

The Potential Economic Impacts of the Badlands Wilderness in Central Oregon



PRODUCED BY
HEADWATERS ECONOMICS
for
OREGON NATURAL DESERT ASSOCIATION



SEPTEMBER 2007

ABOUT HEADWATERS ECONOMICS

Headwaters Economics is a high-tech nonprofit organization that offers a unique blend of research skills and on-the-ground experience based on over 20 years of work with communities, landowners, public land managers and elected officials. Our mission is to improve community development and land management decisions in the West.



P.O. Box 7059
Bozeman, MT 59771
Phone: 406-599-7423

www.headwaterseconomics.org

ACKNOWLEDGEMENTS

The authors would like to thank the following individuals for their willingness to review earlier drafts and provide insightful comments on this report.

Rick Allen

Commercial Broker, Lowe's Commercial Properties
Former Mayor of Madras
Former Jefferson County Commissioner

Diane Bohle Ph.D.

Executive Director, Prineville Chamber of Commerce

Gary Fowles

Real Estate Broker, The Hasson Company Realtors
Founder, Sunnyside Sports

Teague Hatfield

Owner, Footzone of Bend

Suzanne Johannsen

Financial Consultant
Former President of Bend Parks and Recreation Board of Directors
Former Bend City Councilor

Rev. Dr. Steven H. Koski

Senior Pastor, First Presbyterian Church, Bend

Dennis Oliphant

President, Sun Country Tours

Stan Shepardson, M.D.

Ophthalmologist (retired)
Former Chair, Cascade Health Care Community Board of Directors

Joe Stutler

Deschutes County Forester

Linda Swearingen

Consultant, Eagle Crest Resort
Former Deschutes County Commissioner

TABLE OF CONTENTS

	Page
About this Report	1
Executive Summary	2
Introduction	3
Socioeconomic Trends	4
Study Area	4
Regional Trends and Figures	5
Overall Findings	15
Connectedness, Migration, and Land Use	16
Connectedness	16
Migration	17
Land use	21
Overall Findings	25
The Economic Role of Public Lands and the Potential of Wilderness	26
The Role of Protected Public Lands	27
The West – More and Less Wilderness	34
Case Studies – Before and After Wilderness	37
Overall Findings	41
Conclusion	42
Appendices	
A. Differences within the Region	43
B. County-Level Land Use Trends	52

ABOUT THIS REPORT

At the request of the Oregon Natural Desert Association, Headwaters Economics conducted this examination of the potential economic impacts of designating the Badlands as Congressionally protected Wilderness.

This report explores the question of whether and how designation of the Badlands as Wilderness would benefit the communities and economy of Central Oregon, including Deschutes, Crook and Jefferson counties.

First, we characterize demographic and economic trends as well as current performance for the region. This approach allows us to understand how the area is changing and its competitive strengths. It also establishes a context for considering possible impacts of changing land use management and branding.

Second, we explore Central Oregon's connections to larger markets, migration patterns, and land use trends to evaluate how the region's economy is positioned to take advantage of growing sectors in the national economy, meet the needs of a growing number of new residents, and plan for the impacts of growth on the landscape.

Third, we review the literature on the economic role of protected lands, amenity-based migration and quality of life as an attractant for people and business, and discuss findings related to Central Oregon's trends and character. We then analyze peer counties around the West with more and less Wilderness, and three Wilderness case studies before and after designation to determine the role and significance of Wilderness as a contributing factor to economic change and prosperity.

Finally, we summarize our findings and assess the potential economic role of the Badlands Wilderness in Central Oregon.

EXECUTIVE SUMMARY

This report – a comprehensive analysis of Central Oregon and the potential economic benefits of protecting the Badlands as Wilderness – concludes that the region is well suited to benefit from new Wilderness designation. It demonstrates that Central Oregon’s migration patterns and economic growth are largely quality-of-life based. Protection of recognized natural areas should therefore play to the area’s strengths.

For areas like Central Oregon, the economic benefits associated with protecting public lands include faster job and income growth, higher earnings per job and per capita income, and lower unemployment.

We caution that Wilderness by itself is not the main driver of economic development. But in conjunction with current migration patterns, infrastructure such as a viable commercial airport, and growing economic diversification that includes a range of service and professional occupations and retirement income, protected public lands in Central Oregon are a valuable economic asset.

Current growth trends and a highly consumptive pattern of land development in the region are rapidly consuming open space and point to the urgency of protecting fragile open lands that constitute a regional competitive advantage.

We encourage readers to consider Wilderness as part of a larger package of assets that help communities succeed in their efforts to attract and retain people and businesses. A quality environment, protected from degradation and appreciated for its unique characteristics, is part of what allows Central Oregon to compete successfully for people, jobs and wealth.



INTRODUCTION

The Badlands consists of 30,000 acres of high desert that is located east of Bend and straddles the Deschutes-Crook county border. It is surrounded by a mix of public and private lands used for recreation, grazing and residential development.

The Bureau of Land Management currently manages the Badlands as a Wilderness Study Area, and in its 2005 Resource Management Plan closed the area to motorized recreation. The area lacks permanent protection at present.

The Badlands contains old growth juniper, dry river canyons, unique rock formations and ancient pictographs. It is home to pronghorn, deer and elk. The Badlands also provides a nearby place to find solitude for residents and visitors, and year-round recreational opportunities for hikers, equestrians, runners, naturalists, hunters and cross-country skiers.

Most assessments of Wilderness tend to focus on how designation benefits natural systems or opportunities for solitude and recreation. This report considers the potential economic benefits of protecting the Badlands.

We test the claim, made recently by the *Economist* magazine ("Booming Bend," January, 2007), that scenery attracts people with wealth and businesses that create wealth. And we explore why this might be the case and how Central Oregon can sustain this competitive advantage going forward.

What is Wilderness?

There are many attributes that we have come to associate with wilderness, such as clean air and water, a refuge, a playground, a vital habitat for plants and animals, and a spiritual oasis from our increasingly hectic lives.

The Wilderness Act of 1964 describes wilderness in part as a place "... in contrast with those areas where man and his own works dominate the landscape... where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain."

The intent of Congress when passing the Wilderness Act was to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness."

Wilderness designation is the strongest and most permanent protection that public lands can receive. It protects an area from future development, logging and mining, and sets aside the land for use by hikers, hunters, anglers, campers, horseback riders, and all people who want to experience our wild lands in their most pure natural state.

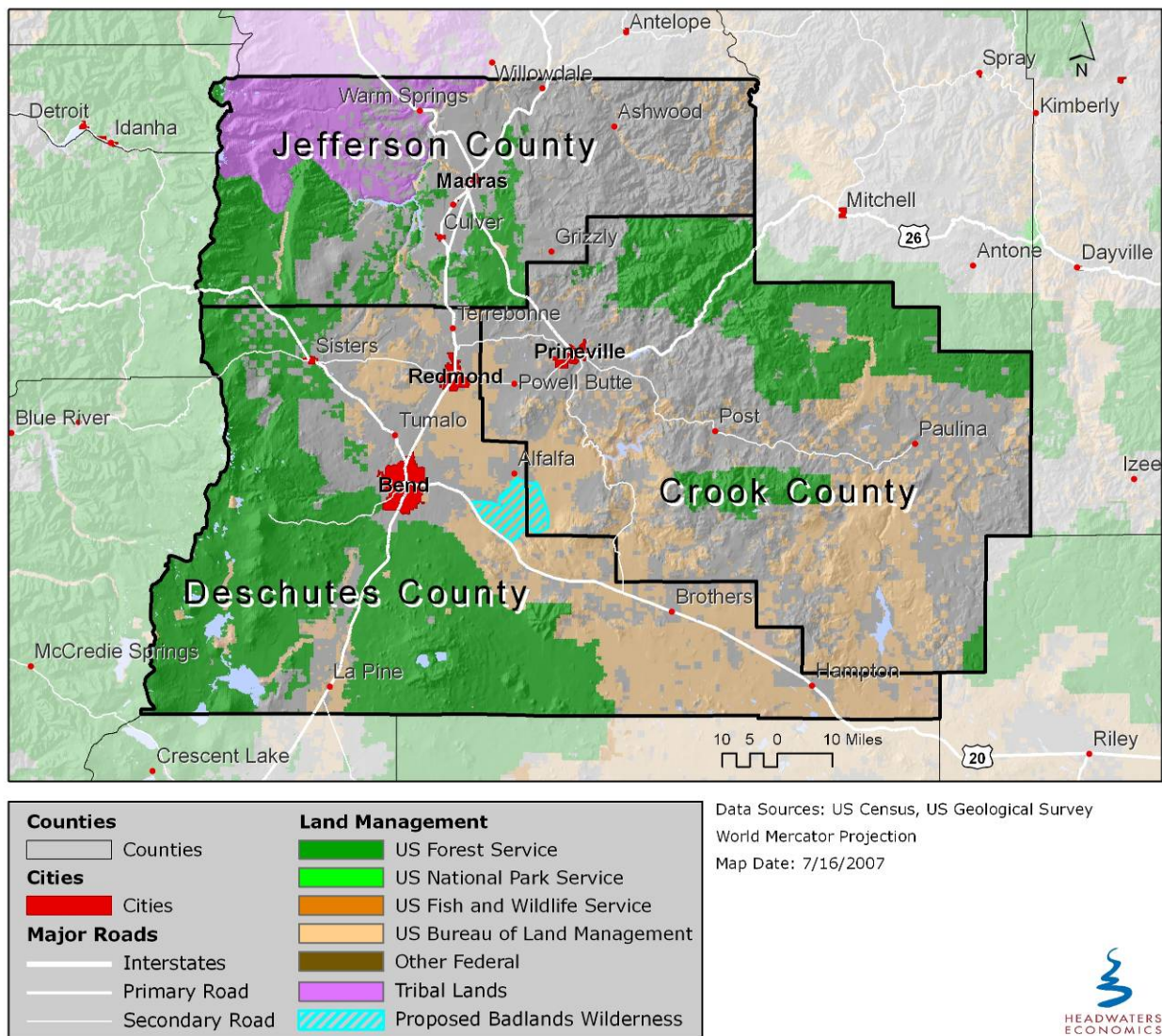
SOCIOECONOMIC TRENDS

This chapter describes regional socioeconomic trends and current conditions important to understanding the area's evolving competitive advantage and the potential for communities and businesses to benefit from designating the Badlands as Wilderness.

Study Area

The study area is comprised of Deschutes, Crook and Jefferson counties. These counties are generally understood to comprise Central Oregon and function as an economic region.

Study Area



Regional Trends and Figures

In this section of the report socioeconomic data for Deschutes, Crook and Jefferson counties are aggregated to show regional trends and conditions. Highlights are explained below. For detailed profiles of the region and each of the three counties, go to www.headwaterseconomics.org.

Population

From 1970 to 2005 population in the three-county region grew by 133,731 people, a 270% increase. This represents an average annual growth rate of 3.8 percent, making Central Oregon one of the fastest growing areas in the state (the state grew by 1.6% per year from 1970 to 2005).

The median age went up from 35.4 in 1990 to 37.9 in 2000.

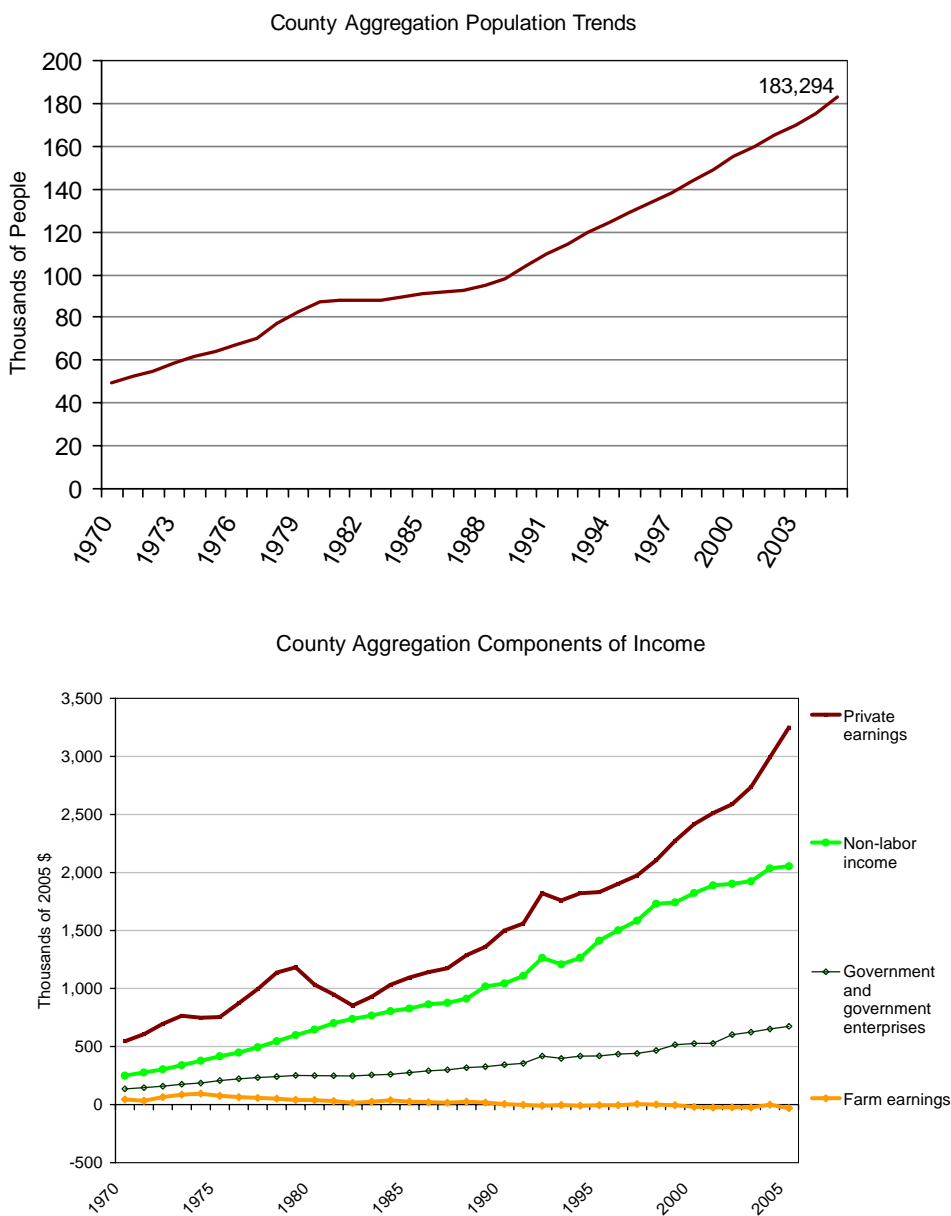
Income

In 2005 earnings from employment in the non-farm private sector consisted of \$3.2 billion dollars, constituting 59 percent of total personal income.

Non-labor income (dividends, interest and rent, and transfer payments) consisted of over \$2 billion in 2005, or 37 percent of total personal income.

Income from people employed in government has grown, and constituted \$674 million dollars in 2005, or over 10 percent of income in the region.

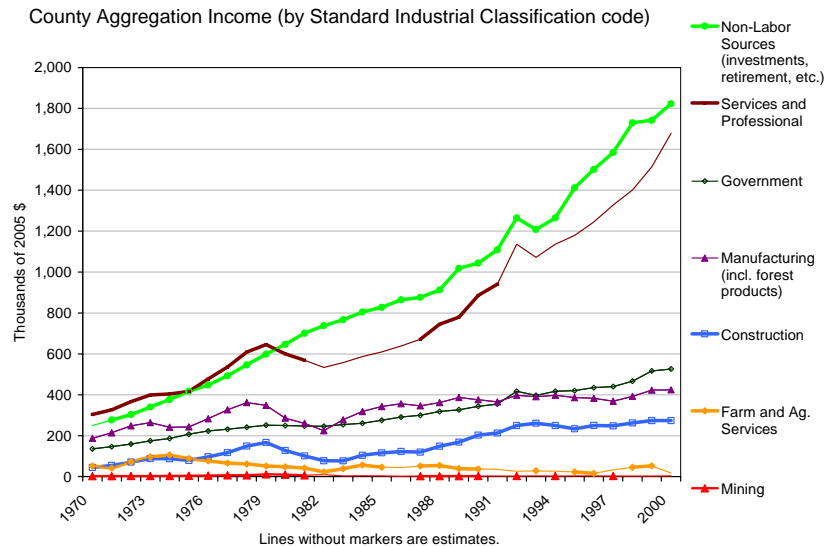
Income from farming and ranching has for many years been a minor contributor to the overall economy.



Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS), Washington, DC.

Personal Income by Source, Historical Trends

The figures below show the growth in personal income by source, from 1970 to 2000, organized by Standard Industrial Code. After 2000 the U.S. Department of Commerce applied a different classification system, which is not backward compatible with historical data. Long-term trends have not changed appreciably in recent years.



All figures in millions of 2000 dollars	1970	% of Total	2000	% of Total	New Income 1970 to 2000
Total Personal Income	931		4,438		3,507
Farm and Agricultural Services	52	5.6%	17	0.4%	(35)
Farm	44	4.7%	(20)	-0.5%	(64)
Ag. Services	8	0.8%	37	0.8%	29
Mining	2	0.2%	3	0.1%	1
Manufacturing (incl. forest products)	187	20.1%	424	9.6%	237
Services and Professional	304	32.7%	1,678	37.8%	1,374
Transportation & Public Utilities	53	5.7%	151	3.4%	98
Wholesale Trade	24	2.6%	174	3.9%	150
Retail Trade	102	11.0%	362	8.2%	260
Finance, Insurance & Real Estate	30	3.3%	304	6.8%	273
Services (Health, Legal, Business, Oth.)	94	10.1%	688	15.5%	593
Construction	44	4.8%	273	6.2%	229
Government	136	14.6%	526	11.9%	391
Non-Labor Income	250	26.9%	1,823	41.1%	1,573
Dividends, Interest & Rent	156	16.8%	1,162	26.2%	1,006
Transfer Payments	94	10.1%	661	14.9%	567

Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS), Washington, DC. Numbers in red are estimates.

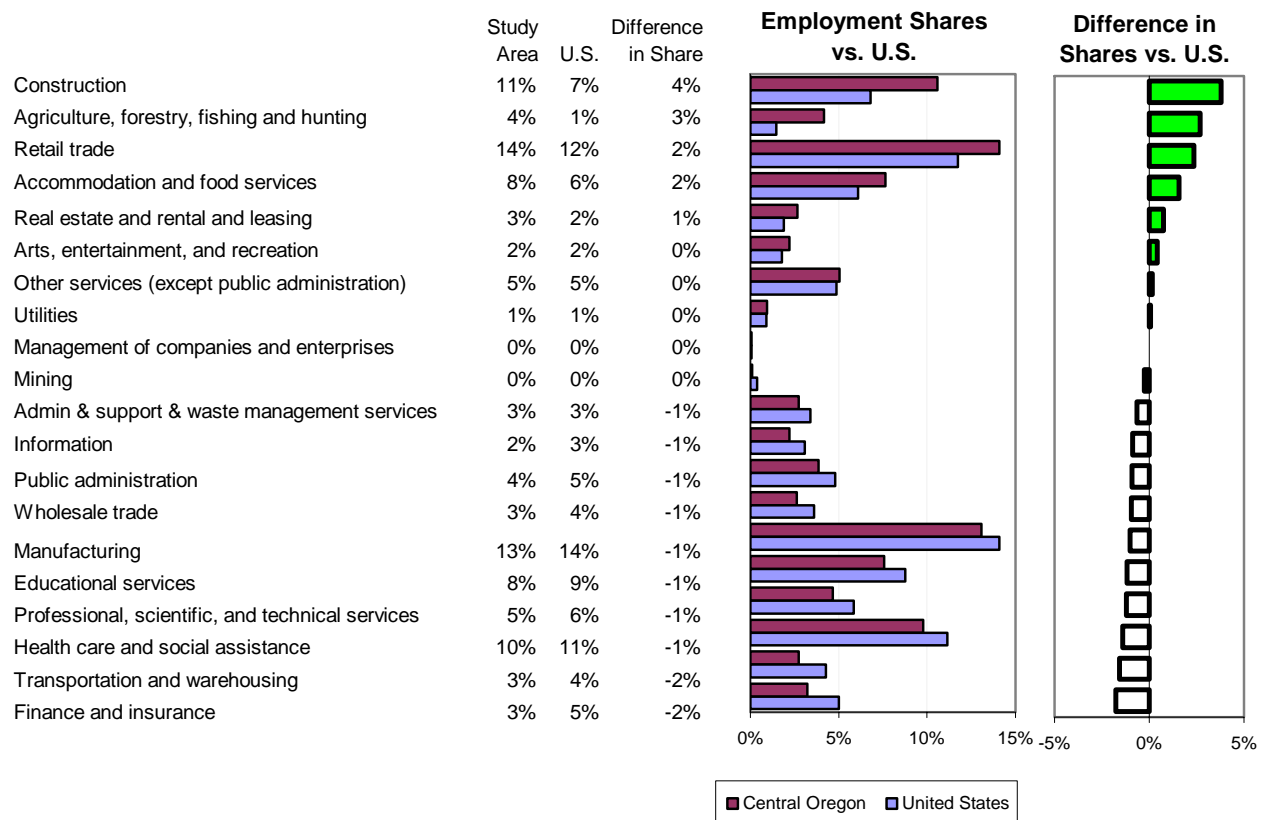
The figures show that the bulk of the growth in personal income was from non-labor income (45% of net new income) and Service and Professional sectors (39% of net growth).¹ Income from workers employed in government contributed to 11 percent of new growth. Manufacturing and Construction contributed another seven percent each to income growth.

¹ We define services broadly as "Services and Professional" industries. We use the term Services and Professional to underscore an important point: non-good-producing industries are a mix of high-paying and low-paying professions, mixing physicians with barbers and with architects retail sales associates. See page 11 below for a detailed breakdown of employment and income in services for the region. For details on individual counties see Appendix A.

Economic Diversity

The income graph on the previous page shows at a glance how the economy has diversified. Since 1970 most sectors have remained steady or grown slightly, with the obvious exception of Service and Professional industries and Non-Labor income.

The figure below illustrates how the distribution of Central Oregon employment by sector compares to the nation. The first bar chart compares the local area to the United States. The second bar chart subtracts one from the other to show where they differ. The closer the bars are to each other, the more the local economic structure is like that of the US.



Source: U.S. Bureau of the Census.

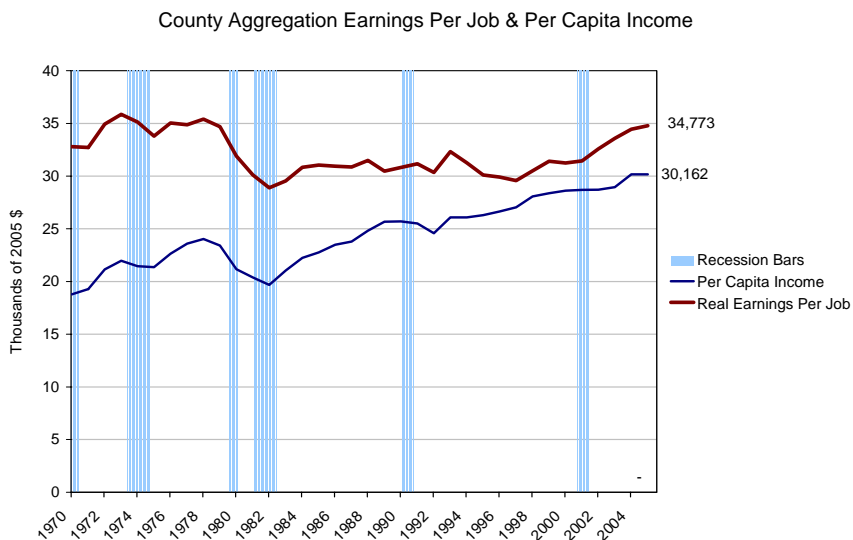
We compare Central Oregon to the U.S., which as a whole is very diverse, to get a sense for areas of specialization and dependency. Areas of significant over-representation in employment are Construction (10.6% compared to 6.8% in the U.S.), Agriculture, forestry, fishing and hunting (4.2% compared to 1.5% in the U.S.), and Retail trade (14.1% compared to 11.7% in the U.S.). There is one area of significant under-representation: Finance and insurance (3.2% compared to 5.0% in the U.S.).

Overall the regional economy is diverse, rating 45 on an index ranging from 0 (very diverse) to 3,441 (very specialized). In general diversified economies are considered positive because they are more resilient to business cycles, and tend to grow more quickly over time. See more information on this topic in detailed socioeconomic profiles for the region at www.headwaterseconomics.org.

Earnings/Per Capita Income

Average earnings per job in the region were \$34,733 in 2005. (see page 11 below and Appendix A for data on wage differentials between study-area counties). This is almost \$2,000 higher, in real terms, than in 1970, and over \$5,000 more than in 1997.

Per capita income – total personal income divided by population – has grown faster than average earnings per job, spurred on by a rapid growth in non-labor income sources, such as retirement and investment income. (In Jefferson and Crook counties over 40 percent of total personal income is from non-labor sources).



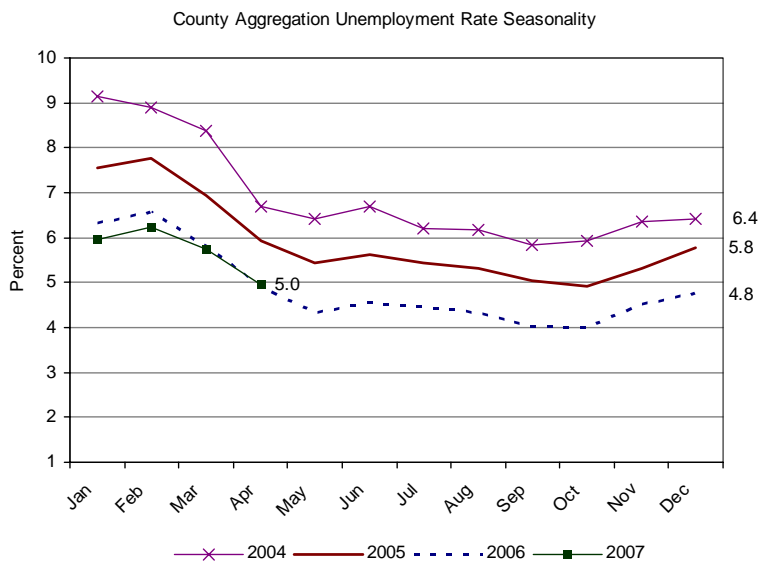
Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS), Washington, DC.

Per capita income and average earnings per job declined significantly in the region in the late 1970s and during the national recessions of the early 1980s – recessions are shown as light blue vertical bars in the graph above. The latest recession appears to have had no impact on average earnings per job, which have grown steadily since 2001, and slowed of per capita income growth temporarily. This is consistent with adjustments in the stock market (*i.e.*, investment income) in the early part of the 2000s.

Unemployment

The unemployment rate in the three-county region has declined over time, from 6.4 percent in December of 2004 to 4.8 percent in December of 2006. The latest figures available show the unemployment rate in April of 2007 to be 5 percent.

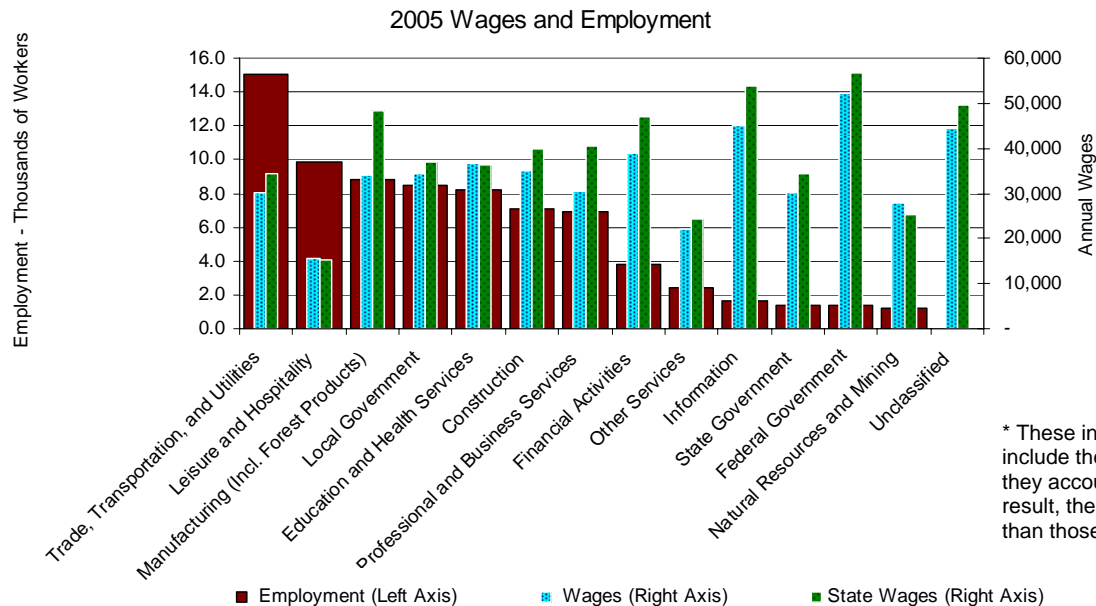
The rate of unemployment shows seasonal variation, with higher rates of unemployment in the winter, and lower rates in the summer and fall. Part of the explanation for seasonal variations is dependence on tourism. As the following sections of this report show, in Deschutes County, where most of the economic activity takes place, 6.5 percent of all private sector employment is in travel and tourism. In Jefferson County it accounts for 10 percent, and in Crook County it accounts for 5 percent of private sector employment.



Source: Bureau of Labor Statistics. 2007. Washington, DC.

Wages by Industry (2005)

The average annual wage in the region for 2005 was \$31,237 (compared to \$36,588 for the state).* The highest paying wages in the region are in Federal Government and Information, both of which are a small part of overall employment. Sectors with relatively high wages and a large number of employees are: Manufacturing, including forest products, primarily in Jefferson County (\$34,108/year, 8,805 employees); Local Government (\$34,231/year, 8,459 employees); Education and Health Services (\$36,665/year, 8,256 employees) and Construction (\$35,052, 7,057 employees).



County Wages and Employment in 2005			
	Employment	% of Total	Average Annual Wages
Total Private & Public	76,358	100%	31,237
Total Private	65,114	85%	30,427
Goods-Producing	17,101	22%	34,046
Natural Resources and Mining	1,238	2%	27,908
Agriculture, forestry, fishing & hunting	469	1%	28,189
Mining	135	0%	35,664
Construction	7,057	9%	35,052
Manufacturing (Incl. Forest Products)	8,805	12%	34,108
Service-Providing	48,013	63%	29,138
Trade, Transportation, and Utilities	15,041	20%	30,131
Information	1,678	2%	45,109
Financial Activities	3,796	5%	38,783
Professional and Business Services	6,892	9%	30,584
Education and Health Services	8,256	11%	36,665
Leisure and Hospitality	9,879	13%	15,656
Other Services	2,454	3%	21,966
Unclassified	19	0%	44,587
Total Public	11,245	15%	35,923
Federal Government	1,376	2%	52,211
State Government	1,410	2%	30,177
Local Government	8,459	11%	34,231

Source: Bureau of Labor Statistics. 2006. Quarterly Census of Employment and Wages (QCEW). Washington, DC.

Wages are shaded in green when they are more than 20% higher than the wages for all sectors and in red when they are less than 20% lower.

Work Flows Across County Boundaries

Commuting between counties for work is significant and one of the reasons Central Oregon should be thought of as an economic region. The bulk of commuting for work is to Deschutes County. There is also a considerable amount of commuting between Jefferson and Crook counties. Figures for 2005 are shown below.

Crook County	Commutes to:			
Workforce	Deschutes	%	Jefferson	%
9,376	1,230	13%	133	11%
Jefferson County	Commutes to:			
Workforce	Deschutes	%	Crook	%
8,720	1,435	16%	197	14%
Deschutes County	Commutes to:			
Workforce	Crook	%	Jefferson	%
75,403	855	1%	550	0.70%

As the table on the left shows, Jefferson County has the largest number of people commuting to neighboring counties; 16% of the workforce goes to Deschutes County, and 14% to Crook County.

Commuting from Crook County consists of 13% of the workforce going to Deschutes County, and 11% to Jefferson County.

More workers are commuting from Crook and Jefferson counties to Deschutes County because more jobs are being created there and, as the table below shows, wages are generally higher for comparable work.

Wages by Sector in 2005 (\$/year)					
	Deschutes	Crook	Wage Difference w/Deschutes	Jefferson	Wage Difference w/Deschutes
Total Private & Public	31,492	31,662	170	28,391	-3,101
Total Private	30,690	30,835	145	26,400	-4,290
Goods-Producing	35,189	30,667	-4,522	30,125	-5,064
Natural Resources and Mining	29,847	32,973	3,126	21,361	-8,486
Agriculture, forestry, fishing & hunting	28,163	na	na	na	na
Mining	35,709	0		0	
Construction	35,515	28,841	-6,674	26,635	-8,880
Manufacturing (Incl. Forest Products)	35,374	30,674	-4,700	32,377	-2,997
Service-Providing	29,309	30,926	1,617	22,348	-6,961
Trade, Transportation, and Utilities	29,152	38,632	9,480	27,257	-1,895
Information	45,734	27,602	-18,132	29,500	-16,234
Financial Activities	39,714	28,485	-11,229	25,268	-14,446
Professional and Business Services	30,477	35,540	5,063	26,096	-4,381
Education and Health Services	37,628	28,596	-9,032	25,120	-12,508
Leisure and Hospitality	16,099	11,227	-4,872	11,929	-4,170
Other Services	22,955	16,344	-6,611	15,653	-7,302
Unclassified	52,063	12,566	-39,497	9,429	-42,634
Total Public	37,463	35,151	-2,312	31,708	-5,755
Federal Government	53,753	51,672	-2,081	44,817	-8,936
State Government	32,121	24,841	-7,280	23,796	-8,325
Local Government	35,892	30,652	-5,240	31,244	-4,648

Source: Bureau of Labor Statistics. 2007. Washington, DC.

The goods-producing sectors pay significantly higher wages in Deschutes County, particularly in construction and manufacturing. Compared to Jefferson County, the service sectors in Deschutes County offer, on average, over \$6,900 more per year. In Crook County service industries pay on average higher than Deschutes County. However, this is not the case with some sectors, such as information and financial sectors. Government wages in Deschutes County are higher than in Jefferson County (\$5,755 more per year) and in Crook County (\$2,312 more per year).



Dependence on Resource Industries and Tourism

This next section shows trends for industries that depend in part on the commercial use of public lands.

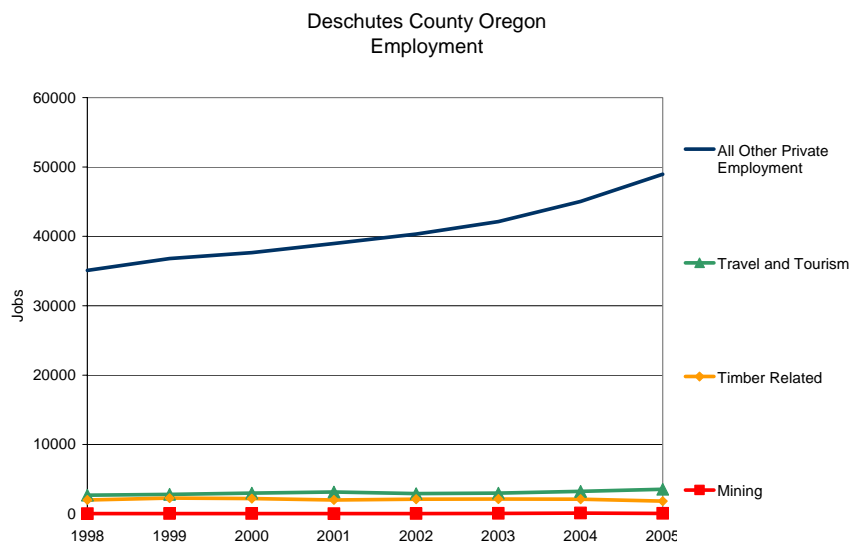
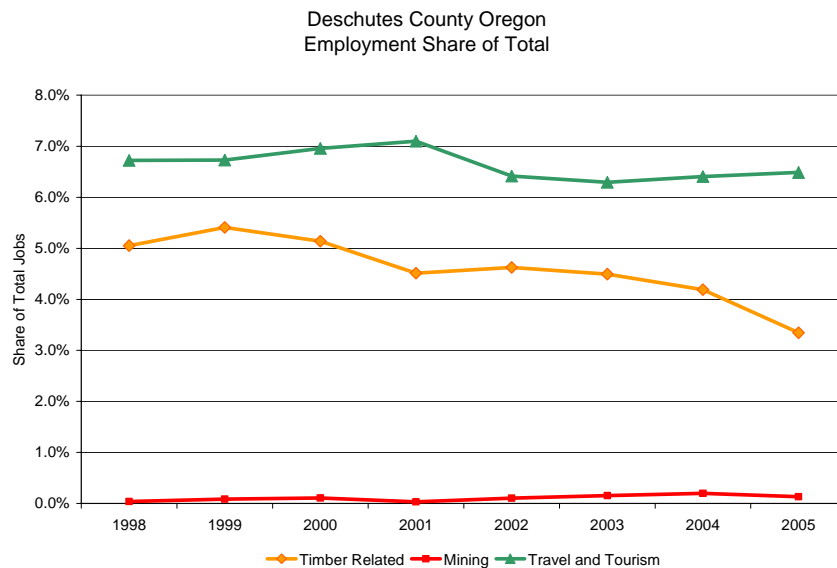
The designation of public lands as Wilderness could have a negative impact on forestry and wood products manufacturing and mining if it forecloses opportunities for these industries on public lands. At the same time, the tourism industry relies in part on access to public lands, including protected public lands, for a variety of activities, not all of which are compatible with Wilderness.

As the graphs on the following pages show, there is virtually no opportunity cost to designating the Badlands as Wilderness, and the industries that rely on commercial use of public land are dwarfed by the rest of the economy, which depends on public lands resources less for their “use values,” than for the setting they provide – for more on this topic see the third chapter in this report.

The statistics below reflect private sector wage and salary employment (*i.e.*, they exclude government employment and proprietors) in each of the three counties. Although the measure of employment by sector shown here is more than the number of jobs that depend on the use of public lands, the numbers show long-term trends in sectors that are likely to be directly affected by public lands management, and help to put the commercial use of public lands in the context of the larger economy.

Deschutes County

In Deschutes County employment in Travel and Tourism² fell from 7.1 percent of total employment in 2001 to 6.5 percent in 2005. Timber-Related employment fell from a high of 5.4 percent of total in 1998 to 3.3 percent in 2005. Mining has always been a small component of the economy, representing less than 0.2 percent of total private employment.



Source: Bureau of the Census, 2007. County Business Patterns. Washington, DC.

Non land-use related employment in Deschutes County is nine times larger than the three land-related sectors. The trends show that the rest of the economy continues to grow at a rapid pace, while strict land-use related sectors are either stable or declining.

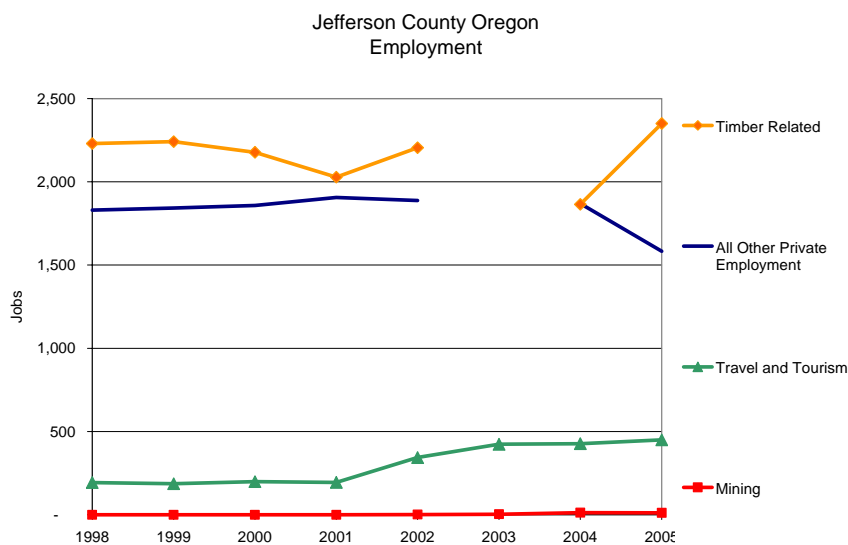
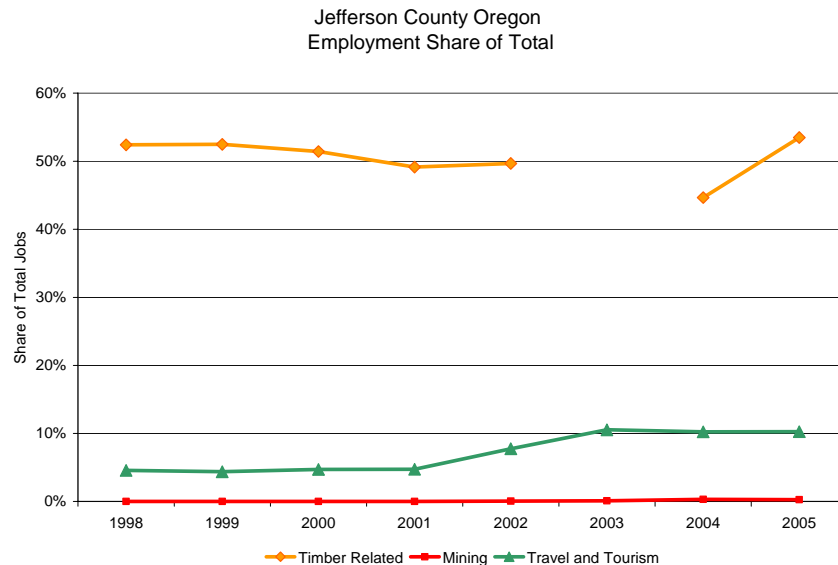
² Travel and Tourism is defined using the methods outlined in a methods paper by Kuhbach et al., "US Travel and Tourism Satellite Accounts for 1998-2003." Bureau of Economic Analysis, September 2004. Timber Related consists of forestry and lumber, paper and wood products manufacturing. Mining includes minerals, coal, and energy development.

Jefferson County

In contrast, Jefferson County is significantly more dependent on resource industries, particularly Timber Related. In 2005 Timber-Related employment consisted of over half of all private sector employment in the county.

Much of the Timber Related activity in Jefferson County occurs on land owned and managed by The Confederated Tribes of Warm Springs, and most of the employment is likely with the Bright Wood Corporation which employs 1,450 people, for the most part in Jefferson County, in Central Oregon.³

The second largest land-use related sector, Travel and Tourism, consisted of more than 10 percent of private sector employment in 2005, up 4.7 percent from 2000.



Source: Bureau of the Census, 2007. County Business Patterns. Washington, DC.
Data not available for Timber Related in 2003.

It is important to note that the figures in this section show only private sector employment, which in the case of Jefferson County consists of a small portion of the overall economy: 37 percent of total employment is government, and over 40 percent of total personal income is from non-labor sources.

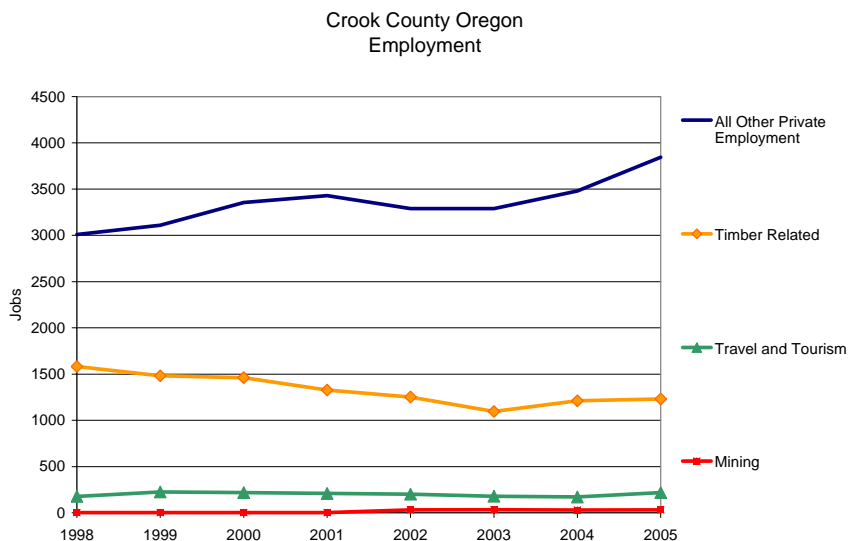
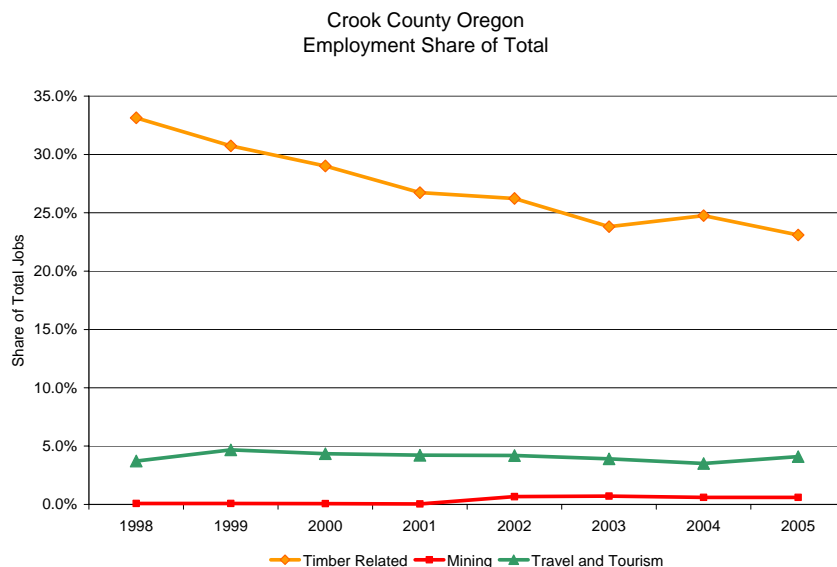
³ 2006 Central Oregon Area Profile. Economic Development for Central Oregon. www.edcinfo.com.

Crook County

In Crook County Timber-Related employment dropped from over 33 percent of total private employment in 1998 to 23 percent in 2005. The relative contribution of Travel and Tourism has remained fairly flat, at around 4 percent of total private sector employment. Mining has remained at less than one percent of total.

Not counting government employment, over 2.5 times as many jobs exist in the rest of the economy of Crook County than in the strict land-use related sectors.

As with Jefferson County, private employment in Crook County represents less than half of the overall economy. Nineteen percent of employment is in government, and over 40 percent of total personal income is from non-labor sources.



Source: Bureau of the Census, 2007. County Business Patterns. Washington, DC.

Timber-Related employment is significant in Jefferson and Crook counties. As a result it is important to point out that there is no commercial forestry on the Badlands. There does not appear to be any conflict with this industry and the designation of the Badlands as Wilderness.

Mining is a very small portion of the economy in each of the three counties. There are no current mining activities in the Badlands. The opportunity cost of Wilderness designation for mining also appears to be remote.

Travel and Tourism ranges between four and 10 percent of private employment in study-area counties. Motorized recreation is currently excluded from the Badlands, so designation as Wilderness would not affect this activity.

Overall Findings

Central Oregon has experienced long-term population growth. The only exception to this trend in the last 35 years is the recessionary 1980s, when population held steady. The region's population is getting older, a function of the aging Boomers and older in-migrants – see next chapter for more details on migration.

Central Oregon has experienced strong economic growth, especially in services and non-labor income. Services are a mix of high and low-paying jobs. Non-labor income is comprised of investment income and government transfer payments, both of which have a significant age-related component.

The economy has become more diverse over time. This makes it easier for the region to absorb losses when individual sectors decline and during broader recessions. Dependencies include reliance on non-labor income, which accounted for 37 percent of total personal income in 2005 (down from 41% in 2000), and construction employment, which made up 10 percent of total employment in 2005.

Earnings are up since the late 1990s, and per capita income is up since the early 1980s. Growth in higher wage jobs and non-labor income, respectively, are driving these gains. Unemployment is low, just below five percent.

The three-county area is functionally connected through commuting-for-work patterns. Each county therefore shares an interest in how economic resources are managed in individual counties.

Deschutes County is the driving economic force in the area, and a net draw for jobs in the region. On average, comparable jobs in Deschutes County pay better than in Jefferson and Crook counties.

Jefferson County and to a lesser extent Crook County continue to have large timber-related industries. But they too are showing signs of developing service-related employment and non-labor income growth.

None of the industries that make commercial use of public lands in the region – timber, mining, and tourism – stand to lose economic value if the Badlands is designated as Wilderness. Tourism may benefit due to branding and investment in new trail heads, bathroom facilities, and interpretation.

The economic values associated with “non-use” are explored in the next two chapters of this report.

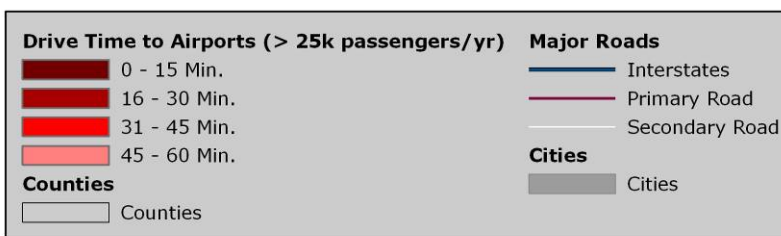
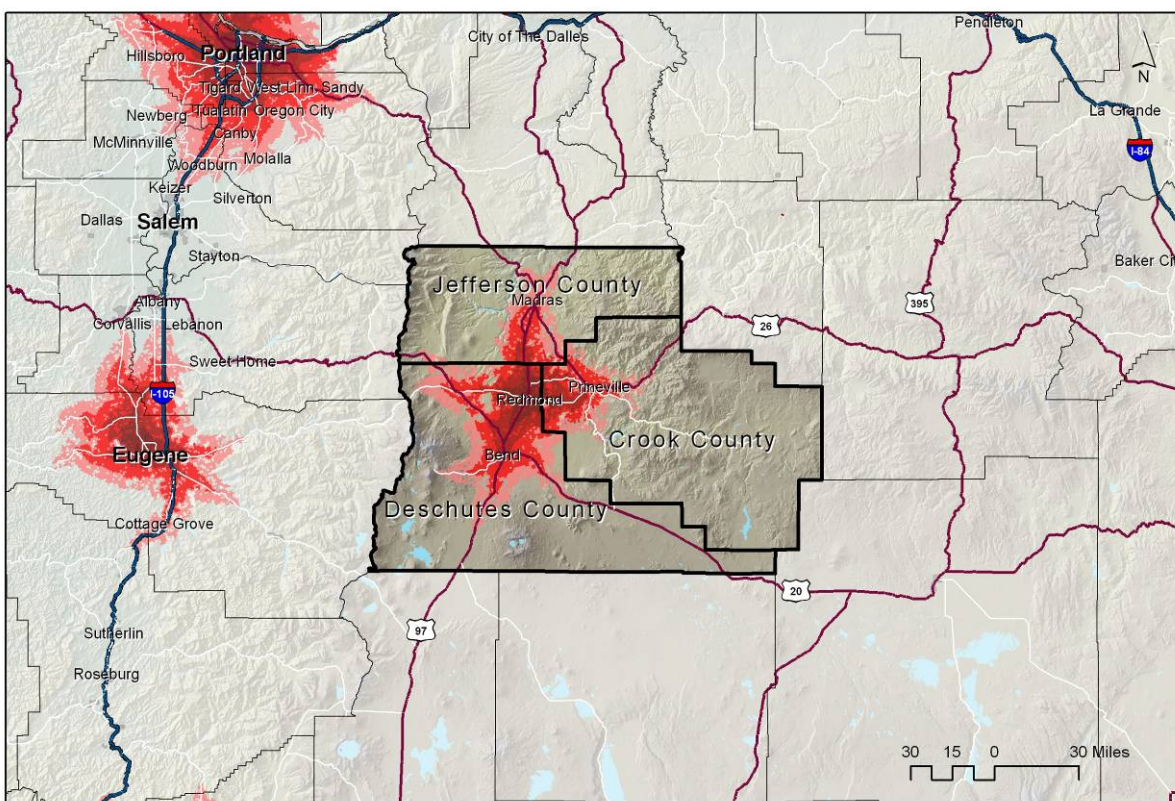
CONNECTEDNESS, MIGRATION, AND LAND USE

This chapter explores the ways Central Oregon is connected to larger markets and population centers, regional migration patterns, and evolving land use patterns in the three-county area. These issues are important to understanding how Central Oregon can take advantage of growing sectors in the national economy, meet the needs of a growing number of new residents, and plan for the impacts of growth.

Connectedness

Access to larger markets via commercial air travel and major highways is important for businesses and communities in remote locations. The map below shows commercial airports and drive times (in red) from them.

Highways and Access to Airports



Data Sources: US Census, US Geological Survey
World Mercator Projection
Map Date: 7/16/2007



Deschutes County is no longer rural by definition. In 2005 its population was 141,288. The U.S Bureau of the Census now considers it a Metropolitan county. However, it is smaller than large urban centers on the coast with more mature and diverse economies. Crook and Jefferson counties are rural by virtue of their small population size.

Central Oregon is relatively isolated from major highway networks. No Interstates pass through the area and drive times for most area residents to Portland, Eugene, and Salem is generally around three hours.

At the same time, the main population centers within Deschutes, Jefferson, and Crook counties are less than an hour's drive from Roberts Field Airport, which offers direct flights to most large metropolitan airports in the region. In practical terms this means that people who wish to commute from Central Oregon to larger markets for business can easily do so (see map on previous page). And conversely, people who wish to come to the region for business, access to a second home, or vacation travel can get to the region with relative ease.

Recent research on the topic of airport connectivity and the rural West indicates that viable commercial airline service is a crucial ingredient to developing a thriving economy in a rural setting. When the rural West is divided up between those with and without commercial airline access, two very different pictures emerge: connected counties typically have strong population, employment and income growth. They are also more diverse than isolated counties and are more successful at developing sectors, such as the growing service sector, associated with national economic growth and prosperity. Most rural and isolated counties, on the other hand, have slower growing or declining economies.⁴

The relative ease of air travel to and from Central Oregon allows the region to grow and diversify, but it is also, of course, a reflection of the demand for regional travel services. As the next section shows, the area is a hot spot for in-migration, the principal driver of growth and changing land use patterns.

Migration

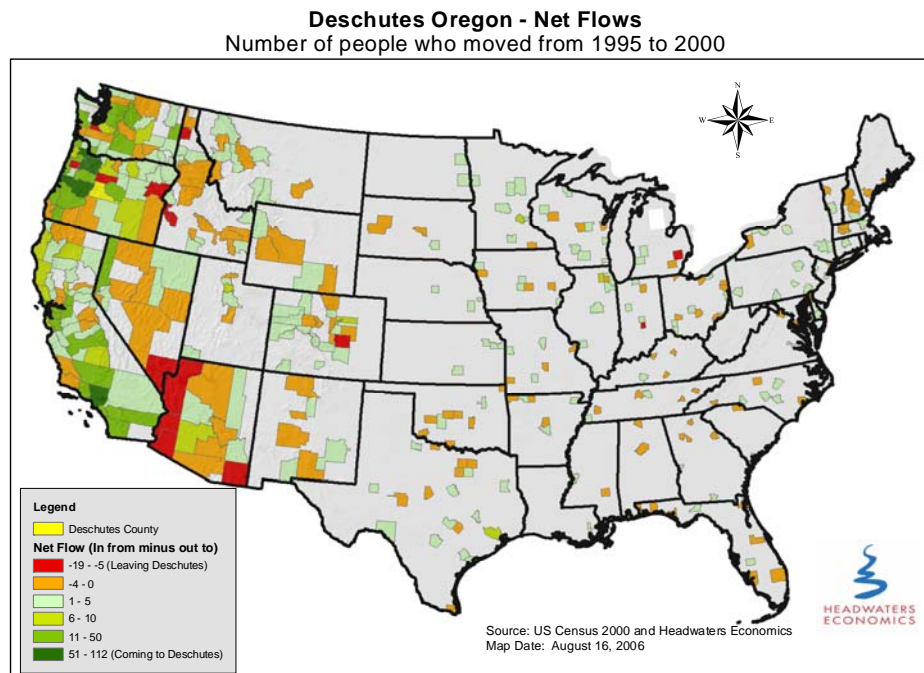
A growing number of people find the area compelling enough to relocate here, and newcomers make up most of the dramatic population increase in the area. Because it is increasingly the case that newcomers bring with them business and business connections (as the next chapter explores at length) and because growth changes the landscape in fundamental ways that may affect its attractiveness for future generations, it is important to understand migration patterns.

The U.S. Bureau of the Census tracks migration. The Decennial Census asks people where they lived five years earlier and where they live in the year of the Census. From this data we can discern where people came from, and where they are headed when they leave.

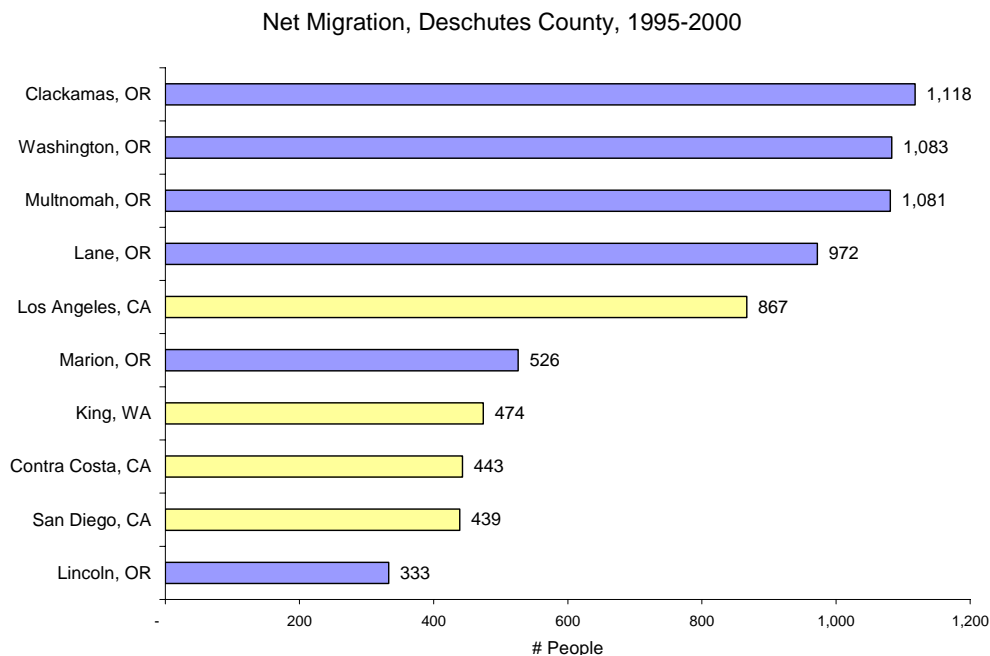
The findings for Deschutes County can be seen on the following page. The focus of the map and graph is on Deschutes County because it represents over three quarters of the region's population. Trends for Crook and Jefferson counties are very similar.

⁴ Rasker, R. 2006. "An Exploration Into the Economic Impact of Industrial Development Versus Conservation on Western Public Lands." *Society and Natural Resources*. 19(3): 191-207.

The map below shows the net difference between in-migration and out-migration. Counties in green show places where people are moving from, and places in red indicate places where people are moving to.



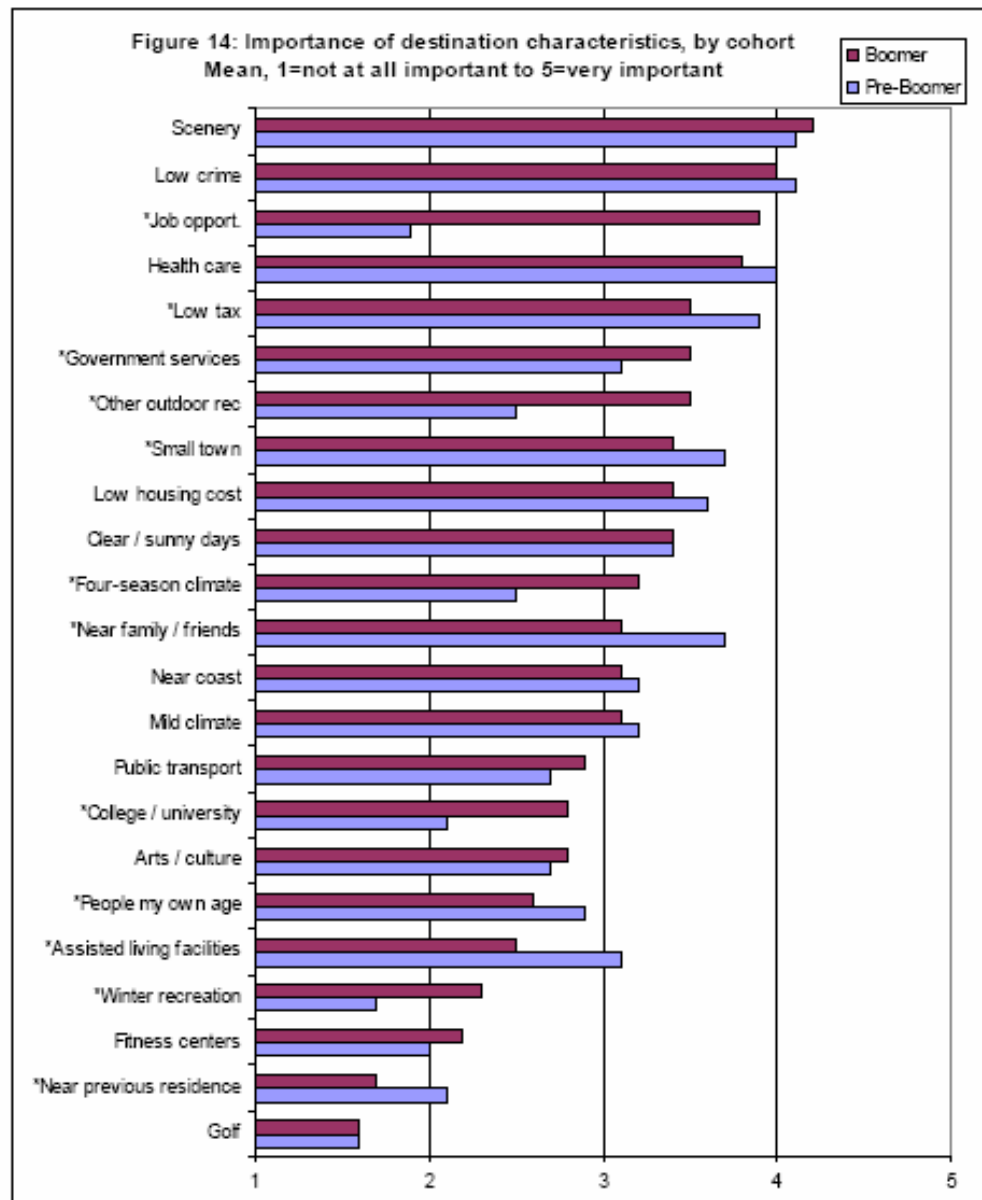
The greatest net gain to Deschutes County is from people moving from western Oregon and southern California. The loss of population is to various places, most prominently the Portland area, as well as Las Vegas and western Arizona, and Jefferson County, Oregon.



Source: Bureau of the Census. 2000. Washington, DC.

The figure above shows the top ten U.S. counties that contributed to the net growth of Deschutes County. Of the three counties in the region, Deschutes County attracted the most people from out of state. In spite of that, the bulk of the influx of people was from eight counties in Oregon.

Recent research by Kreg Lindberg at Oregon State University – Cascades for Oregon State Parks shows similar migration findings. Lindberg focused on the rapidly growing elderly population, what he calls Boomers (born 1946 to 1964) and Pre-Boomers (born 1926 to 1945), and their migration patterns. He found that for the state of Oregon as a whole the following characteristics – see table below – were given for selecting a destination community.

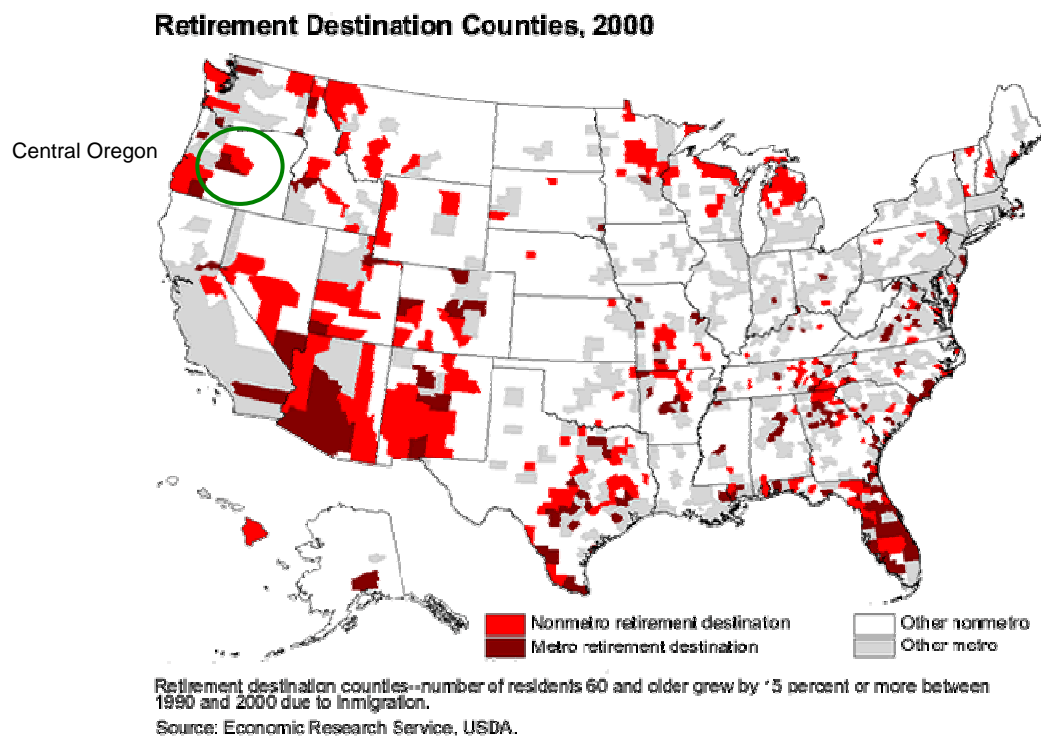


The report concludes that “Based on responses to the Boomer/Pre-Boomer survey, scenery was the most important factor affecting migration decisions amongst Oregonians in this age range.” It goes on to note that “Some scenery components, such as the presence of mountains or coastlines, are not within the control of communities. However, community actions, and the policies and decisions of agencies at the local, state, and federal levels, can affect viewsheds and other aspects of scenery.”⁵

⁵ Lindberg, Kreg. 2007. “Oregon’s Statewide Comprehensive Outdoor Recreation Plan: Boomer and Pre-Boomer Migration To and Within Oregon.” Oregon State Parks. P. 26.

Survey responses in Central Oregon were similar to state-wide responses. For Deschutes County, respondents' top reasons to move were scenery, low crime, health care, and other recreation (hiking, biking, etc.). For Jefferson, Crook, and Wheeler (they were grouped) counties respondents ranked low crime, scenery, small town, and health care as top considerations.⁶

Lindberg's findings are germane to Central Oregon where all three counties are classified as retirement destination counties by the USDA's Economic Research Service.⁷ And they are consistent with other research on the importance of natural amenities to our aging population.⁸



While Boomers, many of whom are still working and will continue to work in what can best be described as “semi-retirement,” working-age adults are drawn to the region for remarkably similar reasons.

Karen Turner, Vice President for Professional Recruitment at Express Personnel in Bend, has extensive experience recruiting people for jobs in the Central Oregon. According to Turner, “The ability to work, live and play in the same community is the biggest calling card for the region.”⁹

This theme is amplified in the next chapter of this report, which looks at quality of life as an attractant for people and businesses, and the role of protected public lands specifically.

⁶ Lindberg, Kreg. 2007. “Oregon’s Statewide Comprehensive Outdoor Recreation Plan: Outdoor Recreation and an Aging Oregon Population.” Oregon State Parks. Pp. 88-90.

⁷ Retirement destination counties defined as counties where the number of residents 60 and older grew by 15 percent or more between 1990 and 2000 due to in-migration. See www.ers.usda.gov/briefing/rurality/typology/maps/Retirement.htm.

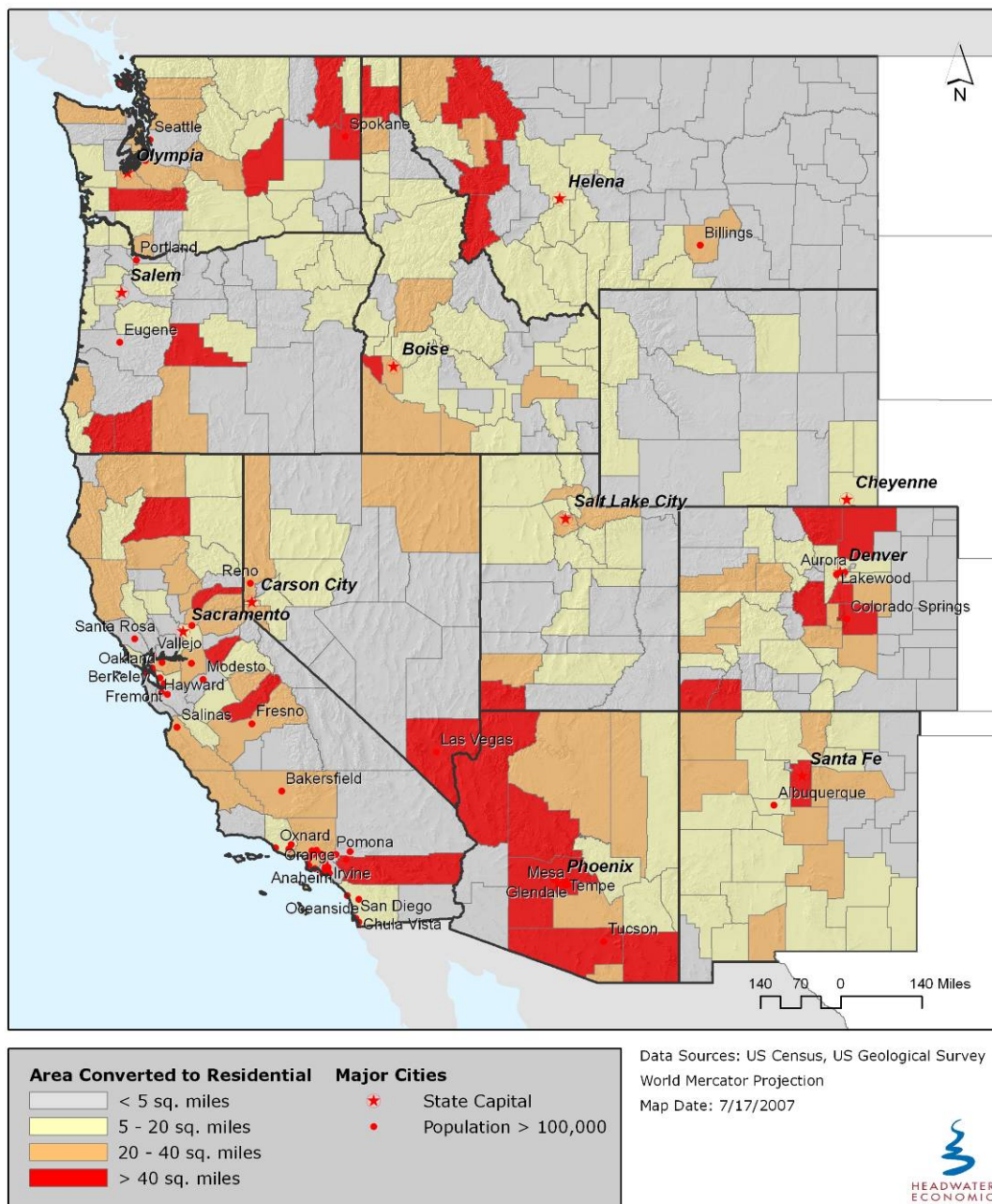
⁸ Lindberg, Kreg. 2007. “Boomer and Pre-Boomer Migration To and Within Oregon.” Oregon State Parks. P. 23; Duncombe, W. M. Robbins, and D. A. Wolf. 2003. Place Characteristics and Residential Location Choice Among the Retirement-Age Population. *Journal of Gerontology*, Vol. 58B, No. 4: 244-252.

⁹ Personal communication with Karen Turner, August 27, 2007.

Land Use

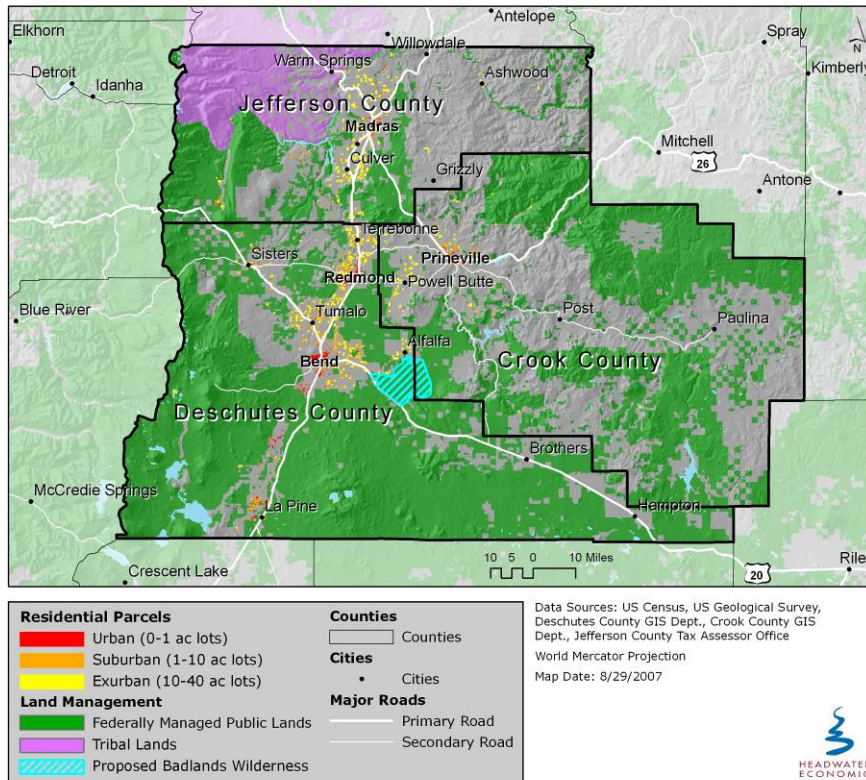
The region, particularly Deschutes County, has been discovered as an attractive place to live, bringing in retirees, tourists, new residents and businesses. One of the consequences of rapid in-migration is a growth in residential development, often outside of current town centers.

Land Converted to Residential Development 1990 - 2000



The map above shows areas in the West with high rates of land conversion to residential development. Counties in red have high rates of conversion, and those in gray have lower conversion rates.

Residential Development in 1970



The two maps on this page show the type and location of residential development in 1970 and 2005, respectively.

Red indicates Urban (0-1 acre), orange Suburban (1-10 acres), and yellow Exurban (10-40 acres) developed residential lots.

In contrast to earlier settlement patterns focused on town centers and limited rural building to support agriculture and forestry, more recent development is increasingly locating on larger lots outside of municipalities. This trend is particularly apparent since 1970.

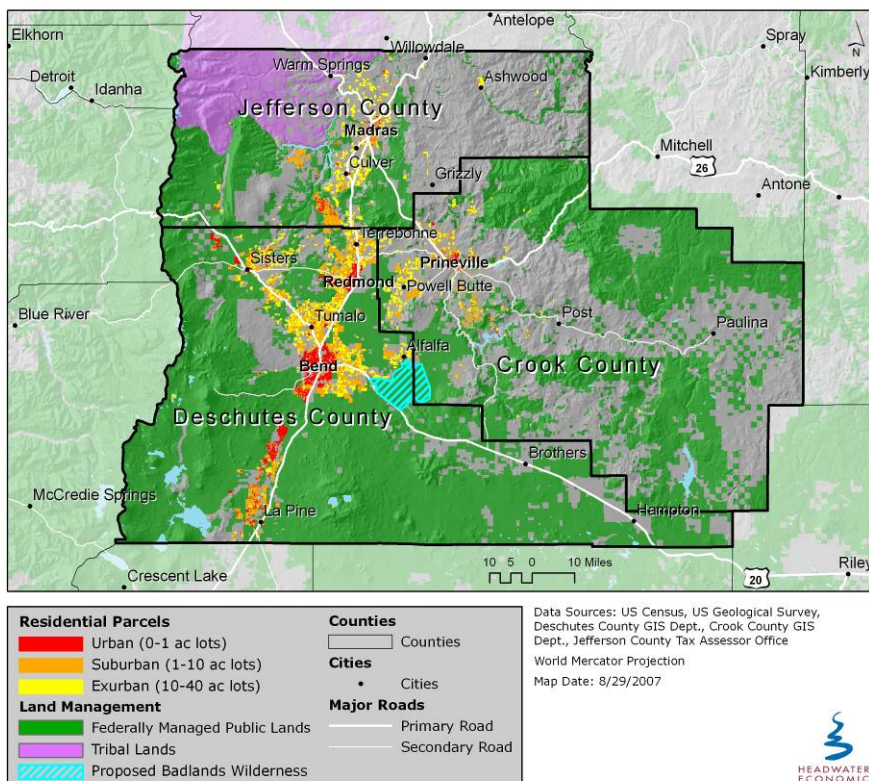
Larger lot development (orange and yellow) clusters outside of towns, along highways, and increasingly adjacent to public lands.

Where development is more advanced, particularly in Deschutes County, public lands are all that is holding back development of open space.

These maps underscore the importance of land use planning to protect environmental assets that draw people and businesses to the region.

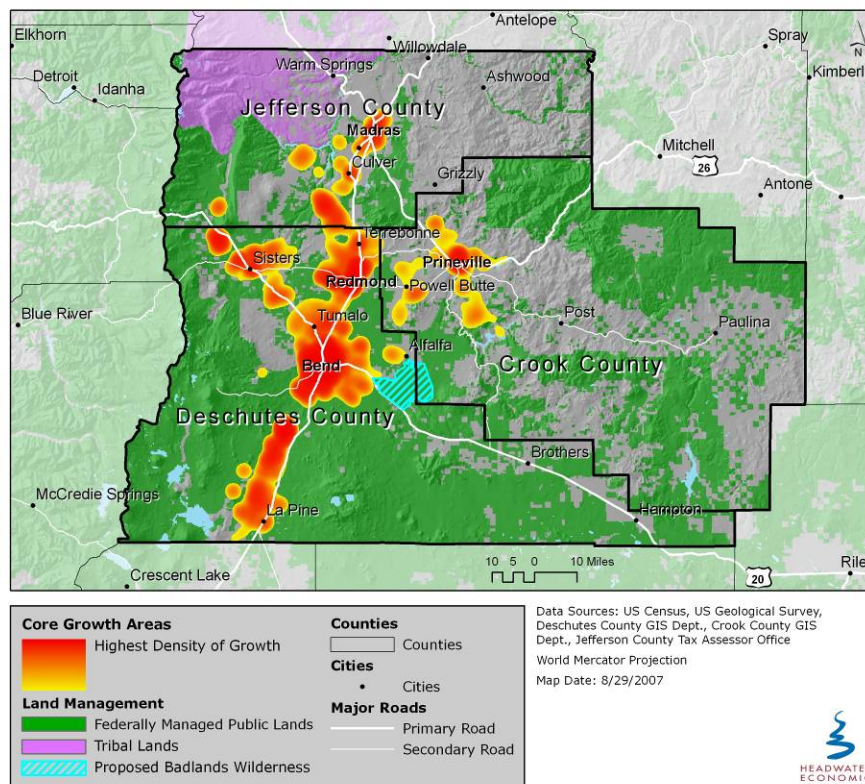
To view a series of residential build-out maps from 1900 to 2005 by decade for the three-county area at a larger scale and as a slide show go to www.headwaterseconomics.org.

Residential Development in 2005



In the map below the gradient of red to yellow represents extremely high to high areas of growth from 1970 to 2005. The areas of growth are generalized so that the patterns are easier to see. It is important to know that these highlighted areas don't encompass all the places where structures were built in this time period, but rather places where the concentration of new structures is highest.

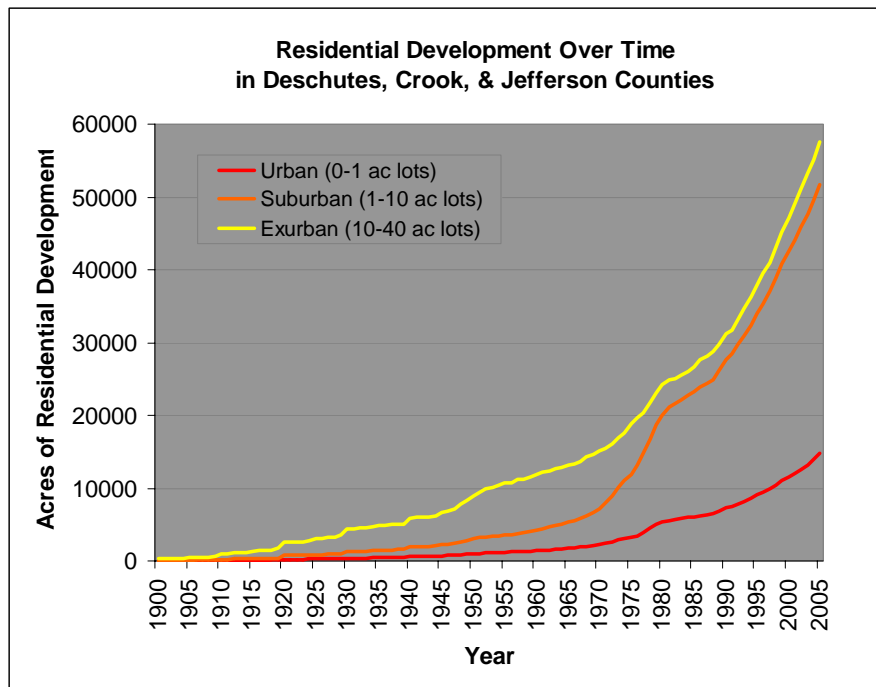
Core Growth Areas 1970-2005



In 2005 the three study-area counties had 67,174 residential lots under 40 acres in size. Seventy-five percent of these are Urban, 22 percent Suburban, and 3 percent Exurban. When looked at from a land consumption standpoint, Urban development encompasses 12 percent, Suburban 41 percent, and Exurban 47 percent of the developed area. A small amount of Exurban development consumes land quickly.

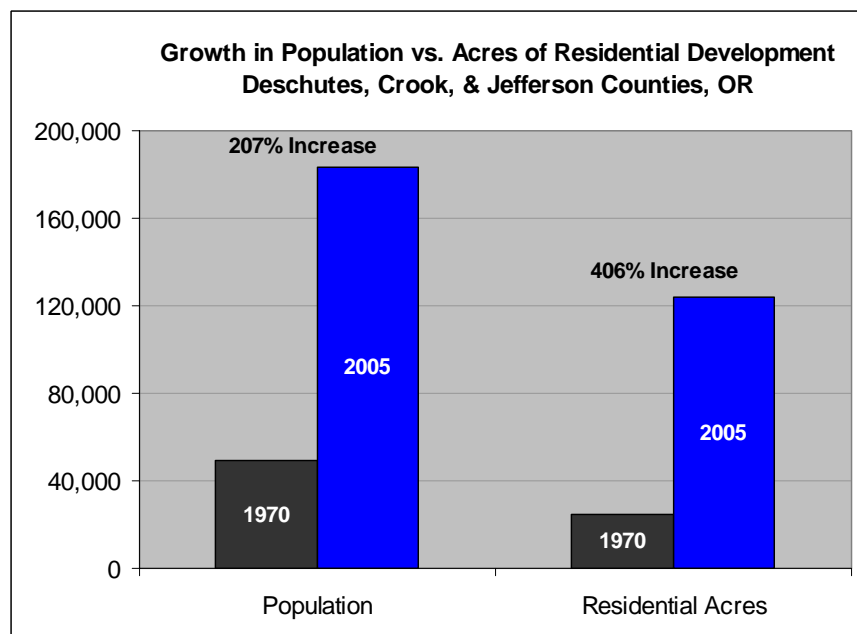
Lots	2005	Number				Percent		
	County	Urban Lots	Suburban Lots	Exurban Lots	Total Lots	Urban Lots	Suburban Lots	Exurban Lots
	Jefferson	3,455	2,394	342	6,191	56%	39%	6%
	Deschutes	43,324	10,507	1,529	55,360	78%	19%	3%
	Crook	3,539	1,681	403	5,623	63%	30%	7%
	Tri-County	50,318	14,582	2,274	67,174	75%	22%	3%

Acres	2005	Number				Percent		
	County	Urban Acres	Suburban Acres	Exurban Acres	Total Acres	Urban Acres	Suburban Acres	Exurban Acres
	Jefferson	1,867	9,790	17,060	28,716	7%	34%	59%
	Deschutes	12,490	36,397	32,538	81,425	15%	45%	40%
	Crook	1,045	6,798	11,065	18,908	6%	36%	59%
	Tri-County	15,402	52,985	60,663	129,049	12%	41%	47%



The graph to the left makes it clear that the trend in Central Oregon is toward more low density development over time. Suburban development spiked in the 1970s and from the early 1990s. Exurban development follows a similar pattern. The steepness of these lines indicates the rapid rate of land conversion by these two forms of development.

Deschutes County is home to most Suburban and Exurban development in the region. It is also responsible for the more promising trends in Urban development. This may be the result of more concerted planning efforts and higher land prices. For detailed graphics on development trends for each county see Appendix B.



People are using more land for housing now than ever before. In other words, growth in land consumption is outpacing population growth. Since 1970 population in the region grew by 207 percent, while land area developed grew by 406 percent.

The map on the previous page shows that development is increasingly pushing up against public lands. Since scenery, outdoor recreation, and the ability to work and get outdoors are top draws for the region, ensuring that these lands are protected will play to the region's strengths.

Overall Findings

Central Oregon has experienced strong population growth, driven largely by in-migration. People from around the state and West are choosing to relocate to the region.

Effective commercial air service and access to larger markets make it possible for population increases to translate into healthy business growth. People want to live in the region, and connectivity allows them to do so while sustaining and growing business activities.

Along with a strong tie between in-migration and business growth is a trend toward retirement age in-migrants, many of whom relocate here for quality of life reasons. Boomers and Pre-Boomers in Central Oregon rank scenery as either the top or among the top factors affecting their migration decisions. A conservative estimate of retirement income in the region (a subset of transfer payments only) amounted to \$495 million, or nine percent of total personal income in 2005.

Working-age adults also find the region's package of livability, easy access to outdoor recreation, and scenery a compelling reason to move to the region.

In-migration to the area has had profound impacts on the landscape. Central Oregon, especially Deschutes County, is among the worst in the West at converting open private land into low-density residential development.

The pattern of Suburban and Exurban development is increasing at a dramatic rate, pushing development outside of incorporated communities and up against public lands. Increasingly, public lands are what remains of uninterrupted open space.

These development trends are increasingly diminishing the open space and scenic values that many residents – longtime and new alike – value. Protecting these landscape values is equivalent to protecting one of the most important ingredients that makes the region's economy hum – unimpaired natural landscapes.

This last point underscores the importance of related strategies: municipal and county planning, and protecting nearby public lands.

In the next chapter we explore in greater depth what happens to an economy when public lands are protected as Wilderness.

THE ECONOMIC ROLE OF PUBLIC LANDS AND THE POTENTIAL OF WILDERNESS

Federally managed public lands have a variety of economic values, some related to the use of natural resources, such as timber and minerals, and some related to non-use values, such as scenery and solitude.

A typology of economic values includes the following:¹⁰

Commercial Use Values	Uses Non-Commercial	Non-Use Values
Timber	Ecosystem services:	Scenery
Minerals	Watersheds	Solitude
Oil, gas, other energy	Biological diversity	Open space
Grazing	Soil health	For next generation
Guides and outfitting	Adaptation to fires	Existence of wild places
Ski areas	Air quality	Setting (surroundings)
Non-traditional products	Flood control	Spiritual
	Carbon storage	
	Habitat	
	Recreation:	
	Wildlife viewing	
	Adventure	
	Travel	
	Hunting & fishing	
	Hiking, etc.	

Commercial values, whether for resource extraction, harvesting or recreation, are a subset of a larger suite of values that derive from public lands. These include ecosystem services, non-commercial forms of recreation, and a variety of non-use values.

In the first chapter of this report we illustrated those industries that depend on the *use* of public lands – tourism, timber and mining – constitute a small to middling portion of the regional economy, depending on the county. And that their overall contribution to employment and income is diminishing as the economy as a whole grows and diversifies. We also noted that the opportunity cost of designating the Badlands as Wilderness is small to none for these industries, and that for tourism there could well be an upside related to new branding and infrastructure investments.

Mountain bikers, who do not use the Badlands in great numbers at present because of the sandy soils, are the only mainstream group with current access that would be excluded by Wilderness designation. The Central Oregon Trail Alliance, a regional volunteer group that works with the USFS, BLM and other land managers to build and maintain trails in Central Oregon and is “interested in creating, enhancing and preserving trail opportunities for mountain bikers,” supports designation of the Badlands as Wilderness.¹¹

In the sections below we explore the role of non-use values, in particular the importance of natural surroundings (*i.e.*, the setting) as a stimulant to economy activity and well-being.

¹⁰ For additional reading on economic valuation methods, see Dixon J.A., Scura F.L., Carpenter R.A and Sherman P.B. 1994. *Economic Analysis of Environmental Impacts*. Earthscan Publications, London; and Loomis J. 2002. *Integrated Public Lands Management: Principles and Applications to National Forests, Parks, Wildlife Refuges and BLM Lands*. Columbia University Press, New York.

¹¹ See the Central Oregon Trail Alliance (COTA) web site: www.cotamtb.org. COTA officially endorsed Wilderness designation for the Badlands at public hearings in 2005: “Although bicyclists are currently not permitted under the 1964 Wilderness Act to ride in the wilderness areas, as an organization we recognize the value of protecting our public lands. Therefore, COTA wholeheartedly endorses the proposed Badlands wilderness, and feels it is a positive action benefiting all Central Oregonians.”

The Role of Protected Public Lands

The most straightforward way to grasp the economic role for protected public lands, including Wilderness, is to review the literature on the topic.

Quality of Life as an Attractant for People and Business

A growing body of research on economic development suggests that amenities such as environmental quality, pace of life, low crime rates, scenery, recreational opportunities, or “quality of life” for short, have become increasingly important in people's decisions about where to live and do business. For the last three decades economists, geographers and demographers have understood that natural and social amenities have become increasingly important in people's decision to live in rural areas.¹²

More recent literature has found that the trend to migrate for quality of life reasons is stronger today than ever, driven in part due to increases in telecommunications technology. Fuguitt and Beale argue that telecommunications technology has allowed businesses to operate far from urban centers.¹³ A 2007 report by the Federal Reserve Bank concluded that “technological progress serves as a powerful driving force driving migration towards locations with high quality of life.”¹⁴

A growing number of analysts, for example Power, Cromartie and Wardwell, and Nelson, argue that footloose entrepreneurs bring their businesses with them when they locate to scenic areas.¹⁵ This has led to a new theory of economic development: from “jobs first, then migration,” to “migration first, then jobs”¹⁶

As the theory goes, the in-migration of quality-of-life seekers leads to the creation of new business, started by people who decide first where they want to live. This in turn stimulates other sectors of the economy, including the local construction industry as the demand grows for new homes. Local retailers learn to cater to the tastes of these new arrivals. When retirees, both seniors and early retirees, move with investments to a rural town, they in turn stimulate other sectors, such as the health industry. In sum, the influx of new people with ideas, experience, and investment income stimulates growth, all of which is related to a search for a higher quality of life.

A recent study by McGranahan of the Economic Research Service, entitled “Natural Amenities Drive Population Change,” found that when population growth rates of U.S. counties were compared, the highest growth occurred in counties with amenities, which included climate, topography, and water area.¹⁷ Shumway and Otterstrom found that the greatest number of new migrants to the West is in counties they

¹² Deavers, K. 1989. “The Reversal of the Rural Renaissance.” *Entrepreneurial Economy Review*. September/October-5; Dillman, D.A. 1979. “Residential Preferences, Quality of Life and the Population Turnaround.” *American J. of Agricultural Economics*. 61:960-966; Long, L.H., and D. DeAre. 1980. “Migration to Nonmetropolitan Areas: Appraising the Trend and Reasons for Moving.” *Special Demographic Analysis, CDS-80-2*. U.S. Bureau of the Census, Washington, D.C.; Williams, J.D., and A.J. Sofranko. 1979. “Motivation for the In-Migration Component of Population Turnaround in Nonmetropolitan Areas.” *Demography*. 16:235-239.

¹³ Fuguitt, G.V. and C.L. Beale. 1996. “Recent Trends in Nonmetropolitan Migration: toward a New Turnaround?” *Growth and Change*. Vol. 27, Pages 156-174.

¹⁴ Rappaport, J. 2007. “Moving to High Quality of Life.” The Federal Reserve Bank of Kansas City, Economic Research Department. RWP 07-02. Also see David A. McGranahan, 1999. “Natural Amenities Drive Rural Population Change.” Food and Rural Economics Division, Economic Research Service, AER-781, Washington DC.

¹⁵ Power, T. M. 1991. “Ecosystem Preservation and the Economy of the Greater Yellowstone Area.” *Conservation Biology*. Vol. 5(3), Pages 395-404; Cromartie, J.B. and J.M. Wardwell. 1999. “Migrants Settling Far and Wide in the Rural West.” *Rural Development Perspectives*. Vol. 14(2), Pages 2-8; Nelson, P.B. 1999. “Quality of Life, Nontraditional Income, and Economic Growth: New Development Opportunities for the Rural West.” *Rural Development Perspectives*. Vol. 14(2), Pages 32-37.

¹⁶ Whitelaw, E. 1992. “Oregon's Real Economy.” *Old Oregon*. Winter: 31-33; Whitelaw, E.W. and E.G. Niemi. 1989. “Migration, Economic Growth, and Quality of Life.” *Proceedings: Pacific Northwest Regional Economic Conference*. April 26 - 28. Corvallis, Oregon.

¹⁷ McGranahan, D.A. 1999. “Natural Amenities Drive Population Change.” Food and Rural Economics Division, Economic Research Service, U.S. Department of Agriculture. Report 781, Pages 1-24.

call “New West” counties.¹⁸ These are characterized by their recreational nature, scenic amenities, proximity to national parks or other federal lands, and preponderance of service-based economies. They conclude that the importance of mineral, cattle, and lumber production in the “New West” is now dwarfed by an economy based on “a new paradigm of the amenity region, which creates increased demands for amenity space, residential and recreational property, second homes, and environmental protection.”

Johnson and Rasker investigated the relative importance of economic, social, cultural and environmental factors in people's decision to locate or retain a business in the northern portion of the Greater Yellowstone area (Madison, Gallatin and Park counties in Montana).¹⁹ The study revealed that the most important reasons for people's decision to locate or retain a business in the area had to do with the scenic amenities, the rural character of the town, the low crime rates, proximity to wildlife-based recreation, and other social, cultural, and environmental factors. They also found that the majority of owners who relocated their businesses first came to the region as tourists. (These findings are similar to findings from Oregon State University's report for Oregon State Parks; see page 21 of this report.)

These studies illustrate there is a positive relationship between environmental protection and in-migration, retaining businesses, and attracting new businesses. Unfortunately, discussions on the economic role of amenities are often limited to whether scenery and recreation opportunities can attract tourists. The literature makes it clear that amenities form part of a mix of factors that serve to attract people *and* businesses, including business owners who may have seen an area first as tourists.



¹⁸ Shumway J.M. and S.M. Otterstrom. 2001. “Spatial Patterns of Migration and Income Change in the Mountain West: The Dominance of Service-Based, Amenity-Rich Counties.” *Professional Geographer*. Vol. 53(4), Pages 492-502.

¹⁹ Johnson, J.D. and R. Rasker. 1995. “The Role of Economic and Quality of Life Values in Rural Business Location.” *Journal of Rural Studies*. Vol. 11(4), Pages 405-416.

Public Lands, Quality of Life, and Economic Development

Building on the growing body of literature related to the importance of quality of life and environmental amenities to rural development, several researchers have focused more specifically on the issue of public lands, and the consequence of wild land protection.

One of the most cited studies is a series of surveys conducted by Rudzitis and Johansen of the University of Idaho. They demonstrated that during the 1960s counties containing federally designated Wilderness areas had population increases three times greater than other non-metropolitan counties. In the 1970s, they grew at a rate twice that of non-metropolitan areas, and in the 1980s their population increased 24 percent – six times more than the national average of four percent for non-metropolitan areas and almost twice as much as counties in the rural West.²⁰

To test the importance of amenities in people's decisions to migrate, Rudzitis and Johansen surveyed more than 11,000 randomly selected migrants and residents in 15 Wilderness counties in the West. Sixty percent said the presence of designated Wilderness was an important reason for why they moved, 45 percent said that Wilderness was why they stayed in the area, and 81 percent felt Wilderness areas were important to their counties. The most significant reasons for locating to a Wilderness county were the environmental and physical amenities, scenery, outdoor recreation, and pace of life. When asked about their attitudes toward development, 90 percent of recent migrants and 85 percent of established residents felt it was necessary to "keep the environment in its natural state."

Lorah and Southwick point out that opponents of roadless areas, National Monuments, National Parks, and Wilderness claim that preserving public lands is detrimental to the economy.²¹ The two researchers tested whether this is true by analyzing the relationship between the presence of protected lands and the performance of the local economies. To ensure that no bias was introduced by comparing metropolitan to non-metropolitan counties, they split their sample of 431 counties into three categories: counties containing metropolitan areas, non-metropolitan counties with protected federal lands, and non-metropolitan counties without protected federal lands.

Their findings show that population, employment, and income growth rates, from 1969 to 1999, were much higher for the non-metro counties with protected lands than those without protected lands. They also found that in the non-metropolitan portions of the West, the highest level of environmental protection on public lands is associated with the highest levels of growth.

Rasker and Hackman compared economic performance of counties with a high degree of land in protected status with those without such protections in Western Montana.²² They found that from 1969 to 1992 "Wilderness" counties (those with Wilderness, Parks and Wildlife Refuges) outpaced resource-dependent counties without protected lands, in terms of employment and real personal income growth. Counties with protected lands also had consistently lower levels of unemployment.

²⁰ Rudzitis, G. and H.E. Johansen. 1989a. "Migration into Western Wilderness Counties: Causes and Consequences." *Western Wildlands*. Spring, Pages 19-23; Rudzitis, G. and H.E. Johansen. 1989. "Amenities, Migration, and Nonmetropolitan Regional Development." Report to the National Science Foundation. Department of Geography, University of Idaho, Moscow, ID; Rudzitis, G. and H.E. Johansen. 1991. "How Important is Wilderness? Results from a United States Survey." *Environmental Management*. Vol. 15, Pages 227-233; Rudzitis, G. 1993. "Nonmetropolitan Geography: Migration, Sense of Place, and the American West." *Urban Geography*. Vol. 14(6), Pages 574-585.

²¹ Lorah, P. and R. Southwick. 2003. "Environmental Protection, Population Change, and Economic Development in the Rural Western United States." *Population and the Environment*. Vol. 24 (3), Pages 255-272.

²² Rasker, R. and A. Hackman. 1996. "Economic Development and the Conservation of Large Carnivores." *Conservation Biology*. Vol. 10(4), Pages 991-1002.

Holmes and Hecox, in a study entitled “Does Wilderness Impoverish Rural Regions?” found a significant positive correlation between the percent of Congressionally designated Wilderness land in a county and growth in population, income, and employment from 1970 to 2000.²³

They discovered that Wilderness does more than simply stimulate tourism: “Wilderness counties generate far more growth in lower paying industries like hotels and other lodging places and eating and drinking establishments, but they also have remarkable growth in higher paying professional services like legal services and investment offices relative to non-Wilderness counties in the rural West.”

Other Factors Important to Growth

In spite of the evidence supporting the importance of protected lands to economic development, the status of public lands is clearly not the only significant driver of growth. Other factors also explain why some rural counties grow, while others do not.

Rasker and Hansen investigated how environmental amenities compare to other factors, such as education levels, crime rates, and other economic and demographic factors, that influenced population growth in the rural portion of the Greater Yellowstone Region.²⁴ They first tested the importance of ecological and amenity variables at the state level, and found that for the rural portion of Idaho, Montana, and Wyoming some variables accounted for a 30 percent variation in population growth from 1970 to 1997. For example, the correlation between population growth in the presence of mountains was 0.26 (a 1.0 suggests perfect correlation), while the correlation between growth and the percent of the county in protected status (Congressionally designated Wilderness, National Park, or Wildlife Refuge), was 0.30. In other words, 30 percent of the variation in growth from one county to the next can be attributed to the presence or absence of environmental amenities. Amenities are clearly important. They are also not the whole story.

In the same study, the authors found that counties that were most likely to grow were those that were mountainous, with an educated workforce, and with ready access to larger commercial markets through commercial airports. They concluded that ecological and amenity variables are necessary but not sufficient condition for growth: “[Th]e results of this study indicate a high degree of correlation between the education of the population and the percentage of people employed in the business and producer services. Combining this fact with the importance of amenities and access to larger population centers via air travel, the logical conclusion for the Greater Yellowstone region and perhaps for the West in general, is: rural, isolated counties with a comparative advantage will be those with natural amenities, an educated workforce, and reliable airline travel. The likely type of growth from this strategy will be in the relatively higher paying service industries.”

Beyers *et al* point out that business owners in the high-wage service industries (*e.g.*, producer services such as finance, engineering, management consulting) can locate in rural areas, but only if these entrepreneurs also have a way to visit their clients.²⁵ FedEx, UPS, and high-speed internet access make it appear that all business owners can now locate in rural areas where they can enjoy the environmental amenities, but in-person access to larger markets is also important.

²³ Holmes, P. and W. Hecox. 2004. “Does Wilderness Impoverish Rural Areas?” *International Journal of Wilderness*. 10(3):34-39.

²⁴ Rasker R. and A. Hansen. 2000. “Natural Amenities and Population Growth in the Greater Yellowstone Region.” *Human Ecology Review*. Vol. 7(2), Pages 30-40; Hansen, A.J.; R. Rasker, B. Maxwell, J.J. Rotella, J.D. Johnson, A.W. Parmenter, L. Langner, W.B. Cohen, R.L. Lawrence; and M.P.V. Kraska. 2002. “Ecological Causes and Consequences of Demographic Change in the New West.” *Bioscience*. Vol. 52 (2), Pages: 151-162.

²⁵ Beyers, W.B., D.P. Lindahl, and E. Hamill. 1995. “Lone Eagles and Other High Fliers in the Rural Producer Services.” Paper presented at the Pacific Northwest Regional Economic Conference, May 1995, Missoula, Montana.

What Are Producer Services?

Producer services is a term used by economists and economic geographers to refer to a class of service industries that are tied to goods production, and tend to be of higher wages and require a higher level of training and education. Producer services sectors tend to consist of architecture, finance, insurance, legal, business, engineering and management services. The reason for this classification is primarily to differentiate higher-paying services from lower-paying service sectors that are not likely to be associated with the production of a good, such as hotels and lodging, personal services, amusement and recreation services, health and educational services.

The exact definition of producer services varies and changes over time. One of the first to define the term were Browning and Singelman in 1975.¹ Later researchers, such as Beyers in 1994, have studied the extent to which services related to goods production – the “producer services” – can locate in rural areas with high quality of life, therefore de-coupling themselves from big cities where the final stages of production and assembly are located.² This brings to mind real life examples like the architect in Bozeman, Montana designing homes that will be built in Atlanta, or the automobile engineer Sand Point, Idaho designing car parts that will be manufactured in Detroit.

¹ Browning, H. and J. Singelman. 1975. “The Emergence of a Service Society: Demographic and Sociological Aspects of the Sectoral Transformation in the Labor Force of the U.S.A.” National Technical Information Service. Springfield, Virginia

² Beyers, W.B. 1994. “Producer Services in Urban and Rural Areas: Contrasts in Competitiveness, Trade, and Development.” 41st North American Regional Science Meetings, Niagara Falls, Ontario, November 1994. See also Beyers, W.B. and D. Lindahl. 1996b. “Explaining the Demand for Producer Services: Is Cost-Driven Externalization the Major Factor? Papers in Regional Science.” 3:351-374.

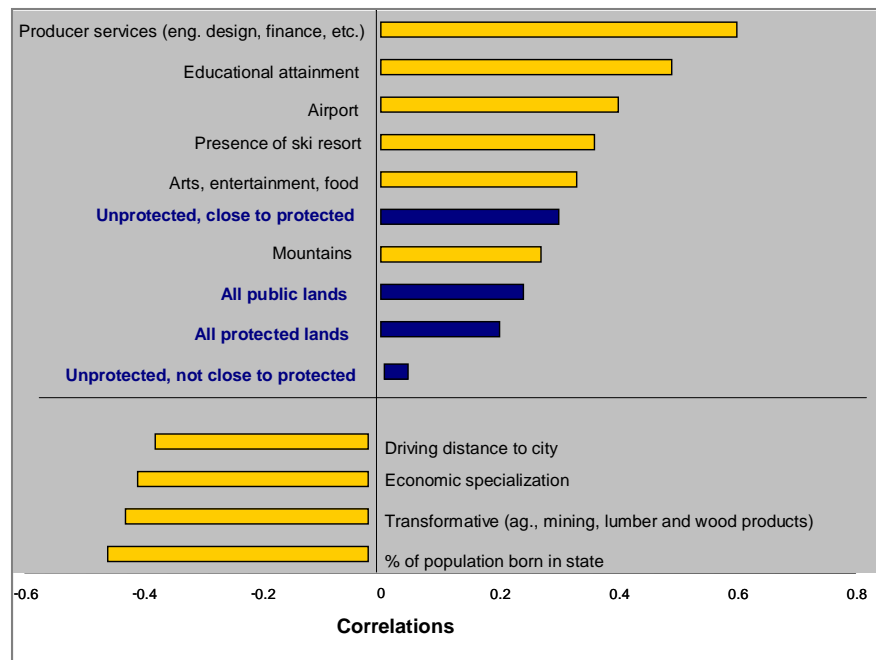
While the “footloose” nature of some businesses is widely heralded in both academic and popular press, some caution is warranted in overstating this as a major driving force for rural development. Not all communities and counties have the needed infrastructure to attract – and retain – this type of economic entity. A rural development strategy based solely on attracting quality of life migrants can be as risky as betting on resource development alone – economic diversity is also important.

The most detailed study on the relationship between Wilderness and other forms of protected public lands and economic development was conducted by Rasker *et al* in 2006. The study also put the role of protected areas like Wilderness in a larger context. The report, entitled *Public Lands Conservation and Economic Well-Being*, found that counties in the West with Wilderness, National Parks, National Monuments and other protected public lands, set aside for their wild land characteristics, can and do play an important role in stimulating economic growth – and the more protected, the better.

The study also found that there are other important pieces of the economic development puzzle, and that not all communities benefit equally from protected lands (see figure on next page). Access to metropolitan areas, via road and air travel, is also extremely important. The education level of the workforce, the arrival of newcomers, and a number of other factors allow some areas to flourish and to take advantage of protected lands as part of an economic development strategy. Communities without these economic assets, in spite of being surrounded by spectacular scenery, tend to struggle in their efforts to capitalize on the values of protected lands.

Correlations Between Real Growth in Total Personal Income 1970 to 2000, and Factors Influencing Economic Growth

(Different Public Lands Management Shown in **Blue**)



Source: Rasker, R. 2006. "An Exploration Into the Economic Impact of Industrial Development Versus Conservation on Western Public Lands." *Society and Natural Resources*. 19(3): 191-207. Rasker *et al.* 2005. *Public Lands Conservation and Economic Well-Being*. Sonoran Institute. "Protected" public lands are defined as those with some form of protection that excludes resource development. It includes Wilderness, National Parks, National Monuments, and Wildlife Refuges.

The figure above shows that public lands of all types correlate positively with growth in personal income. Protected public lands such as Wilderness are a factor that counties with above average income growth tend to have in common. An even stronger correlation is noted for unprotected public lands close to protected lands. This is likely because these areas are often used for commercial development such as ski resorts and other forms of large-scale tourism. Variables negatively correlated with growth in personal income are: driving distance to large cities, the degree of economic specialization, dependence on agriculture, mining, wood products and other "transformative" industries, and the relative lack of newcomers in the community.²⁶

²⁶ Statistical tests used in the study were not limited to correlations; they also included, among others, regression analysis, among others. The findings of all statistical tests yielded similar results. The findings of the correlation analysis are summarized here because they are the easiest to explain.

Literature Findings

Several conclusions can be drawn from this research review:

- There is no evidence in the published, peer-reviewed literature that protecting public lands is detrimental to the economy.
- Significant evidence exists in the literature to suggest a positive relationship between decisions to protect public lands and economic growth and prosperity.
- Literature on economic development shows that development can be described as a function of many different variables, and natural amenities, including Wilderness, are one of these variables. Other factors, such as access to markets and education levels, are also important.

What Do These Findings Mean for Central Oregon?

Central Oregon is already benefiting economically from its relationship to attractive public lands, some of which are protected as Wilderness. Factors that are helpful to have in place in order to benefit from protected public lands like Wilderness are:

- Commercial airport
- Educated workforce
- Influx of recent migrants
- Significant investment income
- High-wage services
- Diverse economy
- Growing earnings per job
- Growing per capita income

The above indicators are well represented in the study area. As a result, it appears Central Oregon is well positioned to take advantage of protecting natural areas as a tool for economic development.

Deschutes County has made the greatest strides in this direction. It is aided by the presence of the area's largest city, a well-established college, easy access to a major ski resort, and an active arts community.

Crook and Jefferson counties are beginning to benefit from the economic growth that has until recently been centered in Bend. They have their own natural areas of significance, cost and affordability advantages, and equal access to the regional airport.

The West – More and Less Wilderness

In this section we compare Deschutes County to all counties in the West that are broadly similar and have more and less Wilderness than Deschutes has currently to see if there is a performance difference. We use Deschutes County for comparison purposes because it contains the majority of economic activity and Wilderness in Central Oregon.

The procedure we followed is as follows:

Step 1. Map all counties in the continental West.

Step 2. Eliminate from the sample all non-mountainous counties (because the three-county region is mountainous, and topographically flat counties perform very differently) and counties with cities whose populations are over 500,000 (because the region has no large metropolitan areas, and it would not make sense to compare Central Oregon to, for example, Los Angeles).²⁷

Step 3. Map remaining counties with more and less Wilderness than Deschutes County has today. Using the neighborhood rule described in the footnote below, the threshold of nine percent (Wilderness as a percent of total land in a county) was used to determine counties with more and less Wilderness.²⁸

Step 4. Compare the performance of the two groups in terms of:

1. Latest data for:

- a. Per capita income
- b. Average earnings per job
- c. Unemployment rates

2. Growth in:

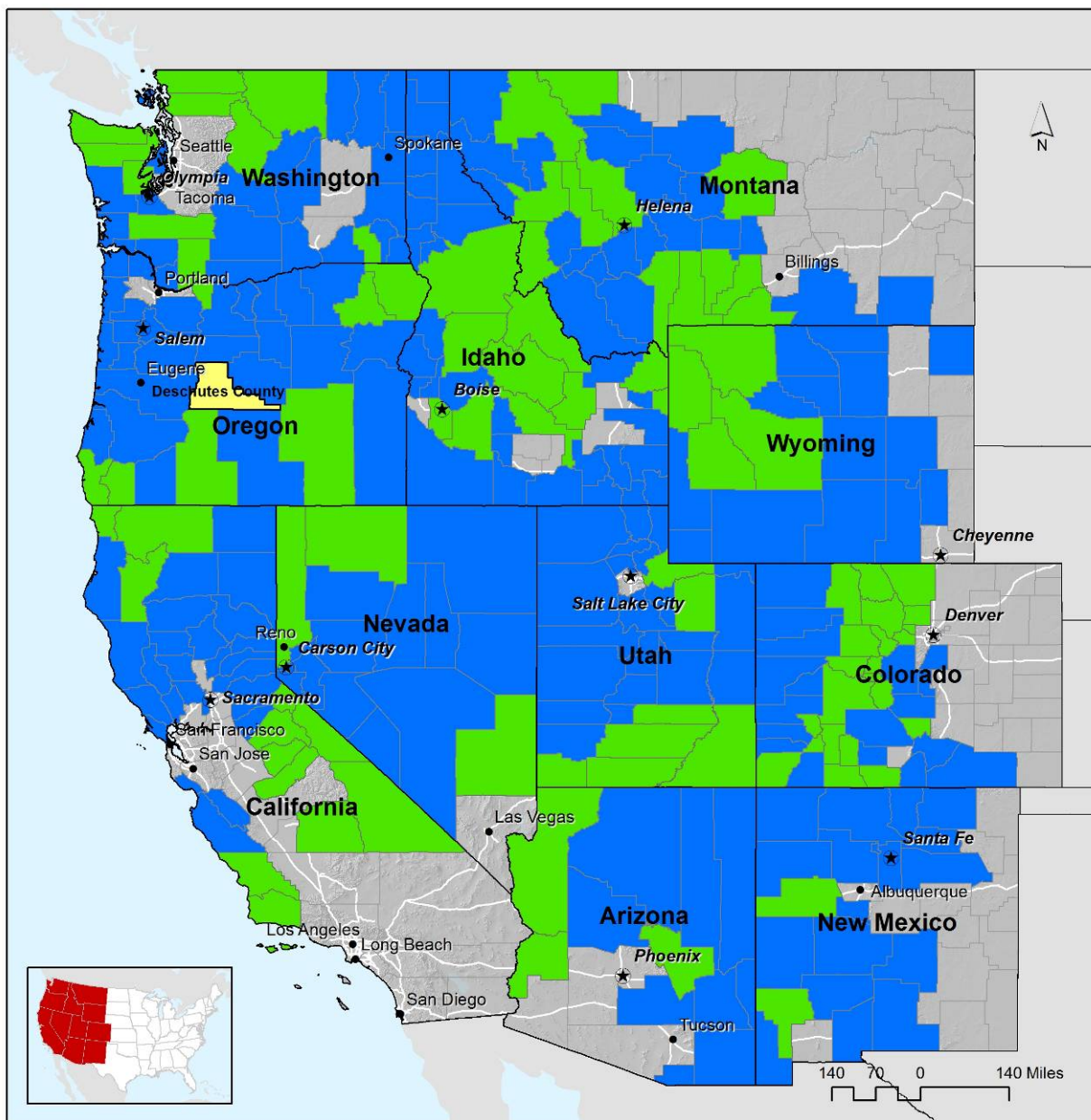
- a. Population
- b. Total personal income
- c. Per capita income
- d. Employment
- e. Average earnings per job

The map on the next page shows the results of this exercise, and tables and charts on the following page outline performance comparisons.

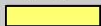
²⁷ Excluded counties with >500,000 people with "more Wilderness:" San Bernardino, Riverside, San Diego, Kern, Los Angeles, Fresno and Ventura California; Clark, Nevada; King, Snohomish and Pierce Washington; Pima and Maricopa, Arizona. Excluded counties with >500,000 people with "less Wilderness:" Arapahoe, Denver, El Paso and Jefferson, Colorado; San Francisco, San Mateo, Alameda, Orange, Contra Costa, Sacramento, Santa Clara, Stanislaus and San Joaquin, California; Salt Lake, Utah, Multnomah and Washington, Oregon; Bernalillo, New Mexico.

²⁸ The procedure for determining the threshold of 9% was based on the same methods used in Rasker, R., B. Alexander, J. van den Noort, R. Carter. 2004. Public Lands Conservation and Economic Well-Being. Sonoran Institute. Bozeman, Montana. The method consisted of using GIS to develop a "Neighborhood Rule;:" some counties in the West do not Wilderness inside their boundaries, but are immediately adjacent to counties that do. A methodology was developed to account for both the amount of a certain class of land within a county, as well as the county's immediate neighboring counties. Each county was split into one kilometer by one kilometer grid cells. A 50-kilometer radius (a "moving window") was drawn around the center of each cell in the input grid, and a calculation was made of the percent of each land classification captured by the "moving window," including land inside the county, and immediately next to the county in neighboring counties.

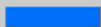
Role of Wilderness Across the West



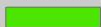
Benchmark County



Peer Counties With Less Wilderness



Peer Counties With More Wilderness



Major Cities



State Capital



Major Cities

Major Roads



Highways

Excluded flat counties and counties with large cities.

Data Sources: US Census, US Geological Survey

World Mercator Projection

Map Date: 8/29/2007



Comparison of “More Wilderness” to “Less Wilderness”

The comparison shows that counties in the West with more Wilderness performed better than counties with less Wilderness for all measures.

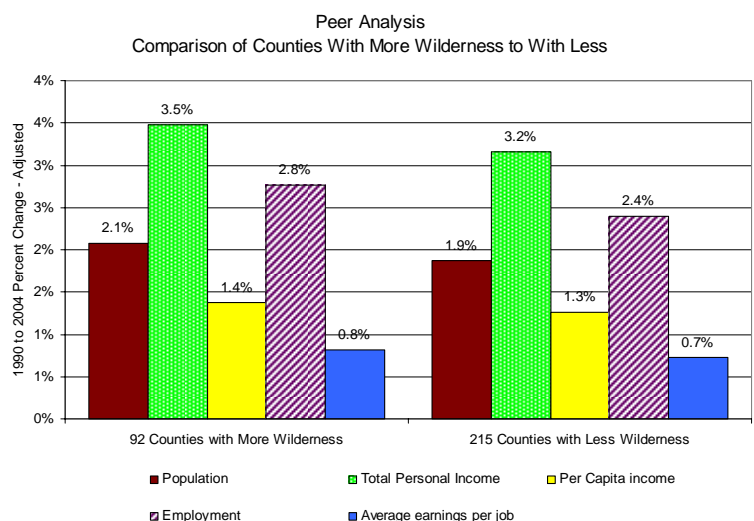
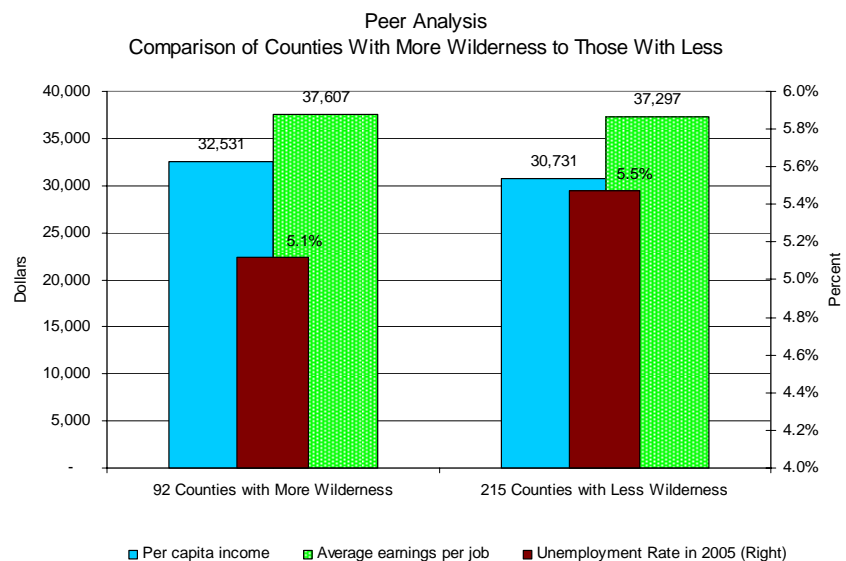
In 2005 “more Wilderness” counties had higher per capita income (\$1,800 higher) and earnings per job (\$310 higher), and lower unemployment (0.4% lower).

Over time, from 1990 to 2005, “more Wilderness” counties performed better in all five measures. This includes growth measures (jobs and income) and qualitative measures (per capita income and earnings per job).

These findings do not prove or disprove a cause-and-effect relationship between Wilderness and economic prosperity or growth. They do suggest that Wilderness is likely to have a positive effect on local economies – both for growth and improved earnings.

It is important to remember that as an economic asset protected public lands like Wilderness function in the broader context of access to markets, migration patterns, education levels, etc. Any economic development strategy should think of these factors in concert.

Percent change 1990 to 2005:	92 Counties with More Wilderness	215 Counties with Less Wilderness
In 2005:		
Per capita income	32,531	30,731
Average earnings per job	37,607	37,297
Unemployment Rate in 2005	5.1%	5.5%
Percent change 1990 to 2005 Adjusted:		
Population	2.1%	1.9%
Total Personal Income	3.5%	3.2%
Per Capita income	1.4%	1.3%
Employment	2.8%	2.4%
Average earnings per job	0.8%	0.7%



Sources: Bureau of Labor Statistics. 2006. Quarterly Census of Employment and Wages (QCEW). Washington, DC; U.S. Department of Commerce. 2007. Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS), Washington, DC.

Case Studies – Before and After Wilderness

The analysis in this section asks whether there was an obvious change in local economic performance after the designation of Wilderness. Each of the three case-study counties is similar to Deschutes County in demographic and economic terms, and each has more Wilderness than Deschutes County has currently. The three counties are: Flathead County, Montana; Skagit County, Washington; and Whatcom County, Washington.

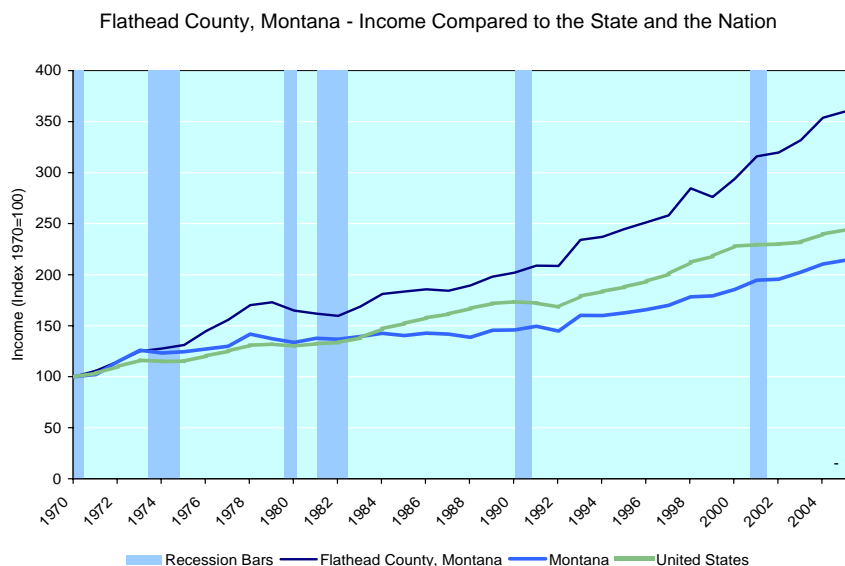
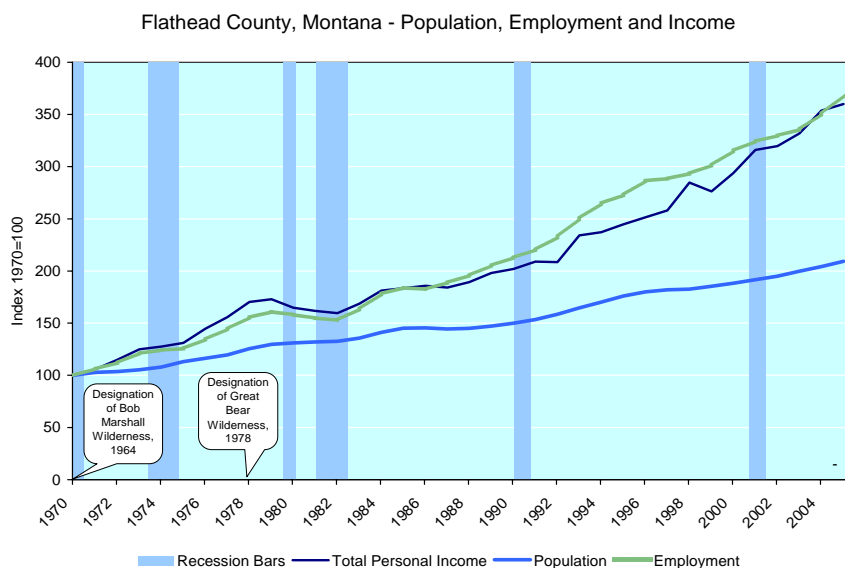
Flathead County, Montana

The Bob Marshall Wilderness (1,009,356 acres) was created in 1964 and the Great Bear Wilderness (286,700 acres) was designated in 1978. The figure to the right shows that there is no significant coincident downturn or upturn in the economy as a result of either Wilderness designation.

What is more apparent is that the county's population, employment and income have grown steadily over the last 35 years. The one prolonged downturn coincides with national recessions in the early 1980s. Economic growth and prosperity are compatible with the presence of significant Wilderness areas.

Over the last 35 years real income growth in Flathead County, Montana has outpaced that of the state and the nation. The average annual growth in personal income during that time was 3.7 percent for the county, compared to 2.2 percent for the nation.

The presence of substantial Wilderness is compatible with above average economic performance over time in Flathead County.



Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis, Regional Economic Information System. Washington DC.

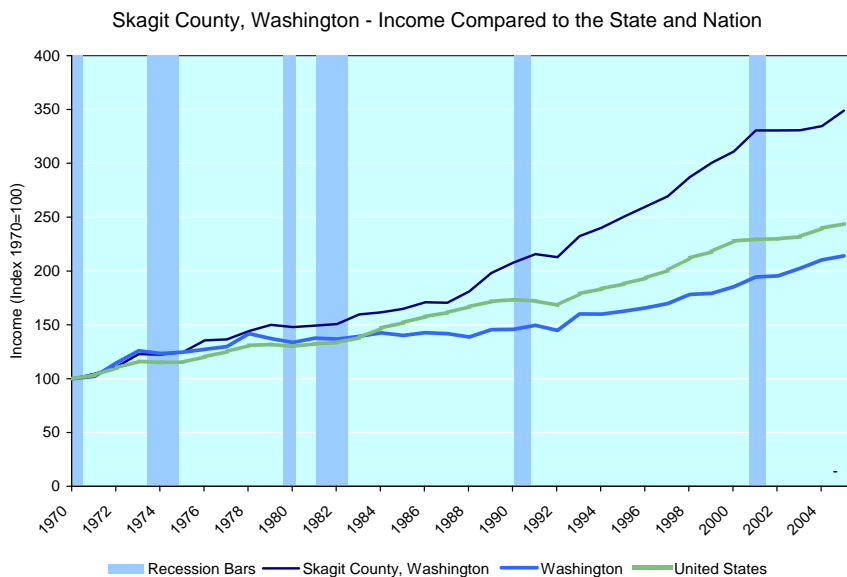
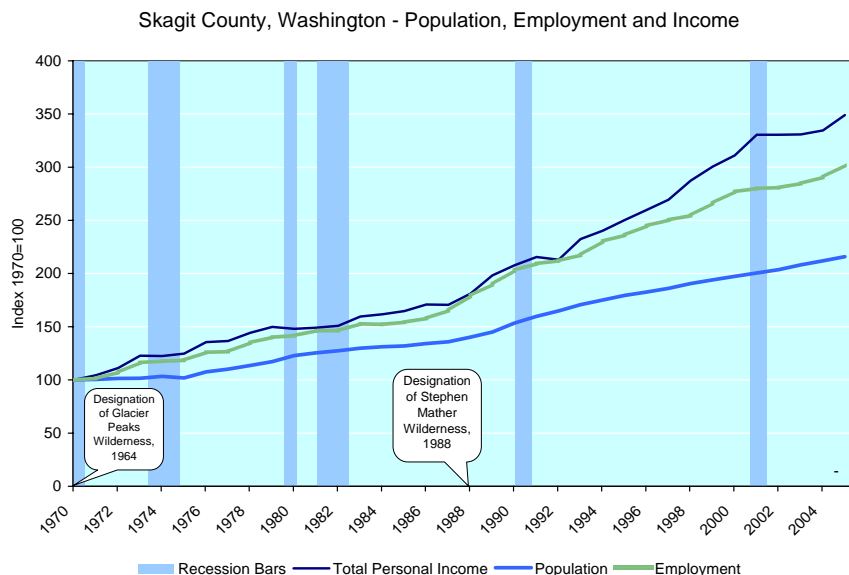
Skagit County, Washington

The eastern third of Skagit County contains portions of two Wilderness areas: the Glacier Peak Wilderness (570,573 acres), designed in 1964, and the Stephen Mather Wilderness (634,614 acres), designated in 1988.

The figure to the right indicates that the designation of these Wilderness areas coincides with a rise in total personal income, population and employment, especially after the designation of the Stephen Mather Wilderness.

Beginning in 1988 the pace of growth of real personal income in Skagit County grew perceptibly. This is coincident, but not necessarily because of, the designation of the Stephen Mather Wilderness. In fact, Skagit County has for the last three and a half decades been a strong economic performer, outpacing the state and the nation. From 1970 to 2005 real personal income grew by an average annual rate of 3.6 percent compared to 2.2 percent for the nation.

The presence of substantial Wilderness is compatible with above average economic performance over time in Skagit County.



Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis, Regional Economic Information System. Washington DC.

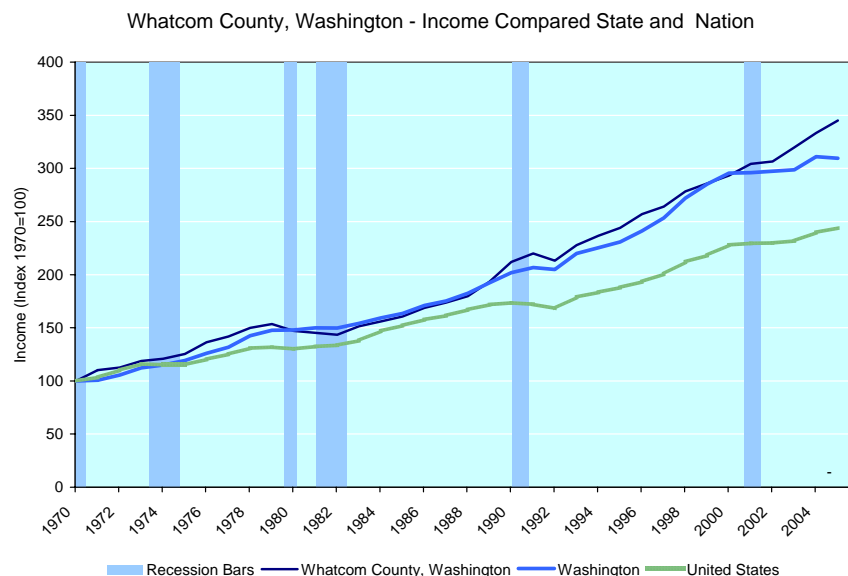
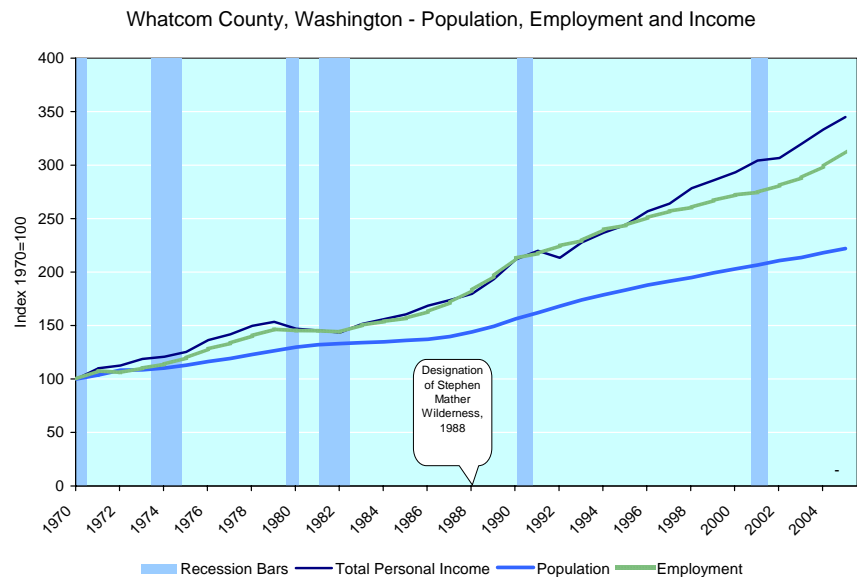
Whatcom County, Washington

The Stephen Mather Wilderness (634,614 acres) was designated in 1988. The figures to the right do not show any obvious impact, positive or negative, that coincides with the designation date. All indicators are on the rise since designation.

Whatcom County appears to be influenced by national recessions, especially in the early 1980s and 1990s. This is less true for the early part of the this century when Whatcom county shows greater resilience.

Total personal income growth in Whatcom County has kept track with the state of Washington, except for the last few years, where it has outpaced the state. Compared to the nation, Whatcom County's income has growth substantially faster. From 1970 to 2005, the average annual growth in personal income for the county was 3.6 percent, compared to 2.2 percent for the nation.

The presence of substantial Wilderness is compatible with above average economic performance over time in Whatcom County.



Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis, Regional Economic Information System. Washington DC.

Before-and-After Findings

These three case studies show that for counties similar to Deschutes County, and its neighbors in Central Oregon, Wilderness designation is compatible with sustained and above average economic performance.

Each of the three case-study counties has more Wilderness, as a percent of the total county land base, than Deschutes has currently or would with designation of the Badlands as Wilderness. And each exceeds the economic performance of their respective states and the nation over the long-term.

The line graphs presented do not prove or disprove a cause-and-effect relationship between Wilderness and economic growth. Nor do they show an obvious “before and after” effect that coincides with the designation date of Wilderness areas. They do illustrate a clear relationship between national recessions and short-term local economic decline.

This underscores a point made throughout this report: in the larger scheme of things the presence or absence of Wilderness *by itself* is not a determinant factor of success. There are more significant drivers of economic change, such as business cycles, access to markets, and the education of the work force.

As an economic resource, Wilderness should be considered as part of a larger package of assets that help communities succeed in their efforts to attract and retain people and businesses. A quality environment, protected from degradation and appreciated for its unique characteristics, is part of what is allowing relatively isolated rural and small metro areas to compete successfully today for people, jobs and wealth.



Overall Findings

Federally managed public lands have a variety of economic values, some related to the use of natural resources, such as timber and minerals, and some related to non-use values, such as scenery and solitude.

In Central Oregon, economic activity related to the commercial use of public lands constitutes a small to middling portion of the regional economy, and its contribution to employment and income is diminishing as the economy as a whole diversifies.

A growing body of literature shows that quality of life, based in large measure on the setting provided by natural resources and amenities on protected public lands, are key to attracting people and businesses to a community. The most plausible explanation for the rapid growth of the study region's population and economy is migration tied to quality of life leading to economic expansion.

There is no evidence, in the literature or in our own west-wide analysis, that the designation of Wilderness in a county has been detrimental to the economy. There is compelling evidence suggesting a positive relationship between protecting public lands and economic growth and prosperity.

In addition to the presence of protected natural amenities, there are more significant determinants of economic success. These include the education of the workforce, ready transportation access to markets, and a diverse economy with an emphasis on high-wage producer services. In the context of these factors, Wilderness is a additive benefit, resulting in stronger economic growth and enhanced well being.

This is evident from our examination of Deschutes County peers with more and less Wilderness. Those with more Wilderness show a performance advantage over peers with little or no Wilderness. This is true over time and of current performance.

The three case-study counties, each with characteristics similar to Deschutes County but with a greater percentage of their land base protected as Wilderness, show strong long-term economic growth. Wilderness has not held these peers back, and is likely part of a package of variables that have translated into above-average economic performance.

Central Oregon is fortunate to have all of the fundamental building blocks – from in-migration and a commercial airport to economic diversity and high-wage services – to support future economic growth. In this context, it is ideally suited to benefit from additional protections to the environment.

Deschutes County has to date the most developed approach to capturing quality of life values and translating them into economic growth. Crook and Jefferson counties are on this path as well. They have their own natural areas of significance, cost and affordability advantages, improving education and earnings levels, and equal access to the regional airport.

CONCLUSION

Central Oregon – Deschutes, Crook and Jefferson counties – has a strong, diverse and growing economy that is attracting many new residents. Bend acts as a regional hub for service industries, medical care and retail trade, and attracts a significant amount of non-labor income, such as retirement and investment income.

West-wide, and in Oregon specifically, research shows that environmental and recreational amenities play an important role in attracting people and businesses. Central Oregon is emblematic of this trend and is well positioned to take advantage of economic benefits related to protecting the environment. There are several reasons for this.

First, the region already demonstrates that quality of life is one of the main driving forces behind its current success. Natural amenities are a key aspect of this quality of life. Efforts to protect the landscape will help to further this trend.

Second, apart from landscape and amenity variables, the region also possesses the main building blocks of a successful economy in a relatively isolated location. These include in-migration, high-wage services, investment and retirement income, access to larger markets, and growing economic diversification.

The combination of a compelling landscape with these other variables puts Central Oregon in a strong position to benefit economically from additional land protections. These benefits include faster job and income growth, higher earnings per job and per capita income, and lower unemployment.

As the region continues to grow and develop its land base, setting aside signature lands in their pristine condition will become even more important.

Much is known about the positive role of Wilderness in the western economy: numerous studies confirm a positive association between economic growth and the presence of Wilderness. Analysis for this report shows that areas in the West with more Wilderness perform better economically than those with less, and counties similar to those in Central Oregon have grown and prospered following the designation of major Wilderness areas.

The proposed Badlands Wilderness represents an opportunity for Central Oregon. The region's landscape is an integral component of local quality of life, and that quality of life is a key attractant for people and businesses. Permanent protection of the land is simply a smart economic decision.

Appendix A: Differences within the Region

This section outlines some of the major economic differences between the three study-area counties.

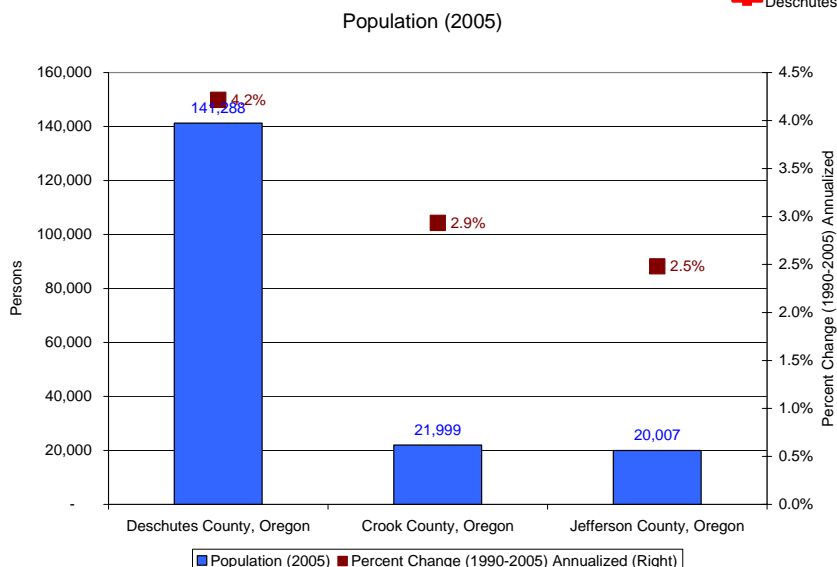
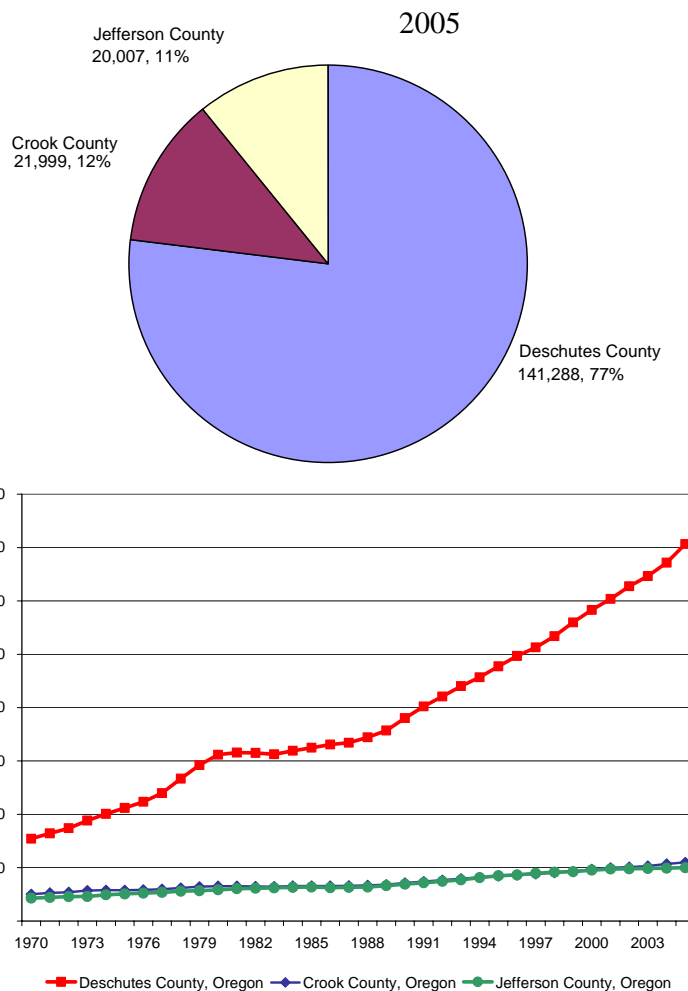
Population

The bulk of the population in the region (77%) is in Deschutes County. Jefferson and Crook counties have roughly the same population (20,007 and 21,999, respectively) representing 11 percent and 12 percent of the region's population.

Deschutes County has seen the largest growth in population since 1970. The average annual rate of population growth for Deschutes County, from 1970 to 2005, was 4.4 percent. This compares to 2.4 percent for Jefferson County, and 2.3 percent for Crook County.

From 1990 to 2005 Deschutes County's average annual rate of population growth was 4.2 percent (see red blocks in image below), while that of Jefferson and Crook counties was 2.9 percent and 2.5 percent, respectively.

By comparison, the average rate of population growth for the state, from 1990 to 2005, was 1.6 percent.



Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS), Washington, DC.

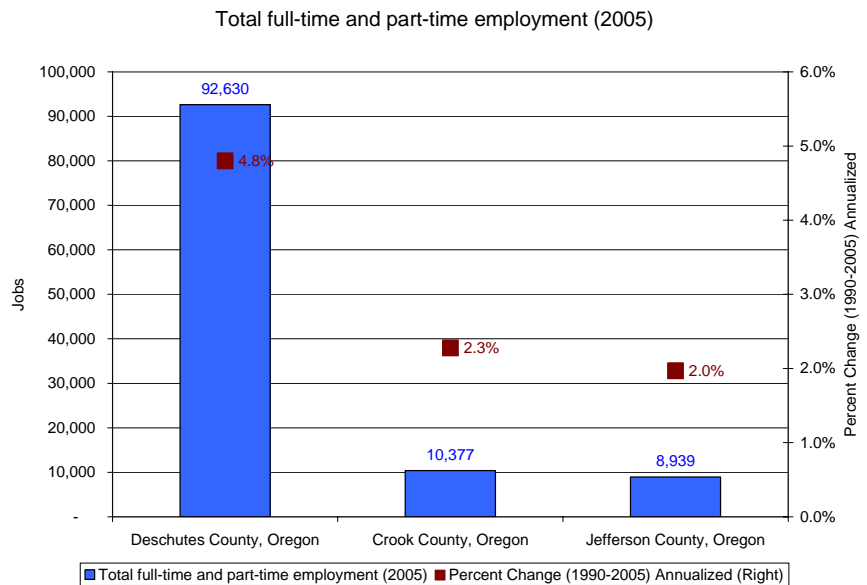
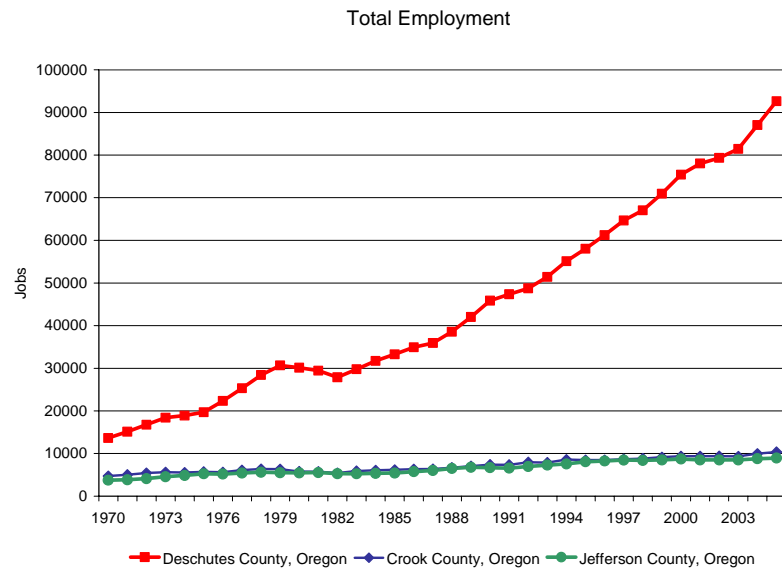
Employment

Deschutes County generated the most new jobs and grew the fastest. From 1990 to 2005 employment grew at an annualized rate of 4.8 percent. The only period of recession was in the late 1970s and early 1980s.

Crook and Jefferson counties have also seen a steady growth in jobs. From 1990 to 2005, Crook County's employment grew by an annual rate of 2.3 percent, adding 2,970 new jobs

In Jefferson County 2,267 new jobs were created at an annual growth rate of 2 percent.

By comparison, the state of Oregon added new jobs from 1990 to 2005 at a rate of 2.1 percent per year.



Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS), Washington, DC.

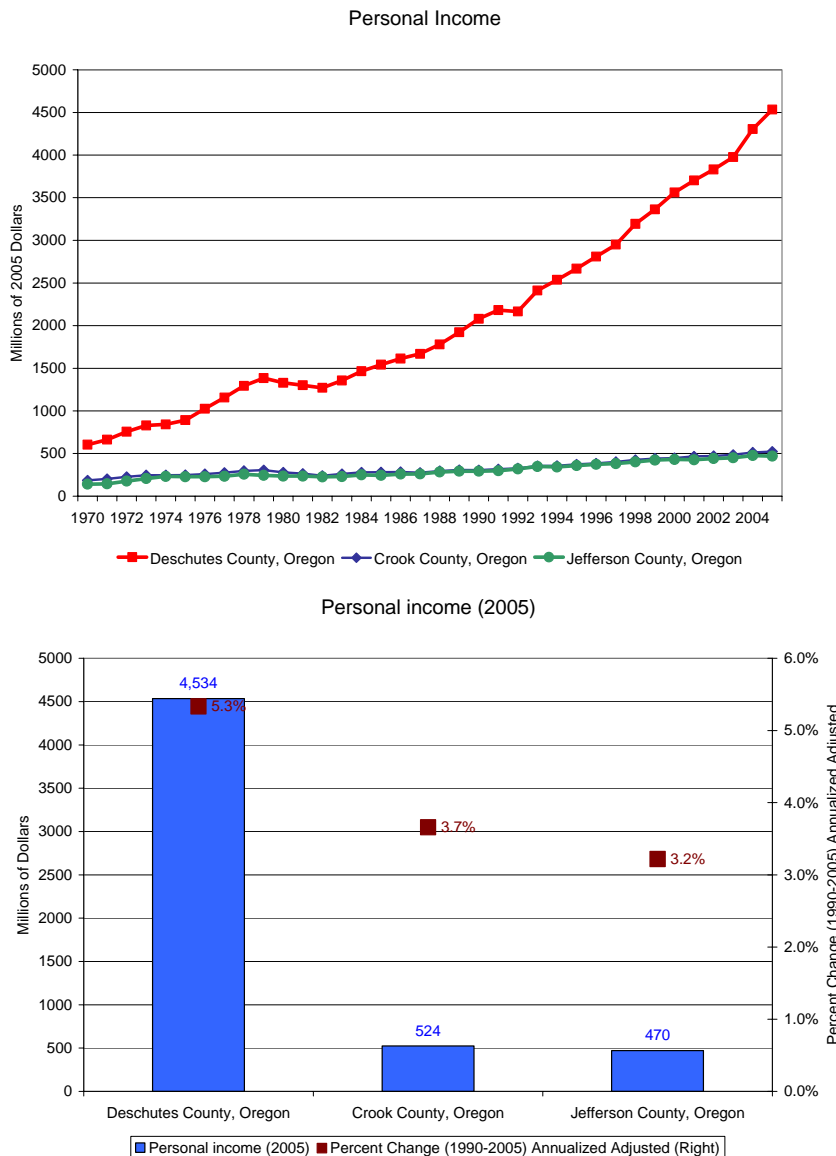
Personal Income

Deschutes County has also seen the highest rate of growth in personal income (all income figures are reported in real dollar terms, adjusted for inflation to 2005 dollars).

As is the case with employment, a recession can be seen in the late 1970s and early 1980s. Since that period the growth of personal income has been strong and steady.

From 1990 to 2005 the average annual rate of growth in real personal income for Deschutes County was 5.3 percent. Crook and Jefferson counties also grew during that time, at an average annual rate of 3.7 percent and 3.2 percent, respectively.

By comparison, the average annual rate of personal income growth in the state during the same period of time was 2.9 percent.



Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS), Washington, DC.

For all three counties the rate of personal income growth is higher than the rate of employment growth. There are two possible reasons for this: either rising earnings rates or an increase in investment and retirement income. As the following pages illustrate, Deschutes County has seen a rise in both. For Jefferson and Crook counties, the relatively higher rise in personal income is mostly due to increase in non-labor sources.

Average Earnings Per Job

Since the 1970s there has been a long-term decline in real earnings per job. While Deschutes County has recovered to levels higher than that of 35 years ago, wages in Jefferson and Crook counties are lower, in real terms, than they were in the 1970s.

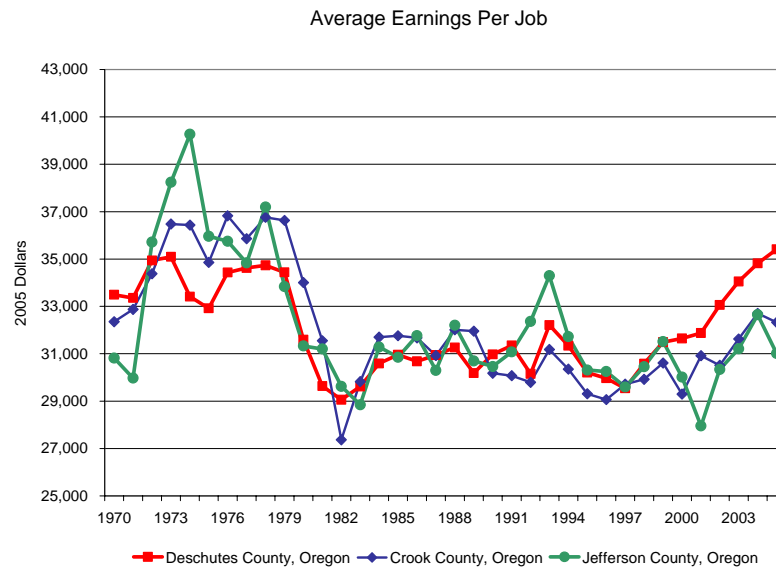
There are a number of reasons why there has been a long-term decline in earnings per job.

These include:

1. Average earnings per job statistics include full and part-time employment. In some counties only a portion of the eligible workforce works full-time, driving down wage statistics. Communities with an increase in tourism may see a decline in earnings due to a rise in seasonal (part-time) workers.
2. Communities that have established themselves as regional retail trade centers may see a decline in wages due to the low wages paid in retail trade.
3. Structural changes in the economy may have resulted in the loss of relatively high-wage occupations.
4. More women have entered the workforce, and because of relatively lower pay, or because of fewer hours worked (or both), earnings may decline over time.
5. Earnings will decline if job growth is primarily from low-wage services industries.
6. People may be choosing to live in some communities for quality of life reasons. In some areas the increase in population can outpace the rate of job creation, thereby flooding the labor market and causing a downturn in wages.

The table to the right shows that real earnings per job, from 1990 to 2005, have risen significantly for Deschutes County, at annual average rate of 2.86 percent. For Jefferson and Crook counties the rise of earnings has barely kept ahead of the rate of inflation.

By comparison, average earnings for the state as a whole, from 1990 to 2005, was 1.1 percent.



	Earnings per job (2005\$)		
	1990	2005	Annual % Change
Deschutes County	30,978	35,410	2.86
Jefferson County	30,464	31,013	0.36
Crook County	30,978	32,325	0.87

Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS), Washington, DC.

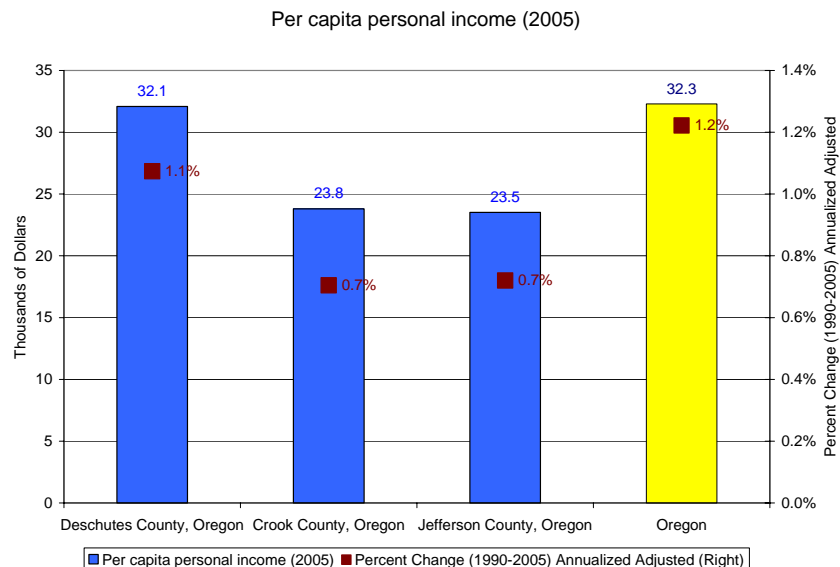
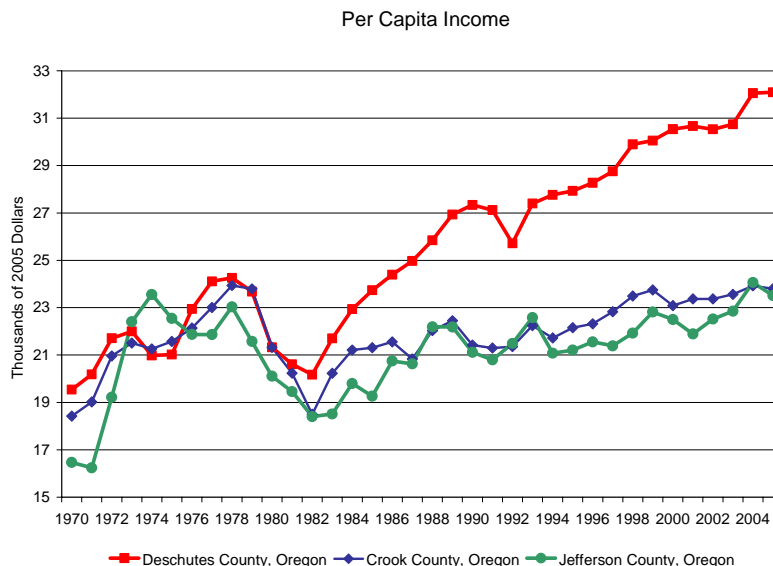
Per Capita Income

Per capita income is total personal income divided by population; it includes labor income (earnings by people who work) as well as non-labor income (money earned from investments, age-related payments, and other forms of government transfer payments).

Deschutes County has the highest per capita income (\$32,100), \$9,000 more than Jefferson and Crook counties (\$23,000).

The growth in per capita income is also the highest for Deschutes County (1.1% per year from 1990 to 2005), but slightly lower than the state (1.2% per year).

As previous pages showed, the growth of per capita income in Deschutes County is stimulated by increasing personal income from labor and non-labor sources. In Jefferson and Crook counties non-labor income, in particular from age-related sources, are important and growing components of per capita income.



Source: U.S. Department of Commerce. 2007. Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS), Washington, DC.

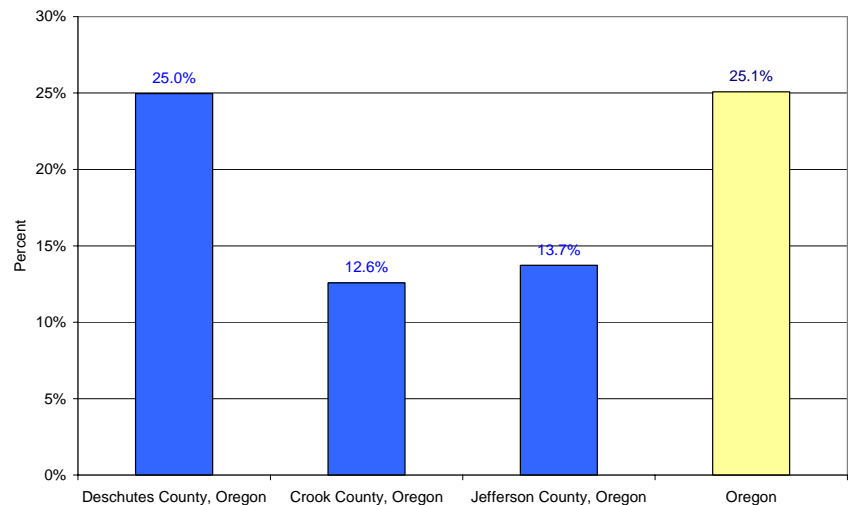
Education

An important measure of a county's economic potential is the education level of its workforce. The figures on this page show the differences in education rates in two ways: the percent of the workforce with a college degree, and the percent without a high school education.

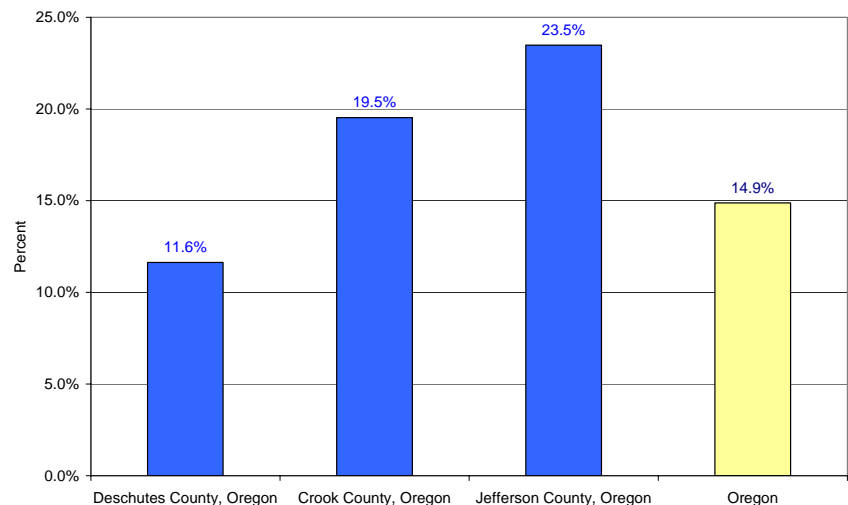
Deschutes has the highest proportion of the workforce with a college degree (25%), equal to the state. Jefferson County has 13.7 percent with a college degree, and Crook County 12.6 percent.

The least educated county, in terms of the percent of the workforce without a high school degree, is Jefferson County (23.5%), followed by Crook County (19.5%). Deschutes County has 11.6 percent of the workforce without a high school degree, which is lower than the state, at 14.9 percent.

Education Rate (% of population 25 and over who have a college degree)



Education Rate (% of population 25 and over without high school diploma)

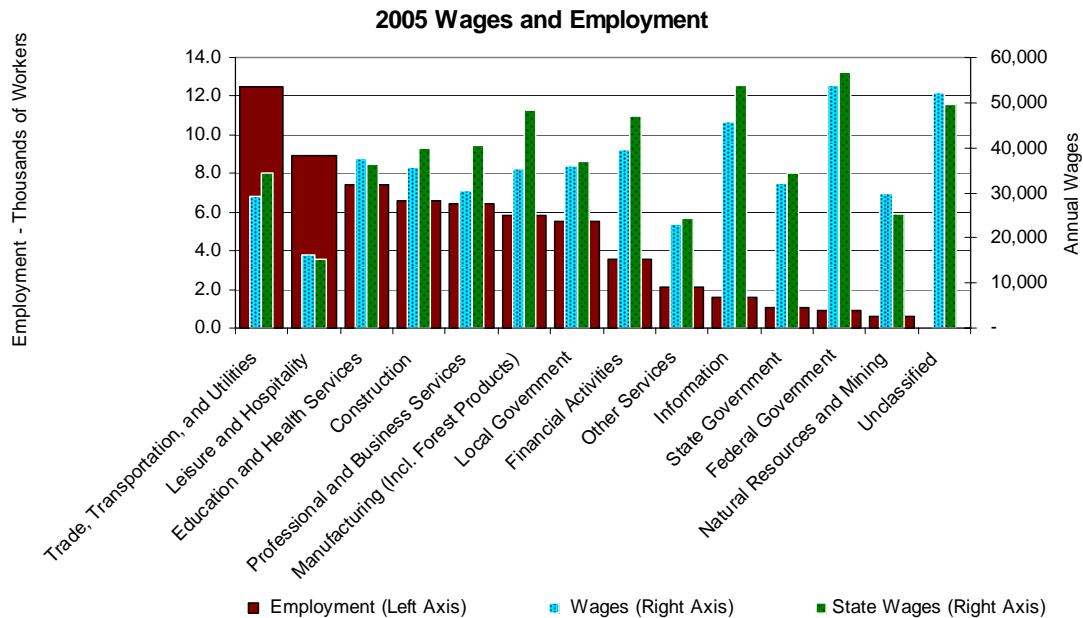


Source: Bureau of the Census. 2000. Washington, DC.

Note: Jefferson County includes the Confederated Tribes of Warm Springs.

Wages by Industry (2005) – Deschutes County

The largest employment category in Deschutes County – Trade, Transportation and Utilities – pays on average \$29,152. Highest wage sectors are Federal Government (\$52,753), Information (\$45,734) and Financial Activities (\$39,714), plus several industry sectors unclassified by the Bureau of Labor Statistics. A large employer – Leisure and Hospitality – has the lowest average wages (\$16,099).

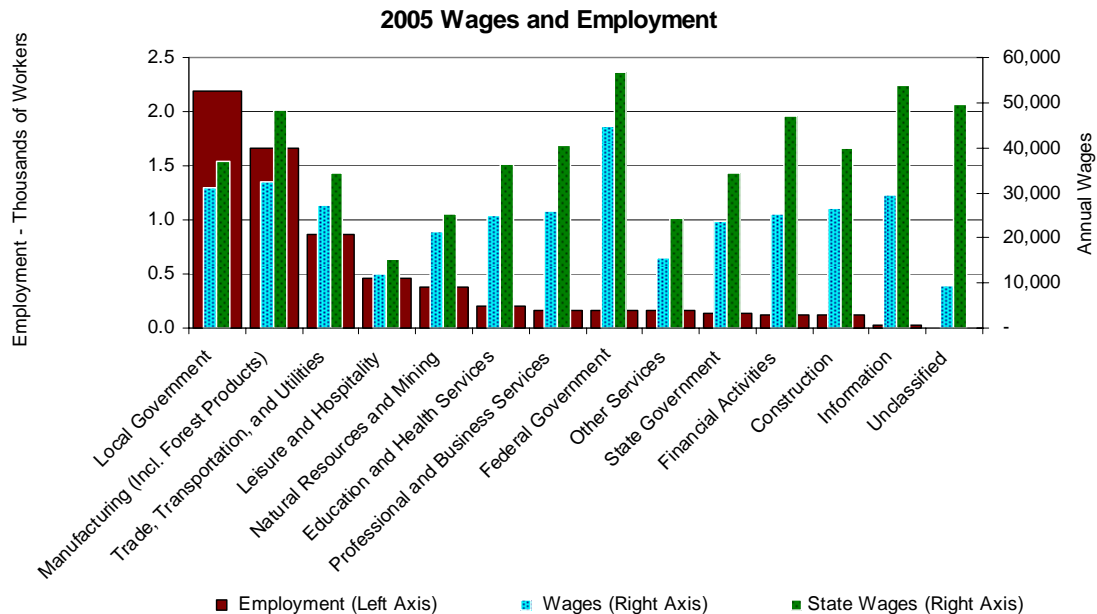


County Wages and Employment in 2005			
	Employment	% of Total	Average Annual Wages
Total Private & Public	63,016	100%	31,492
Total Private	55,549	88%	30,690
Goods-Producing	13,039	21%	35,189
Natural Resources and Mining	604	1%	29,847
Agriculture, forestry, fishing & hunting	469	1%	28,163
Mining	135	0%	35,709
Construction	6,609	10%	35,515
Manufacturing (Incl. Forest Products)	5,826	9%	35,374
Service-Providing	42,510	67%	29,309
Trade, Transportation, and Utilities	12,457	20%	29,152
Information	1,620	3%	45,734
Financial Activities	3,519	6%	39,714
Professional and Business Services	6,431	10%	30,477
Education and Health Services	7,452	12%	37,628
Leisure and Hospitality	8,912	14%	16,099
Other Services	2,105	3%	22,955
Unclassified	15	0%	52,063
Total Public	7,467	12%	37,463
Federal Government	880	1%	53,753
State Government	1,056	2%	32,121
Local Government	5,531	9%	35,892

Wages are shaded in green when they are more than 20% higher than the wages for all sectors and in red when they are less than 20% lower.

Wages by Industry (2005) – Jefferson County

The largest employment category – Local Government – pays on average \$31,244. Of the three counties, Jefferson County has the highest dependence on Government as a source of employment (37% of employment). This is due to classification of Confederated Tribes of Warm Springs employees as Government jobs. The second largest employer is Manufacturing, with the second highest wages (\$32,377). Seventy percent of Manufacturing in Jefferson County is Lumber and Wood Products Manufacturing.

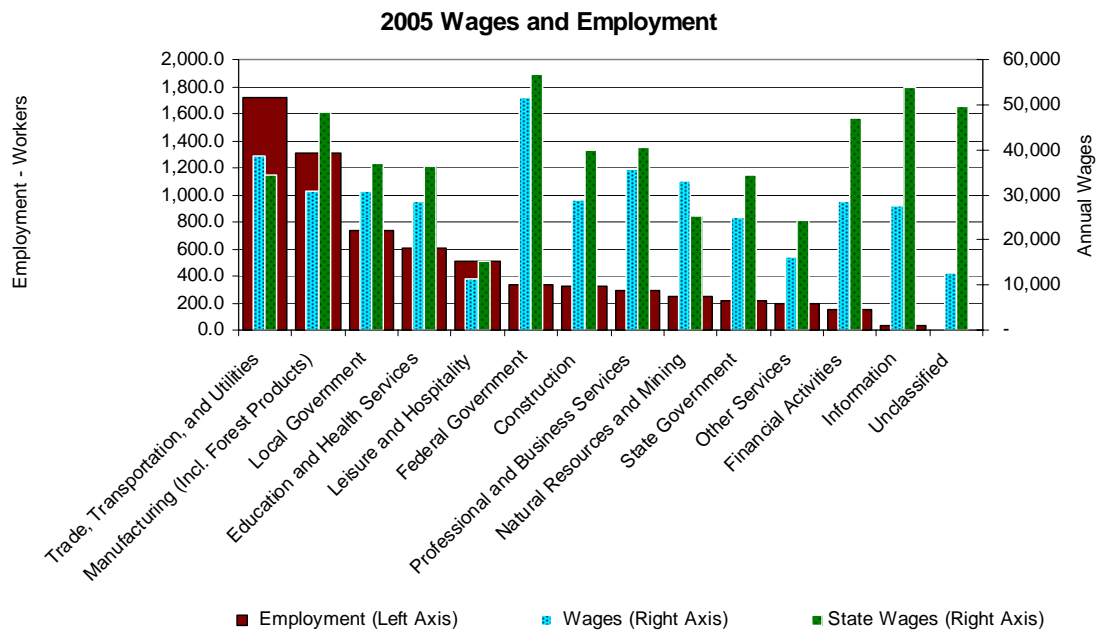


County Wages and Employment in 2005			
	Employment	% of Total	Average Annual Wages
Total Private & Public	6,657	100%	28,391
Total Private	4,164	63%	26,400
Goods-Producing	2,170	33%	30,125
Natural Resources and Mining	380	6%	21,361
Agriculture, forestry, fishing & hunting	#N/A	#N/A	#N/A
Mining	#N/A	#N/A	#N/A
Construction	121	2%	26,635
Manufacturing (Incl. Forest Products)	1,668	25%	32,377
Service-Providing	1,994	30%	22,348
Trade, Transportation, and Utilities	860	13%	27,257
Information	22	0%	29,500
Financial Activities	125	2%	25,268
Professional and Business Services	166	2%	26,096
Education and Health Services	198	3%	25,120
Leisure and Hospitality	464	7%	11,929
Other Services	158	2%	15,653
Unclassified	1	0%	9,429
Total Public	2,494	37%	31,708
Federal Government	162	2%	44,817
State Government	137	2%	23,796
Local Government	2,195	33%	31,244

Wages are shaded in green when they are more than 20% higher than the wages for all sectors and in red when they are less than 20% lower.

Wages by Industry (2005) – Crook County

The highest wages in Crook County are in Federal Government (\$51,672) and Trade, Transportation and Utilities (\$38,632), which also has the largest proportion of employees. The lowest wages are in Leisure and Hospitality (\$11,227).

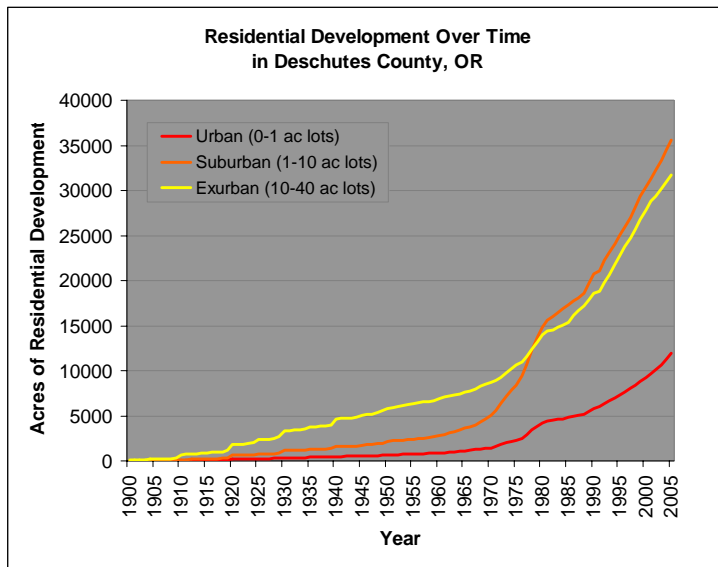


County Wages and Employment in 2005			
	Employment	% of Total	Average Annual Wages
Total Private & Public	6,685	100%	31,662
Total Private	5,401	81%	30,835
Goods-Producing	1,892	28%	30,667
Natural Resources and Mining	254	4%	32,973
Agriculture, forestry, fishing & hunting	#N/A	#N/A	#N/A
Mining	#N/A	#N/A	#N/A
Construction	327	5%	28,841
Manufacturing (Incl. Forest Products)	1,311	20%	30,674
Service-Providing	3,509	52%	30,926
Trade, Transportation, and Utilities	1,724	26%	38,632
Information	36	1%	27,602
Financial Activities	152	2%	28,485
Professional and Business Services	295	4%	35,540
Education and Health Services	606	9%	28,596
Leisure and Hospitality	503	8%	11,227
Other Services	191	3%	16,344
Unclassified	3	0%	12,566
Total Public	1,284	19%	35,151
Federal Government	334	5%	51,672
State Government	217	3%	24,841
Local Government	733	11%	30,652

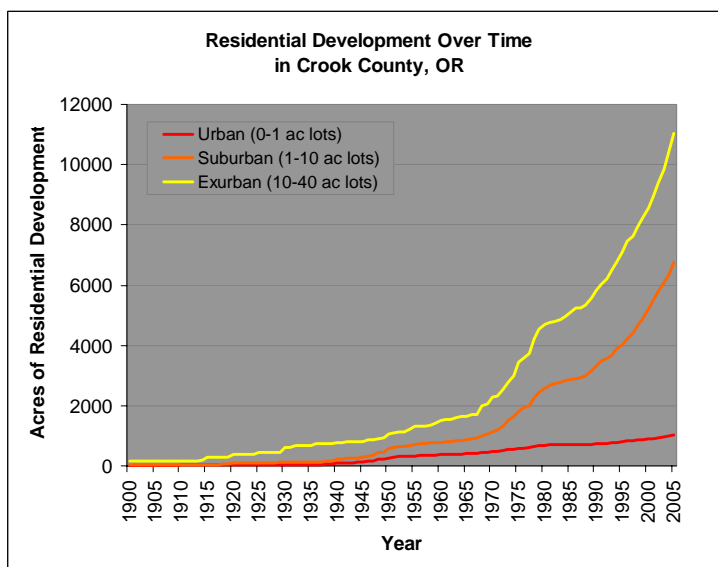
Wages are shaded in green when they are more than 20% higher than the wages for all sectors and in red when they are less than 20% lower.

Source: Bureau of Labor Statistics. 2006. Quarterly Census of Employment and Wages (QCEW). Washington, DC.

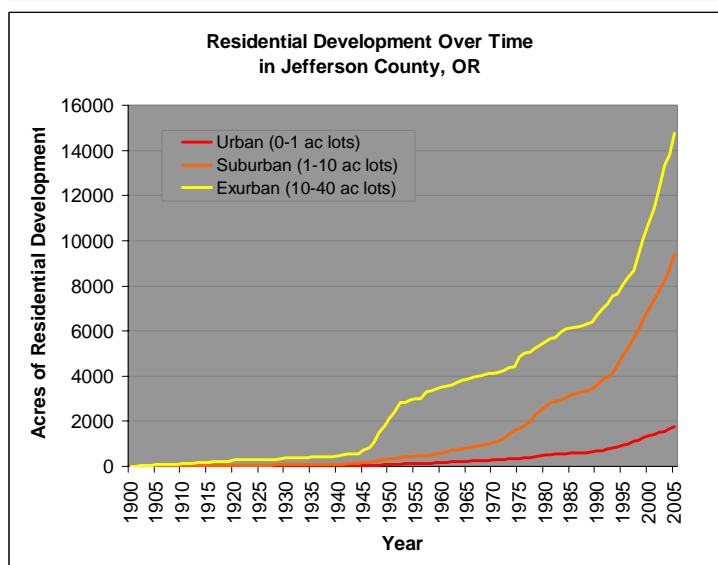
Appendix B: County-Level Land Use Trends



In Deschutes County, Suburban density building is the top consumer of land for development, slightly outpacing Exurban development. Deschutes has significantly more Exurban development than both of the other counties combined. In 2005 Exurban building accounted for 40 percent of all development. Deschutes is the only county in the region with strong Urban development. These lots account for 78 percent of all built lots, and 15 percent of built acreage.

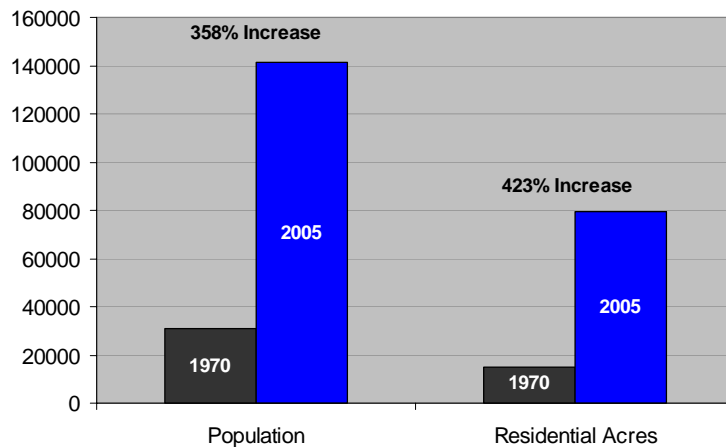


In Crook County, Exurban development is the largest and fastest growing pattern of residential land use. In 2005, seven percent of all developed lots were built at Exurban densities, accounting for 59 percent of all developed land. Urban lots are not growing at the same rate as Exurban and Suburban development, and account for six percent of current residential building.



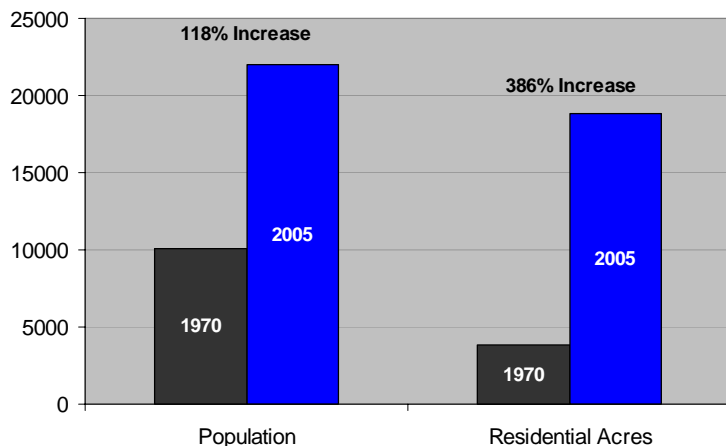
In Jefferson County, the pattern is similar to that of Crook County. Exurban lots and acreage are the largest and fastest growing form of residential land utilization. In 2005 Exurban building accounted for 6 percent of all developed lots and 59 percent of all built acreage. In contrast to Crook County, there is modest growth in Urban residential units.

**Growth in Population vs. Acres of Residential Development
Deschutes County, OR**



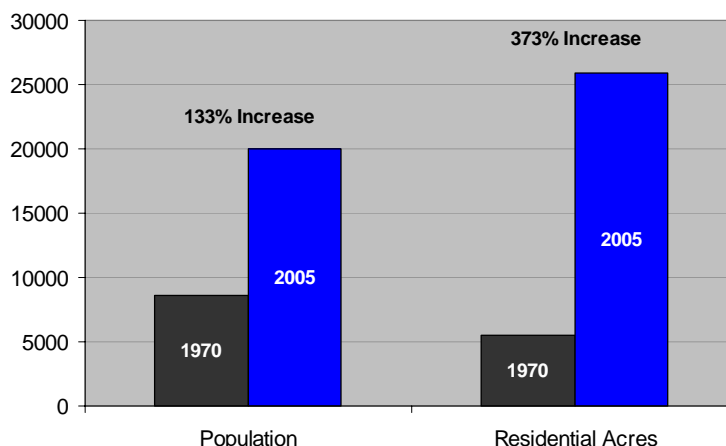
Over the last 35 years, Deschutes County has seen the closest match between population growth and land consumption. This is due to the preponderance of Suburban density development, and the relatively large amount of Urban building, which helps to offset Exurban land use. That said, Deschutes has more Exurban residential development than both Crook and Jefferson counties combined.

**Growth in Population vs. Acres of Residential Development
Crook County, OR**



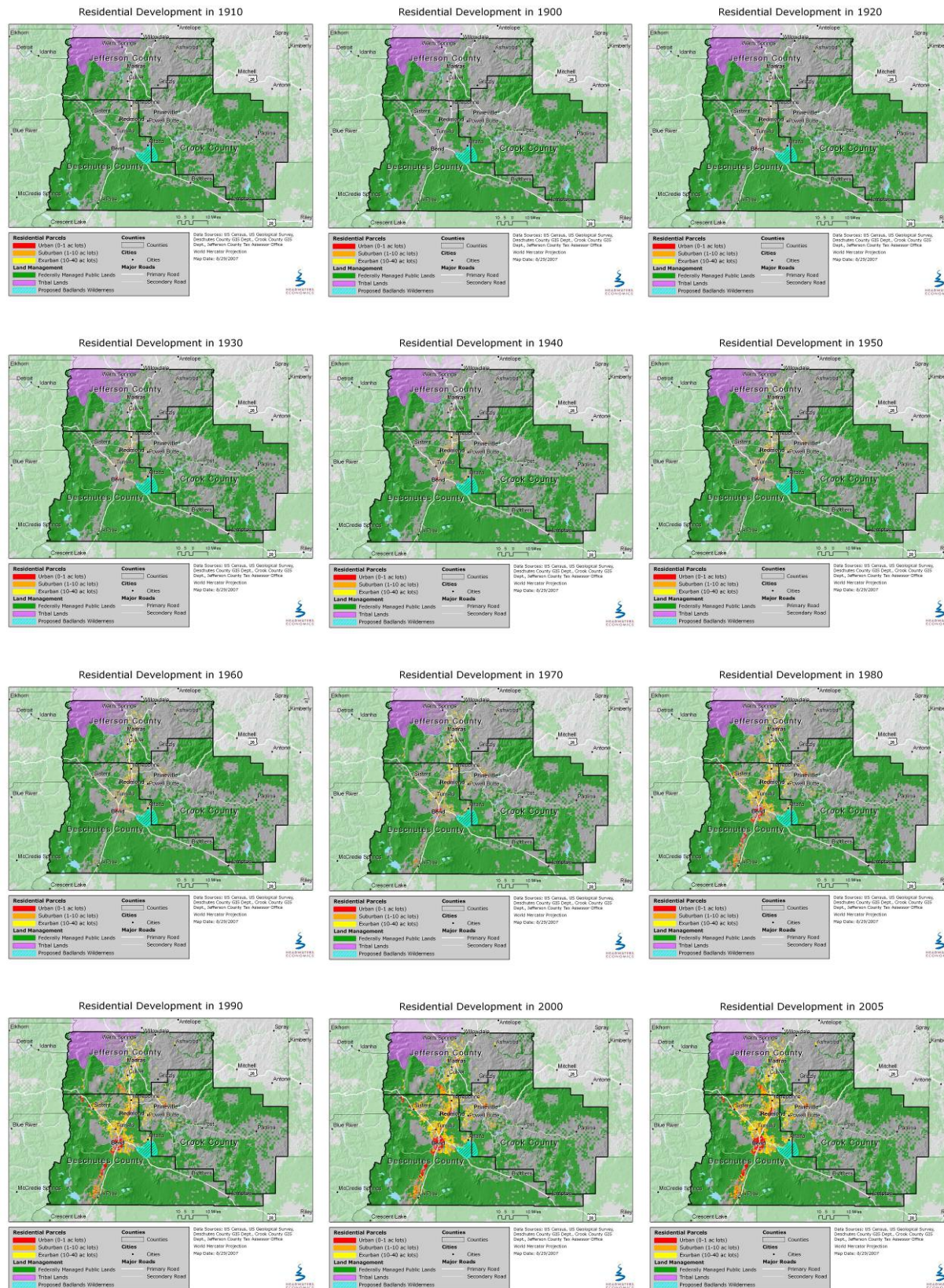
Crook County has a large gap between its population increase (118%) and growth in land consumption (386%) since 1970. This is driven by Exurban and Suburban development, and the absence of much new Urban building.

**Growth in Population vs. Acres of Residential Development
Jefferson County, OR**



The gap between population and land consumption growth in Jefferson County tracks closely to that in Crook County. Over the last 35 years, land consumption has grown almost three times as much as population. This gap continues to grow.

Below is a series of residential build-out maps, from 1900 to 2005, for the three-county area. To view these maps at a larger scale and as a slide show go to www.headwaterseconmics.org.





HEADWATERS
ECONOMICS

P.O. Box 7059
Bozeman, MT 59771
406-599-7423

www.headwaterseconomics.org