Oregon Population Forecast Program
Regional Forecast Meeting – October 26, 2018

Presentation by
Population Forecast Program Team
Oregon Population Forecast Program
Project Team

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Agenda

• Population Research Center (PRC)
• Forecast Program overview
  – Forecast regions
  – Schedule
  – Deliverables
  – Forecasting methods and data sources
  – Process for local input
• Demographic and economic trends
PRC Research areas:
– **Oregon Population Forecast Program**
– Oregon Population Estimates Program
– Oregon State Data Center (SDC)
– Demographic Research and Advisory Services
– Applied Demography Instruction
Forecast Program Overview

PRC Website: http://www.pdx.edu/prc

Click here for more information on OPFP
2018-2021 Update

- Modified Methodology (50 Year Period)
- Forecast Methods (2019-44)
  - Cohort-Component and Housing Unit Model
- Modified Method (2044-69):
  - County: AAGR of the last 5 year period (2040-45) is extrapolated out for the remaining 25 years.
  - Sub-areas: Trend the sub-area share of the County for the remaining 25 years.
Forecast Program Overview

Forecast Program: 4-Year Schedule

Year 1
- Update County-Level Forecasts
- 1st Set of Coordinated City-County Forecasts

Year 2
- Update County-Level Forecasts
- 2nd Set of Coordinated City-County Forecasts

Year 3
- Update County-Level Forecasts
- 3rd Set of Coordinated City-County Forecasts

Year 4
- Update County-Level Forecasts
- 4th Set of Coordinated City-County Forecasts
Coordinated Forecast: Annual Schedule

**August**
- Update input data

**September**
- Build models

**October**
- Hold 1st public meeting
- Distribute data collection surveys
- Update county-level forecasts

**November - February**
- Compile local information
- Prepare Preliminary Forecasts

**February**
- Issue Proposed Population Forecast
- Begin Review period

**March**
- Issue Final Population Forecast

**June**
- Release Preliminary Forecasts
- Hold 2nd public meeting
Deliverables

- **County-level forecasts**
  - 50 year horizon
  - 5-year age cohorts by sex
- **Coordinated city-level forecasts**
  - UGB forecasts
  - Total population
- **Report containing:**
  - Assumptions & Context

Figure 21. Hood River County's Sub-Areas - Total Population

<table>
<thead>
<tr>
<th>Area/Year</th>
<th>2016</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
<th>2045</th>
<th>2050</th>
<th>2055</th>
<th>2060</th>
<th>2065</th>
<th>2066</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hood River County</td>
<td>24,436</td>
<td>25,810</td>
<td>27,442</td>
<td>29,014</td>
<td>30,538</td>
<td>32,045</td>
<td>33,521</td>
<td>34,939</td>
<td>36,300</td>
<td>37,611</td>
<td>38,828</td>
<td>39,049</td>
</tr>
<tr>
<td>Cascade Locks UGB</td>
<td>1,231</td>
<td>1,284</td>
<td>1,347</td>
<td>1,408</td>
<td>1,464</td>
<td>1,515</td>
<td>1,563</td>
<td>1,605</td>
<td>1,644</td>
<td>1,679</td>
<td>1,709</td>
<td>1,714</td>
</tr>
<tr>
<td>Hood River UGB</td>
<td>9,675</td>
<td>10,282</td>
<td>11,051</td>
<td>11,811</td>
<td>12,576</td>
<td>13,342</td>
<td>14,092</td>
<td>14,804</td>
<td>15,486</td>
<td>16,116</td>
<td>16,634</td>
<td>16,712</td>
</tr>
<tr>
<td>Outside UGB Area</td>
<td>13,530</td>
<td>14,244</td>
<td>15,044</td>
<td>15,795</td>
<td>16,498</td>
<td>17,188</td>
<td>17,866</td>
<td>18,529</td>
<td>19,170</td>
<td>19,816</td>
<td>20,485</td>
<td>20,623</td>
</tr>
</tbody>
</table>

Process for Population Forecasts

• Develop demographic models using historic and recent data
  — Post Recession- 2013 and onward
• Gather information about existing and planned future housing, and about population change
  — Housing developments
  — Construction of new GQ facilities
  — New employers
• Make assumptions about future housing and population change
• Regularly revise forecasts
Population Forecast Methods
Primary Models for this Forecast

• **Cohort-Component Method**
  – Relies on Age-Sex Schedules of demographic behavior
  – Population pyramid displays age structure
  – Mortality – Generally Stable
  – Fertility – Delayed Childbearing, Hispanic Fertility
  – Migration Rates – Subject to greater fluctuation than mortality and fertility and more unpredictable
  – Generally used for areas with larger populations
Total Fertility Rates by Ethnicity, Oregon Residents, 1990 to 2017

Based on Age-Specific Fertility Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Hispanic TFR</th>
<th>Non-Hispanic TFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>3.21</td>
<td>2.00</td>
</tr>
<tr>
<td>2000</td>
<td>3.15</td>
<td>1.85</td>
</tr>
<tr>
<td>2010</td>
<td>2.55</td>
<td>1.66</td>
</tr>
<tr>
<td>2017</td>
<td>1.96</td>
<td>1.51</td>
</tr>
</tbody>
</table>

Sources: PEPASR6H-Geography-OregonYear- July 1, 2017 and July 1, 2010
Hispanic Origin-Hispanic: Annual Estimates of the Resident Population by Sex, Age, Race, and Hispanic Origin for the United States and States: April 1, 2010 to July 1, 2017
Population Research Center (PRC), 2017 Population Estimates
Change in Survival Rate for Middle Aged Men (45-64) from 2000 to 2010 for Oregon Counties

Survival Rate Change
- Decrease >= 1%
- Decrease < 1%
- Increase < 1%
- Increase >= 1%
Population Forecast Methods
Primary Models for this Forecast

• Housing Unit Method
  — For smaller cities and unincorporated areas, outside of UGBs
    — Housing unit growth – Trend actual, trend county shares
    — Housing unit type (single-/multi-family)
    — Household composition
    — Persons Per Household (PPH)
    — Occupancy Rates
    — Add Group Quarters Population
  — Controlled to Cohort-Component Model results for county
Population Forecast Data Sources

Primary Sources:
- U.S. Census Bureau, Decennial Censuses
- Population Research Center (PRC), Oregon Population Estimates Program
- Oregon Health Authority, Center for Health Statistics
- Incorporated counties, Assessors Office
- Incorporated cities, Community Development/Planning Department
- Oregon Geospatial Enterprise Office (GEO), Spatial Data Library

Secondary Sources:
- State of Oregon, Office of Economic Analysis
- U.S. Census Bureau, American Community Survey (ACS)
- U.S., Internal Revenue Service
- State of Oregon, Department of Revenue
- Oregon Department of Education
- U.S., Centers for Medicare and Medicaid Services
- State of Oregon, Employment Department
Process for Local Input

• Hold regional meetings
  – Receive feedback on:
    • Historical and current demographic and economic trends
    • Local land use and growth management planning

• Local survey
  – Collect local observations
    • Population composition; recent change
    • Planned housing development plus group quarters facilities
    • Future employers
    • Infrastructure
      – Existing capacity
      – Planned expansion
    • Anything that might promote or hinder population growth
  – Survey will be posted on website and emailed to each jurisdiction
  – Issued in October 2018
Wheeler County
Demographic and Economic Trends

Wheeler County—Total Population by Ten-year Intervals (1930-2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>AAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
<td>2,799</td>
<td>0.0%</td>
</tr>
<tr>
<td>1940</td>
<td>2,974</td>
<td>0.6%</td>
</tr>
<tr>
<td>1950</td>
<td>3,313</td>
<td>1.1%</td>
</tr>
<tr>
<td>1960</td>
<td>2,722</td>
<td>-2.0%</td>
</tr>
<tr>
<td>1970</td>
<td>1,849</td>
<td>-3.9%</td>
</tr>
<tr>
<td>1980</td>
<td>1,513</td>
<td>-2.0%</td>
</tr>
<tr>
<td>1990</td>
<td>1,396</td>
<td>-0.8%</td>
</tr>
<tr>
<td>2000</td>
<td>1,547</td>
<td>1.0%</td>
</tr>
<tr>
<td>2010</td>
<td>1,441</td>
<td>-0.7%</td>
</tr>
</tbody>
</table>

Sources: U.S. Census Bureau, 1930 to 2010 Censuses. Calculated by Population Research Center (PRC).
Note 1: Average annual growth rate is used for simplicity. In actuality the rate is an annualized rate calculated with this formula: [LN(Year1/Year2)/10]
Note 2: The 2000 total population does not reflect Count Question Resolution (CQR) revisions made by the U.S. Census Bureau. Revised total population numbers are used for the “County and Incorporated City Population” table.
Wheeler County — Recent Annual Population Trend — July 1st Estimates

Demographic and Economic Trends

Wheeler County — Natural Increase/Decrease and Net In/Out-Migration

Change in Population (Net in/out-migration and natural inc./dec.)

Annual Population Growth Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Nat. Inc./Dec.</th>
<th>Net In/Out-Mig.</th>
<th>AGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>-3</td>
<td>-18</td>
<td>-1.4%</td>
</tr>
<tr>
<td>2001</td>
<td>-10</td>
<td>-5</td>
<td>-1.0%</td>
</tr>
<tr>
<td>2002</td>
<td>-10</td>
<td>-5</td>
<td>-1.0%</td>
</tr>
<tr>
<td>2003</td>
<td>-14</td>
<td>-1</td>
<td>-1.0%</td>
</tr>
<tr>
<td>2004</td>
<td>-9</td>
<td>-6</td>
<td>-1.0%</td>
</tr>
<tr>
<td>2005</td>
<td>-22</td>
<td>22</td>
<td>0.0%</td>
</tr>
<tr>
<td>2006</td>
<td>-11</td>
<td>1</td>
<td>-0.7%</td>
</tr>
<tr>
<td>2007</td>
<td>-10</td>
<td>0</td>
<td>-0.7%</td>
</tr>
<tr>
<td>2008</td>
<td>0</td>
<td>-5</td>
<td>-0.3%</td>
</tr>
<tr>
<td>2009</td>
<td>-2</td>
<td>0</td>
<td>-0.2%</td>
</tr>
<tr>
<td>2010</td>
<td>-12</td>
<td>7</td>
<td>-0.3%</td>
</tr>
<tr>
<td>2011</td>
<td>-16</td>
<td>6</td>
<td>-0.7%</td>
</tr>
<tr>
<td>2012</td>
<td>-2</td>
<td>7</td>
<td>0.4%</td>
</tr>
<tr>
<td>2013</td>
<td>-8</td>
<td>18</td>
<td>0.7%</td>
</tr>
<tr>
<td>2014</td>
<td>-20</td>
<td>25</td>
<td>0.3%</td>
</tr>
<tr>
<td>2015</td>
<td>2</td>
<td>18</td>
<td>1.4%</td>
</tr>
<tr>
<td>2016</td>
<td>-9</td>
<td>24</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

## Wheeler County and Incorporated City Population

<table>
<thead>
<tr>
<th></th>
<th>Total Population</th>
<th>Share of County Population</th>
<th>Average Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheeler County</td>
<td>1,547</td>
<td>1,441</td>
<td>1,480</td>
</tr>
<tr>
<td>Fossil</td>
<td>469</td>
<td>473</td>
<td>475</td>
</tr>
<tr>
<td>Mitchell</td>
<td>170</td>
<td>130</td>
<td>140</td>
</tr>
<tr>
<td>Spray</td>
<td>140</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>768</td>
<td>678</td>
<td>705</td>
</tr>
</tbody>
</table>

Demographic and Economic Trends

Wheeler County — City Share of Population

Wheeler County – Distribution by Age of Total Population

Source: U.S. Census Bureau, 2000 and 2010 Decennial Census.
Wheeler County - 5yr Net In/Out-Migration Rates for Total Population, 2000-2010


Region 2 trends do not include Lane County.
Demographic and Economic Trends

Wheeler County — Age Specific Fertility Rates

<table>
<thead>
<tr>
<th>Five year age group</th>
<th>2000 3yr avg</th>
<th>2010 3yr avg</th>
<th>2015 3yr avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to 14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 to 19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 to 24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 to 29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 to 34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 to 39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 to 44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 to 49</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Fertility Rate 2.07 2.72 1.31

Wheeler County, Region 2, and Oregon — Age Specific Fertility Rates (2010)

<table>
<thead>
<tr>
<th>Five year age group</th>
<th>Wheeler County (2010 3yr)</th>
<th>Region 2 (2010 3yr)</th>
<th>Oregon (2010 3yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to 14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 to 19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 to 24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 to 29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 to 34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 to 39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 to 44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 to 49</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Fertility Rate**
- Wheeler County: 2.72
- Region 2: 2.37
- Oregon: 1.79


Region 2 trends do not include Lane County.
### Demographic and Economic Trends

#### Wheeler County—Hispanic or Latino and Race (2000 and 2010)

<table>
<thead>
<tr>
<th>Hispanic or Latino and Race</th>
<th>2000</th>
<th>2010</th>
<th>Absolute Change</th>
<th>Relative Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>1,547 100.0%</td>
<td>1,441 100.0%</td>
<td>-106</td>
<td>-6.9%</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>79 5.1%</td>
<td>62 4.3%</td>
<td>-17</td>
<td>-21.5%</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>1,468 94.9%</td>
<td>1,379 95.7%</td>
<td>-89</td>
<td>-6.1%</td>
</tr>
<tr>
<td>White alone</td>
<td>1,431 92.5%</td>
<td>1,307 90.7%</td>
<td>-124</td>
<td>-8.7%</td>
</tr>
<tr>
<td>Black or African American alone</td>
<td>1 0.1%</td>
<td>0 0.0%</td>
<td>-1</td>
<td>-100.0%</td>
</tr>
<tr>
<td>American Indian and Alaska Native alone</td>
<td>8 0.5%</td>
<td>16 1.1%</td>
<td>8</td>
<td>100.0%</td>
</tr>
<tr>
<td>Asian alone</td>
<td>4 0.3%</td>
<td>8 0.6%</td>
<td>4</td>
<td>100.0%</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander alone</td>
<td>0 0.0%</td>
<td>2 0.1%</td>
<td>2</td>
<td>N/A</td>
</tr>
<tr>
<td>Some Other Race alone</td>
<td>0 0.0%</td>
<td>5 0.3%</td>
<td>5</td>
<td>N/A</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>24 1.6%</td>
<td>41 2.8%</td>
<td>17</td>
<td>70.8%</td>
</tr>
</tbody>
</table>

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.
Wheeler County — Age Specific Survival Rates

Wheeler County and Oregon — Age Specific Survival Rates (2010)

Survival rate (Percent survived each five year age group)

Five year age group

Demographic and Economic Trends

Wheeler County—Housing Units (2000 and 2010)

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.
### Wheeler and Incorporated Cities—Persons Per Household (PPH), Occupancy Rate, Percent Group Quarters, and Percent Seasonal Housing (2000 and 2010)

<table>
<thead>
<tr>
<th></th>
<th>Persons Per Household (PPH)</th>
<th>Occupancy Rate</th>
<th>Percent Seasonal Housing</th>
<th>Percent Group Quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wheeler County</strong></td>
<td>2.3</td>
<td>2.2</td>
<td>77.6%</td>
<td>72.7%</td>
</tr>
<tr>
<td><strong>Fossil</strong></td>
<td>2.2</td>
<td>2.0</td>
<td>84.9%</td>
<td>84.5%</td>
</tr>
<tr>
<td><strong>Mitchell</strong></td>
<td>2.3</td>
<td>2.1</td>
<td>82.4%</td>
<td>73.5%</td>
</tr>
<tr>
<td><strong>Spray</strong></td>
<td>2.0</td>
<td>2.2</td>
<td>76.1%</td>
<td>73.4%</td>
</tr>
<tr>
<td><strong>Unincorporated</strong></td>
<td>2.5</td>
<td>2.3</td>
<td>72.5%</td>
<td>65.6%</td>
</tr>
</tbody>
</table>

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

**Note:** Percent Seasonal Housing is the proportion of total housing units in 2000 and 2010 that are identified as vacant “for seasonal, recreational, or occasional use.”
Demographic and Economic Trends

Wheeler County — Employment Growth Since 2000


Region 2 trends do not include Lane County.
Wheeler County and Oregon — Unemployment Rate


Note: The rate represents the percent of the labor force seeking work but not employed.
Demographic and Economic Trends

Wheeler County — Top Three Industries by Average Quarterly Employment 2016


Calculated by Population Research Center (PRC).

Note: The quarterly employment data used in this chart is not seasonally adjusted.
Local Input and Additional Information

• Questions?
• Discussion time
“Parking Lot”
Selection of Forecast Regions

- Looked at regions used by other agencies
  - Workforce
  - Small City Network
- Counted counties and cities in each region
  - Balance workload
Population Estimates vs. Forecasts

• **Population Estimates**
  – Refers to a point in time estimate of population in the present or in the past

• **Population Forecasts**
  – An estimation of future population based on historic and current trends, and assumptions about likely future events
Wheeler County - 10yr Net In/Out-Migration Rates for Total Population, 2000-2010

Wheeler County — Median Home Value (2016 dollars)

Demographic and Economic Trends

Wheeler County—Dependency Ratio

Note: Dependency Ratio = \[\frac{([\text{Population Age 0-14}] + [\text{Population Age 65 or older}])}{[\text{Population Age 15-64}] \times 100}\]
Wheeler County UGBs
Fossil City Limits & Urban Growth Boundary

Sources: Esri, HERE, Garmin, USGS, Intermap, Increment P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Legend
- Urban Growth Boundary
- City Limits