6-30-2019

Coordinated Population Forecast for Sherman County, its Urban Growth Boundaries (UGB), and Area Outside UGBs 2019-2069

Portland State University. Population Research Center

Nicholas Chun
Portland State University

Kevin Rancik
Portland State University

Rhey Haggerty
Portland State University

Jason R. Jurjevich
Portland State University, jjason@email.arizona.edu

Coordinated Population Forecast

2019

Through

2069

Sherman County

Urban Growth Boundaries (UGB) & Area Outside UGBs

Population Research Center
PORTLAND STATE UNIVERSITY

Cover Photo: Sherman County Courthouse. Gary Halvorson, Oregon State Archives.

Coordinated Population Forecast for Sherman County, its Urban Growth Boundaries (UGB), and Area Outside UGBs 2019-2069

Prepared by

Population Research Center

College of Urban and Public Affairs

Portland State University

June 30, 2019

This project is funded by the State of Oregon through the Department of Land Conservation and Development (DLCD). The contents of this document do not necessarily reflect the views or policies of the State of Oregon.

Project Staff:

Nicholas Chun, Population Forecast Program Manager

Kevin Rancik, GIS & Research Analyst

Rhey Haggerty, Graduate Research Assistant

Jason Jurjevich, Associate Director of Population Research Center

Charles Rynerson, Research Consultant

The Population Research Center and project staff wish to acknowledge and express gratitude for support from the Forecast Advisory Committee (DLCD), the hard work of our staff Deborah Loftus, data reviewers, and many people who contributed to the development of these forecasts by answering questions, lending insight, providing data, or giving feedback.

How to Read this Report

This report should be read with reference to the documents listed below—downloadable on the Forecast Program website (http://www.pdx.edu/prc/opfp).

Specifically, the reader should refer to the following documents:

- *Methods and Data for Developing Coordinated Population Forecasts*—Provides a detailed description and discussion of the forecast methods employed. This document also describes the assumptions that feed into these methods and determine the forecast output.
- *Forecast Tables*—Provides complete tables of population forecast numbers by county and all sub-areas within each county for each five-year interval of the forecast period (2019-2069).

Table of Contents

Modified Methodology 6

Comparison to Cycle 1 (2015-17) 6

Executive Summary 7

14-Year Population Forecast 9

Historical Trends 10

- Population 10
- Age Structure of the Population 11
- Race and Ethnicity 12
- Births 13
- Deaths 15
- Migration 16
- Historical Trends in Components of Population Change 17
- Housing and Households 18

Assumptions for Future Population Change 20

- Assumptions for the County and Sub-Areas 20

Forecast Trends 21

- Forecast Trends in Components of Population Change 23

Glossary of Key Terms 25

Appendix A: Surveys and Supporting Information 26

Appendix B: Specific Assumptions 27

Appendix C: Detailed Population Forecast Results 28

Table of Figures

Figure 1. Sherman County and Sub-Areas—Historical and Forecast Populations, and Average Annual Growth Rates (AAGR) 8
Figure 2. Sherman County and Sub-Areas—14-Year Population Forecast 9
Figure 3. Sherman County—Total Population by Five-year Intervals (1975-2018) 10
Figure 4. Sherman County and Sub-areas—Total Population and Average Annual Growth Rate (AAGR) (2000 and 2010) 11
Figure 5. Sherman County—Age Structure of the Population (2000 and 2010) 12
Figure 6. Sherman County—Hispanic or Latino and Race (2000 and 2010) 13
Figure 7. Sherman County and Region 2—Total Fertility Rates (2000 and 2010) 13
Figure 8. Sherman County and Region 2—Age Specific Fertility Rate (2000 and 2010) 14
Figure 9. Sherman County—Average Annual Births (2010-2045) 14
Figure 10. Sherman County—Average Annual Deaths (2010-2045) 15
Figure 11. Sherman County, Region 2, and Oregon—Age Specific Migration Rates (2000-2010) 16
Figure 12. Sherman County—Components of Population Change (2001-2017) 17
Figure 13. Sherman County and Sub-Areas—Total Housing Units (2000 and 2010) 18
Figure 14. Sherman County and Sub-Areas—Persons per Household (PPH) and Occupancy Rate 19
Figure 15. Sherman County—Total Forecast Population by Five-year Intervals (2019-2069) 21
Figure 16. Sherman County and Sub-Areas—Forecast Population and AAGR 22
Figure 17. Sherman County—Average Annual Net In/Out-Migration (2000-2010, 2010-2020, and 2020-2044) 23
Figure 18. Sherman County—Age Structure of the Population (2019, 2030, and 2044) 24
Figure 19. Sherman County—Components of Population Change (2010-2045) 24
Figure 20. Sherman County—Population by Five-Year Age Group 28
Figure 21. Sherman County's Sub-Areas—Total Population 28

Modified Methodology

The Population Research Center, in consultation with DLCD, has identified cost savings associated with a modified methodology for the latter half of the 50-year forecast period (years 26 to 50). Based on feedback we have received, a 25-year forecast fulfills most requirements for local planning purposes and, in an effort to improve the cost effectiveness of the program; we will place more focus on years 1 through 25. Additionally, the cost savings from this move will allow DLCD to utilize additional resources for local government grants. To clarify, we use forecast methods to produce sub-area and county populations for the first 25 years and a modified projection method for the remaining 25 years. The description of our forecast methodology can be accessed through the forecast program website (www.pdx.edu/prc/opfp), while the summary of our modified projection method is below.

For years 26-50, PRC projects the county population using the annual growth rate from the 24th-25th year. For example, if we forecast a county to grow 0.4 percent between the 24th and 25th year of the forecast, we would project the county population thereafter using a 0.4 percent AAGR. To allocate the projected county population to its sub-areas, we extrapolate the change in sub-area shares of county population observed in years 1-25 and apply them to the projected county population.

Comparison to Cycle 1 (2015-17)

To keep up to date with local trends and shifting demands, OPFP regularly updates coordinated population forecasts for Oregon's areas. Beyond the modification to our methodology and additional forecast region (from three regions to four), there are differences between the 2019 updated forecast for Sherman County and the 2016 version. Overall, the 2019 forecast is lower for Sherman County for the 25-year period (2019-2044). While our expectations of births and deaths have not changed from last round, we expect slower net in-migration for Sherman County. The county's UGBs are expected to capture larger shares of the County population by 2044, except for Rufus, whose share is lower relative to last round. The full breakdown of differences by county and sub-area is stored here: https://www.pdx.edu/prc/current-documents-and-presentations.

Executive Summary

Historical

Different parts of the County experience different growth patterns. Local trends within UGBs and the area outside them collectively influence population growth rates for the County as a whole. UGBs in Sherman County include Grass Valley, Moro, Rufus, and Wasco.

Sherman County's total population declined the 2000s (**Figure 1**). Wasco was the only UGB to experience population growth, while all other UGBs declined between 0.4 and 0.7 percent. The area outside of the UGBs experienced a greater decline of 2.3 percent.

The population decline in 2000s was largely the result of net out-migration and periods of natural decrease. An aging population not only led to an increase in deaths but also resulted in a smaller proportion of women in their childbearing years. This, along with more women having fewer children and having them at older ages has led to births stagnating in recent years. A larger number of deaths relative to births caused a natural decrease (more deaths than births) in all but 4 years from 2000 to 2017, resulting in minimal population change.

Forecast

Total population in Sherman County as a whole, as well as within the majority of its sub-areas, will likely continue to decline a slow pace throughout the forecast period (**Figure 1**). Population decline is largely driven by an aging population and natural decrease outpacing net in-migration. Sherman County's total population is forecast to decline by roughly 90 people over the next 25 years (2019-2044) and by more than 130 over the entire 50-year period (2019-2069).

Figure 1. Sherman County and Sub-Areas—Historical and Forecast Populations, and Average Annual Growth Rates (AAGR)

	Historical			Forecast					
	2000	2010	AAGR (2000-2010)	2019	2044	2069	AAGR (2010-2019)	AAGR (2019-2044)	AAGR (2044-2069)
Sherman County	**1,934**	**1,765**	***-0.9%***	**1,709**	**1,619**	**1,576**	***-0.3%***	***-0.2%***	***-0.1%***
Grass Valley	171	164	*-0.4%*	162	154	149	*-0.1%*	*-0.2%*	*-0.1%*
Moro	337	324	*-0.4%*	315	296	285	*-0.3%*	*-0.2%*	*-0.2%*
Rufus	268	249	*-0.7%*	246	232	225	*-0.1%*	*-0.2%*	*-0.1%*
Wasco	381	410	*0.7%*	414	447	492	*0.1%*	*0.3%*	*0.4%*
Outside UGBs	777	618	*-2.3%*	572	489	425	*-0.8%*	*-0.6%*	*-0.6%*

Sources: U.S. Census Bureau, 2000 and 2010 Censuses; Forecast by Population Research Center (PRC).

Note: For simplicity each UGB is referred to by its primary city's name.

14-Year Population Forecast

In accordance with House Bill 2254, which streamlined the UGB process based on long-term housing and employment needs, **Figure 2** provides a 14-year population forecast (2019-2033) for the County and its sub-areas. Populations at the 14th year of the forecast were interpolated using the average annual growth rate between the 2030-2035 period. The population interpolation template is stored here: https://www.pdx.edu/prc/current-documents-and-presentations.

Figure 2. Sherman County and Sub-Areas—14-Year Population Forecast

	2019	2033	14-Year Change	AAGR (2019-2033)
Sherman County	**1,709**	**1,643**	**-66**	***-0.3%***
Grass Valley	162	157	-5	*-0.2%*
Moro	315	299	-17	*-0.4%*
Rufus	246	239	-7	*-0.2%*
Wasco	414	432	18	*0.3%*
Outside UGBs	572	516	-56	*-0.7%*

Sources: Forecast by Population Research Center (PRC).

Note: For simplicity each UGB is referred to by its primary city's name.

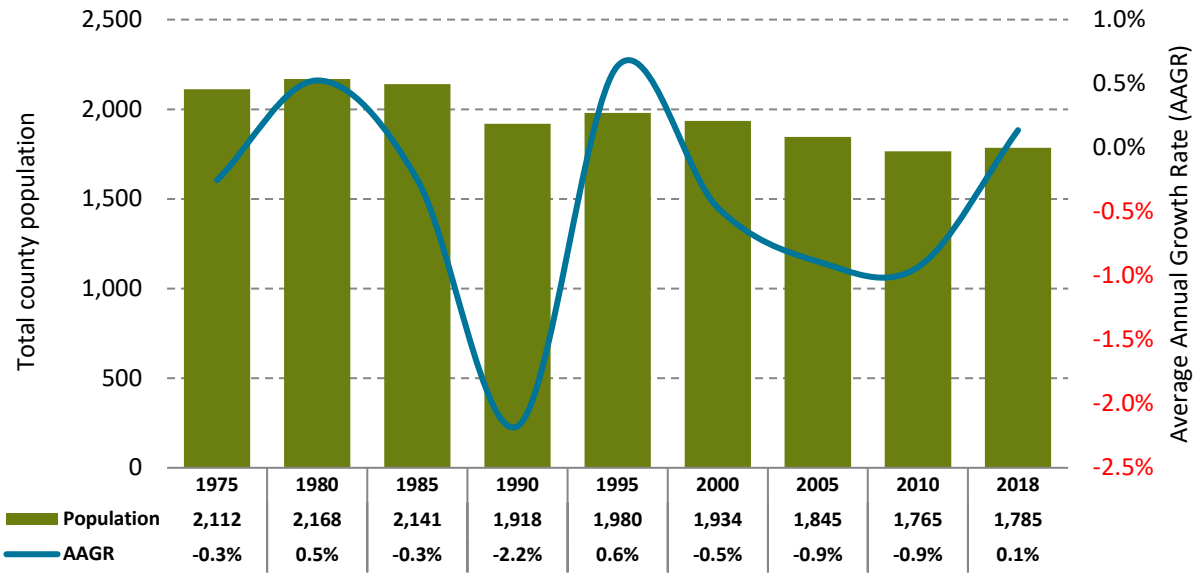
Historical Trends

Different growth patterns occur in different parts of Sherman County. Each of Sherman County's sub-areas were examined for any significant demographic characteristics or changes in population or housing growth that might influence their individual forecasts. Factors analyzed include age composition of the population, race and ethnicity, births, deaths, migration, the number of housing units, occupancy rate, and persons per household (PPH). It should be noted that population trends of individual sub-areas often differ from those of the County as a whole. However, population growth rates for the County are collectively influenced by local trends within its sub-areas.

Population

Sherman County's total population declined from roughly 2,110 in 1975 to 1,785[1] in 2018 (**Figure 3**). After minor growth in the late 1970s, challenging economic conditions, both nationally and within the county, led to negative population growth rates during the 1980s. Population growth rates increased in the early 1990s, but were again curbed by challenging economic conditions late in the decade that led to declines through the 2000s. Since 2010, Sherman County has experienced negligible population change.

Figure 3. Sherman County—Total Population by Five-year Intervals (1975-2018)



	1975	1980	1985	1990	1995	2000	2005	2010	2018
Population	2,112	2,168	2,141	1,918	1,980	1,934	1,845	1,765	1,785
AAGR	-0.3%	0.5%	-0.3%	-2.2%	0.6%	-0.5%	-0.9%	-0.9%	0.1%

Sources: U.S. Census Bureau, 1980, 1990, 2000, and 2010 Censuses; Population Research Center (PRC), July 1st Annual Estimates 1975, 1985, 1995, 2005 and 2018.

[1] Population Estimates from the Oregon Population Estimates Program (OPEP) may not be consistent with the 2019 population forecast due to different methodologies and data sources.

During the 2000s, Sherman County's average annual population growth rate stood at -0.9 percent (**Figure 4**). The UGBs of Grass Valley, Moro, and Rufus all declined at similar rates, though this decline was slower than the County as a whole. Wasco was the only UGB to experience population growth, with an AAGR of 0.7 percent. The area outside the UGB declined at a faster rate than the UGBs or county as a whole, with an AAGR of -2.3 percent.

Figure 4. Sherman County and Sub-areas—Total Population and Average Annual Growth Rate (AAGR) (2000 and 2010)[2]

	2000	2010	AAGR (2000-2010)	Share of County 2000	Share of County 2010	Change (2000-2010)
Sherman County	*1,934*	*1,765*	*-0.9%*	*100.0%*	*100.0%*	*0.0%*
Grass Valley	*171*	*164*	-0.4%	8.8%	9.3%	0.5%
Moro	*337*	*324*	-0.4%	17.4%	18.4%	0.9%
Rufus	*268*	*249*	-0.7%	13.9%	14.1%	0.3%
Wasco	*381*	*410*	0.7%	19.7%	23.2%	3.5%
Outside UGBs	*777*	*618*	-2.3%	40.2%	35.0%	-5.2%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Note: For simplicity each UGB is referred to by its primary city's name.

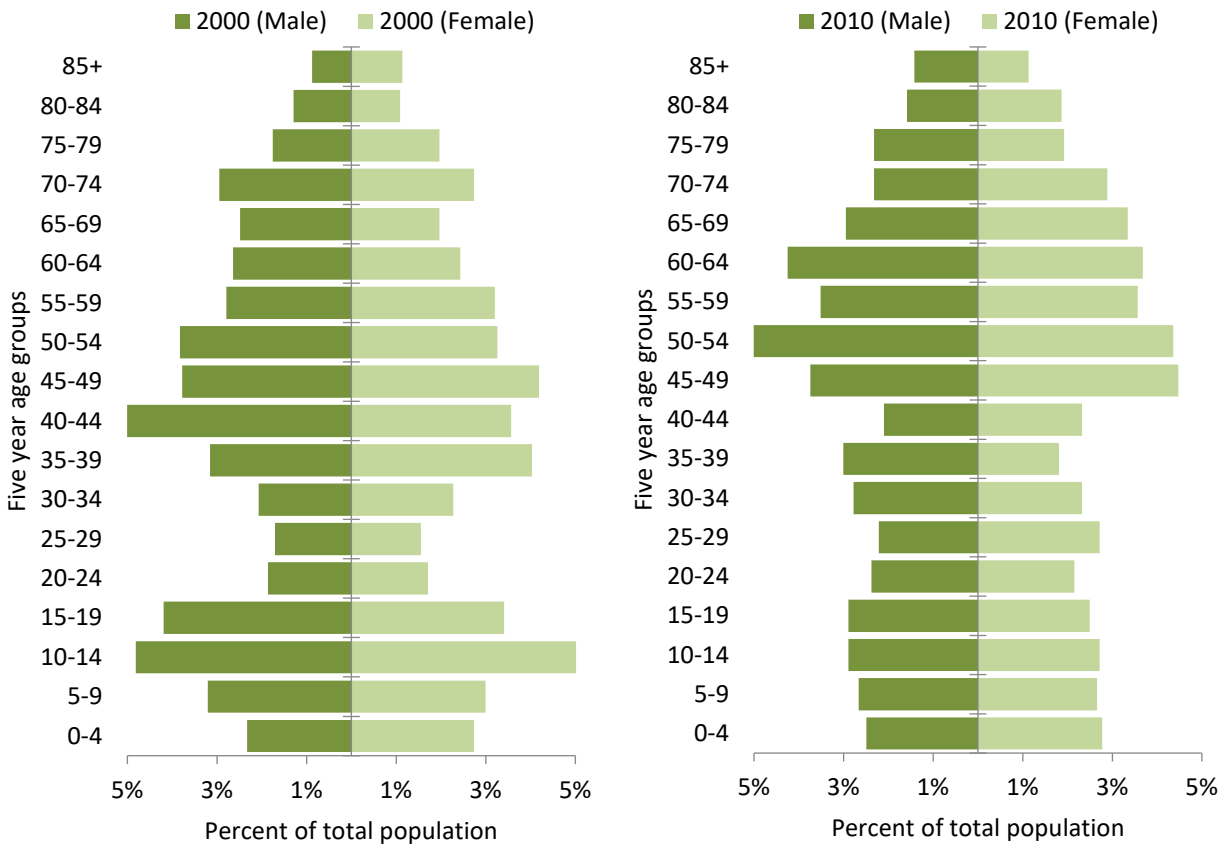
Age Structure of the Population

Similar to most areas across Oregon, Sherman County's population is aging. An aging population significantly influences the number of deaths but also yields a smaller proportion of women in their childbearing years, which may result in a slowdown or decline in births. The shift in the age structure from 2000 to 2010 illustrates this phenomenon (**Figure 5**). Further underscoring the countywide trend in aging—the median age went from about 41.8 in 2000 to 48.2 in 2010[3].

[2] When considering growth rates and population growth overall, it should be noted that a slowing of growth rates does not necessarily correspond to a slowing of population growth in absolute numbers. For example, if a UGB with a population of 100 grows by another 100 people, it has doubled in population. If it then grows by another 100 people during the next year, its relative growth is half of what it was before even though absolute growth stays the same.

[3] Median age is sourced from the U.S. Census Bureau's 2000 and 2010 Censuses.

Figure 5. Sherman County—Age Structure of the Population (2000 and 2010)



Sources: U.S. Census Bureau, 2000 and 2010 Censuses

Race and Ethnicity

While the statewide population is aging, another demographic shift is occurring across Oregon: minority populations are growing as a share of total population. A growing minority population affects both the number of births and average household size. The Hispanic share of total population within Sherman County increased negligibly from 2000 to 2010 (**Figure 6**), while the White; not Hispanic share decreased over the same time period. This minor increase in the Hispanic population and other minority populations brings with it several implications for future population change. First, both nationally and at the state level, fertility rates among Hispanic and minority women tend to be higher than among White; not Hispanic women. However, it is important to note more recent trends show these rates are quickly decreasing. Second, Hispanic and minority households tend to be larger relative to White; not Hispanic households.

Figure 6. Sherman County—Hispanic or Latino and Race (2000 and 2010)

Hispanic or Latino and Race	2000		2010		Absolute Change	Relative Change
Total population	1,934	100.0%	1,765	100.0%	-169	-8.7%
Hispanic or Latino	94	4.9%	98	5.6%	4	4.3%
Not Hispanic or Latino	1,840	95.1%	1,667	94.4%	-173	-9.4%
White alone	1,782	92.1%	1,616	91.6%	-166	-9.3%
Black or African American alone	0	0.0%	2	0.1%	2	--
American Indian and Alaska Native alone	27	1.4%	21	1.2%	-6	-22.2%
Asian alone	8	0.4%	3	0.2%	-5	-62.5%
Native Hawaiian and Other Pacific Islander alone	0	0.0%	1	0.1%	1	--
Some Other Race alone	0	0.0%	6	0.3%	6	--
Two or More Races	23	1.2%	18	1.0%	-5	-21.7%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Births

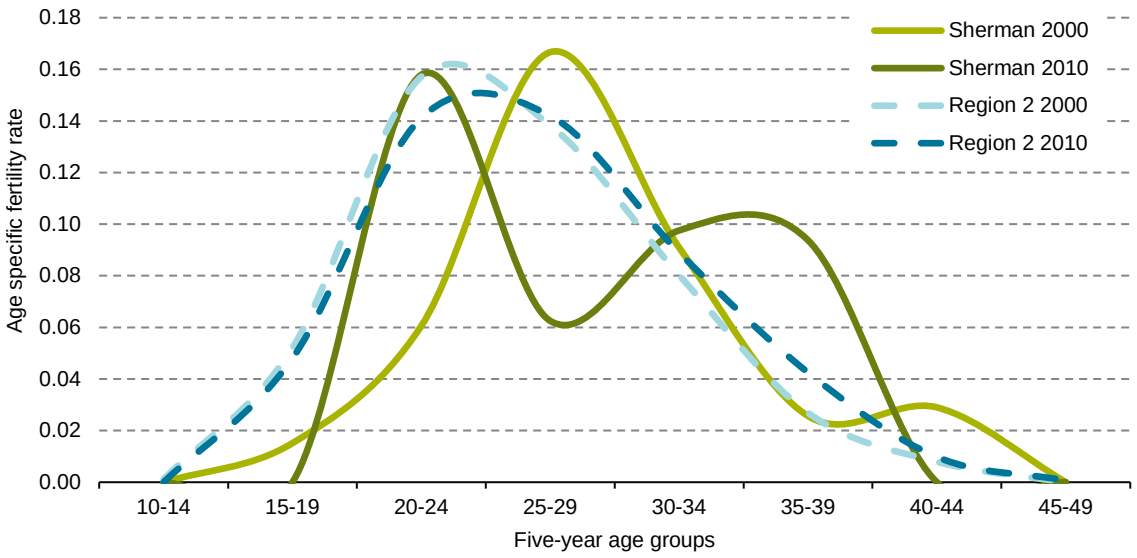
Historic total fertility rates (TFR), or the average number of children that would be born to a woman over her lifetime, are lower in Sherman County comparison to eastern Oregon counties as a whole (Region 2) (**Figure 7**). The county's age specific fertility rates fluctuated from 2000 to 2010 due to its small population size, but total fertility rates were lower in Sherman County in 2000 compared to 2010, similar to Region 2 as a whole (**Figure 8**). However, unlike Region 2, total fertility in the County remains below replacement fertility (2.1), indicating that future cohorts of women in their birth-giving years will shrink overtime without net in-migration.

Figure 7. Sherman County and Region 2—Total Fertility Rates (2000 and 2010)

	2000	2010
Sherman County	1.94	2.06
Region 2	2.32	2.37

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.
Oregon Health Authority, Center for Health Statistics.
Calculations by Population Research Center (PRC).

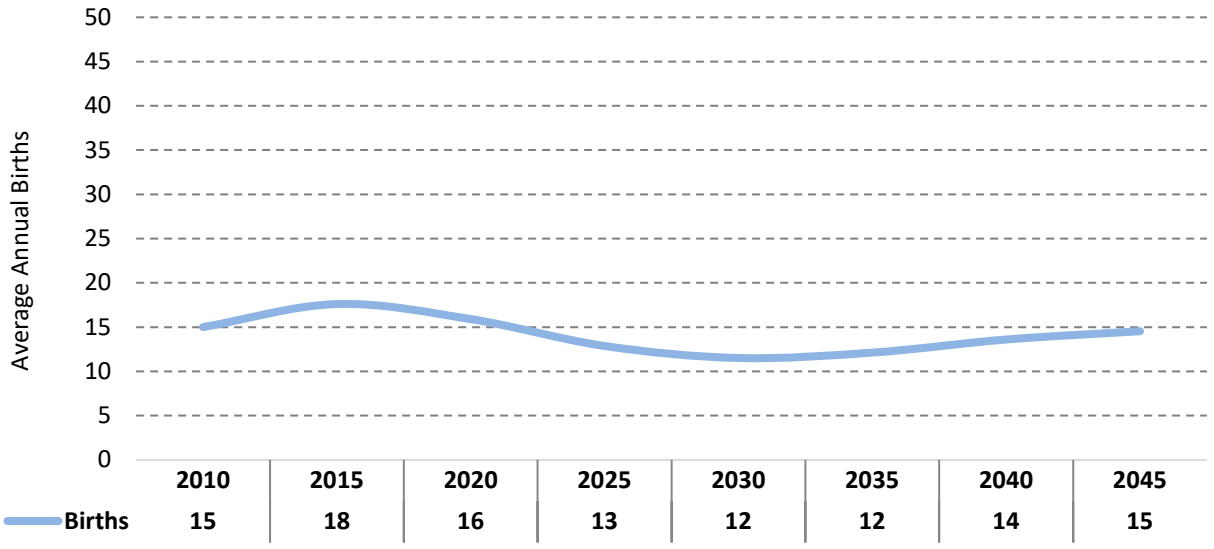
Figure 8. Sherman County and Region 2—Age Specific Fertility Rate (2000 and 2010)



Sources: U.S. Census Bureau, 2000 and 2010 Censuses. PRC Estimates. Oregon Health Authority, Center for Health Statistics. Calculations and Forecast by Population Research Center (PRC).

Figure 9 shows the number of historic and forecasted births for the county. Historically, the number of annual births have been stable, though they are forecasted to decline slightly before stabilizing over the 25 year-period.

Figure 9. Sherman County—Average Annual Births (2010-2045)

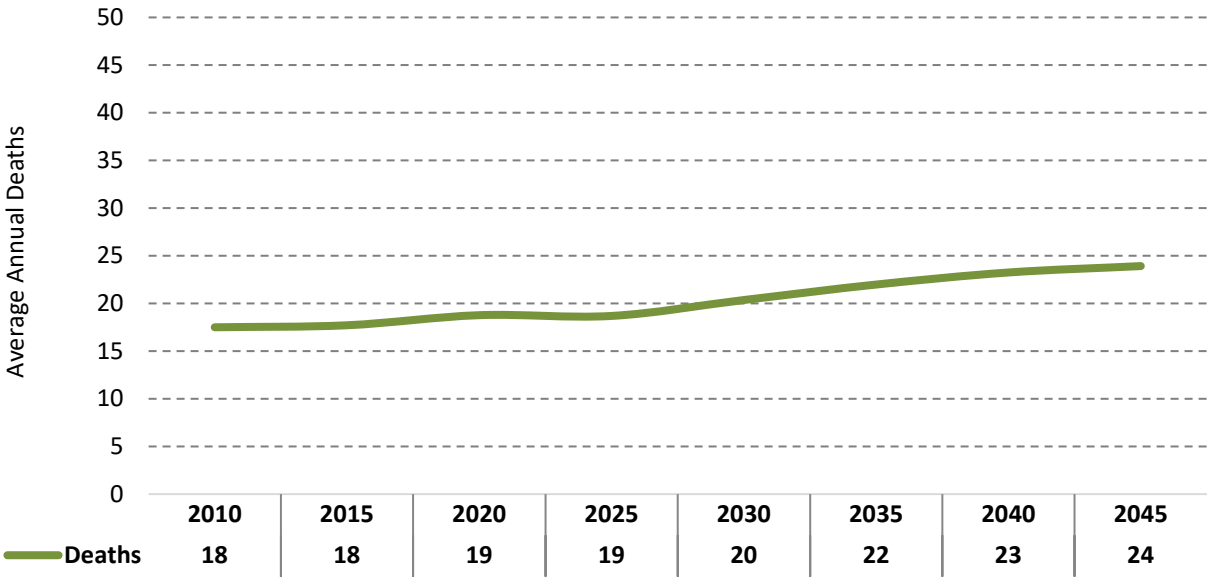


Sources: Oregon Health Authority, Center for Health Statistics. Calculations and Forecast by Population Research Center (PRC).
Note: The years signify the end of the period for which average annual numbers were calculated. The average annual numbers for "2010" were calculated for the 2000-2010 period, with the remaining years calculated for their preceding five-year periods.

Deaths

The population in the county, as a whole, is aging and contrary to the statewide trend, people of all ages are not necessarily living longer[4]. For both Sherman County and eastern Oregon, the survival rates changed little between 2000 and 2010, underscoring the fact that mortality is the most stable component, relative to birth and migration rates, of population change. Average annual deaths remained constant from 2000-10 to 2010-15 but are expected to increase slightly overtime (**Figure 10**).

Figure 10. Sherman County—Average Annual Deaths (2010-2045)



Sources: Oregon Health Authority, Center for Health Statistics. Calculations and Forecast by Population Research Center (PRC).
Note: The years signify the end of the period for which average annual numbers were calculated. The average annual numbers for "2010" were calculated for the 2000-2010 period, with the remaining years calculated for their preceding five-year periods.

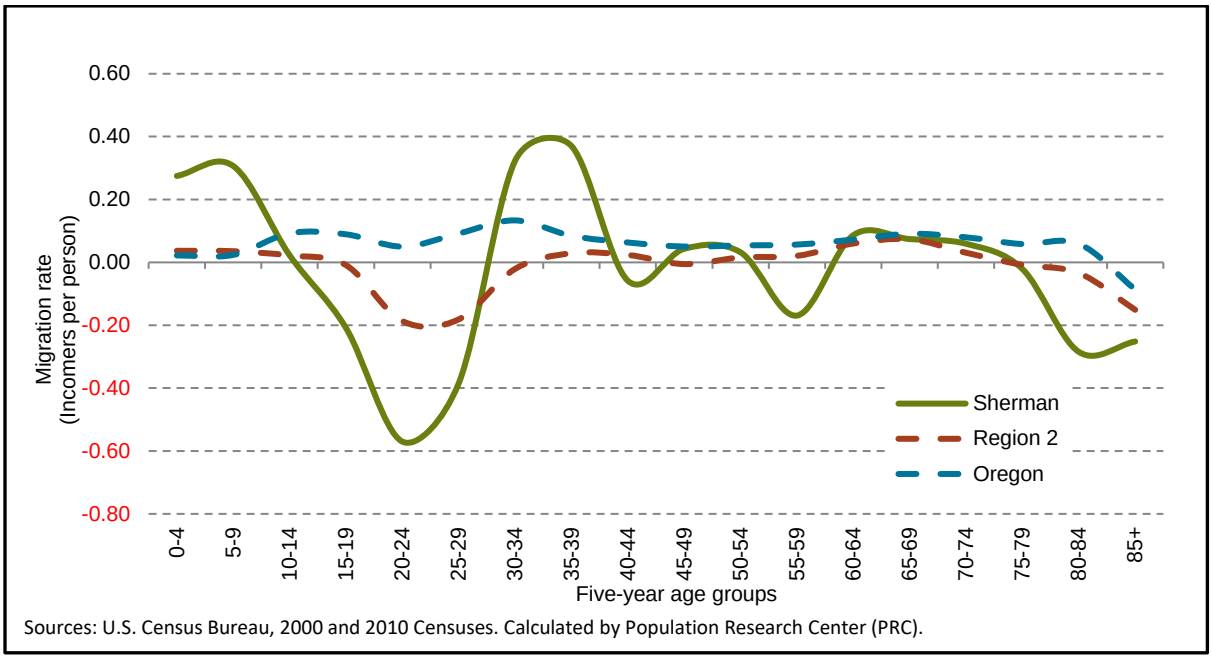
[4] Researchers have found evidence for a widening rural-urban gap in life expectancy. This gap is particularly apparent between race and income groups and may be one explanation for the decline in life expectancy in the 2000s. See the following research article for more information. *Singh, Gopal K., and Mohammad Siahpush. "Widening rural-urban disparities in life expectancy, US, 1969-2009." American Journal of Preventative Medicine 46, no. 2 (2014): e19-e29.*

Migration

The propensity to migrate is strongly linked to age and stage of life. As such, age-specific migration rates are critically important for assessing these patterns across five-year age cohorts. **Figure 11** shows the historical age-specific migration rates by five-year age group, for Sherman County, Eastern Oregon (Region 2), and Oregon. The migration rate is shown as the number of net migrants per person by age group.

While Sherman County experienced a net out-migration in the 00s, its age specific migration rates reflect the patterns of many other Oregon counties. Young adults (20-29) leave the County seeking higher education and employment opportunities, but return in their 30's with their children. A small number of retirees moved to the County in the 00s, but left shortly thereafter to areas with medical facilities and end-of-life care.

Figure 11. Sherman County, Region 2, and Oregon—Age Specific Migration Rates (2000-2010)

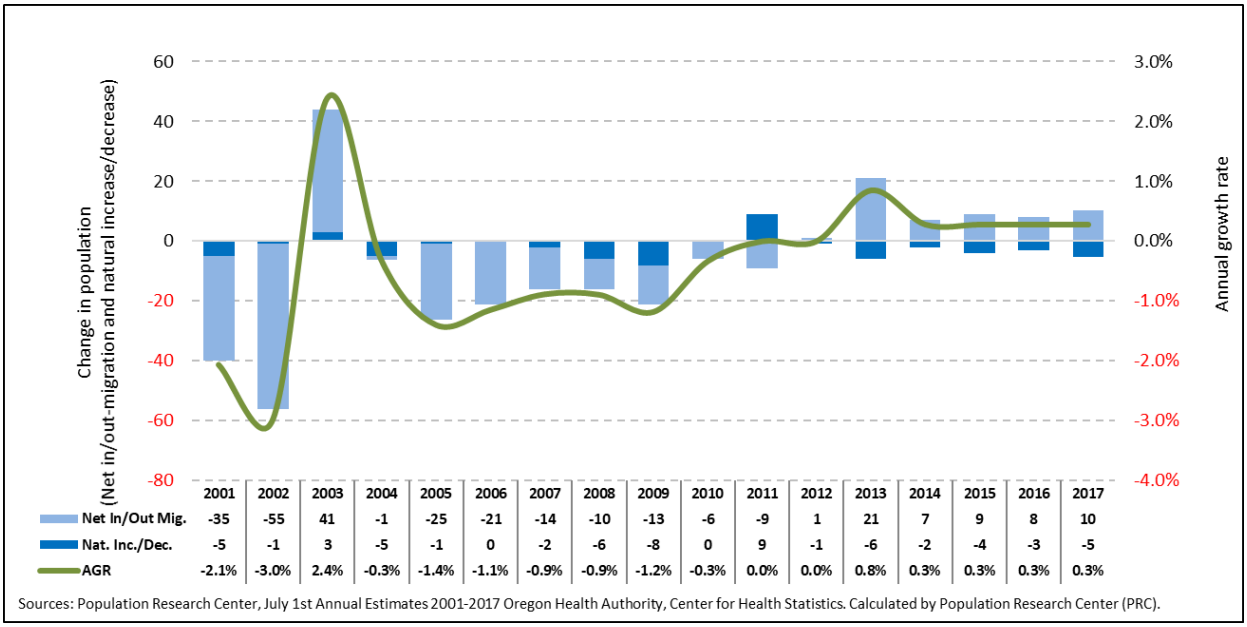


Sources: U.S. Census Bureau, 2000 and 2010 Censuses. Calculated by Population Research Center (PRC).

Historical Trends in Components of Population Change

In summary, Sherman County's population change is largely dictated by migration (**Figure 12**). The slightly larger number of deaths compared to births led to a minor natural decrease in the majority of the years between 2001 and 2017. Overall, net in/out-migration and natural increase/decrease have combined to produce minimal population change for the county.

Figure 12. Sherman County—Components of Population Change (2001-2017)[5]



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Net In/Out Mig.	-35	-55	41	-1	-25	-21	-14	-10	-13	-6	-9	1	21	7	9	8	10
Nat. Inc./Dec.	-5	-1	3	-5	-1	0	-2	-6	-8	0	9	-1	-6	-2	-4	-3	-5
AGR	-2.1%	-3.0%	2.4%	-0.3%	-1.4%	-1.1%	-0.9%	-0.9%	-1.2%	-0.3%	0.0%	0.0%	0.8%	0.3%	0.3%	0.3%	0.3%

Sources: Population Research Center, July 1st Annual Estimates 2001-2017 Oregon Health Authority, Center for Health Statistics. Calculated by Population Research Center (PRC).

[5] Annual net in/out-migration estimates are based on population estimates from the Oregon Population Estimates Program. As such, migration assumptions for the 2019 population forecast may not be consistent with assumptions from OPEP.

Housing and Households

The total number of housing units in Sherman County decreased slightly during the last decade (2000 to 2010). Over the entire period, the total number of housing units decreased by 1.7 percent countywide, or 16 fewer housing units (**Figure 13**). However, this decrease was not distributed evenly across the county. The housing stocks in the UGBs of Moro and Wasco increased by a combined total of 25 units between 2000 and 2010. During this same time, Grass Valley lost one unit while Rufus experienced a loss of 21 units. Furthermore, the outside UGB area experienced a net loss of 19 units.

Housing growth rates may differ from population growth rates because (1) the numbers of total housing units are smaller than the numbers of people; (2) the UGB has experienced changes in the average number of persons per household; or (3) occupancy rates have changed (typically most pronounced in coastal locations with vacation-oriented housing).

Figure 13. Sherman County and Sub-Areas—Total Housing Units (2000 and 2010)

	2000	2010	AAGR (2000-2010)	Share of County 2000	Share of County 2010	Change (2000-2010)
Sherman County	*935*	*919*	*-0.2%*	*100.0%*	*100.0%*	*0.0%*
Grass Valley	93	92	-0.1%	9.9%	10.0%	0.1%
Moro	150	163	0.8%	16.0%	17.7%	1.7%
Rufus	162	141	-1.4%	17.3%	15.3%	-2.0%
Wasco	196	208	0.6%	21.0%	22.6%	1.7%
Outside UGBs	334	315	-0.6%	35.7%	34.3%	-1.4%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses

Note: For simplicity each UGB is referred to by its primary city's name.

Average household size, or persons per household (PPH), in Sherman County was 2.3 in 2010, slightly down from 2.4 in 2000 (**Figure 14**). Sherman County's PPH in 2010 was lower than Oregon's as a whole, which had a PPH of 2.5. PPH was very similar across the sub-areas in 2010, with all of them falling between 2.2 and 2.4 persons per household. However, compared to PPH in 2000, Moro and the outside UGB area experienced a substantial decline, while Rufus experienced a large increase. In general, areas with an older or aging population will, more often than not, experience a decline in PPH over time

Occupancy rates tend to fluctuate more than PPH. This is particularly true in smaller UGBs where fewer housing units allow for larger relative changes in occupancy rates. The occupancy rate in Sherman County decreased slightly overall, though this trend was not shared among all sub-areas (**Figure 14**). Occupancy rates increased in Moro and Wasco, while rates for Grass Valley and Rufus declined. The decline in Sherman County's occupancy rate is largely due to 4.3 percent decline experienced by the outside UGB area.

Figure 14. Sherman County and Sub-Areas—Persons per Household (PPH) and Occupancy Rate

	Persons Per Household (PPH)			Occupancy Rate		
	2000	2010	Change 2000-2010	2000	2010	Change 2000-2010
Sherman County	*2.4*	*2.3*	*-6.5%*	*85.2%*	*84.7%*	*-0.6%*
Grass Valley	*2.3*	*2.2*	*-2.8%*	*80.6%*	*80.4%*	*-0.2%*
Moro	*2.5*	*2.2*	*-14.2%*	*88.7%*	*91.4%*	*2.7%*
Rufus	*2.0*	*2.2*	*7.5%*	*82.1%*	*81.6%*	*-0.5%*
Wasco	*2.3*	*2.3*	*-0.7%*	*85.7%*	*87.5%*	*1.8%*
Outside UGBs	*2.7*	*2.4*	*-11.1%*	*86.2%*	*81.9%*	*-4.3%*

Sources: U.S. Census Bureau, 2000 and 2010 Censuses. Calculated by Population Research Center (PRC)

Note: For simplicity each UGB is referred to by its primary city's name.

Assumptions for Future Population Change

Evaluating past demographic trends provides clues about what the future will look like and helps determine assumptions of likely scenarios for population change. Assumptions about fertility, mortality, and migration were developed for Sherman County's forecast and for each of its larger sub-areas[6]. Population change for smaller sub-areas is determined by the change in the number of total housing units, PPH, occupancy rates, and group quarters population. Assumptions around these components of growth are derived from observations of historic building patterns, current plans for future housing development, and household demographics.

Assumptions for the County and Sub-Areas

From 2000 to 2010, Sherman County experienced 25 more deaths than births, causing a natural decrease. This population loss was amplified by a net out-migration of 144 persons, which resulted in a population decline of 169 people during the 2000 to 2010 period. Although we expect the county-level net out-migration to shift to a net in-migration over time, natural decrease is expected to grow in magnitude, resulting in continued population loss throughout the forecast period.

During the forecast period, the population in Sherman County is expected to age more quickly during the first half of the forecast period. The total fertility rate is expected to decline during the forecast period (2.23 in 2019 to 2.04 in 2044), though births will stagnate due to a net out-migration of young adults. Our assumptions of fertility for the county's sub-areas vary and are detailed in Appendix B.

Changes in survival rates are more stable than fertility and migration rates; overall life expectancy is expected to increase slightly over the forecast period. In spite of this trend, Sherman County's aging population will increase the overall number of deaths throughout the forecast period.

Migration is the most volatile and challenging demographic component to forecast due to the many factors influencing migration patterns. Economic, social, and environmental factors such as employment, educational opportunities, housing availability, family ties, cultural affinity, climate change, and natural amenities occurring both inside and outside the study area can affect both the direction and the volume of migration.

We assume rates will change in line with historic trends unique to Sherman County. Net out-migration of young adults and net in-migration of families and retirees will persist throughout the forecast period. We assume that as deaths rise over time, net in-migration will increase with home turnover rates. Specifically, countywide average annual net in-migration is expected to increase from 4 net out-migrants in 2019 to 8 net in-migrants in 2044. However, a growing natural decrease is expected to curb net in-migration, which results in a slight population decline.

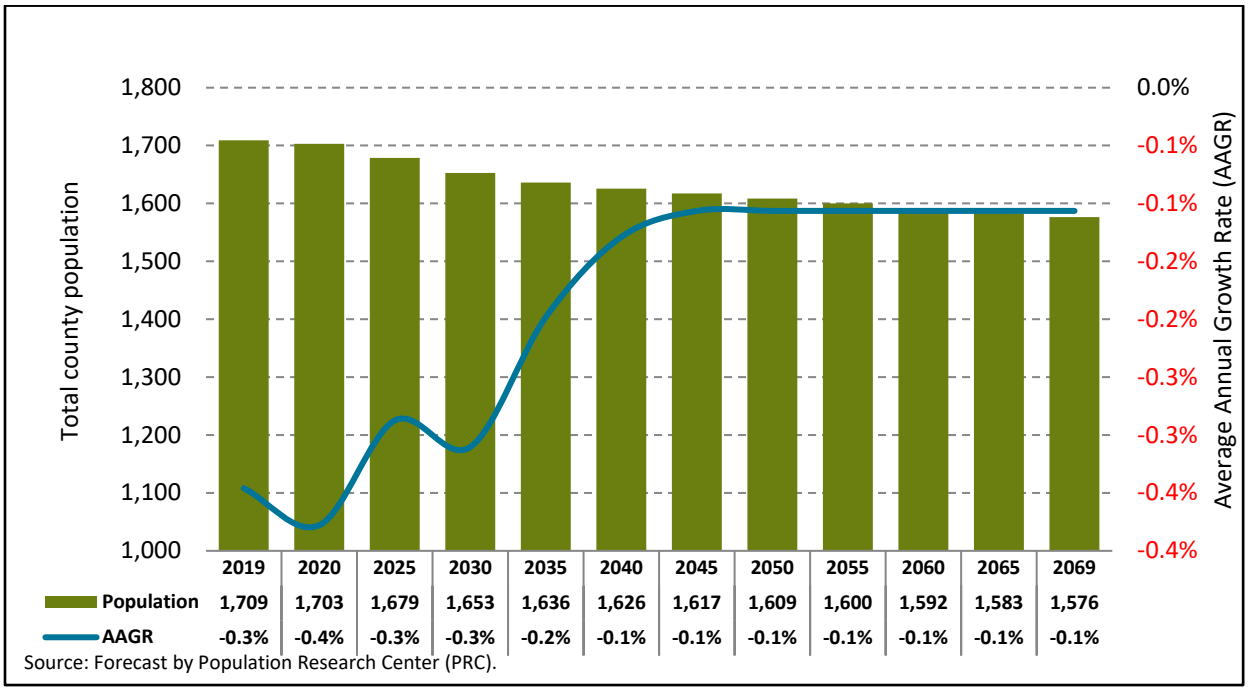
[6] County sub-areas with populations greater than 7,000 in the forecast launch year were forecast using the cohort-component method. County sub-areas with populations less than 7,000 in forecast launch year were forecast using the housing-unit method. See Glossary of Key Terms at the end of this report for a brief description of these methods or refer to the *Methods* document for a more detailed description of these forecasting techniques.

Forecast Trends

Under the most-likely population growth scenario for Sherman County, we expect minimal change to countywide and sub-area populations over the forecast period. The countywide population is forecast to decline at a faster rate in the near term before leveling off during the latter half of the forecast period. An aging population, contributing to steady increase in deaths, drives population decline.

Sherman County's total population is forecast to decrease by 133 persons (-7.8 percent) from 2019 to 2069, which translates into a total countywide population of 1,576 in 2069 (**Figure 15**). The population is forecast to decline at the faster rate rate—0.3 percent—during the near-term (2019-2025).

Figure 15. Sherman County—Total Forecast Population by Five-year Intervals (2019-2069)



Source: Forecast by Population Research Center (PRC).

Sherman County's largest UGB—Wasco—is forecast to experience population growth of more than 30 people from 2019 to 2044, and another roughly 45 people from 2044 to 2069 (**Figure 16**). However, all other UGB areas are expected to experience a decrease in population. Grass Valley, Moro, and Rufus follow the same trend; they are expected to decline by 0.2 percent on average annually during the first half of the forecast period and then at a slightly slower rate in the second half. However, the population living outside the UGBs is expected to decline at a rate of 0.6 percent throughout the forecast period, which will lead to a decline in the total county population.

Figure 16. Sherman County and Sub-Areas—Forecast Population and AAGR

	2019	2044	2069	AAGR (2019-2044)	AAGR (2044-2069)	Share of County 2019	Share of County 2044	Share of County 2069
Sherman County	**1,709**	**1,619**	**1,576**	***-0.2%***	***-0.1%***	--	--	--
Grass Valley	162	154	149	*-0.2%*	*-0.1%*	*9.5%*	*9.5%*	*9.5%*
Moro	315	296	285	*-0.2%*	*-0.2%*	*18.4%*	*18.3%*	*18.1%*
Rufus	246	232	225	*-0.2%*	*-0.1%*	*14.4%*	*14.4%*	*14.3%*
Wasco	414	447	492	*0.3%*	*0.4%*	*24.2%*	*27.6%*	*31.2%*
Outside UGBs	572	489	425	*-0.6%*	*-0.6%*	*33.5%*	*30.2%*	*27.0%*

Source: Forecast by Population Research Center (PRC)

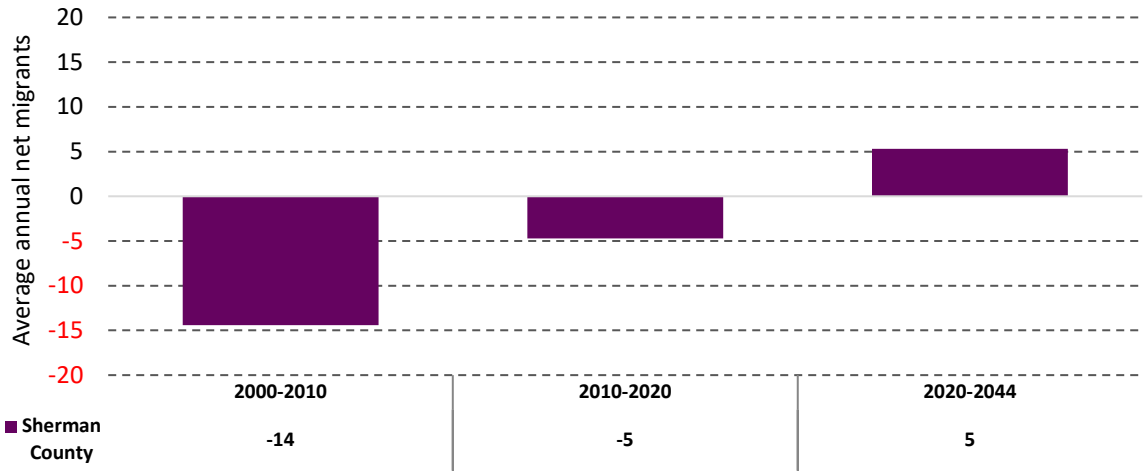
Note: For simplicity each UGB is referred to by its primary city's name.

We forecast population decline in the outside UGB area as PPH and occupancy rates decline from an aging population. This, coupled with the minor growth of populations within Wasco, is expected to create a slight redistribution of the population. Grass Valley, Moro, and Rufus are expected to maintain the same share in the total county population. However, the increasing population in Wasco will lead to an increase in the share of the total county population from nearly 25 percent to over 30 percent by 2069. In contrast, the population share of the area outside the UGB is expected to decline from over a third to roughly 27 percent in the same time period.

Forecast Trends in Components of Population Change

As previously discussed, the number of in-migrants is forecast to outweigh the number of out-migrants in Sherman County, creating a positive net in-migration of new residents that is expected to persist throughout the forecast period as housing turnovers increase with deaths. Furthermore, the average annual net out-migration is forecast to shift from the near-term rate of 5 individuals (2010-2020) to an average annual net in-migration of 5 individuals later in the forecast (2020-2044) (**Figure 17**). The majority of these net in-migrants are expected to be families and older individuals.

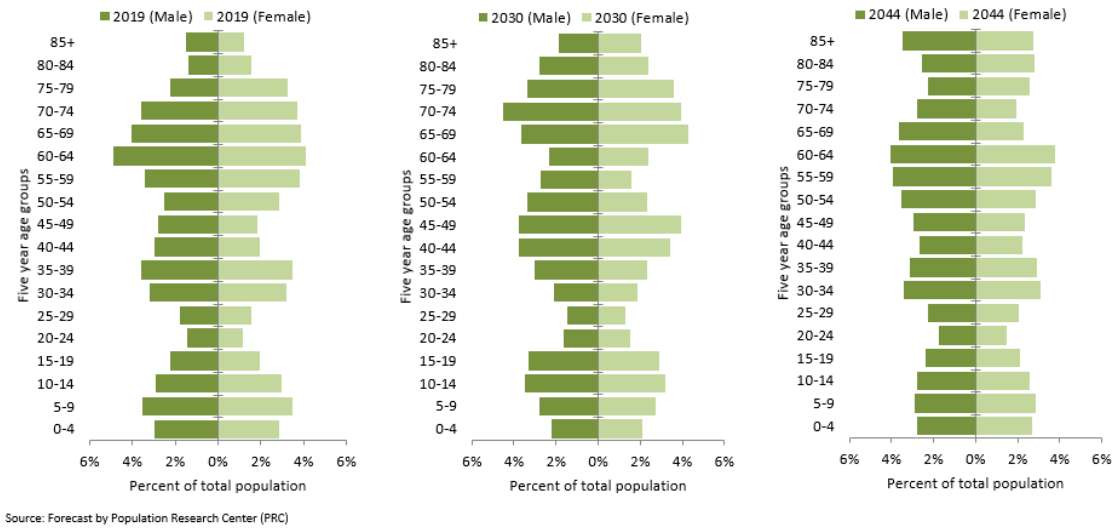
Figure 17. Sherman County—Average Annual Net In/Out-Migration (2000-2010, 2010-2020, and 2020-2044)



Sources: U.S. Census Bureau, 2000 and 2010 Censuses. Calculations and Forecast by Population Research Center (PRC).
Note: The average annual numbers were calculated for the 10 year periods (2000-2010 and 2010-2020) and the 24 year period (2020-2044).

In addition to net in-migration, the other key component shaping Sherman County's forecasted population is the aging population. From 2019 to 2030, the proportion of the County population 65 years of age or older is forecast to grow from roughly 26 percent to 32 percent, before declining to 27 percent by 2044 (**Figure 18**). For a more detailed look at the age structure of Sherman County's population, see the final forecast table published to the forecast program website (https://www.pdx.edu/prc/current-documents-and-presentations).

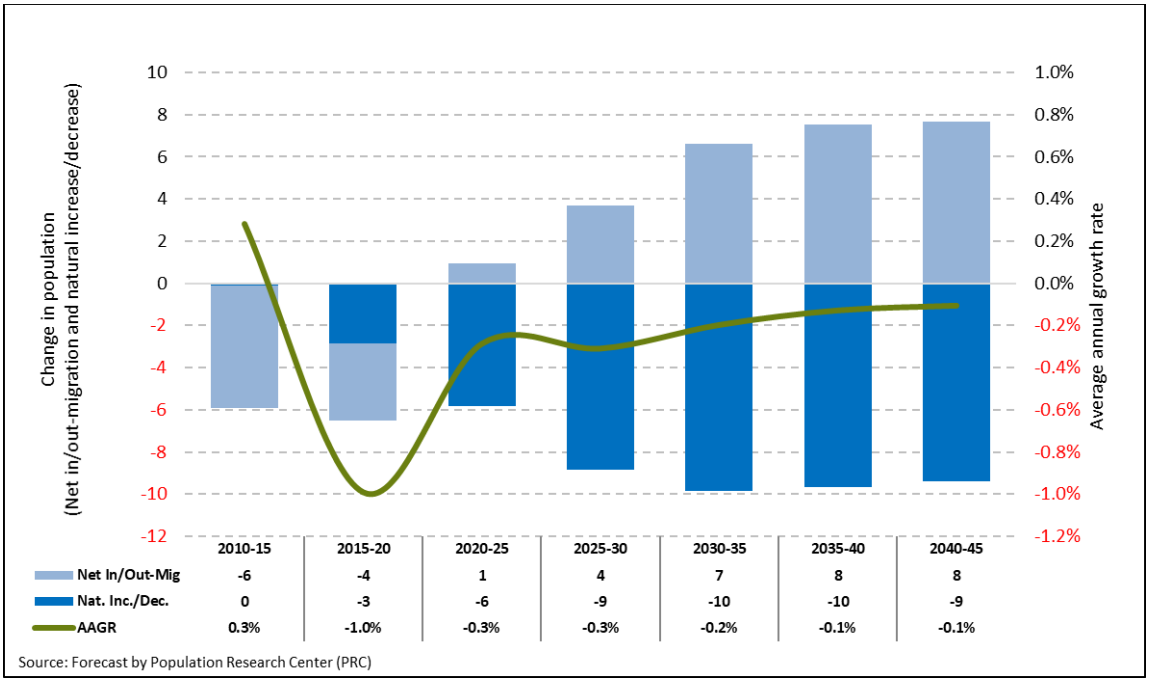
Figure 18. Sherman County—Age Structure of the Population (2019, 2030, and 2044)



Source: Forecast by Population Research Center (PRC)

In summary, natural decrease will produce a population decline that is expected to attenuate as net in-migration rises through the forecast period (**Figure 19**). While net-in migration is expected to increase, the growing number of deaths in the county will outweigh this trend.

Figure 19. Sherman County—Components of Population Change (2010-2045)[7]



Source: Forecast by Population Research Center (PRC)

[7] 2010-15 components are based on population estimates from the Oregon Population Estimates Program. As such, natural increase/decrease and net in/out-migration for that period may not be consistent with the 2019 forecast assumptions.

Glossary of Key Terms

Cohort-Component Method: A method used to forecast future populations based on changes in births, deaths, and migration over time.

Coordinated population forecast: A population forecast prepared for the County along with population forecasts for its urban growth boundary (UGB) areas and non-UGB area.

Housing unit: A house, apartment, mobile home or trailer, group of rooms, or single room that is occupied or is intended for occupancy.

Housing-Unit Method: A method used to forecast future populations based on changes in housing unit counts, vacancy rates, the average numbers of persons per household (PPH), and group quarter population counts.

Occupancy rate: The proportion of total housing units that are occupied by an individual or group of persons.

Persons per household (PPH): The average household size (i.e. the average number of persons per occupied housing unit).

Replacement Level Fertility: The average number of children each woman needs to bear in order to replace the population (to replace each male and female) under current mortality conditions in the U.S. This is commonly estimated to be 2.1 children per woman.

Appendix A: Surveys and Supporting Information

Supporting information is based on planning documents and reports, and from submissions to PRC from city officials and staff, and other stakeholders. The information pertains to characteristics of each city area, and to changes thought to occur in the future. The cities of Grass Valley, Moro, and Rufus did not submit survey responses.

General Survey for Oregon Population Forecast Program	
Jurisdiction: City of Wasco	Date: November 13 , 2018
Observations about Population Composition (e.g. children, the elderly, racial and ethnic groups)	On course with the County demographics- mostly white elderly adults. Wasco has the largest population of all the Cities in Sherman County.
Observations about Housing	
Planned Housing Dev./Est. Year Completion (for detailed information submissions please use the Housing Development Survey)	From Housing Development Survey: Duplex, construction expected to begin Spring 2019, 900 sq ft, 2-3 bedroom & 1 bath unit, $600-$900, ideal renters are retirees or single teachers
Planned future construction of Group Quarters facilities	Possibility of a "Diversion Center" for foster children, 14 beds, ages between 10-17. Community Counseling Solutions board will decide if they are willing to build in Wasco at their December meeting.
Future Employers Locating to the Area	
Capacity and condition of infrastructure to accommodate growth.	
Any Promotions (promos) and Hindrances (hinders) to Population Growth; Other notes	
Highlights or summary from planning documents and studies on influences and anticipation of population and housing growth (including any plans for UGB expansion and the stage in the expansion process)	
Comments?	

Ali Roark	City of Wasco	City Clerk/Recorder
Name	*Organization*	*Title*

Appendix B: Specific Assumptions

Grass Valley

We assume no change to the housing unit inventory for the forecast period. We assume the occupancy rate to be stable at 80.4 percent while persons per household (PPH) will decline slightly from 2.18 to 2.06 for the 25-year horizon. There is no group quarters population in this sub-area.

Moro

We assume the housing unit growth to be slow, but stable throughout the forecast period. We assume the occupancy rate to be stable at 91.4 percent while persons per household (PPH) will decline from 2.02 to 1.67 for the 25-year horizon. There is no group quarters population in this sub-area.

Rufus

We assume slow housing unit growth rates will taper throughout the forecast period. We assume the occupancy rate to be stable at 81.6 percent while persons per household (PPH) will decline from 2.07 to 1.88 for the 25-year horizon. There is no group quarters population in this sub-area.

Wasco

We assume steady housing unit growth throughout the forecast period. We assume the occupancy rate to be stable at 87.5 percent while persons per household (PPH) will decline from 2.20 to 2.07 for the 25-year horizon. There is no group quarters population in this sub-area.

Outside UGBs

We assume no change to the housing unit inventory for the forecast period. We assume the occupancy rate will decline from 79.9 percent to 76.4 percent and persons per household (PPH) will decline from 2.20 to 1.96 for the 25-year horizon. There is no group quarters population in this sub-area.

Appendix C: Detailed Population Forecast Results

Figure 20. Sherman County—Population by Five-Year Age Group

Population Forecasts by Age Group / Year	2019	2020	2025	2030	2035	2040	2044
00-04	100	98	79	71	75	84	88
05-09	120	123	111	91	82	86	93
10-14	101	103	121	111	92	83	86
15-19	72	71	83	102	95	79	73
20-24	44	42	42	52	66	62	52
25-29	58	53	45	46	58	74	69
30-34	110	108	74	66	68	87	104
35-39	121	127	122	88	78	81	98
40-44	85	87	118	119	87	77	79
45-49	79	79	92	127	130	95	86
50-54	91	81	79	94	131	134	103
55-59	124	120	70	72	87	121	122
60-64	154	157	132	78	82	99	127
65-69	136	134	150	131	79	83	95
70-74	124	129	124	139	125	75	76
75-79	94	96	120	116	132	118	78
80-84	51	51	67	86	84	96	87
85+	46	45	51	64	83	92	100
Total	**1,709**	**1,703**	**1,679**	**1,653**	**1,636**	**1,626**	**1,619**

Figure 21. Sherman County's Sub-Areas—Total Population

Area / Year	2019	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2069
Sherman County	1,709	1,703	1,679	1,653	1,636	1,626	1,617	1,609	1,600	1,592	1,583	1,576
Grass Valley	162	162	160	158	156	155	153	153	152	151	150	149
Moro	315	316	308	299	298	297	296	294	291	289	286	285
Rufus	246	245	243	243	237	234	232	231	229	228	226	225
Wasco	414	412	415	425	436	443	448	459	474	482	488	492
Outside UGB Area	572	567	553	527	509	496	488	473	455	443	433	425