjacent to forest conservation areas are excited about possible workforce training opportunities, for example, the proposed heavy equipment training site in Orick. Controlled burns, cultural burns, and other fire- and conservation-related

activities also constitute workforce-development opportunities. The potential for "cooperative" forest management amongst smaller, private landholders is also a cause of excitement. This would entail hiring firefighters in the off-season to process forests, i.e., remove dead trees and use them to provide firewood for those in need, and better manage forests to manage risk of fires.

Climate Vulnerability. The region is vulnerable to drought, fire risk, and sea level rise. Fire insurance is growing more costly, and some companies will no longer insure properties in the region. Vast natural landscapes are costly to manage, increasing that particular risk, which the long history of poor forest management practices has exacerbated by allowing high fuel loads to accumulate in heavily forested areas to drive catastrophic wildfire events. Agricultural industries are particularly vulnerable to this risk. The severe economic losses faced by the wine industry in Lake and Mendocino Counties due to smoke and other wildfire effects provide a stark example.

The region faces other environmental issues. Water rights are often contentious, particularly impacting communities near Clearlake. Commercial fish stocks are trending downwards, and sea level rise and acidification from climate change are occurring. Local fish stocks contain elevated mercury levels, posing a risk to Blue Economy industries (Climate Analysis). Important to note is that, while data on emissions sources are limited, those available suggest that industries within the Working Lands and Blue Economy cluster have higher emissions relative to economic value created than do other clusters.

Boom and Bust Cycles. The economic history of the Redwood Region is marked by commodity boom-and-bust cycles of natural resource extraction. Following the gold rush came waves of timber extraction. The housing boom of the 1960s decimated 90% of the old growth redwood forest, and this was followed by a decline in coastal fisheries by the early 1990s. Most recently, the newly legalized cannabis industry collapsed in 2022 and so is no longer considered a major economic driver for the region. This industry's collapse is having a significant negative impact in rural small towns across the region. Currently, the Redwood Coast region has lost agricultural jobs, gained construction employment, and lost services.

Projects and Initiatives Highlighted by the Community

CEDS and information gathered from Tribal strategic plans, listening sessions, local table meetings, and surveys highlighted the following projects and initiatives:

- Kelp, fungi, and abalone farming; hemp and hempcrete
- Local foods economy: food hubs, farm-to-table, dockside fish markets, local meat processing facilities
- Eco-tourism, outdoor recreation
- Monetizing forest carbon sequestration as a potential opportunity for forested and grassland ecosystems
- Ecosystem restoration and other natural resource management as possible career choices
- Aquaculture Innovation Hub
- Noyo Harbor Collective
- Tribal EcoRestoration Alliance

Conclusion

This Regional Plan Part 1 represents the culmination of extensive data analysis, community engagement, and partnership-building efforts. The report has surfaced key insights into the region's economic well-being, industry composition, workforce dynamics, public health, and environmental risks, with a particular focus on the experiences of priority communities, including those facing workforce barriers, rural and remote areas with limited access to services, and low-income communities in disinvested areas.

Through this process, the collaborative has identified four priority sector nodes - Arts, Culture, and Tourism; Health and Caregiving; Renewable and Resilient Energy; and Working Lands and Blue Economy - that reflect the region's shared economic development priorities and hold the potential for sustainable, inclusive growth. These sector nodes are supported by key underlying infrastructure nodes - housing, broadband, and transportation - that are critical to the region's economic competitiveness and quality of life.

The Redwood Region RISE collaborative is now poised to develop targeted strategies and investments that build on the region's strengths, address its challenges, and create a more equitable, resilient future for all its communities. In Regional Plan Part 2, the collaborative will draw on the data and insights surfaced in this report to craft a roadmap for inclusive and sustainable economic development. This will involve working closely with industry leaders and community partners to identify high-impact projects, prioritize investments, and foster ongoing collaboration and capacity-building.

Central to this effort in Part 2 will be the work of the RRRISE Sector Tables, which bring together industry leaders and community representatives to drive the development of regional strategies and projects. The Sector Tables play a critical role in identifying missing partners for outreach, reviewing data, shortlisting high-alignment projects, assisting with participatory decision-making, and identifying priorities for ongoing sector development. Through the development of sector based and community development strategies, the Collaborative is currently working to identify:

- Key investment areas and workforce development needs to prepare for future disruptions and post-disruption transitions and the emergence of resilient industries, which is one goal of this Regional Roadmap,
- Underutilized synergies within the Redwood Region and with outside markets, with identification of opportunities for intra- and inter-sectoral and public-private cooperation to maximize benefits,
- Ways to effectively utilize the Collaborative regional roadmap, including high-quality job creation targets (pre- and post-disruption) in resilient industries, informed by the needs of disinvested, priority communities in the Redwood Region, and
- Investments that have multipliers and benefits across the Redwood Region, including investments that leverage local, regional, state, federal, and philanthropic dollars to maximize economic benefits, and which reflect the inclusive vision and plan for Redwood Region economic vitality established in the Collaborative regional roadmap.

These strategies will be released August 2024, and comprise the second part of the Roadmap-Regional Plan Part 2.

The Redwood Region has a rich history marked by the resilience and innovation of its diverse communities. From the original stewardship of the land by Indigenous peoples to the boom-and-bust cycles of resource extraction industries, the region has experienced both prosperity and challenges. Today, the Redwood Region faces a critical juncture, with threats such as climate change, worsening economic disparities and disruptions, and workforce barriers. However, the region also possesses unique strengths and opportunities for sustainable, inclusive growth.

As the Redwood Region RISE collaborative moves forward with this work, it will continue to center the voices and needs of priority communities. By leveraging the region's unique assets, fostering cross-sector collaboration, and investing in the infrastructure and workforce of the future, the Redwood Region can emerge as a model for sustainable, inclusive economic development, realizing its vision statement: ***"The Redwood Region is a healing place where everyone belongs, with stable jobs, accessible healthcare, and a thriving natural environment. Together, we work towards a future where anyone can thrive."***

Appendices

A. Glossary of Terms

Arcata Economic Development Corporation (AEDC)	AEDC is the former name of Redwood Region RISE's Fiscal Agent (now called North Edge Financing) responsible for project coordination, fiscal oversight, and reporting.
California Center for Rural Policy (CCRP)	CCRP is the Regional Convener and is responsible for project leadership; Collaborative facilitation; research, analysis, technical assistance with plan preparation; and communication.
California Governor's Office of Business and Economic Development (GO-Biz):	A government agency in the State of California, responsible for providing technical assistance to California Jobs First/Regional Investment Initiative regions.
California Jobs First	California Jobs First, the rebrand of CERF, was created to promote a sustainable and equitable recovery from the economic distress of COVID-19 by supporting new plans and strategies to diversify local economies and develop sustainable industries that create high-quality, broadly accessible jobs for all Californians. This initiative is a partnership between OPR, GO-Biz, and LWDA to support resilient, equitable, and sustainable regional economies.
California Labor & Workforce Development Agency (LWDA)	A government agency in the State of California, responsible for California Jobs First/Regional Investment Initiative to promote safe and fair workplaces, deliver critical worker benefits, and promote good jobs.
Cluster	A group of industries that through our analysis was defined as related and interconnected.
Collaborative	Collaboratives are broad-based regional groups convened by a skilled and impartial intermediary to plan for economic recovery and a sustainable and equitable economic future. These collaboratives shall prioritize equity, sustainability, and job quality, and advance a shared prosperity where workers and communities across California's diverse regions share equally in the benefits of a carbon-neutral future. When referencing "Our Collaborative", it is members in the Redwood Region.
Community-based Organization (CBO)	A Community-based Organization is one that is driven by community residents in all aspects of its existence (Its governing body, staff, and office location; Priority issues identified and defined, including finding solutions and program design, implementation, and evaluation components).

Community Economic Resilience Fund (CERF)	CERF (now California Jobs First/Regional Investment Initiative) was created to promote a sustainable and equitable recovery from the economic distress of COVID-19 by supporting new plans and strategies to diversify local economies and develop sustainable industries that create high-quality, broadly accessible jobs for all Californians. The initiative is being developed by OPR, GO-Biz, and LWDA to support resilient, equitable, and sustainable regional economies.
Comprehensive Economic Development Strategies (CEDS)	The purpose of the CEDS is to bring public and private sectors together to develop a strategic plan to guide local economic development efforts and to strengthen the Region's economy. It comprises four elements (summary background, SWOT analysis, strategic direction/action plan, and evaluation framework).
Disinvested Communities	♦ The California Jobs First grant program defines 'disinvested communities' as any of the following: ♦ Census tracts identified as 'disadvantaged' by the California Environmental Protection Agency. ♦ Census tracts with median household incomes at or below 80 percent of the statewide median income or with the median household incomes at or below the threshold designated as low income by the Department of Housing and Community Development's list of state income limits adopted pursuant to Section 50093 of the California Health and Safety Code. ♦ 'High poverty area' and 'High unemployment area' as designated by the California Governor's Office of Business and Economic Development California Competes Tax Credit Program ♦ California Native American Tribes as defined by the Native American Heritage Commission (NAHC) Tribal Consultation Policy.
Economic Development	The process of improving the economic well-being of a community by creating jobs, increasing incomes, and promoting sustainable, resilient, and equitable growth.
Employment Development Department	A government agency in the State of California, responsible for California Jobs First/Regional Investment Initiative administration.
Gini Index	A measure of distribution of income across a population ranging from 0 (perfect equality - everyone has the same income) to 1 (perfect inequality - one person has all the income).
Industry	For this report, this refers to a single 3 digit NAICS code industry (e.g., Hospitals, NAICS: 622). Technically, these are "subsectors".
Industry Cluster	A geographic concentration of related companies, organizations, and institutions that share markets, workers, supply chain components, and accrue other productive benefits from co-locating.
North American Industry Classification System (NAICS)	A system used to help compare statistical data for similar businesses when analyzing products and services.

North Coast Opportunities (NCO)	NCO is one of the Outreach & Community Engagement partners and is responsible for developing regional outreach and engagement strategies; coordinating with regional Community-based Organizations; ensuring that the voices of disinvested communities are represented; and reporting.
Office of Planning and Research (OPR)	A government agency in the State of California, responsible for California Jobs First/Regional Investment Initiative planning.
Priority Populations	The term used to describe the Redwood Region's "disinvested communities".
Public Use Microdata Areas (PUMA)	Geographic areas within a state that contain no fewer than 100,000 people and no more than 200,000 people each.
Public Use Microdata Sample (PUMS)	Data files containing records about the characteristics of housing units and the people residing in them.
Redwood Region RISE (RRRISE)	Our Region's California Jobs First initiative is called Redwood Region RISE (Resilient Inclusive Sustainable Economy), and includes Tribal Lands, and the counties of Del Norte, Humboldt, Lake, and Mendocino.
Regional Investment Initiative (RRI)	Formerly known as Community Economic Resilience Fund (CERF). The Regional Investment Initiative is a new approach to economic development that seeks to center disadvantaged communities as part of California's transition to a clean energy, carbon neutral economy.
Required Partner Groups	The different groups the State has deemed as necessary to have balanced representation within the Governance Structure of the Collaborative: ♦ Labor organizations, ♦ Employers, businesses, and business associations, ♦ Grassroots and community-based organizations, community organizers, and community members, ♦ Government agencies, ♦ Economic development agencies, ♦ Philanthropic organizations, ♦ Education and training providers, ♦ Workforce development entities, ♦ Environmental justice organizations, ♦ Worker centers, ♦ Disinvested communities, ♦ California Native American Tribes, and ♦ Other regional interest holders capable of contributing to the success of the project.

Senate Bill 162	Governor Newsom signed this bill to establish a $600 million initiative to create high-quality, accessible jobs, and help build resilience to the effects of climate change and other global disruptions impacting the state's diverse regional economies.
True North Organizing Network	This organization is one of the Outreach and Engagement partners, primarily responsible for convening work in Del Norte County. They support community organizing and power building efforts in our Region.
Traditional Ecological Knowledge (TEK)	The knowledge, practices, and beliefs developed by Indigenous communities over generations regarding their relationship with each other and the environment.
Sector	A highly aggregated group of related industries defined by NAICS. These include "2 digit NAICS codes: "(e.g., Healthcare and Social Assistance, NAICS: 62).
Sectoral Strategy	A sectoral strategy is an employer-driven workforce development approach that directly aligns occupational skills training and other workforce development services with the needs of businesses.

B. Partnership Survey

Redwood Region RISE Survey

Welcome to the Redwood Region RISE Survey!

Your survey responses will help us learn about community members and organizations interested and/or available to participate in economic development planning and decision-making in Redwood Region RISE (Resilient Inclusive Sustainable Economy):

Tribal Lands, Del Norte, Humboldt, Lake, and Mendocino Counties. This information is a required part of our region's plan, and your responses are very important!

If you're not representing an organization/affiliation, this survey will take about five minutes to complete. For those representing an organization/affiliation it will take about twelve minutes to complete this survey.

We will use the survey results to prepare these parts of our regional plan:

- A searchable directory of people and organizations interested and available to participate in the Redwood Region RISE planning process.
- Graphics and charts that illustrate all combined survey responses.
- A written analysis of the take-aways.

You can choose not to include your name in the directory and still participate in this survey. Even if you choose to be listed in the directory, all responses in Sections 2 and 3 will be kept confidential.

If you have any questions about this survey, please contact: ccrp@humboldt.edu

Thank you for your time!

SECTION 1: Your Information

1. Email

2. What is your name? (Required Question)

3. Which county or area do you live in? Check all that apply.

   - Del Norte
   - Humboldt
   - Lake
   - Mendocino
   - Tribal Lands

4. If desired, please provide additional information about the area or Tribal Land that you live in. (For example, the name of the city, town or neighborhood in which you live.)

5. If applicable, what is your occupation or title?

6. Would you like to participate in economic development meetings and discussions in your community? Check all that apply.

   - Yes
   - No

7. How would you like to contribute to the Redwood Region RISE planning process? Select all that apply:

   - Attend Zoom meetings of the High Road Transition Collaborative (HRTC) on every last Thursday of the month
   - Participate on a Tribal Planning Table (Tribal members only)
   - Participate on a Local Planning Table
   - Receive the newsletter
   - Receive a mini grant to help Redwood Region RISE recruit community feedback from priority populations/members for Local Planning Tables (more information on this opportunity will be provided upon request)
   - Help us spread the word to encourage people to join the Local Table Meetings
   - Flyering/Promoting/social media/Giving out surveys for community feedback
   - Receive/attend update meetings a few times a year (in addition to or instead of HRTC meetings)

8. Do you represent an organization?

   Examples may include educational institutions, business associations, economic development, community organizations, and others.

   Please note: If you select NO you will skip directly to Section 4, as Sections 2 and 3 pertain only to organizations.

   Select one.

   - Yes (Skip to question 9)
   - No (Skip to question 22)

SECTION 2: Organizations

You are answering these questions because in a previous question you indicated that you represent an organization.

9 What is the name of the organization that you represent?

10 Which areas does your organization serve? Select all that apply:

- Del Norte
- Humboldt
- Lake
- Mendocino
- Tribal Lands

11 If desired, please provide additional information about the areas or Tribal Lands your organization serves.

12 What is your organization's primary physical address?

13 At what geographic scale does your organization operate? Select all that apply:

- National
- State
- Regional (Del Norte, Humboldt, Lake, and Mendocino Counties)
- County
- City
- Neighborhood/Census Designated Place

14 Please choose one response that best describes your organization:

- Business/Business Association
- Economic Development Agency
- Education or Training Center
- Environmental Justice Organization
- Federally/non-federally Recognized Tribe
- Government Agency
- Grassroots/Community-based Organization
- Labor
- Philanthropy
- Workforce Development

15 Which of these priority communities does your organization primarily serve (if any)? Select all that apply:

- Advocates for People of Color (e.g., Black Lives Matter, Asian Americans Advancing Justice, New Hmong Rising Association, etc.)
- Communities of Color
- Immigrants with Documentation (e.g., work visas)
- Individuals that live in extremely remote/ rural areas of the Redwood Coast Region
- Individuals who were Formerly Incarcerated

- Individuals with Hearing Impairment
- Individuals with Intellectual Developmental Disabilities
- Individuals with Learning Disabilities
- Individuals with Physical Disabilities
- Individuals with Vision Impairment
- Individuals without Broadband Access
- Individuals without Documentation
- Lesbian, Gay, Bisexual, Transgender, Queer, Asexual, Intersex + (LGBTQAI+)
- Member of ethnic minority communities
- Members of religions
- Monolingual Hmong-Speakers
- Monolingual Spanish Speakers
- New Citizens
- Non-federally recognized Tribal Nations
- Seniors
- Tribal Citizens
- Tribal Governments
- Unions
- Workers
- Youth

16 If not listed above, please describe the community your organization serves.

17 What is your organization's annual operating budget?

- $0 to $100,000
- $100,000 to $500,000
- $500,000 to $2 million
- $2 million to $5 million
- $5 million to $10 million
- Over $10 million
- I'm not sure.

18 How many full-time staff does your organization employ? Please provide approximate full-time equivalencies (FTEs).

- 0 to 5
- 6 to 10
- 11 to 25
- 26 to 100
- More than 100

19 I would like to be included in a directory of organizations available to partner on economic, community and environmental planning initiatives.

SECTION 3: Partnerships

This section of the survey asks about your partnerships with other organizations in our region.

Important Instructions
As you answer the survey questions, please keep these instructions in mind:

- Please answer from the perspective of the type of partner that best describes your organization.
- Answer from the perspective of the primary address you use when doing economic development work within our region. If your organization has more than one office in our region, please use the main office address.
- Answer from the perspective that best describes the usual type and quality of relationship you have with other partners in one category.

20 The following questions are meant to gauge your or your organization's level of connection with the following organization types. Please evaluate your/your organization's level of involvement with the following organizations.

I/my organization interacts with partners on economic development issues as follows:

	I don't know anyone at this type of organization.	I know someone at this type of organization but don't regularly exchange information with them and have never worked with them.	I regularly exchange useful information with a person in this type of organization but have not/ do not work with them on a project.	I regularly exchange useful information with a person in this type of organization and have worked with them on one or more projects.	I'm in regular contact with people in this type of organization, have participated in a planning process with them before, and have worked with them on projects.	I depend on a person in this type of organization for important information and we collaborate closely on plans and/ or on one or more projects.
Economic Development Organizations						
Community Development Organizations						
Business/ Business Associations						
Education or Training Centers						
Environmental Justice Organizations						
Federally or non-federally Recognized Tribes						

Government Agencies						
Grassroots or Community-based Organization						
Labor Organizations						
Philanthropic Organizations						
Workforce Development Organizations						

21 If desired, please provide further comment on the types of projects and plans that you have worked on with these partners (Optional).

SECTION 4: Capacity and Support

These questions ask you to describe your or your organization's capacity to participate in economic development planning and implementation processes and support that could help encourage broader community participation.

22 Please evaluate your/your organization's capacities to participate in economic development planning and implementation processes:

	No/Limited Capacity	Some Capacity	Adequate/High Capacity
Knowledge/awareness of relevant plans or funding opportunities			
Commitment to build on community strengths and opportunities			
Commitment to address community problems			
Staff			
Partners/relationships			

Skills (in-house)			
Specialized Expertise (in-house or access to consultants)			
Training/professional development			
Funding			
Organizational leadership			
Tools/Infrastructure (broadband, office space, equipment, etc.)			

23 If desired, please provide further explanation of your or your organization's capacities.

24 This question seeks to help us understand barriers that may prevent you or your organization's ability to achieve broader participation in economic development planning.

Please evaluate the barriers, if any, that you or your organization face in reaching the people you serve/your constituents.

	Not a barrier at all	A challenge, but manageable	A significant and difficult challenge
Community Distrust			
Difficulties increasing awareness/ understanding			
Digital inequity (lack of access to broadband or devices)			
General disinterest			
Geographic/ transportation			

Lack of cultural connectivity			
Lack of time to participate			
Language barriers			
Other organizational capacity constraints (staffing, resources)			
None of the above			

25 If desired, please describe any other barriers not listed above or specific populations affected.

26 I/my organization could benefit from access to the following types of training (choose all that apply)

- Redwood Region RISE Basics – what is required in this planning process and what types of projects can be promoted for funding.
- Economic Development Basics – the who, what, where, why and how economic development can create wealth.
- Public Funding Basics – how governments fund economic development projects
- Community Investment Models - how community members can drive change and attract resources
- Project Development - phases of major projects from conceptualization to implementation and opportunities for community input
- Apprenticeship and Career Pathways Programs – what they are and what is available in our region
- Cultural History of our Region
- Immigration in our Region
- Working with Tribes
- Building Community Power – what does community power look like and what does it mean to shift power to communities.
- Board and Committee Leadership Responsibilities – how to participate on a leadership board
- Equitable, collaborative, participatory decision-making
- Employer-Worker Collaboratives – what they are and how they work
- Carbon neutrality – what it means, what are CA's goals and how these goals affect our region.
- Climate resilience – strategies to achieve this goal.

27 If desired, please describe any other training opportunities that you or your organization may benefit from.

28 Please provide your best contact email if you would like to receive more information about Redwood Region RISE, and/or want to be included in our directory:

C. Industry Cluster Methodology

Using the NAICS 3-digit classification system, all industries are assessed based on degree of specialization relative to employment levels in California and changes in employment over the past decade as an indicator of employment resilience to secular factors such as automation. A high level of specialization in an industry cluster is a potential indication of export-oriented trade relationships with other regions that bring in wealth into the region. These industries were organized into clusters based on an assessment of supply chain relationships and in consultation with the Redwood Region RISE collaborative expertise.

Figure C.1 below, describes the precise methodology for determining which industries exhibit evidence of specialization and employment resilience. Specialization is evaluated by calculating location quotients (LQ) which calculate the relative level of employment in each industry compared to the same industry statewide.[160] The RRRISE Collaborative thanks Dr. Robert Eyler at Sonoma State University for his feedback on this methodology.

Figure C.1 Criteria for Identification of Specialized and Resilient Industry Clusters

Criterion	Metrics	Rationale
Established foothold and stable data	Employment ≥ 50	Industries with fewer employees have highly unstable estimated labor market statistics leading to spurious calculations. These industries may present opportunities for development, but these data should not be used as evidence to support decision-making.
Positive indication of specialization or increasing specialization	The industry must either be specialized (LQ ≥ 1.25) or approaching specialization (LQ is at least 0.75 and increased by more than 0.1).	An LQ ≥ 1.25 for an industry is an indication of specialization as an exporter and is an indication of potential competitive advantage. An increasing LQ is a sign of increasing specialization which could be an indication of emergent competitive advantage.
Job Stability and Resilience	Non-negative job growth from 2013 to 2019 or non-negative job growth from 2013 to 2022.	The industry must have either had a non-negative job emerging from the Great Recession (2013) to pre-pandemic (2019). Declines in industry employment during this period cannot be attributed to COVID and are more likely to be due to long-term non-cyclical factors that may persist into the future. To account for the possibility that more recent favorable factors are contributing to employment, an industry can alternatively be included if it experienced non-negative job growth from 2013 to 2022 (the most recent data year available).

[160] A location quotient (LQ) calculates the ratio of the percent of the local workforce employed in an industry divided by the percent of state or national workforce employed in an industry. For example, if 0.91% of the local workforce is employed in Animal Production and Aquaculture while only 0.12% of the statewide workforce is employed in that industry, then the LQ for Animal Production and Aquaculture is 0.91%/0.12% ≈ 7.6. This indicates that a much higher concentration of the local workforce is employed in this industry which suggests a high degree of specialization. A high degree of specialization is an indicator of potential comparative advantage.

References

2023 Otis College Report on the Creative Economy. (2023). https://www.otis.edu/sites/default/files/2023%20Otis%20Report%20on%20The%20Creative%20Economy%20-%20pages%20-%20web.pdf

Abinanti, A., Cavaliere, A., Nulph, A., George, B., Lucchesi, A., Madrid, M., Fisher, A., Ruecker, T., Preciado, V., Smith, J., Balandran, G., & Yurok Tribal Court and Sovereign Bodies Institute. (2020). To' Kee Skuy' Soo Ney-Wo-Chek' *I Will See You Again in a Good Way.*

American Clean Power Association. (n.d.). Environmental, Health, and Safety Services. Retrieved from https://cleanpower.org/environmental-health-and-safety/

BARHII. (n.d.). BARHII Framework. https://barhii.org/framework

Bill Text - SB-525 Minimum wages: health care workers. (n.d.). https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240SB525

Blue Lake Rancheria microgrid – Schatz Energy Research Center. (n.d.). https://schatzcenter.org/blrmicrogrid/

Brooks, C. (2023, November 8). *With little employer oversight, ChatGPT usage rates rise among American workers*. business.com. https://www.business.com/technology/chatgpt-usage-workplace-study/

Bull Bennett, T. M., Cochran, P., Cozzetto, K., Gough, R., Lynn, K., Maldonado, J., Maynard, N. G., Voggesser, G., & Wotkyns, S. (n.d.). *Climate Change Impacts in the United States, chapter 12:Indigenous Peoples, Land, and Resources.* https://nca2014.globalchange.gov/downloads/low/NCA3_Full_Report_12_Indigenous_P eoples_LowRes.pdf

Byrne, J. P., Mann, N. C., Mengtao, D. (2019). Association Between Emergency Medical Service Response Time and Motor Vehicle Crash Mortality in the United States. *JAMA Surgery*, 154(4): 286-293. doi:10.1001/jamasurg.2018.5097

CAL FIRE. (n.d.). *2018 Fire Season Incident Archive | CAL FIRE*. https://www.fire.ca.gov/incidents/2018/

CAL FIRE. (n.d.-b). *2020 Fire Season Incident Archive | CAL FIRE.* https://www.fire.ca.gov/incidents/2020/

Cal Poly Humboldt. (2023, June). *Addressing the North Coast's Behavioral Health Worker Shortage*. https://drive.google.com/file/d/1NoigoFTO64pw5gDgiINS_jUaJjaKz5qb/view

California Department of Food and Agriculture. (n.d.). *CDFA - County - County Crop reports*. https://www.cdfa.ca.gov/exec/county/CountyCropReports.html

California Department of Public Health. (n.d.). *California Overdose Surveillance Dashboard* [Data Dashboard]. https://skylab.cdph.ca.gov/ODdash/?tab=CA

California EDD. (n.d). *California LaborMarketInfo, The economy.* https://labormarketinfo.edd.ca.gov/cgi/databrowsing/localAreaProfileQSResults.asp?selectedarea=Lake+County&selectedindex=17&menuChoice=localareapro&state=true&geogArea=0604000033&countyName=&submit1=View+Local+Area+Profile

California EDD, Labor Market Information Division. (n.d). *Redwood Coast Targets of Opportunity Report 2004-2014.* https://acac.humboldt.edu/sites/default/files/Targets%20of%20Opportunity%20%20Repo rt.pdf

California Energy Commission, California Natural Resources Agency, & OPR. (n.d.). *California's Fourth Climate Change Assessment: North Coast Region Report.* https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018- 001_NorthCoast_ADA.pdf

California Health Interview Survey (CHIS). CHIS 2021-2022 Public Use Files. UCLA Center for Health Policy Research. https://healthpolicy.ucla.edu/our-work/california-health-interview-survey-chis/access-chis-data

California Jobs First: Equity indicators for the Redwood Coast region. (2024). In *National Equity Atlas* [Report].

California Office of Environmental Health Hazard Assessment. (2023). CalEnviroScreen 4.0. [Data Dashboard]. https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

California Office of Traffic Safety. (2023). OTS Crashing Rankings Result. [Data Set]. https://www.ots.ca.gov/media-and-research/crash-rankings-results/?wpv_view_count=1327&wpv-wpcf-year=2020&wpv-wpcf-city_county=Lassen+County&wpv_filter_submit=Submit

California, S. O. (n.d.-a). *ALRB | The California Agricultural Labor Relations Board.* https://www.alrb.ca.gov/

California, S. O. (n.d.-b). *Cal/OSHA - Division of Occupational Safety and Health - home page*. https://www.dir.ca.gov/dosh/

California, S. O. (n.d.-c). *E-6. Population Estimates and Components of Change by County — July 1, 2020-2023 | Department of Finance*. https://dof.ca.gov/forecasting/demographics/estimates/e-6/#:~:text=California's%20population%20declined%20by%2037%2C200,the%20California%20Department%20of%20Finance.

California, S. O. (n.d.-d). *Worker health and safety in wildfire regions.* https://www.dir.ca.gov/dosh/Worker-Health-and-Safety-in-Wildfire-Regions.html

California State Parks. (n.d). *History.* https://www.parks.ca.gov/?page_id=29403

California Department of Education. (n.d.). *2021-22 Teaching Assignment Monitoring Outcomes by Full-Time Equivalent (FTE)*. https://dq.cde.ca.gov/dataquest/DQCensus/TchAssgnOutcome.aspx?cds=00&agglevel=state&year=2021-22&initrow=Subj&ro=y

Cal/OSHA. (n.d.). Retrieved from https://www.dir.ca.gov/dosh/

California Agricultural Labor Relations Board. (n.d.). Retrieved from https://www.alrb.ca.gov/

California Coastal Commission: Sea Level Rise Policy Guidance. California Coastal Commission. (2024). https://www.coastal.ca.gov/climate/slrguidance.html

California Department of Industrial Relations. (n.d.). Retrieved from https://www.dir.ca.gov/

California Department of Public Health. (n.d.). Retrieved from https://www.cdph.ca.gov/

California's commercial dungeness crab fishing season further delayed. (2023, December 23). *Del Norte Triplicate*. https://www.triplicate.com/news/californias-commercial-dungeness-crab-fishing-season-further-delayed/article_6ee76f40-9f60-11ee-90cc-5be3efe19680.html

Caltrans. (2021). *Active Transportation Plan District 1.* https://drive.google.com/file/d/1X7P3KwRvBaNZo4vpapFkpaCzPpysLAy7/view

Carah, J., Howard, J. K., Thompson, S., Gianotti, A. G. S., Bauer, S., Carlson, S. M., Dralle, D., Gabriel, M. W., Hulette, L. L., Johnson, B. J., Knight, C. A., Kupferberg, S. J., Martin, S. L., Naylor, R. L., & Power, M. E. (2015). High time for conservation: Adding the environment to the debate on marijuana liberalization. *BioScience*, 65(8), pp. 822–829. https://academic.oup.com/bioscience/article/65/8/822/240374

Carnwath, J. (2022). *Equity Challenges in California's Arts Ecosystem*.

Carr, B. G., Hiestand, B., Holland, T., Mell, H. K., Mumma, S. N., Stopyra, J. (2017). Emergency Medical Services Response Times in Rural, Suburban, and Urban Areas. *JAMA Surgery*, 152(10): 983-984. doi: 10.1001/jamasurg.2017.2230

CDFW News | CDFW Closes Commercial Dungeness Crab Fishery and Restricts Recreational Crab Traps in the Central Management Area, Limits Commercial Fishing to inside 30-Fathoms in Northern Management Area to Protect Whales from Entanglement. (n.d.). https://wildlife.ca.gov/News/Archive/cdfw-closes-commercial-dungeness-crab-fishery-and-restricts-recreational-crab-traps-in-the-central-management-area-limits-commercial-fishing-to-inside-30-f#gsc.tab=0

Census of Agriculture - 2022 Census Publications - State and county profiles - California. (n.d.). https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/California/index.php

Centers for Disease Control and Prevention (CDC). (2022). Heart Disease and Stroke. National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). https://www.cdc.gov/chronicdisease/resources/publications/factsheets/heart-disease-stroke.htm#:~:text=Leading%20risk%20factors%20for%20heart,unhealthy%20diet%2C%20and%20physical%20inactivity.

Centers for Disease Control and Prevention. (2023, April). *Suicide Mortality in the United States, 2001-2021.* https://www.cdc.gov/nchs/products/databriefs/db464.htm#Key_finding

Chan, V. W.-S., Tan, W. S., Asif, A., Ng, A., Gbolahan, O., Dinneen, E., To, W., Kadhim, H., Premchand, M., Burton, O., Koe, J. S.-E., Wang, N., Leow, J. J., Giannarini, G., Vasdev, N., Shariat, S. F., Enikeev, D., Ng, C. F., & Teoh, J. Y.-C. (2021). Effects of delayed radical prostatectomy and active surveillance on localised prostate cancer—a systematic review and meta-analysis. *Cancers*, *13*(13), 3274. https://doi.org/10.3390/cancers13133274

City of Eureka Coastal Land Use Plan. City of Eureka. (2023). https://www.eurekaca.gov/867/Local-Coastal-Program-LCP-Update

Collins, S. E. (2016). Associations Between Socioeconomic Factors and Alcohol Outcomes. Alcohol Research, 38(1): 83-94. PMID: 27159815; PMCID: PMC4872618.

County Health Rankings and Roadmaps. (2023). 2023 Measures. University of Wisconsin Population Health Institute, School of Medicine and Public Health. https://www.countyhealthrankings.org/explore-health-rankings/county-health-rankings-measures

County of Humboldt, Department of Health and Human Services. (2019). *Humboldt County unintentional injury mortality data report, 2005-2018,*. https://humboldtgov.org/DocumentCenter/View/82838/Humboldt-County-Unintentional-Injury-Mortality-Data-Report-2005-2018-PDF

COVID-19's Pandemic's Impact on the Arts: Research Update May 12, 2022. (2022, May 12). Americans for the Arts. https://www.americansforthearts.org/node/103614

Credentials granted by Academic Year. (n.d.). https://pine.humboldt.edu/anstud/cgi-bin/filter.pl?relevant=degreesallopts_cred_C.out

Crescent City Harbor: Coastal Land Use Plan. Crescent City Harbor District. (2020). https://www.ccharbor.com/files/ec88774cc/CC+Harbor+Area+LUP_Updated+5.28.20_clean.pdf

Cuellar Mejia, M., Rodriguez, O., & Johnson, H. (2016). *Preparing students for success in California's community colleges*. https://www.ppic.org/wp-content/uploads/content/pubs/report/R_1116MMR.pdf

Dean Runyan Associates. (2023). *The Economic Impact of Travel in California*.

Del Norte County Historical Society. (2021, August 6). *Del Norte History, More Precious than Gold.* https://delnortehistory.org/

Del Norte County Historical Society. (2021b, August 6). *Del Norte History, Del Norte's Economic History*. https://delnortehistory.org/del-nortes-economic-history/

Department of Cannabis Control - State of California. (n.d.). *Monthly Sales Summary Report. Department of Cannabis Control.* https://cannabis.ca.gov/resources/data-dashboard/daily-sales-customer-type-item-category-report/

Department of Cannabis Control - State of California. (n.d.-a). *Harvest Report*. Department of Cannabis Control. https://cannabis.ca.gov/resources/data-dashboard/harvest-report/

Department of Public Health. (n.d.). *Commercial shellfish growing areas*. https://www.cdph.ca.gov/Programs/CEH/DRSEM/Pages/EMB/Shellfish/Commercial-Shellfish-Growing-Areas.aspx

Donahue, R., Parilla, J., & McDearman, B. (2018, July). *Rethinking Cluster Initiatives.* Metropolitan Policy Program at Brookings. https://www.brookings.edu/wpcontent/uploads/2018/07/201807_Brookings-Metro_Rethinking-Clusters-Initiatives_Full-reportfinal.pdf

Dumont, A. (2024, January 19). *Changes in the U.S. economy and Rural-Urban employment disparities*. https://www.federalreserve.gov/econres/notes/feds-notes/changes-in-the-us-economy-and-rural-urban-employment-disparities-20240119.html

Economic impact. (n.d.). https://industry.visitcalifornia.com/research/economic-impact?sort=region®ion=North%20Coast

Education — ERRP. (n.d.). ERRP. https://www.eelriverrecovery.org/education

Education - Redwood National and State Parks (U.S. National Park Service). (n.d.). https://www.nps.gov/redw/learn/education/index.htm

Environmental Department | Yurok Tribe. (n.d.). Yurok Tribe. https://www.yuroktribe.org/environmental-department

Environmental Science & Management. (n.d.). https://environment.humboldt.edu/

EPIC: Environmental Protection Information Center. (n.d.). EPIC Website. https://www.wildcalifornia.org/

Elizabeth. (2016, November 14). *Two California forestry bills passed*. National Agricultural Law Center. https://nationalaglawcenter.org/two-california-forestry-bills-passed/

Experience. (n.d.). https://experience.arcgis.com/experience/ed5953d89038431dbf4f22ab9abfe40d/page/Indicators/?views=Children%E2%80%99s-Lead-Risk-from-Housing

Fair Access to Insurance Requirements (FAIR) plans. (n.d.). https://content.naic.org/ciprtopics/fair-access-insurance-requirements-fair-plans

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine*, *14*(4), 245–258. https://www.sciencedirect.com/science/article/pii/S0749379798000178

Fire Adapted Communities Learning Network. (2021, March 31). *Middletown Art Center: a community hub for wildfire recovery*. https://fireadaptednetwork.org/middletown-art-center-community-hub-wildfire-recovery/

Fisheries, N. (n.d.). *California Dungeness Crab Pot Fishery - MMPA list of fisheries*. NOAA. https://www.fisheries.noaa.gov/national/marine-mammal-protection/california-dungeness-crab-pot-fishery-mmpa-list-fisheries#:~:text=The%20fishery%20is%20divided%20into,can%20continue%20until%20July%2015.

Foreign Agricultural Service & U.S. DEPARTMENT OF AGRICULTURE. (2022). *Ukraine Agricultural Production and Exports (2021/22 Marketing Year)* [Report]. https://www.fas.usda.gov/sites/default/files/2022-04/Ukraine-Factsheet-April2022.pdf

Freedman, A., Garmisa-Calinsky, S., Chan, J., Lua, V., & Nwobilar, N. (2019, June). County of Del Norte Community Health Assessment. https://delnortecalfresh.org/wp-content/uploads/Del_Norte_HHS_CHA_Report_20190724_Final.pdf

Gramlich, J. (2023, April 26). What the data says about gun deaths in the U.S. *Pew Research Center*. https://www.pewresearch.org/short-reads/2023/04/26/what-the-data-says-about-gun-deaths-in-the-u-s/

Hackett, S., Anderson, J., Humboldt State University, & Schatz Energy Research Center. (2020). California North Coast Offshore Wind Studies. In M. Severy, Z. Alva, G. Chapman, M. Cheli, T. Garcia, C. Ortega, N. Salas, A. Younes, & J. Zoellick (Eds.), *California North Coast Offshore Wind Studies*. Schatz Energy Research Center. https://schatzcenter.org/pubs/2020-OSW-R10.pdf

Hanna, T. P., King, W. D., Thibodeau, S., Jalink, M., Paulin, G. A., Harvey-Jones, E., O'Sullivan, D. E., Booth, C. M., Sullivan, R., & Aggarwal, A. (2020). Mortality due to cancer treatment delay: systematic review and meta-analysis. *BMJ*, m4087. https://doi.org/10.1136/bmj.m4087

Hatzius, J., Briggs, J., Kodnani, D., Pierdomenico, G., & Goldman Sachs & Co. LLC. (2023). *The potentially large effects of artificial intelligence on economic growth* (By Goldman Sachs Co. LLC). https://www.key4biz.it/wp-content/uploads/2023/03/Global-Economics-Analyst_-The-Potentially-Large-Effects-of-Artificial-Intelligence-on-Economic-Growth-Briggs_Kodnani.pdf

Health Resources and Service Administration. (n.d.). *Data Downloads: Shortage Areas* [Data Set]. U.S. Department of Health and Human Services. https://data.hrsa.gov/data/download

Healthy People 2030. (n.d.). Education Access and Quality. Office of Disease Prevention and Health Promotion. U.S. Department of Health and Human Services. https://health.gov/healthypeople/objectives-and-data/browse-objectives/education-access-and-quality

Healthy People 2030. (n.d.). Environmental Health. U.S. Department of Health and Human Services. https://health.gov/healthypeople/objectives-and-data/browse-objectives/environmental-health#cit2

Healthy People 2030. (n.d.). Poverty. Office of Disease Prevention and Health Promotion. U.S. Department of Health and Human Services. https://health.gov/healthypeople/priority-areas/social-determinants-health/literature-summaries/poverty

Healthy People 2030. (n.d.). *Social Determinants of Health*. Office of Disease Prevention and Health Promotion. U.S. Department of Health and Human Services. https://health.gov/healthypeople/priority-areas/social-determinants-health

High-Need Subject Areas. (n.d.). Teach California. https://www.teachcalifornia.org/Home/Shortage

History | NEC. (n.d.). https://www.yournec.org/mission-history/

Hoopa Valley Land Management | Tribal EPA/Realty. (n.d.). http://www.hoopatepa.org/

HUD.gov / U.S. Department of Housing and Urban Development (HUD). (n.d.). HUD.gov / U.S. Department of Housing And Urban Development (HUD). https://www.hud.gov/

Humboldt Bay Area Plan. Humboldt Planning and Building. (2022). https://humboldtgov.org/1678/Local-Coastal-Plan-Update

Humboldt County, California. (2017, October 23). *Humboldt County General Plan, chapter 9*. https://humboldtgov.org/DocumentCenter/View/61985/Chapter-9-EconomicDevelopment-Element-PDF

Humboldt County Historical Society. (n.d.). *A Brief History of Humboldt County.* https://www.humboldthistory.org/a-brief-history

IMPLAN. (2020, December 17). *Government-Administrative Government versus Government Enterprises.* https://support.implan.com/hc/en-us/articles/115009505787-Special-Industries-forEmploymentData#:~:text=%22Administrative%22%20or%20%22general%22,similar%20to%20those%20of %20industries

Jaeger, K. (2024, February 21). *California regulators unveil new marijuana dashboard with data on sales, pricing, licensing and harvests - Marijuana Moment.* Marijuana Moment. https://www.marijuanamoment.net/california-regulators-unveil-new-marijuana-dashboard-with-data-on-sales-pricing-licensing-and-harvests/

Jerrett, M., Jina, A., & Marlier, M. E. (2022). Up in smoke: California's greenhouse gas reductions could be wiped out by 2020 wildfires. *Environmental Pollution, 310, 119888.* https://doi.org/10.1016/j.envpol.2022.119888

Karlamangla, S. (2024, March 15). *How a Tiny Arts Center Is Helping a Rural County Heal After Wildfires*. nytimes.com. https://www.nytimes.com/2024/03/15/us/lake-county-california-art-center.html

KidsData. (2023). https://www.kidsdata.org/

Kirsch, S. (2023). *California's Redwood Region: Exploring the Roots of Health Disparities.* California Center for Rural Policy at Cal Poly Humboldt.

Lake County, California. (2020, December 2). *The history of Lake County California. Lake County.* https://lakecounty.com/explore/history-of-lake-county-california/

Lake County, California. (2022, November 11). *The history of Lake County's Mineral Springs - Lake County*. Lake County. https://lakecounty.com/blog/history-of-lake-countys-mineralsprings/

Lake County Farmers' Finest. (n.d.). http://www.lakecountyfarmersfinest.org/

Lake County Cannabis Equity Assessment. (2020). In *California Center for Rural Policy (CCRP) and the Humboldt Institute for Interdisciplinary Marijuana Research (HIIMR) at Humboldt State University*. https://ccrp.humboldt.edu/sites/default/files/final_lake_county_cannabis_equity_assessment.pdf

Little Hoover Commission. (2022). *Issue Brief: Using Data Tools to Compare Regional Economic Well-Being in California.*

Medical Board of California. (n.d.). *Medical Board of California*. https://www.mbc.ca.gov/FAQs/?cat=Licensees&topic=Supervising%20Physician%20Assistants#:~:text=Are%20physician%20assistants%20allowed%20to,PA%20in%20the%20practice%20agreement.

Medium- and Heavy-Duty Diesel Regulations | California Air Resources Board. (n.d.). https://ww2.arb.ca.gov/our-work/programs/truckstop-resources/truckstop/medium-and-heavy-duty-diesel-regulations

MFDE: Custom queries. (n.d.). https://wildlife.ca.gov/Conservation/Marine/Data-Management-Research/MFDE/Custom-Queries

Moskowitz, P. (2017, September 11). *What Role Do Artists Play in Gentrification*. https://www.artsy.net/article/artsy-editorial-role-artists-play-gentrification

Mozingo, J. (2019, June 12). The world's largest pot farms, and how Santa Barbara opened the door - Los Angeles Times. *Los Angeles Times*. https://www.latimes.com/local/california/la-me-santa-barbara-pot-grows-20190612-htmlstory.html

Natural resources. (n.d.). https://www.karuk.us/index.php/departments/natural-resources

North American Industry Classification System (NAICS) U.S. Census Bureau. (n.d.). https://www.census.gov/naics/?input=81&chart=2022&details=81

North Coast Resource Partnership. (2018). *Healthy Watersheds, Vital Communities, Thriving Economies: Actionable Strategies for California's North Coast Region*. https://northcoastresourcepartnership.org/site/assets/uploads/2018/06/NCRP_Report_Greenprint_v3.pdf

Occupational Employment and Wage Statistics. (n.d.). U.S. Bureau of Labor Statistics. https://www.bls.gov/oes/current/oes499081.htm#(3)

Organisation for Economic Co-operation and Development. (2016). Displaced workers. https://www.oecd.org/employment/displaced-workers.htm

Our story | Humboldt Sawmill. (n.d.). https://www.mendoco.com/our-story

Parks, C. S. (n.d.). *California State Parks*. CA State Parks. https://www.parks.ca.gov/?page_id=23308

Penalties for not following labor laws. (2022). In *Labor Enforcement Task Force*. https://www.dir.ca.gov/letf/Agriculture_Employer_Brochure.pdf

Pomeroy, C., Thomson, C., & Stevens, M. (2010). *California's North Coast Fishing Communities Historical Perspective and Recent Trends*. Scripps Institution of Oceanography, University of California San Diego.

Porter, M. (1998). *Clusters and the New Economics of Competition - Article - Faculty & Research.* Harvard Business School. https://www.hbs.edu/faculty/Pages/item.aspx?num=46852

Professional, C. C. M. (n.d.). *Nurse practitioner*. Cleveland Clinic. https://my.clevelandclinic.org/health/articles/24651-nurse-practitioner

Proposition 64: The Adult Use of Marijuana Act - criminal_justice_prop-64. (n.d.). https://www.courts.ca.gov/prop64.htm

Registered nurse shortage areas in California - Registered nurse shortage areas - California Health and Human Services Open Data Portal. (n.d.). https://data.chhs.ca.gov/dataset/registered-nurse-shortage-areas-in-california/resource/73f4c56c-ba4f-4cb7-bb69-b0727a0f5a50

Richmond, L., Fisher, W., Smith, W., Hackett, S., Tyburczy, J., Humboldt State University, & California Sea Grant. (2018). *Humboldt Bay Shellfish Mariculture Business Survey: Assessing economic conditions and impact*. https://repository.library.noaa.gov/view/noaa/40848/noaa_40848_DS1.pdf

Ritchie, H., & Roser, M. (2024, February 2). *Is organic really better for the environment than conventional agriculture?* Our World in Data. https://ourworldindata.org/is-organic-agriculture-better-for-the-environment

Schatz Energy Research Center, Quanta Technology, Inc., National Renewable Energy Laboratory, H. T. Harvey & Associates, Mott MacDonald, Conaway Geomatics, Zoellick, J., Adams, G., Mustafa, A., Cooperman, A., Anilkumar, R., Duffy, P., Sparks, A., Kramer, S., Trush, S., Bernstein, S., Butler, C., Porter, A., Herath, A., . . . Jacobson, A. (2024). *Northern California and Southern Oregon Offshore Wind Transmission Study: Revised* (Vol. 1). Schatz Energy Research Center. https://schatzcenter.org/pubs/2023-OSW-R2.pdf

Schroeder, S. A. (2007). We can do better — improving the health of the American people. *New England Journal of Medicine/the New England Journal of Medicine*, *357*(12), 1221–1228. https://doi.org/10.1056/nejmsa073350

Schroyer, J. (2024, April 26). *Humboldt County officials report on 'overall decline' of local cannabis industry*. Green Market Report. https://www.greenmarketreport.com/humboldt-county-officials-report-on-overall-decline-of-local-cannabis-industry/

Sierra Business Council. (2023). *Climate & Environment, pp. 20-21.* https://docs.google.com/document/d/1rolDfzYr3LabMFOerVpVB51tO3kzS96qYWTnrBiCTc/edit#heading=h.kth08cue12ai

Stats Report Viewer. (n.d.). https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=REDW

Stenger, R. (2018, May 7). Humboldt Tourism Industry Tops $440M. *Visit Redwoods.* https://www.visitredwoods.com/articles/post/humboldt-tourism-industry-record-impact/

Stone, M., California Department of Insurance, California Forestry Association, & Karuk Tribe. (2021). SB 332. In *ASSEMBLY COMMITTEE ON JUDICIARY* [Report]. https://trackbill.com/s3/bills/CA/2021/SB/332/analyses/assembly-judiciary.pdf

Submitted. (2022, September 13). Visit Mendocino County reports on 2021/2022 fiscal year. *The Ukiah Daily Journal.* https://www.ukiahdailyjournal.com/2022/09/13/visit-mendocinocounty-reports-on-2021-2022-fiscal-year/

Symptoms Matter—Leading Causes of Disability. (n.d.). NCCIH. https://www.nccih.nih.gov/about/symptoms-matterleading-causes-of-disability#:~:text=In%20the%20United%20States%2C%20pain,lived%20with%20disability%20(YLD)

Teaching AMO Definitions. (n.d.). California Department of Education. https://www.cde.ca.gov/ds/ad/tamoinfo.asp#amodefinitions

The redwoods of Coast and Sierra. (n.d.). https://www.nps.gov/parkhistory/online_books/shirley/sec6.htm

ThinkPlace. (n.d.) Redwood region rise: Working toward a future where everyone can thrive. https://drive.google.com/file/d/1IfG1KbPJ95czPFfKxFaCII1wCYY_S-4h/view?usp=sharing

Tolbert, C. M., Mencken, F. C., Riggs, T. L., & Li, J. (2014). Restructuring of the financial industry: The disappearance of locally owned traditional financial services in rural America. *Rural Sociology, 79(3),* 355–379. https://doi.org/10.1111/ruso.12037

Toma Resilience Campus. (n.d.). Blue Lake Rancheria Tribal Education Agency. https://www.tea.bluelakerancheria-nsn.gov/tea/toma/

UCLA, Native Nations Law & Policy Center. (2022, September). *Tribal Broadband.* https://law.ucla.edu/sites/default/files/PDFs/Native_Nations/245939%20UCLA%20Law %20publications%20broadband_R4.pdf

U.S. Census Bureau. (n.d.). *Explore Census data.* https://data.census.gov/profile?g=040XX00US06

U.S. Census Bureau, 2022

U.S. Census Bureau, 2024

USDA - National Agricultural Statistics Service - Census of Agriculture. (n.d.). https://www.nass.usda.gov/AgCensus/

University of Oxford. (2019). *The Boom and the Busts*: *Mendocino County's Agricultural Revolution*. https://globalcapitalism.history.ox.ac.uk/files/case08-theboomandthebustspdf

United States Environmental Agency. (2023). Wildland Fire Research: Health Effects Research. https://www.epa.gov/air-research/wildland-fire-research-health-effects-research

U.S. Surgeon General. (2023). *Our Epidemic of Loneliness and Isolation*: *The U.S. Surgeon General's Advisory on the Healing Effects of Social Connection and Community*. https://www.hhs.gov/sites/default/files/surgeon-general-social-connection-advisory.pdf

Waldorf, B., Kim, A. (2018). The Index of Relative Rurality (IRR) : US County Data for 2000 and 2010. Purdue University Research Repository. doi:10.4231/R7959FS8

WEP:wine economics and policy:12, 1, 2023. (2023). Firenze University Press - Torrossa. https://www.torrossa.com/en/resources/an/5562986#

Yang, J. R., Briggs, A., Shakesprere, J., Spievack, N., Spaulding, S., Brown, K. S., & Urban Institute. (2021). *Arts Workers in California*: *Creating a more inclusive social contract to meet arts workers' and other independent contractors' needs* [Research report]. https://www.urban.org/sites/default/files/publication/103496/arts-workers-in-california_0_0.pdf

Yurok Tribe Comprehensive Economic Development (CEDS) and Tourism Investment Strategies. (n.d.). https://planwestpartners.com/yurok-tribe-ceds/