

3.2.2 Social and Economic Analysis

Summary of Findings

Introduction

The programmatic management changes to the Eastside Screens has the potential to affect local communities. People in these communities are the direct or indirect beneficiaries of their Forest ecosystems, visitation patterns, scenery, natural resources and other valued experiences associated with adjacent forestlands. Supply of natural resources as well as visitation, grazing and other special uses from the Forests involved with the Eastside Screens generate employment and income in the surrounding communities and counties and generate revenues that help improve ecosystem and infrastructure conditions, as well as returning revenues to the U.S. Treasury.

The proposed Land and Resource Plan Amendment represents a potential change to programmatic management of the associated Forests that may alter the delivery of benefits to people in nearby communities, as well as other non-local users of the Forest. The proposed change is solely focused on relieving the Forests of the variable challenges of guiding and implementing the 21” dbh standard, which has been implemented differently across each Forest and has been partially amended many times since 1994. This amendment is proposed as an overarching solution to the existing challenges with the 21” standard of the Eastside Screens.

This section of the environmental assessment presents concepts and methods used to qualitatively analyze the potential and significance of any financial, economic or social impacts that may result across decision alternatives. The section will cover communities that may be sensitive to social or economic changes, as well as information and analysis that reflects on these programmatic changes and any connection they may have to communities, economies, and beneficiaries of the Forests.

Regulatory Framework

The preparation of NEPA documents is guided by CEQ regulations for implementing NEPA (40 CFR 1500-1508). NEPA requires that consequences to the human environment be analyzed and disclosed. The extent to which these environmental factors are analyzed and discussed is related to the nature of public comments received during scoping. NEPA does not require a monetary benefit-cost analysis. However, if an agency prepares an economic efficiency analysis, then one must be prepared and displayed for all alternatives (40 CFR 1502.23).

OMB Circular A-94 promotes efficient resource use through well-informed decision making by the Federal Government. It suggests agencies prepare an efficiency analysis as part of project decision making and prescribes “present net value” as the criterion for the efficiency analysis.

The development of timber programs and individual timber sales is guided by agency direction found in Forest Service Manual (FSM) 2430. Forest Service Handbook (FSH) 2409.18 guides the financial and, if applicable, economic efficiency analysis for timber sales.

Many of the costs and benefits associated with programmatic management of Forests are not quantifiable in financial terms. For example, the benefit to wildlife from habitat improvement from a programmatic

change is not quantifiable in financial terms. These costs and benefits are described qualitatively in the indicated resource sections of this document.

Land and Resource Management Plan

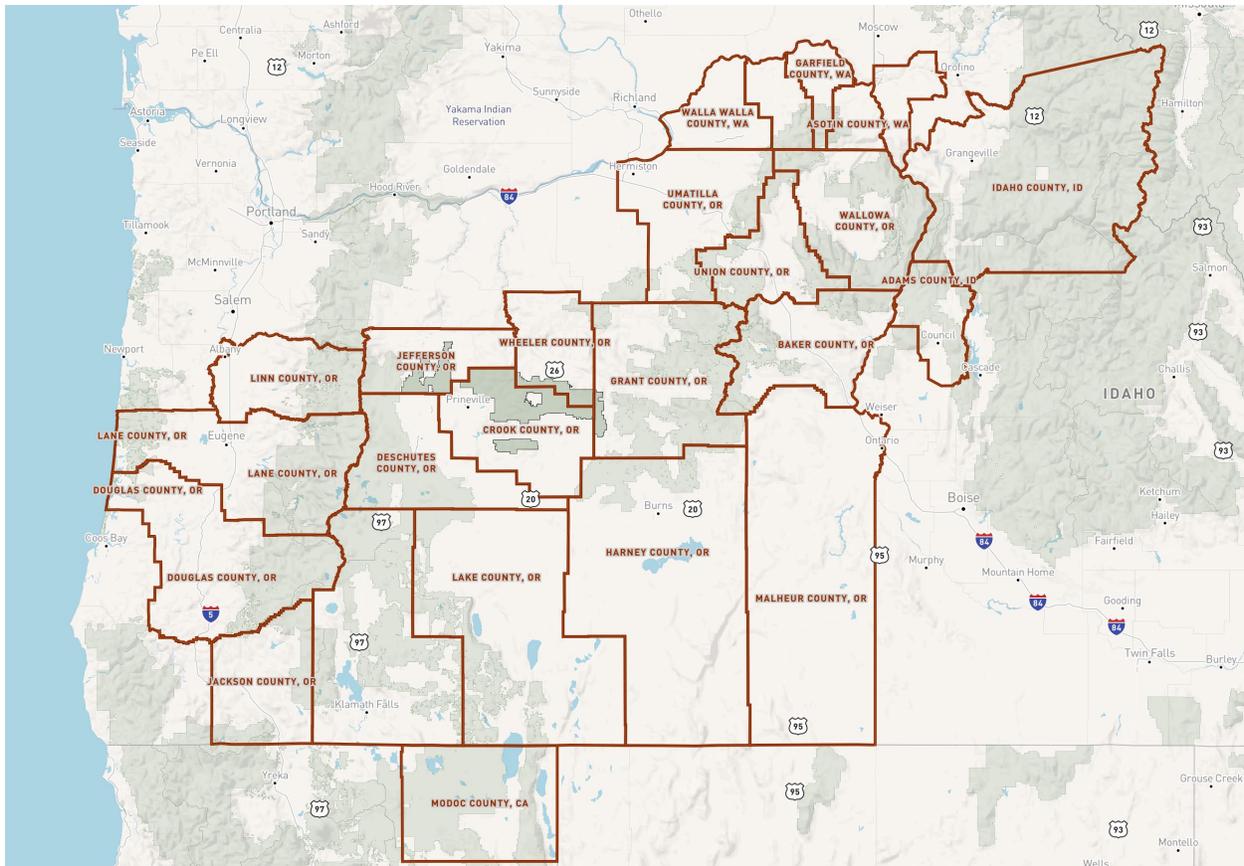
The forest plan provides overall guidance for the management of the lands in the National Forest System. Plans describe the goals, desired conditions, and objectives toward which the management of the land should be directed. And it establishes standards and guidelines to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. This amendment proposal is directed at existing standards which were part of the Eastside Screens and LRMP's of six National Forests.

Analysis Area

Spatial Bounds

This economic and social analysis is applicable to all proposed affected areas described for programmatic changes to the Eastside Screens. This includes the eastern National Forests (Umatilla, Malheur, Wallowa-Whitman, Ochoco, Deschutes, Fremont-Winema) and surrounding counties and tribes and tribal land in Oregon, Washington, and limited parts of Idaho and Northern California. County administrative areas do not represent the full extent of potential social and economic influence from the proposed programmatic changes, but those counties highlighted (Figure 1) yield information most critical to the proposal and populations within the associated geography. Methods for determining the county selection for these Forests are described further (METI, 2010).

Figure 1. Map of the County Economic Analysis Area



Source: Screen captured via [Headwaters Economics, Economic Profile System](#) (2020)

Affected Environment

The combination of small towns and rural settings, along with people from a wide variety of backgrounds, provides a diverse social environment for the geographical region around these six National Forests. Local residents pursue a wide variety of lifestyles, but many share a common theme—an orientation to the outdoors and natural resources. This is reflected in both vocational and recreational pursuits including employment in logging and milling operations, outfitter and guide businesses, hiking, hunting, fishing, camping, and many other recreational activities.

Timber, tourism, range and agricultural industries are important to the economy of local areas. Despite the common concern for, and dependence on, natural resources within the local communities, social attitudes vary widely with respect to their management. Residents hold a broad spectrum of perspectives and preferences ranging from complete preservation to maximum development and utilization of natural resources.

Socioeconomic measures used to describe the affected environment were obtained from the Headwaters Economics Economic Profile System (EPS 2020), which compiles and summarizes primary population and economic data from a variety of government sources into a report. Key measures used in this report include land ownership, population, income, and natural resource commodity dependency. These measures and additional social and economic information from the EPS reports are included in the project file.

Land Ownership and Federal Land Payments

Decisions made by public land managers may influence the local economy and lifestyles of residents, particularly if public lands represent a large portion of the land base. Agency management actions that affect water quality, access to recreation, scenery (as well as other quality of life amenities), and the extent and type of resource extraction are particularly important in areas where much of the land is managed by public agencies.

Similarly, Federal land activities generate direct revenues for state and county governments in the form of Federal Land Payments. Some of these revenues are directly attributed to timber sale activities on the National Forest System. As shown (Table 2) all counties in the analysis area receive some form of Federal Land Payments, ranging from over \$19 million in Lane County, Oregon, down to \$39 thousand in Walla-Walla County in Washington. These revenues help facilitate additional public services provided by state and county governments, and fluctuations in these revenues due to change in Federal activities can have an impact on funding for local public services as a result.

Across the greater multi-county analysis area, Forest Service specific payments totaled over \$48 million in 2019.

Table 1. 2019 Federal Land Payments to Analysis Area Counties

Analysis Counties	Total Federal Land Payments	PILT	Forest Service Payments
<i>Combined Counties</i>	<i>\$109,231,257</i>	<i>\$32,608,542</i>	<i>\$48,715,846</i>
Lane County, OR	\$19,140,046	\$2,167,517	\$8,001,291
Douglas County, OR	\$19,016,922	\$2,544,849	\$6,872,806
Klamath County, OR	\$10,684,429	\$3,204,149	\$6,169,938
Idaho County, ID	\$8,813,832	\$1,762,493	\$6,486,887
Jackson County, OR	\$8,488,301	\$1,828,066	\$1,536,749
Linn County, OR	\$4,856,077	\$1,007,652	\$3,052,146
Grant County, OR	\$4,683,978	\$924,601	\$3,747,315
Deschutes County, OR	\$4,356,473	\$3,172,684	\$1,113,146
Lake County, OR	\$3,786,344	\$1,220,427	\$2,411,778
Crook County, OR	\$3,546,147	\$2,210,867	\$1,299,156
Malheur County, OR	\$3,221,380	\$2,718,439	\$679
Harney County, OR	\$3,171,833	\$1,150,621	\$1,658,179
Baker County, OR	\$2,647,244	\$1,656,951	\$844,740
Union County, OR	\$2,394,531	\$1,628,872	\$764,795
Wallowa County, OR	\$2,107,507	\$1,074,053	\$1,031,685
Modoc County, CA	\$1,959,988	\$675,836	\$1,229,782
Jefferson County, OR	\$1,290,471	\$741,988	\$546,973
Adams County, ID	\$1,233,060	\$339,794	\$713,483
Umatilla County, OR	\$1,193,554	\$1,074,251	\$118,245
Wheeler County, OR	\$761,092	\$215,244	\$539,831
Morrow County, OR	\$618,940	\$384,555	\$230,458
Columbia County, WA	\$545,497	\$385,583	\$159,061
Garfield County, WA	\$354,651	\$234,090	\$120,527
Asotin County, WA	\$230,822	\$168,566	\$60,953

Analysis Counties	Total Federal Land Payments	PILT	Forest Service Payments
Nez Perce County, ID	\$89,065	\$86,503	\$2,516
Walla Walla County, WA	\$39,073	\$29,891	\$2,727

Source: Data Sources: U.S. Department of Interior. 2020. Payments in Lieu of Taxes (PILT), Washington, D.C.; U.S. Department of Agriculture. 2020. Forest Service, , Washington, D.C.

Population, Employment, and Income

One measure of economic and social environment is whether a geography is growing or declining. Standard measures of growth and decline are population, employment, and real personal income. The information in this section helps to understand whether geographies are growing or declining at different rates and makes it easy to see if there are discrepancies between changes in population, employment, and real personal income. If population and employment are growing faster than real personal income, for example, it may be worthwhile to do further research on whether this is because growth has been in low-wage industries and occupations. Alternatively, if personal income is growing faster than employment, it may be because of growth in high-wage industries and occupations and/or non-labor income sources.

Overall, (Table 2) 2018 population across counties in the analysis area varied substantially, with most counties in considerable rural levels. Of the group, Lane and Wheeler County had the highest and lowest population with 379 thousand and 1.3 thousand people, respectively. The total area had an approximate estimate of 1.5 million people residing.

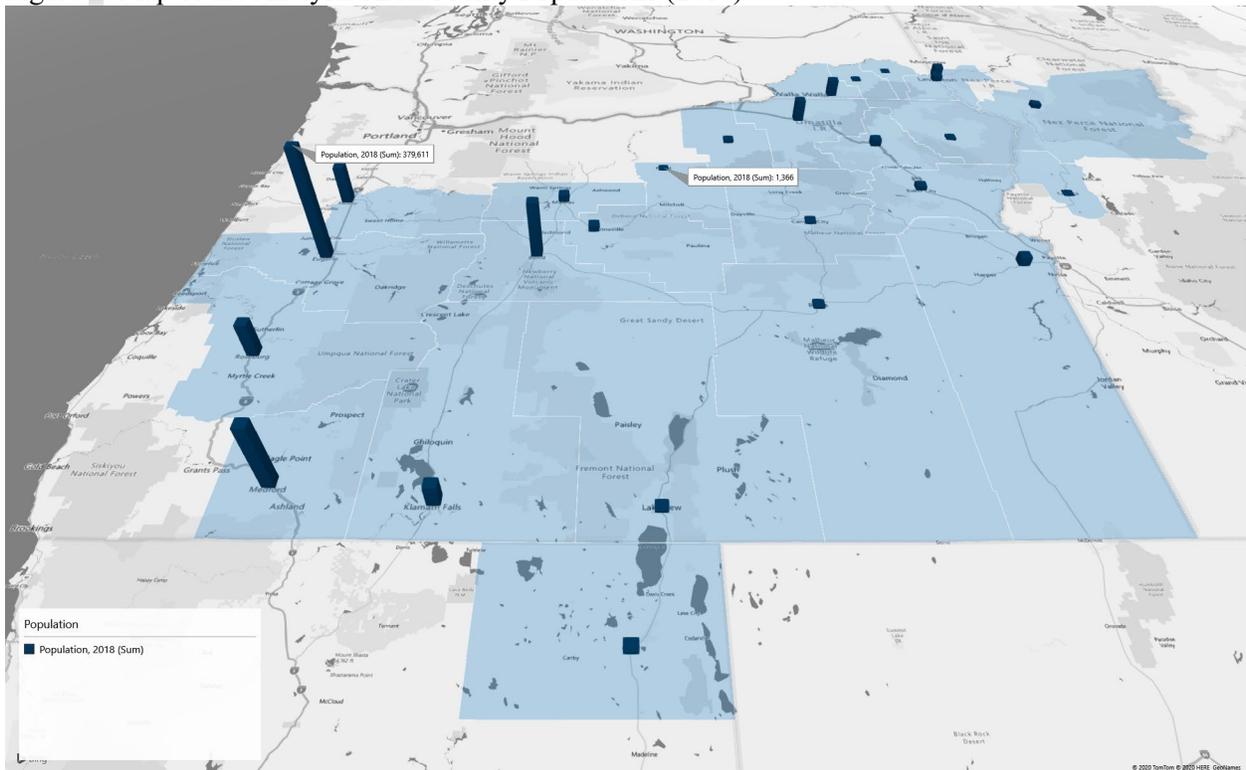
From 1970 to 2018, the population in the impact area (combined area) grew by 85 percent, led by 522 percent population growth in Deschutes County. Wheeler County had the highest population decline, at negative 26 percent over the period. Over the same geographic extent, employment and personal income changed by 145% and 246%, in the same 48 year period; higher than U.S. averages. Employment growth across the counties ranges from a striking 859% in Deschutes County down to a negative 34% in Garfield County, a sparsely populated county similar to Wheeler.

Additional economic performance measures for employment and income are provided below (Table 3). Labor income and total personal income are often used as proxies for standard of living. To understand the data on earnings and income, it is important to understand the different types of income. Earnings per job (or average earnings) is the sum of wage and salary disbursements plus other labor and proprietors' income for the area of interest (county or aggregation of counties), divided by total full-time and part-time employment for the area of interest. Average earnings per job is an indicator of the quality of local employment, with a higher average earnings per job indicating that there are relatively more high-wage occupations.

Per capita income is the sum of total personal income for the area of interest divided by the sum of total population in the area. Per capita income is considered one of the most important measures of economic well-being. However, this measure can be misleading. Because total personal income includes non-labor income sources (dividends, interest, rent and transfer payments), it is possible for per capita income to be relatively high due to the presence of retirees and people with investment income. Additionally, because per capita income is calculated using total population as the denominator and not the labor force as in average earnings per job, it is possible for per capita income to be relatively low when there are a disproportionate number of children and/or elderly people in the population.

From 1970-2016, real (adjusted for inflation) personal income in the analysis area grew 246 percent, a trend led by a 1213 percent increase in Deschutes County and bottomed with a negative 7 percent in Garfield County.

Figure 2. Map of the Analysis Area County Populations (2018)



Source: Multiple Federal sources including County Business Patterns data, and multiple agencies. Accessed via Headwaters Economics EPS, [Here](#).

Table 2.1970 - 2018 Population, Employment, and Income Trends in Analysis Area Counties

Analysis Counties	Population, 2018	Population % change	Employment % change	Personal Income % change
<i>Combined Counties</i>	<i>1,497,198</i>	<i>85%</i>	<i>145%</i>	<i>246%</i>
Lane County, OR	379,611	75%	147%	241%
Jackson County, OR	219,564	130%	249%	376%
Deschutes County, OR	191,996	522%	859%	1213%
Linn County, OR	127,335	75%	118%	248%
Douglas County, OR	110,283	53%	84%	165%
Umatilla County, OR	77,516	72%	99%	168%
Klamath County, OR	67,653	34%	40%	105%
Walla Walla County, WA	60,922	45%	89%	160%
Nez Perce County, ID	40,408	33%	83%	137%
Malheur County, OR	30,725	32%	39%	81%
Union County, OR	26,461	35%	70%	130%
Jefferson County, OR	24,192	181%	160%	324%
Crook County, OR	23,867	137%	107%	297%
Asotin County, WA	22,610	63%	191%	234%
Idaho County, ID	16,513	27%	49%	100%
Baker County, OR	16,006	6%	37%	83%
Morrow County, OR	11,372	154%	249%	233%
Modoc County, CA	8,777	17%	10%	80%

Analysis Counties	Population, 2018	Population % change	Employment % change	Personal Income % change
Lake County, OR	7,879	24%	28%	92%
Harney County, OR	7,329	2%	16%	49%
Grant County, OR	7,176	1%	14%	70%
Wallowa County, OR	7,081	13%	75%	103%
Adams County, ID	4,250	48%	81%	124%
Columbia County, WA	4,059	-8%	-9%	35%
Garfield County, WA	2,247	-23%	-34%	-7%
Wheeler County, OR	1,366	-26%	-8%	15%

Source: Multiple Federal sources including County Business Patterns data, and multiple agencies. Accessed via Headwaters Economics EPS, [Here](#).

In current years, the highest unemployment was reported in Modoc, Grant, and Adams Counties. Similarly, the lowest average income or per capita income were reported in Wheeler, Wallowa, Idaho, Adams, Malheur, and Jefferson Counties. In 2018, average earnings per job in the impact area were \$49,838 per year, compared to an average of \$63,443 in the U.S. Common to other rural regions in the U.S., concerning economic performance is most apparent in some of the more sparsely populated counties.

Table 3. Analysis Area Economic Performance Measures for Income and Employment

Analysis Counties	Population, 2018	Unemployment rate	Average earnings per job	Per capita income
<i>Combined Counties</i>	<i>1,497,198</i>	<i>4.4%</i>	<i>\$49,838</i>	<i>\$45,703</i>
Lane County, OR	379,611	4.1%	\$52,412	\$46,746
Jackson County, OR	219,564	4.4%	\$49,539	\$47,442
Deschutes County, OR	191,996	3.9%	\$52,484	\$56,136
Linn County, OR	127,335	4.3%	\$51,176	\$43,663
Douglas County, OR	110,283	4.9%	\$46,832	\$41,135
Umatilla County, OR	77,516	4.8%	\$48,225	\$40,398
Klamath County, OR	67,653	6.2%	\$47,080	\$40,609
Walla Walla County, WA	60,922	4.9%	\$53,638	\$46,975
Nez Perce County, ID	40,408	2.8%	\$50,737	\$45,196
Malheur County, OR	30,725	4.1%	\$41,760	\$31,550
Union County, OR	26,461	4.8%	\$43,839	\$41,277
Jefferson County, OR	24,192	5.1%	\$42,421	\$33,555
Crook County, OR	23,867	5.3%	\$45,393	\$41,682
Asotin County, WA	22,610	4.1%	\$47,380	\$47,951
Idaho County, ID	16,513	4.5%	\$37,235	\$35,754
Baker County, OR	16,006	4.6%	\$36,124	\$41,432
Morrow County, OR	11,372	4.1%	\$58,705	\$39,798
Modoc County, CA	8,777	7.1%	\$47,043	\$45,629
Lake County, OR	7,879	5.4%	\$42,499	\$40,513
Harney County, OR	7,329	5.3%	\$37,302	\$39,827
Grant County, OR	7,176	6.9%	\$40,957	\$42,694
Wallowa County, OR	7,081	5.8%	\$30,963	\$45,910
Adams County, ID	4,250	6.8%	\$34,517	\$38,126
Columbia County, WA	4,059	5.5%	\$52,098	\$50,974
Garfield County, WA	2,247	5.4%	\$50,841	\$45,311
Wheeler County, OR	1,366	4.3%	\$20,130	\$37,811

Source: Multiple Federal sources including County Business Patterns data, and multiple agencies. Accessed via Headwaters Economics EPS, [here](#).

Commodity sectors are industrial sectors that have the potential to use Federal public lands for the extraction of commodities. Commodity sectors include timber, mining (including oil, gas, and coal), and agriculture. Public lands can play a key role in stimulating local employment by providing opportunities for commodity extraction. It is important to understand the relative size of these sectors to put the economy related to commodity extraction in perspective. For example, a county with most of its employment in the commodity sectors has a higher chance of being impacted by decisions that permit (or restrict) timber, mining, and grazing activities on public lands than a county where only 10 percent of the workforce is in these sectors.

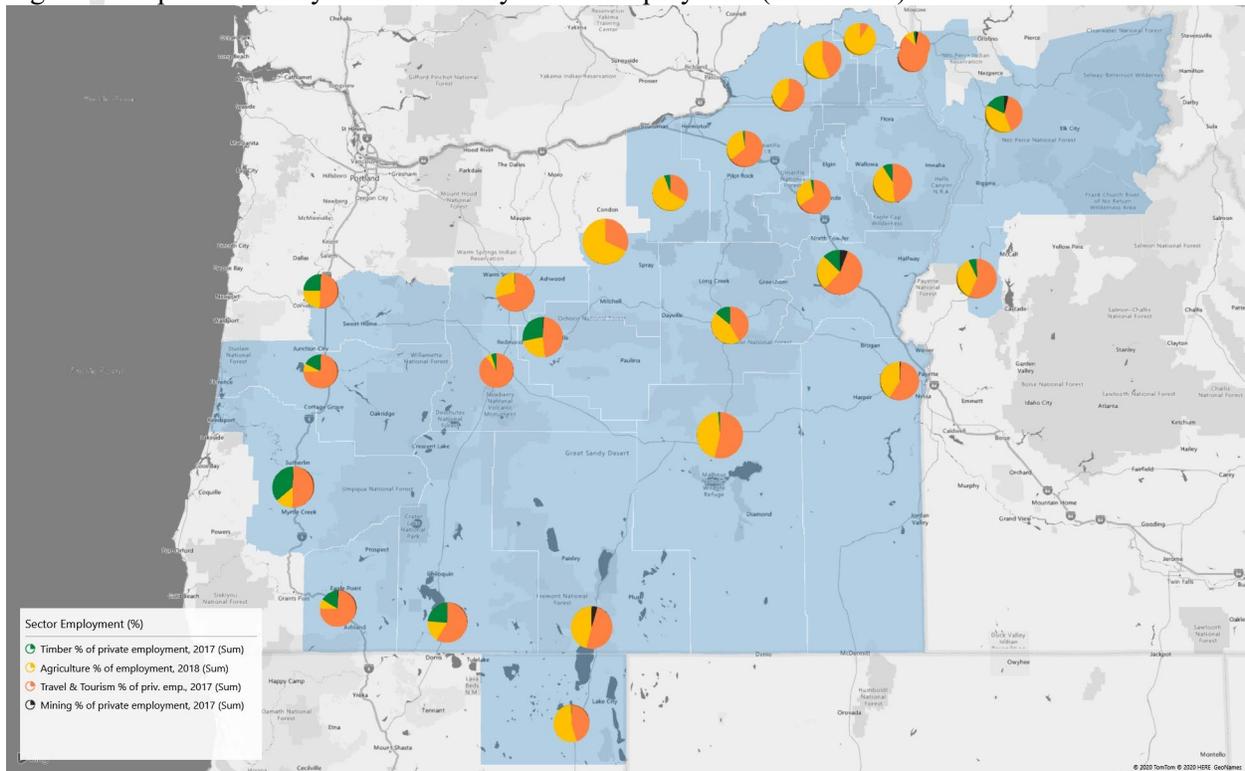
In 2018, agriculture including range was a slightly larger component of commodity sector employment in the analysis area, accounting for 4.3 percent of total employment, followed by timber at 3.8 percent of total employment (Table 4). Mining was far less critical to the employment base of this area and Travel and tourism activities supported 17.5 percent of the employment base in the same area. Depending on the county under review, these sectors vary in relative support they provide and percentage makeup the represent of the local economy. With a focus on the timber, it is worth noting that Douglas, Crook, Klamath, Linn, Idaho, and Baker County, have a relative higher percent of their employment base represented by timber sector industries. Similarly, in travel and tourism industries, Deschutes, Baker, Jefferson, and Harney County each have over 20% of their employment related.

Table 4. Commodity Sector Percentage Employment including Travel and Tourism Sector

Analysis Counties	Population, 2018	Timber %	Mining %	Agriculture %	Travel & Tourism %
<i>Combined Counties</i>	<i>1,497,198</i>	<i>3.8%</i>	<i>0.1%</i>	<i>4.3%</i>	<i>17.5%</i>
Lane County, OR	379,611	4.1%	0.1%	1.8%	17.3%
Jackson County, OR	219,564	4.2%	0.1%	2.1%	19.1%
Deschutes County, OR	191,996	1.2%	0.1%	1.3%	21.7%
Linn County, OR	127,335	6.0%	0.1%	6.0%	12.1%
Douglas County, OR	110,283	12.3%	0.1%	4.6%	16.8%
Umatilla County, OR	77,516	0.5%	0.1%	9.2%	17.3%
Klamath County, OR	67,653	7.3%	0.0%	5.3%	18.1%
Walla Walla County, WA	60,922	0.0%	0.0%	9.1%	13.3%
Nez Perce County, ID	40,408	0.4%	0.6%	2.0%	15.1%
Malheur County, OR	30,725	0.0%	0.3%	12.4%	17.5%
Union County, OR	26,461	0.7%	0.0%	7.5%	15.7%
Jefferson County, OR	24,192	0.3%	0.0%	8.7%	21.6%
Crook County, OR	23,867	9.4%	0.3%	7.8%	15.7%
Asotin County, WA	22,610	0.0%	0.0%	2.3%	15.9%
Idaho County, ID	16,513	5.0%	1.1%	10.7%	11.5%
Baker County, OR	16,006	5.3%	2.5%	10.7%	23.5%
Morrow County, OR	11,372	1.5%	0.0%	16.4%	9.1%
Modoc County, CA	8,777	0.1%	0.0%	13.7%	11.4%
Lake County, OR	7,879	0.0%	1.5%	15.6%	16.9%
Harney County, OR	7,329	0.5%	0.0%	19.5%	23.4%
Grant County, OR	7,176	4.0%	0.0%	12.6%	12.0%
Wallowa County, OR	7,081	2.7%	0.0%	13.2%	15.2%
Adams County, ID	4,250	2.2%	0.0%	11.7%	18.4%
Columbia County, WA	4,059	0.0%	0.0%	16.8%	13.4%
Garfield County, WA	2,247	0.0%	0.0%	19.6%	2.0%
Wheeler County, OR	1,366	0.0%	0.0%	29.4%	13.9%

Source: Multiple Federal sources including County Business Patterns data, and multiple agencies. Accessed via Headwaters Economics EPS, [here](#).

Figure 3. Map of the Analysis Area County Sector Employment (2017-2018)



Source: Multiple Federal sources including County Business Patterns data, and multiple agencies. Accessed via Headwaters Economics EPS, [here](#).

Land Use and Development

Lastly, in describing the economic affected environment, it is relevant to consider land-use patterns (Table 5). Land-use pressure, concerns with land management activities, and resource conflicts all seem to rise in relations to increasing residential development, especially development in the Wildland urban interface, and the relative proportion of land in each county that is managed by federal agencies. Approximately 32 percent of the multi-county analysis area is managed by USDA Forest Service, with a range of percentage ownership across counties, the highest being Idaho County with 82 percent. The highest levels of development in WUI areas tends to happen adjacent to metropolitan areas. In this case, Deschutes County, and the Bend residential development has driving WUI in this county up to 42 percent as was measured in 2010. Residential land area percentage change is most noticeable in counties with small populations that have grown more recently. Counties such as Crook and Adams County, for example, may have experienced trends of in-migration, or growing smaller residential areas.

Agency activities focused on fuels reductions and other WUI centered ecosystem needs are more likely to effect counties with high or rising WUI development.

Table 5. Land Use Ownership and Development, 2010

Analysis Counties	Forest Service Land %	Residential land area % change, 2000-2010	WUI % developed, 2010
<i>Combined Counties</i>	32%	21%	7%
Lane County, OR	48%	14%	12%

Analysis Counties	Forest Service Land %	Residential land area % change, 2000-2010	WUI % developed, 2010
Jackson County, OR	25%	20%	14%
Deschutes County, OR	51%	22%	42%
Linn County, OR	31%	11%	3%
Douglas County, OR	31%	14%	3%
Umatilla County, OR	20%	12%	6%
Klamath County, OR	45%	20%	4%
Walla Walla County, WA	0%	25%	0%
Nez Perce County, ID	1%	23%	11%
Malheur County, OR	0%	27%	2%
Union County, OR	47%	40%	1%
Jefferson County, OR	24%	24%	10%
Crook County, OR	23%	92%	7%
Asotin County, WA	13%	53%	3%
Idaho County, ID	82%	59%	8%
Baker County, OR	33%	36%	4%
Morrow County, OR	11%	21%	6%
Modoc County, CA	51%	79%	2%
Lake County, OR	19%	80%	0%
Harney County, OR	8%	48%	0%
Grant County, OR	55%	43%	1%
Wallowa County, OR	57%	30%	2%
Adams County, ID	58%	138%	10%
Columbia County, WA	29%	43%	4%
Garfield County, WA	21%	23%	15%
Wheeler County, OR	15%	55%	0%

Source: Multiple sources. Accessed via Headwaters Economics EPS, [here](#).

Populations at Risk and Environmental Justice Communities

Identification of potential environmental justice communities requires observations or measurements of poverty, federal assistance, and minority population presence in an assessment analysis area.

The human environment surrounding the National Forests in Eastern Oregon and Washington include families living below the poverty line. Tabular data below (Table 6) describes the number of families living below the poverty line, and separately reports families with children and single mother families with children. The Census defines a family as a group of two or more people who reside together and who are related by birth, marriage, or adoption. The Census Bureau uses a set of income thresholds that vary by family size and composition to define who is poor. If the total income for a family or an unrelated individual fall below the relevant poverty threshold, then the family or an unrelated individual is classified as being below the poverty level.

Families in poverty may lack the resources to meet their basic needs. Their challenges cross the spectrum of food, housing, health care, education, vulnerability to natural disasters, and emotional stress. To save money, families with low incomes often have to make lifestyle compromises such as unhealthy foods, less food, substandard housing, or delayed medical care. Lack of financial resources makes families in poverty more vulnerable to natural disasters. This is due to inadequate housing, social exclusion, and an inability to re-locate or evacuate. Inadequate shelter exposes occupants to increased risk from storms,

floods, fire, and temperature extremes. Households with low incomes are more likely to have unhealthy housing such as leaks, mold, or rodents. The expense of running fans, air conditioners, and heaters makes low-income people hesitant to mitigate the temperature of their living spaces. Furthermore, those in high-crime areas may not want to open their windows. Families in poverty are disproportionately affected by higher food prices, which are expected to rise in response to climate change. Children in poor families, on average, receive fewer years of education compared to children in wealthier families. Low-income residents are less likely to have adequate property insurance, so they may bear an even greater burden from property damage due to natural hazards. Living in poverty can lead to a lack of personal control over potentially hazardous situations such as increased air pollution or flooding. Impoverished families may be less likely to take proactive measures to prevent harm.

Malheur and other rural counties measure above other counties in terms of the percentage of families observed in poverty. Multiple counties have a higher than U.S. average percentage of households in poverty.

Table 6. Families in Poverty by Analysis County, 2018

Analysis Counties	Total families for whom poverty status is determined	Families in poverty	Families with children in poverty	Single mother families in poverty
<i>Combined Counties</i>	371106	10.5%	7.7%	4.4%
Lane County, OR	88873	10.3%	7.5%	4.5%
Jackson County, OR	55629	11.5%	8.7%	4.6%
Deschutes County, OR	48879	7.3%	4.9%	2.4%
Linn County, OR	31814	10.5%	7.5%	3.9%
Douglas County, OR	29377	11.3%	7.8%	4.9%
Umatilla County, OR	18188	13.8%	11.5%	7.7%
Klamath County, OR	17277	14.0%	9.6%	4.9%
Walla Walla County, WA	14341	7.8%	6.4%	4.6%
Nez Perce County, ID	10657	9.0%	6.9%	4.9%
Malheur County, OR	6782	17.1%	14.4%	7.9%
Union County, OR	6733	10.5%	8.1%	5.3%
Crook County, OR	6198	10.1%	8.0%	5.4%
Asotin County, WA	5807	7.4%	5.7%	3.6%
Jefferson County, OR	5383	11.3%	8.0%	5.8%
Baker County, OR	4319	10.9%	7.8%	4.0%
Idaho County, ID	4244	9.0%	4.5%	1.6%
Morrow County, OR	2927	11.1%	7.8%	3.3%
Modoc County, CA	2173	9.0%	6.6%	1.1%
Harney County, OR	2137	11.9%	8.0%	5.3%
Lake County, OR	2120	15.3%	11.1%	8.6%
Wallowa County, OR	2051	11.5%	8.6%	4.9%
Grant County, OR	1937	7.6%	4.3%	2.4%
Adams County, ID	1115	6.5%	5.3%	4.8%
Columbia County, WA	1101	5.4%	2.3%	0.5%
Garfield County, WA	656	6.4%	5.6%	1.5%
Wheeler County, OR	388	12.1%	9.3%	2.3%

Source: U.S. Department of Commerce. 2019. Census Bureau, American Community Survey Office, Washington, D.C.

Other Federal assistance metrics can help evaluate poverty status (Table 7). Supplemental Security Income, or SSI, provides financial assistance to people with limited income who are aged, blind, or disabled. Unlike Social Security benefits, which are determined by the recipient's lifetime earnings, SSI benefits are not based on prior work. Cash public assistance can be from the Federal program, Temporary

Assistance for Needy Families (TANF), or various state-level cash assistance programs. It does not include separate payments received for hospital or other medical care (vendor payments) or SSI or noncash benefits such as the Supplemental Nutrition Assistance Program.

The Supplemental Nutrition Assistance Program, or SNAP, (formerly known as food stamps), provides benefits to those who are unemployed, have no or low incomes, are elderly, are disabled with low incomes, or are homeless. The income threshold for SNAP varies with household size and other factors. SNAP benefits can be used to purchase grocery items such as breads, cereals, fruits, vegetables, meats, and dairy products. Median income can be used to identify areas of high or low income, but care should be taken to consider regional differences in cost of living.

The number of households receiving public assistance are indicative of households living in poverty or with insufficient resources. In 2011, families receiving public assistance spent 77 percent of their household budget to meet the basic necessities of housing, food, and transportation. Payments associated with economic hardship are associated with lower household income and educational attainment, higher poverty and unemployment. They are often high in communities that are losing population.

Similar counties are observed here with higher than average federal assistance per household.

Table 7. Percentage of Households Receiving Additional Federal Assistance

Analysis Counties	Households	% SSI	% CPAI	% Food Stamps	Δ(SSI)	Δ (CPAI)	Δ Stamps
<i>Combined counties</i>	581,852	5.6%	3.5%	19.1%	162%	52%	455%
Lane County, OR	150,780	5.7%	3.6%	20.1%	158%	78%	400%
Jackson County, OR	87,417	5.1%	3.7%	19.2%	181%	79%	499%
Deschutes County, OR	72,471	3.0%	1.8%	13.6%	42%	-103%	394%
Linn County, OR	47,030	6.3%	3.9%	20.2%	268%	73%	507%
Douglas County, OR	45,026	6.7%	3.7%	21.2%	187%	79%	537%
Klamath County, OR	27,402	7.9%	4.4%	25.1%	243%	114%	731%
Umatilla County, OR	26,886	6.3%	4.4%	23.2%	230%	201%	573%
Walla Walla County, WA	22,304	5.6%	3.1%	13.4%	-3%	-177%	91%
Nez Perce County, ID	16,302	7.1%	4.0%	12.7%	247%	118%	391%
Union County, OR	10,481	5.3%	4.4%	19.3%	215%	146%	456%
Malheur County, OR	10,138	8.3%	4.9%	28.7%	390%	162%	1302%
Crook County, OR	9,339	6.7%	4.5%	23.0%	292%	236%	784%
Asotin County, WA	9,171	4.9%	3.6%	16.4%	-59%	62%	162%
Jefferson County, OR	7,892	6.6%	4.4%	27.4%	391%	93%	1126%
Baker County, OR	6,927	6.4%	4.4%	18.5%	219%	52%	257%
Idaho County, ID	6,466	4.8%	4.3%	8.9%	76%	151%	-83%
Morrow County, OR	3,959	5.0%	2.9%	17.4%	-75%	12%	105%
Modoc County, CA	3,660	5.7%	1.3%	9.5%	-264%	-422%	123%
Lake County, OR	3,494	6.1%	2.1%	19.2%	145%	-302%	309%
Grant County, OR	3,294	5.5%	2.6%	18.4%	140%	64%	359%
Wallowa County, OR	3,165	4.6%	5.6%	18.5%	20%	373%	564%
Harney County, OR	3,157	7.3%	5.4%	21.5%	248%	-142%	255%
Columbia County, WA	1,758	5.8%	3.5%	12.6%	240%	-127%	131%
Adams County, ID	1,675	6.0%	2.4%	6.8%	379%	-161%	316%
Garfield County, WA	997	9.2%	2.2%	8.6%	436%	-67%	21%
Wheeler County, OR	661	4.1%	2.1%	18.3%	-210%	117%	705%

Source: U.S. Department of Commerce. 2019. Census Bureau, American Community Survey Office, Washington, D.C.

Race is self-identified by Census respondents who choose the race or races with which they most closely identify. Included in Other Races are Asian, Native Hawaiian or Other Pacific Islander, and respondents providing write-in entries such as multiracial, mixed, or interracial. Ethnicity has two categories: Hispanic or Latino, and Non-Hispanic or Latino. The federal government considers race and Hispanic origin to be two separate and distinct concepts. Hispanics and Latinos may be of any race.

Race and ethnicity are strongly correlated with disparities in health, exposure to environmental pollution, and vulnerability to natural hazards. Research consistently has found race-based environmental inequities across many variables, including the tendency for minority populations to live closer to noxious facilities and Superfund sites, and to be exposed to pollution at greater rates than whites. Many health outcomes are closely related to the local environment. Minority communities often have less access to parks and nutritious food, and are more likely to live in substandard housing. Minorities tend to be particularly vulnerable to disasters and extreme heat events. This is due to language skills, housing patterns, quality of housing, community isolation, and cultural barriers. Blacks and Hispanics, two segments of the population that are currently experiencing poorer health outcomes, are an increasing percentage of the US population. Research has identified measurable disparities in health outcomes between various minority and ethnic communities.

Across races, the rates of preventable hospitalizations are highest among black and Hispanic populations. Preventable hospital visits often reflect inadequate access to primary care. These types of hospital visits are also costly and inefficient for the health care system. Relative to other ethnicities and races, Hispanics and blacks are less likely to have health insurance, but rates of uninsured are dropping for both groups. Compared to other races, blacks have higher rates of infant mortality, homicide, heart disease, stroke, and heat-related deaths. Hispanics have higher rates of diabetes and asthma. American Indians have a distinct pattern of health effects different from blacks and Hispanics. Native populations are less likely to have electricity than the general population. They have high rates of infant mortality, suicide and homicide, and nearly twice the rate of motor vehicle deaths than the U.S. average.

Specific to the program actions associated with Eastside Screens, there is existing evidence that low-income and minority populations fail to benefit proportionally from hazardous fuel reduction projects on federal land (Adams and Charnley 2020). These potential impacts are important to consider, especially in the design and implementation of on-the-ground projects.

Across counties in the analysis area, Jefferson, Walla Walla, Umatilla, Lane, Klamath, Morrow, Malheur, have higher than average percentages of minorities within their populations and may be more likely to observe issues related to hazardous fuel reduction projects.

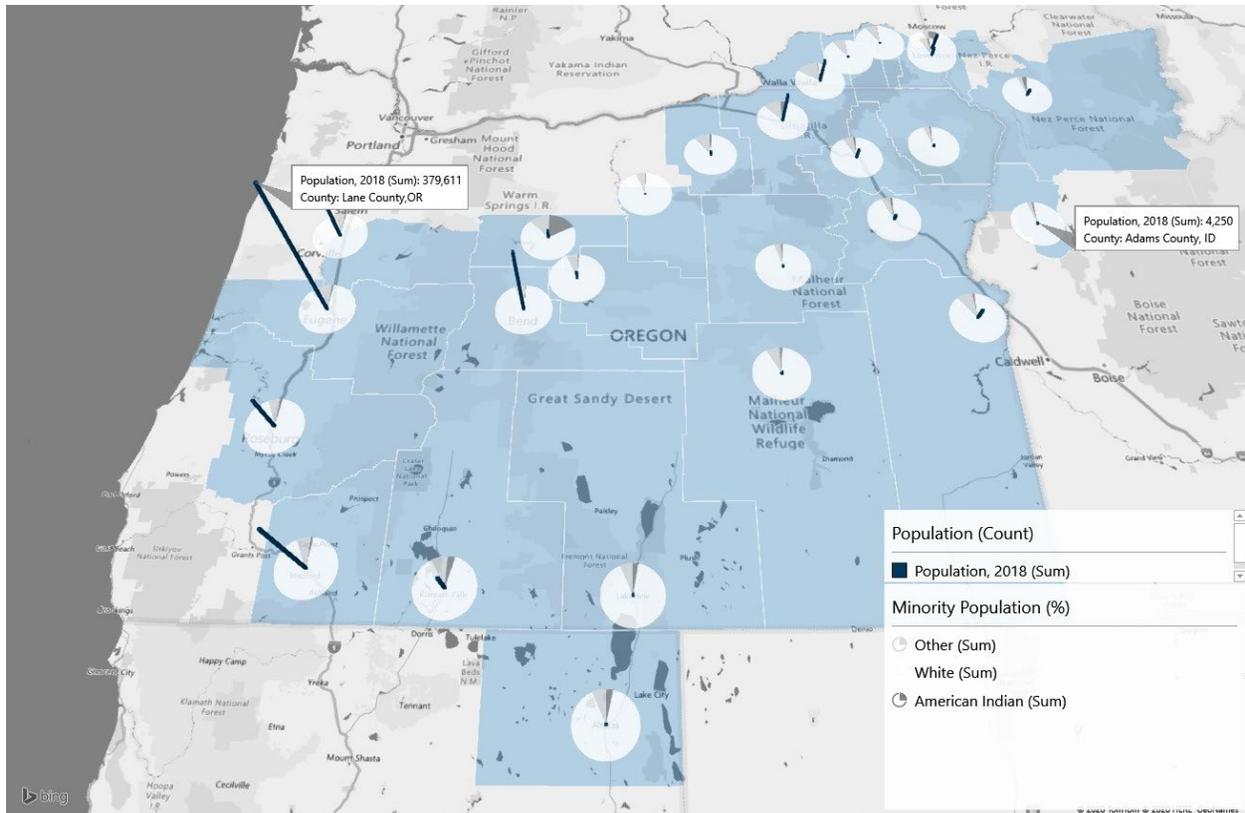
Similarly, the highest presence of Native American populations is observed in Jefferson, Nez Perce, Klamath, Umatilla, Idaho, and Lake Counties. These population areas are of importance as they can spatially relate to the unique tribal community values placed on associated resources and species. More discussion on tribal values is provided in the Cultural and Heritage Resources section below.

Table 7. Race and Ethnic Profile by Analysis Counties, 2018

	All other races	Black or African American	American Indian	Other races	Hispanic ethnicity
Jefferson County, OR	29%	1%	17%	11%	20%
Walla Walla County, WA	16%	2%	1%	13%	21%
Umatilla County, OR	15%	1%	3%	10%	26%
Lane County, OR	13%	1%	1%	11%	9%
Klamath County, OR	12%	1%	4%	7%	13%
Morrow County, OR	11%	0%	1%	10%	36%
Malheur County, OR	11%	1%	1%	9%	33%
<i>Combined Counties</i>	<i>11%</i>	<i>1%</i>	<i>2%</i>	<i>8%</i>	<i>11%</i>
Nez Perce County, ID	10%	0%	6%	4%	4%
Modoc County, CA	10%	2%	3%	5%	14%
Linn County, OR	10%	0%	1%	8%	9%
Harney County, OR	9%	1%	2%	7%	5%
Lake County, OR	9%	0%	3%	6%	8%
Columbia County, WA	9%	1%	0%	8%	8%
Jackson County, OR	9%	1%	1%	7%	13%
Garfield County, WA	8%	0%	0%	8%	2%
Union County, OR	8%	1%	1%	6%	5%
Douglas County, OR	7%	0%	1%	6%	6%
Crook County, OR	7%	0%	1%	6%	8%
Asotin County, WA	7%	0%	1%	5%	4%
Baker County, OR	7%	1%	1%	5%	4%
Idaho County, ID	7%	0%	4%	3%	3%
Deschutes County, OR	7%	1%	0%	5%	8%
Wheeler County, OR	6%	0%	1%	5%	10%
Grant County, OR	5%	0%	1%	4%	4%
Wallowa County, OR	5%	0%	1%	4%	3%
Adams County, ID	4%	0%	1%	3%	4%

Source: U.S. Department of Commerce. 2019. Census Bureau, American Community Survey Office, Washington, D.C.

Figure 4. Map of the Analysis Area County Minority Populations (% , 2018)



Source: Multiple Federal sources including County Business Patterns data, and multiple agencies. Accessed via Headwaters Economics EPS, [here](#).

For more information on environmental justice communities see the “Social At-A-Glance” reports provided in the project record.

Benefits to People (Including Ecosystem Services)

National forests and grasslands provide public benefits (including ecological dependent benefits known as ecosystem services) such as timber, clean air and water, forage, and energy production. National Forest System lands also provide recreation, cultural and heritage opportunities that play an important role in how communities come together for physical and mental health, family, and to connect to the land. In many rural areas, the infrastructure, employment, goods and services provided are a basis for the structure of the community.

Across the Forests, benefits to people, including valued ecosystem services, include recreation opportunities and scenery, cultural and heritage resources, research and education, access, forest products, water and air, forage and botany of interest, minerals and more. For Forest specific information on benefits to people, refer to “Benefits to People At-A-Glance” reports provided in the project record.

Key ecosystem services reviewed in this analysis are those that have an importance to a wide group of people and may be potentially impacted by decisions within the scope of alternatives considered for a NEPA decision.

Of the broad categories of ecosystem services valued across the eastern Forests, forest products, cultural and heritage resources, wildlife presence through habitat management, and foraged botany are of the most relevance to the scope of the proposed amendment.

Forest Products (timber and other wood resources)

Forest products are of primary focus among other key ecosystem services due to the potential to be influenced by decision changes to Eastside Screens.

In terms of direct benefits to people, timber sale activities contribute to local income and employment opportunities, especially so in timber dependent communities. Douglas, Klamath, and Crook Counties, have a higher proportion of their population working in industries that generate income and employment from processing forest products and may be more susceptible to changes in timber market conditions, including supply of timber from National Forests.

Historically, harvested timber from the Forests in eastern Oregon and Washington was much higher in volume than it has been in more recent years (Figure 4). Harvested volumes have shrunk from a high in 1987 (1500 MMBF) down to a steady state level from 2000-2018, fluctuating around 200 MMBF annually. In 2018, 204 MMBF was harvested from the Forests in the analysis area. Given the duration of this new, steady period, forest product manufacturers across this region will have long since adapted to the more limited timber availability from these National Forests. Industrial processing capacity needed to return to high volume harvest years would not be immediately available, and given the dynamics of competition for the production of structural lumber, especially, increasing volumes may not be strategically appropriate to firms operating in this particular subregion of the U.S.

The pattern of mill closures on the eastside is consistent with patterns across the West and elsewhere in the U.S. A review of the literature shows that mill closures result from a mix of factors, with timber supply changes being one contribution (Charnley et al. 2018). The importance of the federal timber supply to mill success is much greater, however, in areas such as the eastside where federal forests comprise most of the productive forestlands.

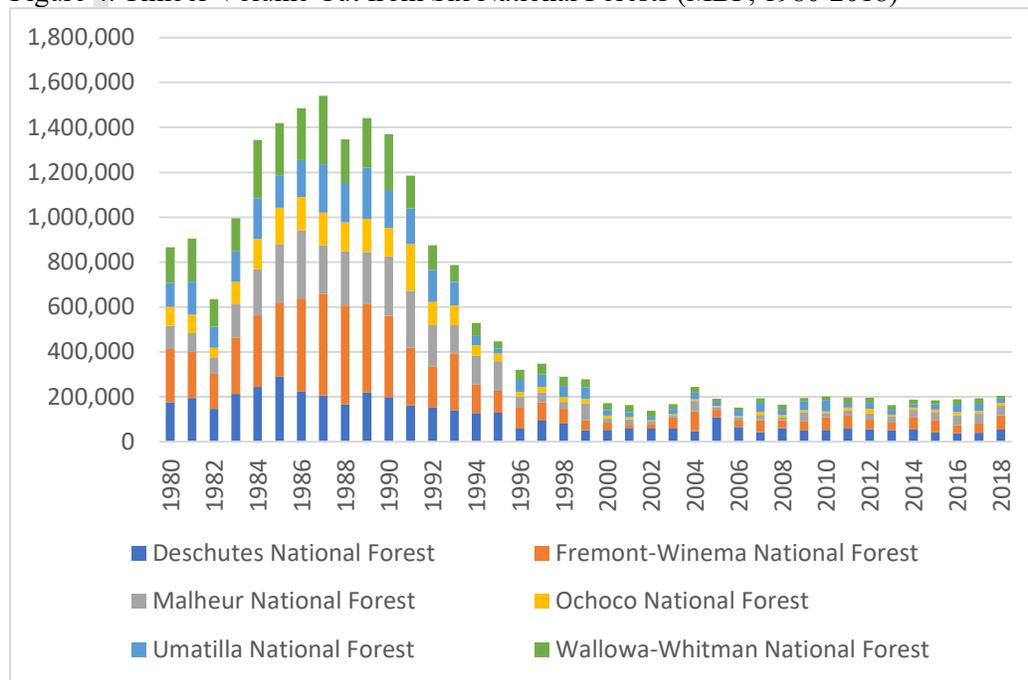
Complete loss of milling infrastructure would present a significant challenge to implementation of fuels reduction in frequent-fire forests. Prestemon et al. (2012) showed that if no timber products could be sold from forest restoration actions, there was no place in eastern Oregon or Washington where the expected net economic benefit from treatment would be positive, even when accounting for avoided wildfire damage because of fuel treatment. This implies that in the absence of the ability to sell timber: 1) all fuel treatments in eastern Oregon and Washington would have to be paid for, and 2) it makes little economic sense to do fuel treatments when the only economic benefit is potential avoided damage to property or natural resources from wildfire.

In general, mills have trended towards processing smaller logs over the last several decades (Gale et al. 2012, McIver et al. 2015). In some cases, mills on the eastside have added new infrastructure specifically focused on small-log processing (e.g., White 2018). Managers considering harvest of larger trees would need to be cognizant of input size restrictions of mills local to eastside forests, and their investments to recapitalize their infrastructure to more efficiently handle smaller material. Harvesting large trees from eastside forests only to have them shipped outside the local forest area for processing is inconsistent with community and local stakeholder motivations to positively affect local economies via restorative activities (White et al. 2015, Davis et al. 2018b, Brown 2019). Additional details on the forest products and timber industry in Oregon are available in the 21 Inch

Market Report, available in the project file. This short report details the Oregon industry size and trends along with identification of mills around the project area.

It is important to note that the relationship of the Eastside Screens, and changes to them, with potential harvest volume is not particularly strong. Silvicultural practices and timber sale administration allows for a great deal of substitution across species and dimension of trees available, not only in the market context, but specifically in the design and application of timber sale cutting units. Additionally, as discussed above industrial utilization across the West has greatly shifted towards smaller dimension timber, for economic and technological reasons. Larger dimension trees are more efficient for transportation costs, but may be less desirable for sawmills that have transitioned capital for processing of smaller dimension timber. Lastly, it is anticipated that changes to Eastside Screens may increase the flexibility of timber sale designs to achieve project-level economic goals along with ecological ones, a result that may increase project efficiency, but not necessarily harvest volume supplied to market.

Figure 4. Timber Volume Cut from Six National Forests (MBF, 1980-2018)

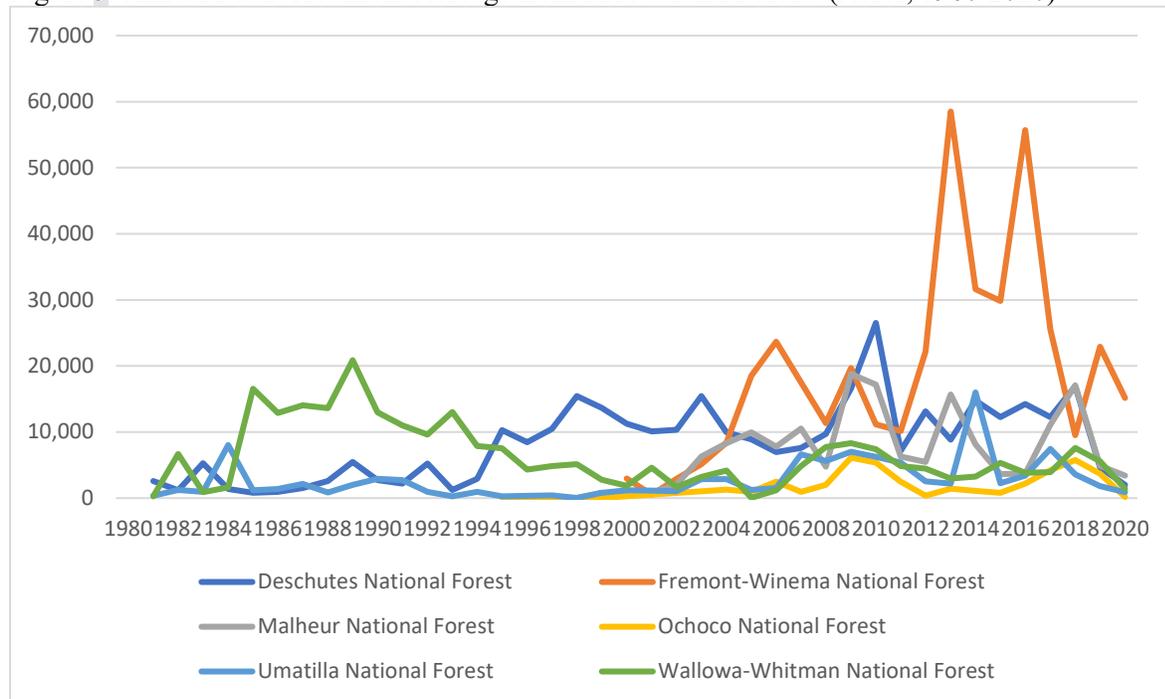


Additional to timber, other wood resources for subsistence and other uses would be influenced and relevant to the scope of this project. This includes the availability of biomass, heating fuels, and other products that may result from commercial and non-commercial treatments under agency programmatic direction.

Fuels treatments specifically can generate additional raw materials for industry and subsistence uses. Like timber sales, treatment contracts can also influence local economics by generating income and employment for firms and proprietors located around National Forests.

Fuels treatment trends have decreases on some Forests, and increased on others, over the last forty years (Figure 5). For example, Deschutes National Forest has increased fuel treatments due to increasing WUI development, where fuels treatments are more critical for lowering asset risk during large fire events.

Figure 5. Annual Fuels Treatment Acreage from Six National Forests (Acres, 1980-2020)



Cultural and Heritage Resources

Regional cultural and heritage resources are of key interest with respect to Eastside Screens. In addition to specific sites, values are often associated with habitat types that foster diverse and culturally meaningful plants and animals, as well as important individual trees and groves. The proposed review and potential changes may involve important values that belong to tribal and other historically positioned communities and stakeholders.

Specifically, forests are important to tribes in part because of the environmental services they provide (e.g., filtering air and water); their role in sustaining habitats for fish and wildlife; the foods, medicines, fuels, and materials they produce; and their importance to tribal members' sense of place, all of which help sustain the lifeways, cultures, and spiritual practices of tribal members (Gordon et al. 2013). For example, California black oak (found across California and into southwest Oregon) is a cultural keystone species for many local tribes because it plays a fundamental role in their diet, materials, medicines, and/or spiritual practices (Long et al. 2016). Large-diameter oaks produce more acorns than small-diameter oaks, one of their most valued products (Long et al. 2016).

Another cultural keystone species important to PNW tribes is huckleberry, especially the thin-leaf huckleberry (*Vaccinium membranaceum*, Long et al. 2018, Steen-Adams et al. 2019). Forest tree size and distribution can have an impact on populations of thin-leaf huckleberry, which are most prevalent in open forest stands of the western Oregon Cascades (Kerns et al. 2004). The Sahaptin, Wasco, and Northern Paiute peoples (comprising the Confederated Tribes of Warm Springs) historically used fire in the moist mixed-conifer zone of the eastside Cascades to maintain and extend forest openings created by previous ignitions to promote huckleberry shrub productivity and access to harvest sites (Steen-Adams et al. 2019). Cultural burns ceased by the 1940s, causing forest canopy closure and encroachment of trees and shrubs. These changes contributed to a decline in huckleberry productivity in traditional harvest areas and declines in social and cultural traditions associated with huckleberry harvesting (Steen-Adams et al.

2019). Thus, it is important to consider how changes in forest management may affect culturally-important species.

Tribes also value large, old trees that have been culturally modified, bearing evidence of historic or prehistoric human forest uses, such as scars from wood, bark, or sap harvest. Some anthropogenic scars found on North American trees date back as far as the 1400s (Arno et al. 2008, Mobley and Eldridge 1992). For example, Deur (2009) describes Klamath and Modoc tribal use of sap and inner bark (or cambium) from pine (especially lodgepole pine, ponderosa pine, and junipers) in south-central Oregon and northeastern California. The Klamath Tribes' historical practice of harvesting cambium for food and medicinal use was also documented by earlier anthropologists (Coville 1897, Spier 1930). Today, culturally-modified trees provide Native American communities with a link to traditional cultural practices and beliefs, and a tie to the past (Deur 2009). They also provide information about traditional forest management practices, and beliefs about preservation and conservation, warranting further study (Turner et al. 2009). For instance, the partial harvest of tree products reflects a reverence for trees, as only parts of the tree were removed, keeping the tree alive (Zahn et al. 2018, Deur 2009, Turner et al. 2009). Government programs in the U.S. and Canada are crucial to the preservation of culturally-modified trees (Mobley and Eldridge 1992). Franklin et al. (2013:27) recommend conserving and restoring culturally-modified trees as a management goal on eastern Oregon forests.

Social-ecological systems in the PNW have been shaped by indigenous peoples over millennia, and there is great potential for integrating traditional ecological knowledge into forest management and decision-making (Long et al. 2018, Charnley et al. 2007, Steen-Adams et al. 2019). One effective way to do so is to directly engage traditional knowledge holders as active participants in forest planning, management, and implementation (Charnley et al. 2007). Collaboration in resource management can help build trust between the USFS and Native American tribes (Dockry et al. 2018). Other ways to build trust include upholding formal relationships and agreements, developing informal and personal relationships, practicing respect, listening, and demonstrating engaged leadership (Dockry et al. 2018).

Forage, Botany, and Range

Similar to cultural and heritage resources, forage and range opportunities and botany species of interest have human-use and other economic and social value and may be influenced by changes to silvicultural practices. This benefit category includes botany and forage resources within forest stands, as well as grazing opportunities on ranges lands leased by the Forest Service for cattle and other ranching businesses. For more information on botany, see the Botany section in this EA

It is important to note that the economic values associated with range, alone, are sizeable. In 2016, economic contributions from range resources across the six Forests in this analysis area provided an estimated direct employment of 820 jobs and millions in direct labor income associated with these jobs.

Aquatic Resources

Aquatic species are of high interest and value across the West. As noted in section 3.2.3, the Eastside Screens Wildlife Standard does not apply to Riparian Habitat Conservation Areas and will not have significant impacts on aquatic resources. However, some changes may occur to wetland habitat and resources, as indicated in the Wildlife section.

Wildlife and Wildlife-Based Recreation

Wildlife species present on National Forest System lands have varying levels of community interest and human-placed value. Effects to wildlife are covered in detail in the wildlife section. In addition to sensitive, threatened, and endangered species, many others are important for hunting, viewing and existence values, and their vitality can contribute to social and economic conditions in surrounding communities.

Environmental Effects

The proposed amendment, and the alternatives considered here, are programmatic and reflect changes to management practices, allowing for in some cases greater adaptivity to conditions found on the ground. Due to the limited scope of this amendment, and the unknowns associated with specific site and project activity, the potential social and economic effects described here are limited to qualitative, descriptive analysis, which are summarized in an ordinal ranking (Table 8) across alternatives.

The focus of this effects section is to identify the relative balance of key benefits to people, including ecosystem services, identifying any possible relative shift in benefit streams across alternatives. Key benefits are those that have a wide social or economic importance and, more importantly, have the potential to change as a result of a decision alternative. Below, the relative effects to key benefits are described in greater detail.

In summary of all alternatives (Table 8), available volume for forest products and jobs and income supported by the harvest of timber, and milling operations are ranked as having the highest benefit in the adaptive management alternative, second highest in the old tree standard alternative, third in the old tree and large tree guideline alternative, and lastly, fourth under the current management alternative.

All other benefit types have the same or similar relative benefit ranking, across alternatives. That is, in total, all action alternatives are slightly, or higher, preferred over the current management alternative, for these remaining benefits listed below (Table 8). Benefit rankings indicate potential improvements to the overall human environment, both economically and socially, given the increased management flexibility offered by the action alternatives. Rankings were determined through a synthesis of resource discussions and analysis, as well as cumulative professional input.

There are multiple primary reasonings for this ranking outcome. Foremost on the list, this result relates to increased potential for larger natural disturbance impacts, under current management direction. Large fire events have the ability to remove or interrupt ecosystem services, and benefit streams that humans and communities enjoy, at greater scale and with less control in many cases, than human-sourced disturbances.

Another contributor to this ranking involves shading and encroaching habitat conditions. Older habitats and ponderosa pine encroachment can remove additional forage opportunities for recreation related species, such as deer and elk, as well as for domestic cattle operations. They can also limit meadow and wetland retention, potentially affecting aquatic and terrestrial species that survive in these land types. Increased management flexibility leads to better fire management results, as well as habitat, current and future desired conditions.

Beyond over all rankings, for some species and resources there are important risk trade-offs to consider. For example, cultural resources include forage species like huckleberries, as well as characteristics such as large and old tree details that are impacted greatly by large fire events, in addition to disturbances by human activities. To the extent that action alternatives would improve fire event outcomes and limit the scale of impacts from natural disturbances relative to the slight increase in human disturbances, would

represent an overall benefit, but still represent a risk trade-off. Similar risk trade-offs could be described for individual wildlife and plant species, as well as individual places and habitats with community significance. Analysis of individual species and resource details are available in respective resource sections of this EA.

Table 8. Alternative Ordinal Ranking Across Benefit Types

Benefit to People	Current Management Alternative	Old Tree and Large Tree Guideline Alternative (with Adaptive Management)	Old Tree Standard Alternative	Adaptive Management Alternative
Forest Products Resources	4th	3rd	2nd	1st
Jobs and Income Opportunities	4th	3rd	2nd	1st
Forage, Botany, Range Opportunities	2nd	1st	1st	1st
Cultural and Heritage Resources	2nd	1st	1st	1st
Wildlife and Wildlife-Based Recreation	2nd	1st	1st	1st
Aquatic Resources	2nd	1st	1st	1st

Details for Forest Products

Volume availability was analyzed in the FVS model runs utilized in the vegetation section 3.2.1. The model was given the task to identify volume available for removal in commercial thinning treatments as well as non-commercial thinning at intervals of time that were appropriate for silvicultural prescriptions. The result of the FVS model yielded the maximum available volume for thinning, across alternatives. Given the differences in stand management direction, each alternative yielded a slightly different total available volume. The following graphs visualize these differences across alternatives (Figure 6-8: Alt0 – current management alternative, Alt1 - Old Tree and Large Tree Guideline Alternative (with Adaptive Management, Alt2 - Old Tree Standard Alternative, Alt3 - Adaptive Management Alternative).

Most notably, the adaptive management alternative provided the highest level of management flexibility and therefore increased the available volume for treatment by approximately 45 percent over the current management alternative to 6.65 MMBF, compared to 4.60 MMBF under current management direction, in year one (Figure 7 and 8). The old tree stand alternative and guideline alternative increase available volume as well, by 13 and 4 percent, respectively, or in volume terms 5.18 and 4.77 MMBF, respectively.

These potential volume availability differences do not represent Forest scheduled activities, or site specific plans, but rather growth and yield potential. With increased volume available in the action alternatives, it is reasonable to assume that additional volume could be treated under the forest management projects of each Forest. As a result, the action alternatives provide increased potential for the support of income and employment associated with timber harvesting activities and forest products manufacturing.

Similar outcomes were determined for non-commercial volume available for removal. With the exception of a slight decrease in guideline alternative in year one, the action alternatives remain as productive, or better than the current management direction, in terms of offering smaller diameter wood resources for treatment (Figure 8).

Figure 6. FVS modeled inventory of merchantable volume per alternative and event year (MMBF)

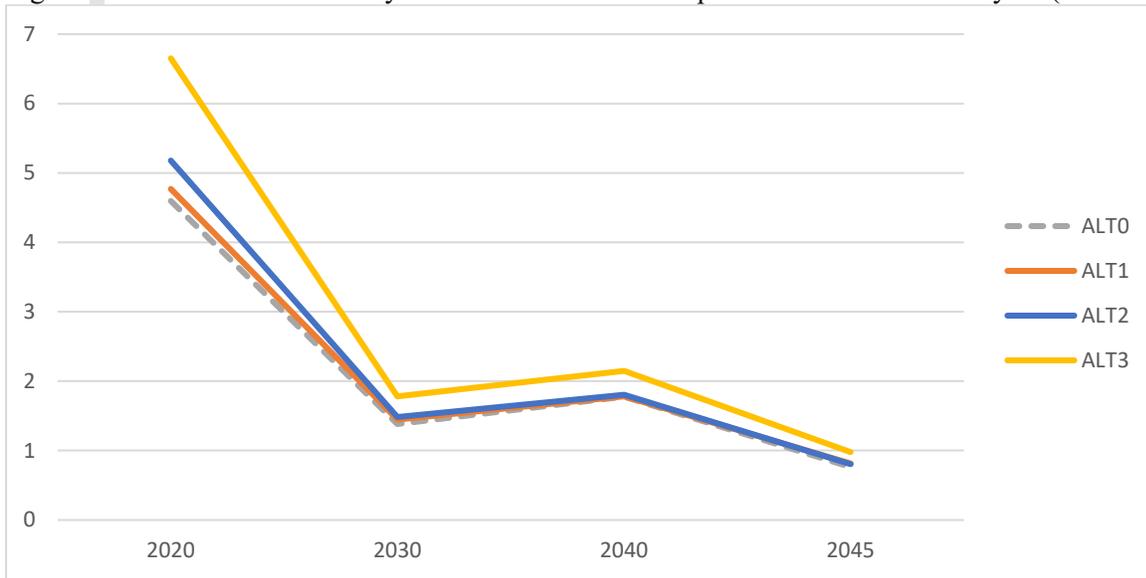


Figure 7. FVS modeled inventory of merchantable volume per alternative and event year (% above no-action)

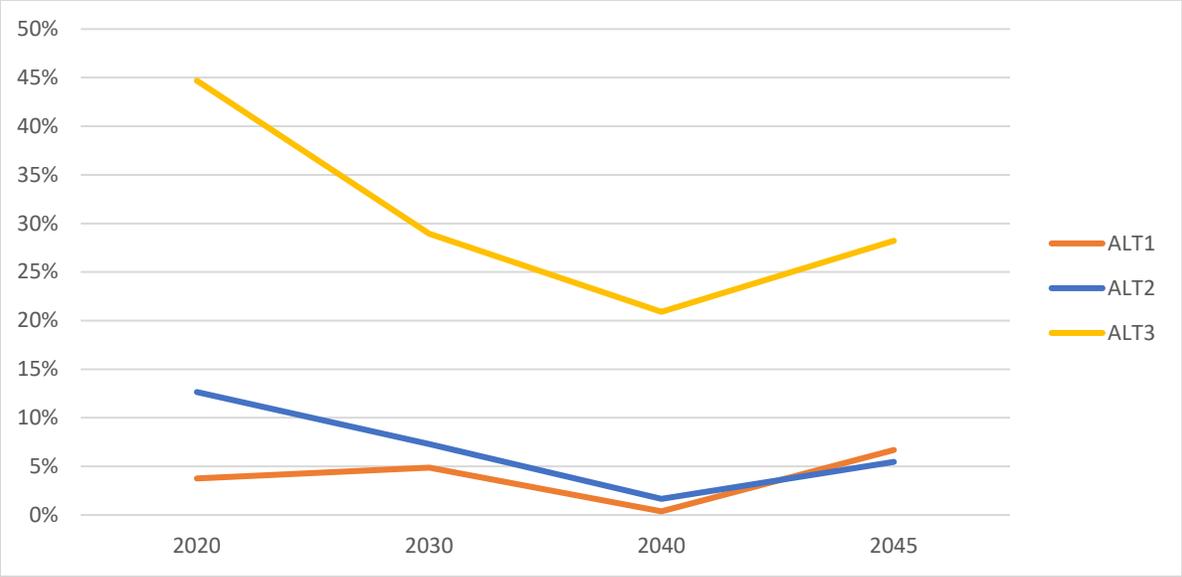
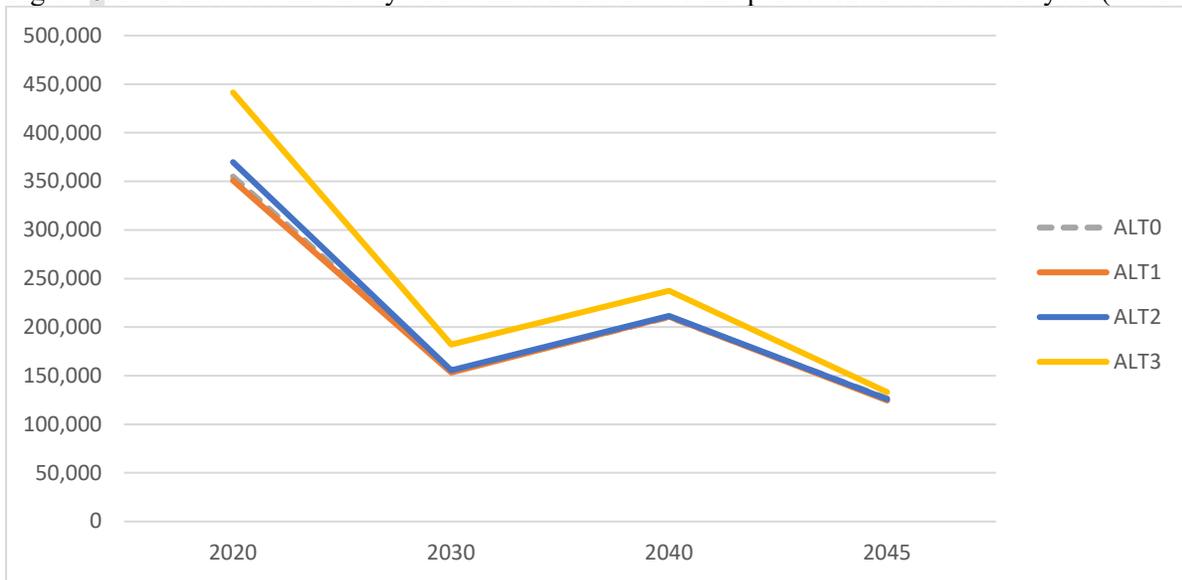


Figure 8. FVS modeled inventory of sub-merchantable volume per alternative and event year (Cubic Ft)



Cumulative Effects

For cumulative effects for the key resources see cumulative effects description in respective sections of this EA.

Cumulative effects for forest products are limited to long term changes to volume availability as highlighted in Figures 6-8. It is possible the volume available to increased management flexibility under the action alternatives leads to mid and long term changes in small industry and proprietor practices within the forest products sector around the six Forest area.