Methods and data appendices for socioeconomic monitoring of nonmetropolitan communities following 25 years of the Northwest Forest Plan (1994–2018).


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Appendix A: Additional Methods

A.1 Semi-structured Interview and Coding Protocols

We used a semi-structured interview protocol with closed and open-ended questions in 10 key areas of interest and specific protocol addendums for agency personnel and timber industry stakeholders.

A.1.1 Interview Guide

Case study name: 
Case study id:
Interview id:
Date/time: ______/_______
Interviewer:
Location:

Introduction to the Project

Hello! Thank you for meeting with me today. Before we get started I would like to explain the interview process. This interview will be structured differently than an everyday conversation. I will be changing the subject from time to time, and I will not be responding in agreement or disagreement to the things that you are saying. I am going to be as neutral as possible, focusing my comments on letting you know when I understand what you are saying and when I do not, encouraging you to elaborate, or asking follow-up questions.

When the Northwest Forest Plan was formally adopted in 1994, the US Forest Service and Bureau of Land Management agreed to monitor changes to the forests they managed, as well as the social and economic characteristics of communities within the plan era. The "social and economic” monitoring reports have been released every 5 years since 2006. Our interview today is part of the 25-year update to NWFP social and economic monitoring. The 25-year update will include case studies of 10 communities within the plan area. Each case study will based primarily on interviews like ours today, with the intention of recording community members' perceptions of how their communities have changed over the past 25 years, and how changes to the community might be related to changes in how the neighboring federal forest lands are managed. The 25-year update to which this interview contributes is scheduled to be released sometime in the fall of 2019.

By contributing to this research, you are helping to assist forests in communicating more effectively with their stakeholders about local conditions and to respond to stakeholder feedback requesting more narrative descriptions of their changing communities, and more information about the connection between federal agency land management, and local community well-being.
Interview Questions

1.0 Community of Place Questions

1.1 Can you tell us briefly about your background and how your work relates to this community?
1.1.1 How long have you done that?
1.1.2 Have you had other roles previously?
1.2 How well do you think the school district represents your community?
1.3 Are you familiar with the Northwest Forest Plan?
1.3.1 If yes, Can you name three things that describe what the plan is about to you?
1.4 How have employment opportunities in your community changed in the last 25?
1.4.1 Is this trend specific to the timber industry?
1.4.2 If not timber industry, what industry?
1.5 Has the cost of buying/renting a home changed in the last 25 years?
1.5.1 Can you describe the housing situation in the community in terms of rental or purchase availability and affordability?
1.6 How has access to goods and services changed in the last 25 years? [e.g. stores, health, restaurants, schools, etc.]
1.6.1 Can you expand on that?
1.7 Has the number of people who to commute to work changed?
1.7.1 Have commute distances increased or decreased [and what are those locations?]?
1.8 Have there been changes in recreational, leisure, or socializing opportunities?
1.8.1 For children
1.8.2 For adults
1.9 Have there been changes in the surrounding landscape or waterways?
1.10 Discuss school enrollment and F&R Lunch data, ask if they can name 2 or 3 factors that explain it.
1.11 Do these trends relate to how federal agencies manage the forest?
1.11.1 What are some other explanations?
1.12 Are you familiar with the secure rural schools funding program?
1.12.1 How important was secure rural school funding to the community?
1.12.2 What is your perception of the trend in local school funding?
1.13 Have the number of families with children changed over the last 25 years?
1.14 Do young people stay in town or come back to have families?
1.15 Do retirees stay here?
1.15.1 Why/Why not
1.16 Are there new people moving here?
1.17 How would you describe people who move here?
1.17.1 What draws them here?
1.18 Are there other changes in the community not asked about?
1.19 Have these changes affected the community positively or negatively?
1.20 Would you consider the federal timber land [insert NF or BLM] as an integral component of this community?
1.20.1 What drives that connection?
1.21 Are there other commercial forestlands that are important to the community?
1.22 Would you consider that federal agency people engage in the community?
1.22.1 Describe the relationship between community and staff
1.23 How does the community view the agency [FS or BLM]?
1.24 How does the community view the current forest management policies?
1.25 Is fire hazard management a community concern?
1.25.1 Does the Agency do enough to protect its resources and adjacent private property?
1.25.2 Do they do too much? If yes, is Prescribed fire or smoke an issue, is there too much thinning?
4.6.3 Has fire affected the economy? If so, how?
4.7 Does the federal land manager [insert FS or BLM] communicate or interact effectively with the community?
4.8 If any, what are the key issues of concern between the FS and community?
5.1 Are there specific land use activities that are important to the community?
5.1.1 [If yes for each of the following can you expand on that?]
5.1.2 Grazing
5.1.3 Recreation
5.1.4 Mining
5.1.5 Game/Fish habitat
5.1.5.1 Specific game/fish
5.1.5.2 Other? What are they?
5.2.1 Non-timber/special forest products, what are they?
5.2.1.2 Where do the SFP users come from?
5.2.2 Are special forest products well managed and do people respect agency rules for their use?
6.1 What [if any] of the above changes that you have described in this interview do you feel are directly related to the Northwest Forest Plan?
6.2.1 If there were fewer restrictions on logging in federal timberlands, how would this effect the community?
6.2.2 What are other possible futures you could envision for the development of the town?
6.3 Anything else we didn’t discuss that you feel it is important for me to know?

7.0 Federal Agency Addendum
7.1 How have the number of forest service employees changed in the last 25 years?
7.1.1 How have the type of forest service employees changed
7.1.1.1 Have these changes affected their ability to carry out their mission?
7.1.2 Has Agency staff demographics change?
7.1.3 Where do Agency staff live and has this changed in last 25 years
7.1.4 Have these changes affected the community?
7.1.4.1 How?
7.2 Have you seen changes in program areas or priorities?
7.2.1 Are you noticing more restoration related contracting in the district?
7.2.2 Have you seen changes in the amount or type of contracts being used for timber sales?
7.2.2.1 How have timber purchasers responded to these changes?
7.2.3 Has there been a change in the amount of collaboration or the use of collaboration in the district?

8.0 Timber Industry Addendum
8.1 How many do you employ?
8.1.2 Has the employment increased/declined at all or has it been on a steady trend since the 80s?
8.1.3 Where is your workforce housed currently? E.g. How many are local versus commuting?
8.1.4 Have you seen changes in the last 25 years in the composition of your work force?
8.2.1 What have you done to diversify or respond to change in timber supply?
8.3.1 Could you talk a little bit about what public lands you were sourcing your timber from 25 years ago versus now?
8.3.2 Are you having to go further or extend your reach to meet your targets?
8.3.3 Were you primarily pulling from the [nearest National Forest X]?
8.3.4 What National Forests do you pull from now?
8.3.5 For the amount of your timber supply that is non-public, what percent of that is coming off your land versus private non-industrial?
8.4 With the changes in the Forest Service in the last 25 years how does your relationship with them compare to working with the state or with BLM in terms of the types of sales that they are offering?
### A.1.2 Coding Protocol

**Table A1.1: Coding schema for semi-structured questions.**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Question Text</th>
<th>Coding Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview Type</td>
<td>Can you tell us about your background and how your work relates to this community?</td>
<td>Interviewee Type</td>
</tr>
<tr>
<td>Feedback</td>
<td>How well do you think the school district represents your community?</td>
<td>Quality, Well - Not Well</td>
</tr>
<tr>
<td>NWFP</td>
<td>1.3 Are you familiar with the NWFP?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>NWFP</td>
<td>1.3.1 If yes, Can you name three things that describe what the plan is about to you?</td>
<td>Free List</td>
</tr>
<tr>
<td>Employment</td>
<td>2.1 Have employment opportunities changed in the last 25?</td>
<td>Quantity Change, Increase - Decrease</td>
</tr>
<tr>
<td>Employment</td>
<td>2.1.1 Is this trend specific to the timber industry?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Housing</td>
<td>2.2 Has the cost of buying/renting a home changed?</td>
<td>Quantity Change, Increase - Decrease</td>
</tr>
<tr>
<td>Services &amp; Commuting</td>
<td>2.3 How has access to goods and services changed in the last 25 years?</td>
<td>Quantity Change, Increase - Decrease</td>
</tr>
<tr>
<td>Services &amp; Commuting</td>
<td>2.3.1 Can you expand on that?</td>
<td>Open</td>
</tr>
<tr>
<td>Social Fabric Socializing</td>
<td>2.5 Have there been changes in recreational, leisure, or socializing opportunities? Greater/Fewer</td>
<td>Quantity Change, Greater - Fewer</td>
</tr>
<tr>
<td>Social Fabric Socializing</td>
<td>2.5.1 For children</td>
<td>Quantity Change, Greater - Fewer</td>
</tr>
<tr>
<td>Social Fabric Socializing</td>
<td>2.5.2 Adults</td>
<td>Quantity Change, Greater - Fewer</td>
</tr>
<tr>
<td>Environment</td>
<td>2.6 Have there been changes in the surrounding landscape or waterways?</td>
<td>Open</td>
</tr>
<tr>
<td>Social Fabric Education</td>
<td>2.7 Show them School data, ask if they can name 2 or 3 factors that explain it.</td>
<td>Free List</td>
</tr>
<tr>
<td>Social Fabric Education</td>
<td>2.8 Do these trends relate to how federal agencies manage the forest?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>NWFP</td>
<td>2.9 Are you familiar with the rural schools funding program?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>NWFP</td>
<td>2.9.1 How important was secure rural school funding to the community?</td>
<td>Likert 1-5</td>
</tr>
<tr>
<td>NWFP</td>
<td>2.9.2 Perception of the trend of rural school funding</td>
<td>Quantity Change, Increase - Decrease</td>
</tr>
<tr>
<td>Social Fabric Demography</td>
<td>3.1 Have the number of families with children changed</td>
<td>Quantity Change, Increase - Decrease</td>
</tr>
<tr>
<td>Social Fabric Demography</td>
<td>3.2 Do young people stay in town or come back to have families?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Social Fabric Demography</td>
<td>3.3 Do retirees stay here?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Social Fabric Demography</td>
<td>3.3.1 Why/Why not</td>
<td>Open</td>
</tr>
<tr>
<td>Social Fabric Demography</td>
<td>3.4 Are there new people moving here?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Social Fabric Demography</td>
<td>3.5 How would you describe people who move here?</td>
<td>Open</td>
</tr>
<tr>
<td>Social Fabric Demography</td>
<td>3.6 Are there other changes?</td>
<td>Open</td>
</tr>
<tr>
<td>Social Fabric Demography</td>
<td>3.7 How have these changes affected the community?</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td>Relationship with Forest and Forest Service</td>
<td>4.1 Would you consider the federal timber land [insert NF or BLM] as an integral component of this community?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Relationship with Forest and Forest Service</td>
<td>4.1.1 What drives that connection? [to Forest Lands]</td>
<td>Open</td>
</tr>
<tr>
<td>Relationship with Forest and Forest Service</td>
<td>4.2 Are there other commercial forest lands that are important to the community?</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>
Relationship with Forest and Forest Service

4.3 Would you consider that federal agency people engage in the community? Yes/No
4.3.1 Describe the relationship between community and staff Positive/Negative
4.4 How does the community view the agency [FS or BLM]? Positive/Negative
4.5 How does the community view the current forest management policies? Positive/Negative
4.6 Is fire hazard management a community concern/issue Yes/No
4.6.1 Does the Agency do enough to protect its resources and adjacent private property? Yes/No
4.6.2 Do they do too much? If yes, is Prescribed fire or smoke an issue, is there too much thinning? Yes/No
4.6.3 How does fire affect the economy? Open
4.7 Does the federal land manager [insert FS or BLM] communicate or interact effectively with the community? Yes/No
4.8 If any, what are the key issues of concern between the FS and community? Open
5.1 Services: Are there specific geographic areas that are important to the community? Open
5.1.1 Can you expand on that? Open
5.1.2 Grazing – yes/no Yes/No
5.1.3 Recreation – yes/no Yes/No
5.1.4 Mining – Yes/no Yes/No
5.1.5 Game/Fish habitat- Yes/No Yes/No
5.2.1 Non-timber forest products, what are they? Free List
5.2.1.2 Where do the users come from? Open
5.2.2 Non-timber forest products, are they well managed / Do people respect Agency rules? Yes/No
6.1 What [if any] of the above changes that you have described in this interview do you feel are directly related to the Northwest Forest Plan? Open
6.2.1 If there were fewer restrictions on logging in federal timberlands, how would this effect the community? Open
6.2.2 What are other possible futures you could envision for the development of the town? Open

7.0 Fed Agency Addendum

FS Perspective
7.1 How have the number of forest service employees changed in the last 25 years? Quantity Change, Increase-Decrease
7.1.1 How have the type of forest service employees changed Open
7.1.1.1 Have these changes affected their ability to carry out their mission? Yes/No
7.1.2 Have Agency staff demographics changed? Yes/No/Expand
<table>
<thead>
<tr>
<th>Question</th>
<th>Response Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1.3 Where do Agency staff live and has this changed in last 25 years</td>
<td>Open</td>
</tr>
<tr>
<td>7.1.4 Have these changes affected the community?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>7.1.4.1 How?</td>
<td>Open</td>
</tr>
<tr>
<td>7.2 Have you seen changes in program areas or priorities? Where/How?</td>
<td>Yes/No/Expand</td>
</tr>
<tr>
<td>7.2.1 Are you noticing more restoration related contracting in the district?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>7.2.2 Have you seen changes in the amount or type of contracts being used for timber sales?</td>
<td>Yes/No/Expand</td>
</tr>
<tr>
<td>7.2.2.1 How have timber purchasers responded to these changes?</td>
<td>Open</td>
</tr>
<tr>
<td>7.2.3 Has there been a change in the amount of collaboration or the use of collaboration in the district?</td>
<td>Yes/No/Expand</td>
</tr>
<tr>
<td>8.1 How many do you employ?</td>
<td>Quantity</td>
</tr>
<tr>
<td>8.1.2 Has the employment changed at all or has it been on a steady trend since the 80s?</td>
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<td>Yes/No Expand</td>
</tr>
<tr>
<td>8.3.3 Were you primarily pulling from the [nearest National Forest X]?</td>
<td>Open</td>
</tr>
<tr>
<td>8.3.4 What National Forests do you pull from now?</td>
<td>Open</td>
</tr>
<tr>
<td>8.4 With the changes in the Forest Service in the last 25 years how does your relationship with them compare to working with the state or with BLM in terms of the types of sales that they are offering?</td>
<td>Open</td>
</tr>
</tbody>
</table>
A.2 Research Protocol for Case Study Background Data

A2.1 Inventory of Services and Amenities

We exported the case study boundaries from ArcGIS into a KMZ layer (see section A.3 for details on case study boundaries). The case study boundary KMZ was then imported into Google My Map (https://www.google.com/maps). The boundaries were then visible on the Google map, and were used to evaluate the locations of relevant destinations such as vacation rental homes, libraries, ski areas, and more. The ease of searching Google My Maps made this tool more useful than the use of the layer in Google Earth.

To search the map, the following methods were used:
1. Zoomed view extent to case study boundary on the Google My Map.
2. Searched for each service item using common search terms, “motel” and case study place name. If the boundary contained multiple place names, multiple searches were performed, e.g. for Restaurants: Used search term “restaurants near [town name].”
3. Unless otherwise noted below, the results that lay within the case study boundaries were recorded.

Count of Vacation Rental Homes

- Used Airbnb and VRBO. Homeaway is another popular site but seemed to largely contain duplicates of the VRBO listings.
- Individual listings from each website were compared to each other and to local hotels in the area.
- When duplicates were identified in on Airbnb and VRBO, the Airbnb listings were eliminated and the VRBO listings were retained for the count purposes and pricing average/standard deviation calculations.
- When hotel rooms were listed on Airbnb, those listings were eliminated from the Airbnb count and pricing average/standard deviation calculations, and retained as hotel rooms in the hotel listings only.
- Cascade School District proved a challenge due to the sheer volume of rentals. Airbnb & VRBO were meticulously counted in the Leavenworth area. The Lake Wenatchee area is another popular tourist destination – for this area, only the Airbnb listings were counted.

Hotel/Motel Beds & Rooms

- To count beds and rooms, the hotel website was checked first, followed by Trip Advisor (which typically has room counts). If the room count was unavailable from these sources, the hotel was phoned directly and asked.
- For many of the hotels, bed counts were unavailable.

Campgrounds (Site/Capacity)

- Undeveloped campgrounds (no developed campsites, only primitive/dispersed camping) were not included in the count.
- For campgrounds with a few rustic cabins, the cabins were included in the campground accommodation count, rather than the vacation rental homes or hotel/motel counts.
- Total number of campsites, including double & group sites counted as one site as well.
- Campgrounds are still counted even if marked as seasonally "closed" on webpage.

Restaurants

- Searched “restaurants” by place name.
- Used map on Yelp.com cross-validate count.

Recreation Outfitters & Marinas

- Counted guides, equipment rentals, and gear shops -- all must have a storefront or office within the school district boundaries.
- Marinas were also included in this metric.
- Used Google My Maps with school district layer, Google search, and Yelp.

Golf Courses/Ski Area/Amusement Parks/Other Attractions

- Places that would motivate people to visit the town for vacation.
- Ski Areas are counted if they are within 45 mi of boundary

Post Office

- Method: Looked up post office locations on USPS.com (https://tools.usps.com/go/POLocatorAction.action). If they have “Retail Hours” listed, that means that the office is staffed.

Libraries

- Google searched for the key communities (“town name” “library”).

Public Transportation

- Binary: 1 if it exists, 0 if not
- In appendix, record the website for the business that does it
- Needs to allow for commuting: Morning and evening bus to or from a larger community, under two hours

Hospitals

- Google searched for the key communities (“town name” “hospital”).

Wellness Centers

- Medical clinic, mental health clinic, crisis center
- Searched Google Maps for “health clinic,” “medical clinic,” and “urgent care.”

Ambulances – Number

- Counted the number of ambulances that were operated within the school district.
- Included both volunteer and professional ambulances.
- Business address must be within the school district boundaries.
Ambulances – Type (paid or volunteer)

- Binary: 1 if the staff is paid, 0 if volunteer, NA or – if no ambulance exists in the school district.

Dentists

- Counted the number of dentists within the school district.
- Used Yelp.com and Google Maps.

Number of paid fire/emergency response staff

- firedepartment.net > Directory > State > County
- All paid fire and emergency personnel. Full-time counts as one person, part-time counts as 0.5.
- All numbers are for firefighters; other emergency personnel were not listed in this database.
- Some counties listed Forest Service firefighters and resources in this database, but this information was not included in the count as its presence was not consistent across counties.

Community Center/Resources

- Google searched for the key terms (“town name” “community center”).

Heritage Museum/Society

- Google searched for the key terms (“town name” “heritage society”).

A2.2 History, Economy, Additional Background

History

Constructing detailed and accurate local-level historical narratives are research intensive processes. We referenced peer reviewed sources and official government issued documents wherever they were available. To fill in the gaps and cross-check facts, we relied on gray literature and websites maintained by community organizations and locally invested industries. See Appendix D for a list of internet resources we reviewed.

Economy

We used median home prices as a metric for the current state of the local economy and infrastructure. We retrieved median home prices for case studies and states from Zillow.com. See Appendix D for dates and webpage addresses.
Community Assets, Barriers, and Other Current Issues

Additional information on current community assets, barriers, and other issues were gathered through internet search of scholarly and general audiences resources. The results of this research can be found in the Chapter 4 background sections with supplemental summaries reported in Appendix B. Although we used a variety of internet search terms to locate this information, the summaries provided are by no means exhaustive. The impetus for investigating the specific topics outlined came from a combination of topics raised by interviewees, background research, and site visits. We gave priority to peer reviewed and gray literature documents (such as official government reports), followed by reputable news articles, and finally community maintained websites to inform our understanding of these topics. Appendix D notes the sources used, in addition to the sources noted in text.

A.3 GIS Data Sources and Methods

A.3.1 Case Study Community Boundaries

As described in Chapter 4 of this volume, we used school district boundaries to physically bound our case study communities. School district boundaries for each state were downloaded from the U.S. Government open data files (https://www.data.gov/). We merged individual states’ boundaries into one dataset and selected and visually inspected school district boundaries for a subset of our case study sample communities. We then used this initial inspection to further limit our case study sample to 10 communities that were uniquely bounded by one school district.

Seven out of ten of our final case studies were singularly bounded by their school district which included one or more elementary schools and one traditional-track secondary school. Our three exceptions include Happy Camp, California, Santiam Canyon and Gilchrist, Oregon. For Happy Camp we used the elementary school district boundary only since this was more restricted than the secondary school boundary. Santiam Canyon spans two counties, but is otherwise makes sense as a community of place because it contains only one traditional high school and one alternative on-line high school. Gilchrist is technically lumped in with North Klamath County as a school district (which includes Chiloquin), however, we were able to obtain the school-level “district” boundary for this case study which is effectively equivalent to districts in other areas as it has only one school k-12 (see Table A3.1).

<table>
<thead>
<tr>
<th>Case Study Community</th>
<th>School District Name</th>
<th>Schools Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darrington</td>
<td>Darrington School District</td>
<td>-Darrington Elementary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Darrington High School</td>
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<tr>
<td></td>
<td></td>
<td>-Beaver Valley K-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Peshastin-Dryden k-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Alpine Lakes 3-5</td>
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<td></td>
<td></td>
<td>-Icicle River Middle 6-8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Cascade High School 9-12</td>
</tr>
<tr>
<td>Leavenworth</td>
<td>Cascade School District</td>
<td></td>
</tr>
<tr>
<td>Lake Quinault</td>
<td>Lake Quinault School District</td>
<td>Lake Quinault School</td>
</tr>
</tbody>
</table>
A3.2 Isolation Analysis

To calculate the relative isolation of each community, we used highway drive time to nearest large commercial center. We downloaded highways and locations for interstate highway on/exit-ramps, Walmarts, hospitals, and banks from ArcGIS Online (https://www.arcgis.com/home/index.html). We clipped the highway shapefile to the Northwest Forest Plan area and converted it to a raster format with a 100m resolution. We converted each cell value to miles (0.0621372). We snapped point located data to the raster highway layer and calculated minimum drive times from any location along the road network to Walmarts, hospitals, banks, and interstate highway ramps respectively. We then calculated the zonal mean cost distance (drive time) for each data type using case study school districts as our reference zones.

Because each case study included at least one bank (or ATM), we used the bank layer as a way to measure within community travel time to goods and services. We used this within community distance layer as our model for pre-NWFP distance to goods and services, which reflects the greater local diversity and availability of goods and services cited by our interviewees for the 1990s and earlier. We used distance to Walmarts as our model proxy for distance to large commercial center since they were all located within the metropolitan or micropolitan communities closest to our case studies. This distance model served as our proxy for current isolation from goods and services since interviewees in each case study reported the need to commute to these locations in order to access at least some goods or services. We also looked at distance to hospitals as an alternative measure of isolation from goods and services.
A3.3 Commutability and Bedroom Community Potential

“Commutability” (cost-savings in housing by commute drive time) was calculated through the following steps:

1. We assigned a “commute to work community” to each case study by identifying the commute destination most commonly reported by interviewees.
2. We calculated the drive time between case study communities and the work community.
3. We retrieved the median home price (see Appendix A2.2 and Appendix D) for both work community and case study community and the median household wage in the work community.
4. We calculated a commutability index in the follow way: Housing costs were based on a standard monthly 30 year mortgage payment for the median priced home in the residence and work communities. Monthly housing payments were then calculated as a percentage of the median monthly household income for the work community. The difference between the income adjusted monthly housing costs for each community was then divided by the round trip drive time between the two communities.

$$\frac{[(30 \text{ year monthly mortgage payment 4.5 \% interest, } 20\% \text{ down for median home price in work community}) \times \text{(Median monthly household income in work community)}] - [(30 \text{ year monthly mortgage payment 4.5 \% interest, } 20\% \text{ down for median home price in residence community}) \times \text{(Median monthly household income in work community)}]}{(\text{Round trip drive time between residence and work communities})} \times \frac{\text{Median home price in commute target community} - \text{median home price in case study community}}{\text{drive time between case study and the target community}}.$$  

A3.4 Land Management

We downloaded land management and ownership data from the BLM Landscape Approach Data Portal (https://www.blm.gov/services/geospatial/GISData), selecting the BLM [state] Land Status- Surface Management Areas data.

Administrative boundaries for national forests, ranger districts, and wilderness areas were downloaded from the USDA Forest Service “FSGeodata Clearinghouse,” (https://data.fs.usda.gov/geodata/edw/datasets.php?dsetCategory=boundaries).

We conducted basic geostatistical analyses to tabulate percentage of case study land area for each land management type.
A.4 Demographic Trajectory

A.4.1 School Enrollment Data

To track local level (sub-census tract) demographic trends, we turned to school enrollment data. We downloaded the data from California, Oregon, and Washington Department of Education websites (see Appendix D). We organized the data by school district and year for (1) total enrollment, (2) minorities as percentage of total enrollment, and (3) Free and reduced lunch eligible as a percentage of total enrollment. To clear the data, we excluded alternative, on-line schools that recruit from other districts. We then conducted basic summary statistics, calculating the moving averages, standard deviations, percent change for all years that were available across all states (1999-2016).
Appendix B: Additional Considerations of Community Assets, Barriers, or Other Current Issues

This appendix contains additional information gathered through background research for the case studies, and other document review. The impetus for investigating these topics came from a combination of topics raised by interviewees, background research and site visits. We used a variety of news articles, documents and other sources to inform our understanding of these topics. Appendix A.2 describes the methods used for collecting the information, and Appendix D notes the sources used, in addition to the sources noted in text. The text in this section serves as additional summary notes about the case study areas, and is not comprehensive for each case in each theme area. The sections include considerations around case study’s potential assets, barriers, and current issues.

B.1 Darrington

B1.1 Assets

Darrington Bluegrass Festival—

Since 1986, the Darrington Bluegrass Festival has been held at the Darrington Bluegrass Music Park next to the Darrington Rodeo Grounds, just west of Darrington. Founded in 1977, the festival’s origins are in the North Carolina migrant community that was prevalent in Darrington’s timber industry. Now in its 43rd year, the event spans three days and typically draws over 8,000 attendees from Seattle and the surrounding area. In the months after the 2014 Oso landslide, which had temporarily blocked Darringtonians’ access to amenities in western cities, Snohomish County invested $150,000 in state money in a marketing campaign promoting Darrington’s Stillaguamish Valley. In addition to promoting the natural beauty of the valley, the campaign promoted the Darrington Bluegrass Festival and other local events. The Bluegrass Festival was used as a barometer for the recovery of Darrington’s tourism economy. Festival attendance in 2014 was on par with previous years, proving the strength of its draw and its importance as a tourism event for the town.

B1.2 Barriers

Restrictions on new wells—

The 2016 Washington State Supreme Court “Hirst decision” changed how counties approve building permits that use wells for a water source and resulted in the 2018 passage of the Streamflow Restoration Act. The new rules place the onus on Washington counties to assess the levels of rivers and streams when determining groundwater availability for wells. Counties may turn down building permits with insufficient water availability, regardless of the presence or lack of an existing well.
The law also requires 15 WA watersheds to produce updated plans to protect water availability while providing water for residents. In Snohomish County, where Darrington resides, the watershed WRIA 7 “has an instream flow rule that does not regulate permit-exempt wells,” although new wells for domestic use have usage limitations and an associated $500 fee (EZ View).

Snohomish County Planning & Development Services (PDS) procedures in response to the new rules require that all building permit applicants provide proof of adequate potable water supply, through documentation from an approved water purveyor, the Department of Ecology, or the Snohomish Health District. At minimum, the additional regulations under PDS introduce increased complexity for new buildings, which could create barriers to development in Snohomish County.

Oso landslide—

The 2014 Oso mudslide temporarily blocked Darringtonians’ access to amenities in western cities. This landslide occurred on March 22, 2014 at 10:37 am, killing 43 people, injuring another 10, and destroying 49 homes and other structures. More than 18 million tons of sand, till, and clay fell from an unstable hill located east of Oso and west of Darrington, covering State Route 530 and blockading the small community of Darrington from the amenities of larger cities to the west. For about a month following the slide, residents of Darrington (and visitors traveling to Darrington from the west) had to take a two-hour detour via Highway 20. In addition to the impacts on tourism, increased fuel usage, and reduced access to amenities resulting from the blocked road, the landslide also dammed the North Fork of the Stillaguamish River, resulting in additional concerns around flooding.

B.2 Leavenworth

B2.1 Issues

Cryptocurrency mining—

Over the last few years, digital crypto-currency miners have established a presence in north central Washington. Individuals are technically taking advantage of low cost hydro-electric power produced by the region. The influx of mines could represent economic opportunity, with large businesses flocking to the area, but their extreme demand for electricity could have negative impacts on the area’s tourism industry, power rates, and other amenities. In 2018, the Leavenworth City council passed a zoning ordinance to regulate the growing industry, citing concerns over the fire hazards associated with large electrical loads, noise pollution from heat-dispersal fans cooling computer servers, aesthetic concerns over the look of computer-filled cargo containers, and the potential effects of the industry on power rates. That same year, Chelan
County Public Utility District’s board of commissioners voted unanimously to cease review of new bitcoin mining facility applications, effectively halting the influx of new miners. However, in 2019, the city of Leavenworth loosened their requirements for cryptocurrency mining, by removing the requirement for a conditional-use permit to mine, stating that other existing restrictions on new mines (approval from the Chelan County PUD and state Department of Labor and Industries) were sufficient.

**B.3 Lake Quinault**

**B3.1 Assets**

**Lake Quinault Lodge—**

The original Lake Quinault Lodge, built in 1903, burned and was rebuilt in the 1920s. Today, the lodge is listed in the National Register of Historic Places. In 2010, USFS data counted 707,000 total visits to the Olympic National Forest, 82,000 of which were overnight visits to developed areas, with the overnight visitors spending an average of $167 per day in the local community. Visitors from outside Washington generated $240 of tax revenue for each Washington household.

As of 2010, the lodge employed about 150 people and supported community events by donating gift certificates for raffles and even hosting an annual community fundraiser in support of local schools, with reduced lodging and restaurant prices for community members. According to a 2012 report by Headwaters Economics, some community residents feel that the lodge’s community ties have diminished since its purchase by Aramark. Further, its all-inclusive amenities (restaurant, pool, gift shop) could in fact serve to reduce the tourist dollars that are spent in the community. Lake Quinault Lodge has contributed to Olympic National Forest programs by raising more than $150,000 via voluntary contributions made by its guests.

**B3.2 Barriers**

**Limited Broadband Access—**

The Quinault nation suffers from limited broadband access and limited cell service due to small populations. This limits economic development, emergency response, and access to information for students. The FCC’s 2018 Broadband Deployment Report notes that tribal areas lag behind in mobile broadband deployment, with 1.2 million Americans living on Tribal lands still lacking mobile LTE broadband at acceptable speeds.
B.4 Stevenson

B4.1 Assets

Columbia Gorge Interpretive Center—

In a 2015 Gorge tourism report conducted by ECONorthwest and Travel Oregon, Stevenson WA (location of the interpretive center) was rated as the fifth most popular tourist destination in the Columbia Gorge, slightly above the general “parks and natural areas” destination option. In addition to the Columbia Gorge Interpretive Center, Stevenson’s major tourist attractions include the Skamania Lodge, and various scenic overviews and hiking trails. However, a 2011 Gorge Commission study of the Gorge National Scenic Area found that fewer than 2% of respondents visited the Columbia Gorge Interpretive Center. In the cultural tourism category, visitors were much more likely to spend time on the historic Columbia River Highway, Vista House, or Bonneville Dam. A 2016 Travel Oregon study found that Oregon visitors seek out heritage and culture-related activities more frequently than most other activities, and this trend is even stronger in the Mt Hood/Gorge region than in the state of Oregon as a whole. However, they recommended further collaboration among heritage museums, including the CG Interpretive Center and its counterpart the Columbia Gorge Discovery Center in Dallas OR.

Wind River Nursery—

Wind River Nursery, located in Carson WA, was initially used by the US Forest Service as a tree nursery, producing up to 36 million seedlings a year, which were used to reforest clearcut and burned areas. In addition to producing seedlings as a nursery, the site also had a collection of buildings which served as a forestry research site. The nursery was closed in 1997, resulting in the loss of approximately 300 seasonal and full-year jobs. The land was transferred to Skamania County, which intends to re-use the site as Wind River Business Park with a focus on benefiting county residents. Potential lease opportunities include festival grounds, research facilities, and small group retreat centers, as well as the potential for further development into business centers and manufacturing facilities.
B.5 Santiam Canyon

B5.1 Assets

**Detroit Lake**—

Detroit Lake is a reservoir impounded by the Detroit Dam on the North Santiam River. The dam and reservoir are managed by the US Army Corps of Engineers. The lake is nine miles long by one mile wide, with 32 miles of shoreline when full. In addition to flood control and power generation, Detroit Lake is one of 32 lakes federally designated for recreation. Among its numerous recreation and tourism opportunities are year-round fishing of stocked rainbow trout and other fish; a designated state recreation area with 300 campsites, marina, visitor center, and gift store; and a second privately owned marina with additional services.

B5.2 Barriers

**Detroit Lake**—

The US Army Corps of Engineers is conducting environmental review of the Detroit Dam. They are considering various projects to improve temperature control and fish passage for salmon and steelhead at the dam. One solution entails constructing a 300-foot tower at the dam, which would result in Detroit Lake being drawn down for up to two years. Lowered water levels in Detroit Lake could have a number of negative implications, including potentially lowering the quality and quantity of drinking water from the North Santiam River, source of drinking water for Salem and surrounding jurisdictions. Lowered water levels could also impact tourism in Detroit and surrounding areas. Studies by ECONorthwest and Oregon State University have found significant economic impacts from lowered levels in the North Santiam and Detroit Lake, including $2-3.6 million lost in outdoor use of the North Santiam River, and 2% decline in visitor days for every foot of drop in water level at Detroit Lake.

**Sewer problems**—

Out of the five jurisdictions in North Santiam Canyon (Detroit, Gates, Lyons, Idanha, and Mill City), only Mill City has a centralized wastewater treatment facility. The other towns rely on septic systems for their wastewater disposal. Multiple sources, including a 2014 Economic Opportunity Study and a 2016 NSC Inventory Analysis, have identified the reliance on septic systems as a major obstacle to economic development, especially the potential growth of Detroit’s tourism industry, and recommended that the other four towns implement water system improvements in the form of sewer systems and wastewater treatment facilities. In recent years, the Marion County Board of Commissioners has been working with city mayors other stakeholders to develop a wastewater treatment district which would entail shared systems for
the cities that had previously relied on septic systems. The management of the new wastewater infrastructure has not been finalized.

**Drinking water**

More than 200,000 daily users get their drinking water from the North Santiam River, including residents of the five jurisdictions in North Santiam Canyon as well as the larger city of Salem. Due to the Three Basins rule, which restricts water discharge into the North Santiam River, many of the properties in the North Santiam Watershed are constrained to septic systems for their wastewater disposal, runoff from which could contaminate the North Santiam River, and potentially contribute to algae blooms.

In addition, toxic algae blooms resulting from warm weather during summer months can affect drinking water, as well as tourism activities. Detroit Lake’s recreational tourism activities such as fishing, swimming, and boating have increasingly been impacted by occasional closures and warnings due to toxicity resulting from algae blooms. In 2018, the effects of the toxic algae blooms reached a new high when low levels of cyanotoxins in drinking water prompted a “do not drink” tap water advisory for children and other vulnerable groups. This drinking water advisory remained in place for nearly a month.

**B.6 Gilchrist**

**B6.1 Assets**

**Crescent Creek Resort**

In 2007, developers proposed building a 9,000-acre destination resort with two golf courses, 2,000 home sites, and 800 overnight lodging units west of Highway 97, neighboring the communities of Gilchrist and Crescent. In November 2009, the resort’s master plan was approved, but it has been on hold since then, with one source citing low demand for resort homes and a general slump in the real estate market as the rationale for the hold. Beginning in 2010, the creation of the Gilchrist State Forest was facilitated by The Conservation Fund’s acquisition and ensuing sale to the state of Oregon of over 72,000 acres of former Gilchrist Timber Company land. The land comprising the state forest sits directly across the street from the proposed site of Crescent Creek Ranch on the southeast side of Highway 97 and is managed by the Oregon Department of Forestry.
B6.2 Barriers

Sewer problems—

The Klamath-Gilchrist School District boundary includes the towns of Chemult, Crescent, and Gilchrist. Crescent, Gilchrist, and West Crescent do not have adequate wastewater collection and treatment systems, relying either on septic systems or antiquated sewer systems. This lack of infrastructure produces the potential for health hazards resulting from elevated nitrate levels and coliforms such as E. coli, which could threaten the drinking water that residents obtain from the Little Deschutes River.

A 2015 Environmental Report proposed the development of a wastewater treatment facility and collection system in Crescent, with the potential to expand and include Gilchrist and West Crescent. In 2016, the Crescent Sanitary District worked with the Central Oregon Regional Solutions Team to implement this proposal and obtain a portion of the Gilchrist State Forest for the project. The project has moved forward, with all residents being hooked up to the system at no cost, an anticipated residential monthly sewer bill of $40 per household, and new residential hookup fees of $150, or $3500 if new lateral lines must be installed. Thus, the burden on residents is relatively low, with an anticipated high return on the investment. However, new regulations require developers to pay for their own sewer connection, which could present a burden to some future residents.

B.7 Myrtle Point

B7.1 Assets

Dairy farming—

Beyond its history with the timber industry, Myrtle Point’s history also includes dairy farming as another central source of income and industry for area residents. According to the Myrtle Point website, early settlers built a “booming agriculture industry in the area, with dairy farming and production of dairy products such as butter and cheese being supplied to communities as far away as San Francisco.” The Sinko Dairy in Myrtle Point has been recognized as the first certified organic dairy farm in Oregon, dating to 1994, and organic products are still emphasized in the area’s dairy production. Today, the small town of 2,500 still boasts seven dairy farms within its town limits, as well as additional farms in the surrounding Coquille Valley.
B.8 Riddle

B8.1 Assets

**Green Diamond Performance Materials—**

Green Diamond Performance Materials manufactures and sells specialty sand, which is used for sandblasting, asphalt shingle manufacturing, metal casting, and, most recently, filling the divots in grass on golf courses. The company began with three employees in 1961, and has grown to employ over 60 people, creating a reliable source of income and economic opportunity at their magnesium orthosilicate reserve and plant in Riddle. In 2017, MSI Capital Partners invested in Green Diamond (then called Green Diamond Sand Products) and recapitalized the company.

**Seven Feathers Casino Resort—**

Owned by the Cow Creek Band of Umpqua Tribe of Indians, Seven Feathers Casino Resort in Canyonville, Oregon, brings economic opportunity through jobs and tourism. The casino has over 900 slot machines, as well as table games and a bingo hall. In addition, it maintains 300 rooms at the attached hotel, as well as a restaurant, spa, arcade, gift shop, and meeting rooms. There is also a 191-space RV park at the resort as well. The resort grew from a 450-seat bingo hall that was established in 1992. The Cow Creek tribe has repeatedly protested and called attention to the Coquille Indian Tribe’s “clandestine” attempts to increase the size of a proposed casino project in Medford” (Mail Tribune, 2019). In 2005, the casino resort laid off 93 employees, citing economic recession and competition resulting from the Coquille tribe’s casino expansion. Although numbers specific to the casino are not available, the tribe provides 1,331 payroll jobs and contributes $188.5 million in economic output to Douglas County, according to a 2016 study by ECONorthwest.

B8.2 Barriers

**Formosa Mine Superfund Site—**

The abandoned Formosa Mine which re-opened for a short time in the early 1990s is now a superfund site that leaches heavy metals and acid mine drainage into the headwaters of Middle Creek which potentially threatens Riddle’s ground water source. The site was initially used for copper and silver mining for over 25 years, from 1910 to 1937. Recent actions at the site include a water diversion system installation by the Oregon Department of Quality in 2000, an investigation of the site’s contaminated soil by the EPA in 2012, and a feasibility study of cleanup alternatives by the EPA in 2013. In addition, the Oregon Environmental Health Assessment Program (EHAP) completed a study of the health impacts associated with the site, concluding that drinking water quality is not affected by the site, but that “drinking or bathing in the water directly downstream from the mine is a health hazard” and should be avoided due to the water’s high acidity level. The EPA is currently in the process of designing the site’s remedy.
procedure, which will include excavating contaminated materials, building a containment facility to address leaching issues, contouring select areas to redirect water and reduce associated leaching of waste material, and covering some areas with waste material intact. The site cleanup is funded federally, with the cleanup being managed through state and federal actions.

B.9 Happy Camp

B9.1 Issues

Karuk Tribe—

Based in Happy Camp, the Karuk Tribe’s lands are non-contiguous tracts along the Klamath River in Siskiyou and Humboldt counties. The tribe is one of the largest tribes in California. The Karuk Tribe actively contributes to the development of its community, both economically and otherwise. Recent projects include housing divisions, health clinics, Head Start programs, salmon fisheries enhancements, small business assistance, and more. The tribe also operates the People’s Center, a museum and cultural center, as well as an internet service provider. The tribe provides jobs to rural communities, currently employing over 100 people. In Happy Camp, the tribe opened a wellness center with a gym, kitchen, computer lab, exercise room, and showers, providing a space for the community to gather and improve wellness.

Marijuana—

Happy Camp has been subject to many of the same difficulties around marijuana legalization as Weaverville, including tensions between the illegal small farms that operated prior to 2018, and the larger operations that emerged with legalization. In addition, residents of Siskiyou County were divided on the subject, with residents voting almost exactly 50-50 for and against California’s legalization of recreational marijuana. Additional tensions in the county arose on the subject around illegal cannabis farms, with Siskiyou County Sheriff Jon Lopey targeting these farms and 150 National Guard troops deploying to Northern California in pursuit of illegal farms. The issue is complicated by the presence of over 1,500 Hmong farmers, most of whom who immigrated to the region to grow marijuana prior to its legalization.
B.10 Weaverville

B10.1 Issues

Marijuana industry—

After decades of illegal marijuana growing buoyed the rural economy of Weaverville and the surrounding Trinity County, the 2018 legalization of recreational marijuana in California created a huge shift in market prices and availability, resulting in rippling effects on local marijuana growers. Legalization opened the door for larger growers and marijuana producers to enter the market, effectively crowding out small-scale farmers like those in rural Trinity County, who buckle under the weight of extensive regulation and shrinking profits. Many small-scale growers only entered the industry after the collapse of the timber industry in the 1990s, the area’s prior economic industry. Although the marijuana industry represents the opportunity for economic growth, the area’s history and limited amenities create economic struggle, as well. Further negative implications result from the high rate of water use by marijuana farms.

B.11 Oregon (Statewide)

B11.1 Issues

Gas station regulations—

Many of the case study participants in Oregon complained about a decline in the number of gas stations over the last 25 or more years. In fact, in 1988, the EPA established federal standards for underground storage tanks (USTs) in response to growing evidence that contemporary steel tanks frequently leaked hazardous waste into the ground. The 1988 standards mandated various tank safety features and required that all existing tanks be either upgraded to newer more stringent standards by 1993 (costs $10,000) or be closed by 1998. To replace the tank with a new compliant tank, associated costs were approximately $43,000. Interestingly, the state of Oregon was one of only twelve states that provided financial assistance for tank upgrades. Since then, Oregon has obtained State Program Approval (SPA) for the Oregon Department of Environmental Quality (DEQ) to manage its own UST regulation program, which is at least as stringent as the EPA’s.
Appendix C: Annotated Bibliography

In preparation for case study fieldwork and analysis, we conducted a review of previously published case studies of communities within the Northwest Forest Plan area. For each census designated place (CDP) within the Northwest Forest Plan area we searched Google Scholar by CDP name. The total number of returned items during each Google search determined the number of search pages we explored. For example, some communities returned only four pages (or 40 search items), and therefore, we would look through all four pages. Alternatively, other communities returned thousands of pages of search results. In these cases, we used multiple search terms (e.g. “Community Data,” “Northwest Forest Plan,” “Socioeconomic”) to narrow the scope of results.

We reviewed over 286 peer-reviewed publications, gray literature reports, and other miscellaneous documents pertaining to 227 CDPs within the NWFP area. Below, we provide a summary of case studies for communities that had research most relevant to the Northwest Forest Plan (excluding previous NWFP socioeconomic monitoring reports). These communities tended to have more research focused on economic measures related to forestry and the timber industry.

1. **Omak, Okanogan County, Washington** - The studies for Omak provide a historical context to the Native American population and the community’s interaction with the timber industry. The primary focus of the paper looks at employment trends and economic indicators in relation to the NEAI. Some of these indicators include number of timber employers and jobs, unemployment rates, education levels across the community.
   
   

2. **Aberdeen, Grays Harbor County, Washington** – Aberdeen had been a logging community for many years. However, unsustainable logging practices caused a decline in wood-products production and contributed to job loss, in turn causing a 15.1% drop in the city’s population between 1950 and 1990. The decline in timber supply was evident by 1970 and many of Aberdeen’s mills had already closed by the 1990s.


3. Packwood, Lewis County, Washington – This study primarily analyzes qualitative research gathered through interviews regarding forest governance, the timber industry and its socioeconomic effects, and community involvement in the governance of the forest as a natural resource. However, limited economic data is reported, including the number of jobs in timber, number of businesses outside of industry, and the percentage of school children on free or reduced price lunches.


4. Hood River, Hood River County, Oregon – These studies on Hood River look at the community’s primary economic activities: forestry and agriculture. Hood River has a high rate of Hispanic workers in comparison to the rest of Oregon counties. These workers fill many of the low wage jobs in the area. All four studies discuss changing demographics as well as the change in forest activity that have occurred over the last few decades.


5. Black Butte Ranch, Deschutes County, Oregon – The Kelly (2010) examines the forest management and governance through qualitative research gathered via interviews. The author discusses the interaction between the decline in timber and the region’s other industries.

6. Eugene-Springfield Metro, Lane County, Oregon – The two studies below look at economic indicators such as location quotients, income distribution, and median household income by county subdivision. There is a thorough analysis of “national share, industry mix, and regional shift” that looks at industry growth nationally in comparison to Lane County, and attempts to explain the shifts between 2001-2011 by analyzing industries at different scales. These studies focus on Lane County as a whole and the communities within Lane County are statistically described, but the majority of detail concern the Eugene-Springfield Metro area.


7. Port Orford, Curry County, Oregon – The studies documenting Port Orford provide an assessment of the interaction between the fishing industry, timber extraction, and an influx of a retirement population. The consensus among these researchers seems to be that Port Orford has seen itself as a fishing community, but competition from larger commercial fishing boats, decreased stocks, and increased regulations have challenged the future of that identity. Timber was at one time a major economic activity, but has also declined in recent years, with only one sawmill left in Curry County near Brookings. Tourism and an influx of retirees are creating some economic activity, but largely to the dissatisfaction of the local residents. Shoji (2002) outlines a tourism-oriented development plan produced for the Port Orford Planning Commission.


8. **Happy Camp, Siskiyou County, California** – The two studies below looked at the Northwest Economic Adjustment Initiative in relation to Happy Camp and their Native American populations. They looked at several dimensions: physical capital, financial capital, natural capital, human capital, cultural capital, and social capital. While the NEAI provided communities with assistance, many necessary supports were needed to achieve success in boosting the economy.

   

9. **Weed, Siskiyou County, California** – The report below looks at the effect of the timber industry on community features in relation to the Northwest Economic Adjustment Initiative from 1990-1999. Features examined include: unemployment and poverty rates, community development efforts, community capacity, physical capital, financial capital, cultural capital, natural capital. Statistics presented show a decrease in population, a decrease in unemployment, yet an increasing number of school-aged children eligible for free lunch programs. School enrollment dropped by 81 students. The conclusion seemed to be that the decline in the timber industry had a negative effect on some workers, who later left with their families to find other work before NEAI money arrived.


10. **Hayfork, Trinity County, California** - The several studies below describe community based forestry, resource management and the decline of timber in Hayfork, California. Harrison’s study looked at the social impacts and aspects of personal identity in this shift away from timber. Flint et al (2008) and Abrams et al. (2015) review the importance of connections between forest management and community commitment that must be in place to support efforts for watershed research and restoration forestry.

   
Also noteworthy is a technical memo from the National Oceanic and Atmospheric Administration (NOAA) that describes a list of communities and their socioeconomic relationship to local fisheries. While fisheries are not the focus of our study, the study provides relevant pieces of information on communities of interest that relate to natural resources, tourism, recreation (for example, number of sport fishing licenses), employment features, governance features, and more.

Appendix D: Web-Based Resources

The outline below depicts the format for web-based resource categories that will be listed for each case study.

Case Study
Geography
Geology—
Climate—
History
Economy

Services and Amenities

Low order services—
- Gas station
- Post offices
- Libraries
- Public transportation
- Supermarkets and grocery stores
- Number of paid fire/emergency staff
- Ambulances: number and type (paid or volunteer)
- Hardware/auto parts stores
- Pharmacies

High order services—
- Community center/resources
- Heritage museum/society
- Banks
- Insurance branch
- Real estate branch
- Hospitals
- Wellness centers
- Dentists

Low order tourist amenities—
- Count of vacation rental homes
- Hotel/motel beds and rooms
- Campground capacity
- Restaurants

High order tourist amenities—
- Recreation outfitters and marinas
- Golf courses, ski areas, and amusement parks
- Music venues, fairgrounds, other resorts

Infrastructure Themes
Darrington

Geography

Geology—


Climate—


History


Economy


Services and Amenities

Low order services—

Gas station


Post offices

- 1 post office

_Libraries_


- 1 public library

_Public transportation_


- Yes, public transportation options exist to commute to and from the area

_Supermarkets and grocery stores_


_Number of paid fire/emergency staff_


- 12 paid personnel (24 part-time paid firefighters calculated as equivalent to 12 full-time)

_Ambulances: number and type (paid or volunteer)_


- 2 ambulances, both paid

_Hardware/auto parts stores_


_Pharmacies_


_High order services—_

_Community center/resources_

- 1 community center

Heritage museum/society

- 1 historical society

Banks

Insurance branch

Real estate branch

Wellness centers
Skagit Regional Clinics. [N.d.]. Skagit Regional Health – Darrington Family Medicine.

- 1 medical clinic

Dentists

- 1 dentist (Darrington Family Dental)

Low order tourist amenities—

Count of vacation rental homes

- 8 vacation rental homes

Hotel/motel beds and rooms
Discover Darrington. [N.d.]. Darrington Motor Inn.

- 16 units, approximately 24 beds
Ellerie’s River Cottages. [N.d.]. Ellerie’s River Cottages. 

- 4 units, 16 beds

Campground capacity


- Paca Pride, 9 tent sites, 1 small yurt, 1 large yurt (accommodates up to 10)

Recreation.gov. [N.d.]. Campgrounds in Darrington area, map view. 

- Bedal Campground, 21 tent sites
- Buck Creek Campground, 29 tent sites
- Clear Creek Campground, 13 tent sites

Snohomish County. [N.d.]. Squire Creek Campground. 

- Squire Creek Campground, 33 tent sites

Restaurants


- 5 restaurants

Community Assets, Barriers, and Other Current Issues

Darrington Bluegrass Festival—


Darrington Bluegrass Festival. 2019. 43rd Annual Darrington Bluegrass Festival. 


Restrictions on new wells—


Oso landslide—


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Leavenworth (Cascade School District)

Geography

Climate—


History


Economy


Services and Amenities

Low order services—

Gas station


Post offices


- 3 post offices

Libraries


- 2 public libraries

Public transportation


- Yes, public transportation options exist to commute to and from the area

Supermarkets and grocery stores


Number of paid fire/emergency staff

- 14 paid personnel (3 full-time, plus 22 part-time firefighters calculated as equivalent to 11 full-time)

_Ambulances: number and type (paid or volunteer)_


- 1 ambulance, with paid personnel

_Hardware/auto parts stores_


_Pharmacies_


_High order services—_

_Heritage museum/society_


- 1 heritage museum

_Banks_


_Insurance branch_


_Real estate branch_


_Hospitals_

- 1 hospital

**Dentists**


- 2 dentists (O’brien Bradford P DDS; and Schiefelbein John M DMD)

**Low order tourist amenities—**

**Count of vacation rental homes**


- 553 vacation rental homes on Airbnb, both areas combined


- 13 vacation rental homes


- 1 vacation rental home

**Hotel/motel beds and rooms**


- 9 units, 24 beds


- 15 units, 19 beds
   - 27 units, approximately 34 beds

   - 90 units

   - 16 units, approximately 20 beds

   - Could not verify number of rooms, nor beds

   - 51 units

   - 104 units, approximately 155 beds

   - 40 units

   - 78 units

   - 6 units

- 77 units


- 151 units


- 23 units


- 41 units


- 19 units


- 33 units


- 8 rooms


- 9 units, 17 beds


- 27 units, approximately 34 beds
- 16 units

- 55 units

- 58 units

- Did not include units in hotel/motel room count because the units were listed on Airbnb and were included in that count. (5 units)

- 6 units

- Could not verify number of rooms, nor beds

Campground capacity

- Alpine View RV Park, 33 campsites

- Canvas and stars, 4 sites

- Leavenworth RV Campground, 279 sites (including cabins and tiny houses)


- Leavenworth KOA, 39 tent sites, 118 RV sites, 47 cabins


- Rock Island Campground, 20 single, 2 double sites
- Johnny Creek Campground, 56 single, 9 double sites
- Eightmile Campground, 41 single, 4 double, 1 group site (up to 70 people)
- Phelps Creek Campground/Horse Camp, 13 sites
- Alpine Meadows Campground, 4 sites
- Nineteenmile Campground, 4 sites
- Atkinson Flat Campground, 4 sites
- Blackpine Horse Camp, 10 sites
- Bridge Creek Campground, 6 single sites, 1 group site (55-70 people)
- Chatter Creek Campground, 12 single sites, 1 group site (45 people)
- Chiawa Horse Camp, 7 sites
- Finner Creek Campground, 3 sites
- Glacier View Campground, 23 sites
- Goose Creek Campground, 26 single, 3 double sites
- Grasshopper Meadows Campground, 5 sites
- Ida Creek Campground, 10 sites
- Lake Creek Campground – Little Wenatchee River, several dispersed sites
- Meadow Creek Campground, 4 dispersed sites
- Nappeequa Crossing Campground, 5 sites
- Nason Creek Campground, 70 single, 3 double sites
- Rainy Creek Campground, 10 sites
- Riverbend Campground, 6 sites
- Rock Creek Campground, 4 sites
- Schaefer Creek Campground, 10 sites
- Soda Springs Campground – Little Wenatchee River, 5 sites
- White River Falls Campground, 5 sites

- Lake Wenatchee State Park, 199 sites, 1 group site (20-80 people)

Restaurants

- 70 restaurants

High order tourist amenities—

Recreation outfitters and marinas


- 10 recreation outfitters

_Golf courses, ski areas, and amusement parks_


- 6 total (3 golf courses, 3 ski areas, 0 amusement parks)

_Music venues, fairgrounds, other resorts_

Community Assets, Barriers, and Other Current Issues

Cryptocurrency mining—


Lake Quinault

History


Economy

Services and Amenities

**Low order services—**

**Gas station**


**Post offices**

  - 4 post offices

**Libraries**

  - 1 public library

**Public transportation**


  - Yes, public transportation options exist to commute to and from the area

**Supermarkets and grocery stores**


**Number of paid fire/emergency staff**

  - 7.5 paid personnel (15 part-time firefighters calculated as equivalent to 7.5 full-time)
Hardware/auto parts stores


Pharmacies


High order services—

Heritage museum/society


- 1 historical society / museum

Banks


Insurance branch


Real estate branch


Wellness centers


- 1 medical clinic

Low order tourist amenities—

Count of vacation rental homes


- 6 vacation rental homes

- 1 vacation rental home

Hotel/motel beds and rooms


- 92 units, approximately 118 beds


- 6 units, 12 beds


- 8 units, approximately 12 beds


- 28 units, 52 beds

Campground capacity


- Satsop Center Campground, 13 campsites
- Coho Campground, 56 campsites
- Willaby Campground, 21 campsites
- Falls Creek Campground, 31 campsites
- Gatton Creek, 5 campsites

Restaurants

6 restaurants

High order tourist amenities—

Music venues, fairgrounds, other resorts


Community Assets, Barriers, and Other Current Issues

Lake Quinault Lodge—


Limited Broadband Access—


Stevenson

History


Economy


Services and Amenities
Low order services—

Gas station


Post offices


- 4 post offices

Libraries


- 2 public libraries

Public transportation


- Yes, public transportation options exist to commute to and from the area

Supermarkets and grocery stores


Number of paid fire/emergency staff


- 7.5 paid personnel (15 part-time firefighters calculated as equivalent to 7.5 full-time)

Ambulances: number and type (paid or volunteer)

- 4 ambulances, 2 of which are maintained with full staff (part-time, full-time, and volunteer)

**Hardware/auto parts stores**


**Pharmacies**


**High order services—**

**Community center/resources**


**Washington Information Network 211. 2019.** North Bonneville Senior Center. https://www.resourcehouse.info/win211/Providers/North_Bonneville_Senior_Center/Senior_Center/1?returnUrl=%2Fwin211%2FSpecialTopics%2FSeniors%2FSenior_Centers%3F. (8 February 2019).

- 2 community centers

**Heritage museum/society**


- 1 heritage museum

**Banks**


**Insurance branch**


**Real estate branch**

Wellness centers


- 1 medical center

Dentists


- 1 dentist (Jack D. Clifton, DDS)

Low order tourist amenities—

Count of vacation rental homes


- 34 vacation rental homes


- 10 vacation rental homes

Hotel/motel beds and rooms


- 78 units, approximately 117 beds


- 10 units, 10 beds

- 30 units, approximately 45 beds


- 8 units, 18 beds


- 258 units, 387 beds


- 7 units, 19 beds

**Campground capacity**


- Panther Creek Campground, 33 campsites
- Beaver Campground, 25 campsites
- Government Mineral Springs Guard Station, 1 site
- Paradise Creek Campground, 42 campsites
- Goose Lake Campground, 18 campsites
- Peterson Prairie Campground, 31 campsites
- Atkisson Group Campground, 1 site

**Restaurants**


- 29 restaurants

**High order tourist amenities—**

**Golf courses, ski areas, and amusement parks**

Carson Hot Springs Resort. [N.d.]. Elk Ridge Golf Course. 


- 3 total (3 golf courses)

Music venues, fairgrounds, other resorts


Community Assets, Barriers, and Other Current Issues

Columbia Gorge Interpretive Center—

Burns, R.C. 2011. Columbia River Gorge vital signs indicators resident and visitor study. 

ECONorthwest. 2015. Columbia River Gorge visitor opportunities survey. Travel Oregon. 


Write to Know Consulting. 2016. Columbia Gorge Tourism Studio baseline assessment. 

Wind River Nursery—


Port of Skamania County. [N.d.]. Wind River Business Park: history of the site. 
Santiam Canyon

Geography

Geology—


History


Economy


Services and Amenities

Low order services—

Gas station


Post offices


- 4 post offices

Libraries


- 1 public library

Public transportation


- Yes, public transportation options exist to commute to and from the area

Supermarkets and grocery stores


Number of paid fire/emergency staff


- 1 paid personnel (1 full-time)
**Hardware/auto parts stores**


**Pharmacies**


**High order services—**

**Community center/resources**


- 1 community center

**Heritage museum/society**


- 1 heritage society

**Banks**


**Insurance branch**


**Real estate branch**

Wellness centers

- 1 medical clinic

Dentists

- 2 dentists (Cynthia Peticolas DMD; and Mill City Dental Center)

Low order tourist amenities—

Count of vacation rental homes

- 13 vacation rental homes

- 18 vacation rental homes

Hotel/motel beds and rooms

- 17 units, approximately 22 beds

- 50 units, approximately 68 beds

- 4 units, 8 beds
- 12 units, 19 beds

- 7 units, 10 beds

- 93 units, approximately 133 beds total

Campground capacity

- Rock Creek Campsites, 3 sites
- Santiam Horse Camp, 9 sites

- Detroit Lake State Recreation Area, 271 sites
- North Santiam State Recreation Area, 9 sites

- Gold Butte Lookout, 1 site (primitive cabin)
- Cleator Bend Group Campground, 1 group site (45 people)
- Cove Creek Campground, 63 single sites, 1 group site (70 people)
- Hoover Campground, 36 single sites, 1 group site (70 people)
- Fox Creek Group Campground, 1 group site (75 people)
- Piety Island Campground, 22 sites
- Santiam Flats Campground, 32 sites
- Southshore Campground, 32 sites
- Elk Lake Campground, 17 sites
- Humbug Campground, 22 sites
- Marion Forks Campground and Day Use Area, 15 sites
- Riverside at Detroit Campground, 36 sites
- Shady Cove Campground, 13 sites
- Whispering Falls Campground, 16 sites


- Lower Lake Campground, 8 sites
- Breitenbush Lake Campground, 20 sites

Restaurants


- 12 restaurants

High order tourist amenities—

Recreation outfitters and marinas


- 4 total (2 recreation outfitters, 2 marinas)

Golf courses, ski areas, and amusement parks


- 2 total (1 golf course, 1 ski area)

*Music venues, fairgrounds, other resorts*


Community Assets, Barriers, and Other Current Issues

**Detroit Lake—**


Sewer problems—


Marion County, Oregon. [N.d.]. North Santiam joint wastewater project. https://www.co.marion.or.us/CS/EconomicDevelopment/Pages/North-Santiam-Joint-Wastewater-Project.aspx. (22 March 2019).


Mid-Willamette Council of Governments. 2014. North Santiam Canyon economic opportunity study. https://www.mwwcog.org/wp-admin/admin-ajax.php?cdm-download-file-id=NDV8MjAxNS0wOC0yNyAxMDoyNToyM3xuc2MtZW9zLWRyYWZ0LX BsYW4tOS4yNS5wZGY. (22 March 2019).


Poechler, B. 2019. How Salem’s water will be improved by a sewer 60 miles away in Detroit. Salem Statesman Journal.
Drinking water—


Gilchrist

Geography

Climate—


History


Economy


Services and Amenities

Low order services—

*Gas station*


*Post offices*


- 3 post offices
Libraries


- 2 public libraries (Chemult and Gilchrist)

Supermarkets and grocery stores


Number of paid fire/emergency staff


- 4 paid personnel (4 full-time)


- 1.5 paid personnel (3 part-time firefighters calculated as equivalent to 1.5 full-time)

Ambulances: number and type (paid or volunteer)


- 2 ambulances, staffed with volunteer personnel


- 2 ambulances, with paid personnel

Hardware/auto parts stores


Pharmacies

High order services—

Community center/resources


- 1 community center

Banks


Insurance branch


Real estate branch


Wellness centers


- 1 health center

Low order tourist amenities—

Count of vacation rental homes


- 19 vacation rental homes

- 16 vacation rental homes

**Hotel/motel beds and rooms**

- 5 units, 11 beds

- 7 units, 13 beds

- 9 units, 15 beds

- 16 units, 25 beds

- 15 units, 20 beds

- 5 units, 13 beds

- 16 units, 30 beds

- 11 units, 31 beds
  - 21 units, 48 beds

  - 20 units, 30 beds

  - 20 units, 49 beds

  - 10 units

  - 37 units

Campground capacity

  - Big Pines RV Park, 73 sites

  - Shelter Cove Resort & Marina, 74 sites

  - Odell Lake Lodge & Resort, 30 sites

- Crescent Lake Campground, 28 single, 8 double, 3 yurts
- Contorta Flat Campground, 22 sites
- Contorta Point Group Campground, 2 group sites (total up to 80 people)
- Crescent Creek Campground, 9 sites
- East Davis Lake Campground, 17 single, 3 double
- Princess Creek Campground, 32 sites
- Spring Campground, 69 single, 4 multi, 5 tent, 1 group site
- Sunset Cove Campground, 20 single, 1 double
- Trapper Creek Campground, 26 single, 3 double
- Simax Group Campground, 3 group sites (total up to 110 people)
- Windy Group Campground, 1 group site (up to 42 people)
- Whitefish Horse Camp, 13 single, 5 double


- Corral Springs Campground, 6 sites
- Digit Point Campground, 65 sites
- Walt Haring Sno-Park/Campground, 10 sites

Restaurants


- 14 restaurants

High order tourist amenities—

Recreation outfitters and marinas


- 3 total (3 marinas)

Golf courses, ski areas, and amusement parks


- 2 total (both ski areas)

Music venues, fairgrounds, other resorts


Community Assets, Barriers, and Other Current Issues

Crescent Creek Resort


Sewer problems—


Myrtle Point

Geography

Climate—

**U.S. Climate Data. [N.d.].** Climate Myrtle Point.

History

**City of Myrtle Point. [N.d.].** History of Myrtle Point.
http://www.ci.myrtlepoint.or.us/general/page/history-myrtle-point. (15 April 2019).

**Coquille Indian Tribe. [N.d.].** Our Lands: Through the millennia.
https://www.coquilletribe.org/?page_id=34. (15 April 2019).

Economy


**Oregon State University. 2014.** Oregon Forest Industry Directory: W&L Lumber LLC.


Services and Amenities

Low order services—

*Gas station*

Post offices


- 2 post offices

Libraries


- 2 public libraries (Dora and Myrtle Point)

Public transportation


- Yes, public transportation options exist to commute to and from the area

Supermarkets and grocery stores


Number of paid fire/emergency staff


- 1 paid personnel (1 full-time)

Ambulances: number and type (paid or volunteer)


- 4 ambulances, with paid personnel

Hardware/auto parts stores

Pharmacies


High order services—

Heritage museum/society


- 1 heritage museum

Banks


Insurance branch


Real estate branch


Wellness centers


- 2 medical clinics

Dentists

  - 2 dentists (James R Gronemyer DDS; and Advantage Dental)

Low order tourist amenities—

Count of vacation rental homes

  - 1 vacation rental home

  - 1 vacation rental home

Hotel/motel beds and rooms

  - 28 units, approximately 42 beds

Campground capacity

  - Remote Outpost, 28 sites total (25 RV sites, 3 cabins)

Restaurants

  - 7 restaurants

High order tourist amenities—

Music venues, fairgrounds, other resorts

Community Assets, Barriers, and Other Current Issues

Dairy farming—


Riddle

History


Economy


Services and Amenities

Low order services—

Gas station


Post offices


- 1 post office

Libraries


- 1 public library

Public transportation


- Yes, public transportation options exist to commute to and from the area

Supermarkets and grocery stores


Hardware/auto parts stores


Pharmacies

High order services—

Community center/resources


- 1 community center

Banks


Insurance branch


Real estate branch


Dentists


- 1 dentist (Smiles Dental)

Low order tourist amenities—

Count of vacation rental homes


- 2 vacation rental homes


- 1 vacation rental home
Restaurants

- 2 restaurants

High order tourist amenities—

Music venues, fairgrounds, other resorts


Community Assets, Barriers, and Other Current Issues

Green Diamond Performance Materials—


Seven Feathers Casino Resort—


Formosa Mine Superfund Site—


Happy Camp

Geography


History


Economy


Services and Amenities

Low order services—

Gas station


Post offices


- 1 post office

Libraries


- 1 public library

Supermarkets and grocery stores

Ambulances: number and type (paid or volunteer)


- 3 ambulance, with volunteer personnel only

Hardware/auto parts stores


Pharmacies


High order services—

Community center/resources


- 1 community center

Banks


Insurance branch


Real estate branch


Wellness centers

- 1 health clinic

**Dentists**


- 2 dentists (Happy Camp Dental Clinic; and Ives Harold N Dr Dentist)

**Low order tourist amenities—**

**Count of vacation rental homes**


- 1 vacation rental home

**Hotel/motel beds and rooms**

**Big Foot RV Park & Cabins. [N.d.]. Accommodations.**

- 4 units, 7 beds

**Elk Creek Campground. [N.d.]. Cabins.**

- 3 units, 4 beds

**Klamath River Resort Inn. 2018. Accommodations.**

- 7 units, 12 beds

**Trip Advisor. [N.d.]. Forest Lodge Motel.**

- 15 units, 25 beds
Campground capacity

- Big Foot RV Park, 22 sites

- Curly Jack Campground, 16 single, 3 group sites (30 people each)
- West Branch Campground, 12 sites
- Sulphur Springs Campground, 4 sites
- Norcross Campground, 4 sites

Restaurants

- 4 restaurants

High order tourist amenities—

Music venues, fairgrounds, other resorts


Community Assets, Barriers, and Other Current Issues

Karuk Tribe—


Marijuana—


Weaverville

History


Economy


Services and Amenities

Low order services—

Gas station


Post offices


- 1 post office

Libraries

- 1 public library

Public transportation


- Yes, public transportation options exist to commute to and from the area

Supermarkets and grocery stores


Number of paid fire/emergency staff

FireDepartment.net. 2015. Weaverville Fire Department.

- 1 paid personnel (1 full-time)

Ambulances: number and type (paid or volunteer)


- 3 ambulances, with paid personnel

Hardware/auto parts stores


Pharmacies


High order services—

Community center/resources

Golden Age Center. [N.d.]. Welcome to the Golden Age Center, Inc.

- 1 community center
Heritage museum/society


- 1 heritage museum/society

Banks


Insurance branch


Real estate branch


Hospitals


- 1 hospital (Trinity Hospital)

Wellness centers


- 1 health clinic (Trinity Community Health Clinic)

Dentists


- 4 dentists (Carlin Fred R. Jr. DDS; Brookshier Rockne DDS; Schalo and Bigelow Orthodontics; and Davis Robert J Wvvl)
Low order tourist amenities—

Count of vacation rental homes

- 3 vacation rental homes

- 3 vacation rental homes

Hotel/motel beds and rooms

- 54 units, 209 beds

- 25 units, 37 beds

- 25 units, bed count uncertain

- 15 units, bed count uncertain

- 24 units, bed count uncertain

- 11 units, bed count uncertain


- 7 units, 9 beds


- 5 units, 6 beds

Campground capacity


- Pinewood Cove, 72 sites


- Sidney Gulch RV Park, 40 sites


- Rush Creek Campground, 10 sites
- Stoney Point Campground, 21 sites
- Fawn Group Campground, 19 sites (total up to 300 people)
- Stoney Creek Group Campground, 1 group site (total up to 50 people)
- Tannery Gulch Campground, 82 sites
- Bridge Camp Campground, 10 sites
- East Weaver Group Campground, 11 sites
Restaurants


- 18 restaurants

High order tourist amenities—

Recreation outfitters and marinas


- 2 total (1 marina, 1 recreation outfitter)

Golf courses, ski areas, and amusement parks


- 1 total (1 golf course)

Music venues, fairgrounds, other resorts


Community Assets, Barriers, and Other Current Issues

Marijuana industry—


**Oregon (Statewide)**

Community Assets, Barriers, and Other Current Issues

Gas station regulations—


School Enrollment Data (California, Oregon, Washington)


