IN-FLUX: ECONOMIC AND COMMUNITY ADAPTATIONS OF FORMER TIMBER MILL-TOWNS IN THE AMERICAN WEST

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A Thesis Presented to

The Faculty of Humboldt State University

In Partial Fulfillment of the Requirements for the Degree

Master of Science in Natural Resources: Forestry, Watershed, and Wildland Sciences

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July 2021

ABSTRACT

IN-FLUX: ECONOMIC AND COMMUNITY ADAPTATIONS OF FORMER TIMBER MILL-TOWNS IN THE AMERICAN WEST

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Once built around natural resource extractive industries, rural communities' economies are changing as the United States is transitioning away from its industrial past. While much research has focused on rural economic shifts from natural resource production toward amenity-driven economies (Morzillo et al., 2015; Winkler et al, 2007), less research has explored the economic and demographic trends in areas pursuing new modes of production. This two-part study focuses on an understudied region with historic ties to timber in dry mixed-conifer forests, much of which are under federal land management. With few natural amenity draws, the region has largely maintained production-based sectors. Chapter One spatially maps an economic and demographic inventory of 24 northeastern California and eastern Oregon counties, then provides an interpretive framework to characterize production transitions across counties. This analysis helps clarify how the intersection of geographic location and landownership are associated with the continuation of natural resource sectors, or the pursuit of new modes of production. Chapter Two is comprised of two case studies in two former timber mill towns, both with U.S. Forest Service supervisor offices, that had pursued different economic paths, one with data centers (Prineville, Oregon) and the other with prisons (Susanville, California).

These cases engage residents through 37 semi-structured interviews to document each community's post-mill transition, community well-being, governance, economic strengths and weaknesses, and linkages to the remnant timber industry and public lands. Prineville's data centers provided new economic opportunity, though were divergent from the town's historic economic and community identity, which was rooted in timber and ranching. The city and county government worked closely together and with public land management agencies through formal collaboratives that focused on economic and ecosystem benefits. Susanville's early turn to a prison sector offered few economic prospects and has had unanticipated negative impacts on community well-being. The city and county governments work with public land management agencies separately, relying on non-governmental organizations to pursue restoration, conservation, and economic opportunities. This study contributes to the small pool of literature on production as an economic transition and provides contextual insight into economic transitions and natural resource governance within the American West.

ACKNOWLEDGEMENTS

First off, I would like to express my gratitude to my advisor, Dr. Erin C. Kelly, for the opportunity to take on this project, for your guidance, encouragement, and patience. I am so grateful to have worked with you throughout this process. To my committee members, Dr. Mark Adams and Dr. Laurie Richmond, thank you for your direction, insights, and expertise. Hailee N., you are the best research partner I could have imagined – thank you for keeping me motivated and for the many times I proposed an idea and you simply replied, "Um, no". This project would not have been possible without the generous participation of the residents in Prineville and Susanville that shared their experience and perspectives with us – thank you. In the past when I saw acknowledgements where students thanked family and partners, I always wondered what they were doing – now I know. To my partner, Jonathan, thank you for your support in everything from snacks (so many snacks) to helping with transcriptions to encouraging me to take a break, or to keep working.

Funding for this project was supported by the Humboldt State University Trione Graduate Scholarship, established by Henry Trione.

TABLE OF CONTENTS

ABSTRACT ii

ACKNOWLEDGEMENTS iv

TABLE OF CONTENTS v

LIST OF TABLES viii

LIST OF FIGURES x

INTRODUCTION 1

CHAPTER I: SOMEWHERE IN THE MIDDLE: POST-INDUSTRIAL ADAPTATIONS IN A NEW AMERICAN WEST INTRODUCTION 4

Rural Adaptation and Economic Transitions 7

Factors for Economic Transitions 7

Ever Adapting Tribal Nations 12

Demographic Trends: Who Leaves, Who Stays, and Who Moves In 14

The West and Public Land Policy 16

Economic Effects of the NWFP 17

Uneven Effects and Community Adaptation Following the NWFP 18

METHODS 21

Data 21

Location Quotients and Spatial Analysis 25

Expanding the Production Typology 27

RESULTS 28

Regional Trends 28

Demographic Trends 30

Economic Trends 36

Socioeconomic Well-Being 46

Characterizing Eastside Counties 49

Heritage Production 52

Heritage Production + Public Administration..... 53

Diversified Production 54

Amenity..... 55

Signs of Economic & Population Decline 56

DISCUSSION 57

Production Counties: Implications for Resource Base and Social Adaptability 58

Heritage Production: Manufacturing Sector, Private Land, and Racial Diversification 59

Heritage Production + Public Administration: Natural Resource Sectors and Federal Land 61

Diversified Production 62

NWFP: Compare and Contrasting Relationships to Federally Managed Lands 65

CONCLUSIONS..... 70

CHAPTER II: COMMUNITY-LEVEL ADAPTATION IN TWO NEXT WEST PRODUCTION TOWNS INTRODUCTION 71

Adjacent Communities in an Era of Forest Resilience and Health: Community-Level Response and Adaptation..... 73

Case Study Context: Former Timber Towns in an Era of Forest Health and Resilience 80

METHODS 82

Pilot Interviews: Clarifying Community Objectives 82

Adjusting the Project: Ranching and Timber Overlap..... 84

Interviews 85
RESULTS 87
Prineville 88
Community Collaboration and Leadership: Community, Economies, Federal Lands 92
The Cloud on the Hill: Big Tech in Prineville 95
Timber Was King: Timber and Secondary Wood Products 98
"This is a different game now": The Future of Timber in Prineville 100
In a Sea of Public Lands: Prineville's Ties to Federally Managed Lands 101
Susanville 107
We Are a Prison Town Now 113
From Mill Town to Prison Town: Community Identity, Unity, and Leadership 116
Community Ties to Federal Lands 123
DISCUSSION 132
Adapting Governance: Organizational Structure and Leadership 134
Community Adaptation: Unanticipated Outcomes on Capacity and Cohesion 138
Newcomers: Belonging or Residing? 140
Ties to Heritage Economies and Federal Lands: Maintaining Economic Presence and Community Relevance 141
CONCLUSION 148
REFERENCES 149
APPENDIX 164

LIST OF TABLES

Table 1 Supersectors from the Bureau of Labor Statistics. Public administration includes wages from law enforcement, national defense, environmental review, and tribal governments. 23

Table 2 *Heritage production* counties have manufacturing, and natural resource sectors rooted in traditional natural resource industries. For a table with all counties, see Table 15 in the appendix. 52

Table 3 *Heritage production + public administration* counties have industries rooted in traditional natural resource sectors and have a high proportion of wages from public administration. Public administration wages may be from local, state, federal or tribal governments. For a table with all counties, see Table 15 in the appendix 53

Table 4 *Diversified production* counties are blending traditional natural resource industries with new economic sectors, including amenity-driven sectors. Some *diversified production* counties had mixed trends characteristic of *heritage production* and *heritage production + public administration*. For a table with all counties, see Table 15 in the appendix. 55

Table 5 Amenity-driven counties were using local and nearby natural resources to draw in recreation tourism and amenity migrants. For a table with all counties, see Table 15 in the appendix. 56

Table 6 Counties indicating decline lost population and total wages. Counties in decline are isolated and are trying to diversify or capitalize on natural resource sectors. Both counties have high proportions of wages coming from USFS and BLM. For a table with all counties, see Table 15 in the appendix. 56

Table 7 Eastside Counties and NWFP counties differences in metropolitan counties establishes differing levels of connectivity. This influences economic transitions. 67

Table 8 Key findings for Chapter One are summarized by Morzillo et al,'s (2015) characteristics, connectivity, resource base, and social adaptability. 69

Table 9 Interviewees are organized by the perception to which they spoke most toward, though many fell into multiple categories. Interviewees are organized broadly to maintain anonymity. 86

Table 10 The interview guide incorporated a series of questions that asked participants what Strengths, Weaknesses, Opportunities, and Threats (SWOT) they observed in their

community. This framework provided a snapshot of interviewees perceptions of Prineville. Responses are organized using Morzillo et al.'s (2015) three factors for transition: connectivity, resource bae, and social adaptability. 89

Table 11 The interview guide incorporated a series of questions that asked participants what Strengths, Weaknesses, Opportunities, and Threats (SWOT) they observed in their community. This framework provided a snapshot of interviewees perceptions of Susanville. Responses are organized using Morzillo et al.'s (2015) three factors for transition: connectivity, resource bae, and social adaptability. 109

Table 12 Local characteristics (Morzillo et al. 2015) of Prineville and Susanville provide a comparison for each community's resource base, connectivity, and social adaptability. 132

Table 13 Regional values and percentages provide context to location quotient values for Eastside Counties. *Values for incarcerated populations have been removed. 164

Table 14 Production Types, adapted from Morzillo et al. (2015) to include three new production types: *diversified production, heritage production,* and heritage *production + public administration.* 166

Table 15 County snapshots were created from a combination of data analysis, typologies, and information collected from each county's economic development plans and websites. 168

LIST OF FIGURES

Figure 1: Eastside County study region of northeastern California and eastern Oregon. Case Study communities were in Susanville, California, and Prineville, Oregon. 3

Figure 2 Eastside case study counties are at the eastern side of Oregon and California and overlap with the eastern border of the Northwest Forest Plan. 6

Figure 3 Economic transitions adapted from Morzillo et al. 2015. Production economies may fall into decline, follow the amenity model, or incorporate new production into local economies**.** 8

Figure 4 County Beale Codes illustrate each county's population and connection to a metropolitan county. 29

Figure 5 **Left:** 54,581,659 total acres (54.6 million acres), 53% of which is federally managed land. Values are from the Headwater's Economics 2016. **Right:** Federal land displayed by location quotient. All values are separated by one standard deviation, with proportionate values within one standard deviation from the mean. (M = 0.96, SD = 0.43) 29

Figure 6 **Left:** Distribution of population in 2016 shown by the percent of the area's population in each county. Values for incarcerated residents in High Desert State Prison (N=7,968) in Lassen County were removed. **Right:** Percent of population change from 1990-2016. Six of the 24 counties experienced population loss while the remaining counties experienced increases in population. All values are separated by one standard deviation, with proportionate values within one standard deviation from the mean. (M = 0.20, SD = 0.30). Values for incarcerated residents in High Desert State Prison (N1990 = 4,198, N2016=7,968) in Lassen County were removed. 33

Figure 7 **Left:** 2016 Census count of residents over 65 years of age represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean (M = 1.00, SD = 0.21). **Right:** Change in the location quotient of residents over 65 years of age between 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.00, SD = 0.18). 34

Figure 8 **Left:** 2016 Census count of residents under 18 years of age represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean. (M = 1.005, SD = 0.18). **Right:** Change in location quotient for residents under 18 years of age from 1990-2016. One standard

deviation separates all values. Values titled “About the Same” are within one standard deviation from the mean. (M = -0.00, SD = 0.12). 34

Figure 9 Percent change in school enrollment from 1990-2016. 35

Figure 10 **Left:** 2016 Census count of residents that identify as Native American, Native Hawaiian, or Alaskan represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean (M=1.05, SD = 0.77). **Right:** Change in location quotient of residents that identify as Native American, Native Hawaiian, or Alaskan. One standard deviation separates all values. Values titled “About the Same” are within one standard deviation from the mean. (M = -0.10, SD = 0.70). 35

Figure 11 **Left:** 2016 Census count of residents that identify as Hispanic represented in area location quotients. Values for incarcerated residents in High Desert State Prison (N= 4,582) in Lassen County have been removed from these values. One standard deviation separates all values; proportionate values are within one standard deviation from the mean (M = 0.89, SD = 0.06). **Right:** Change in location quotient of residents that identify as Hispanic. Values for incarcerated residents in High Desert State Prison (N1990= 1,142, N2016 = 4,582) in Lassen County. One standard deviation separates all values. Values titled “About the Same” are within one standard deviation from the mean. (M = -0.01, SD = 0.29). 36

Figure 12 **Left:** 2016 proportion of the region’s total harvest. **Right:** Change in percentage of total harvest on public land from 1990-2016. One standard deviation separates all values. Values titled “About the Same” are within one standard deviation from the mean. (M = 0.00, SD = 0.03). 41

Figure 13 **Left:** 2016 harvest on USFS and BLM lands represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean. (M = 1.25, SD = 1.11). **Right:** Change in location quotient harvest on USFS and BLM land from 1990-2016. One standard deviation separates all values. Values titled “About the Same” are within one standard deviation from the mean. (M = 0.32, SD = 0.93). 42

Figure 14 **Left:** 2016 harvest on private lands represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean. (M = 0.90, SD = 0.43). **Right:** Change in location quotient harvest on private land from 1990-2016. One standard deviation separates all values. Values titled “About the Same” are within one standard deviation from the mean. (M = -0.20, SD = 0.40). 42

Figure 15 **Left:** 2016 total wages from the Bureau of Labor Statistics as values normalized by county population. **Right:** Percent of change for total wages from 1990-

2016. Decline represents decreases in total wage, all other values are at equal intervals above zero (M = 0.43, SD = 0.55). All values are in 2016$. 43

Figure 16 **Left:** 2016 wages from the Bureau of Labor Statistics manufacturing supersector data represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 1.04, SD = 0.88). **Right:** Change in location quotient for manufacturing sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean (M = -0.02, SD = 0.69). All values are in 2016$..... 43

Figure 17 **Left:** 2016 wages from the Bureau of Labor Statistics natural resources supersector data represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 1.81, SD = 1.37). **Right:** Change in location quotient for natural resources sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.17, SD = 0.89). All values are in 2016$. 44

Figure 18 **Left:** 2016 wages from the Bureau of Labor Statistics leisure and hospitality supersector data represented as location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean. (M = 0.80, SD = -0.36). **Right:** Change in location quotient for leisure and hospitality sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.05, SD = 0.28). All values are in 2016$. 44

Figure 19 **Left:** 2016 wages from the Bureau of Labor Statistics financial supersector data represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 0.65, SD = 0.42). **Right:** Change in location quotient for financial sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.06, SD = 0.29). All values are in 2016$. 45

Figure 20 **Left:** 2016 wages from the Bureau of Labor Statistics public administration supersector data represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 1.29, SD =1.08). **Right**: Change in location quotient for Public Administration sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.02, SD = 0.59). All values are in 2016$. 45

Figure 21 **Left:** 2016 salaries for USFS and BLM employees from the OPM data represented as location quotients using BLS data for each county's total wages. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 3.06, SD =3.37). **Right:** Change in location quotient for USFS and BLM employee salaries from 1990-2016 calculated by each county's total wages. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.84, SD = 1.56). All values are in 2016$..... 46

Figure 22 **Left:** Median Household Income from the 2016 Census represented as grouped values. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 44,606, SD = 6,256). **Right:** Percent of change for Median Household Income from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.03, SD = 0.12). All values are in 2016$. 48

Figure 23 **Left:** Residents in financial poverty from the 2016 Census represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 0.96, SD = 0.17). **Right:** Change in location quotient for residents in financial poverty from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.01, SD = 0.15). All values are in 2016$..... 48

Figure 24 Eastside Counties were organized into seven types based on economic sector*: metropolitan, amenity, diversified production, heritage production, heritage production + public administration,* and *decline*. Lassen County's economy was dominated by the public administration sector. Though not above the mean, the natural resources sector was the second highest proportion of wages evaluated. Therefore, Lassen County was classified as *heritage production + public administration.*..... 50

Figure 25 Production types, adapted from Morzillo et al. (2015) to include three new production types: *diversified production, heritage production,* and *heritage production + public administration*. See Table 13 in the appendix for detailed descriptions..... 51

Figure 26 Community timeline shows events that have contributed to how Susanville and Prineville's economies have transitioned since the 1960s. 87

Figure 27 Prineville's formal governance entities used bonding and bridging social capital to consolidate overlap and collaborate on economic and natural resources. Areas of collaboration are highlighted in red. The City and County worked closely together with each other and federal land management agencies. The Crook County Natural Resources Committee and Ochoco Forest Collaborative, exhibited by the red dotted circle, served as mechanisms to bring natural resource stakeholders together. 135

Figure 28 In Susanville, the Lassen Land and Trails Trust (LLTT) and Lassen County Firesafe Council (LCFSC) lead natural resource issues by creating points of common interest among community members. Points of collaboration are highlighted in red. These organizations shared information with formal city and county governing entities but operate independently, represented by the red dotted lines. The Lassen-Plumas County Trails Committee, exhibited by the dotted cercle, was a formal collaborative that brought the BLM and Lassen County together. 136

Figure 29 Prineville's collaboratives brought heritage industries (forestry and ranching) together with other natural resource stakeholders to incorporate timber and ranching into economic and natural resource planning. Areas of collaboration are highlighted in red. Formal collaboratives, , exhibited by the red dotted circle, served as mechanisms to bring natural resource stakeholders together. 142

Figure 30 Susanville's heritage industries (forestry and ranching) were collaborating with the Lassen Land and Trails Trust (LLTT) and the Lassen County Fire Safe Council (LCFSC) to maintain economic relevance through conservation and restoration. Points of collaboration are highlighted in red. 143

Figure 31 Abrams 2019 describes four types of governance networks based on the collaborative and partnership of local federal land management agencies and adjacent communities. 145

INTRODUCTION

Concurrent with the United States' Department of Agriculture and Department of the Interior movement away from industrial management of federal lands, adjacent cities' and towns' economies, demographics, and community well-being are changing. As communities move away from natural resource extractive industries, researchers have documented three types of transitions: amenity-driven, economic and population decline, or new modes of production (Morzillo et al. 2015). Amenity transition, which is a shift from industrial production to commoditization of natural resources through recreation and tourism, is perhaps the most well-studied transition. Yet not all communities have the resources (natural, built, and social) to follow this transition. Therefore, I selected to focus on a region with historic ties to timber, where many communities undergoing socioeconomic transition, but with relatively few communities undergoing an amenity transition (Figure 1).

This two-part study establishes an economic and demographic inventory of 24 counties in northeastern California and eastern Oregon, then uses economic data to characterize economic transitions and demographic change in a region where production sectors are important economic contributors. Because secondary data are limited in evaluating social nuance, Chapter Two is comprised of two community case studies, Prineville, Oregon and Susanville, California. These towns are not necessarily representative of the region but share striking similarities and differences. Both are former timber-mill towns with substantial federal land management presence, including

USFS forest supervisor offices and BLM district offices. However, the towns provide two distinct case studies to examine economic and social transitions following their shifts toward new industries, and an opportunity to explore the ways that these communities have maintained ties to timber industries and public lands.

Figure 1: Eastside County study region of northeastern California and eastern Oregon. Case Study communities were in Susanville, California, and Prineville, Oregon.

CHAPTER I: SOMEWHERE IN THE MIDDLE: POST-INDUSTRIAL ADAPTATIONS IN A NEW AMERICAN WEST

INTRODUCTION

Once largely dependent on natural resource extractive industries and associated processing facilities, rural communities are transforming as the United States moves away from its industrial past. Communities formerly dependent on natural resource extractive industries, particularly in counties with a high proportion of federally managed lands, have had to re-envision local economies. As communities adapt to external factors, such as changing policy and markets, some are transitioning away from relying on natural resource production by incorporating new economic sectors. As old industries are replaced with new economic pathways, communities' demographics are changing in terms of who stays, who leaves, and who moves in.

Shifts from industrialization to new economies, or lack thereof, have implications that can impact a community's ability to respond and adapt to economic pressures (Donoghue & Haynes, 2002). Community adaptation is the continuous adjustment in response to shifting ecological, political, social, or economic systems (Folke, 2006). Variation in community ability to adapt results in a spectrum of economic and community change, where some communities transition toward new industries and others fall into decline.

While these trends are occurring across the rural United States, the Pacific Northwest offers a case study of expedited pressure on communities to adapt away from

timber-centric economies. The Northwest Forest Plan (NWFP), a federal policy enacted by the U.S. Department of Agriculture and the U.S. Department of the Interior in 1994, shifted federal forest management practices from timber production to ecosystem management. This decision accelerated the transition of forest-based economies in the Pacific Northwest away from timber manufacturing by reducing timber harvests on federal lands (Christensen et al., 1999; Spies et al., 2018). Researchers and federal land managers are asking how impacted rural communities are adapting and in what ways these transitions affect communities' socioeconomic well-being.

It is in this context that I select to analyze how economic and demographic change in twenty-four counties of a predominantly rural region in northeastern California and eastern Oregon, an area that I refer to as Eastside Counties (Figure 2). Geographically, these counties are at the eastern edge of the NWFP. The NWFP has been heavily studied because it was a politically charged, discrete land management action that required socioeconomic monitoring. But NWFP boundaries follow the biological delineation of the Northern Spotted Owl (*Strix occidentalis caurina*), a boundary that intersects counties and national forests and ignores political boundaries. Economic transition, demographic trends, and socioeconomic well-being in Eastside public land counties has not been as thoroughly explored.

Eastside counties' historic ties to timber, land ownership patterns, and natural resources make them a desirable region to examine new production transitions following shifts in the timber industry. These counties are a patchwork of farmlands, forests, and rangelands under private, public, and tribal ownership. The region has a large proportion

of federal land, and many counties have a rich history in natural resource and manufacturing industries, including timber, yet receive less attention than their well-studied western neighbors. These characteristics lead me to ask 1) What are the diverse ways that former timber mill-towns in Eastside Counties are demonstrating community adaptation and well-being? 2) What community ties (social, political, cultural, and economic) remain to timber industries? And 3) What are community ties to federally managed lands in these counties?

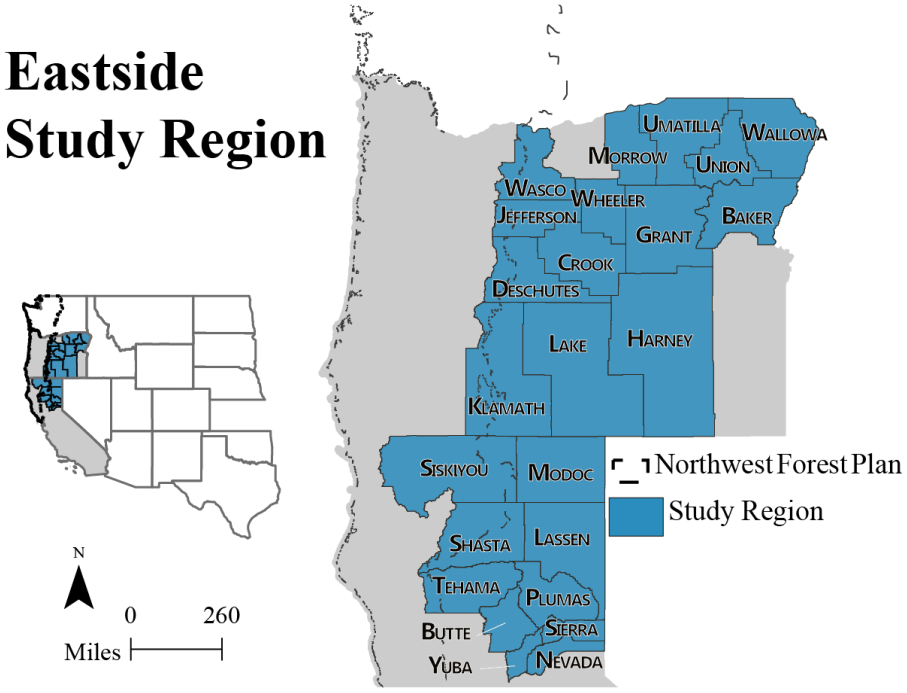

Figure 2 Eastside case study counties are at the eastern side of Oregon and California and overlap with the eastern border of the Northwest Forest Plan.

Rural Adaptation and Economic Transitions

In the economic narrative of rural America, towns were built around natural resource extractive industries (e.g., fishing, mining, forestry, ranching), which were a foundation for rural jobs. As the United States has undergone deindustrialization, industries that used to be central to rural America have seen a decline. In response, communities are pressured to adapt by diversifying or transitioning economically. The outcome is a range of economic strategies that capitalize on natural resources, connectivity to metropolitan centers, and existing industries.

Factors for Economic Transitions

As rural communities respond to economic changes, researchers have found that three variables often predict a community's economic transition: 1) available natural resources, 2) transportation connectivity, and 3) social adaptability (Bowe & Marcouiller, 2007; Charnley et al., 2008; Donoghue, 2003; Morzillo et al. 2015; Rasker et al., 2009). Starting from a natural resource production-based economy, Morzillo et al. (2015) explain how all three factors (connectivity, natural resources, and social adaptability) produce three different economic transitions: amenity, decline, or new production (Figure 3). These three pathways are accompanied by factors that may predict a community's economic transition and may influence demographic trends. According to Morzillo et al. (2015), areas with a high level of connectivity, social adaptability, and natural resources are likely to follow an amenity transition. Communities with natural resources but lacking connectivity or social adaptability are more likely to fall into decline. Those with

social adaptability and natural resources, but low connectivity, are predicted to shift to primary production industries, such as a move from timber to ranching, or carve out new production strategies, such as biofuel.

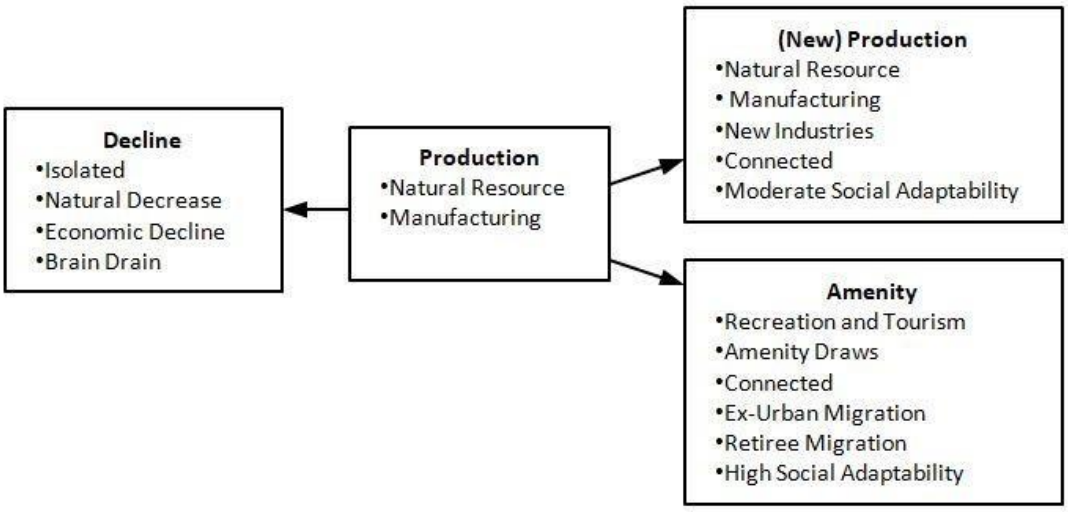

Figure 3 Economic transitions adapted from Morzillo et al. 2015. Production economies may fall into decline, follow the amenity model, or incorporate new production into local economies.

Proximity to natural resources and the types of natural resources drive different types of community transitions. Natural amenities are features of the natural environment and may include shorelines, forests, mountains, lakes, or rivers. Winkler et al. found that public lands considered high in natural amenities, such as National Parks or high elevation National Forest lands, attract amenity-driven economies (Winkler et al., 2007). Communities that are in closer spatial proximity to "shadow" public lands, such as dry, low elevation Bureau of Land Management (BLM) lands are less likely to follow the amenity model (Winkler et al., 2007).

In addition to the types of natural resources, community connectivity can predict economic transitions (Rasker et al., 2009). Connectivity is a community's accessibility to metropolitan areas through airports and major highways, and technological connections, such as fiber optics or access to global markets (Morzillo et al., 2015). Connectivity is important for both amenity and production economies. However, these economic types may emphasize connection to different resources. For communities seeking to capitalize on recreation tourism, connectivity is a critical component, as it brings in seasonal tourism, as well as attracts retirement aged residents and high wage telecommuting professionals relocating from urban areas (Rasker et al., 2009). While connectivity to urban centers is central to amenity-driven adaptation, connectivity and industry access also help maintain manufacturing and natural resource sectors (Bentley-Brymer et al., 2018; Morzillo et al., 2015). This is because greater distance between a harvest site (timber, hay, ranch) and a processing facility (mill, meat processor) drives up costs and viability of natural resource and manufacturing sectors (Bently-Brymer et al., 2018).

The third component, social adaptability, is a combination of human, social, cultural, and economic elements (Doak & Kusel, 1996; Donoghue & Haynes, 2002; Morzillo et al, 2015). Social and economic indicators, also referred to as well-being indicators, measure a community's capacity to adapt (Doak & Kusel, 1996; Morzillo et al., 2015), as well as how well or poorly communities are doing following economic shocks (Charnley et al., 2008; Morzillo et al., 2015). Indicators of a community's social ability may be socioeconomic, such as poverty, income, population changes, and age diversification (Donoghue & Sturtevant, 2007; Folke, 2006; Magis, 2010), or social, such

as social cohesion and civic leadership (Donoghue & Haynes, 2002; Morzillo et al., 2015). The social, human, and economic elements that contribute to social adaptability may increase or decline as communities change, thus improving or impairing a community's ability to adapt (Charnley et al., 2006).

As public lands move away from commodity-based production models, one supposition is that communities will capitalize on surrounding natural resources and public lands to transition toward amenity-based economies, which cater to tourists, retirees, and exurban migrants looking to relocate out of cities (Bowe & Marcouiller, 2007; Charnley et al., 2008; Egan & Luloff, 2000; Winkler et al., 2007). Communities that are following amenity transitions tend to have desirable natural characteristics, moderate climate, or seasonal draws and are connected to urban centers via airports or major highways (Ulrich-Schad & Duncan 2018; Winkler et al., 2007). These communities have growing service sectors and seasonal employment to accommodate tourism (Gosnell & Abrams, 2011). Demographically, these locations attract retirees, seasonal residents, second homeowners, and telecommuting professionals (Nelson & Nelson, 2011).

In addition to growth for the community's population and economy, this transition can bring in low-wage, sometimes seasonal, service sector jobs to support tourism with high-wage professionals or "non-earnings income" visitors and residents (Gosnell & Abrams, 2011; Nelson et al., 2009; Rasker et al., 2009). This process creates a socioeconomic gap and is described as "hollowing out the middle" (Marcouiller et al.,

2004). Alternatively, other researchers have found that the amenity model can reduce income inequality (Deller, 2010; Marcouiller et al., 2004).

In contrast, communities that do not have the capacity to respond to changing economic conditions are suffering from, or at risk of, economic or population decline. Decline can refer to both economic decline and outmigration of residents seeking new jobs and opportunities. Communities at risk for decline are often remote, have "complex topography" that limits transportation, and do not have local ownership or decision-making power over natural resources (Morzillo et al., 2015). They are also less connected, meaning they do not have commercial airports or are distant from major highways (Ulrich-Schad & Duncan, 2018, Winkler et al., 2007).

Between the connected areas that follow the amenity path and the disconnected communities suffering from decline, lies a range of economic production strategies that fall somewhere in the middle (Morzillo et al., 2015). New production may adjust existing natural resource industries. For example, innovative wood products sectors that meet market demands for green energy are bringing new economic opportunities and advanced technology to rural communities (Soloviy et al., 2019). Other communities are moving away from natural resource extractive industries by bringing in alternative industries. Prisons have been considered stable, well-paying, government-backed replacements to towns with declining production (Che, 2005; Cherry & Kunce, 2001). Big Tech data centers are an emerging sector in rural areas (Burrell, 2020; Levenda & Mahmoudi, 2019), and have been likened to modern manufacturing (Pickren, 2017). Another less recognized, but central economic contributor particularly in the West, is tribal

governments and organizations (Morzillo et al., 2015). Each of these strategies fall under Morzillo et al.'s (2015) new production.

Characterizing economic transitions is one useful method for describing rural change. Yet, Robbins et al. (2009) observed that new economies do not necessarily displace older ones, but that they may co-exist in varying degrees. This is particularly true for communities that fall under Morzillo's new production category, where economic strategies may blend old economies with new ones. Morzillo et al. (2015) acknowledged that new production transitions have had little attention to date. By selecting an area with historical ties to production economies, yet with fewer amenity draws, my research helps fill this gap by contributing to the small pool of literature that focuses on economic strategies that are "in the middle."

Ever Adapting Tribal Nations

As the longest-standing residents of the United States, Tribal Nations have had to adapt to external pressures and transitions more times than any other community group. The substantial presence of indigenous peoples is a testament to their endurance through many egregious federal policies, economic ruptures, and demographic transformations. The Euro-American westward expansion has been described as "migratory genocide" (Dunbar-Ortiz, 2014, p. 149) and "wholesale theft" (Deloria, 1988, p. 49). As Euro-American settlers moved across the West, indigenous peoples' livelihoods and very survival were threatened through over-extraction and elimination of resources, and more pointedly threatened through forced removal, violation of treaty agreements, forced

economic-dependence, starvation, and civilian attacks (Dunbar-Ortiz, 2014). Over time, the relationship between Tribes and the United States has vacillated between imposed economic dependence on the federal government to one of economic self-determination through indigenous movements and federal policies (Deloria, 1988, Dunbar-Ortiz, 2014; Vincent et al., 2017). These policies have concentrated indigenous people into small pockets of land, or scattered them away from traditional homelands, effectively creating uneven geographic distribution of indigenous peoples while reducing access to resources. As a result, tribal treaty lands, reservations, and rancherias are clustered throughout current political boundaries, often in rural areas, creating an uneven geographic distribution of indigenous peoples.

Tribal nations have demonstrated continuous adaptation as economic necessity has positioned some indigenous people to join the workforce supporting natural resource industries, or to engage in tribally owned and operated forestry and agriculture (Brown, 2016; Bull, 2019). Tribal governments are taking increasingly active roles in land management, similar to federal land management agencies (Burow et al., 2019; Harris, 2020). However, for tribal entities the management approach may differ from that of federal land managers as “there is no separation of home from homeland” (Erickson, 2014, p. 26).

Shifts away from natural resource jobs have both compounded existing issues from political injustices and highlighted the role that tribal governments and tribal organizations play in some areas. Despite strains on rural economies, in some regions, tribal governments and tribally managed forests have helped retain timber jobs, created

new jobs, and contributed to community development through tribal business, administration, and social and environmental services (Charnley et al., 2006).

Demographic Trends: Who Leaves, Who Stays, and Who Moves In

In the same way that rural communities follow different economic transitions, rural demographics are shifting. Historically, rural areas that have experienced rapid population increase and demographic change have depended primarily on waves of "boomtown" industries, usually natural resource-dependent; or cultural movements, like the back to land movement (Johnson & Lichter, 2012; Johnson & Lichter, 2019). In periods outside of boom economies, population growth has relied on natural increase, meaning there are enough births to replace aging residents (Johnson & Lichter, 2012). Broadly, rural areas are experiencing growing populations of retirees and Hispanic residents, and declining populations of young people.

The outmigration of younger populations reflects economic rupture or lack of opportunity (Carr & Kefalas, 2011; Corbett & Forsey, 2017). It can also foreshadow economic and population decline if young families and educated individuals are leaving more quickly than their same demographic is moving in. *Brain drain* refers to the decrease of young residents that relocate away from their rural hometowns for more opportunities in education and employment (Carr & Kefalas, 2011). *Brain drain* creates a void of able-bodied workforce and families, leaving older residents behind (Johnson & Lichter, 2012). These trends perpetuate natural decrease, where there are more deaths

than births (Carr & Kefalas 2011, Johnson & Lichter, 2012). While outmigration is seen across rural areas, it is most threatening to areas experiencing economic decline.

Retirement aged residents are one of the fastest-growing proportions of residents in rural communities (Glasgow & Brown, 2012, Johnson & Lichter, 2012). In some communities, increases in the proportion of older populations are caused by outmigration of younger age groups, others are a result of in-migration of relocating retirees. In-migration of retirement aged residents is partly responsible for the growing proportion of elderly people in rural areas and this demographic is increasing rapidly in high-amenity areas (Glasgow & Brown, 2012; Johnson & Lichter, 2012; Nelson et al., 2009). Retiree relocation is promoted in some areas as an economic strategy as it creates demand for housing, and brings residents with spending power, who contribute to social adaptability through volunteerism or professional services (Glasgow & Brown, 2012). While retiree resettlement may boost economic growth and promote economic transition, retirement destination areas have been found to have low rates of natural increase (Johnson &Lichter, 2012). Glasgow and Brown (2012) caution that areas depending on retirement relocation are at risk for natural decrease in the future due to low natural increase and the inevitable natural decrease of older populations.

Residents that identify as Hispanic are another rapidly growing demographic in rural communities. This trend is diversifying populations beyond states that have traditionally had higher proportions of Hispanic residents, such as California, Arizona, New Mexico, and Texas (Johnson & Lichter, 2016). While the growth of Hispanic populations is widespread across the rural United States, the population is increasing

more rapidly in areas with manufacturing sectors (Nelson et al., 2009) and existing Hispanic populations (Johnson & Lichter, 2019). Researchers have found that increase of Hispanic residents is a result of in migration (Lichter & Johnson, 2009) and natural increase (Johnson & Lichter, 2016). For some rural areas, increase in Hispanic residents has reversed or neutralized population decline (Carr et al, 2012; Johnson & Lichter, 2016; Nelson et al., 2009).

The West and Public Land Policy

The Pacific Northwest offers a case study of rapid economic change and the relationship between rural economies and federal lands. Forty-six percent of land in the eleven most western states[1] is federal land (Vincent et al., 2017). In the 1990s, management of federal timberlands shifted from a natural resource extractive model to an ecosystem management model (Charnley et al., 2008). Policies such as the Northwest Forest Plan (1994) and the Eastside Screens (1994) reduced harvest volume on federal lands in California and Oregon.[2] These changes shrunk federal and private employment at the harvest, processing, and distribution phases (Christensen et al., 1999; Haggerty 2018). Thus, as federal forests move away from a production model, adjacent communities have had to navigate impacts to timber production economies. Of these

[1] The 11 western states are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
[2] The NWFP reduced harvesting on federal forests in the northern spotted owl habitat. The Eastside Screens are a prohibits cutting trees over 21-inches in diameter in federal forests.

plans, the NWFP stands out as the most influential across California, Oregon, and Washington.

Economic Effects of the NWFP

The anticipation of economic impacts associated with the NWFP influenced the decision to incorporate a socioeconomic element into monitoring requirements. At the time of the enactment of the NWFP, an estimated 25-percent of timber in the NWFP's area came from federal forests (Charnley et al, 2006). Socioeconomic monitoring reports record economic changes and impacts to community socioeconomic well-being within the NWFP area. Federal forest managers anticipated a loss in jobs, but forest products sector jobs, such as logging and timber manufacturing, declined more than anticipated (Grinspoon & Phillips, 2016). Further, job loss was spread unevenly across NWFP counties, with roughly 70% of jobs lost were in non-metropolitan counties (Grinspoon & Phillips, 2011). The NWFP shifted economic and community ties to public land. As early as 10-years after the NWFP's enactment, the timber sector had become "minor or negligible" in many communities. By year 15, area monitoring determined that managing agencies "no longer play significant roles" in area timber, though acknowledging that federal timber may still play an important part for some mills at local levels (Charnley et al., 2006, p. 15; Grinspoon & Phillips, 2011, p. 41).

In addition to losses of timber-related jobs, the BLM and USFS lost district employees (Charnley et al., 2006). BLM and USFS budget and employment cuts, reduced from the loss of timber-funded positions, significantly impacted some adjacent communities (Charnley et al., 2006). To retain federal employees, procurement contracts

expected to provide local jobs outside of agencies were typically completed in-house (Charnley et al., 2006; Moseley, 2006). The combined loss of timber sector and federal employment has correlated with the outmigration of individuals under 45-years-old, indicating a lack of educational and employment opportunities (Grinspoon & Phillips, 2011; Grinspoon & Phillips, 2016). Outmigration was evident in the first 10 years, and it was noted that the trend has had impacts on a loss of "talented [community] leaders" (Christensen et al., 1999, p. 61).

Uneven Effects and Community Adaptation Following the NWFP

Socioeconomic monitoring in the Pacific Northwest emphasizes that as the region adapts to new economies, trends in community well-being were not equally distributed among counties or localities. In some areas, timber industries were already in decline and communities sought to transition to new industries. Other communities had more economic diversification or were less dependent on timber industries. Economic transitions and demographic trends suggest a difference between metropolitan and non-metropolitan counties, as well as differences between western and eastern counties in the NWFP (Charnley et al., 2018; Spies et al., 2018).

The NWFP had a greater impact to rural counties and communities than those in urban areas. Non-metropolitan counties were more dependent on the forest products sector than metropolitan counties (Charnley et al., 2006). In western Washington, Oregon, and northwestern California, the timber sector made up an estimate of 10% of rural economies in 1990, compared to only 1% in metro counties (Grinspoon & Phillips, 2011). Roughly 70% of jobs lost were in non-metropolitan counties (Grinspoon &

Phillips, 2011). As a result, the NWFP's nonmetropolitan counties have had to navigate greater economic effects.

In anticipation of shifting economies, one assumption of the NWFP was that forested communities would capitalize on public lands for recreation and tourism, thus transitioning toward amenity-based economies. Though amenity-driven trends in NWFP Counties exceed national averages (Grinspoon & Phillips, 2016), amenity transitions have not been realized for all adjacent communities in the NWFP (Donoghue, 2003). The majority of NWFP counties that are following amenity models are located along the Pacific coast or within the Cascade Range (Spies et al., 2018), regions located to the west of Eastside Counties. Counties that have not followed amenity transitions may continue to be manufacturing dependent, are pursuing new modes of production, or are suffering from economic and population decline (Spies et al., 2018). New modes of production include attracting new industries, restoration economies, or alternative timber sectors, such as biomass, food processing plants, or prisons (Spies et al., 2018).

Demographically, NWFP counties experienced trends that reflect those of the rural United States. Nearly all counties show growth in residents over 45-years-old, meaning that NWFP populations are disproportionately aging (Grinspoon & Phillips, 2011; Grinspoon & Phillips, 2016; Spies et al., 2018). This may be in part related to increasing rates of in-migrating retirees (Spies et al., 2018). Yet, nonmetropolitan counties also experienced decreases of up to 10% in residents under 18-years-old (Grinspoon & Phillips, 2016).

Demographic shifts in racial and ethnic diversity occurred unevenly across metropolitan and nonmetropolitan geographies. Overall, NWFP counties have higher proportions of indigenous people than nationwide, clustered in nonmetropolitan counties (Charnley et al., 2018) and increasing Hispanic populations (Johnson & Lichter, 2016)., attributed to employment in non-timber agricultural (Charnley et al., 2018).

As the region adjacent to the NWFP, Eastside Counties provide a distinct, yet connected case study. Both regions' historic ties to the timber industry and ties to federal timber position NWFP and Eastside Counties to follow post-production economic transitions (Morzillo et al., 2015). Yet differences in connection to metropolitan areas, natural resources, historic industries, and land ownership situate many counties to follow a range of economic transitions, based on the resources available. As such, my research methods to inventory economic change, demographic trends, and well-being indicators are inspired by the NWFP socioeconomic monitoring reports. Characterizing these trends to describe the diversity in economic transitions are adapted from Morzillo et al.'s 2015 publication, among others (Ulrich-Schad & Duncan, 2018; Winkler et al., 2007).

METHODS

My study aims to explore three socioeconomic factors of Eastside Counties: 1) economic trends and changes, particularly as they relate to timber manufacturing and federally managed lands, 2) demographic trends and changes, and 3) indicators of counties' socioeconomic well-being. To answer these questions, I selected twenty-four counties in the interior northwest. Qualifying counties were at the eastern fringe of the Northwest Forest Plan, and had public lands managed by the USFS and/or BLM. I used 1990 as a baseline and compared it against 2016 data to explore the ways in which the region demonstrates economic adaptation, population trends, and shifts in well-being, then examined changes between 1990 and 2016.

To examine change at the county-level, I calculated percentages and location quotients for economics, demographics, and socioeconomic well-being indicators for each county. Mapping location quotients provided a tool to analyze spatial variables and regional trends. Economic transitions were determined by calculating the mean location quotients of five economic sectors, then characterize Eastside Counties based on Morzillo et al.'s (2015) economic types. Finally, I completed a document analysis of economic development plans and websites to provide additional context to each county.

Data

To qualify as part pf the case study, counties had to have federal lands managed by the USFS, indicating the presence of national forests. Some had lands managed by

both the USFS and BLM. Public Land data came from Headwaters Economics. I used data on USFS and BLM lands, timber harvest volume, and mill counts to assess shifts in timber harvests on public lands and declines in associated infrastructure. Timber harvest data was sourced from the Oregon Department of Forestry and the California State Board of Equalization. Data for wood products facilities came from USFS reports (Marcille et al., 2020; Simmons et al., 2016; Ward, 1997a; Ward, 1997b) and the Pulp and Paperworks Resource Council (PPRC). Wood processing facility data is inconsistent in the way that facilities are recorded and classified between all sources. Some facilities appear to be missing from the 1994 USFS reports but appear in the 2016 and 2020 publications. To mitigate this inconsistency, I include values from both sources. Changes in the number of wood processing facilities was calculated by creating a sum of facilities in 1990 (Ward, 1997a; Ward, 1997b) and subtracting these values from the sum of facilities in 2013 and 2016 (Marcille et al., 2020; Simmons et al., 2016). Mill closures recorded by the PPRC were summed for each county between the years of 1994-2016.

To assess economic change, I used wages from the United States Bureau of Labor Statistics (BLS) supersectors. To avoid county level sector non-disclosures, I used BLS supersector data which obscures data for counties with businesses to protect wage and employee privacy. My analysis includes six supersectors (Table 1) that represent forest products industries, the service sector, public administration, and financial sectors. Forest products industries include the manufacturing supersector, as a proxy for timber mills, and natural resources, a proxy for logging and forestry. I used the BLS Leisure and hospitality and financial supersectors to characterize jobs associated with amenity-driven

economies. The leisure and hospitality sector was used as a proxy for jobs sensitive to tourism; the financial sector captures real estate sales and non-earnings income. Public administration encompasses city, county, state, federal, and tribal administration position, including defense, law enforcement, and environmental review. I used the public administration suspersector to represent jobs in federal and state corrections facilities, tribal governments, and some federal land management agency jobs. Wages from the Office of Personnel Management (OPM) provided data for USFS and BLM employee salaries to measure change in agency employment. All values were adjusted for inflation to $2016.

Table 1 Supersectors from the Bureau of Labor Statistics. Public administration includes wages from law enforcement, national defense, environmental review, and tribal governments.

Supersector Descriptions	
Natural Resources and Mining (1011)	Agriculture, Forestry, Fishing, and Hunting (NAICS 11) Mining, Quarrying, and Oil and Gas Extraction (NAICS 21)
Manufacturing (1013)	Textiles, Leather, and Food and Beverage (31, 311-316) Wood, Gas, Coal, Nonmetallic Minerals, and Chemicals (32, 321-327) Metal, Electronic, Furniture, and Miscellaneous (33, 331-339)
Leisure and Hospitality (1026)	Arts, Entertainment, and Recreation (NAICS 71) Accommodation and Food Services (NAICS 72)
Financial Activities (1023)	Finance and Insurance (NAICS 52) Real Estate and Rental and Leasing (NAICS 53)
Public Administration (1028)	Public Administration (NAICS 92)

To determine who is living in this region and to capture residential change, I sourced data from the U.S. Census Bureau and the National Center for Education Statistics (NCES). Data sets include population, school enrollment, age, identification of race and ethnicity, language spoken at home, median household income, and measures of

poverty. Demographic measures and socioeconomic well-being indicators commonly rely on publicly available data from the decennial Census and American Community Survey (ACS) for years between decennial counts. In 2000 the Census Bureau changed their method of data collection to provide population estimates between decennial collection years (Bazuin & Fraser, 2013; Bell et al., 2016). The change in collection method has reduced the confidence level of Census data between decennial collection periods (Bazuin & Fraser, 2013). To mitigate high estimates of error in the 2016 ACS, I incorporate school district data from the NCES into measures of demographic change and poverty.

School district enrollment data provide additional information related to population, demographics, and language. Enrollment in National Free and Reduced Priced Meal (FRPM) plans provides a measure of poverty. While this data provided accurate local measures, it is not without shortcomings. As measures of demographics, school district data accounts only for enrolled students. As an indicator of poverty, FRPM qualifications differ from Census measures of poverty, and the FRPM program automatically enrolls children in households with food assistance, Temporary Assistance for Needy Families (TANF), or on American Indian Reservations (Bass, 2010; Cruse & Powers, 2006). Despite these differences, researchers have found that these data are strongly correlated with neighborhood poverty and single-parent households and may act as additional indicators of well-being beyond household poverty (Domina et al., 2017; Kurki et al., 2005). I use FRPM data to supplement 2016 indicators for socioeconomic well-being.

When assessing population, I considered the high percentage of incarcerated residents in Lassen County. In 2016 the two-state corrections facilities and one federal prison housed approximately 8,900 residents in Lassen County, 28% of the county's total population. Notably, these residents are disproportionally Hispanic and Black/African American. To represent population changes of choice more accurately within the county, I selected to remove one block group that accounts for the two state prisons. The block group that includes Herlong Federal Prison remains in the data analysis. This is because the block group also included non-incarcerated residents and the federal prison houses fewer inmates (approximately 925 in 2021). I identified tables and figures where incarcerated residents had been removed to adjust population counts.

Location Quotients and Spatial Analysis

To examine economic change, demographic trends, and shifts in well-being indicators, I calculated each county's relative change to the 24-county region using location quotients and percentages. Location quotients show how a defined area's economics or demographics compare to a predetermined region (Bowe & Marcouiller, 2007). Location quotients show the proportion of an economic sector or demographic in comparison to a region. Using federal land as an example, the calculation for location quotients follows:

$$LQ = \frac{\frac{County's\ Federal\ Land}{County's\ Total\ Land}}{\frac{Region's\ Federal\ Land}{Region's\ Total\ Land}}$$

I used location quotients to compare counties to the region in two ways: 1) I calculated county location quotients for both 1990 and 2016. 2) I assessed rate of change by the difference between location quotient in 1990 and 2016. When using location quotients, it is important to note that an increase or decrease in a location quotient does not necessarily reflect an increase or decrease in total (wage, demographic, sector), but rather the way individual counties compare to the region. For example, when calculating change between 1990 and 2016, a negative value may mean that the concentration of an economic sector or demographic has changed at a rate lower than the comparison region and does not necessarily indicate a loss. I included percentages in my analysis to mitigate for this (Table 13).

Spatial analysis provided a tool to examine how regional and county demographics, economics, and well-being varied in 2016 and changed since 1990. Maps focused on demographics, economic sectors, well-being, distribution of federal land, and connectivity. Census Topographically Integrated Geographic Encoding and Referencing (TIGER) shapefiles define state and county boundaries. I sourced federal lands data for the NWFP boundaries and USFS and BLM lands from federal government datasets; transportation-related data from state databases; and county-level data from local jurisdictions. I used a combination of location quotient calculations, means, and percentage of change to inform spatial attributes. Categories of change are grouped by the number of standard deviations from the mean.

To examine connectivity, I incorporated Beale codes and major highways. Beale Codes are numeric codes used by the U.S. Department of Agriculture to define where a

county is situated on an urban-rural spectrum. Using a nine-point scale, Beale codes follow an urban-centric model that combines county population and proximity to urban areas. This results in classifications of metro and non-metro counties, where non-metro counties fall on a scale of adjacent to metro areas to completely rural.

Expanding the Production Typology

After calculating each county's location quotients, I calculated the region's mean location quotient for each economic sector. I then used, and expanded, Morzillo et al.'s (2015) typology to categorize each county by calculating which sectors' location quotients fell above or below the regional mean. Counties that were metropolitan counties in 1990 were typed as metropolitan. Counties that had losses in both population and total wages between 1990 and 2016 were typed as in decline.

RESULTS

Results are divided into two sections. Section one discusses general economic, demographic, and indicators for each county's socioeconomic well-being in Eastside Counties. For economic changes, I focus primarily on timber production and manufacturing by using harvest volume, harvest location, and wood processing facilities. Though my analysis predominantly used location quotients, Table 13 in the appendix provides regional context using percentages. In section two, I discuss how Eastside Counties fall into Morzillo et al.'s (2015) economic types: decline, production, and amenity. I then expand production counties from one type to three types: *heritage production*, *heritage production + public administration*, and *diversified production*. I use the term *heritage industries* to describe natural resource industries, such as timber, ranching, agriculture, or mining, that have historically been central to county economies. In Eastside Counties, economies driven by heritage industries include wages from natural resource and manufacturing sectors. This typology provides a descriptive snapshot of each county's economies and demographics in 2016.

Regional Trends

Overall, Eastside Counties are predominantly rural counties with high proportions of public lands. A change in Beale Codes between 1990 and 2016 shows that Deschutes county's population growth has reclassified it as a metropolitan county (Figure 4). This has created more connectivity among eastern Oregon counties to urban areas and

associated benefits, such as commutability to the economic diversification associated with urban areas. Eastside Counties have high proportions of lands managed by the USFS and BLM (Figure 5). Fifty-three percent of the region is managed by the USFS or BLM.

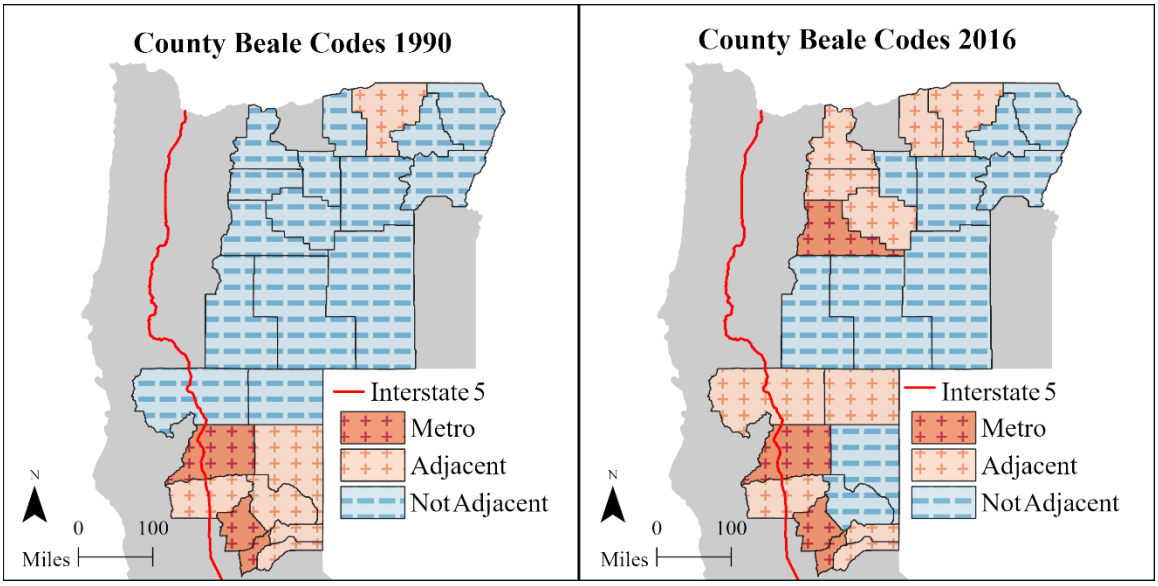

Figure 4 County Beale Codes illustrate each county's population and connection to a metropolitan county.

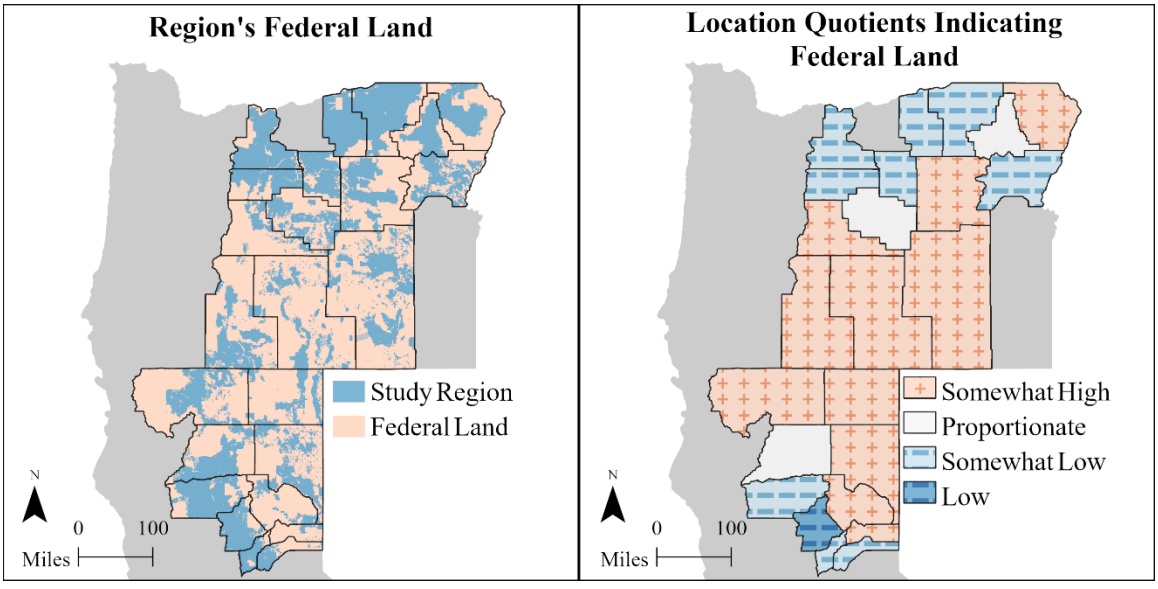

Figure 5 **Left:** 54,581,659 total acres (54.6 million acres), 53% of which is federally managed land. Values are from the Headwater's Economics 2016. **Right:** Federal land displayed by location quotient. All values are separated by one standard deviation, with proportionate values within one standard deviation from the mean. (M = 0.96, SD = 0.43)

Demographic Trends

Eastside County population change, age, race, and ethnicity were uneven across the region. Population per county in 2016 ranged from 1,369 to 223,887. California counties had higher proportions of the region's population, while Oregon counties had higher rates of population growth (Figure 6). All metropolitan counties had population growth. Among rural counties, some had rapid growth, some population decline, and others were somewhere in between. Deschutes County had the most growth, shifting it from a rural county in 1990 to a metropolitan county in 2016. Sierra County lost the highest proportion of residents (-12%).

Together, proportions of residents over 65 (Figure 7), residents under 18 years old (Figure 8), and school enrollment (Figure 9) showed changing age demographics. As a region, Eastside Counties were aging; all counties experienced increased percentage in residents over 65, and most had decreased proportions of residents under 18. Small-metropolitan counties (in order of population: Butte, Shasta, Deschutes, and Yuba Counties) had more even distribution among age groups and population increase. Butte, Shasta, and Deschutes counties' disproportionate rate of residents over 65, coupled with population growth, suggested that theses counties were retirement destinations. Retirement destination counties had an increase in residents over 65 at rates higher than other proportions of the population. Baker, Crook, and Nevada Counties had increasing retirement aged residents and decreasing proportions of residents under 18. Yet, school district data showed that some areas had increasing student enrollment. This suggests that residents under 18 were increasing, but at a lower proportion than older residents. As an

example, Crook was the only county where the population increased above the regional average, residents over 65 increased at a high rate, residents under 18 had a decreased location quotient, but school enrollment increased 12.5%. This suggests that Crook is growing rapidly and that the fastest growing age group may be residents over 65 years old.

Counties at risk for population decline experienced increases in the proportion of residents over 65 because other age groups had moved out. Wheeler County was one such example. Between 1990 and 2016, Wheeler County's total population decreased, and the county had lost the highest proportion of residents under 18 and had the greatest increase in the proportion of residents over 65.

Population growth in youth was indicated by increases in both the proportion of residents under 18 (Figure 8) and increases in school enrollment (Figure 9). While Eastside Counties had a general, disproportionate increase in older residents, 17 of the 24 counties had an increase in school enrollment (Figure 9). Seven counties (Deschutes, Tehama, Butte, Yuba, Wasco, Morrow, and Umatilla) had above average increases in the proportion of residents younger than 18 years old (Figure 8). Three of these counties were metropolitan counties.

Most Eastside Counties' racial and ethnic diversity increased. These changes were measured by the proportion of residents that identify as Native American, Alaskan, and Native Hawaiian (Native American) (Figure 10), White, and Hispanic (Figure 11).

Eastside Counties were home to 17 federally recognized tribes spread among 13 counties. Some tribal lands spanned county boundaries, while others had one or more

tribal lands within county limits. Counties with above average proportions of Native American residents also had federally recognized tribes. There were two exceptions. Yuba County, which had higher than average proportions of Native American residents, but no federally recognized tribes, and Butte County, which has four federally recognized tribes, but lower than average proportions of Native American residents. Proportions of Native American residents changed very little within the region. Jefferson County location quotients have decreased since 1990, though the population of indigenous peoples remains extremely high. A decrease in a location quotient value does not necessarily mean that the number of residents identifying as Native American has declined, but rather that proportions of other population groups increased faster.

The greatest racial and ethnic change in Eastside Counties was Hispanic residents (Figure 11). All counties, except for Lassen County, had an increase in the percent of Hispanic residents. This could be a result of removing two Census block groups to adjust for incarcerated residents in Lassen County. Morrow County had the highest proportion of Hispanic residents and the greatest growth in this demographic. These changes were confirmed though school enrollment data of Hispanic students. Though not always an indicator of Hispanic households, Morrow County also had the highest proportion of Spanish-speaking residents.

Despite high proportions of Native American residents and growing proportions of Hispanic residents, Eastside Counties were overwhelmingly White. Jefferson County had the lowest proportion of White residents (79%). Ninety-nine percent of residents in Wallowa and Grant Counties identified as White. Of the 13 counties with above average

federal lands, 12 had 91% or more of the population that identified as White. Only three low federal land counties had more than 90% of residents that identified as White. This suggests that in Eastside Counties, counties with higher proportions of federal lands had less racial and ethnic diversity than counties with lower proportions of federal lands.

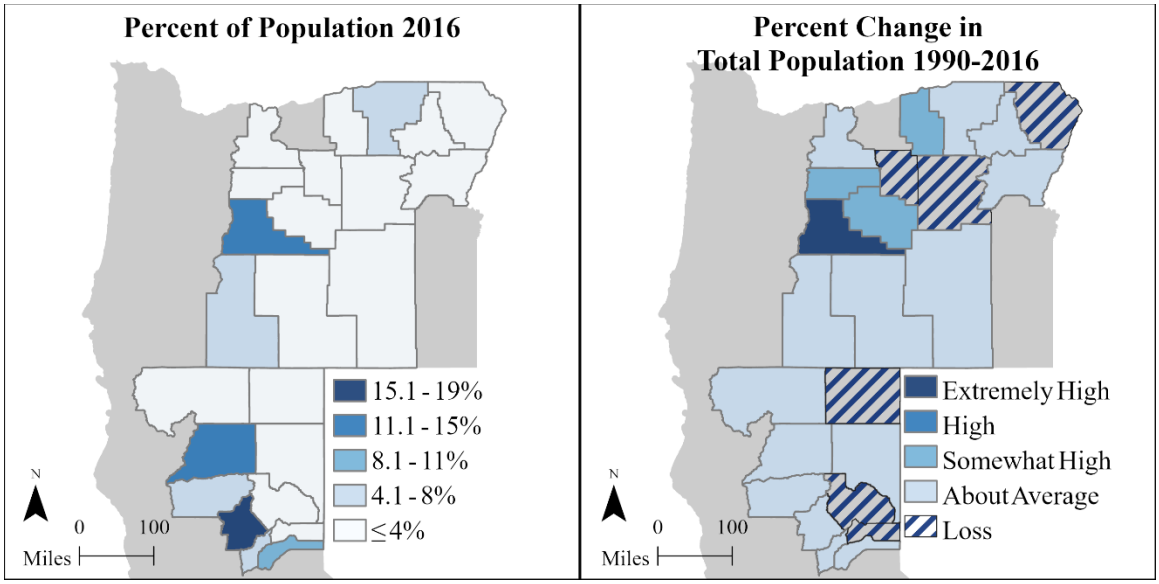

Figure 6 **Left:** Distribution of population in 2016 shown by the percent of the area's population in each county. Values for incarcerated residents in High Desert State Prison (N=7,968) in Lassen County were removed. **Right:** Percent of population change from 1990-2016. Six of the 24 counties experienced population loss while the remaining counties experienced increases in population. All values are separated by one standard deviation, with proportionate values within one standard deviation from the mean. (M = 0.20, SD = 0.30). Values for incarcerated residents in High Desert State Prison (N1990 = 4,198, N2016=7,968) in Lassen County were removed.

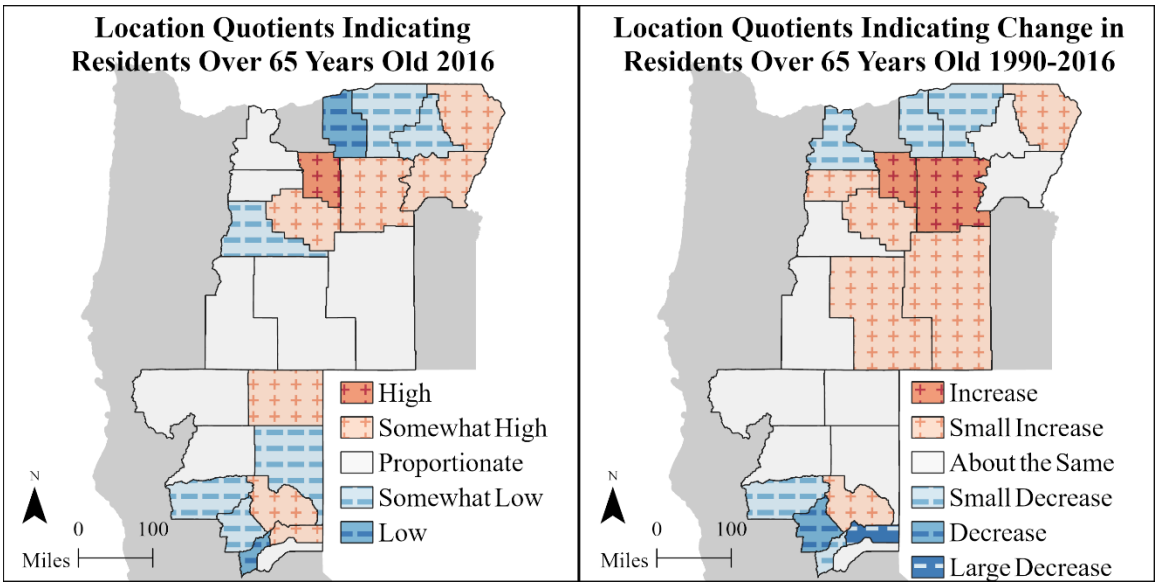

Figure 7 **Left:** 2016 Census count of residents over 65 years of age represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean (M = 1.00, SD = 0.21). **Right:** Change in the location quotient of residents over 65 years of age between 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.00, SD = 0.18).

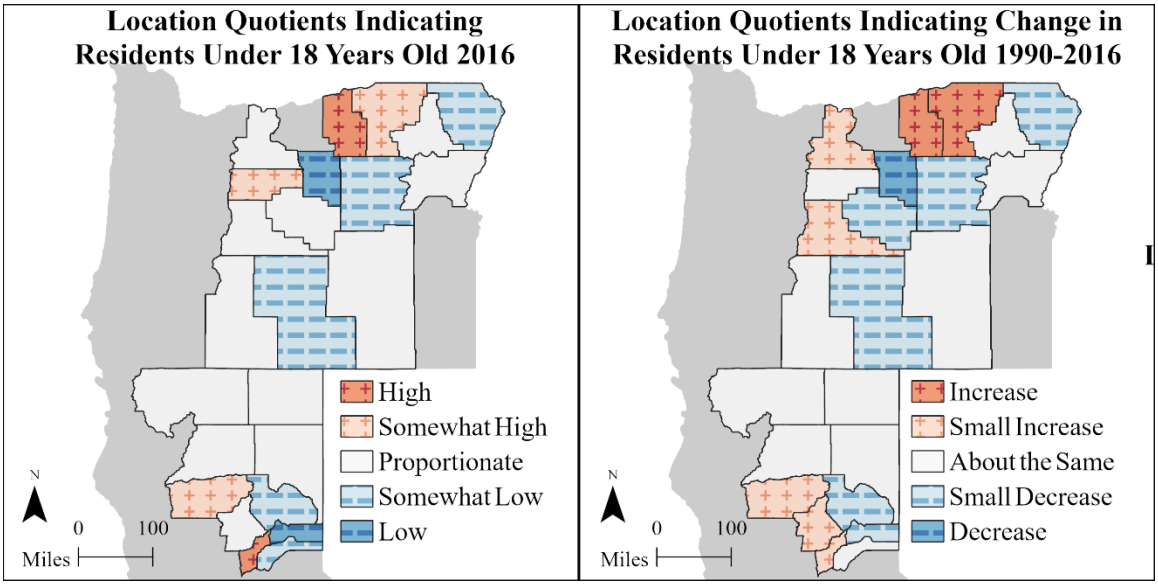

Figure 8 **Left:** 2016 Census count of residents under 18 years of age represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean. (M = 1.005, SD = 0.18). **Right:** Change in location quotient for residents under 18 years of age from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.00, SD = 0.12).

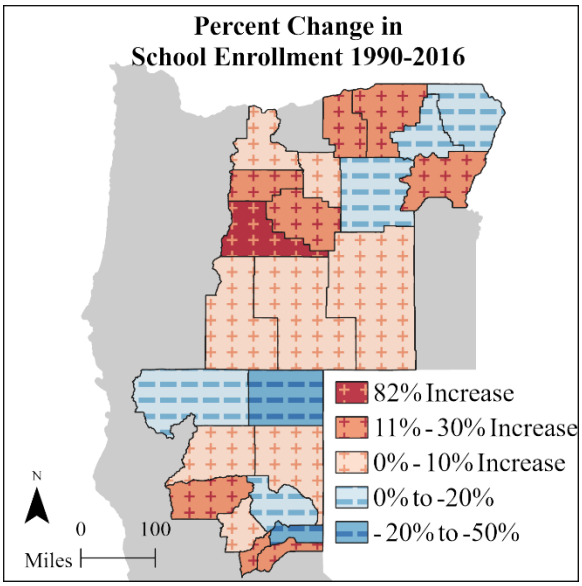

Figure 9 Percent change in school enrollment from 1990-2016.

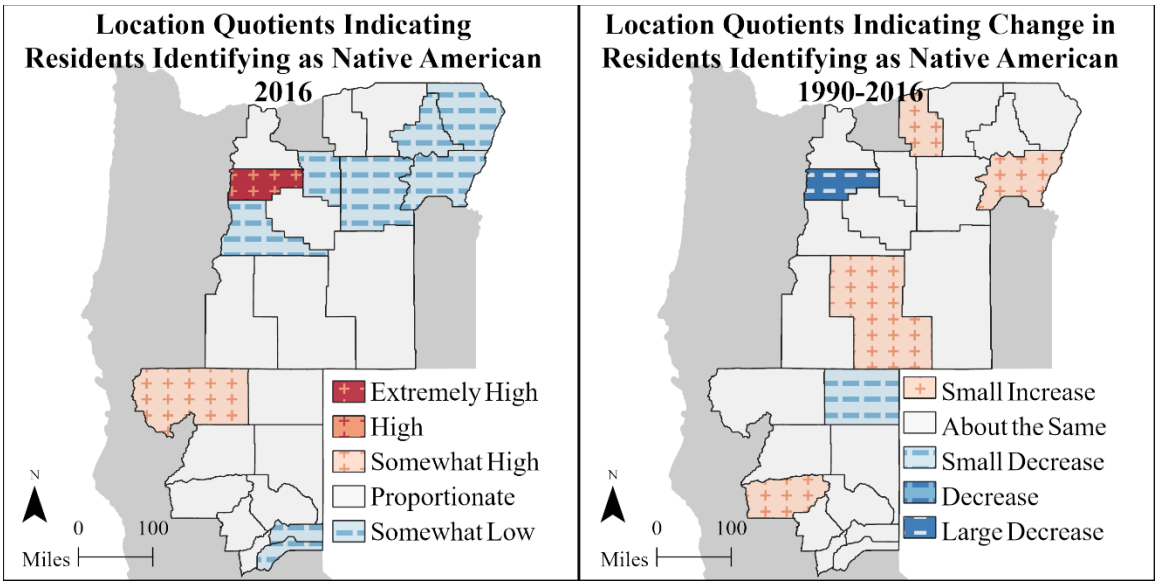

Figure 10 **Left:** 2016 Census count of residents that identify as Native American, Native Hawaiian, or Alaskan represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean (M=1.05, SD = 0.77). **Right:** Change in location quotient of residents that identify as Native American, Native Hawaiian, or Alaskan. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.10, SD = 0.70).

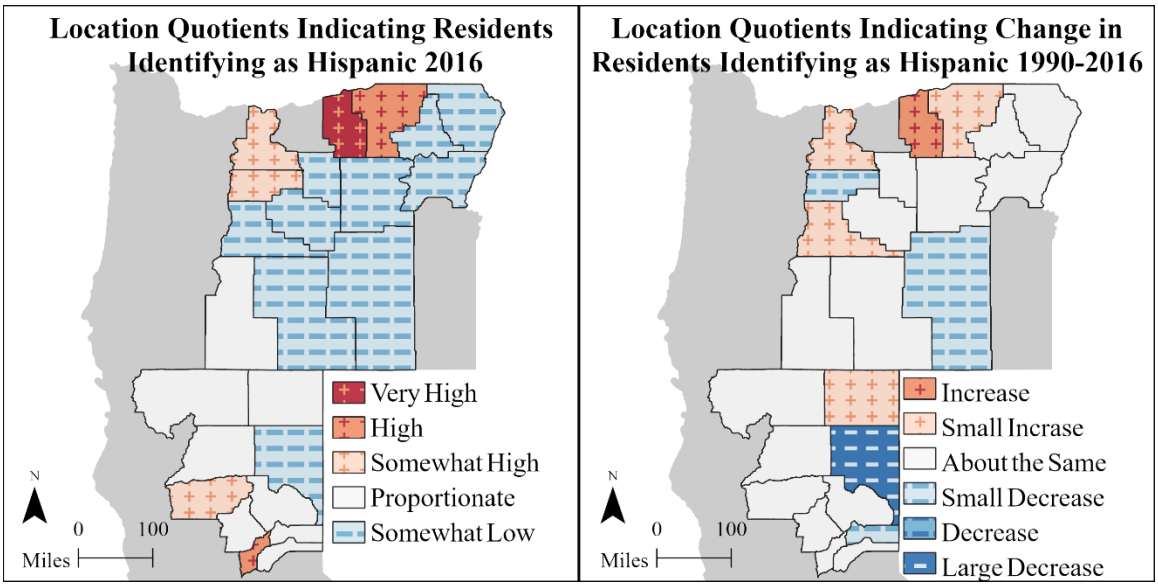

Figure 11 **Left:** 2016 Census count of residents that identify as Hispanic represented in area location quotients. Values for incarcerated residents in High Desert State Prison (N= 4,582) in Lassen County have been removed from these values. One standard deviation separates all values; proportionate values are within one standard deviation from the mean (M = 0.89, SD = 0.06). **Right:** Change in location quotient of residents that identify as Hispanic. Values for incarcerated residents in High Desert State Prison (N1990= 1,142, N2016 = 4,582) in Lassen County. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.01, SD = 0.29).

Economic Trends

Between 1990 and 2016, economic transitions in Eastside Counties were seen in manufacturing and natural resource sectors, though individual county dependence on these sectors differed. In general, metropolitan counties had more economic diversity than rural counties and were less dependent on manufacturing and natural resources.

Timber Mill Closures and Changes in Timber Harvests

To measure forest-related production in Eastside Counties, I used the number of wood processing facilities and timber harvest volume. In 1990, Eastside Counties had approximately 51 active timber processing facilities, including 39 timber mills, spread among 18 of 24 counties. Data on wood processing closures suggested that timber mills

were already declining during the early 1990s. In 2016, the region had approximately 30 active timber mills among 18 counties. Data from the Pulp and Paperworks' Resource Council recorded a total of 75 processing facility closures between 1990 and 2016.

The number of secondary wood processing facilities grew. Where in 1990 the region had 24 secondary processing facilities, this number grew to 38, including eight biomass facilities, in the 2012/2016 USFS reports. The geographic distribution of secondary processing facilities was notable. California counties had all 8 of the region's biomass facilities and no other secondary processing facilities. Oregon had more secondary wood processing facilities than California counties. Collectively, these numbers indicate that timber manufacturing continued in Eastside Counties but suggested that the wood products industry had shifted from many timber mills, or primary processing, to more secondary processing and biomass facilities.

Though timber harvest decreased dramatically since 1990, Eastside County forests were productive (Figure 12). In 2016, timber came from private, public, and tribal lands. Timber harvests were higher in counties with more federal lands, but harvests from private lands (Figure 14) made up most of the Eastside County's timber production (71%). California counties harvested more volume than Oregon Counties. The three highest producing counties (Siskiyou, Shasta, and Plumas) contributed to 44% of the region's total harvest. Though these counties have high proportions of federal lands, harvests came predominantly from private forests. In Morrow and Wasco Counties, most of the timber harvested came from tribally owned land.

Though the overall volume of timber production declined in Eastside Counties, changes in the proportion of timber harvested on public land from 1990-2016 varied greatly between counties (Figure 13). Modoc, Jefferson, and Nevada Counties had the greatest loss in timber harvested from public lands. Yet, four counties, Crook, Wasco, Wheeler, and Yuba County had an increase of timber harvested from public lands.

Manufacturing and Natural Resources

Of all economic sectors used in this analysis, the manufacturing sector had the greatest decline (Figure 16). Despite declines, manufacturing remains a large proportion of some Eastside Counties' economies. Morrow County stood out with the largest manufacturing sector, proportionate to total wages, as well as the largest increase in the sector. Crook County has had substantial decreases in manufacturing wages but has maintained an average rate proportionate to the region, suggesting that the manufacturing sector was central to Crook County in 1990 and has since declined.

Combining manufacturing data and wood products facilities, data indicated that wood products manufacturing is an important sector for some counties. Four counties, Klamath, Plumas, Union, and Umatilla were likely somewhat dependent on timber manufacturing, as they had high location quotients and wood processing facilities. Based on their low number of timber processing facilities and high manufacturing wages, Baker, Crook, Jefferson, Morrow, and Tehama Counties likely had more diversified manufacturing sectors, with wages coming from sectors other than wood processing.

Data on natural resource wages include jobs that can be considered work in the forests, (logging, harvesting, restoration) in agriculture (ranching and horticulture), and in

mining (Figure 17). In 2016, Grant County had the highest rate of natural resource wages, followed by Lake County. In general, counties with high natural resource wages also had higher rates of federal land.

Combining timber harvest volume and natural resources sectors suggests counties where timber harvesting contributed to a proportion of the natural resource sector. As a result, timber harvesting substantially contributed to wages in only six counties, Grant, Lake, Wallowa, Wheeler, Harney, and Tehama. Counties that had higher than average natural resource sectors, but lower than average timber harvests, were likely agriculturally based. Within Eastside Counties, four counties had large natural resource sectors that appeared to be unrelated to timber, Morrow, Modoc, Wasco, and Umatilla.

Leisure and Hospitality and the Financial Sector

Wages from leisure and hospitality and the financial sector were a proxy for amenity-driven sectors. Together, leisure and hospitality and the financial sector indicate the strength of amenity migration and/or tourism. Seven of the 24 counties were above average in both leisure and hospitality (Figure 18) and financial sectors (Figure 19). Of these, Deschutes and Nevada Counties were well above average in both, followed by Butte and Wallowa. These indicated trends towards amenity-based economies.

The leisure and hospitality sector grew in Eastside Counties, though in a low proportion of the counties' economies. This means that a few counties had large growth in recreation and tourism-driven sectors. Connected counties had more leisure and hospitality than disconnected counties. Crook County had the highest proportion of growth. Crook County's growth was likely due to its proximity to neighboring Deschutes

County. Sierra, Morrow, Lassen, and Lake Counties had the lowest proportion of the sector. Sierra and Lake Counties also had the highest decrease. This can indicate that these counties either lost wages in this sector or had much slower growth when compared to the region.

The financial sector grew but at a slow rate. Wages from the financial sector were higher in metropolitan and connected counties. Wallowa County was an exception; Wallowa had the highest location quotient for the financial sector, as well as the highest rate of growth from 1990-2016. Sierra and Wheeler Counties had the lowest proportions.

Public Administration and Federal Land Management Agency Wages

The public administration sector encompasses all government wage jobs, including federal, state, local, and tribal governments. In combination, public administration wages in Eastside Counties may come from local administration, state agencies, federal jobs related to land management (USFS, BLM, USFW, NRCS), federal jobs not related to land management (prisons or Department of Defense), or tribal administration. Nine counties were above average in public administration wages in 2016 (Figure 20). Lassen and Harney Counties had experienced the highest rates of increase in public administration wages since 1990. In 2016, Lassen County had the highest proportion of public administration wages. This was in large part due to the state and federal prisons in the county. Yuba County was the only metropolitan county with above average public administration, which may be explained in part because Beale Air Force Base was located within the county. Apart from Yuba and Jefferson Counties, all counties with

above average public administration sectors were high federal land counties. Additionally, five of the six counties had federally recognized tribes.

Combined with total salaries from USFS and BLM, this analysis showed that some counties have very high proportions of wages coming from federal land management agencies (Figure 21). Grant County had the highest proportion of the county's total wages coming from USFS and BLM salaries (15.6%), followed by Lake County (14.2%) and Modoc County (12.7%). In this way, federal land management agencies, whether through natural resources or public administration sectors, are important contributors to county's total wages.

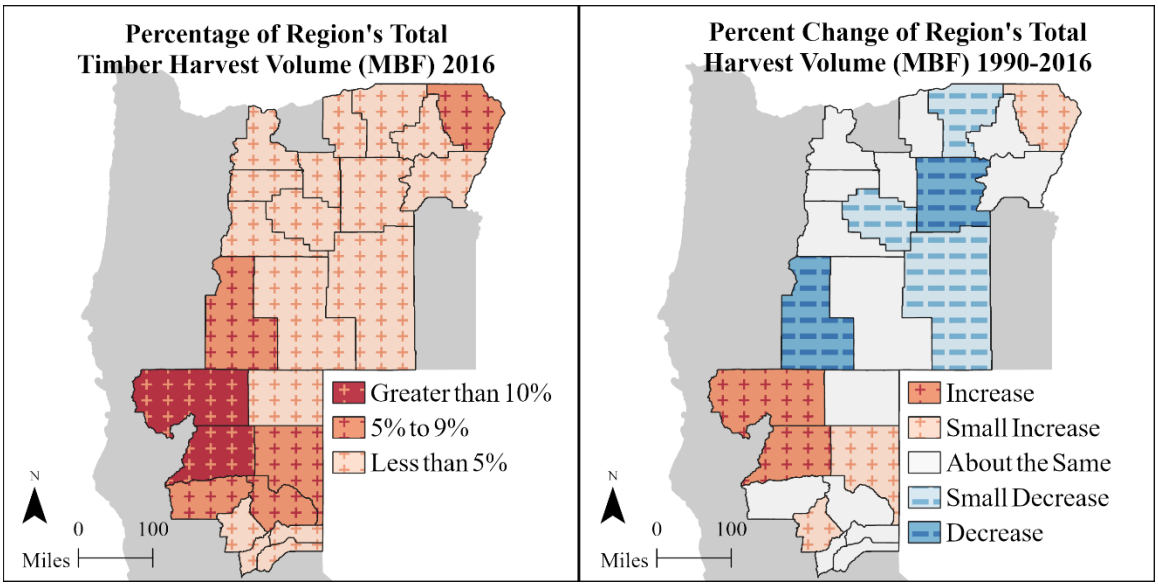

Figure 12 **Left:** 2016 proportion of the region's total harvest. **Right:** Change in percentage of total harvest on public land from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.00, SD = 0.03).

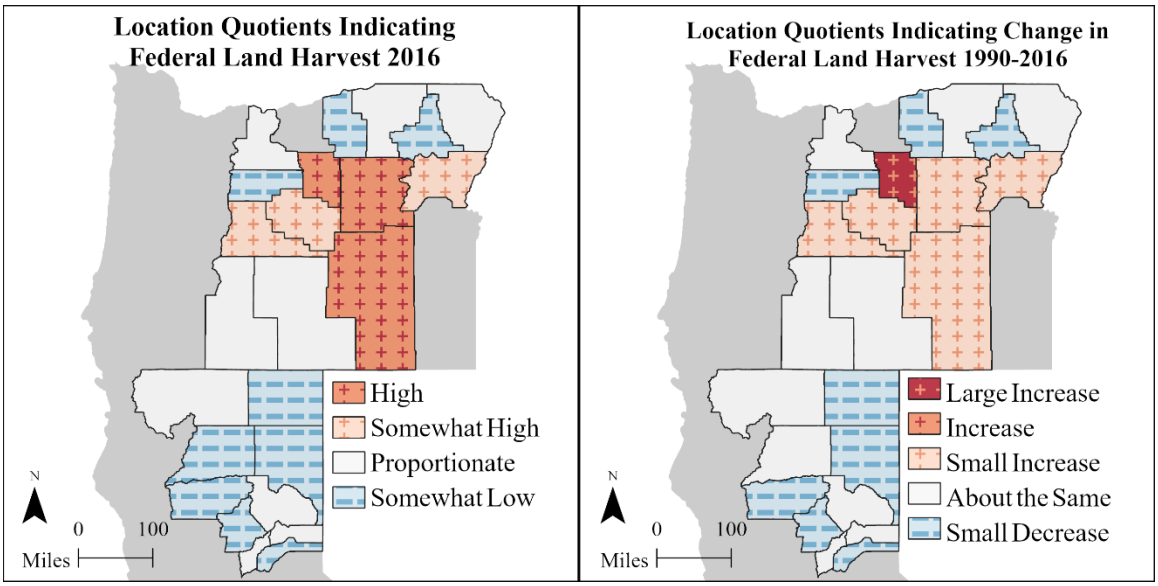

Figure 13 **Left:** 2016 harvest on USFS and BLM lands represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean. (M = 1.25, SD = 1.11). **Right:** Change in location quotient harvest on USFS and BLM land from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.32, SD = 0.93).

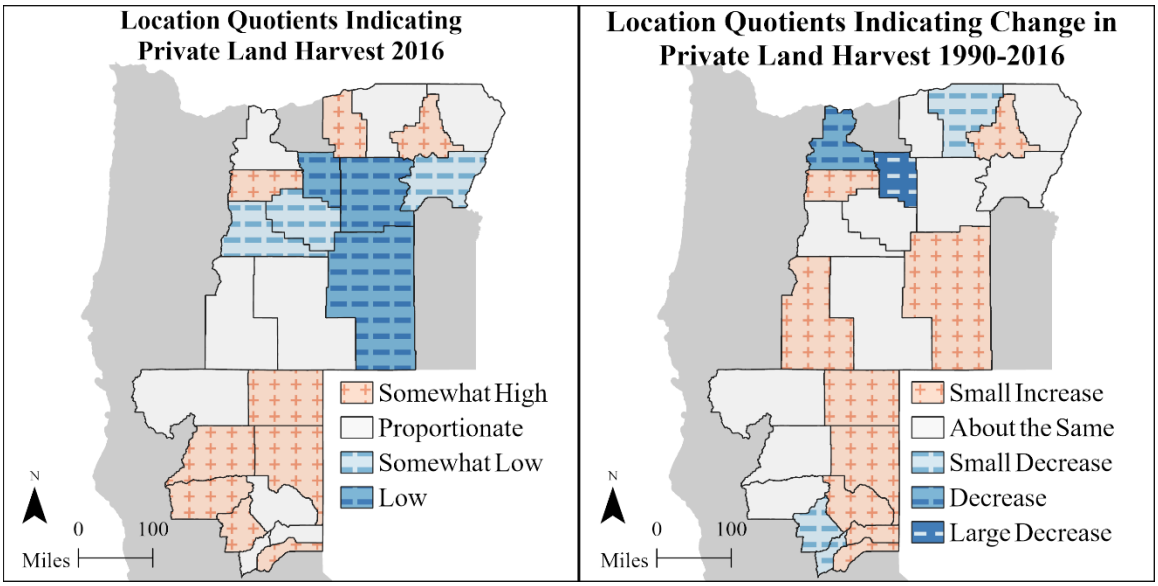

Figure 14 **Left:** 2016 harvest on private lands represented in area location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean. (M = 0.90, SD = 0.43). **Right:** Change in location quotient harvest on private land from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.20, SD = 0.40).

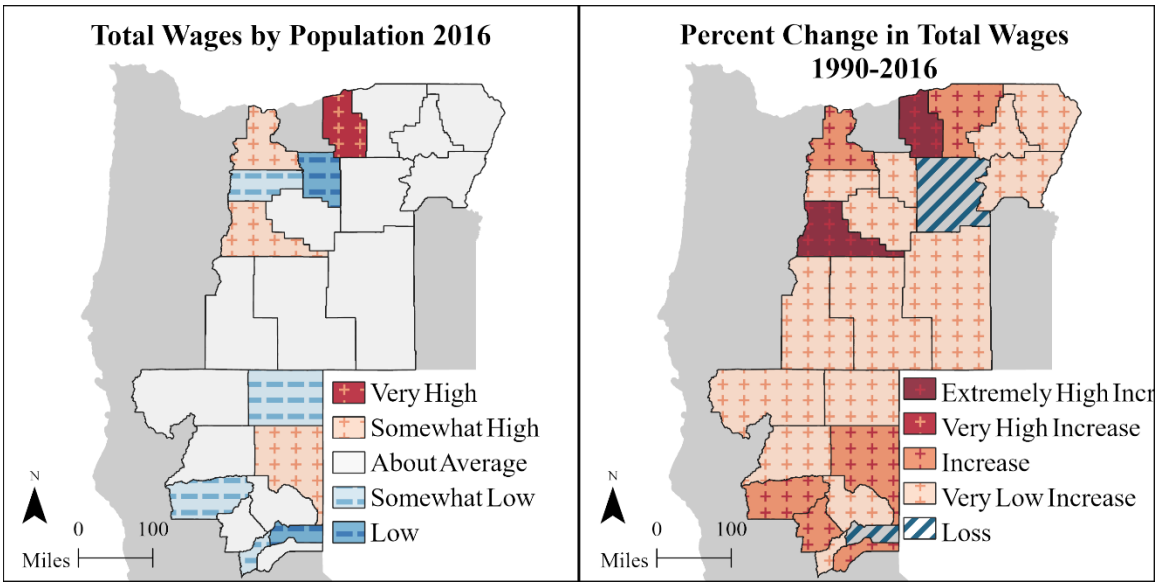

Figure 15 **Left:** 2016 total wages from the Bureau of Labor Statistics as values normalized by county population. **Right:** Percent of change for total wages from 1990-2016. Decline represents decreases in total wage, all other values are at equal intervals above zero (M = 0.43, SD = 0.55). All values are in 2016$.

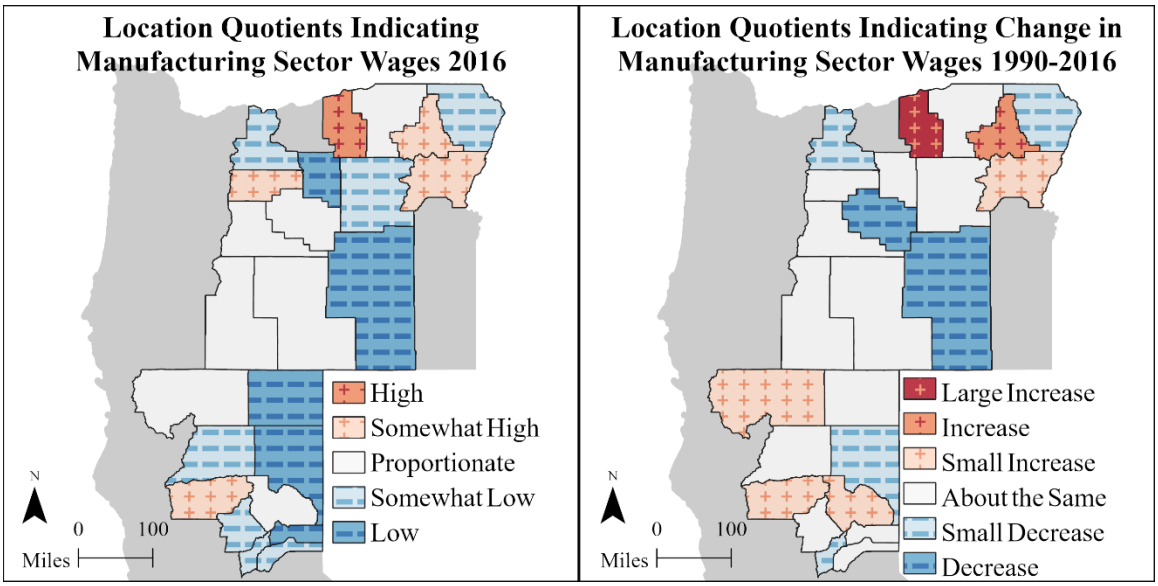

Figure 16 **Left:** 2016 wages from the Bureau of Labor Statistics manufacturing supersector data represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 1.04, SD = 0.88). **Right:** Change in location quotient for manufacturing sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean (M = -0.02, SD = 0.69). All values are in 2016$.

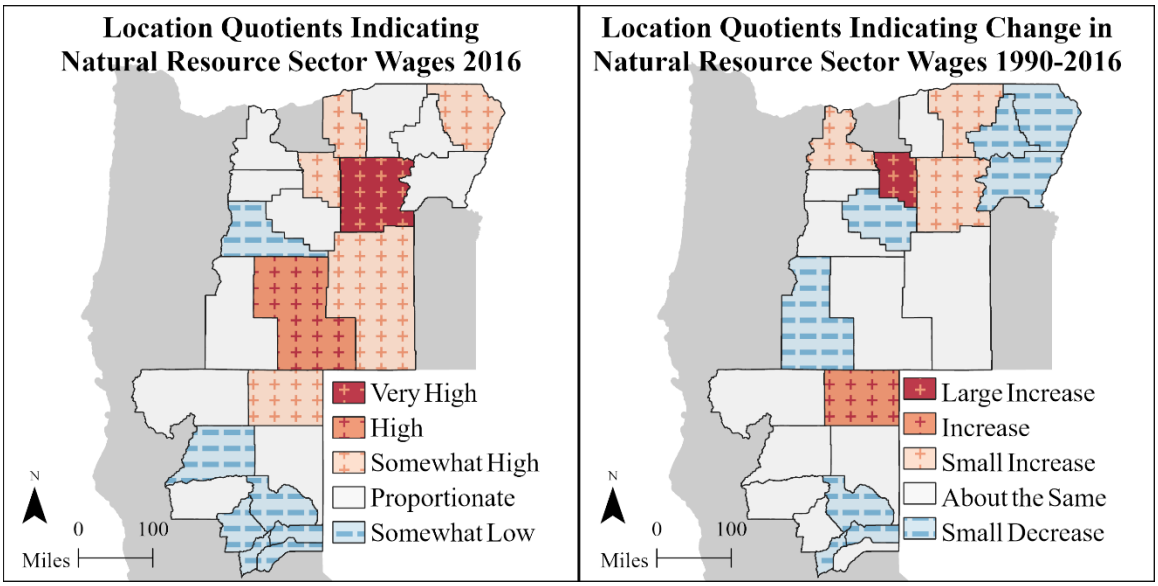

Figure 17 **Left:** 2016 wages from the Bureau of Labor Statistics natural resources supersector data represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 1.81, SD = 1.37). **Right:** Change in location quotient for natural resources sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.17, SD = 0.89). All values are in 2016$.

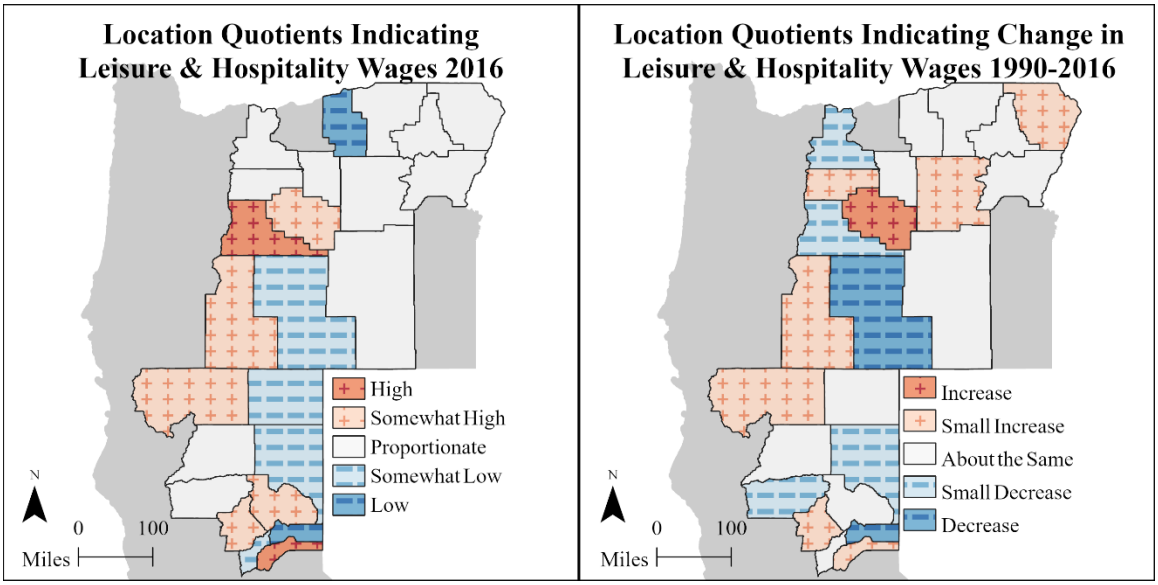

Figure 18 **Left:** 2016 wages from the Bureau of Labor Statistics leisure and hospitality supersector data represented as location quotients. One standard deviation separates all values; proportionate values are within one standard deviation from the mean. (M = 0.80, SD = -0.36). **Right:** Change in location quotient for leisure and hospitality sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.05, SD = 0.28). All values are in 2016$.

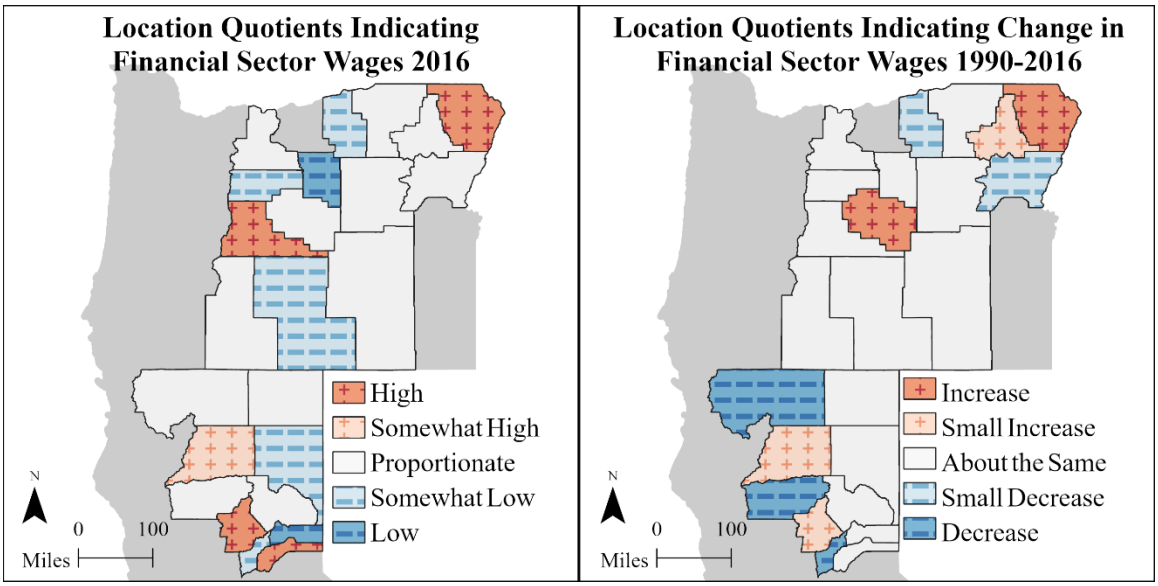

Figure 19 **Left:** 2016 wages from the Bureau of Labor Statistics financial supersector data represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 0.65, SD = 0.42). **Right:** Change in location quotient for financial sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.06, SD = 0.29). All values are in 2016$.

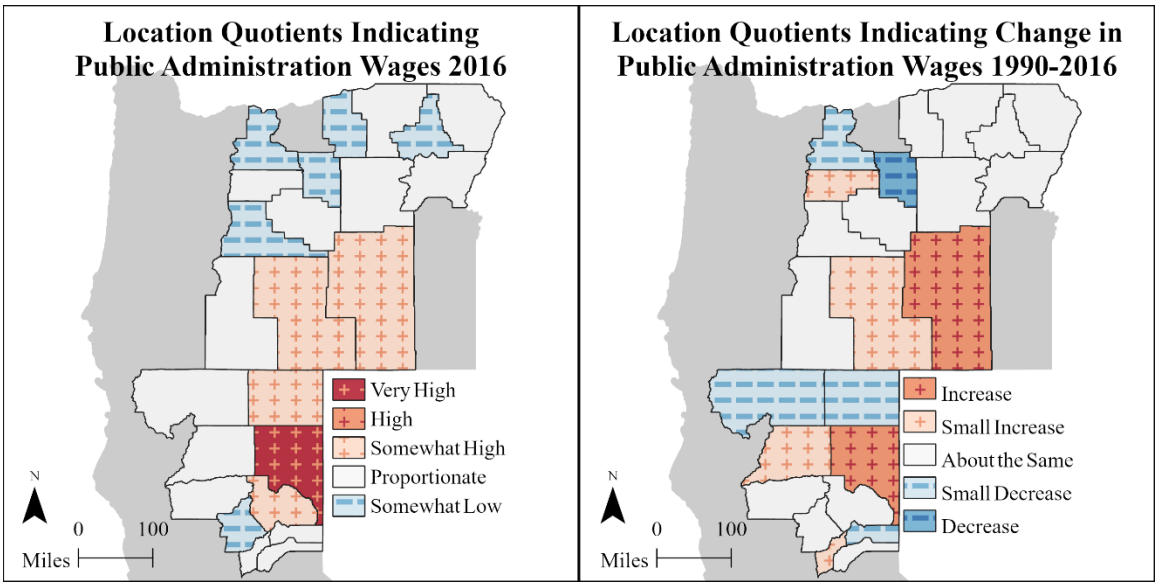

Figure 20 **Left:** 2016 wages from the Bureau of Labor Statistics public administration supersector data represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 1.29, SD =1.08). **Right**: Change in location quotient for Public Administration sector wages from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.02, SD = 0.59). All values are in 2016$.

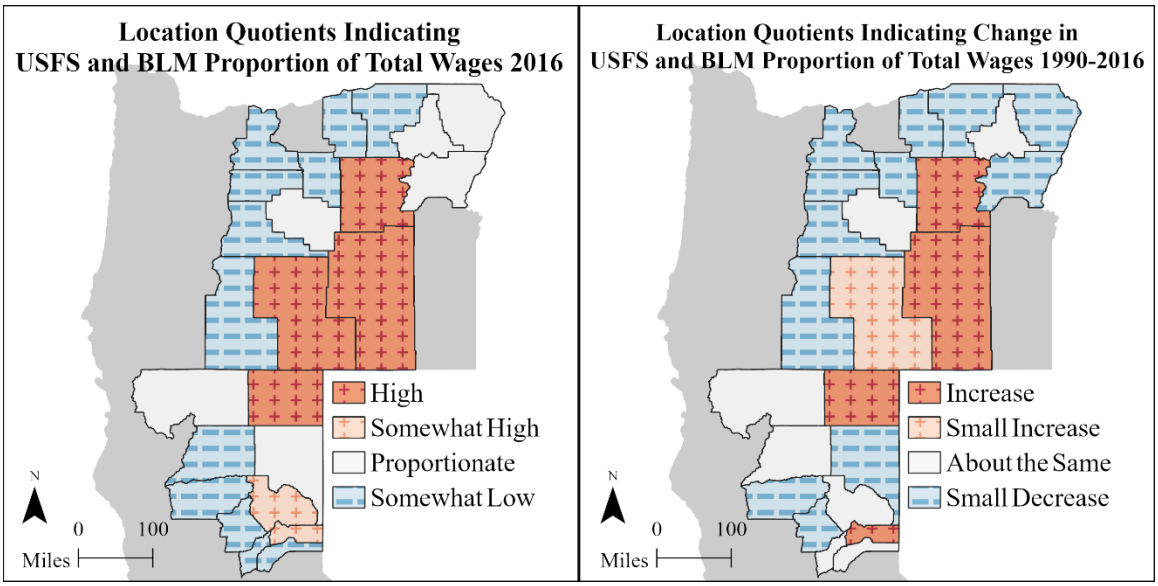

Figure 21 **Left:** 2016 salaries for USFS and BLM employees from the OPM data represented as location quotients using BLS data for each county's total wages. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 3.06, SD =3.37). **Right:** Change in location quotient for USFS and BLM employee salaries from 1990-2016 calculated by each county's total wages. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.84, SD = 1.56). All values are in 2016$.

Socioeconomic Well-Being

Socioeconomic Well-Being was measured using total wage growth, population growth, median household income, poverty, and age demographics. Changes in county socioeconomic well-being were uneven across counties and appeared to have little to no relation to economic trends.

Total wage growth demonstrated the total economic growth for each county (Figure 15). Within Eastside Counties, Morrow and Deschutes Counties had the highest percentage of wage growth, nearly doubling from 1990-2016. This growth paralleled population growth (Figure 6). Counties that lost total wages and population were in decline. Sierra and Grant County had both population and economic decline.

Median household income was adjusted for inflation then calculated as each county's percent of the region's average median household income (Figure 22). Nevada, Morrow, and Deschutes Counties had the highest household incomes compared to the region; Wheeler and Lake Counties had the lowest. When observing household income and demographics, Plumas and Wheeler were the only counties that experienced similar rates of increase in both residents over 65-years-old and median household income. The remaining four counties with above average increases in residents over 65 had lower household incomes. Wheeler, Morrow, and Umatilla had above average increases in median household income and Hispanic residents.

Poverty was inconsistent with other measures of socioeconomic well-being, changes in economic sectors, and county demographics (Figure 23). In 2016, Yuba was the only county with a higher than regional average median household income and poverty rates higher than the regional average. Butte and Tehama Counties have increased total wages, but also increased poverty.

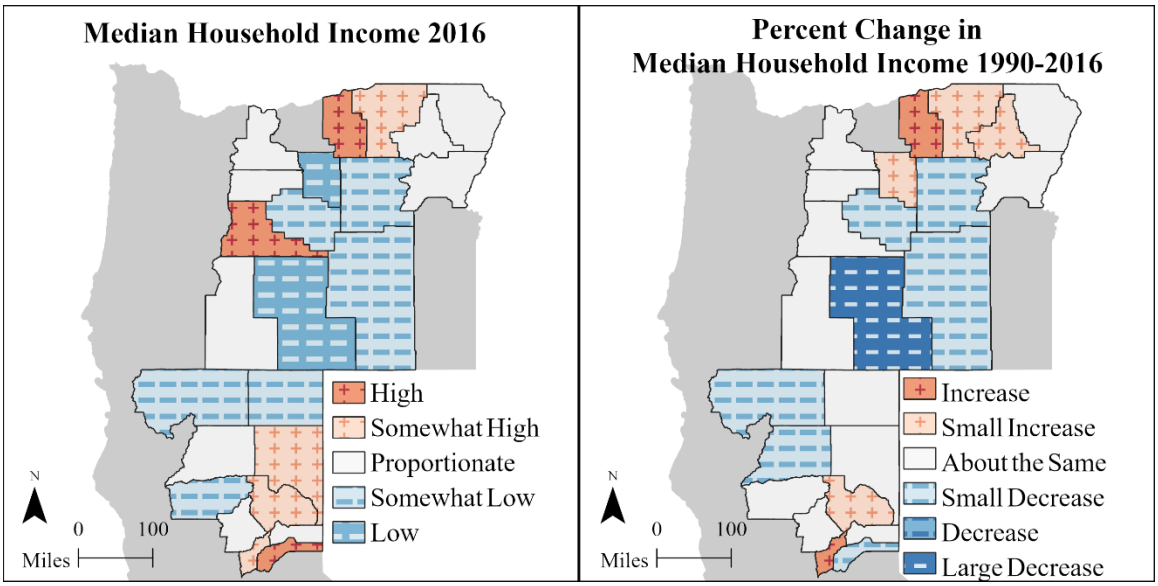

Figure 22 **Left:** Median Household Income from the 2016 Census represented as grouped values. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 44,606, SD = 6,256). **Right:** Percent of change for Median Household Income from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = 0.03, SD = 0.12). All values are in 2016$.

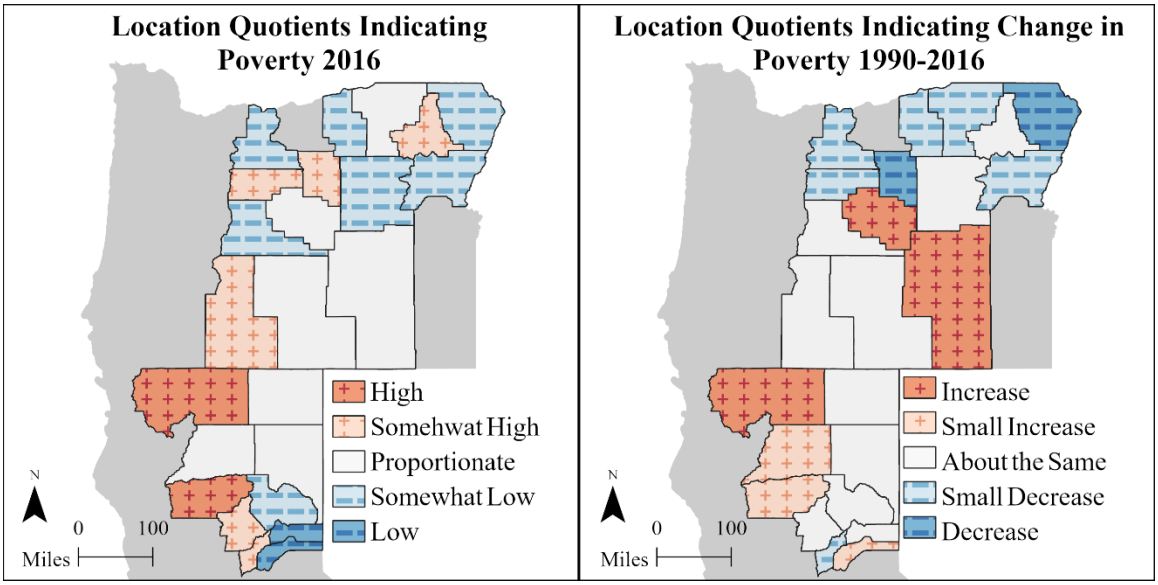

Figure 23 **Left:** Residents in financial poverty from the 2016 Census represented as location quotients. One standard deviation separates all values: proportionate values within one standard deviation from the mean. (M = 0.96, SD = 0.17). **Right:** Change in location quotient for residents in financial poverty from 1990-2016. One standard deviation separates all values. Values titled "About the Same" are within one standard deviation from the mean. (M = -0.01, SD = 0.15). All values are in 2016$.

Characterizing Eastside Counties

Eastside Counties followed diverse economic transitions. To characterize economic types, I applied Morzillo et al.'s categories, decline, amenity, and production, to Eastside Counties based on economic sectors in 2016. Most Eastside Counties fell into the production category and were following distinct economic and demographic patterns. Counties also showed patterns based on connection to metropolitan counties and some correlations with federal lands (See Table 14 in the appendix for detailed descriptions of production types). Thus, I expanded Morzillo et al.'s typology to include three new types of production that were present in Eastside Counties: *heritage production*, *heritage production + public administration*, and *diversified production*. I then characterized Eastside Counties into the following types: *metropolitan*, *amenity*, *diversified production*, *heritage production*, *heritage production + public administration*, and *decline* (Figure 24 & Figure 25). County snapshots (Appendix) were created using data from county economic development plans and websites.

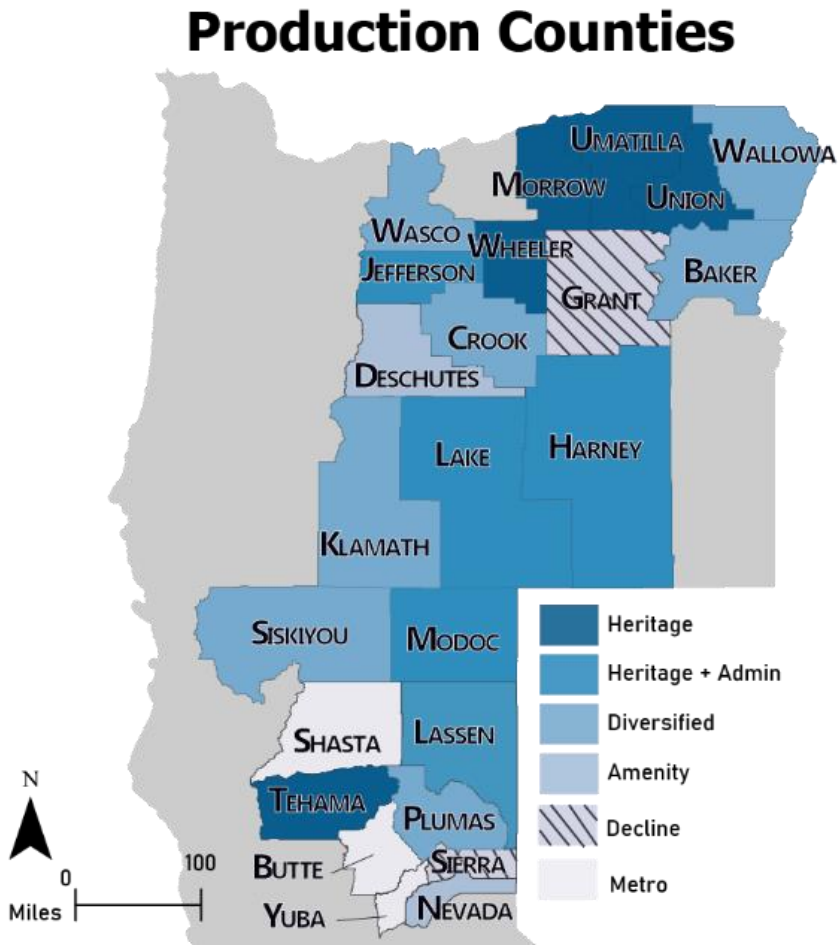

Figure 24 Eastside Counties were organized into seven types based on economic sector*: metropolitan, amenity, diversified production, heritage production, heritage production + public administration,* and *decline*. Lassen County's economy was dominated by the public administration sector. Though not above the mean, the natural resources sector was the second highest proportion of wages evaluated. Therefore, Lassen County was classified as *heritage production + public administration*.

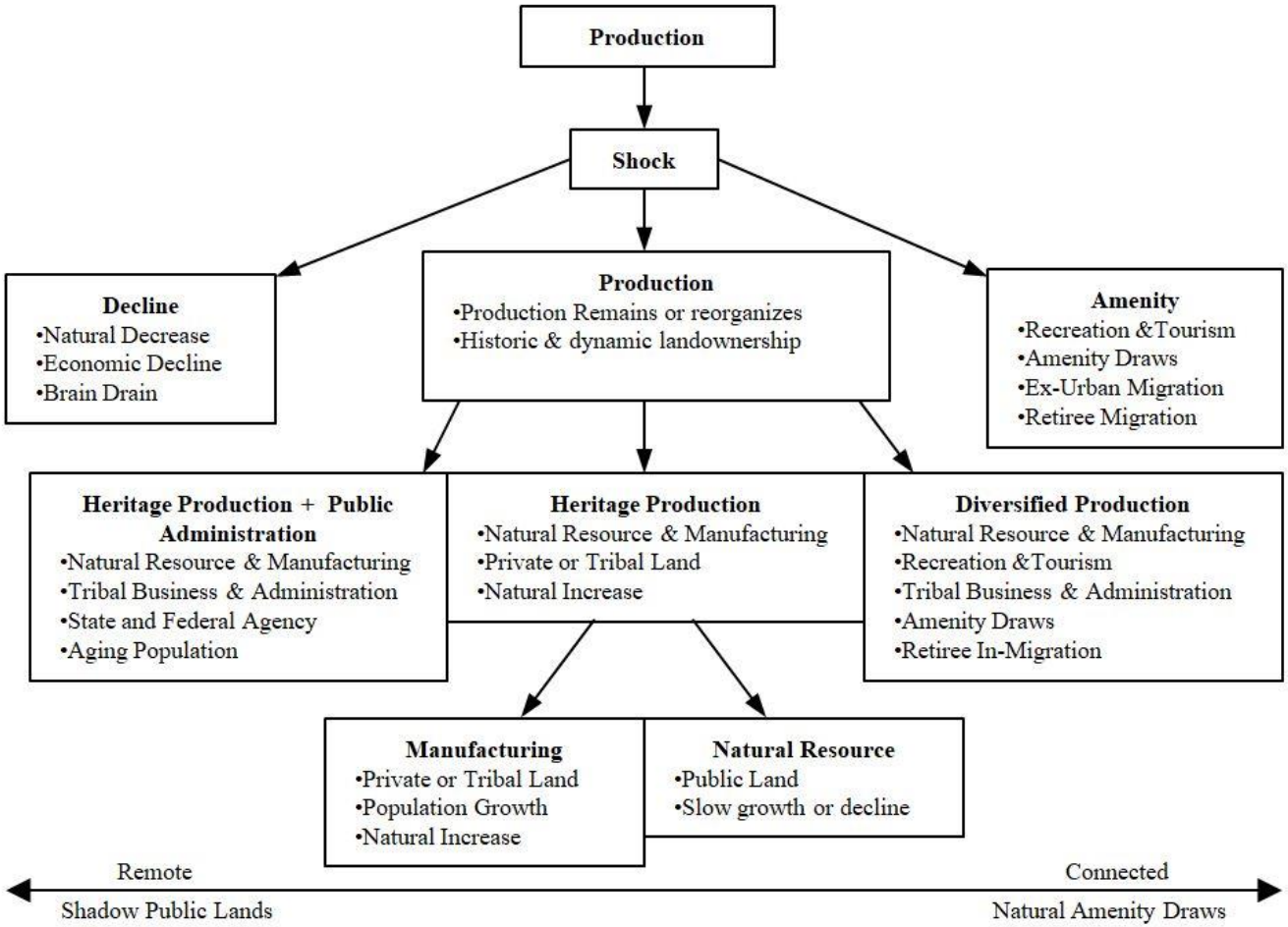

Figure 25 Production types, adapted from Morzillo et al. (2015) to include three new production types: *diversified production, heritage production,* and *heritage production + public administration*. See Table 13 in the appendix for detailed descriptions.

Heritage Production

Heritage production counties are counties that had above average location quotient in manufacturing or natural resource sectors (Table 2). All other sector location quotients in these counties were below average. There are two types of *heritage production* counties, those that 1) relied on manufacturing, versus 2) relied on natural resources. *Heritage production counties* had lower than average proportions of federally managed lands and were generally more connected.

Table 2 *Heritage production* counties have manufacturing, and natural resource sectors rooted in traditional natural resource industries. For a table with all counties, see Table 15 in the appendix.

County	**Population & Demographics**	**County Snapshot**
Morrow	Population Growth; Increase in Younger Residents	Morrow County/Tillamook County Creamery Association, crop agriculture and processing, ranching, secondary wood products manufacturing
Tehama	Increase in Younger Residents	East county timber harvest and ranching, west county agriculture, wood products and crop agricultural products manufacturing, Paskenta Rancheria
Umatilla	Slow Increase, Increase in Younger Residents	Pendleton Woolen Mills, wood products manufacturing, Amazon.com Data Center, East Oregon Correctional Institution, Confederated Tribes of the Umatilla Indian Reservation
Wheeler	Increase in Older Residents	Public administration, ranching, fossil beds inviting tourism

There was a difference between *heritage production* counties that relied on manufacturing versus those that relied on natural resources. *Heritage production* counties with high manufacturing sectors had population and economic growth. Some counties also had above average poverty. Wheeler was the only *heritage production* county did not have a manufacturing sector, had slower economic growth and population decrease.

Demographically, *heritage production* counties with manufacturing sectors had established Native American and growing proportions of Hispanic residents. These counties also had signs of increasing youth and growing racial and ethnic diversity.

Heritage Production + Public Administration

Counties that were characterized as *heritage production + public administration* had above average location quotients for public administration sectors in addition to the same qualifying economic characteristics as *heritage production* counties (Table 3). In general, *heritage production + public administration* counties were less connected, had low population increase and low wage growth. Most *heritage production + public administration* counties had high natural resource sectors. These counties had slow economic and population growth or decline.

Table 3 *Heritage production + public administration* counties have industries rooted in traditional natural resource sectors and have a high proportion of wages from public administration. Public administration wages may be from local, state, federal or tribal governments. For a table with all counties, see Table 15 in the appendix.

County	**Population & Demographics**	**County Snapshot**
Harney	Increase in Older Residents	Public administration, ranching, Burns Paiute Tribe
Lake	Increase in Older Residents	Red Rock Biofuel biomass to jet fuel, wood products manufacturing, ranching, high proportion of wages from USFS and BLM
Jefferson	Increase in Younger Residents, In-migration	Rapid growth, retiree in-migration, Confederated Tribes of Warm Springs, timber mill closed in 2016
Modoc	Increase in Older Residents	Ranching, Piute Tribes, public administration, high proportion of wages from USFS and BLM

To address economic barriers, some *heritage production + public administration* counties organized regional networks that engage counties to develop workforce and

economic development (Alliance for Workforce Development, 2021; Northeast Oregon Economic Development District, 2018; Northern Rural Training and Employment Consortium, 2021).

Jefferson County was an exception. Jefferson had a high manufacturing sector and followed all economic and demographic growth as *heritage production* counties with manufacturing. Jefferson County's public administration was likely a combination of federal and tribal administration. Data from manufacturing in Jefferson County may have since changed, as the Warm Springs Timber Mill closed production in 2016.

Diversified Production

Diversified production counties had above average location quotients for leisure and hospitality in combination with above average location quotients for natural resources, manufacturing, and/or public administration (Table 4). Most *diversified production* counties had, or were near, a major natural resource attraction, such as national parks or ski areas. Economically, these counties were incorporating new production strategies, like data centers and universities.

Diversified production counties were generally more connected. Some of these counties were marketing their connections to transportation infrastructure, ports, and urban centers to draw in new industries (Economic Development for Central Oregon, 2021; Baker County Economic Development, 2015; Choose Klamath, 2021). Demographically, most were growing in population and generally had higher rates of residents over 65. Some had increased in school enrollment.

Table 4 *Diversified production* counties are blending traditional natural resource industries with new economic sectors, including amenity-driven sectors. Some *diversified production* counties had mixed trends characteristic of *heritage production* and *heritage production + public administration*. For a table with all counties, see Table 15 in the appendix.

County	**Population & Demographics**	**County Snapshot**
Crook	Growing; Increase in Older Residents	Manufacturing, growth from Deschutes, amenity migration, secondary wood products manufacturing, Apple and Facebook data centers
Klamath	Slow Increase	Secondary and primary wood products manufacturing, agricultural manufacturing, Crater Lake National Park, Oregon Tech, agriculture
Plumas	Population Decline, Increase in Older Residents	Wood products manufacturing, drawing in recreation tourism and amenity migration, second homeowners, Greenville Rancheria
Baker	Growing; Increase in Older Residents	Coal and ore mine, timber, agriculture, food manufacturing, Anthony Lakes Ski Area
Siskiyou	Increase in Older Residents	Mt. Shasta recreation, timber harvest, public land management agencies.
Union	Slow Population Increase	Eastern Oregon University, wood products manufacturing, public land management headquarters
Wallowa	Increase in Older Residents	Amenity migration, agriculture, timber harvest, tourism
Wasco	Slow Population Increase	Crop agriculture, ranching, growing amenity migration, Google Data Center

Amenity

Deschutes and Nevada Counties had amenity-driven economies, though these patterns differed (Table 5). Deschutes was following economic and demographic patterns that more closely resembled its metropolitan peers and was trending on a path of amenity transition. Deschutes had increasing youth and a growing Hispanic population.

Nevada County was also following amenity patterns, but these transformations were starkly different from Deschutes. Nevada County was a retirement destination and a commuter county. Nevada County was connected to the Sacramento area, and was near

Lake Tahoe, an all-seasons tourist destination. Nevada County had a rapidly growing retirement population, but also had a growing school enrollment. Despite growth, the population remained heavily White.

Table 5 Amenity-driven counties were using local and nearby natural resources to draw in recreation tourism and amenity migrants. For a table with all counties, see Table 15 in the appendix.

County	Population & Demographics	County Snapshot
Deschutes	Rapid Increase	Rapid growth in Bend, amenity migration, Mt. Bachelor Ski Resort, primary and secondary wood products manufacturing
Nevada	Growing; Retiree In-migration	Amenity migration, commuter town, Sacramento area growth, Lake Tahoe area Recreation, recreation tourism, restoration, and conservation non-profits

Signs of Economic & Population Decline

Counties with signs of economic and population decline had lost population, lost total wages, and were isolated (Table 6). Sierra County appeared to be struggling to diversify. A substantial portion of Grant County's wages (16%) came from the USFS and BLM. The county appeared to be dependent on the natural resources sector and federal land management agency jobs.

Table 6 Counties indicating decline lost population and total wages. Counties in decline are isolated and are trying to diversify or capitalize on natural resource sectors. Both counties have high proportions of wages coming from USFS and BLM. For a table with all counties, see Table 15 in the appendix.

County	Population & Demographics	County Snapshot
Sierra	Population Decrease	Isolated, in Decline, trying for recreation tourism, high proportion of wages from USFS and BLM.
Grant	Population Decrease	Timber, wood products, ranching, high proportion of wages from USFS and BLM

DISCUSSION

As a region, Eastside Counties offer a glimpse into the communities that are maintaining industries centered on natural resource extraction and new modes of production, which has been understudied and somewhat overlooked relative to counties undergoing amenity-based transition. Morzillo et al.'s typology of economic transitions is a useful tool to explore economic transitions of individual counties that are in flux. Characterizing Eastside Counties by economic sector in 2016 provides a snapshot of each county's economy. Many Eastside Counties exhibit characteristics that fall into one of Morzillo et al.'s (2015) three categories, which are decline, amenity, or production. Few counties experienced amenity transitions. Instead, most counties have maintained some level of natural resource production. In production counties, I found combinations of economic sectors that expand the production category into three subcategories: *heritage production, heritage production + public administration,* and *diversified production* (Figure 25). Focusing on the production category complements Morzillo et al.'s (2015) observation that many counties are pursuing production as a viable economy, despite movement away from the industrial past. Expanding the production category serves to further explore factors that position counties to maintain production, and the types of demographic trends that occur in those counties.

This typology of production counties draws from key factors that Morzillo et al. (2015), and others (Rasker et al., 2009; Winkler et al., 2007; Ulrich-Schad & Duncan, 2018), have shown are central to economic transition: natural resources, connectivity, and

social adaptability. Morzillo et al. (2015) suggest that new production economies emerge in areas with high connectivity, high resource base, and moderate social adaptability. By expanding the production category, I found that production counties have distinct patterns in public and private lands, which may contribute to different types of economic combinations. I also found that production types may have broader socioeconomic implications. Though beyond the scope of this study, each of these points of intersection has implications for civic culture, a component of social adaptability, that includes social networks, institutions, trust, traditions, and community identity (Morzillo et al., 2015). I briefly discuss these conditions and point to additional case study research that may help inform community-level trends in production counties. I then compare and contrast Eastside Counties to neighboring NWFP counties.

Production Counties: Implications for Resource Base and Social Adaptability

Among Eastside Counties, I find that *diversified production*, *heritage production*, and *heritage production + public administration* counties differ in the proportions of federal and non-federal lands. Landownership and land use are factors that are not fully captured in my typology but likely contribute to natural resource production trends in Eastside Counties. Others have found that counties with high proportions of federally managed lands have been positively associated with growth from amenity migrants, and counties with more private land have been positively associated with growth from industrial development (Chi & Marcouiller, 2013). My findings reinforce these observations and indicate that in Eastside Counties federally managed lands and private

or tribally owned lands are associated with differing types of economic diversification in production counties (Figure 25, Table 14).

Heritage Production: Manufacturing Sector, Private Land, and Racial Diversification

Heritage production counties with manufacturing sectors appeared to be growing. In addition to their growth, these counties stood out among Eastside Counties in two ways: landownership and demographic change.

Heritage production counties had higher proportions of private or tribal lands than federally managed lands. Counties with higher proportions of private land, or in some cases tribal land, appeared to have more manufacturing. This may be explained landowners having more authority and control over natural resources on private lands, compared to those managed on federal lands. Timber production serves as an example, where some private industrial forest owners, such as Sierra Pacific Industries and the Collins Company, also own their own mills. Similarly, the Confederated Tribes of Warm Springs manage tribally owned forests and operated a tribally owned mill until its closure in 2016 (KTVZ News, 2016). Essentially, these private entities with large land bases can provide their own products, process them, and deliver them to the market. By retaining authority of natural resources and the manufacturing of timber products, these counties can maintain heritage industries, such as timber or agriculture.

Private land ownership offers control over residential and industrial development, which can draw in new industries and residents (Crowe, 2006). The amount of private land may position *heritage production* countries to draw in new industries or diversify existing industries. While economic and population growth are generally positive, private

agriculture land, forests, farmlands, and rangelands in developing areas are sometimes threatened by subdivisions or rezoning for development (Drummond & Loveland, 2010; Francis et al., 2012; Heimlich & Anderson, 2001). This is an issue in areas where land value becomes more profitable than maintaining timber or agricultural production (Heimlich & Anderson, 2001). Therefore, economic and population growth in *heritage production* counties may put pressure on heritage industries if the lands they depend on are converted for development.

Second, *heritage production* counties had high growth in Hispanic residents. In response to literature on the West, Burow et al. (2019) identified a need to explore if "old West" (heritage-driven) or "new West" (amenity-driven) economies have different Hispanic settlement patterns. My research suggests that the answer to this question is yes. *Heritage production* counties with manufacturing sectors had the highest level of Hispanic population growth, alongside economic growth, steady median household income, and natural population increase, suggesting there were many stable family-wage opportunities. Like trends in *heritage production* counties, researchers have found that high manufacturing counties have growing Hispanic populations across the United States (Carr et al., 2012). Some counties already had higher proportions of Hispanic residents, yet others suggest in-migration, or linked migration between manufacturing and Hispanic residents (Nelson et al., 2009).

While *heritage production* counties had growing economies and increases in median household income, they also had high rates of poverty. This points to a possible bifurcation in the population, where settlement patterns segregate White and Hispanic

residents (Nelson & Hiemstra, 2008; Nelson et al., 2009). In these cases, Hispanic residents are central to local economies, but according to Nelson and Hiemstra (2008), their presence within the community may be obscured out of sight in predominantly White communities and constrained to poor living conditions. Though these countries have diversified age structure and human capital, socioeconomic inequality has negative implications for social adaptability (Morzillo et al., 2015).

Heritage Production + Public Administration: Natural Resource Sectors and Federal Land

High federal land counties with little economic diversification continue to have important relationships with natural resource sectors and federal land management agencies through local employment. This relationship is most evident in *heritage + public administration* counties (Figure 25, Table 14). For these counties, there appears to be little transition from former natural resource production industries. Instead, they are in a state of flux, teetering on the edge of economic and population decline unless they can engage new industries.

Jobs from public administration sectors, including wages from federal land management agencies, are important economic contributor in these counties. In addition to economic contribution, federal land management agency employees can increase community capacity for small towns (Charnley et al., 2006; Moseley, 2006). Many federal land counties have already lost local jobs due to agency restructuring (Charnley et al., 2006; Moseley, 2006). Further loss in agency employees has potential to impact *heritage production + public administration* counties at the community level.

With changing management paradigms and regulatory structures, *heritage production + public administration* counties are at risk of decline if they are unable to adapt to changing markets and natural resource regulations or diversify economically. Economic and population decline have negative implications for social adaptability (Morzillo et al., 2015). Without amenity draws and the connectivity that fuels amenity transitions, these counties continue to rely on natural resource sectors that may continue to dwindle. Incorporating alternative natural resource production sectors, such as the Red Rock Biofuel Plant in Lake County (Liedtke, 2019), may stimulate economic growth at the community-level.

Because federal land management agencies have substantial economic presence in *heritage + public administration* counties, collaborative partnerships between county government and federal land management agencies that identify ways that timber industries can engage in ecosystem management activities that also produce revenue may serve to revitalize communities on the verge of decline. These types of partnerships to revision natural resource dependent industries are already taking place in Grant and Harney Counties (Gatz, 2011).

Diversified Production

Diversified production counties are incorporating amenity-driven sectors to balance natural resource and manufacturing sectors, characteristics similar to what other authors have referred to as "transitioning" (Ulrich-Schad & Duncan, 2018) or "New West" (Winkler et al., 2007). These counties exemplify Robbins's et al.'s (2009) argument that "new economies do not wholly displace old ones, but that shifting sources

and flows of capital change the financial and regulatory conditions for both traditional and economic interests" (p. 372).

Among *diversified production* counties, there was a tendency to have economic sectors connected to natural resources, including recreation tourism, natural resource production, and agency employment (Figure 25, Table 14). This multifaceted relationship with natural resources on federal lands differs from amenity counties and from *heritage production* counties, particularly in the role that natural resources may play in local economies. In *diversified production* counties, natural resources may serve economic objectives through both recreation tourism and natural resource production.

With both amenity-driven and natural resource production-driven economies, *diversified production* counties are the most likely places for residents to navigate differing perceptions and land management priorities (Lybecker, 2020). As an example, Wallowa County's heritage industries, ranching and forestry, has been a point of contention between incoming residents seeking a rural lifestyle and long-term ranchers as the county becomes an amenity destination (Abrams et al., 2013). Robbins et al. (2009) point out that advocates for heritage industries and advocates for ecosystem benefits may have very similar, rather than opposing, interests. Collaboration between managing for natural resource production and ecosystem benefits have been described in a land-related context as "working lands" (Diekmann et al., 2007; Naugle et al., 2020) or in a social context as "co-opetition" (Larsen & Hutton, 2012). *Diversified production* counties may offer an opportunity to explore how communities are integrating multi-use landscapes.

Because *diversified production* counties may employ multiple uses for natural resources and have mixed proportions of private and public lands, they may have the benefits or disadvantages of both *heritage production* and *heritage production + public administration* counties. For example, *diversified production* counties that are incorporating new industries or have rapidly growing populations may put pressure on heritage industries. In contrast, less connected counties may rely more on natural resource production and federal land management agencies, similar to *heritage production + public administration*, and be vulnerable to shifts in markets, policies, or climate. Blending multiple strategies for natural resources, such as recreation and natural resource production, may offset some of these risks.

This study was able to directly measure some elements of social adaptability, including ownership and control, age structure, and poverty and income. It was unable to measure many elements of civic culture, such as networks, institutions, trust, traditions, and community identity. Yet, socioeconomic trends in Eastside Counties pose new questions that form around the elements of civic culture. For example, many *diversified production* counties were incorporating new industries, such as data centers or prisons. Data centers transitions depend on community networks and local leadership (Burrell, 2020). In contrast, prison transitions have had negative impacts on trust and community identity (Che, 2005; Packard & Courtright, 2015). In what ways are these economic transitions affecting community identity and socioeconomic well-being? I aim to answer these questions in Chapter Two.

NWFP: Compare and Contrasting Relationships to Federally Managed Lands

Comparisons between Eastside and NWFP counties give a side-by-side regional comparison in economic and demographic change. In many ways, NWFP counties and Eastside Counties follow similar economic and demographic trends. It is differences between the two regions, such as the Eastside's dry forests, "shadow" public lands, and lower population, that provide illuminating lessons.

Though many Eastside Counties do still have mills, the substantial loss of infrastructure has created geographic gaps, where remaining mills are clustered within counties. Eastside forests are dry, with slower-growing species, and have species that have a lower market value (Adams & Latta, 2005). Distance between wood processing facilities drives up haul costs. This increases harvest costs, which further challenges the market value of Eastside wood products. Low revenue from harvests on federal forests has challenged Eastside forests' ability to subsidize restoration, reducing the viability of restoration in some areas (Adams & Latta, 2005).

Declining wood processing infrastructure perpetuates uneven restoration and uneven fire risk. Federal land management policies that suggest a hands-off approach are "inconsistent" with management conditions in Eastern forests, which have historically been exposed to frequent fires (Spies et al., 2019, p. 515). NWFP studies found that communities with closer proximity to wood products processing facilities, such as small diameter mills or biomass plants, had higher success rates in meeting restoration goals (Nielsen-Pincus & Moseley, 2013). Restoration and vegetation management

achievements are especially important to reduce fire risks in NWFP communities that are experiencing population growth in the Wildland Urban Interface (WUI) and are an explicit priority of forest managers in the NWFP (Spies et al., 2018; Spies et al., 2019). With drier forest conditions and some of California's largest wildfires to date, Eastside Counties are facing greater pressure to reduce fire risks. Butte County's forested community, Paradise, was destroyed in 2018 by the Camp Fire. In the same year, Shasta County, another metropolitan county, experienced the Carr Fire. In 2020 Butte County burned again during the North Complex Fire. These fires underscore the urgency to reduce fire risks in the region.

The location of these fires highlights a primary difference between the population distribution in Eastside and NWFP counties, primarily in the number and size of metropolitan areas. Four of the 24 Eastside Counties are metropolitan counties (16.6%), compared to 32 metropolitan counties in the 72 NWFP counties (44%). Eastside metropolitan counties are small metropolitan counties with small urban centers; the remainders of the counties are largely rural and sparsely populated. In contrast, the NWFP had several large metropolitan centers and associated urban sprawl.

Unlike NWFP metropolitan counties, Eastside Counties are disconnected from large urban centers. This limits the economic diversity, meaning economic stability, of Eastside metropolitan counties to fall back on when there are changes in natural resource sectors. Further, Eastside Counties are less able to benefit from connectivity to metropolitan centers that helps promote amenity and production-driven economies. This factor in connectivity, combined with the type of natural resources, may highlight the

difference in the rate of amenity transitions between the NWFP and Eastside Counties. Although my study and NWFP studies evaluated amenity counties differently, recreation counties in the NWFP and amenity counties in the Eastside provide a rough comparison. Twenty of the 72 NWFP counties (28%) depend on recreation tourism (Spies et al. 2018), while only two of the 24 Eastside Counties (8%) followed this transition. Issues of connectivity and natural amenities that draw tourism and amenity migration are likely factors in the low number of counties that have selected to shift toward the amenity model.

Table 7 Eastside Counties and NWFP counties differences in metropolitan counties establishes differing levels of connectivity. This influences economic transitions.

Region Characteristics	Eastside Counties	NWFP Counties
Number of Counties	24	72
Metro Counties	4 (16.6%)	32 (44.4%)
Amenity Transitions	2 (8.3%)	20 (27.8%)
Timber Processing Facilities	62	197

Metropolitan counties in both Eastside and NWFP were more racially and ethnically diverse than non-metropolitan counties. The NWFP reports identify a difference in demographic trends between the western and eastern areas, where the eastern side of the Cascades has higher proportions of Hispanic residents than non-metropolitan NWFP counties (Charnley et al., 2018; Johnson & Lichter, 2016). My findings reinforce these observations, and some Eastside Counties showed signs of growth in Hispanic residents. These counties showed signs of increasing younger populations, whereas other non-metropolitan counties in the Eastside and the NWFP show general trends toward aging populations (Spies et al., 2018; Nelson et al., 2009). Natural increase in these counties coupled with high proportion of Hispanic residents

supports research on rural areas nationwide that show counties with higher proportions of Hispanic residents both contribute to natural increase and may offset population decline in some counties (Johnson & Lichter, 2016; Nelson et al., 2009).

This uneven spread of increasing Hispanic and younger residents point to possible questions about settlement patterns in the NWFP and Eastside Counties. Population growth from Hispanic residents may revitalize communities that are otherwise in decline (Johnson & Lichter, 2016; Nelson et al., 2009). How can residents incorporate these community dynamics into making more vibrant communities? How do these rural communities avoid (or reinforce) racial bifurcation? Minority populations have historically been underrepresented in visitors to federally managed lands (Charnley et al., 2018; Weber & Sultana, 2013). In what ways can federal land managers in diversifying communities incorporate Hispanic populations in collaborative projects?

Differences between Eastside and NWFP counties underscore that communities, natural resource industries, and economic relationships with federally managed lands are adapting in differing ways. Connectivity, resource base, and social adaptability all contribute to economic transitions. Eastside Counties and NWFP counties are dissimilar in terms of connectivity and ecology. This distinction suggests that available economic paths and community ties to federal lands for NWFP and Eastside Counties will differ. Key findings in Table 8 summarize these differences.

Table 8 Key findings for Chapter One are summarized by Morzillo et al,'s (2015) characteristics, connectivity, resource base, and social adaptability.

Key Finding	**Explanation**
Connectivity to metropolitan counties affects production and amenity driven transitions in Eastside counties	With fewer and smaller metropolitan counties, compared to NWFP counties, Eastside counties exhibit less connectivity to metropolitan areas. Thus, these counties have fewer benefits from the economic diversity of metropolitan counties and transportation connectivity that supports amenity-driven sectors. As a result, Eastside counties will likely continue to depend on natural resource sectors or integrate new modes of production.
Resource base, particularly land ownership and economic base, produce novel natural resource centric economies in Eastside counties.	The opportunities for natural resource production in Eastside counties differed according to land ownership (i.e., public vs. private ownership). For some counties, public lands provided natural resources attractions; for others, federal land management agency employment was a substantial economic contributor to the county's total wages. Private land ownership for agriculture and timber production in some counties established decision making and control over natural resource production and manufacturing, operating through vertically integrated production. For some counties, private agriculture and timber helped stabilize economies following changes to federal timber management and reduction to timber related manufacturing jobs.
Economic transitions have implications for social adaptability and well-being in Eastside counties	Eastside counties exhibit a range of economic transitions and demographic and well-being trends. Some production trends correlated with demographic and economic trends. Steady manufacturing corresponded to signs of economic and population growth, paired with an increase in poverty. Natural resource economies had signs of slow population and economic growth, aging residents, and (in some cases) economic and population decline. Thus, specific production types have implications for social adaptability and well-being.

CONCLUSIONS

Natural resource and manufacturing are key sectors in many Eastside Counties, as are increasing amenity-driven sectors. Eastside Counties encompass what Lybecker (2020) describes as the "Next West", where both old west (heritage industry-driven) and new west (amenity-driven) economies, perceptions and use of public lands, development, and demographic trends are blended across the geographic landscape of the West. Focusing on production counties gives insight to where these economic sectors and demographic trends are blending. Secondly, focusing on production counties offers an opportunity to see how relationships between federal lands and adjacent communities are developing outside of the amenity model. Case study research in Eastside Counties can offer insight into the links between economic, demographic, well-being, and community ties to heritage industries and public lands. I pursue some of these questions in Chapter Two.

CHAPTER II: COMMUNITY-LEVEL ADAPTATION IN TWO NEXT WEST PRODUCTION TOWNS

INTRODUCTION

In the United States, rural communities situated near federally managed lands (e.g., adjacent communities) have had an economic relationship with federal forests and rangelands that has historically stemmed from production and utilization, and economies and identities built on natural resource extractive industries, such as forestry, ranching, agriculture, and mining. I call these relationships to natural resource dependent industries *heritage economies*. These industries have historically been part of individual identities of community members (Harrison, 2017; Holland et al., 2020) and community identity (Bell & York, 2010; Harrison, 2017; Lewin ,2019; Williams et al., 1995).

Forest products jobs, such as logging or timber mill workers, are an example of a heritage economy that has undergone dramatic change due to shifting markets and land management policy. Since at least the 1990s, public opinion steered federal land management policies away from natural resource production and extraction (Cubbage & Newman, 2006; Kelly & Bliss, 2009; Spies et al., 2018). Policies such as the Northwest Forest Plan and Eastside Screens were put into action to shift the way that federal land management agencies, such as the United States Forest Service (USFS) and Bureau of Land Management (BLM) manage federal forests. As federal land management changes, forest products industries' access to timber on federally managed lands have been reduced or more stringently regulated.

At the community level, tensions have risen between residents in some communities as they grapple with differing perceptions of natural resource use (Abrams et al., 2012; Boucquey et al., 2012; Sherman, 2018). An example of local contention comes from the Pacific Northwest, where movement to protect the federally listed Northern Spotted Owl erupted in the "Timber Wars" (Loomis & Edgington, 2012). Contention arose around jobs versus "the owl", where employees that had jobs in forest products perceived their financial security to be at risk from changing forest management policies (Loomis & Edington, 2012). To further compound the issue, forest products workers may lose a sense of identity in addition to jobs (Harrison, 2017). Thus, in the social context of changing land-use policy, economies, individual livelihoods, and identities were all at risk.

In the wake of revised federal land management policy, changing markets for timber products, and national deindustrialization, timber towns have been positioned to search for new ways to diversify local economies (Morzillo et al., 2015). In this Chapter, I focus on two case study communities that are economically diversifying by inviting in new industries unrelated to federally managed lands. I selected two small cities, Prineville, Oregon, and Susanville, California. In response to mill-closures and a declining timber industry, Prineville and Susanville have identified and pursued new industries to support their local economy. Following Prineville's last timber mill closure in 2001, the city "courted" Apple and Facebook to site data centers. In a proactive response to the first signs of a wavering timber economy, Susanville voted to allow the construction of the California Corrections Center in 1963. The community voted again in

1995 to allow a second prison, High Desert Maximum Security State Prison. Shortly after, in 2007, the Federal Correctional Institute, Herlong, was built just outside of Susanville. In these case studies I ask: 1) What are the diverse ways that former mill-towns are demonstrating community adaptation and well-being? 2) What community ties (social, political, cultural, and economic) remain to timber industries? 3) What are community ties to federally managed lands?

These case studies document residents' experiences of community change in towns that pursued new economic ventures as a result of declining timber-based economies. They contribute to a growing body of literature that explores changing rural communities in a post-industrial United States, rural adaptation strategies, community identity, ties to heritage economies, and adjacent communities' ties to public lands.

Adjacent Communities in an Era of Forest Resilience and Health: Community-Level Response and Adaptation

In an era of forest management that is focused on health and resilience, adjacent forest communities are encouraged to be adaptive (Kelly & Bliss, 2009). Adaptable communities have the capacity to respond to economic or social shocks by absorbing them or adjusting (Morzillo et al., 2015). This adjustment is facilitated by community capacity, which is the ability of a community to access and leverage community assets, such as social capital, connectivity, or natural resources (Magis, 2010, Morzillo et al., 2015; Wilson, 2012). Social capital, the "glue" that binds communities together, is an important factor to help creates cohesive groups within a community. Bridging social

capital is the ties between community groups that might otherwise not interact (Granovetter, 1973; Woolcock, 2000). Both bonding and bridging social capitals build community capacity (Chaskin, 2001; Cheng & Sturtevant, 2012), bonding facilitates trust and reciprocity, and bridging leverages distinct groups' resources. Importantly, community capacity must be evaluated at the local level to account for local circumstances (Steiner & Markantoni, 2013).

Research on adaptation has found that communities' response to economic shocks may be proactive, leveraging local capacity, or reactive, building or adjusting local capacity (Burrell, 2020; Emery & Flora, 2006; Skerratt, 2013). Response is shaped by local leadership, both formal governance, such as city or county officials, and informal governance, such as community organizations (Abrams, Davis, et al., 2015; Wollstein & Davis, 2020). Blending leadership between informal and formal governance is a strategy emerging in rural communities and is described as adaptive governance (Abrams, Knapp, et al., 2015) or network governance (Abrams, 2019; Steen-Adams, 2020; Wyborn et al., 2015). Local leadership determines local priorities and strategies for adaptation (Burrell, 2020). Out of varying combinations of community capacity and local priorities, adjacent communities have emerged with a range of economic transitions (Morzillo et al., 2015; Ulrich-Schad & Duncan, 2018; Winkler et al., 2007), changing residents, shifting relationships with natural resources, and differing governance structures. I discuss each of these in turn.

Many adjacent communities are looking to stabilize local economies through economic diversification and by replacing jobs lost from shifts away from

industrialization. As communities adapt, researchers have examined how the ways that communities organize themselves positions them to draw in new industries (Crowe, 2007; Steiner & Atterton, 2015). Economic transitions include shifts in natural resource management, such as restoration economies (Hibbard & Lurie, 2013; Formosa & Kelly, 2020), emphasis on recreation and tourism (Abrams et al., 2012; Charnley et al., 2008; Hunter et al., 2005), to new agriculture, such as cannabis production (Kelly & Formosa, 2020), or alternative industries, such as prisons (Chappell, 2012; Che, 2005) or data centers for big tech companies such as Google, Amazon, Facebook, and Apple (Burrell, 2020; Pickren, 2017).

Prisons emerged as an economic strategy for rural towns in the 1980s and 1990s, a period where declines in manufacturing and agricultural jobs coincided with the United States' "tough on crime" era (Gilmore, 1999; Hooks et al., 2010). Prisons were sited during these years on "devalued rural land" (Gilmore, 1999, p. 184) in "lagging" communities (Cherry & Kunce, 2001, p. 1). In potential host communities, advocates for prisons focused on their economic potential to replace jobs lost from declining manufacturing and agriculture sectors (Che, 2005). However, the economic benefits of prisons have emerged as questionable at best. At the times prisons are established, they do encourage population and employment growth (Hooks et al., 2010). However, benefits after the introduction period are unclear and may "impede" additional economic growth and "may harm struggling communities" (Hooks at al., 2010, p. 238). Prisons often fail to meet local contracting propositions (Hooks et al., 2010; Packard & Courtright, 2015). Instead, fast food restaurants and "big-box stores" follow prison installments (King et al.,

2004). A divide between low-wage service jobs and high-wage prison jobs have provided limited local employment options.

Prison economies have consequences on community identity and social cohesion as well (Che, 2005; Packard & Courtright, 2015). Residents may be resistant to the stigma of being a "prison town" and division within the community may emerge as the community determines if they want to establish a prison (Che, 2005). Communities have turnover because of correctional officer transfers (King et al., 2004) and many correctional officers choose to commute from nearby areas (Che, 2005; Packard & Courtright, 2015). Packard and Courtright (2015) found that, though they are garnering wages from the local institution, correctional officers may not support local businesses, and frustration with prison employees' demeanor and attitudes created tension within the community and prison employees. Prisons have surfaced racial and socioeconomic prejudice, specifically toward inmate families moving into the community (Che, 2005; Packard & Courtright, 2015).

More recently, data centers, the physical housing of the internet or "the cloud", are emerging across rural landscapes. These large facilities have been likened to modern day factories, a reference to their environmental impacts more than to their production (Pickren, 2017). However, for communities that lost manufacturing jobs, data centers have been welcomed as an employer that provides family wage jobs: above average wages with benefits (Burrell, 2020). Research on the relationship between data centers and communities is sparse. Gilmore and Troutman (2020) conclude that residents in communities with incoming data centers are uncertain about the effects a data center will

have on local “culture” and natural resources. This case study helps fill in some of these gaps.

As communities pursue new industries, economic adaptation may be challenging if community identity is built around heritage economies (Che, 2005; Sherman, 2018; Walker & Fortman, 2003). Heritage industry employees or long-term residents may grieve the past and feel a sense of loss or nostalgia (Sherman, 2018). As new industries move in, residents may find themselves in conflict over economic shifts as a result of attachment to heritage industries and a changing sense of community identity (Che, 2005; Walker & Fortman, 2003). Community attachment to heritage industries may vary, meaning some communities may be more willing, and ready, to adapt than others (Lyons & Parkins, 2013).

As adjacent communities adjust to economic shifts and changes in residence, researchers have found differing, and sometimes competing, perceptions of land use (Boucquey et al.,2012; Hull et al., 2001). Adjacent communities may find themselves in conflict with external perceptions on appropriate use of natural resources or public land (Young et al., 2010), or face barriers to achieving local interests due to external political structures (Wyborn, 2015). A common narrative in rural literature is contention between land-use perception, particularly between long-term, or generational, residents and newcomers (Boucquey et al., 2012; Walker, 2006; Walker & Fortmann, 2003; Sherman, 2018). Many researchers have claimed that long-term residents value the utilization of natural resources, while newcomers prioritize recreation and amenity use (Boucquey et al., 2012; Walker & Fortmann, 2003; Sherman, 2018). Others have found that heritage

industries and conservation efforts may share stewardship interests (Brunson & Huntsinger, 2006; Kelly & Kusel, 2015; Wollstein & Davis, 2020). The paradox of mutual, yet competing, interests on natural landscapes has been described as "co-opetition" (Larsen & Hutton, 2012). Negotiations over natural resource use are anticipated to continue as a central dialogue that shapes the future of the Western United States (Lybecker, 2020).

A variance in local governance capacity to address economic and natural resource interests is emerging as adjacent communities undergo economic and social transitions (Abrams, Davis, et al., 2015; Burow et al., 2019; Robbins et al., 2009; Wyborn, 2015). Communities differ in their economic capacity, and their organizational approach to addressing natural resource issues. The capacity of local governance to be proactive or reactive can propel community adaptation or perpetuate disparities. For example, NWFP monitoring reports found that communities that had strong leadership, educated workforce, and organizational ability were able to access economic stimulus programs made available to help adjacent communities following the NWFP decision (Christensen et al., 1999). Smaller communities with less transitional capacity were unable to take advantage of these resources, resulting in an inability to mitigate significant economic loss from reduced timber harvests (Christensen et al., 1999).

Out of differing community capacity, adaptive governance is emerging by creating networks between formal and informal governance to determine local priorities and meet objectives at multiple scales (i.e., local, regional, state, national) (Abrams, Knapp, et al., 2015; Crowe, 2007; Robbins et al., 2009). This creates a variance in the

ways that communities are addressing natural resources. Formal governing bodies provide structure, such as permitting, taxes, school districts, etc. (Crowe, 2007), while non-governmental organizations are asserting themselves as local leaders, particularly in areas concerning natural resources (Burow et al., 2019). In communities where formal governance has low capacity, "non-governmental governance" is emerging as a leadership strategy to "supplement – in some cases supplanting – formal governance entities (Burow et al., 2019, p. 7). These organizations are emerging to address community priorities in response natural resource issues that threaten residents, like wildfires (Abrams, Knapp, et al., 2015), threats to adjacent federal forests (Steen-Adams, 2020), species and habitat conservation (Wollstein & Davis, 2020), and to pursue economic development (Davis et al., 2016). Importantly, the focal interest (e.g., recreation, restoration, forestry, ranching) of community organizations coupled with their ability to gain financial or political support and influence has the potential to shape local relationships with federal lands (Abrams, Davis, et al., 2015; Abrams, 2019; Walker, 2006).

The capacity of adjacent communities and capacity of local federal agency offices may structure both parties' ability to partner and collaborate (Abrams, 2019; Kelly, 2018). Federal agency restructuring has influenced the capacity for local agency offices to engage with their host communities. Abrams (2019) identified three factors that contributed to the transformation of the USFS in its current stage: loss of political constituency, shifts in budget priorities to fire suppression, and loss of staffing positions previously funded by timber receipts. Reduced numbers of agency staff in adjacent

communities has contributed to a loss of community capacity to respond to forest management goals (Buttolph et al., 2006; Spies et al., 2019). The result of the agency's transformation has weakened its capacity and positioned the agency to rely more on partnerships with state or local governments and non-governmental organizations (Abrams, 2019; Abrams, Davis, et al., 2015; Spies et al., 2019).

In addition to reducing agency capacity, federal land management transitions resulted in a loss of community trust (Coleman et al., 2021; Spies et al., 2019). Federal land management agency representatives were part of their resident communities, and reduced staffing and staff turnover has eroded relationships with local agency offices and local perception of agencies (Coleman et al., 2021). Collaborative community-agency partnerships are identified as one way to rebuild community trust and repair community-agency relationships (Davis et al., 2018; Spies et al., 2018).

Case Study Context: Former Timber Towns in an Era of Forest Health and Resilience

It is in this context of shifting economies and shifting ties to adjacent public lands that this case study is situated. Prineville and Susanville host the forest supervisor and district offices of USFS and BLM. In Prineville, the local ranger district serves the Ochoco National Forest and BLM serves the Prineville Field Office. In this region, the Eastside Screens are in effect for federal forests. Susanville hosts the Lassen National Forest district office and BLM's Eagle Lake Field Office. The Lassen National Forest is under the Sierra Nevada Forest Plan Amendment. Though neither county falls within the biological habitat of the Northern Spotted Owl, which delineated the boundary for the

NWFP, both counties are included in the NWFP's socioeconomic monitoring reports. While NWFP communities have generally been well studied, since the initiation of NWFP monitoring, case studies have not been completed in these communities, which are at the edge of the NWFP.

METHODS

Both case study cities are the county seats, former timber mill-towns, and had ranching as a component of economies at the time of interviews. Case studies can uncover unique and complex relationships within social and environmental context and allow researchers to test theories and generalizations where similar phenomena are observed in multiple locations (Yin, 2018). To gather local perspectives, I conducted semi-structured interviews, which provide rich data that may not be captured by quantitative methods (Breslow et al., 2016; Charnley et al., 2008, Parkins et. al, 2001; Stedman et al., 2012; Urlich-Schad & Duncan, 2018), and may obtain residents' views that cannot be represented by census measures. I followed a combination of purposive and snowball sampling methods by identifying residents who could speak to current and past timber related jobs, timber and management of federal forests, and local community and economic well-being; if inclined, interviewees then suggested other residents who may be interested in participating in the study. My approach of case studies and selective, semi-structured interviews parallels the methods used to evaluate socioeconomic impacts in NWFP monitor reports (Charnley et al., 2006; Dillingham et al., 2008; McLain et al., 2006).

Pilot Interviews: Clarifying Community Objectives

One of my priorities was to design a study that is beneficial and relevant to the participating communities. Community-engaged research emphasizes the inclusion of

perspectives, values, and questions of informant communities (McKenna & Main, 2003; van der Meulen, 2011). Advocates for this approach assert that this style of research design adjusts the position of the researcher to listen to community needs more appropriately, honor community knowledge, and include perspectives of marginalized populations (van der Meulen, 2011), and that results may improve research quality and applications of findings (McKenna & Main, 2003).

To implement participatory research methods, I began initial outreach by identifying possible interviewees via web searches for representatives of community organizations related to natural resources or economic development. I contacted participants by phone or email and provided the interview guide prior to our conversation. Five respondents, three in Prineville and two in Susanville, participated in pilot interviews to discuss research questions that would be relevant to their community, the structure of interviews and interview questions, how questions might be adjusted, and what might be of local interest to include on a revised interview guide. With all interviewees, we discussed ways in which to share results back with participating and non-participating residents. Finally, each participant received a copy of the results.

Another consideration of community engaged research is clearly defining community and spatial boundaries (McKenna & Main, 2003). I asked participants of preliminary interviews three questions to define a community: to clarify the spatial and social boundaries of their town or region, to define the term in their own words, and if my working definition made sense. Each interviewee was asked if the town where the

interview was conducted was their community and participants clarified the scale to which they would speak (town, county, region). I used purposive and snowball sampling techniques to expand my pool of informants and critically examine the social positions and roles of informants to offer a range of perspectives and voices in research results.

Adjusting the Project: Ranching and Timber Overlap

Following preliminary interviews, it was clear that there was a prominent perspective missing from community heritage, local economies, and public land ties: the ranching community. To include rancher perspectives, I invited another graduate student to join the project and create a collaborative project that engages with the overlap of timber and ranching economies in eastern forests. We used the same case study locations and developed a shared interview guide for participants that could speak to both timber and ranching economies, as both have historically and recently used federal forests. We expanded our proposed sampling to include ranchers, rangeland managers, and ranching organizations.

Most interviewees had multiple roles, such as a public role in local government and individual or family ties to ranching or forestry. Using the shared interview guide, we interviewed these participants together. Residents with individual roles in ranching, timber, or public lands, were interviewed by a single researcher with a guide specific to their expertise, timber, or ranching. It is worth noting that we frequently found overlap in land use or participant ties related to both ranching and timber, even in participants

identified as having a single expertise. When referring to community ties to both ranching and timber, I refer to heritage industries or heritage economies.

Interviews

Between December 2019 and October 2020, we conducted 45 semi-structured interviews. On average the interviews were 60-90 minutes in length and were conducted over the phone or a web-based platform to adhere to COVID-19 precautions. Interview participants were given the approved IRB consent form that describes the project goals, our contact information, a copy of the interview guide, and were briefed on what we would be doing with the data we collected. Participants were given the option to be audio recorded and interviews were transcribed for analysis. Interviewees were aggregated into broad categories to ensure anonymity (Table 9).

In addition to open ended questions, the interview guide incorporated a series of questions that asked participants what Strengths, Weaknesses, Opportunities, and Threats (SWOT) they observed in their community (Table 10 and Table 11). Each interviewee received a transcription of their interview. Direct quotes were approved by the interviewees for use. All interviewees were anonymous and were not named in the project or presentations of the results.

Our analysis took an inductive approach, where categories, concepts, and themes emerge from the data, rather than predetermined categories or concepts (Patton, 2015). Interview transcriptions first went through a round of open coding to identify emerging

patterns and themes. All interviews were coded by both researchers to ensure intercoder reliability. Findings emerged by compiling codes and themes. Major findings include change in community and economies, community ties to timber, community ties to rangeland and ranching, and local relationships to federal lands and managing agencies. Excerpts that highlighted major themes demonstrate local perspectives on these topics.

Table 9 Interviewees are organized by the perception to which they spoke most toward, though many fell into multiple categories. Interviewees are organized broadly to maintain anonymity.

Representing	**Prineville**	**Susanville**	**Total**
Federal Agency[3]	6	9	15
Heritage Industry Representatives[4]	5	4	9
Local Government[5]	4	5	9
Non-Profit/Community Organization[6]	3	1	4
Grand Total	18	19	37

Women and minority populations were underrepresented in interviews. Of the participants, ten are women; though interviewees were not explicitly asked, only one identified themselves as other than White. Five participants did not live in Prineville or Susanville, but either worked in the town or were former residents. The duration of residency ranged from three months to over 60 years; many participants in both towns had multigenerational family ties.

[3] U.S. Forest Service, Bureau of Land Management, Natural Resource Conservation Service,

[4] Private timber manufacturing, forest managers, registered professional foresters (California), ranchers, University Extension

[5] Elected officials and staff for city and county

[6] Central Oregon Trails Alliance, EDCO (Crook), Lassen Land and Trails Trust, Lassen County Fire Safe Council

RESULTS

Prineville and Susanville had many similarities. Both are county seats and are geographically located where dry, eastern forests meet the high desert. Prineville's last mills closed in 2001 and Susanville's mill closed in 2003. Each city had turned to new industries and was finding pathways to maintain ties to public lands and heritage economies based on forestry and ranching. Despite these similarities, Prineville and Susanville held their own stories as they adapted from their timber-centric economies of the past (Figure 26). For this reason, I relay these stories in a way that is relevant to each location. For Prineville, one must understand local governance structure prior to understanding new economic ventures and the community's relationship with adjacent federal lands. In contrast, because Susanville began to shift economically prior to losing their last timber mill, one must first understand this economic transition.

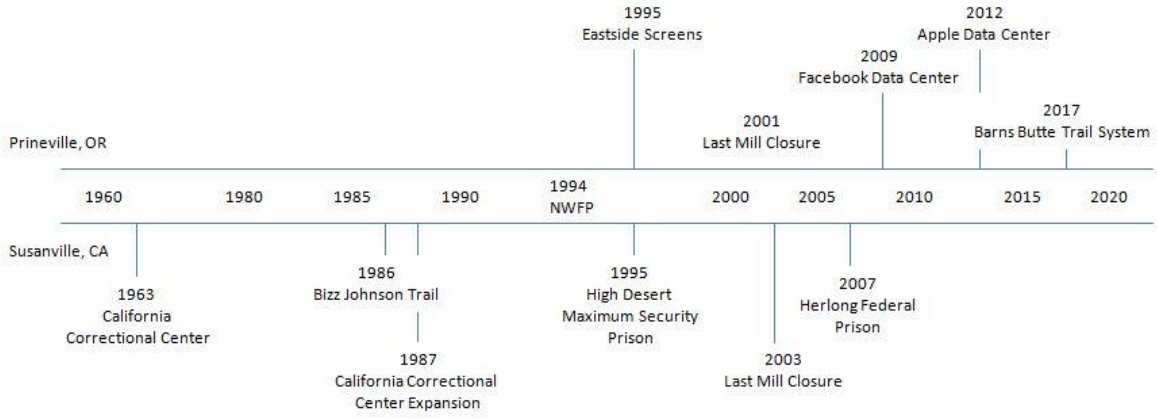

Figure 26 Community timeline shows events that have contributed to how Susanville and Prineville's economies have transitioned since the 1960s.

Prineville

Prineville is geographically and socially at the edge of different land uses, economies, and community perspectives. The Ochoco National Forest and open rangelands dotted with ranches cover the eastside of the county. The rural setting of the eastern county was illustrated by the distances rural ranching students must travel to attend high school. With the only high school in Crook County, Prineville residents board high school students from ranching families during the week. In stark contrast to this rurality, to the west of Prineville is the rapidly growing city of Bend, Oregon. Only a 45-minute drive, Bend's growth as a four seasons recreation hub and rapidly increasing housing costs. Interviewees shared that this made Prineville an attractive, and more affordable, option for new residents. As a community, Prineville was navigating how to balance the social and economic realities of a growing population, community ties to timber and ranching industries, new industries, and new residents. A local government representative explained the changes Prineville has gone through in the past two decades:

> I think the biggest significant change is as the sawmills really died out, we became truly a bedroom community of Bend where we had a little slower lifestyle. [Prineville was] this little Forest Products community that was very independent and for all the right reasons. And now we're kind of not independent. We're on the map. We got these two big companies here. We've got people from different backgrounds that are moving to our community and participating in some of the things that we're doing here.

Among the changes the city experienced, Prineville held its historic charm and embraced its natural features. Historic neighborhoods bordered Main Street to the Crooked River. The Barns Butte trails, a collaborative project between the city and BLM,

overlooked the new neighborhood and elementary school rising on the hills outside of the older part of town. A coffee shop, bike shop, museum and small brewery were scattered throughout the main part of town. Though a quiet town, Prineville was lively and growing. The SWOT analysis completed by interviewee is displayed in Table 10.

Table 10 The interview guide incorporated a series of questions that asked participants what Strengths, Weaknesses, Opportunities, and Threats (SWOT) they observed in their community. This framework provided a snapshot of interviewees perceptions of Prineville. Responses are organized using Morzillo et al.'s (2015) three factors for transition: connectivity, resource bae, and social adaptability.

Strengths	Weaknesses
● Resource Base ○ Ochoco NF ○ National Grassland ○ Crooked River ○ Weather draws in data centers ● Connectivity ○ Transportation ○ Proximity to Bend ○ Railroad ○ Airport ○ Broadband ● Social Adaptability ○ Strong sense of community ○ Turn liabilities into assets ○ Collaborative leadership ○ University extension	● Resource Base ○ Lack of diversification ○ Low-wage jobs ○ Small businesses compete with Bend's big stores ○ Market for eastside timber ○ Public land-locked ○ Fewer recreation draws than surrounding counties ● Connectivity ○ Off major highway ○ Haul costs from forests to processing facility
Opportunities	**Threats**
• Social Adaptability ○ Sense of community ○ Turn liabilities into assets ○ Collaborative leadership ○ University extension	● Resource Base ○ Wildfire Risks ○ Regulatory changes ● Social Adaptability ○ Bedroom community to Bend ○ Mismanaging population and economic growth ○ Division on change

Interviewees explained that the growth in Prineville was a comeback from an economic low following mill closures and the 2008 recession. The city had been losing local employment due to mill closures prior to the recession. Prineville once hosted five

timber mills, all of which had closed by 2001, with the Ochoco Lumber Company the last to close. One interviewee, a timber industry representative, recalled that when the last mill closed, “[Prineville] never set up for this. They didn’t, they weren’t prepared, the community, for something like this to happen.” Several interviewees indicated that this change was a shock for Prineville as a community and for their local economy. Another resident said, “when that was disrupted so quickly, and that stability was just taken away, almost like, just ripped away from this community.” Prineville struggled to recover. In the aftermath of the 2008 recession, Prineville had one of the highest rates of unemployment in the United States.

Though unprepared for a total loss of timber mills and the economic hardship following, interviewees indicated that Prineville had a history of “turning bad hands into good hands.” This optimism, accompanied by a sense of community pride, came through in conversations with residents. An industry representative reflected on the town’s history and geographic location, “We're sort of at the short end of the stick some that's sort of a whether it's true or not, it's kind of the long-held belief. It's not necessarily a weakness. It's kind of what makes us stronger because we work harder.” When asked where this adaptability came from, a local government representative said “There is an attitude. And [that] attitude is, let's work on the things that can make us successful and stable in the long run.”

The City of Prineville Railway was a tangible example that interviewees used to illustrate Prineville’s adaptability and proactiveness. When the Oregon Trunk Railroad was going to bypass the city in in 1918, Prineville built their own connecting line, the

City of Prineville Railway. The railroad was highlighted regularly in conversations, as well as by the Prineville History Museum, as a point of pride and local investment. Once "the lifeblood" to the timber mills, the City of Prineville Railway continued to serve, and attract, Prineville's new industries.

Prineville's natural features and transportation infrastructure created the conditions for the timber and ranching industries that the community was built on. In the same way, Prineville's natural environment and transportation infrastructure, including the Redmond Municipal Airport outside of Prineville, created conditions that attracted Prineville's newest industry: information technology. As of 2020, Prineville hosted data centers owned by Facebook and Apple. With cool nights and dry weather, Prineville provided the ideal climate for keeping energy costs low.

Interviewees suggested that Prineville's built infrastructure and climate were attracting more than new industries. Interviewees suggested that Prineville's proximity to "Big Bad Bend" was putting pressure on Prineville. Bend's growth was described as "explosive" and regional programs were described as being "Bend-centric". Growth for Bend meant growth for Prineville, in part because Prineville was more affordable than Bend. As a community organization representative said, "Bend is getting ridiculously priced for everything. People just can't afford to go there." Interviewees perceived that Prineville's affordability, compared to Bend's un-affordability, influenced who could afford to settle where. In some ways Bend and Prineville were commuter communities for each other. Residents that worked at high wage jobs in Prineville selected to live in Bend and commute to Prineville. In reverse, residents who worked lower-wage, or

service, jobs in Bend often selected to live in Prineville and commute to Bend. Because of Prineville's economic and population growth, several interviewees indicated that there were stresses on community infrastructure and lower income residents, as well as community identity.

Overall, interviewees were cautious about the economic transition and population growth, uncertain about what rapid growth meant for the community's attachment to its heritage industries. Interviewees suggested that navigating growth while maintaining Prineville's core values may be one of Prineville's greatest challenges. An agency representative explained:

> I wonder a little bit about the community in its transition… I don't have a high degree of concern about it because I think there's just so many opportunities here... But I think there is a little bit of a tension between the connection to the rural core values that are held near and dear to the heart of Prineville and this idea of progressive thinking around continued development… it just feels like that sort of dynamic tension around where, what's going to tip? I mean, where those two things clash, what's going to happen?

Prineville's population and economic growth is relatively recent and dynamic. All interviewees expressed that they were navigating what these changes mean for the community they cared about.

Community Collaboration and Leadership: Community, Economies, Federal Lands

Interviewees shared unanimously that one of Prineville's greatest strengths was in their collaboration and local leadership. From businesses and economic development to community groups, to interagency collaborations, interviewees recounted how they had witnessed different facets of the community working together. Community members and

leaders emphasized that to succeed, Prineville's local government demonstrated a willingness to listen to different perspectives and respond to meet community needs. A timber industry representative said:

> I think the community has great leadership. I think the community is willing to hold true to their values of who they are, but at the same time understands, and they may have been kicking and screaming, but they now understand that society has different values than they did thirty years ago and so they're ready to learn.

Interviewees said that Prineville's recipe for success relied on communication and collaboration between Prineville and adjacent federally managed lands.

Prineville interviewees indicated that the community had the ability to work together to create legislative change. A local government representative stated, "When it came to communicating and developing opportunities with our state legislators, with our federal agencies or state agencies, our federal delegation, we were able to do some very wonderful things in terms of some legislation." Interviewees explained how the city secured water rights and a voice in federal land management.

Interviewees identified that Prineville's local leadership prioritized communication at multiple levels of the community. Interviewees told how, over time, community leaders identified where they could work together and reported that the city and county worked very well together, and often spoke of the work that the city and county was doing as a unified entity. City, county representatives, federal land managers, and community organizations regularly met with multiple parties at the table. Interviewees indicated that communication opened opportunities for collaboration. Economic diversification took a collaborative approach through EDCO (Economic

Development in Central Oregon), a community organization that presented regularly at city and county meetings. Interviewees approvingly reported that the Ochoco National Forest Supervisor was a board member of the local economic development group.

The county took a proactive approach to working with federal land management agencies and timber industry representatives. Two examples interviewees described were the Ochoco Collaborative and the Crook County Natural Resources Committee. These organizations bring together representatives from local government and community organizations, state and federal agencies, and forest-based industries (wood products and restoration). At the county's request, the USFS and BLM presented regularly at public meetings to keep the community aware of upcoming projects. Regionally, county representatives were engaged in the Eastern Oregon River Rack, an inter-county organization of Eastern Oregon counties that advised the USFS and BLM. When it came to federal land management decisions, participation in these collaboratives "definitely gives us a place at the table."

Though timber was no longer a central economic contributor to Prineville, the city's heritage ties to timber and to the Ochoco National Forest were central to many conversations with interviewees. Local government representatives were adamant about finding ways to continue community connections to the timber industry through developing processing facilities, community events, and through collaborations with public land management agencies. With the notion of prioritizing economic diversification, some interviewees questioned if the city might offer tax incentives to wood products industries, such as a small diameter timber mill, to help the struggling

sector regain some footing. Many interviewees, including city representatives, asserted that a small diameter mill in Prineville would benefit the city and surrounding forests. The obstacle was the investment to get a mill started. Both federal land management agency representatives, local leadership, and timber industry representatives acknowledged that investors would need guaranteed timber volume to consider a new mill. All agreed that private land harvests were inconsistent due to market conditions for eastside timber, and public land harvests were inconsistent due to regulatory restraints. Though interviewees were hopeful for a mill, they were aware it would require cooperation and commitment between public and private forests.

The Cloud on the Hill: Big Tech in Prineville

> What we were able to do again as a community was recruit Facebook and Apple. And that's a game changer for us from a host of different perspectives. (Local Government Representative)

The biggest new industry in Prineville since the last mill closure was tech. Since 2009, Facebook and Apple built multiple data centers on the hills just outside the city center. Interviewees suggested that though a different industry, the data centers offered Prineville many benefits that were lost with the mills. Like the former mills, the data centers provided local jobs and created additional jobs through supporting industries. Where the mills might have created opportunity for mechanics, loggers, and foresters, data centers brought in construction. Timber-related jobs of the past provided direct pathways to locals, especially young people, to pursue technical training or employment out of high school. Similarly, Prineville was looking for pathways to connect residents, including youth, to data center jobs through education at the community colleges and

Oregon State University Extension. In this way, Prineville and supporting educational institutions were strategizing how to provide jobs for young people and reduce youth outmigration or rely on in-migration to support local jobs.

In addition to economic growth, the connections to the data centers gave Prineville incentive and capacity to expand their fiber optic broadband, something that many rural communities find themselves at a disadvantage. Further, they were preparing to have the largest solar field in central Oregon. Interviewees suggested that these advancements were strengths and offered future economic diversification and energy independence.

Interviewees observed that the data centers had made efforts to be active community partners. A local government representative said, “I don't feel as at risk as we were before. The data centers have invested literally billions of dollars in Crook County.” Facebook and Apple’s engagement with the community offered a sense of economic stability for residents.

Employing locals was a direct way interviewee saw the data centers supporting the community. A community organization representative explained that approximately 75% of Facebook employees were from Crook County. They noted, “it’s kind of who you hire when it comes to the personality of the place, I feel like they’ve done a good job about immersing themselves in the community.” Prineville residents indicated that they valued the effort that the data centers were making to engage with the community. Though the data centers are not located right in town as the mills were, Facebook was

recognized as a community player. Facebook donated to tech programs at the schools, contributed funds to trail work, and had employees that sit on local boards.

With the data centers in Prineville, interviewees observed economic and social changes. A local government representative observed that as community, Prineville is "close-knit", yet since the data centers moved in, it has "kind of changed the dynamics." Many interviewees valued the economic diversification but had mixed feelings about what this meant for Prineville's ties to natural resource industries. Some interviewees expressed that the data centers and employees simply do not align with "the heart of Prineville", which is the ranching and timber heritage. Heritage industry representatives raised concern that Prineville might lose economic and political ties to natural resource industries, "the data centers, the solar farms, and all that's coming up that's really going exponentially fast… I think that that's bringing in people with more of a liberal politics. I think that we're becoming less dependent upon natural resources."

Despite economic growth attributed to the incoming tech industry, some interviewees were concerned that Prineville lacked enough economic diversification should a recession or an unforeseeable impact to the tech industry occur. A timber industry representative explained, "We're relying heavily on the tech thing you know, the Apple, the Facebook. Which we all know, just one little glitch in the giddy-up and they go out of business in a heartbeat. I mean, I think they're pretty stable. But I think we're too reliant." A local government representative echoed the concern, "So when you talk about risks, I guess the greatest risk would be something that comes along and closes data centers." A major question for locals was what would happen when the data centers were

done expanding. Residents recognized that the centers themselves have limited employment, and that the center construction created more jobs than the centers. With these questions in the open, interviewees believed that local leaders were doing what they could to draw in new industries.

Timber Was King: Timber and Secondary Wood Products

For many long-term residents, mills and the "era of timber" were seen as a positive time in the community. Interviewees referred to the five mills, steady wages, and family-wage jobs, especially for local high school graduates. Many interviewees had direct ties to the timber industry through employment, their own or family members, at mills or in logging. A timber industry representative remembered, “I mean, man, we couldn't wait to get out and make better money. You know, logging was king… And those guys couldn't wait to get out of high school and start logging, buy a home and stuff like that. And that's all changed.” Though there was a sense of nostalgia for a time past, all interviewees agreed that the pace of previous timber harvests was not sustainable.

Long-term residents recalled how the declining public land harvest and mill closures had spilt over onto small businesses, such as loggers, machine shops, hardware stores. One interviewee, a timber industry representative, described that local business closures created lasting hardship for residents, “We used to have supplies right here. Now everything is just next day, or the next day, or the next day. You can't just go down and, like we did in the old days, and get a part. For even a pick-up. It's just horrible.” Further, mill closures contributed to job losses, residents leaving, frustration with public land managing agencies, and grief.

In addition to supporting infrastructure and businesses, interviewees observed that institutional support for natural resource related programs, such as those with the Oregon State University Extension, had declined. Retiring federal and extension agents were not replaced and programs were underfunded or cut. Interviewees interpreted these changes as a dwindling support for natural resource industries. Many interviewees identified challenges for the timber industry, even at its relatively lower (post-1990s) profile. One of the most common struggles for the timber of the Eastside was the market value, exacerbated by high haul costs. An industry representative explained, “The prices for logs haven't gone up but the price gas fuel operations have gone up… You know, talking to people, it's getting harder to operate and doing it right.” Prineville’s nearest mills in John Day and Gilchrist were both over 100 miles from some parts of the Ochoco National Forest. During interviews, the Gilchrist mill laid off employees, posing a possible threat to further reduce Prineville’s nearest processing facilities.

Finally, timber industry representatives explained that there were barriers in running small logging operations. For example, a timber industry representative said that they were competing for labor with data center wages, “For me, you have got to drive an hour and a half into the woods. It is pretty quick to make your choice. You either got to love it so much that you’re willing to make that sacrifice or why would you do it if the same money is just up on the hill here?” As the timber economy dwindled, so did trained personnel. Simultaneously, technical training required to enter the field increased as equipment and technology upgraded. Technological advances in logging equipment

increased the costs to get established as a logger. As a result, interviewees were uncertain about the future of small, locally owned logging operations.

Interviewees reasoned that both private timber and public forests were at risk if what remained of Prineville's timber industry decreased any further. Public forests need wood processing facilities, even for restoration projects, as well as the foresters and loggers to do work. Agency representatives told how to thin forest stands, they were using federal subsidies such as Integrative Resource Timber Contracts (IRTC) and stewardship agreements to help offset haul costs. In this scenario, the market value for timber does not cover the costs to do the work. To see the project though, the USFS offset the costs. Interviewees suggested that these public-private partnerships were the future of the timber industry in Prineville.

"This is a different game now": The Future of Timber in Prineville

The future of forest-based industries in Prineville illustrated a continued interdependence on both federal forests and forest products industries. With overgrown forests, USFS representatives and non-agency representatives were searching for solutions to create jobs and improve stand conditions. Biomass, torrefaction, and a small-diameter mill were three possibilities that were suggested by participants. Each opportunity was supported by regional or local demand, which interviewees explained made them more realistic industries for Prineville to pursue. For example, Biomass in Prineville was described as an exciting option where the city would create its own market for the product. Essentially, the data centers' energy consumption was already moving Prineville to search for alternative energy through solar fields. Including biomass would

allow Prineville to produce electricity and provide it to the data center. Torrefaction would establish a partnership between the mills in John Day, Oregon. Local secondary wood products processing facilities created demands for a small diameter mill. A local government representative explained, “I’m disappointed the mill went down, but I don’t think it is the end of the road for what opportunities may exist going forward.”

While there was a sense of nostalgia and ties to the mill as a part of the community heritage, there was also a sense of pride tied to returning mills to the towns. Advocates for a new mill in Prineville emphasized that it could not be done by private dollars alone. The cost of starting a new enterprise would need subsidies and supply commitments from a federal partner. Both agency representatives and non-agency interviewees supported the idea. With new technology, interviewees recognized that a new mill would not provide the same number of jobs as mills in the past. Interviewees indicated that while they did not see the booming timber industry of the past returning with a new mill, having a mill in town would bring in a sense of pride and reduce haul costs for forest management.

In a Sea of Public Lands: Prineville’s Ties to Federally Managed Lands

One participant described Prineville as “an island in a sea of public land”; a sea managed by the USFS and BLM. Federally managed lands and their managing agencies were central in Prineville’s past and are key players in the city’s present and future. Interviewees identified the natural beauty, resource, openness, and recreation potential of public lands as one of the greatest strengths and opportunities. Simultaneously, federal

lands' ever-changing regulatory environment and risk of wildfire were identified as one of the greatest threats.

Community-Federal Relationships

Prineville's relationship with federal land management agencies was in a process of rebuilding and reinforcing community partnerships following agency changes in the 1980s and 1990s. As a timber industry representative said, "they say time heals all things, and I think it's going to take a lot more time." Interviewees suggested that "cultural changes" in federal land management agencies were encouraging local engagement. Agency engagement and presence in the community was rebuilding the "credibility" of the USFS and "redefining" the agency's relationship with Prineville. For Prineville interviewees, this responsibility fell on the individual representatives of the agency. A local government representative stated, "It's all about the people, not about the agency."

Active presence of agency representatives was important to Prineville residents. There were two ways this was illustrated, the first was through agency representatives living in Prineville. A community organization representative opined, "If you are going to manage natural resources for a community, I feel like you need to be a member of the community to adequately gauge what they need." Many interviews offered the example of how the Ochoco National Forest's Forest Supervisor moved to Prineville when he accepted the position.

The second way that agency presence was recognized was agency representatives in the field. Whether in the forests or on grazing allotments, both agency representatives and non-representatives agreed that when agency employees "get out from behind the

desk" their community relationships improve. One representative said "time spent in person is always so much better, more effective that being behind the desk knowing what we know. So, it doesn't make our job a lot more difficult."

Agency representatives' ability to build relationships was dependent on at least two factors: the time spent in a position and on leadership or agency-wide decisions. Because individual agency representatives are "the face of" BLM or USFS, all parties agreed that agency turnover was a struggle for maintaining community partnerships. An industry representative spoke directly about the USFS, "It's just an open door and it's frustrating. Really frustrating for us. We develop these relationships and understanding and the next minute, you know, they're gone." An agency representative echoed the sentiment, saying that the agency's encouragement of employees to move up by moving to other districts creates turnover. Interviewees expressed that agency turnover removed representatives from the community and eroded community trust.

In scenarios that came from external agency decisions, such as budgets and priorities, agency representatives likened themselves to "middlemen" or "go betweens" between the agency and the community. "It's a real fine line to walk," one stated. Shifting direction from leadership, whether local or agency-wide, was one challenge that all parties acknowledged. Budget shifts or priorities were a tangible way that challenged agency engagement in the community. An agency representative said, "We go through so many changes so quickly that we haven't fully adapted to whatever change that we've been asked to do before we see another one coming." Another agency employee elaborated:

> I hate to go to funding first, but funding kind of slows us down. Where the priorities are, the area of districts, competing funding sources, projects that have been on the table for a myriad of years that just aren't getting the attention because something came up higher priority.

Interviewees suggested that finding a way to "steady" budget and priority changes would go a long way in improving the agency's work and ability to build community relationships.

While agency employees are required to follow regulations, agency representatives explained that they prioritized community collaboration. One representative offered that "we do have local discretion to an extent," and expressed that as an agency, there was "a lot of flexibility in the way that we approach our work." Agency representatives explained that intentionally finding ways to collaborate with the community positioned the agency to adapt and evolve with the communities they were a part of and the industries they engaged with. They said, "We need to be at the table with everyone else. And we need to be there in a place of respectful inquiry and not have a place of the position that says' this is how we do it."

Forests for All: Working Lands and Recreation in Prineville

> We've got livelihood, we've got recreation, we've got environmental. (Local Government Representative)

Formal forest collaboratives provided a solution for integrative forest management. Collaboratives brought multiple parties together to develop "practical solutions to deal with regulatory requirements." Interviewees suggested that if all parties, agency, community, loggers, ranchers, and conservation-focused, were represented in

creating the project plan, they had more success getting it through administrative reviews. Formal forest collaboratives assisted in making these goals a reality.

With the economic and population growth that Prineville was experiencing, local government representatives, agency representatives, and community organizations acknowledged that it was a priority to maintain public lands that meet the interests of recreation, ranching, and logging. All interviewees acknowledged that each of these forest uses had important economic potential to Prineville. The solution was proactive cooperation and communication.

Prineville interviewees were in a process of creating what recreation looks like in Prineville and the Ochoco. What they did know was what they did not want local recreation to look like: Bend. Interviewees perceived Bend's explosive recreation tourism as a warning of what could happen in Prineville, and as something to be avoided. Prineville residents believed that the city could not compete with Bend, nor did interviewees want to imitate Bend's transition. These interviewees perceived that Bend's history as a mill town was barely recognizable.

Interviewees suggested that Prineville's relationship with recreation was shaped by Bend's transition. A community representative explained, "Recreation… because we're so close to Bend… we get bleed over into the Ochoco National Forest where people are just trying to find a place where there's nobody at." Local leadership in Prineville was engaged in recreation planning, but not prioritizing recreation as a primary economic driver. As a local government representative stated, "Our focus is on family wage, benefited jobs and let recreation and tourism take care of itself." Another

expressed that their priority was on working with the Forest Service to create healthy forests through active land management, “We have a lot of recreation in the forest, believe me… But as far as relationships between the Forest Service and the community, we need to have a healthy forest.” When it came to recreation planning for public lands, interviewees shared that trail coalitions and local organizations were working with federal land management agencies to map out non-motorized trail routes.

Public land managers and local representatives in Prineville recognized an interconnection and interdependence between community benefits and economies, timber and ranching industries, and public lands. Local government, timber industry, and agency representatives expressed that they would like to see logging as a part of forest management return to federal forests. Reincorporating logging was seen as a way to improve forest health conditions, maintain access, diversify Prineville’s economy, and reinvigorate forest-based industries. Not only were public lands a benefit to Prineville, but that forest-based industries were necessary to improve and maintain the health of federal forests surrounding Prineville. An agency representative stated:

> We need to embrace change, and be part of that, not that we’re always going to get that right, but we need to be open and adaptable. If we don’t do that, then we become a hindrance to exploring some of these new opportunities and new solutions, as opposed to being part of the positive change that comes from our involvement.

Agency representatives expressed that they would like federally managed lands to be part of local solutions rather than a hindrance to Prineville’s development and change.

Susanville

Susanville, California was built for its heyday, a time when timber mills created boxes for fruit orchards and shipped them out on the Southern Pacific Railroad. Wide streets provided ample parking. Highway 395 passed directly through the center of town. The old railroad, converted to the Bizz Johnson trail, paralleled the Susan River, just outside of the city center. To the West were the forested Diamond Mountains, the northern end of the Sierra Nevada Mountains, to the east, open rangeland and high desert. More recently the historic upper main street was oddly quiet and virtually empty. Murals on historic buildings told the story of Susanville, with the faces of indigenous peoples, Euro-American settlers, and scenes of logging and cattle in forests. Now the timber industry lies dormant within city limits. Susanville's last mill closed in 2003. A long-term resident remembered when the mill was active in town, and recounted the changes that followed the closure:

> The mill, actually, is just a huge part of our town. When I was [young], when the mill whistle blew, we all knew to come in for lunch… and then it will blow again at 5 and then everybody knew it was dinner time… When it left, some of those employees got jobs at other mills, but some of them went ahead and went to work in our prisons.

Murals, museums, and memory conveyed the City of Susanville's ties to the timber industry.

Susanville was once a place of firsts and has a history of proactive community engagement. The city had one of the early rails to trails projects, completed in 1986. At one point, Susanville had the youngest mayor and county board member in the history of

California. When public land harvests were reduced in the 1990s, Susanville residents became active in one of the first forest collaboratives focused on public lands, the Quincy Library Group (QLG), which met about an hour southwest of Susanville in Quincy, Plumas County. A local legacy, the QLG brought together regional representation across county, city, and sectors to develop a management plan for the Tahoe, Plumas, and Lassen National Forests.

Interviewees overwhelmingly shared that there remained a strong sense of community. The community came out in force in reaction to crises, such as fires, or their neighbors' needs, such as fundraising. Interviewees were proud to share of Susanville's strengths, like its natural beauty. A local government representative described Susanville as "the world's best kept secret" where "you have beauty, you have peace, you have everything that's perfect, you have one of the best places on the entire planet. So that is a strength. That's a strength that cannot be ignored."

However, conversations were riddled with a general sense of being stuck, stagnation, frustration, and disappointment. This gave the sense that interviewees cared greatly about Susanville. As one interviewee, a timber industry representative, put it, "Susanville is in a funk." Another newer resident referred to Susanville as "a fixer upper," explaining, "This is like going buying the worst house in the best neighborhood and then fixing it up. I can't think of another town or city in Susanville that is more of an opportunity then Susanville." Collectively, interviewees suggested that what Susanville needs is a new vision; yet getting to a shared community vision had been difficult. The SWOT analysis completed by interviewees is displayed in Table 11.

Table 11 The interview guide incorporated a series of questions that asked participants what Strengths, Weaknesses, Opportunities, and Threats (SWOT) they observed in their community. This framework provided a snapshot of interviewees perceptions of Susanville. Responses are organized using Morzillo et al.'s (2015) three factors for transition: connectivity, resource bae, and social adaptability.

Strengths	Weakness
● Resource Base ○ Recreation ○ Four seasons ○ Stable government jobs ● Social Adaptability ○ Strong sense of community	● Resource Base ○ Small businesses struggling ○ Money leaving town ● Connectivity ○ Limited transportation (highways, railways) ○ Distance to wood processing facilities ● Social Adaptability ○ Lack of unity ○ Resistance to change ○ Education and exposure
Opportunity	**Threat**
● Resource Base ○ Recreation tourism ● Social Adaptability ○ Community economic vision	● Resource Base ○ Reliance on the government sector ○ Forest fires ○ Federal and State regulation challenging fire and water ● Social Adaptability ○ Perceived increase in crime and violence ○ Houselessness ○ Youth outmigration ○ Community division on future vision ○ COVID-19 in prisons spreading to community

As its timber economy began to sputter, Susanville residents anticipated a need to shift the city's economic focus. The city acted early and began to bring in prisons to replace job losses from a declining timber industry. With two prisons in Susanville's City limits, incarcerated residents bolstered Susanville's population, making it appear to be more populated than it is. Susanville hosted over 5,000 incarcerated residents, approximately one third of the city's population was incarcerated[7]. Employing

[7] According to the California Department of Corrections, California Correctional Center and High Desert State Prison

correctional officers and administrative roles, prisons are now the primary employers. With two state prisons, one federal, regional USFS, BLM, and NRCS offices, and local law enforcement jobs, the public sector now dominates Susanville's economy.

Though Susanville has had a history of taking initiative, residents said that in its current state, they "wouldn't see it as a visionary town". Some economic diversity is found in chain retail, and ranching remains a stable sector. Surrounding the city, small businesses - "mom and pop shops" - and locally owned restaurants are largely absent. Small businesses are struggling on the main streets, and most buildings along the street are empty.

Residents had many explanations for the quiet downtown. A lack of local support, high costs to renovate buildings to meet public code requirements, and the most common, competition from chain stores, Amazon.com, or large retail in Reno, only an hour and a half away. Lack of support from short-term residents or commuting prison employees were another speculation. As one resident stated, no money stays in Susanville. Another observed that ranching was the only local industry bringing in new money. Interviewees were generally perplexed by the struggling downtown and observed that it was one of the biggest changes in Susanville. A timber industry representative remembered, "Susanville used to have some nice family-owned restaurants where you go out and get a nice steak dinner, you knew the people that were there, you'd say hello, they knew you by name... And that's, it's all gone." Another interviewee, an agency representative, pondered why

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had 5,566 residents on May 21, 2021. https://www.cdcr.ca.gov/research/population-reports-2/

the locally owned businesses were gone, “There’s something funny, where we can't support our local small businesses. Especially with the entertainment side. Especially niche. The only thing that can stay in business is Walmart, McDonald's.”

All interviewees acknowledged that small businesses struggled in Susanville. In general, interviewees were perplexed as to why this was such a challenge. Many interviewees stated their commitment to shopping locally. Despite these efforts, businesses were closing or moving off Main Street. During interviews, the celebrated brewery closed its restaurant then relocated off the main street to the old mill district. As a result, Main Street lost one more place for the community to gather and resulted in one less draw to the center of town.

City representatives were aware of Main Streets’ struggle and stated that they were actively working on ways to support small businesses and improve its condition. To remedy Main Street’s empty buildings, the city was working to provide a clear and accessible pathway for new small business owners. City representatives said that efforts were being made to bring in and keep local businesses. For the short term, some offered the idea of painting the street facing windows of empty storefronts.

While interviewees acknowledged that they would like to see changes, they suggested that a general indifference or lack of motivation among Susanville residents challenged implementation. One agency representative explained, “I think that there’s always kind of been a challenge to support something new, or to try something new.” Interviewees told of an approved Caltrans plan to install bike lanes in Susanville and change the highway design that was voted down at a city council meeting. Interviewees

used this as an example of the city and residents' motivation to preserve Susanville as it once was.

Susanville's infrastructure and location contributed to economic challenges and limited the city's options to attract new industries or diversify existing industries. Transportation infrastructure in Susanville posed an import-export challenge for existing sectors, like agriculture. Built infrastructure was a barrier to incoming industries to diversify economics. Though Highway 36 and Highway 395 ran directly through town, these highways were susceptible to winter weather closures that created inconsistent shipping conditions. A representative of a community organization expanded on the "big issue" of infrastructure:

> The transportation system is very limited. It's only by truck and in the wintertime, not even by truck because they close the highway between here and Reno due to winds that blow trucks over. So, you know, you have transportation issues, you know, for companies to come here and get their products out.

Water security and availability was another factor that limited development. Some interviewees perceived that more industrial or residential developments would threaten water for Susanville's second largest industry, agriculture.

Though Main Street was not what it once was, interviewees were optimistic about trends in Susanville that were happening in roughly the previous five years. Interviewees described a growing number of recreation opportunities through trails and organized trail races. Some interviewees said that they observed new, younger residents moving into the community. Many interviewees suggested that the younger residents and recreation opportunities were going hand in hand. Indeed, interviewees that were new to the

community said that Susanville was a “hidden gem”, and that they were drawn to the community for its recreation and natural beauty, as well as its affordability. Some had family ties; others moved there for work in federal, often natural resources, jobs. Interviewees indicated that younger residents were more willing to “take risks" than long-term residents or leadership who were unwilling to “rock the boat”, and that new, younger residents were shaking things up in the community, in a good way.

We Are a Prison Town Now

> You might say that the first prison wasn't too bad . . . In retrospect, I think, had some of us appreciated what that would have meant, I think we might have thought differently about whether or not we want to embrace having additional prison employment. . . I think we lost a lot of cohesiveness and closeness, and the ‘role up your sleeves and let's make our community better’ attitude was lost by that expansion. (Long-term Resident)

Interviewees identified prisons as the replacement sector for the declining timber industry. Though a major provider of local jobs, residents expressed mixed feelings about the prisons and discussed both the benefits and disadvantages of the prisons. The benefit of the prisons, from the perspective of interviewees, was that they offered high-paying, stable jobs. One interviewee pointed out that the median household income and education level in Lassen County was higher than the average rural county because of the employment prisons offer. Correctional Officers were well-paid and needed only a high school diploma.

Though the prisons provided stable, well-paying jobs, residents identified several downsides of the industry. Interviewees perceived that increasing from one prison to three had two primary effects on Susanville: 1) The two newest prisons were maximum

security prisons, which was interpreted by interviewees as causing stress on correctional officers; 2) Interviewees offered that many correctional officers were part-time residents and contributed to a high community turn over and a portion of the community that was under-engaged; and 3) Interviewees indicated that when the second and third prisons opened, this marked a shift toward a prison economy dependence for Susanville. With the prisons came unanticipated socioeconomic and community shifts that strained Susanville's community's unity and sense of identity.

Prison Employees and Community

Interviewees expressed that shifting to a prison industry decreased the level of community engagement in Susanville. In general, interviewees perceived that prison guards were less engaged than other community members, and that their work environment increased Susanville's increased "social problems." A local business owner explained:

> One of the things that we discovered, I think it's kind of more of an unintended consequence . . . it's not a very happy work environment. It's really kind of dreadful environment to work in . . . And I think people who worked in that environment over a period of time . . . They're not happy. They're not happy that they, that that's the environment they have to work in. And so, they bring that unhappiness home, home with them, and . . . it can affect the children, it can affect marriages, and affect their relationships. (Long-term Resident)

Interviewees said that they witnessed changes in friends and family members that started to work at the prisons. This grounded the perception that it was the job itself that was responsible for the changes residents witnessed. A timber industry representative expressed, "It's a very good paying job, it's just. It sucks your soul out of your body, I think, because I know a lot of those guys are changed once they go to be a prison guard."

Another interviewee, an agency representative, remembered that they saw these changes happen over time and felt there were not many other employment options available should someone want to change careers:

> Seeing my friends' parents deciding to go to the prison and now they seem more angry when they come home . . . It's not the best quality of life to be working as a prison guard. So, that's pretty rough . . . But that's pretty much what we have here . . . that's all we have to rely on right now.

Interviewees suggested empathetically that the job's tough working conditions appeared to drain correctional officers. These issues were perceived to overflow into general happiness and community engagement for resident prison employees.

Prison employee turnover was identified as another contributing factor to reduced community engagement. Interviewees said that correctional officers would stay at the prisons for only a short time, using the job as a steppingstone or in pursuit of a less intense prison environment. An agency representative elaborated:

> Maybe it's because it's not considered a desirable place to live, or what have you, but a lot of our population is circulating prison workers. Like, a lot of it. And those people tend to come in . . . complete their one-year term at our very nasty state prison here. And then they're very eager to get to a job at a at a less intense prison somewhere else, and they tend to leave. And so, we have this, these revolving, this revolving workforce that represents a huge proportion of the town's population.

This "transitory population" caused high community turnover and a lack of local engagement for short-term prison employees. A timber industry representative explained, "I think they turn their employees through the town so often that it's hard for them to be part of that community."

Prison employees who selected to live outside Susanville created another challenge for community engagement. Interviewees observed that some correctional officers lived in Reno and commuted into Susanville. This resulted in a large, commuting workforce that was disengaged and does not have "a whole lot of impetus in the community."

The "influx of in and out" created a perception where some residents were "local", and others were simply temporary. Many interviewees said that some prison employees "were raised in Susanville, and that's where they got the best job." Prison employees who were not "local" were perceived to be less involved in the general community. As one interviewee, an agency representative, expressed, "people within the prison system tend to leave after retirement and the locals don't." This perception created a fractured community, where some prison employees and long-term residents were disconnected from one another.

From Mill Town to Prison Town: Community Identity, Unity, and Leadership

When asked about Susanville's sense of community, interviewees unanimously offered a 'yes, but . . .' type of response. All participants shared that the people in Susanville were one of its greatest strengths. Residents were described as friendly, motivated to come together in crisis, and collectively enjoyed community events. Interviewees explained that there was a strong sense of community, but the community was anything but homogenous.

Susanville's community was divided on the decision to bring in the second prison in 1995. Interviewees' perspectives suggested that division related to the prison industry

remained. Interviewees commented that Susanville “seems very divided”, is “not cohesive”, and that “the community is far from being a unified force.” Others explained that community divides appeared to be centered on the community’s acceptance of the prisons and employees. One interviewee, a local government representative, said, “not everybody has accepted the correctional officers as part of the community” and continued to explain that as the majority of the workforce, prison employees are a “big part of the community”.

Susanville’s lack of unity over the prisons was both economic and related to community identity. Susanville’s decision to bring in more prisons invited questions of economic dependence on the government sector. Some interviewees expressed a sense of betrayal that the community did not show more support for heritage industries, timber and ranching. A timber industry representative explained, “The biggest threat to Susanville is that they put all their eggs in one basket. They put it in the prison basket, they didn't stand behind the ranching and in the logging community. They watched the mill destroyed.” Interviewees expressed that the loss of the timber industry replaced by the prisons had greater impacts on community connection. Forestry and ranching were perceived as more local and community oriented than the way the prisons operate. As one interviewee, an agency representative, remembered:

> When I was growing up, you know, we didn't have the High Desert Correctional Center or High Desert state prison or the federal prison . . . it was really a ranching and logging town when I was growing up. Everybody had a job, you know, no matter what. You know, kids could go find work for any ranch . . . if you didn't have that, you just went down to the mill and you had a job there. There was always kind of this connection between the logging and the ranching community. You know, everybody knew each other. So, you know, say I was

> working here, someone would say, “Well, they need help here” and they were just real community driven, you know? Everybody helped each other.

While prisons replaced jobs and wages, interviewees did not perceive prisons to replace the community cohesion that came with heritage industries. Shifting from a mill town to a prison town has diminished the sense of pride for many residents. An agency representative provided context:

> To take a big payroll to an entity which is really not producing anything other than locking up, unfortunately, young minority males, for in many cases minor drug offenses, but that’s [it] . . . where's the heart and soul of your community if you [produce something you] can’t exactly get your hands on? What is your community known for? Having a state prison? Well, that’s probably for a lot of people what would come up.

Conversations with interviewees about Susanville’s early adaptation to mill closures toward prisons gave a sense that Susanville had become entrenched in the prison economy and was unable to shift despite negative social, economic, and cultural impacts. One interviewee, a local government representative, mused that Susanville’s residents' sense of the town “failing” was because they perceive the town as a victim of government intervention, “the government forced restrictions on the timber industry, meaning the mill had to shut down . . . and then the government came in here and made us a [prison] deal we couldn't refuse.” There was a sense that, since the mill closures, Susanville kept losing. An impression of economic and community skepticism and defeat permeated conversations with long-term residents. Newer residents were more optimistic. All interviewees communicated that they cared greatly about Susanville and were cautiously optimistic about what the community could do next.

Unity and Leadership in Susanville

Interviewees told how Susanville had struggled to achieve a unified vision for the city and its economic development. The absence of a shared vision was identified as one of Susanville's weaknesses, and was illustrated by disagreement of local elected officials and the electorate. Interviewees provided examples of failed proposals, such as a sales tax to increase services, or biking lanes along Main Street. Interviewees explained that in these decisions, either the electorate or elected officials disagreed on how to move forward, and the proposals failed. During discussions on local leadership and collaboration, interviewees voiced that a general lack of unity challenged Susanville's City and County government and electorate to move in a unified way. Interviewees suggested that the potential for social cohesion existed if, and when, residents were willing to talk with each other to find points of common ground.

City of Susanville

"Overworked and under focused" was the way that one interviewee explained the City of Susanville. Interviewees explained that, to their knowledge, the City of Susanville had no guiding economic vision or natural resources plan, though the city was taking steps to create a guiding plan. City Council members were in conversation with a consultant on economic development and local government representatives said that gathering residents' priorities for Susanville was something that the newly elected city council was proposing to act on. The hope was that the city could identify local priorities, which would act as a guiding vision for Susanville. At the time interviewees, the city was focused on improving the aesthetic of Main Street, addressing houseless populations

along the Susan River, and restoring the historic courthouse. In addition to improving aesthetics, local government representatives explained that the city was committed to supporting community traditions, such as annual celebrations and events, and Susanville's ties to the timber industry through in-town commemoration.

When addressing natural resources, formal city and county leadership operated relatively independently. Interviewees used the city's relationship with BLM and the Susan River as an example. Because BLM and the City share jurisdiction near the Susan River, the two entities engage on issues concerning the river. Other than this relationship with BLM, city representatives had little engagement with federal land management agencies. Instead, conversations with federal land management agencies were viewed as the responsibility of the county or community organizations. City representatives would then communicate with the county or community organizations as a partnering entity.

Interviewees explained that Susanville's elected leadership had generally been long-term residents and served in elected positions for an extended period. This suggested commitment to the community but contributed to a lack of movement. Interviewees expressed the impression that elected officials were focused on the "same-old-same-old stuff that we got to keep on top of" and were unwilling to "look at new initiatives." Others felt that the city and county were slow to act on public input, "But if there's enough people that want the same thing, then they do respond." A timber industry representative provided more context beyond the slow response, explaining, "they don't try to rock the boat and they don't, you know they're not going out to address many of

these issues." In other words, elected officials were hesitant to take proactive action and cautiously avoided controversy.

Other interviewees suggested more directly that the long-standing elected officials were resistant to change. Interviewees gave the example of the younger generation, who have been making efforts to propose new visions for Susanville. A timber industry representative described "a whole nucleus of young people", many who are employed in natural resource jobs, who "want to make a lot of changes and stuff." An agency representative expanded, "I think they kind of get stomped on a lot because these people [elected government representatives] have been here forever and they're kind of like, 'Who are you?'" Susanville's 2020 vote for city council reflected this frustration, and that Susanville residents were ready for change. The public had elected two new younger members to the city council. Some interviewees were excited about two newly elected council members and shared that they saw them as "railroaders" and that "folks are even more hopeful that the city will finally start responding to concerns."

Susanville interviewees suggested that residents' social cohesion and community capacity was exhibited predominantly through local non-governmental organizations. Examples of where the community shared common interests were in community events, which engaged the community as a whole, and natural resource focused groups. Interviewees regularly mentioned two community organizations that led interagency collaborations: the Lassen Fire Safe Council and the Lassen Land and Trails Trust. In addition to organizations, interviewees discussed community-led businesses that bridged

diverse groups of residents together; these were the new community garden and the local brewery.

Community Organizations: The Lassen Land and Trails Trust and the Lassen County Fire Safe Council

Interviewees indicated that despite the challenges the city council had faced, community collaboration on federally managed land and leadership existed, but was located largely outside of formal local government, in community organizations. Susanville's community organizations were local leaders for natural resource focused collaboratives. They served as a place where inter-agency partnerships were formed and were leading the community in conserving natural landscapes, building recreation trails, and establishing a fire-safe community. Moreover, they were a nexus between federal land management agencies, community safety, and economic development through recreation and restoration. Interviewees regularly brought up two local organizations, the Lassen Land and Trails Trust and the Lassen Fire Safe Council, as examples of community leadership. These organizations were seen as places where community members with differing perspectives, such as agency representatives, foresters, and ranchers, could join to support the same vision.

The Lassen Land and Trails Trust (LLTT) is a land and recreation focused non-profit organization. A local business owner shared, "A lot of people put a lot of respect and trust in them." The LLTT had a small staff but relied primarily on volunteers. LLTT was one of the primary collaborators on the Bizz Johnson trail, long-time hosts of the farmers market, was actively expanding trail systems, and hosted recreation events, such

as marathons and mountain bike races, in and around Susanville. Interviewees identified the LLTT as a local partner with USFS and BLM, as well as actively conserving rangelands and forests.

The Lassen County Fire Safe Council (LCFSC) is focused on establishing a fire safe community. The LCFSC was viewed as a "blending factor" between the county, federal and state agencies, and private lands and industries. A federal agency representative stated, "it takes someone outside to bring it together" and the LCFSC served to create this network. Interviewees said that the work that the Fire Safe Council engages in had potential to create jobs for forest-based jobs through restoration and vegetation management work. Others expressed that the LCFSC's ability to receive grant funds was impressive. As a result, the LCFSC was collaborating with communities outside Lassen County to establish fire safety plans for neighboring communities. One of the only caveats with the Fire Safe Council is that much of the funding came from California state grants, which may be unstable.

Community Ties to Federal Lands

The Lassen National Forest and BLM lands surround Susanville. Post-timber decline, Susanville's relationship with surrounding public lands was linked in four areas: ranching, agency jobs, managing wildfires and wildfire risk, and recreation. Susanville's economic ties to adjacent federal lands were predominantly through ranching and agency employment. Ranchers in Susanville used both public and private forests for cattle; some local ranches co-manage their properties for timber and cattle. As one timber industry representative remarked, "they're in the business of growing, whether it's beef or trees."

Interviewees indicated that there are strong ties between federal forests and private ranchers through grazing permits.

The employment that federal land management agencies offer Susanville was a direct link to federally managed lands. Some interviewees indicated that if its residents were not employed at the prison, then they were likely employed through a federal land agency. Interviewees observed that many federal land management agency employees lived in Susanville and were active in the community, but remembered that in the past decade, this had not always been the case. Some expressed that there was still a lack of visibility in agency leadership in Susanville.

Community Relationships with Adjacent Federal Land Management Agencies

Agency representatives and non-agency interviewees alike were vocal about local challenges with the USFS. These challenges were attributed to centralization of the USFS, shifting priorities and budgets at the national level, and rigid, slow, and outdated regulation. Interviewees indicated that Susanville's relationship with the USFS had dissolved over time as the agency's priorities shifted and fire risks increased. Community organizations served to build bridges between the USFS and Susanville through vegetation management projects, reducing fire risk, and recreation.

In general, interviewees felt that the BLM was more engaged with the community than the Forest Service. In part, residents attributed the difference in community involvement to the structural differences between the USFS and BLM. BLM was described as "more politically savvy" and restructuring to encourage local district managers to engage the public, in this case adjacent communities, on management

decisions. USFS was described as less participatory with adjacent communities. Interviewees described the BLM as responsive and engaged. In contrast, the USFS was described as "pretty absent", and gave examples that USFS representatives stopped attending local Fire Safe Council Meetings and recreation collaboratives between Lassen and Plumas County.

As an agency, the USFS's lack of engagement was sometimes justified because of underfunding. Agency representatives and non-agency representatives acknowledged that budgets "hampered", or more pointedly, "emaciated", local federal land management representatives' community engagement. Agency representatives expressed that budget restrictions challenged public engagement and project objective. In general, they acknowledged that while project-level public outreach existed, the community itself, and even some project partners, were unaware of the USFS's priorities.

Dissolving Community Relationships and Escalating Tension

Susanville interviewees indicated that local tension with the USFS grew over an extended period of time. Conversations about community relationships with the USFS reflected a two-layered relationship with the agency. The first was with local representatives. Many interviewees reflected that regular turnover contributed to the "bumpy road" with the USFS, and that the relationship with the agency was very specific to the local staff. Interviewees reminisced over forest supervisors that had been "obstacles" to local objectives and relationships. One community organization representative shared, "We finally ended up with a team from the Forest Service that wanted to get things done on the ground." Interviewees reasoned that it was not the

employees themselves, but the agency that restricted local projects. They described tensions compounding with the USFS shift toward a centralized management approach, slow bureaucratic regulation that challenged projects, and budget restraints.

Recent fire threats were an illustrative example of Susanville's challenges with the USFS and, given that approximately 200,000 acres in Lassen County burned during fires in 2020, interviewees spoke of them frequently. In large part, interviewees attributed the growing fire threat to the shift in the USFS management to a more hands-off approach. One interviewee described the USFS's movement away from timber-productive forests as "look but don't touch." One interviewee, an agency representative, questioned the capacity of the agency's ability to manage national forests, despite the Forest Service headquarters located in Susanville:

> We have the supervisor's office here, we have Eagle Lake District, we have all this Forest Service land in the county . . . what is that providing for the people that live here? They're basically doing the best they can do to manage fuels, which is not good enough. I mean, their giant fuels project up on Diamond Peaks was like two or three years too late. It all just burned this year. It almost, you know, it's threatening the town . . . is that really the best the Forest Service has to offer Susanville is fuels management?

Interviewees expressed that the regulatory and budget restrictions slowed projects to reduce fire risks, post-fire harvests, and post-fire restoration. Interviewees recounted that in past years, the USFS missed opportunities to harvest "black timber", charred from the fire, because the regulatory process slowed the USFS's ability to respond. Two community organization representatives compared burn areas on USFS land to private industrial timber land, saying, "on private land, they were already salvaging the trees that

fall . . . The Forest Service. . . lags years behind to the point that the value of these burned trees gone." Restoration of burn areas came years later or was virtually non-existent. The second interviewee recalled the restoration effort, "The industry land was planted within a year and a half. And the forest in the National Forest was left to struggle on its own." While these deficiencies challenged local relationships, they were opening opportunities for local collaboration.

Opportunities to Renew Relationships: Public Land Management Collaboration and the Future of Recreation

In a cooperative effort with the Fire Safe Council, the USFS had completed a small timber harvest project near the Diamond Mountains. The success of the timber harvest on the Diamond Mountains was seen as one way to improve the USFS's land and local image. A timber industry representative explained that collaborative projects like the work on the Diamonds could help the USFS "rehabilitate their own image." They said:

> I think it's something they can be proud of, because they can only do so much black timber and just spend all the time just cleaning up fires. They need a way they can create a new image to work on these fire safe projects that do logging, and do chipping, and do Aspen release, and do these things that are going to improve the forest.

Because timber harvest was no longer a primary focus of the USFS, some interviewees observed that the USFS was understaffed in this area. Interviewees perceived that incorporating commercial thinning into restoration projects was one way to improve conditions of national forests and rebuild the USFS's capacity.

The cost of thinning and restoration projects were cited as underlying barriers and solutions to agency-community partnerships, and public land harvests were described as not being "economical." Though federal forests were not harvesting the volume of timber they once did, agency and timber industry representatives identified similar issues. A slow timber market in the Susanville area was attributed to shifting timber markets for the area's timber, declining infrastructure, and regulation. Susanville's available timber, generally fir and pine, was at a low market value during interviews. The nearest mills were in Chester, 35 miles to the Southeast, and Burney, 78 miles to the northwest. The distance to the mills increased haul costs, driving up costs for harvests. The lack of mills complicated harvests for all forest owners. A timber industry representative explained that if, and when, the USFS does harvest, they overwhelmed the mills and blocked small private land harvests. Yet without public land harvests, there was not enough volume to justify another mill.

Interviewees identified agency-community partnerships as opportunities to improve project costs and support federal restoration goals. Interviewees said they would like to see partnerships between the region's national forests and private industrial forests to reduce access and haul costs. Others suggested investments in lightweight harvest equipment could improve access to areas in need of restoration. Interviewee suggestions for collaborations illustrated that the underlying factor was to reduce project costs.

Revitalizing a forest products manufacturing sector in Susanville was something that interviewees shared could be a good step for the community. Wood processing infrastructure would serve to diversify Susanville's economy and help improve

restoration efforts on federal forests. An agency representative shared, “It would be really, really cool if we had a mill again. I think that we’re just starting to realize the hardship that it is putting on us that it is gone.” Bringing back a mill was talked about as if it could serve to restore some of the provide or “vibrancy” that Susanville lost. While residents liked the idea of a mill, they expressed that it seemed like an unlikely option for Susanville.

An alternative to the mill were small-diameter wood products manufacturing and biomass. Interviewees said that a company that constructs sections of modular buildings had moved to the old mill site. Another potential wood products sector, a cross-laminated timber plant, was considering Susanville’s old mill site as a possible location. Biomass, another forest products industry, was active just 33 miles outside of Susanville, in Wendel. Interviewees identified that biomass plant as an asset to local forest restoration. Like haul costs to mills, haul costs to biomass plants were a limiting economical factor.

Recreation

> It's a unique area that it’s got winter opportunities. There's usually a fair amount of snow and we've got it at the crossroads here. We've got a high desert out to the east and, kind of, the convergence of where the Sierra Nevadas and the Cascades come together. So, it's an interesting place for it all to come together if you're interested in wildlife, the outdoors. All things meld together. (Agency Representative)

Interviewees identified recreation as one of Susanville’s greatest opportunities for economic growth by capitalizing on natural resources, such as the Susan River and adjacent public lands. Recreation was a positive bridge between the BLM and the USFS. The BLM funded a county Trails Coordinator position and the inter-county trail plan for

Plumas and Lassen National Forests were two examples interviewees gave of cooperative efforts toward recreation. Interviewees shared that trail systems that connect Tahoe, Plumas, Lassen, and Modoc National Forests were in planning stages. A local government representative saw an open opportunity for the city to capitalize on Susanville as the "gateway to Lassen Volcanic National Park."

Where federal lands held opportunity for recreation, interviewees stated that it was up to Susanville to provide shops, hotels, and interpretive elements that connected recreation and tourism to the community. Interviewees suggested that Susanville has potential for recreation, and that recreation tourism was growing, but still slow. As an agency representative put it, the "town stuff for tourism. It's not just around." Downtown improvements and improved infrastructure, such as fiber optics for the internet, were both suggestions needed to get Susanville to a place that is inviting to tourists.

Other interviewees questioned if Susanville had the amenity draws to truly capitalize on tourism. "We don't have any, you know, attractions. We don't have ski resorts. We don't have stuff that brings the concentrations of people with significant money," said an agency representative. Interviewees cited similar reasons for lack of tourism as other economic diversification. Isolation and lack of a unified vision were two reasons why "tourism has not taken off" in Susanville.

A shift toward tourism as a central economic sector in Susanville brought mixed reactions from Interviewees. On one hand, recreation tourism offered diversification. A local business owner observed that California Corrections was reducing inmate time and closing older facilities. Thus, California Correctional Center in Susanville might be at

risk of closing in the future, reducing the seemingly stable prison industry.[8] This interviewee suggested that recreation tourism had the potential to offset this loss. On the other hand, some interviewees felt that seasonal residents and tourism may further impact Susanville's ability to rebuild community cohesion. Reflecting on other communities that shifted from natural resource production to tourism an agency representative observed:

> If our community ends up changing to a way where we were relying on sort of presenting Susanville as this tourist attraction, that will just make it harder for us to focus our attention on building the community in a way that it centered on the people currently living in a community instead of centered on the people visiting.

For this resident, rebuilding Susanville's sense of community was as important to residents as gaining economic stability.

[8] In April 2021, California Governor Newsom announced the planned closure of the California Correctional Center. This closure would cause the loss of approximately 1,000 jobs in Susanville (Sheeler, 2021). In June 2021, Susanville City Council planned to respond with a lawsuit against the State of California (Moleski, 2021).

DISCUSSION

These case studies provide a glimpse into two communities that have selected divergent economic adaptation strategies, one centered on data centers (Prineville), and the other on prisons (Susanville). Prineville exhibited strong leadership and social capital. In turn, the town is building capacity as it draws in new industries and residents (Table 12). Susanville's limited connectivity and early adaptation toward a prison economy suggests path dependencies that spill beyond local economics into social capital, local leadership, and resident turnover (Table 12). Interviewees expressed a resignation over their economic path, restrained optimism regarding future diversification, and a sense of division and caution about ways to move forward.

Table 12 Local characteristics (Morzillo et al. 2015) of Prineville and Susanville provide a comparison for each community's resource base, connectivity, and social adaptability.

Category	**Characteristic**	**Prineville**	**Susanville**
Resource base	Economic base	Data centers, ranching, and manufacturing	Prisons, public land management jobs, ranching
	Public-private land ownership	50% USFS & BLM land	57% USFS & BLM land
	Topography & ecology	Dry forests, fire threats, water security	Dry forests, fire threats, water insecurity
Connectivity	Transportation	Near airport; city-owned railway	On highway, highway closed seasonally
	Technology	Broadband access	No broadband access
Social Adaptability	Age structure & human capital	Retire in-migration, youth outmigration	Population turnover
			Youth outmigration
		Hope that data centers provide tech jobs to retain younger residents	Limited job opportunities for younger residents

Category	Characteristic	Prineville	Susanville
		Commuting residents from Bend	
	Poverty & income	Comparable affordability to Bend attracts lower income residents	Prisons draw in inmate families, some of which may be of a lower socioeconomic status
		Data centers pay benefited jobs	Growing houseless population
			Prisons provide high wage, benefited jobs, but have a challenging work environment.
	Civic culture (social networks, trust, traditions & community identity)	Exhibit bonding & bridging social capital.	Exhibit bonding social capital.
		Formal governance entities lead natural resource concerns, supplemented by informal governance entities.	Community identity and unity was fractured with prison expansion
			In-formal governance entities lead natural resource concerns, including conservation and recreation
		Formal natural resource collaborative establish communication between public land managers, city and county, and community timber industry, stakeholders.	Formal governance entities shifting focus from natural resource production to recreation

I found that both communities are willing to take risks by venturing into new industries that are independent of natural resource production. In this, they are adapting away from reliance on federally managed lands. At the same time, these communities are working to maintain connections to adjacent federal lands by encouraging recreation tourism or sustaining heritage economies. An unexpected finding was how local governance can lead community adaptation, and how it may adapt alongside the community as it changes. Consequently, in addition to community adaptation, this study

contributes to a growing body of literature that explores how the structure and capacity of local governance shapes collaborations between federal land management agencies and adjacent communities. In their 2012 study, Lobao et al. (2012) suggested that governance research has overemphasized policy and underemphasized governance structure. This research contributes to that gap and agrees that formal government structure and capacity directly influence community socioeconomic well-being. Because local governance is central to economic adaptation and ties to federal lands, this discussion is organized through that lens. I start with governance organizational structure, then discuss how organization contributes to community adaptation, community ties to forest products industries, and partnership and collaboration with federal land management agencies.

Adapting Governance: Organizational Structure and Leadership

These case studies demonstrate how two communities use differing local governance structures to achieve economic and natural resource objectives. Local governance systems consist of both formal (city and county government) and informal (non-governmental) entities. Local governance influences economic adaptations by drawing in new industries (Burrell, 2020; Crowe, 2007) and structures local-level relationships with federal land managers (Abrams, Davis et al., 2015; Blumm & Fraser, 2017; Gatz, 2011). In Prineville and Susanville, local governance networks included formal governance, informal governance, and federal land management agencies (Figure 27 and Figure 28).

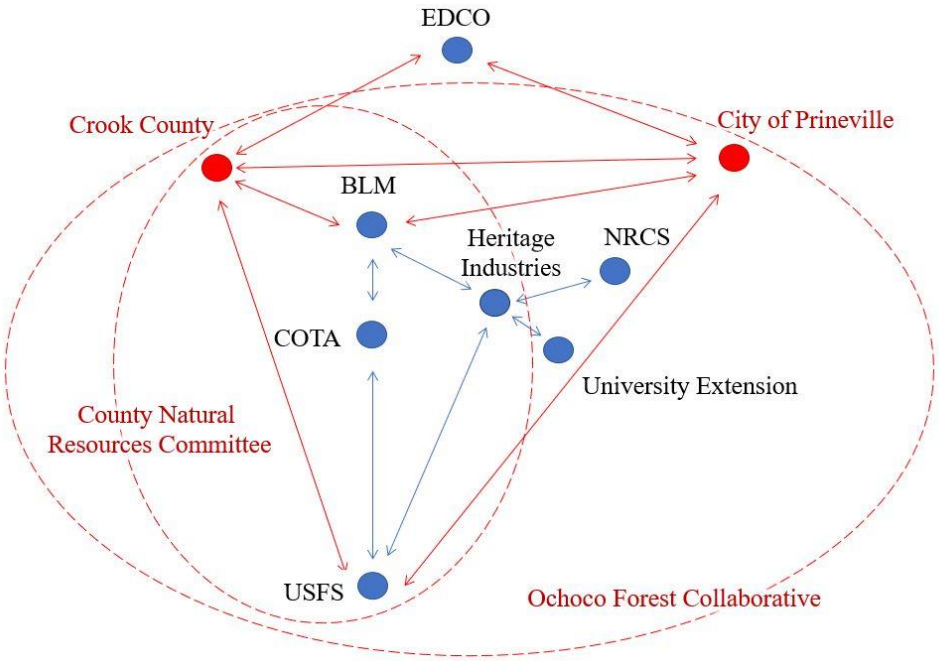

Figure 27 Prineville's formal governance entities used bonding and bridging social capital to consolidate overlap and collaborate on economic and natural resources. Areas of collaboration are highlighted in red. The City and County worked closely together with each other and federal land management agencies. The Crook County Natural Resources Committee and Ochoco Forest Collaborative, exhibited by the red dotted circle, served as mechanisms to bring natural resource stakeholders together.

Prineville's governance structure relied heavily on cooperation between formal and informal entities. This governance structure exhibits bonding social capital points of mutual interest, then engages in bridging social capital to tie together governance entities (Figure 27). In Prineville, this type of governance structure emerged through collaboration and consolidation. Formal and informal governance identified overlap between opportunities and interests to enhance the local economy, engage natural resource concerns, and improve community-wellbeing, then collaborate around these points. The formal city and county governments identified areas of overlapping services and consolidated or collaborated where each indicated they could not succeed alone. This

structure creates, and relies on, communication and bridging social capital. As a result, this structure of governance seems to enhance capacity and social capital.

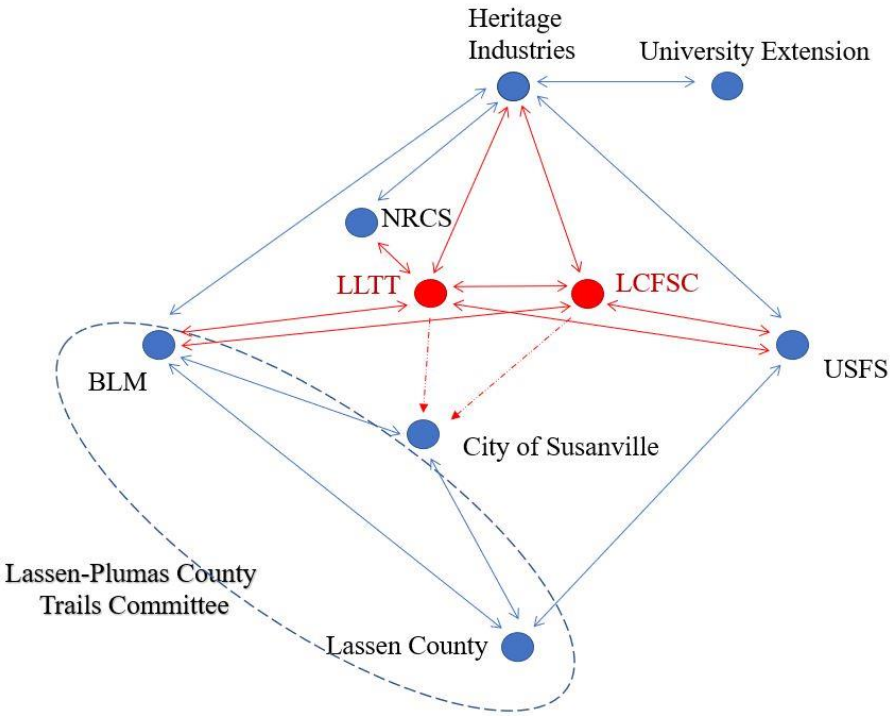

Figure 28 In Susanville, the Lassen Land and Trails Trust (LLTT) and Lassen County Firesafe Council (LCFSC) lead natural resource issues by creating points of common interest among community members. Points of collaboration are highlighted in red. These organizations shared information with formal city and county governing entities but operate independently, represented by the red dotted lines. The Lassen-Plumas County Trails Committee, exhibited by the dotted cercle, was a formal collaborative that brought the BLM and Lassen County together.

In Susanville, I found a different governance structure where formal and informal entities operate relatively independently but may partner on limited areas of interest or land ownership (Figure 28). This governance structure operates with less bridging social capital. In this structure, formal governance entities delegate natural resource interests to community organizations. Though communicating with formal city and county governments, there was less cooperation among groups. In Susanville, city economic

concerns were delegated to the city. Natural resources on federal lands or county lands fell under the responsibility of the County or community organizations. Community organizations led local vision for natural resources and collaborative partnerships with federal land management agencies. In this model, informal governance entities serve to build bridging and bonding social capital through cross interests in multi-stakeholder groups, including federal land management agencies.

The organization and capacity of local governance entities in adjacent communities structures the ways in which they may interact with natural resources on adjacent federally managed lands. Burow et al. (2019) suggest that in communities with weak formal governance, informal governance may supplement, or supplant, formal governance. My findings support this suggestion. Simply, the organization of local governance determines who is involved, who has the authority to make decisions, and who has the capacity to lead projects. Social capital plays a critical role in building the capacity of local governance (Chaskin, 2001; Cheng & Sturtevant, 2012; Marré & Weber, 2010). Where there was social cohesion determined which governing entities, formal or informal, emerged as local leaders for natural resource issues.

In Prineville, there was collaboration and common ground that led the local governing entities to work together to address natural resource concerns. Community organizations *supplement* formal governing entities' capacity to engage with federal land management agencies. In Susanville, by contrast, lack of public agreement reduced the capacity of formal governing entities to move projects forward. Residents were drawn to community organizations that organized around shared values, such as conserving

working lands and reducing fire risk. As places of common ground, community organizations built bridging social capital and had more capacity than the City and led much of the interactions with federal land management agencies. This positioned the City of Susanville to act as a community partner in decisions concerning natural resources, such as economic or community safety, rather than a community leader. Susanville's governance structure positions community organizations to *supplant* formal governance entities in leading natural resource concerns in engagement with federal land management agencies.

Community Adaptation: Unanticipated Outcomes on Capacity and Cohesion

As communities adapt economically, there may be unanticipated outcomes that impact community capacity and social capital. This contributes to changes in local governance structures. I found that both communities took a proactive approach to economic adaptation that relied on strong formal governance entities to pursue new industries when replacing losses in timber manufacturing. Susanville's early adaptation had unexpected consequences that reduced social cohesion and resident turnover that reduced the capacity of formal governance entities. Prineville's slower adaptation took the city through years of economic struggle but produced a local governance structure that is drawing in new industries to build local capacity. If local industries and residents are willing and able to reinvest locally, adapting communities may see increases in social capital, capacity, and community well-being (Magis, 2010). These case studies underline the value of attracting industries and residents who are willing to contribute to community resources, whether they are social, financial, or human.

Each city sought to engage different industry types, one prisons and the other data centers. Susanville's limited connectivity to urban areas by highway, railway, or air reduced the industries available to the city to pursue. Despite gaining stable jobs, counties that have pursued prisons as an economic development have experienced disruptions and declines in economic growth and human and social capitals (Hooks et al., 2010). Prisons are limited on resources they can reinvest into the community. This case study, and others that focus on rural prison towns, suggest that communities that took the prison pathway are finding that they do not have the ability to absorb community impacts (Hooks et al., 2010), such as socioeconomic disparities, community divisions, district, and social services. As an economic adaptation, prisons may provide stable jobs, but can corrode community well-being. For Prineville, attracting data centers opened opportunities to reinvest resources into the communities. The data centers can allocate funds through donating tangible products, such as equipment to local schools, or through donating employee time to community trail projects. These actions served to build social acceptance toward the sector, while supporting community education and recreation.

Data center investment into local infrastructure positions communities to pursue new innovations that bolster existing infrastructure, such as renewable energy or fiber optic systems. While many rural communities may be at a technological disadvantage (Velaga et al., 2017), these types of improvements build capacity to draw in new industries and serve the local community. Notably, these improvements may help to build regional capacity. In 2020 the California Public Utility Commission (CPUC) announced the Prineville to Reno Fiber Optic Project ("Prineville to Reno", 2021), which proposes

to extend an underground fiber optic network between the cities. This would make this technology accessible to rural communities within the project area, including Susanville.

As a more recent economic adaptation strategy, little research has been done to date to examine the social impacts of data centers. Because they are relatively new to communities, long-term effects, if any, may not be visible for some years to come. What research is available, including this case study, suggests that the greatest impact data centers can have on local communities is to establish a local presence that builds trust and contributes to community capacity (Burrell, 2020). While it is still unknown how what ways data centers impact community well-being and identity over time, the goal of emerging education programs in Prineville was to retain or draw in younger, educated residents.

Newcomers: Belonging or Residing?

Both Susanville and Prineville found that they were competing for residents with nearby cities that may be considered more desirable. I found that it was important to residents that industry and agency employees lived locally and were engaged in the community; there is a difference between belonging in a community versus residing in a community (Che, 2005). Residents who see themselves as belonging in a community and share in community events and objectives have the potential to increase community capacity (Magis, 2010). For small communities undergoing change, it is important to existing residents that newcomers want to integrate.

In communities in flux, engaged community members, new and old, contribute to local vision. Both case studies provide examples of new and old residents banning

together to advocate for community benefits, such as bike paths, water parks, and reducing wildfire risks. Robbins et al. (2009) offers that some newcomers and long-term residents may have more in common than the literature suggests. I found this to be true. Some newer residents were drawn to Susanville and Prineville because they had not followed the amenity route but offered quality of life factors and a small-town feel. New residents were seeking ways to foster economic presence and relevance of each community's heritage industries, timber and ranching. This poses a question for future research: are there ways to attract and engage newcomers to revitalize communities and their natural resource production potential?

Ties to Heritage Economies and Federal Lands: Maintaining Economic Presence and Community Relevance

In contrast to the idea that heritage economies are left behind as part of the "Old West" (Winkler et al., 2007), I found that some communities are problem solving to maintain ties to forest products as a heritage industry. Community networks that forest products industry representatives, formal governance entities, and federal land management agencies served to bring partners together and incorporate forest products as part of shared economic and natural resource objectives and solutions. Accessible markets and transportation connections were instrumental in keeping, or incorporating, forest products industries into economic planning.

Local leadership and social capital played roles in economic and community ties to timber industries (Figure 29). In Prineville, local leadership were carefully navigating

changes in community identity as the city was growing and following the introduction of the data centers. Simultaneously, they were proactively searching for ways to revitalize forest products in Prineville's economy. The City of Prineville Railway made secondary manufacturing or innovated wood products a realistic economic opportunity. Integrating forestry and timber production into Prineville's economic vision, such as finding ways to bring in secondary wood products manufacturing or a small diameter mill, kept economic connections. By supporting community events, such as rodeos, they were maintaining community ties to heritage economies. Instituting the Crook County Natural Resources Committee and the Ochoco Forest Collaborative brought heritage industries together with natural resource stakeholders to advocate for forest-based industries as a part of natural resource planning.

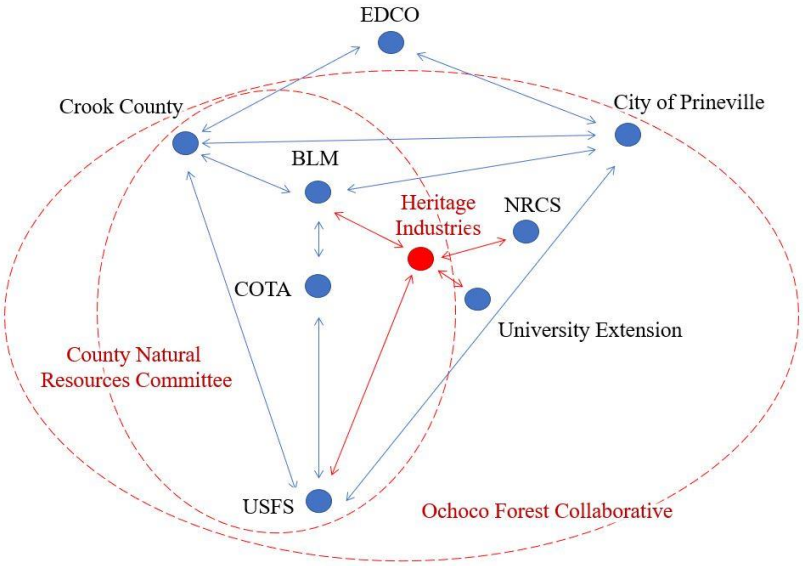

Figure 29 Prineville's collaboratives brought heritage industries (forestry and ranching) together with other natural resource stakeholders to incorporate timber and ranching into economic and natural resource planning. Areas of collaboration are highlighted in red. Formal collaboratives, exhibited by the red dotted circle, served as mechanisms to bring natural resource stakeholders together.

Susanville economic connection was stronger to ranching than to timber. Informal governance entities offered support to heritage industries through conserving rangelands and forests used for grazing and by collaborating with federal land management agencies (Figure 30). Formal governance entities were supporting community ties to forest products industries through in-town commemoration, such as murals, road names, and parks. Because the City lacked transportation and processing infrastructure and were under engaged in forest and recreation collaboratives, diversifying or reinforcing forest products industries in Susanville was not part of the economic vision for natural resources. Instead, Susanville was transitioning its intention for surrounding natural resources toward recreation and tourism, including agrotourism were a part of this hope.

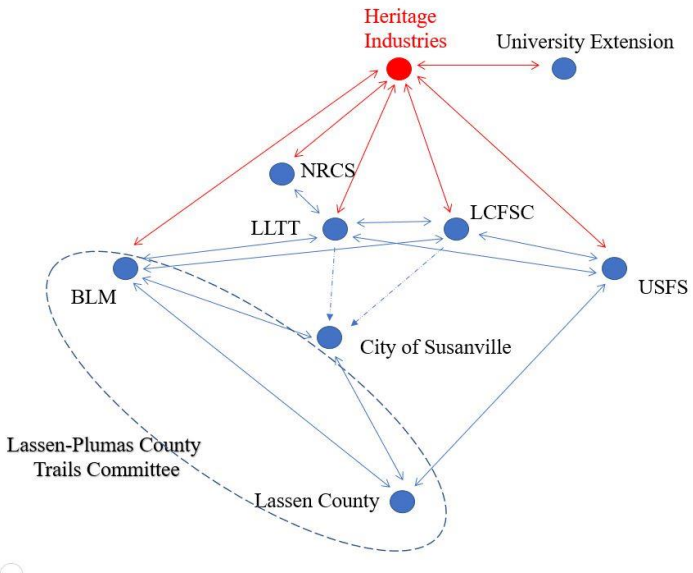

Figure 30 Susanville's heritage industries (forestry and ranching) were collaborating with the Lassen Land and Trails Trust (LLTT) and the Lassen County Fire Safe Council (LCFSC) to maintain economic relevance through conservation and restoration. Points of collaboration are highlighted in red.

Because forestry and timber production historically had economic ties to public lands, local agency representatives are central to the relationship between heritage industries and adjacent federal lands. This means that the capacity and involvement of federal land management district offices have opportunities to support forest-based industries through project partnerships and collaborations. This study contributes to a growing body of literature that explores partnership and collaboration between federal land management agencies and adjacent communities (Abrams, 2019; Steen-Adams et al., 2020; Wollstein & Davis, 2020).

Community capacity is crucial to rural communities, as many rural communities, despite level of capacity, face similar natural resource issues, such as water security and wildfire risks. I found that the organizational structure and capacity of local governance shapes the ways in which communities and federal land management agencies prioritize and achieve stewardship goals. The outcome is uneven management across federally managed lands. Uneven capacity of both adjacent communities and federal land management offices may increase natural resource threats in some communities, such as wildfires, further threatening community well-being by impacting natural resources that support forest-based industries or recreation draws. Like others, I identified areas of interdependencies between federal lands and adjacent communities that may create threats or act as opportunities; these are capacity, trust, workforce, infrastructure, and technology (Spies et al., 2018; Spies et al., 2019). These are starting places for common ground, where both agencies and communities with forest products industries have overlapping interests.

Both local governing bodies and local branches of federal land management agencies may vary in capacity (Abrams, 2019). The capacity of local federal land management offices can contribute to the relationship between federally managed lands and adjacent communities (Kelly, 2018). Abrams (2019) suggests that each entity's ability to engage in partnership and collaboration provides differing outcomes for natural resource objectives, in addition to different forms of governance networks (Figure 31). Case studies in Prineville and Susanville provide two examples of federal land management agencies and communities that engage in differing levels of partnership and collaboration based on capacity.

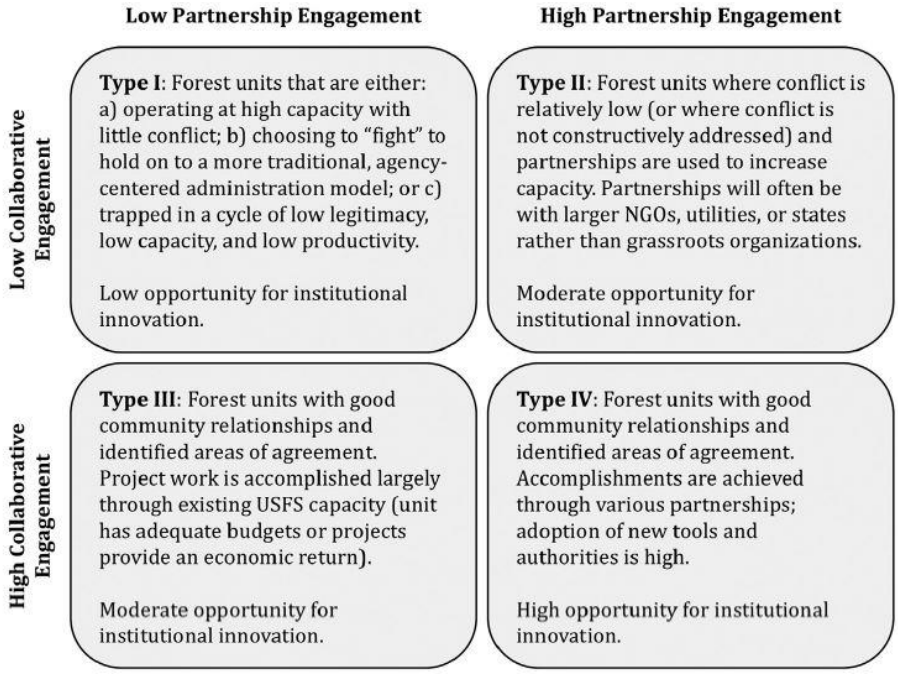

Figure 31 Abrams 2019 describes four types of governance networks based on the collaborative and partnership of local federal land management agencies and adjacent communities.

Using Abrams' types, Susanville falls somewhere between Type I and Type II collaborative partnership. In accordance with Abrams' observations, Susanville's capacity for innovation was relatively low. Though community organizations were making progress with vegetation management and recreation trails, the process had been a struggle. Collaborative projects served as an opportunity to rebuild relationships between Susanville and adjacent federal lands. For Susanville residents, like other communities, overcoming past grievances is a hurdle to rebuilding trust with adjacent federal land management agencies (Weissberg et al., 2018). If locals can overcome this hurdle, community engagement can act as a mechanism to rebuild trust (Davis et al., 2018) and build community and agency capacity (Kelly, 2018). Like others, I identified that a starting point for rebuilding trust comes with long-term assignments for agency representatives (Coleman et al., 2021) and local representatives living within adjacent communities (Buttolph et al., 2006).

In contrast, Prineville falls into a type IV collaborative partnership. In agreement with Abrams' observations, Prineville's capacity for institutional innovations was high. Both federal land management agencies and local governing entities were searching for innovative solutions to meet multi-stakeholder goals on federal lands, as well as to have federal lands meet community objectives. The collaborative partnerships between Prineville and adjacent federal lands had gained trust and capacity and were moving on to determine if they could rebuild infrastructure and technology.

Uneven capacity of local governing entities and local federal land management agency offices can create variation in natural resource management on federal lands

(Abrams, 2019; Cheng & Sturtevant, 2012). Agencies have identified that capacity limitations can prohibit communities from accessing grant funding or economic support (Christensen et al., 1999), further crippling these communities. In a similar way, the uneven spread of land management capacity can be to the detriment of both natural resources and adjacent communities. Wildfire threats are an example of uneven management and capacity that can impact communities and natural resources.

Though no longer timber focused, community ties to adjacent federal lands remain an important part of both cities. Further, adjacent federal lands provided some of the greatest opportunities and threats to both communities. Thus, future research may explore the ways in which federal land management agencies might identify community disparities and support agency districts, thus supporting adjacent communities.

CONCLUSION

Adaptation is a continuous process. Decisions made throughout this process reverberate through time. As communities adapt, their capacity may expand, and contract, based on the outcomes of previous decisions. These case studies capture a snapshot of two communities that are in flux. Susanville is navigating unanticipated results from earlier economic decisions that have spilled over to affect social capital and the capacity of local governments. Anticipated prison closures illustrate that communities are in constant flux, as Susanville may be on the verge of another economic transition. Prineville is in the midst of responding to rapid growth and economic effects. The social effects on community well-being are not yet fully realized. To return to these communities at a later date, one might have a different picture. What these communities generously share is how the strength of local leadership is paramount for communities following new adaptation strategies in areas with limited amenity draws. They share how communities are holding onto forest products industries. Though timber production was no longer a primary economic contributor, forest-based industries contributed to community ties with adjacent federally managed lands. Local visions for the future incorporate federal lands by providing a community resource and as a source of economic diversification.

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APPENDIX

Table 13 Regional values and percentages provide context to location quotient values for Eastside Counties. *Values for incarcerated populations have been removed.

		2016				1990-2016			
		Min	**Max**	**Median**	**Mean**	**Min**	**Max**	**Median**	**Mean**
Land Ownership	Total Acres	412,164	6,544,924	1,933,466	2,274,236	-	-	-	-
	USFS & BLM	14.9%	75.4%	48.8%	46.0%	-	-	-	-
	Private	22.0%	82.9%	43.3%	48.1%	-	-	-	-
	Tribal	0%	24.4%	0%	2.3%	-	-	-	-
Timber and Wood Products	Harvest Total (MBF)	818	199,787	29,531	45,428	-	-	-	-
	Private Harvest	2.2%	100%	69.4%	64.9%	-59.4%	53.2%	18.2%	16.9%
	Public Harvest	0%	97.8%	30.6%	35.1%	-53.2%	59.4%	-18.2%	-16.9%
	Tribal Harvest	0%	100%	84.3%	84.3%	0%	60.4%	45.5%	45.5%
	Total Wood Products Processing Facilities	0	8	2	2.5	-4	5	0	0.375
	Mill	0	4	1	1.25	-3	2	0	-0.375
	Secondary	0	7	1	1.25	-	-	-	-
	Biomass	0	4	0	0.33	-	-	-	-
	Mill Closures Pulp Paper	-	-	-	-	0	10	3	3.12
Demographics	Total Population*	1,369	223,877	23,141	50,129	-11.6%	127.8%	11.7%	19.5%
	Over 65 Years Old*	14.5%	36.6%	23.9%	22.7%	-1.1%	15.1%	6.0%	5.7%
	Under 18 Years Old*	11.5%	28.3%	20.6%	20.8%	-10.4%	-1.8%	-6.5%	-6.2%
	School Enrollment	376	31,357	3,643	7,701	-52.9%	82.5%	-6.3%	-5.5%
	Native American*	1.6%	19.1%	4.6%	4.8%	-0.4%	3.2%	2.0%	1.7%
	White	71.8%	98.8%	93.0%	92.1%	-8.7%	2.5%	-1.2%	-1.1%

		2016				1990-2016			
		Min	**Max**	**Median**	**Mean**	**Min**	**Max**	**Median**	**Mean**
	School Race& Ethnicity White	35.2%	89.2%	70.2%	68.5%	-39.7%	-2.5%	-17.5%	-18.1%
	Hispanic*	1.9%	34.7%	9.2%	12.0%	-2.0%	23.6%	5.3%	6.7%
	School Race& Ethnicity Hispanic	4.3%	54.2%	16.7%	20.0%	-1.2%	38.8%	11.6%	13.4%
	Spanish Speaking Households*	1.4%	28.2%	5.8%	7.8%	-0.1%	18.7%	2.6%	4.0%
	ESL Learners	0	2,517	254	644	0.0%	26.6%	4.3%	7.9%
	School Spanish Speakers	0.0%	23.2%	4.0%	6.4%				
Economic	Total Wages	-	-	-	-	-50.6%	199.2%	30.3%	43.2%
	Manufacturing Sector	0.0%	28.4%	6.9%	8.0%	-30.5%	0.4%	-10.1%	-9.6%
	Natural Resources Sector	0.0%	24.7%	6.8%	8.4%	-10.1%	12.9%	-2.9%	-2.3%
	Leisure & Hospitality Sector	0.0%	7.7%	4.1%	4.3%	-2.4%	3.8%	0.4%	0.7%
	Financial Sector	0.0%	6.0%	2.4%	2.7%	-2.3%	2.8%	0.0%	0.0%
	Public Administration Sector	1.1%	58.2%	10.7%	13.8%	-12.6%	19.7%	0.6%	2.1%
	USFS and BLM Wages	0.0%	15.6%	2.0%	4.5%	-2.5%	6.9%	1.4%	1.6%
Socioeconomic Well-Being	Median Household Income	33,400	57,429	44,175	44,606	-26.1%	23.7%	2.5%	3.5%
	Poverty	11.3%	22.0%	17.2%	17.0%	-1.2%	8.0%	2.1%	2.6%
	Free and Reduced Priced Meal (FRPM)	20.5%	76.9%	52.7%	53.6%	-14.2%	48.5%	24.2%	24.9%

Table 14 Production Types, adapted from Morzillo et al. (2015) to include three new production types: *diversified production, heritage production*, and heritage *production + public administration*.

Economic Transition	**Description**	**Resource Base**		**Connectivity**	**Social Adaptability**			
		Economic Base	Land Ownership	Transportation	Age Structure	Poverty	Economic Growth & Income	Race & Ethnicity
Amenity	Natural resource amenity-driven economies that draw in tourism, recreation, or amenity migration.	Natural resource tourism and recreation, service sector	Mixed private and public land	Connected	Mixed age structure with retiree in-migration	Low rates of poverty	Increases in economic growth. Above average household income	Predominantly White
Diversified Production	Production and amenity-driven economies	Range of economic sectors blended with manufacturing or natural resources	Mixed private and public land	Connected	Aging from retiree-in-migration or youth outmigration	Mixed poverty	Slow economic growth. Proportionate household income	Predominantly White
Heritage Production	Production based on ties to historic natural resource dependent industries or new modes of production	Manufacturing of timber, ranching, or agriculture	More private land	Connected	Mixed age structure with increase in youth	Above average	Increases in economic growth. Above average household income	Increasing Hispanic Residents. High proportions of Native American
		Natural resources of timber, ranching, or agriculture	More public land	Less connected	Aging population	Below average		Predominantly White

Economic Transition	**Description**	**Resource Base**		**Connectivity**	**Social Adaptability**			
		Economic Base	Land Ownership	Transportation	Age Structure	Poverty	Economic Growth & Income	Race & Ethnicity
Heritage Production + Public Administration	Heritage Production combined with high proportions of wages from public administration	Heritage production combined with public administration from federal, state, local, or tribal government	More public or tribally owned lands	Less connected	Aging population	Below average	Slow wage growth. Below average household income	Predominantly White
Decline	Economic and population decline	Heritage production	More public lands	Isolated	Population decrease	Average	Proportionate household income. Wages in decline.	Predominantly White

Table 15 County snapshots were created from a combination of data analysis, typologies, and information collected from each county's economic development plans and websites.

Economic Type	County	Population & Demographics	County Snapshot
Metro	Butte	Slow Increase	Chico State University, agriculture
	Shasta	Slow Increase	Growth in Redding, agriculture, timber harvest, timber mill, Lassen Volcanic National Park
	Yuba	Slow Increase, Increase in Youth	Beale Air Force Base, agriculture, Sacramento area growth
Metro-Amenity	Deschutes	Rapid Population Growth	Rapid growth in Bend, amenity migration, Mt. Bachelor Ski Resort, primary and secondary wood products manufacturing
Amenity	Nevada	Growing Population, Increase in Older Residents	Amenity Migration, Commuter town, Sacramento area growth, Tahoe recreation, recreation tourism, restoration and conservation non-profits
Diversified Production	Crook	Growing Population; Increase in Older Residents	Manufacturing, growth from Deschutes County, amenity migration, secondary wood products manufacturing, Apple and Facebook data centers
	Klamath	Slow Population Increase	Secondary and primary wood products manufacturing, agricultural manufacturing, Crater Lake National Park, Oregon Tech, agriculture
	Plumas	Population Decline, Increase in Older Residents	Wood products manufacturing, drawing in recreation tourism and amenity migration, second homeowners, Greenville Rancheria
	Baker	Growing Population. Increase in Older Residents	Coal and Ore Mine, timber, agriculture, food manufacturing, Anthony Lakes Ski Area
	Siskiyou	Increase in Older Residents	Mt. Shasta recreation, timber harvest
	Union	Slow Population Increase	Eastern Oregon University, wood products manufacturing, public land management headquarters
	Wallowa	Increase in Older Residents	Amenity migration, agriculture, timber harvest, tourism
	Wasco	Slow Population Increase	Crop agriculture, ranching, growing amenity migration, Google Data Center

Economic Type	County	Population & Demographics	County Snapshot
Heritage Production	Morrow	Population Growth, Increase in Youth	Morrow County/Tillamook County Creamery Association, crop agriculture and processing, ranching, secondary wood products manufacturing
	Tehama	Increase in Youth	East county timber harvest and ranching, west county agriculture, wood products and crop agricultural products manufacturing, Paskenta Rancheria
	Umatilla	Slow Population Increase, Increase in Youth	Pendleton Woolen Mills, wood products manufacturing, Amazon.com Data Center, East Oregon Correctional Institution, Confederated Tribes of the Umatilla Indian Reservation
	Wheeler	Increase in Older Residents	Public administration, ranching, fossil beds
Heritage Production + Public Administration	Harney	Increase in Older Residents	Public administration, ranching, Burns Paiute Tribe
	Lake	Increase in Older Residents	Red Rock Biofuel biomass to jet fuel manufacturing, ranching
	Jefferson	Population Growth, Increase in Youth	Rapid growth, retiree in-migration, Confederated Tribes of Warm Springs, timber mill closed in 2016
	Modoc	Increase in Older Residents	Ranching, Piute Tribes, public administration
Decline	Grant	Increase in Older Residents	Timber mill, ranching
	Sierra	Increase in Older Residents	Isolated, in Decline, trying for recreation tourism