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# Atlas of Human Adaptation to Environmental Change, Challenge, and Opportunity: Northern California, Western Oregon, and Western Washington

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## Abstract

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This atlas illustrates the dimensions, location, magnitude, and direction of social and economic change since 1989 in western Washington, western Oregon, and northern California that have occurred during a major transition period in natural resource management policy as well as large decreases in timber harvests. The diversity and the social and economic health of the Northwest Forest Plan region are synthesized by examining the fundamental attributes of the region, provinces, and communities; the atlas includes information about ourselves, our settlements, and our natural resources. We set the stage for dialogue, debate, and developing a set of indicators to monitor the dimensions of well-being for sustainable development. The atlas is a tool for decision-makers, civic leaders, economic development practitioners, researchers, and others interested in understanding change, easing the transition, and finding and pursuing opportunities to enrich society.

Keywords: Northwest Forest Plan, social and economic indicators, GIS, atlas, regional scale, provincial scale, county scale.

## Executive Summary

The Northwest Forest Plan (NWFP) is a new paradigm for forest management. It is intended to provide a sustainable balance between the needs of people and the environment by focusing on three areas: economic assistance, forestry, and coordination among agencies. It is a major effort to end years of legal gridlock and to address human and ecological needs served by Federal forests of the Pacific Northwest and northern California.

Developed in response to the need to maintain habitat for the northern spotted owl, this new approach to forest management led to reductions in timber harvests across all ownerships in western Washington, western Oregon, and northern California from 1989 to 1994. This fundamental change in forest management reflects social values. These values share common roots with those that led to the passing of the Endangered Species Act, international agreements for the protection of wildlife, and local, regional, and national responses to international global environmental awareness. Under the Northwest Forest Plan, the decline in timber harvests and subsequent changes are aimed at achieving, for the most part, long-term societal goals and sustainability.

The period from 1989 to the present has been marked by an abrupt transition with rapid declines in timber harvest and related effects. Human populations in the Pacific Northwest impacted by change will emerge from this transition period as having either addressed or disregarded the problems, issues, and opportunities facing rural economies, communities, and regions. The as-yet-unknown long-term impacts of forest management changes will evolve from the actions and processes that individuals, communities, and society at large initiate during this transition.

## How This Atlas Will Contribute

During the late 1980s, many people predicted major impacts, including the demise of the timber industry in many rural areas and selected community collapse. In a spatial display created from county-level data, this document demonstrates how, and in what direction, change has occurred.

This atlas illustrates the dimensions, location, magnitude, and direction of social and economic change in western Washington, western Oregon, and northern California, beginning in 1989. This atlas synthesizes the diversity and the social and economic health of the Northwest Forest Plan region by examining the fundamental attributes of our region, provinces, and counties; it includes information about ourselves, our settlements, and our natural resources. The stage is set for dialogue, debate, and development of a set of indicators to monitor the dimensions of well-being for sustainable development. The atlas is a tool for decisionmakers, civic leaders, economic development practitioners, researchers, and others interested in understanding change, easing the transition, and finding and pursuing opportunities to enrich society.

Explaining the "why" of change requires a scientific research design with well-defined dependent, intervening, and independent variables, which is beyond the scope of this atlas. A change in a community or county, such as high in-migration, is not due to any one factor but several factors. The replacement of labor by technology in mills and factories has had an immense effect on the economic well-being of some rural communities. Rural resource-based communities also are affected by regional, national and global factors, both political and economic, such as globalization of the economy and cyclical variations of the market. Our stories attempt to show the magnitude, location, and direction of change and the possible reasons for change.

## Telling the Story

Three base maps (maps 1-3) and two Mylar overlays provide context. Following a section on context, we ask seven questions. The information addressing each question is accompanied with maps, figures, and tables that illustrate the collected data. The questions are as follows:

1. What kinds of social and economic changes have taken place in the face of reduced timber harvest? Are Pacific Northwest communities changing? If so, how?
2. What changes have occurred in the timber industry since 1990? Has timber employment changed? Is private harvest increasing?
3. Have changes in Federal harvest had a significant effect on county revenues?
4. Are western Washington, western Oregon, and northern California singularly dependent on natural resources?
5. What Federal assistance has aided cities and rural areas?
6. How have the population characteristics changed? What are the trends in migration, educational attainment, and changes in ethnicity?
7. What have been the changes in selected social issues such as rates of poverty, property and violent crimes, and alcohol-related incidences?

The stories depicted in each map and accompanying text are complex and require consideration of data accessibility and limitations, the external conditions occurring during the time frame of each map, such as recessions and broader social trends, and undefined relations among indicators. We highlight below some important points depicted in each map.

## **Change in Timber Harvest and Wood Products Employment**

### *Change in Public Timber Harvest*

- Public timber harvest is the volume of timber harvested from Federal, state, county, and municipal lands. Public timber harvests decreased in all but four counties in the region. The volume decreases were particularly large on the Olympic Peninsula, in the Washington Cascades, and in coastal and southwest Oregon.

### *Change in Public and Private Timber Harvest*

- The total change in timber harvest was affected by both the harvest from public lands and the harvest from privately owned lands. As Federal harvests declined, harvests from other ownerships could either moderate or exacerbate the change.
- The largest declines in total harvests were in many of the same areas that showed large declines in public harvests, but additional counties in Washington also showed large total decreases.

### *Change in Wood Products Employment*

- Employment changes in the wood products industry are affected by the availability of raw material as well as several other conditions.
- Wood products employment decreased in most counties of the region and percentage decreases were particularly large in the counties along the Columbia River, in southwestern and along coastal Oregon, and in northern California.
- Secondary wood products manufacturing caused increases in wood products employment in certain areas.

### *Federal Lands-Related Payments to Counties*

- Federal lands-related payments are relatively more important to the rural counties of southwest Oregon and Klamath provinces and Skamania and Jefferson Counties in Washington. Federal legislation has insulated counties that historically have received large payments from experiencing rapid declines in the Federal payments as timber harvests and sales values have fallen.

## **Change in Economic Conditions: Economic Performance**

### *Unemployment Rate Compared to Region*

- Unemployment rates in the Pacific Northwest have followed national trends since the mid-1980s, but there has been a large variation in absolute value of the rates in the three states when compared to the Nation.
- Unemployment rates in northern California, the Washington Cascades, and selected coastal counties have consistently been higher than the rate in the rest of the region.

### *Change in Total Employment*

- Changes in wood products employment provide one indicator of economic performance, but it is important to know the changes in total employment to have a better understanding of the general health of the economy and availability of potential opportunities for unemployed workers. The lowest increases in total employment were in the rural southwestern Oregon and northern California counties. Changes in total employment for a county may not always reflect changes in specific communities.

### *Wage Trends*

- Wages are an indicator of job quality and labor market conditions. Events of the early 1980s were particularly devastating to the Pacific Northwest.
- Nonmetropolitan wages were consistently lower than metropolitan wages in each state. There was a general downward trend in earnings per job in counties along the Columbia River and certain coastal counties. Twelve of the 14 counties in the region that have had experiences with a downward trend in the region are counties with moderately large percentage declines in wood products industry employment.

### *Wage Level*

- The absolute value of wage levels is another useful indicator of economic performance. Wage levels were relatively high in those counties along the Interstate 5 corridor, from Everett to Salem, and in California counties adjacent to the San Francisco metropolitan area.
- Only four of the counties with the lowest wage level had a generally upward trend in wage levels. This indicated that those counties with the lowest wage level were not likely to increase in wage level ranking in the region.

## **Structural Economic Change**

### *Economic Diversity*

- Economic diversity is the way to assess the structure of the economy by looking at the distribution of jobs across industries. There were few patterns in economic diversity within the region, except for a concentration of low diversity in the eastern Washington portion of the region. There was a general trend of increasing industrial diversity over time in the region and the Nation.

### *Fastest Growing Nonfarm Industries*

- The country and the region have undergone a fundamental shift from a manufacturing economy to a knowledge-based economy. Services, trade, finance, and construction were the fastest growing sectors in most counties of the region. In very few counties in the region were manufacturing and durable goods manufacturing, in particular, the fastest growing industries.

### *Slowest Growing Nonfarm Industries*

- The relative decline of manufacturing was evident at the county-level in the Northwest Forest Plan region, and manufacturing was the slowest growing industry in 38 of the 72 counties. Durable goods manufacturing, which includes wood products manufacturing, was the slowest growing industry in 75 percent of these 38 counties.

## Characteristics of the Population

### *Change in County Population*

- The entire west coast and Pacific Northwest grew faster in population than the United States as a whole between 1989 and 1994. The population growth persisted even through the economic downturn in California.
- Different patterns were found in population growth. Many western counties considered to be high amenity counties experienced high migration turnover. Northern California counties tended to exhibit slow to medium growth during this period. The Puget Sound area and northern Cascades counties exhibited fast growth. In Oregon, the metropolitan areas and the Crook-Deschutes-Jefferson area had the fastest growth.

### *Change in Unincorporated and Incorporated Population*

- Because many of the counties in the NWFP region experienced fairly rapid population growth in the early 1990s, it was useful to examine whether the unincorporated portions experienced the same growth rates as the incorporated areas. Twenty-three of the 72 counties in the region experienced population growth in both incorporated and unincorporated portions of the county. Thirteen counties experienced rates of growth in unincorporated areas that actually exceeded rates for the incorporated population.

### *Migration Status and Trends*

- Increasing employment opportunities encourages in-migration and also encourages upward mobility, including the search for better jobs outside of an area. Of the 36 counties with high in-migration in the region, 27 also had high out-migration relative to the rest of the counties in the region.
- Net migration, natural change (the difference between births and deaths), and to a lesser extent, international in-migration affect population dynamics. For 16 of 26 metropolitan counties, the majority of the population growth was attributed to natural increase. Some natural decrease occurred along the northern Oregon coast.

### *Change in Ethnicity*

- Ethnicity is an indicator of identity and population diversity and has implications for forest management, as well as for school systems, health providers, and other public services. Asian or Pacific Islanders showed the largest percentage of increase between 1980 and 1990 in the major metropolitan areas of Oregon, Washington, and northern California. Native American populations increased on the coasts of Oregon and Washington.

### *Educational Attainment*

- Educational attainment is one of the most important indicators of lifetime economic opportunities. Nationally, 25 percent of individuals did not have a high school diploma in 1990. The three states fell below the national figure with California at 24 percent, Oregon at 19 percent, and Washington at 16 percent. The percentage of individuals that were high school graduates or had some college during 1990 was lower in California and higher in Washington and Oregon as compared to the national percentage.
- The higher educational attainment was found in the major metropolitan areas such as Puget Sound, Portland, and San Francisco suburban areas. In contrast, the lowest educational attainment in the region was in counties traditionally dependent on natural resources, and that creates a challenge for economic and community development efforts focusing on diversifying the economy.

## Social Issues

### *Change in Income Maintenance*

- Income maintenance is an indicator of economic stress and poverty. The largest per capita average annual change from 1989 to 1994 occurred in northern California and southern Oregon, in the Puget Sound region, and in counties of eastern Washington. The smallest change occurred in the San Francisco Bay area, Shasta County, California, and Jackson and Deschutes Counties, Oregon.

### *Change in Poverty Rate*

- The poverty rate reflects the distribution of income and is an indicator of economic distress. In 1995, California had a higher percentage of persons of poverty level than the national level of 14 percent. Oregon and Washington were lower than the national average. Poverty rates increased in the majority of counties in all three states and ranged from 0 to 5 percent for 1979 to 1993.

### *Change in Violent Crime Rates*

- High and increasing violent crime rates reflect social and economic distress. Violent crime rate analysis showed that the majority of the NWFP landscape had no primary trend—neither an increase nor a decrease in violent crime. Pockets of change were evident, however.

### *Change in Property Crime Rates*

- An increase in rates of property crime is an indicator of economic or social stress, or both. Downward trends were reflected in Skagit and Adams Counties, Washington; and Clatsop, Clackamas, Wasco, Marion, Linn, and Jackson Counties and the Oregon coast, Oregon. In Humboldt, Tehama, and Glenn Counties, California, property crime rates appeared to be in an upward trend from 1989 to 1995.

### *Alcohol-Related Incidences*

- Alcohol-related incidences are indicators suggesting stress in a person, family, or community. In Oregon, 6 to 10 people per 1,000 population experienced alcohol-related arrests. In Washington, between 10 and 15 percent of the total collisions in 1993 were alcohol related. Data from California were unavailable.
- Local differences may have reflected variations in enforcement activities as well as absolute differences in the rate of incidences. The lower rates in the largest metropolitan areas may be related to several factors including the availability of alternative transportation, the prevalence of nonalcohol drug problems, and the close proximity of alcohol sources in urban areas.

## Federal Assistance

### *Northwest Economic Adjustment Initiative*

- The Northwest Economic Adjustment Initiative is one part of the NWFP intended to support the region's people and communities during the economic transition resulting from changing natural resource management policies.
- Beginning in fiscal year 1994, \$1.2 billion was allocated over 5 years. Four counties in the region received between \$20 and 30 million. Most of the eligible counties received \$10 million or less.

## Summation

The period from 1989 to the present was a time of transition for Washington, Oregon, and California as a result of changing forest management policies. Counties in the NWFP region have and will continue to experience impacts to society and the economy related to changes in public and private forest management. This atlas provides information on many of these social and economic variables, which can be used as indicators of change. The information is on state and county levels.

This atlas provides information under six sections, as follows:

1. Change in timber harvest and wood products employment
2. Change in economic conditions—economic performance
3. Structural economic change
4. Characteristics of the population
5. Social issues
6. Federal assistance

With this document, the stage is now set for dialogue, debate, and development of a set of indicators to monitor the dimensions of our natural resources. This atlas is a tool for those interested in understanding change, easing the transition, and finding and pursuing opportunities to enrich society.

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## Introduction

The Northwest Forest Plan (NWFP) is a new model for forest management. It is intended to provide a sustainable balance between the needs of people and the environment. This plan, originally entitled the "Forest Plan for a Sustainable Economy and a Sustainable Environment," focuses on three areas: economic assistance, forestry, and coordination among agencies. The plan is a major effort to end years of legal gridlock and develop a direction addressing the human and ecological needs served by Federal forests in the Pacific Northwest and northern California.

In response to the need to maintain habitat for the northern spotted owl (*Strix occidentalis caurina*), a new approach to forest management led to reductions in timber harvests across all ownerships from 15.6 billion board feet in 1989 to 8.4 billion board feet in 1994 in western Washington, western Oregon, and northern California. This fundamental change in forest management reflects social values. These values share common roots with those that led to the passing of the Endangered Species Act (U.S. Laws, Statutes 1973), international agreements for the protection of wildlife, such as Convention of International Trade of Endangered Species (CITES), and local, regional, and national responses to international global environmental awareness. Under the NWFP, the decline in timber harvests and subsequent changes are aimed at achieving, for the most part, long-term societal goals and sustainability.

Historians suggest that it took 150 years to arrive at the current situation in the Pacific Northwest with regard to timber harvest and subsequent effects, as shown in the following list:

Early to mid 1800s	Cutting of forests begins with non-Indian settlers.
Late 1800s to early 1900s	Lumber camps are noticeable, and commercial timber harvesting increases.
Early 1900s to World War II	Widespread logging and industry harvest of old growth from private lands increases.
Post-World War II	Logging begins on Federal lands in the Pacific Northwest.
1980s	1988-89 is an all-time peak in timber harvesting activity.  Public perceptions and expectations concerning Federal timber management in the Pacific Northwest lead to increased protection of species and ecosystems.  Timber harvesting declines.  Widespread social and economic changes begin to occur in the region.

The 10 years from 1989 to 1999 were marked by a new transition with rapid declines in timber harvesting and related effects. Human populations in the Pacific Northwest impacted by change will emerge from this transition period as having either addressed or disregarded the problems, issues, and opportunities facing rural economies, communities, and regions. The as-yet-unknown long-term impacts of forest management changes will evolve from the actions and processes that individuals, communities, and society at large initiated throughout this transition period.

This atlas is a reference book illustrating the dimensions, location, magnitude, and direction of social and economic change in western Washington, western Oregon, and northern California that have occurred since 1989. We synthesized the diversity and the social and economic health of the NWFP region by examining the fundamental attributes of our region, provinces, and communities, including information about ourselves, our settlements, and our natural resources. We set the stage for dialogue, debate, and development of a set of indicators to monitor the dimensions of well-being for sustainable development. This atlas is a tool for decisionmakers, civic leaders, economic development practitioners, researchers, and others interested in understanding change, easing the transition, and finding and pursuing opportunities to enrich society.

## Telling the Story

Three base maps (maps 1-3) and two Mylar<sup>1</sup> overlays provide context. Following the section on context, we ask seven questions:

1. What kinds of social and economic changes have taken place in the face of reduced timber harvest? Are Pacific Northwest communities changing? If so, how?
2. What changes have occurred in the timber industry since 1990? Has timber employment changed? Is private harvest increasing?
3. Have changes in Federal harvest had a significant effect on county revenues?
4. Are western Washington, western Oregon, and northern California singularly dependent on natural resources?
5. What Federal assistance has aided cities and rural areas?
6. How have the population characteristics changed? What are the trends in migration, educational attainment, and changes in ethnicity?
7. What have been the changes in selected social issues such as rates of poverty, property and violent crimes, and alcohol-related incidences?

During the late 1980s, many people predicted major impacts, including the demise of the timber industry in many rural areas and selected community collapse. In a spatial display created from county-level data, this document demonstrates how and in what direction change has occurred.

<sup>1</sup>The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

Explaining the “why” of change requires a scientific research design with well-defined dependent, intervening, and independent variables; that is beyond the scope of this atlas. A change in a community or county, such as high in-migration, is not due to any one factor but to several factors. The replacement of labor by technology in mills and factories has had an immense effect on the economic well-being of some rural communities. Rural resource-based communities also are affected by regional, national and global factors, both political and economic, such as globalization of the economy and cyclical variations of the market. Our stories attempt to show the magnitude, location, and direction of change and potential reasons why change has occurred. The focus of this material is on the NWFP region and does not directly portray the impacts and effects of implementing the plan. In other words, this is not a cause-and-effect analysis, but rather the status and trends of 22 social and economic indicators in the region.

#### **Organization of the Atlas**

This atlas is divided into seven sections:

1. Overlays and base maps
2. Change in timber harvest and wood products employment
3. Change in economic conditions—economic performance
4. Structural economic change
5. Characteristics of the population
6. Social issues
7. Federal assistance

Mylar transparencies of county names and province boundaries are included and can be overlaid on the other maps. The content and scope of the atlas are focused on selected indicators from the Northwest Forest Plan. It is intended to complement existing information. We expect the atlas to stimulate interest and discussion. We welcome your comments on this atlas.

## **Section 1:**

### **Overlays and Base Maps**

**County Names**

**Provinces of the Northwest Forest Plan**

**Federal and Tribal Lands**

**Population Distribution: 1990 Census Places**

**Metropolitan Counties**

# County Names



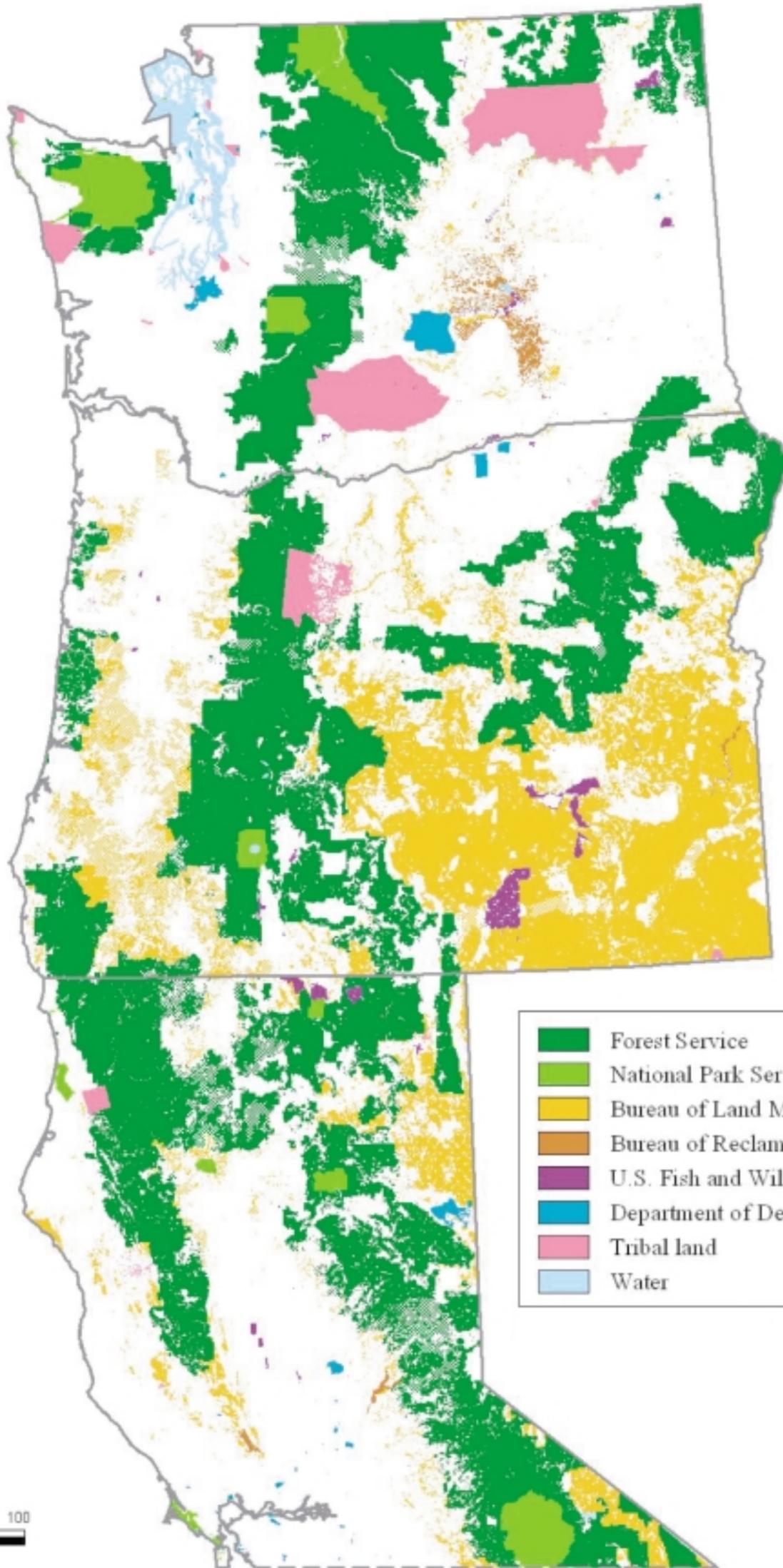
State boundaries

# Provinces of the Northwest Forest Plan



∩ Spotted Owl Province Boundaries      ∩ State Boundaries

# Map 1-Federal and Tribal Lands



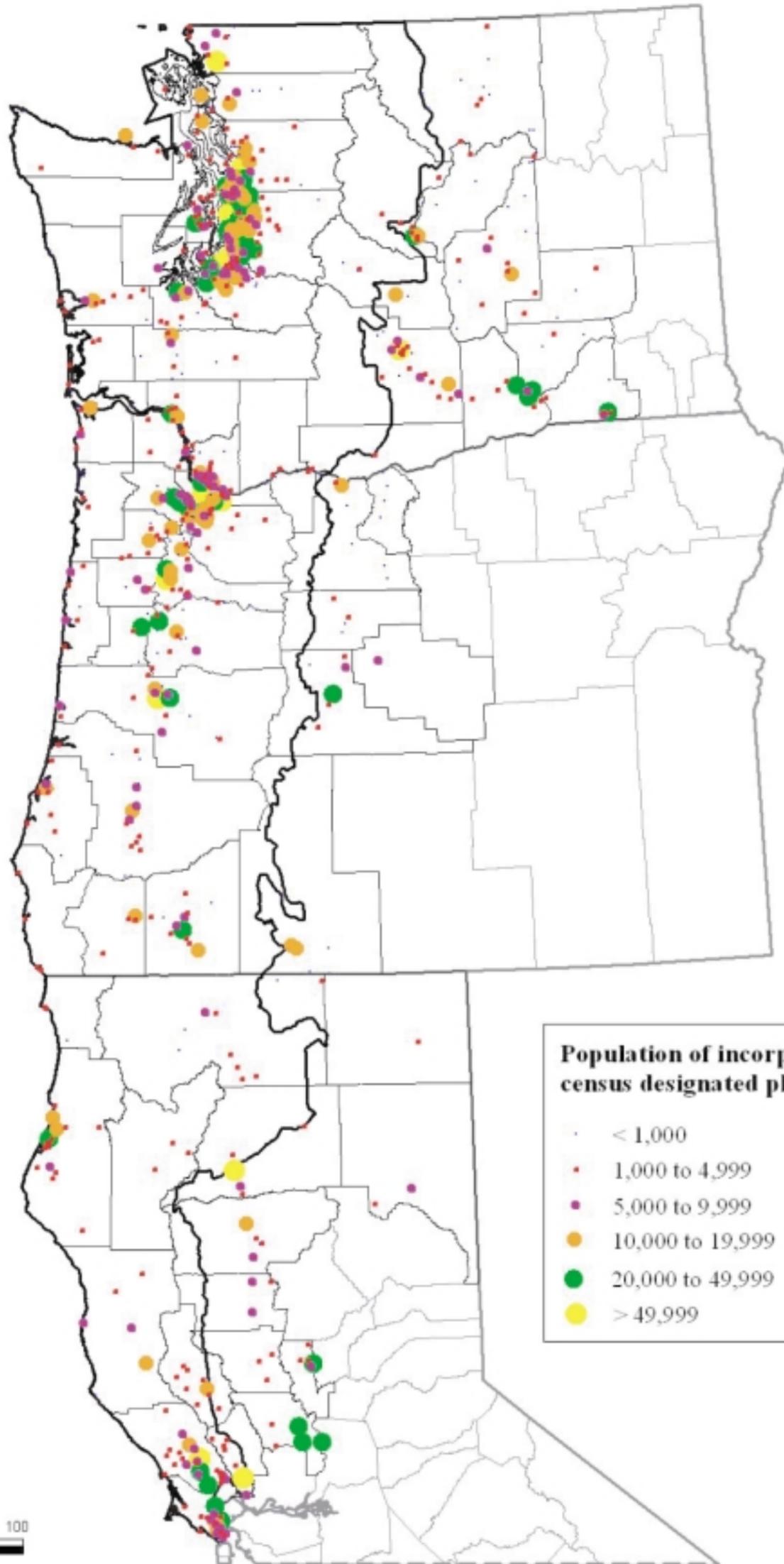
- Forest Service
- National Park Service
- Bureau of Land Management
- Bureau of Reclamation
- U.S. Fish and Wildlife Service
- Department of Defense
- Tribal land
- Water



0 25 50 75 100  
Miles

State boundaries

## Map 2-Population Distribution: 1990 Census Places

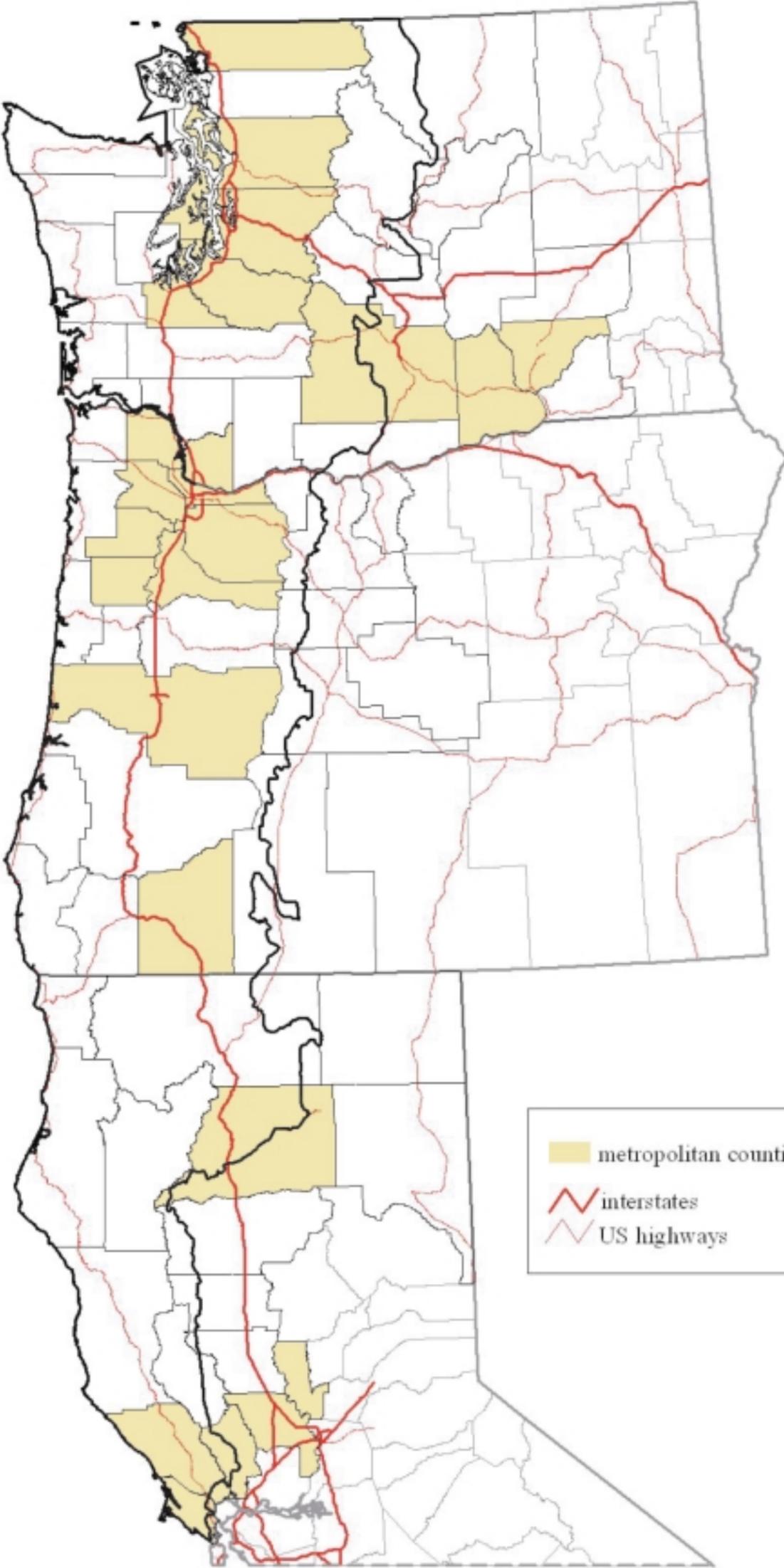


### Population of incorporated and census designated places, 1990

- < 1,000
- 1,000 to 4,999
- 5,000 to 9,999
- 10,000 to 19,999
- 20,000 to 49,999
- > 49,999

Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

# Map 3-Metropolitan Counties



Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

## **Section 2:**

### **Change in Timber Harvest and Wood Products Employment**

**Change in Public Timber Harvest**

**Change in Public and Private Timber Harvest**

**Change in Wood Products Employment**

**Federal Lands-Related Payments to Counties**

## Change in Public Timber Harvest

The debate over how public lands should be managed escalated in the late 1980s. “A series of legislative and legal battles in the late 1980s led to an injunction in 1991 that prevented the Forest Service from preparing any new timber sales in northern spotted owl habitat; in 1992, the Bureau of Land Management was also enjoined from any new timber sales in owl habitat” (Tuchmann and others 1996:1). These legal actions virtually halted Federal timber sales for 3 years. In 1994 the injunctions were lifted as a result of the adoption of the NWFP, and Federal timber was again offered for sale but at a much lower rate. “The [Federal] timber pipeline went down from about 5 billion board feet sold and available for harvest before the injunction to about 1 billion board feet three years later” (Tuchmann and others 1996:3). The NWFP allows for a sustainable Federal timber harvest of 1.1 billion board feet per year from the plan region. By 1996, 873 million board feet were offered for sale from Federal lands.

Reduced levels of public timber sales started to show up in 1989 and 1990, even before the injunctions, as new Federal plans, policy uncertainties, and conflict at the local level began to impact the Federal agencies (see fig. 1, a, b, and c). After the injunctions were implemented, there still was volume under contract that could be harvested (Federal timber sales can be harvested for an extended period after purchase); thus the drop in Federal timber harvest occurred over several years, but this time line probably was different in different areas. The large drop in timber harvest between 1989 and 1990 occurred simultaneously with a national recession, which further complicated the assessment of what was happening.

Tuchmann and others (1996) provide a good overview of the events surrounding Federal forestry in the late 1980s and early 1990s; however, most of their analysis is for the entire plan region or for metropolitan versus nonmetropolitan portions of the region. Our goal was to further spatially disaggregate, to the county level, some of the information on the timber situation and the economic and social indicators.

Map 4 shows the change in public harvest by county between 1989 and 1994. Harvest referred to as “public” includes the harvest from lands managed by Federal, state, county, and municipal entities (harvest from tribal lands in Washington also is included as “public”); in most cases, this category is dominated by harvest from Federal lands. Note that 1989 was one of the higher harvest years in the last decade (see fig. 1, a, b, and c) but near the long-term average harvest for nonrecession years. By 1993 the public harvest in all three states had fallen below the levels experienced in the early 1980s recession years. Timber harvest since 1994 has remained relatively stable. Map 4 shows that the largest declines were in southwest Oregon, especially Douglas and Lane Counties, where the 1994 harvest from public lands was more than 600,000 thousand board feet lower than the 1989 harvest. When the transparency for the provinces is overlaid on the public timber harvest map, it can be seen that the southwest Oregon province is the only one made up entirely of counties with decreases greater than 100,000 thousand board feet. At the other end of the spectrum, the northwest Sacramento province is composed mostly of counties having decreases of less than 45,000 thousand board feet. Eighteen counties on the Olympic Peninsula and in the Cascades and coastal areas south of Puget Sound that traditionally had large Federal timber harvests also had relatively large decreases in public timber harvests (greater than 100,000 thousand board feet). The two Cascades provinces of Washington are striking in their uniformity across an eight-county area—all had decreases between 45,000 and 100,000 thousand board feet. Four counties in northwest Oregon and southwest Washington showed a slightly larger public timber harvest in 1994 compared to 1989. These counties historically had negligible acres of Federal public land and very small public harvests.

Public and particularly Federal ownership of forest lands (largely lands managed by the USDA Forest Service and the Bureau of Land Management) are most important in the Willamette, southwest Oregon, and Klamath provinces. State-owned lands are locally important in Washington. Private forest lands account for a larger proportion of the ownership and harvest in Washington and parts of northern California (McGinnis and others 1996, 1997).

Public timber harvest changes could be calculated for 58 of the 72 counties in the region. In all, timber harvest declined in 54 of the 58 counties and increased in 4 counties. Large decreases in public harvest occurred across the region and in all three individual states.

Displaying the change in public timber harvest in board feet indicates the potential impacts in absolute terms rather than relative terms. Small decreases in public timber harvest may indicate a low level of public timber harvest to begin with rather than a small percentage of decrease in harvest.

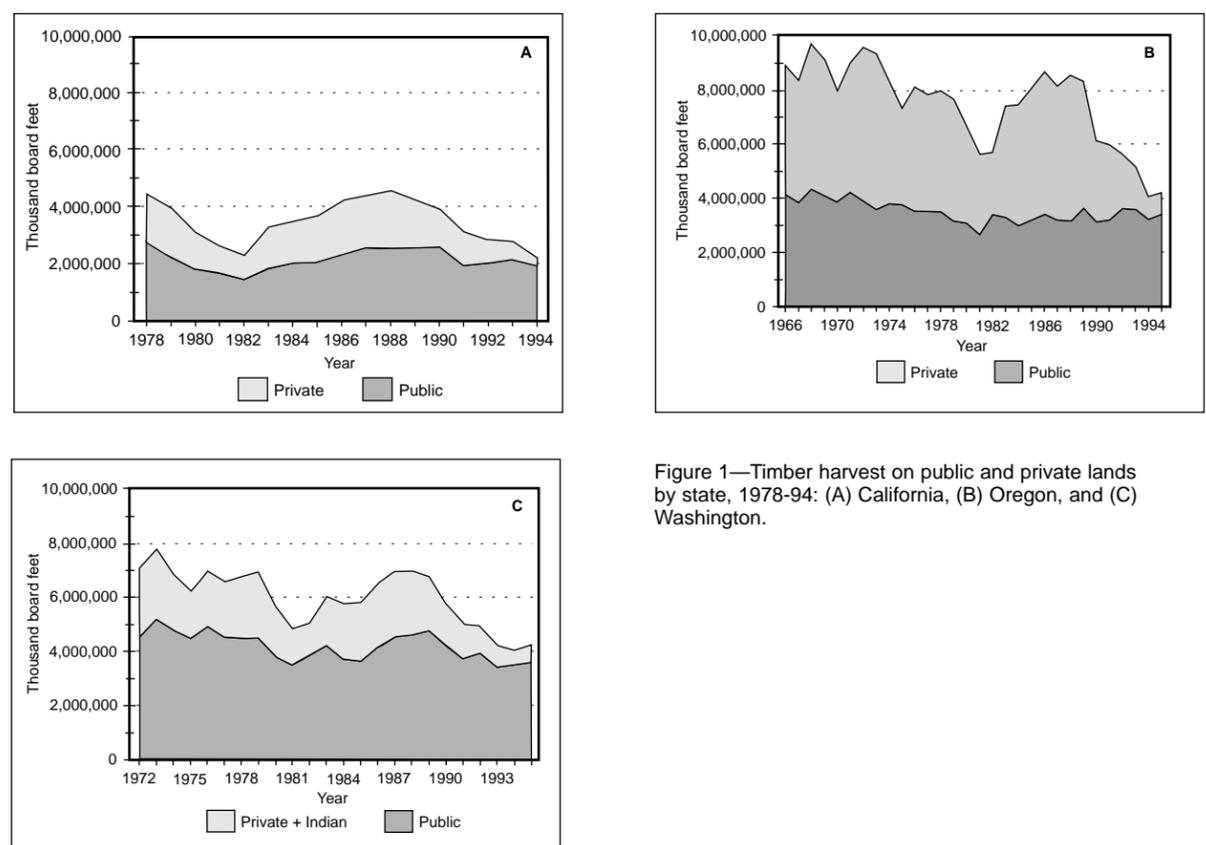
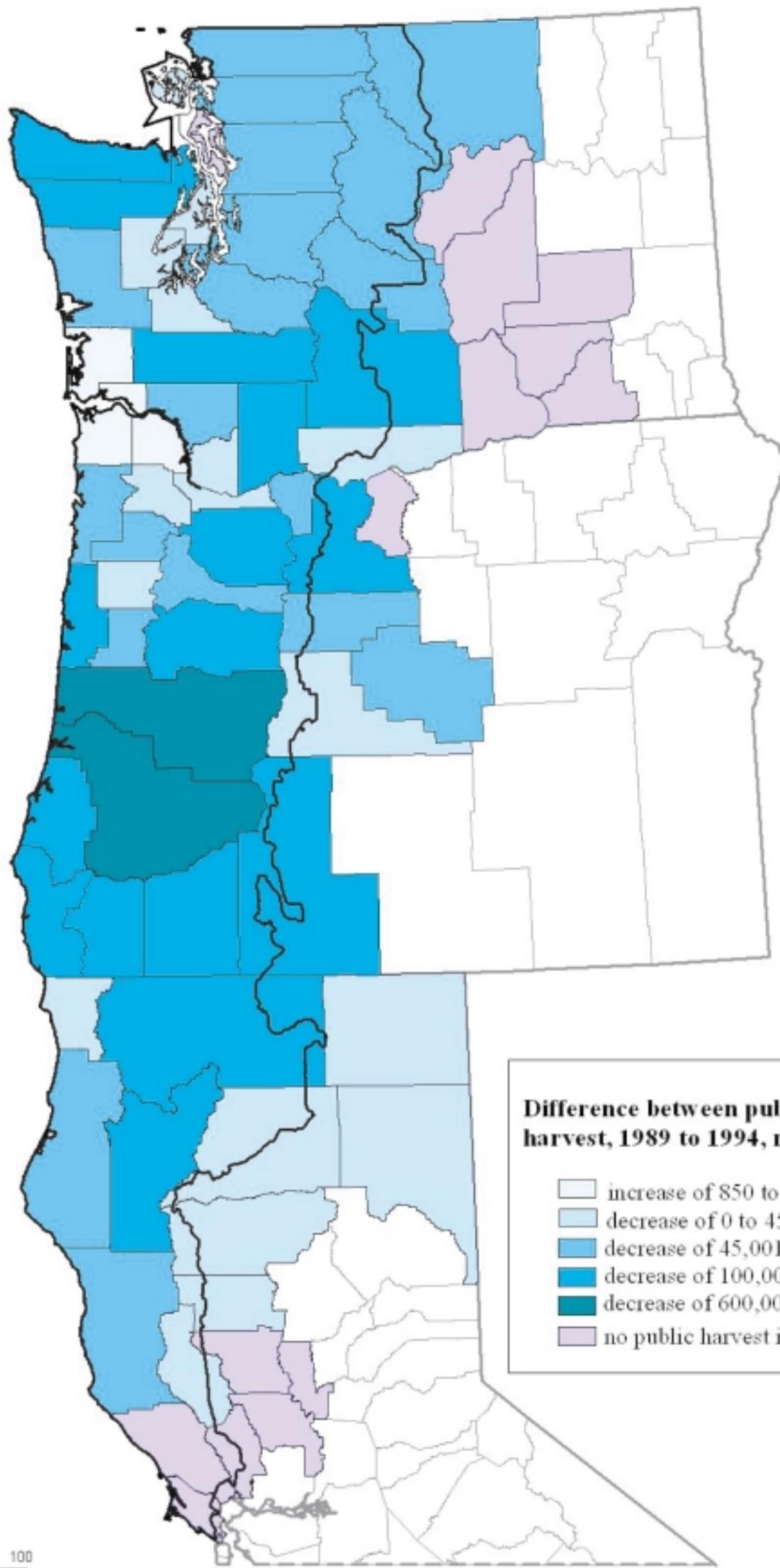


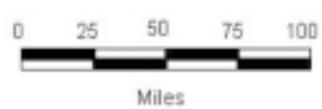
Figure 1—Timber harvest on public and private lands by state, 1978-94: (A) California, (B) Oregon, and (C) Washington.

# Map 4-Change in Public Timber Harvest



**Difference between public timber harvest, 1989 to 1994, million board feet**

- increase of 850 to 16,800
- decrease of 0 to 45,000
- decrease of 45,001 to 100,000
- decrease of 100,001 to 275,000
- decrease of 600,000 to 750,000
- no public harvest in either year



Spotted owl region boundary    
 State boundaries    
 County boundaries    
 Counties outside study area

## Change in Public and Private Timber Harvest

Total timber harvest is affected not only by the public harvest (Federal, state, county, other public) but also by harvests from other ownerships. Land ownership differs by county, and the harvest decisions of landowners depend on various things, including market conditions, stocking levels, management goals, and changing forest regulatory policies that can affect private as well as public lands. Thus there was uncertainty about how private timber harvest would respond as public harvest declined. As Federal harvests declined, harvests from other ownerships could either moderate or exacerbate the change. One possible scenario was that the public timber supply constriction would cause a price increase with private landowners responding to the price signal by harvesting more timber. In reality, harvest decisions are highly complex and ownership patterns differ, so that even though prices increased, in many areas private harvest declined too. In some cases private landowners were constrained by inventory; they lacked sufficient mature timber to increase harvest.

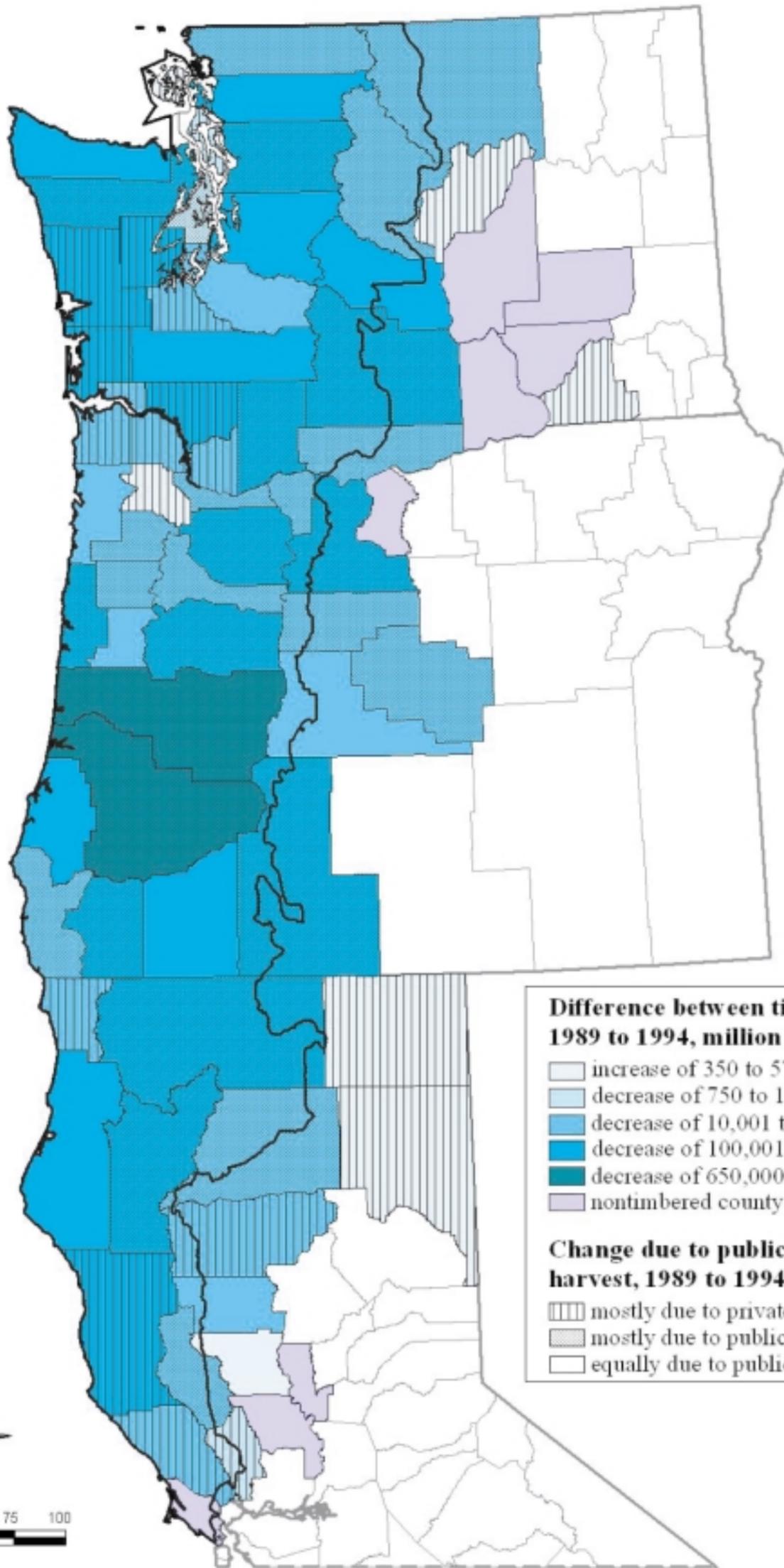
For the region displayed in map 5, 42 percent of harvest came from public lands in 1989 versus 17 percent in 1994, and the total harvest dropped from 16 to 9 billion board feet. Of the 55 counties that had decreases in public harvest (regardless of whether they are in the "mostly public" group or not), 16 (30 percent) had increases in private harvest. In Pierce County, Washington, and Tillamook County, Oregon, these increases substantially offset the public decreases.

Map 5 shows how harvest from all owners in 1994 differed from harvest in 1989 (portrayed by the shadings) and whether the difference was primarily the result of change in public harvest, private harvest, or a nearly equal combination of both (represented by the patterns). We classified the change as "mostly due to public" if the absolute value of the change in public harvest was at least 1.5 times greater than the absolute value of the change in private harvest, and the opposite for "mostly due to private." The remaining counties fell into the "due equally" category (though the changes may not be exactly equal). Thus, one cannot tell which direction public and private changed, only their relative magnitudes.

Map 5 shows that the largest declines in total harvest were in many of the same areas that showed large declines in public harvest (see map 4), but additional counties in Washington now appear in the categories having larger decreases (over 100,000 thousand board feet decline), thereby indicating declines in private harvest as well. A larger share of timberlands and harvest in Washington are private compared to Oregon, so that private harvest has a greater potential to affect total harvest in Washington. Change in private timber harvest was more than 1.5 times greater than change in public harvest for 22 of the 72 counties, and in 15 of these 22 private harvest went down (ranging from -750 to -200,000 thousand board feet). Twenty-nine counties were in the "mostly public" group, and private harvest decreased in all but three of these. The harvest changes in 13 counties were not categorized as "mostly public" or "mostly private," and in all but two (Pierce and Tillamook, mentioned above) private harvest went down as did public harvest. Six counties had small increases in total harvest, driven by harvest from private lands. Of the 27 counties with declines of more than 100,000 thousand board feet in total harvest, 14 were in the "mostly public" category, 5 were in the "mostly private" category, and 8 were in the "equally public and private" category.

Map 5 shows changes in timber harvest to be a complex issue, with total harvest being affected by a variety of factors including but not limited to public policy on Federal lands.

# Map 5-Change in Public and Private Timber Harvest



 Spotted owl region boundary
  State boundaries
  County boundaries
  Counties outside study area

## Change in Wood Products Employment

**Table 1—Change in jobs, Pacific Northwest and northern California, 1990 to 1994**

County and state	Employment change standard industrial classification 24	
	Percent	Number
Napa, CA	76.6	49
Jefferson, OR	34.0	316
Tillamook, OR	32.7	127
Yakima, WA	26.4	394
Marion, OR	18.7	603
Thurston, WA	15.3	152
Humboldt, CA	8.2	317
Marin, CA	4.4	3
Crook, OR	3.4	65
Trinity, CA	1.2	5
Colusa, CA	NA	NA
Sherman, OR	NA	NA
Adams, WA	NA	NA
Benton, WA	NA	NA
Douglas, WA	NA	NA
Franklin, WA	NA	NA
Grant, WA	NA	NA
Island, WA	NA	NA
Kittitas, WA	NA	NA
Wahkiakum, WA	NA	NA
Walla Walla, WA	NA	NA
Whatcom, WA	-0.5	-6
Lewis, WA	-0.9	-22
Washington, OR	-2.2	-44
San Juan, WA	-2.2	-1
Mason, WA	-2.6	-37
Jackson, OR	-3.5	-185
Yamhill, OR	-3.8	-49
Clark, WA	-4.2	-65
Pierce, WA	-7.7	-338
Lassen, CA	-9.8	-69
Yolo, CA	-10.0	-93
Chelan, WA	-11.9	-28
Linn, OR	-12.6	-521
King, WA	-13.0	-952
Curry, OR	-13.3	-97
Okanogan, WA	-13.7	-166
Hood River, OR	-14.0	-78
Sutter, CA	-14.1	-101
Snohomish, WA	-14.3	-442
Jefferson, WA	-14.4	-13
Pacific, WA	-15.0	-97
Grays Harbor, WA	-16.1	-451
Tehama, CA	-16.3	-213
Lincoln, OR	-17.0	-82
Benton, OR	-19.1	-266
Deschutes, OR	-19.2	-654
Multnomah, OR	-19.4	-435
Cowlitz, WA	-19.5	-610
Klamath, OR	-20.0	-703
Polk, OR	-21.7	-193
Lane, OR	-22.2	-2,269
Mendocino, CA	-22.6	-724
Klickitat, WA	-23.3	-181
Modoc, CA	-23.5	-23
Glenn, CA	-24.4	-10
Josephine, OR	-24.6	-485
Coos, OR	-25.7	-593
Columbia, OR	-25.9	-273
Wasco, OR	-26.7	-82
Shasta, CA	-27.0	-640
Douglas, OR	-28.3	-2,388
Skagit, WA	-28.7	-244
Sonoma, CA	-29.2	-523
Clatsop, OR	-29.6	-232
Clackamas, OR	-30.5	-629
Lake, CA	-32.0	-16
Kitsap, WA	-33.8	-102
Siskiyou, CA	-40.9	-508
Clallam, WA	-45.9	-648
Del Norte, CA	-53.5	-253
Skamania, WA	-63.3	-297

NA = not applicable.

Economic systems are complex. Wood products employment (especially logging and saw milling) in the NWFP region clearly has been affected by changes in harvest from Federal lands, but many other factors came into play to determine the changes in wood products employment across the region. As map 5 shows, total harvest was affected by what was happening with other ownerships (stocking levels, management goals, and age class distribution).

Additional factors included the following:

- The availability of wood from sources outside the region (imports) and exports of unprocessed logs.
- Increases in labor productivity (a given amount of timber can be processed with fewer employees).
- Trends in other segments of the industry, such as growth in secondary manufacturing.
- Regional, national, and international economic conditions, which affected demand for wood products.
- The structure of the local industry, and log flows from harvesting areas to processing centers.

Map 6 shows how wood products employment (SIC 24)<sup>2</sup> changed between 1990 and 1994 in percentage terms. Percentages were used, as opposed to absolute number of jobs, to give a relative sense of how the wood products industry changed in the various counties: Was the change large or small relative to the number of people in the industry in that county? Small percentages can correspond to large absolute numbers of jobs (and vice versa), however; thus, table 1 shows the change in the number of jobs. The map and table are based on data from each state's employment department; those data include only those employees covered by unemployment insurance. Certain classes of employees such as proprietors and partners are omitted.

Across the region, the 51 counties having declines in wood products employment far outnumbered the counties showing increases in lumber and wood products employment. Importantly, the counties losing wood products employment had large relative and absolute declines when compared to the increases in counties gaining lumber and wood products employment. Two counties, Douglas and Lane in Oregon, had net losses of more than 2,000 lumber and wood products workers between 1990 and 1994. The 23 counties with large relative losses in lumber and wood products employment (greater than 20 percent) are distributed across the region, with concentrations in those counties having a high proportion of timber harvests coming from public lands or processing facilities dependent on public lands in other counties.

Ten counties had more people employed in the wood products sector in 1994 than they did in 1990 (eight of these were increases of less than 5 percent). There have been important changes in the geographical distribution of the specific industries comprising the lumber and wood products sector (SIC 24). One of these changes was the increasing share of the sector that is accounted for by secondary manufacturing industries (Raettig and McGinnis 1996) as employment was declining in primary processing industries. This change is most noticeable in Oregon and Washington (fig. 2, b and c) but also is evident in recent years in California as the recession of the early 1990s has abated (fig. 2a). In those counties with increasing wood products employment, the increase was due to growth in secondary manufacturing (such as mobile home manufacturing in Marion County, Oregon) or the importance of private harvest (in Tillamook County, for example).

Changes in income derived from wood products employment provide another measure of the role of the wood products industry in the economy. Changes in income may be either higher or lower than the changes in employment because of such factors as whether part-time or full-time jobs are lost or created, whether the jobs are low paying or high paying, and the seasonality of the jobs. In many of the important timber counties of the region, the percentage of decline in payrolls was less than the percentage of decline in employment, thereby indicating that wages in the wood products sector actually went up between 1990 and 1994.

<sup>2</sup> SIC stands for standard industrial classification. Classification 24 includes all the lumber and wood product industrial sectors.

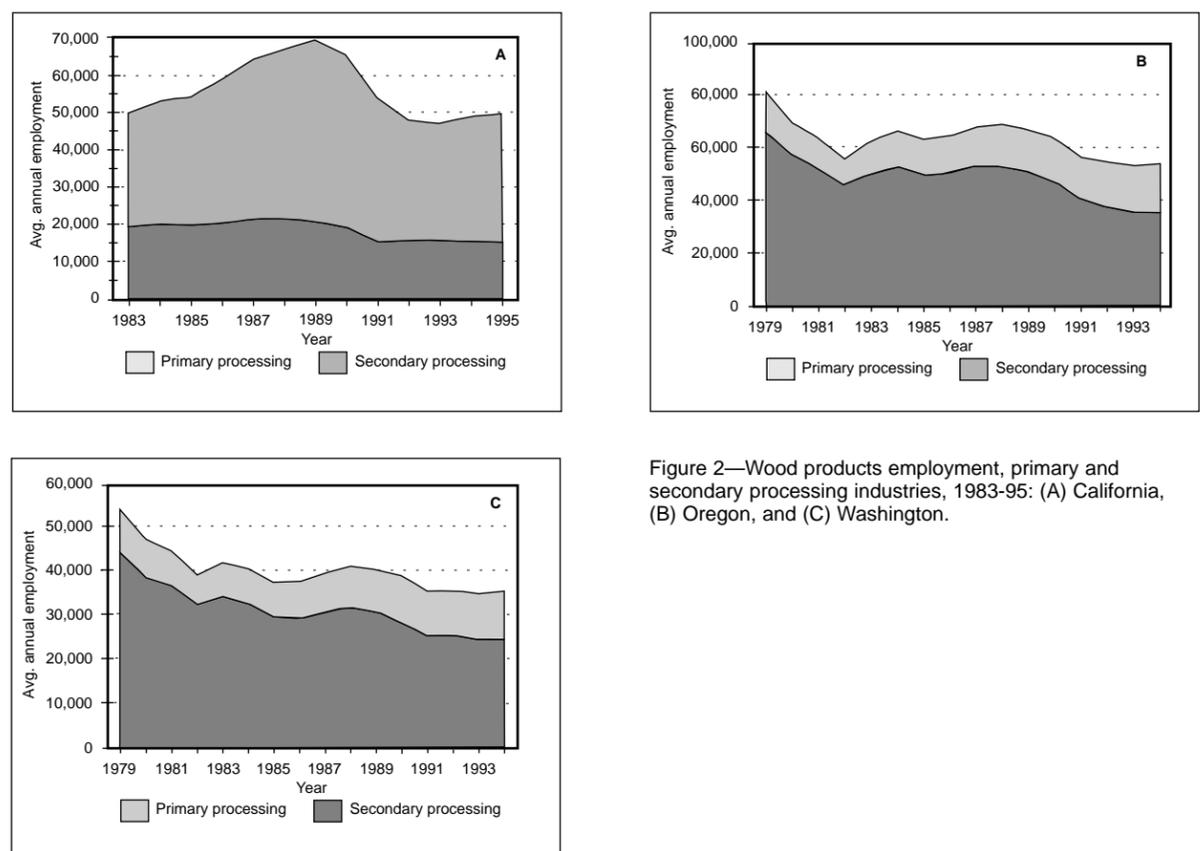
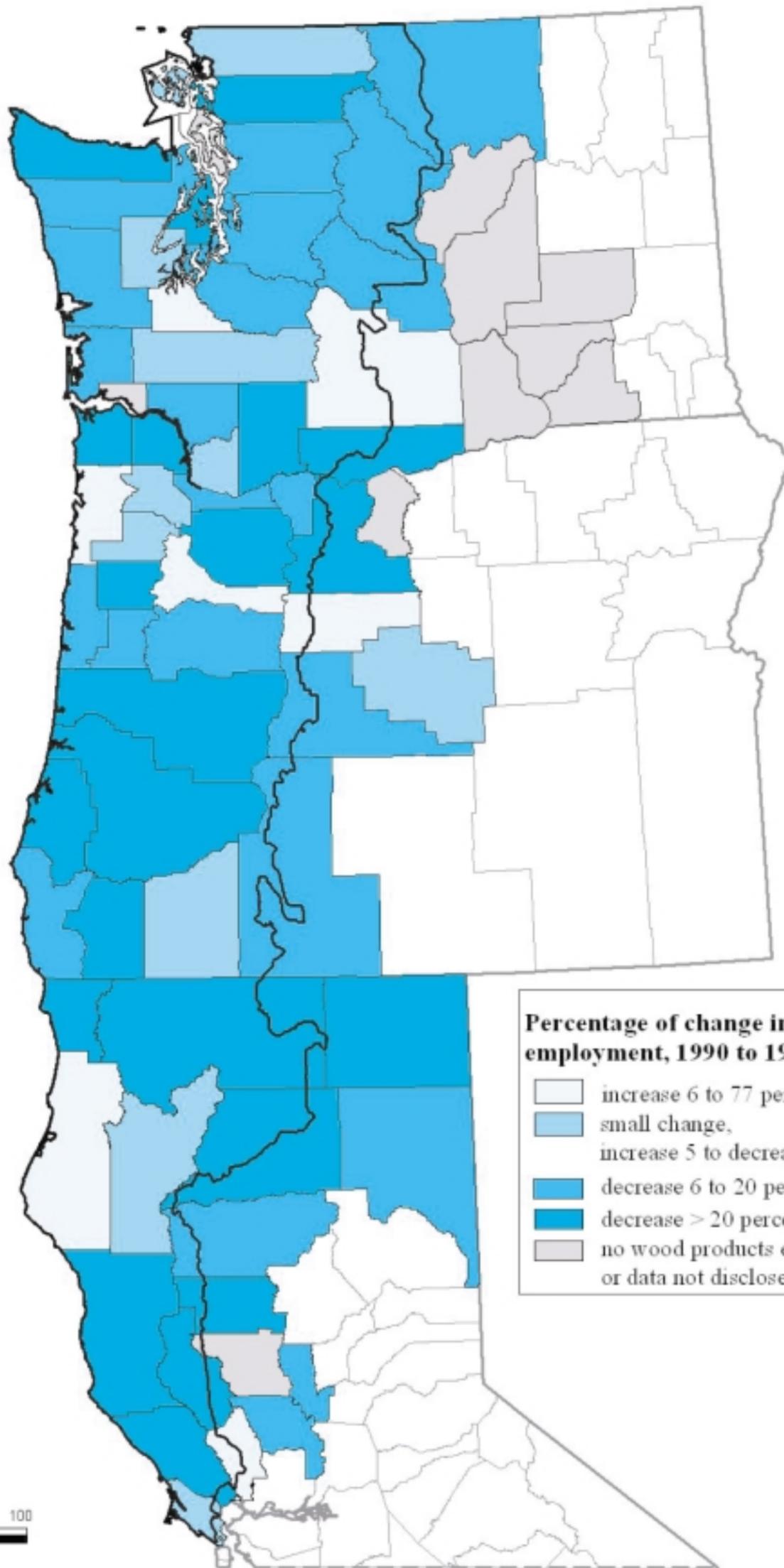


Figure 2—Wood products employment, primary and secondary processing industries, 1983-95: (A) California, (B) Oregon, and (C) Washington.

# Map 6-Change in Wood Products Employment



 Spotted owl region boundary
  State boundaries
  County boundaries
  Counties outside study area

## **Federal Lands-Related Payments to Counties**

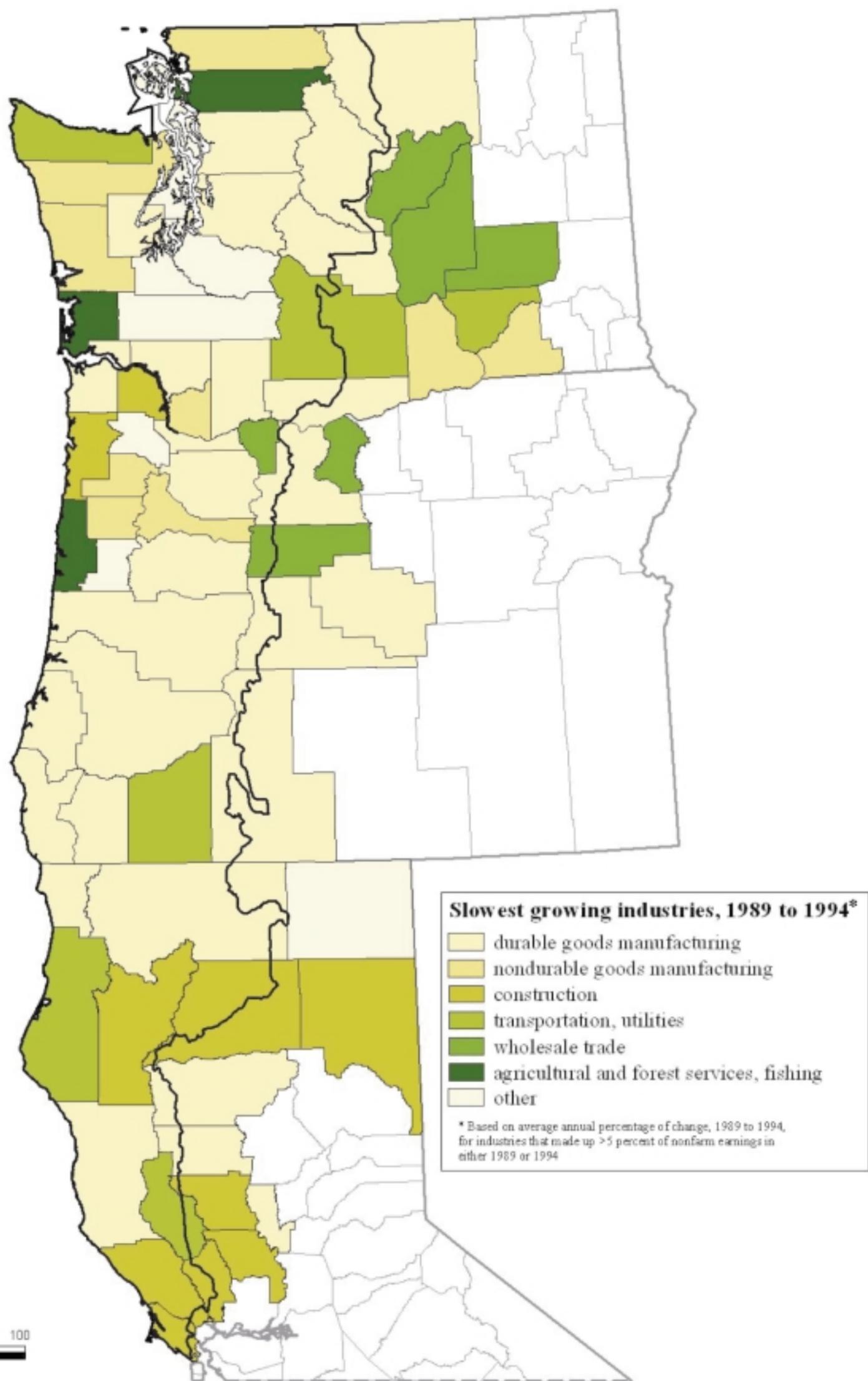
Federal agencies historically have returned a portion of the receipts from the sale or lease of natural resources on Federal lands to local governments. These payments offset, in part, the property and harvest taxes that local governments would realize were the Federal lands in private ownership (Bray and Lee 1991). Examples of these payments are the return of 25 percent of gross timber receipts from National Forest lands and 50 percent of the timber revenues from Oregon and California lands managed by the Bureau of Land Management to local governments (Tuchmann and others 1996). Counties also receive Federal land-related payments through a program for payments in lieu of taxes (PILT) established in 1976. The PILT payments are based on a complex formula that includes county population, two alternative per-acre payment rates, acres of Federal lands, and receipts from prior years from Federal natural resource-based programs (Schuster 1995).

Map 7 shows Federal land-related payments as a percentage of county expenditures and is an indication of the relative importance of Federal land payments to a specific county. The percentage of Federal land payments used in the calculations for the map included PILT payments, Oregon and California (O&C) payments from the Bureau of Land Management, and National Forest payments for 1995. The specific year used in the calculations is not particularly important because some Federal land payment programs are subject to legislatively mandated floors, and short-term trends are dampened. County expenditures used in the calculations for map 7 included both total (nonschool) county expenditures and school expenditure for 1991-92 from the Federal government census (U.S. Department of Commerce, Bureau of the Census 1997b). National Forest payments can be used only for school and road expenditures; O&C payments can be used for any purpose.

Federal land-related payments are most important to the rural counties of the southwest Oregon and Klamath provinces. Skamania and Jefferson Counties in Washington also receive a relatively large share of funding from Federal land-related payments. In general, the counties where Federal land payments are relatively more important are those containing Federal lands with high sales value of natural resources and comparatively low populations. Federal land-related payments are relatively unimportant in the Portland and Seattle metropolitan counties.

Federal legislation has, in the short run, insulated those counties receiving payments from the sale of Federal natural resources from experiencing rapid declines in the Federal payments as timber harvests and sales value fall. Federal legislation passed in 1993 specified that payments in 1994 to counties in the region would be at least 85 percent of the 1986-90 average (Tuchmann and others 1996). Minimum payments will decrease gradually to 58 percent of the base period in 2003. The floor is eliminated in 2004. The PILT legislation also acts as a floor on Federal land payments to local governments; however, inflation has significantly reduced the real value of PILT payments over time. An adjustment specified to increase the PILT payments has never been fully funded. As the full impact of declining sales value of natural resources (particularly timber) begins to be felt in counties tied to sales value, more counties will be tied primarily to PILT instead of sale value for Federal land-related payments. This has the potential to make more counties dependent on annual congressional funding of the PILT program and to increase the amount of funding Congress must appropriate to fully fund the program. Those counties most likely to be impacted in the future by changes in the value of Federal land-related payments are those having the greatest percentage of Federal land-related payments, as indicated in map 7.

# Map 14-Slowest Growing Nonfarm Industries



 Spotted owl region boundary  
  State boundaries  
  County boundaries  
  Counties outside study area

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## **Section 3:**

### **Change in Economic**

### **Conditions—Economic Performance**

#### **Unemployment Rate Compared to Region**

#### **Change in Total Employment**

#### **Wage Trends**

#### **Wage Level**

**Unemployment Rate Compared to Region**

Unemployment information is collected monthly by the U.S. Department of Labor, Bureau of Labor Statistics. This information is available by state, county, and metropolitan area. It is expressed as a percentage of the civilian labor force that has been unemployed for a given period. The basis for map 8 is the annual average unemployment rate for the designated years.

Unemployment rates in the Pacific Northwest have followed national trends since the mid 1980s, but there has been variation in the absolute value of the rates in the three states when compared to the Nation (fig. 3). The unemployment rate in California was very close to the national rate prior to the 1990 recession and has been higher than the national rate since. The unemployment rates in Washington and Oregon were generally above the national rate prior to 1990 and very close to the national rate since 1990. Some areas (often urban) where growth in high technology, construction, and services is keeping labor markets tight have had consistently low unemployment rates; however, other areas, especially some rural places, have experienced high unemployment during this period. Some counties have experienced consistently higher annual unemployment rates owing to the structures of their economies. Many jobs in agriculture, tourism, and natural resource industries tend to be seasonal, thus contributing to a higher unemployment rate during the off-season. These counties may have different needs than those where high unemployment rates are due to different circumstances (one of which may be the loss of timber jobs and the resulting restructuring of the local economy). Though we do not know the underlying reasons with certainty, in map 8 we have tried to differentiate between counties with consistently high unemployment rates and those where rates became high in the early 1990s. In half a dozen counties, the unemployment rate was more than one standard deviation (about 1.5 percentage points) above the rate for the NWFP region as a whole for each year between 1975 and 1995. This is almost certainly a sign of unemployment inherent in the local economic structure. In map 8, 19 counties are indicated that had consistently high unemployment rates (greater than one standard deviation from the regional rate) from 1988 to 1995. Most are in northern California, in interior Washington, or along the southwest coast of Washington. What cannot be determined from map 8 is what kind of variation these areas experienced in their unemployment rates during this period (for instance, they may have gone very high or they may have stayed just barely 1.5 points above the regional rate).

A larger group of counties have had consistently lower unemployment rates than the region as a whole, and these 40 counties are indicated on map 8. These were consistently 1.5 percentage points below the regional rate between 1988 and 1995. Most are metropolitan counties, counties in northern and central Oregon, or fast-growing rural counties. Some counties may have experienced job losses in wood products that were offset by gains in other sectors, or unemployed workers may have left or dropped out of the labor force, which also would keep the unemployment rate low. In other words, a variety of factors can lead to low unemployment rates.

A second pattern occurred for 13 counties, indicated in map 8. These counties were lower than the regional rate (by at least 1.5 points) during the first part of the period (roughly 1988 to 1990) and then were higher than the regional rate (by at least 1.5 points) during all or most of the remaining years. These are areas where there may have been a structural change in the early 1990s that altered local labor market conditions. Most of these counties are rural where timber traditionally has been an important part of the economy. From a policy perspective, these counties (as well as the California counties noted above) will require a detailed review to determine what led to this transition. Many of these counties were high-unemployment counties in the early to mid 1980s as well, became lower than the regional rate by the late 1980s, and returned to higher rates in the early 1990s.

See table 2 for annual data on how these consistently high-unemployment counties changed between 1988 and 1995. The table shows that several California counties have shifted to even higher rates since 1991, while many others experienced the regional pattern of elevated rates in the early 1990s and a drop back to rates similar to the late 1980s after that.

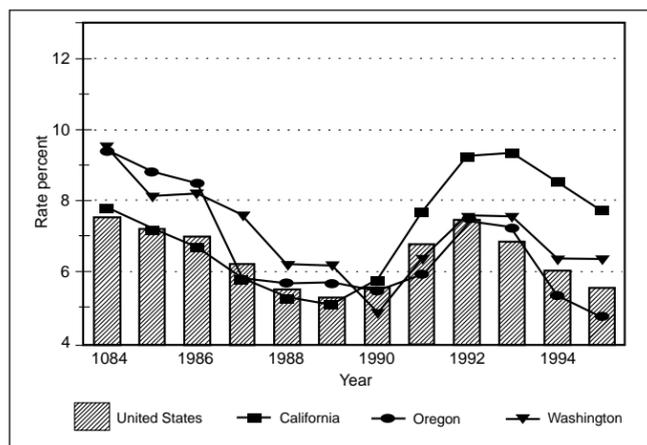


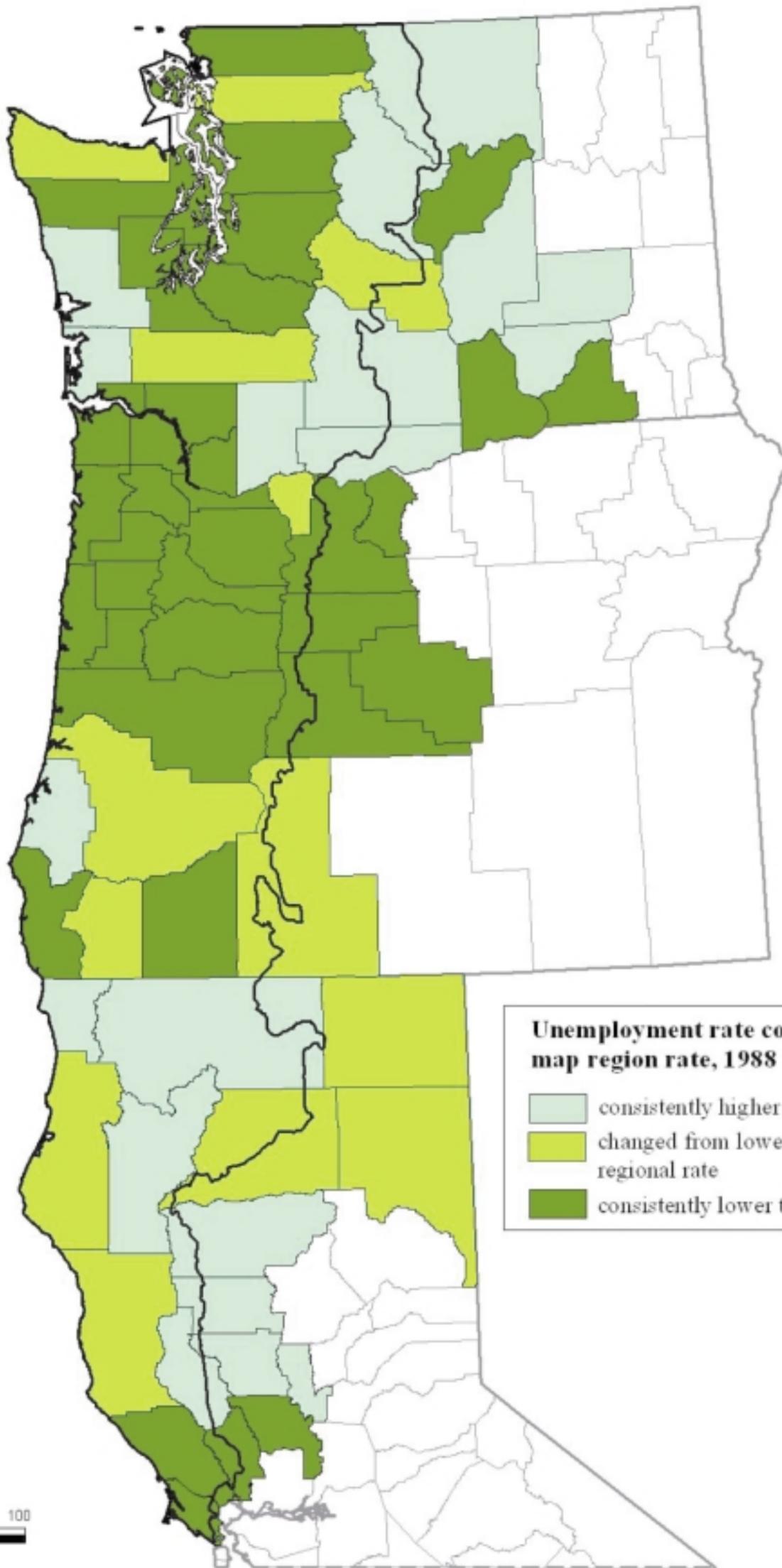
Figure 3—Unemployment rate (percentage of civilian force unemployed), by state, compared to the national unemployment rate, 1984-94.

**Table 2—Unemployment rates and consistently high unemployment counties, Pacific Northwest and northern California, 1988 to 1995**

County and state	Unemployment rates <sup>a</sup>							
	1988	1989	1990	1991	1992	1993	1994	1995
	<i>Percent</i>							
Clallam, WA	8.2	8.5	6.8	7.7	8.9	9.8	9.3	8.7
Douglas, OR	7.7	7.8	8.2	10.0	12.1	11.2	8.6	7.4
Hood River, OR	8.6	8.0	8.2	8.9	10.5	10.1	7.6	8.7
Humboldt, CA	7.7	7.9	7.4	8.4	9.9	9.9	8.8	8.3
Josephine, OR	7.1	7.7	7.2	8.1	10.1	10.4	8.7	8.5
Kittitas, WA	9.9	8.9	7.6	9.8	12.6	10.7	8.9	8.7
Klamath, OR	8.5	7.8	9.0	8.9	10.4	10.5	8.3	7.5
Lassen, CA	8.2	8.4	8.7	10.8	10.5	11.8	10.7	11.0
Lewis, WA	8.9	8.9	7.8	10.1	11.0	10.9	8.6	8.6
Mendocino, CA	8.4	7.9	7.5	10.2	12.1	11.1	9.7	9.6
Modoc, CA	7.9	8.5	8.7	11.6	12.6	12.6	11.9	12.9
Shasta, CA	9.0	9.0	7.9	10.1	12.4	12.0	11.8	11.3
Skagit, WA	8.7	8.4	6.6	8.1	9.9	10.8	9.3	9.0

<sup>a</sup> Expressed as a percentage of the civilian labor force unemployed during the given time period.

# Map 8-Unemployment Rate Compared to Region



Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

## Change in Total Employment

Employment changes in the wood products industry (section 2) provide an indication of economic performance in the region's counties, but it is also important to know what has happened to employment in all economic sectors combined. This is an indicator of the general health of the economy and the availability of potential alternative opportunities for unemployed workers. It does not address the quality or suitability of opportunities for workers who have lost their jobs in specific industries, such as the wood products industry.

Total employment trends in many of the region's counties followed the pattern shown in figure 4. For the groups of nonmetropolitan counties in this chart, employment growth slowed, and for some individual counties it declined in 1990 and began rebounding by about 1992 or 1993. Map 9 portrays the change in total employment between 1990 and 1994. For the counties that experienced the state trends for nonmetropolitan counties, this map shows how much employment has rebounded relative to its 1990 level rather than how big the decline was during the early 1990s. In all but six cases, county employment surpassed its 1990 level by 1994, and those six were all within 3 percent of their 1990 levels. Figure 5 shows the total employment trends for three of these counties—Siskiyou and Trinity in California and Douglas in Oregon—that also had reductions of over 100,000 thousand board feet in public timber harvest for the same period (see map 4).

Except for Yolo County, California, all the counties with moderate or large gains in total employment for the period were in Washington and Oregon. In Oregon, except for four counties adjacent to the Columbia River, all the counties in the Oregon Coast area and Willamette and Deschutes provinces had moderate or large gains in total employment. The Southwest Oregon province, which had large declines in public timber harvest, showed a mixed picture for county-level employment growth, with employment growth rates in the southern, more economically diverse, part of the province outpacing those in the northern part. In Washington, the counties with larger gains in total employment were distributed across all provinces. Counties with smaller total employment gains tended to be rural counties with relatively important forest products industries but also included King County in the Seattle metropolitan area and two counties in the Tri-Cities area of eastern Washington.

The recession of the early 1980s had a larger impact on the nonmetropolitan counties of the region than did the recession of the early 1990s. Recessions, as indicated in figure 4 for the block of nonmetropolitan counties in each state, reflect employment changes in many industrial sectors. The wood products industry has tended to be closely tied to national business cycles (fig. 2).

Counties in the Pacific Northwest can be large and include many diverse communities with wide variations in important industrial sectors. Employment trends (fig. 4) should be interpreted with caution, because county-level data may be a mix of communities with relatively poor economic performance and those with more robust economic health. Many rural counties that have experienced large decreases in timber harvest and wood products industry employment also include urban communities with relatively diverse and healthy economies. Employment gains in the diverse portion of the county may be locationally and occupationally unavailable to unemployed wood products industry workers.

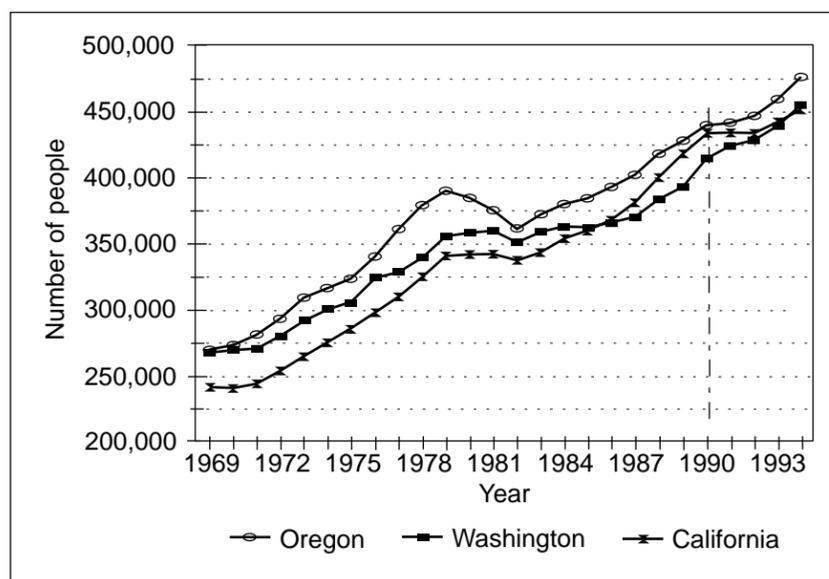


Figure 4—Total nonmetropolitan employment by state, 1969-93.

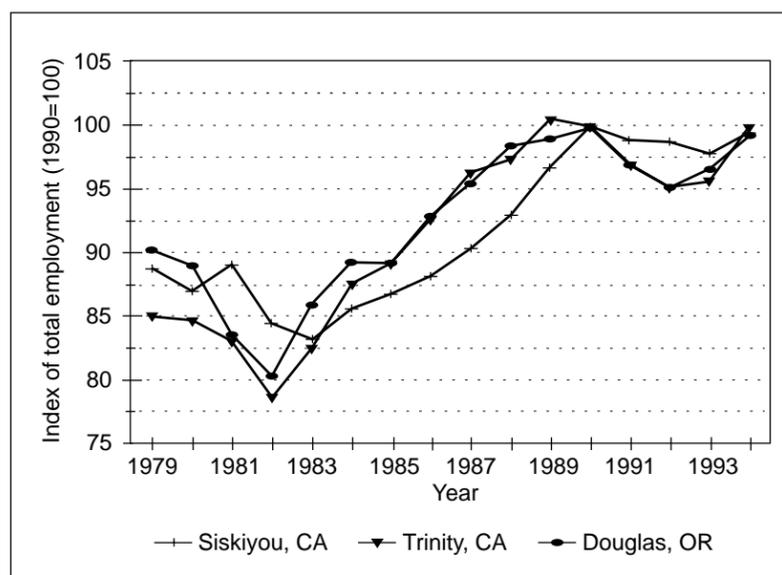
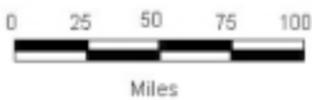
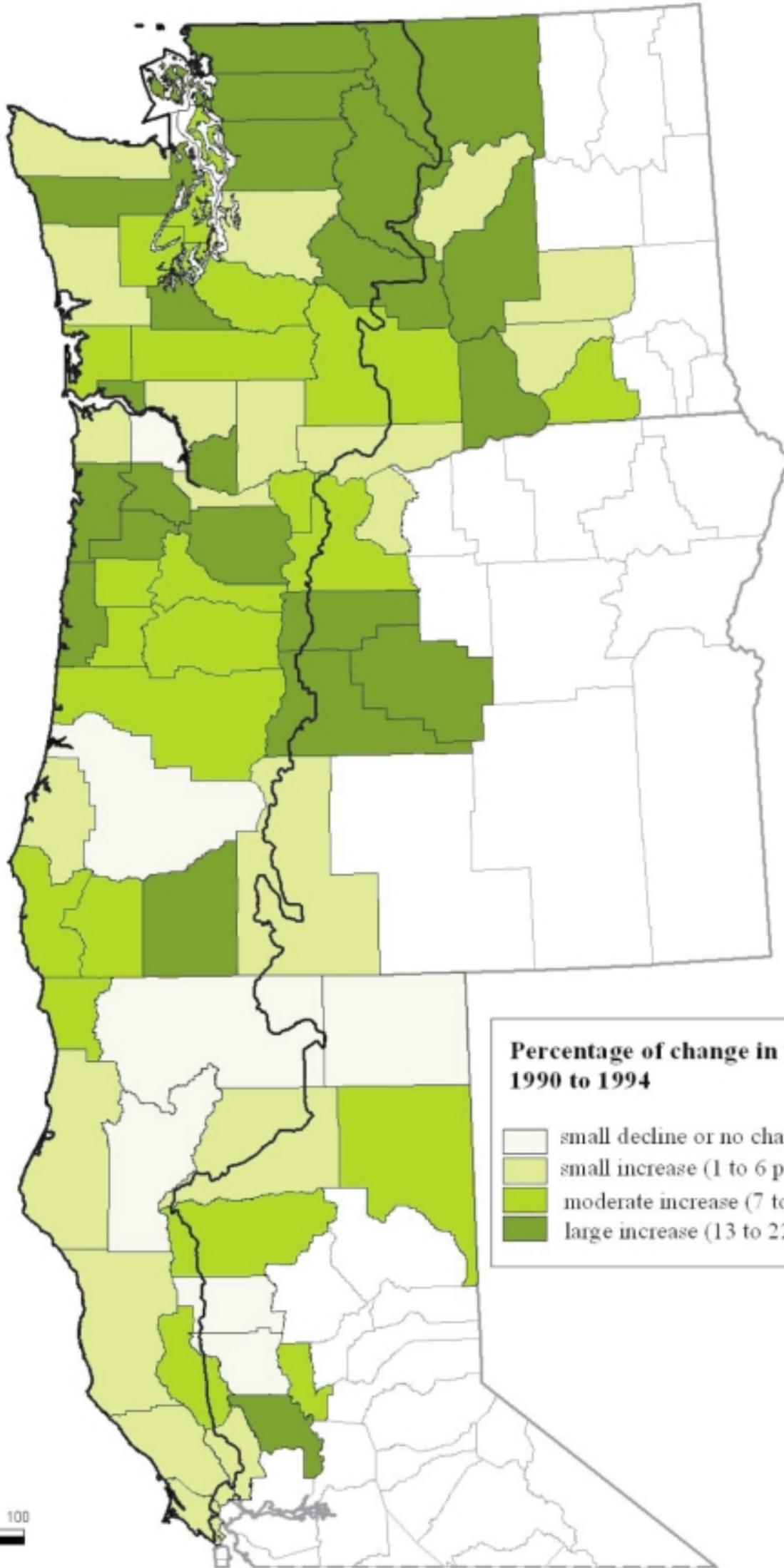


Figure 5—Employment trends for counties with reductions of over 100,000 board feet in public timber harvest, 1979-93.

# Map 9-Change in Total Employment



Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

## Wage Trends

Wages often are used as an indicator of job quality and labor market conditions. If high-wage, full-time jobs are lost and replaced by low-wage or part-time jobs in an economy, the average wage level, measured here as Bureau of Economic Analysis (BEA) average earnings per job, should drop. Map 10 explores the pattern of wage changes from 1989 to 1994. To more fully understand wage trends in the Northwest, however, it is necessary to view them in the context of a longer time horizon.

Events of the early 1980s were particularly devastating to wages in the Northwest, especially the rural Northwest. Figure 6 shows metropolitan and nonmetropolitan area wage trends (in constant 1992 dollars) for each state compared to the Nation. Several trends are apparent: First, nonmetropolitan wages were consistently lower than metropolitan wages in each state and that gap widened during the 1980s, as nonmetropolitan wages fell further during the recession of the early 1980s or recovered to a lesser degree afterwards. Second, there were differences among the states. Wages were lowest in Oregon and highest in California, but these differences were greater for the metropolitan portions of the states. Inflation-adjusted wages in the nonmetropolitan portion of each state were fairly similar and shared similar trends, declining significantly during the early 1980s and recovering little afterwards. Third, nonmetropolitan wages declined between 1989 and 1991 but began to rise again after that (there may have been another drop in 1994, but the most recent year is likely to be revised and too much emphasis should not be placed on it). Thus it does not seem that there has been a widespread permanent shift to lower nonmetropolitan wages since 1989. Fourth, the drop in the early 1990s was much smaller than the drop in the early 1980s; however, wages were starting from a lower level in the early 1990s, so it can be argued that smaller reductions may have a large impact on already tight family budgets. The decrease in wages in the rural portions of the NWFP region in the early 1980s also coincided with a period of intense restructuring and pressure on increasing labor productivity in natural resource industries in general and particularly the wood products industry. In any case, it is apparent that the general economic climate during which large structural shifts take place has an important role in how economies respond. In the early 1980s, a time of recession and low economic activity, the loss of high-wage nonmetropolitan jobs was very apparent in the average wage data.

The nonmetropolitan portion of each state may not be representative, however, of the experiences of all nonmetropolitan counties in the state. In map 10, we therefore examine county-by-county trends in inflation-adjusted wages in the early 1990s. Counties are the smallest unit for which BEA reports wage information. The shadings represent general patterns in the way wages behaved between 1989 and 1994—general downward trend, down in early 1990s with partial recovery, and full recovery or general upward trend. Seven counties had no clear pattern. Six of these seven counties are in the eastern Washington Yakima and Cascades provinces. From the standpoints of policy and socioeconomic well-being, the 14 counties having a downward trend in wages, including those counties with a downward trend in the early 1990s and little recovery since, are cause for concern and warrant further investigation. With one exception, the counties with downward trends in wages are located along either the Pacific coast or the Columbia River. The 15 counties concentrated in the Southwest Oregon and Klamath provinces that have recovered only partially from a drop in the early 1990s are the next tier to be concerned about and would be good candidates for more indepth investigation. Given the historical wage trends, most nonmetropolitan counties would benefit from continued economic development efforts targeted at increasing wage levels. There were 36 counties with a more positive wage picture in the early 1990s. These 36 counties included almost all the metropolitan counties in the NWFP region as well as many of the adjacent nonmetropolitan counties. Twelve of the 14 counties in the region that experienced a generally downward trend in wages also were counties with moderate to large percentage declines in wood products industry employment between 1990 and 1994.

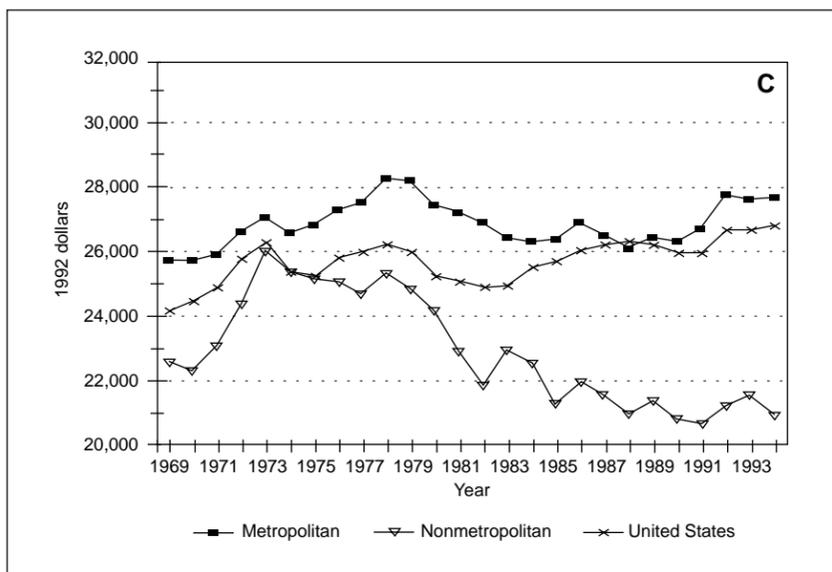
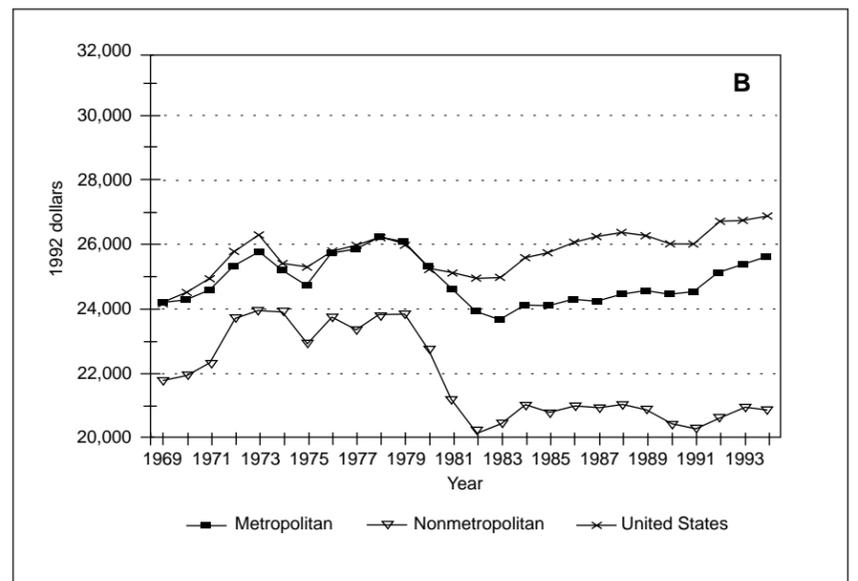
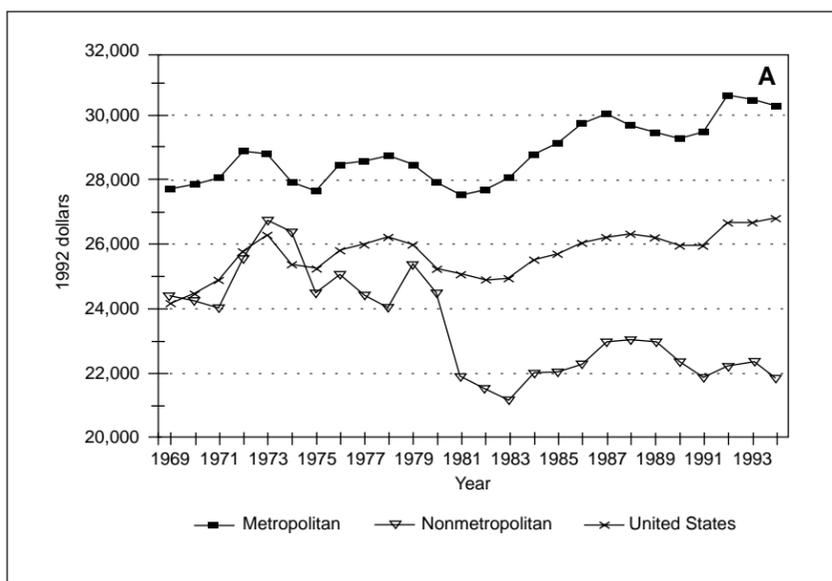
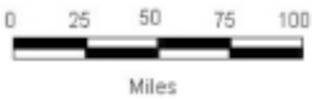
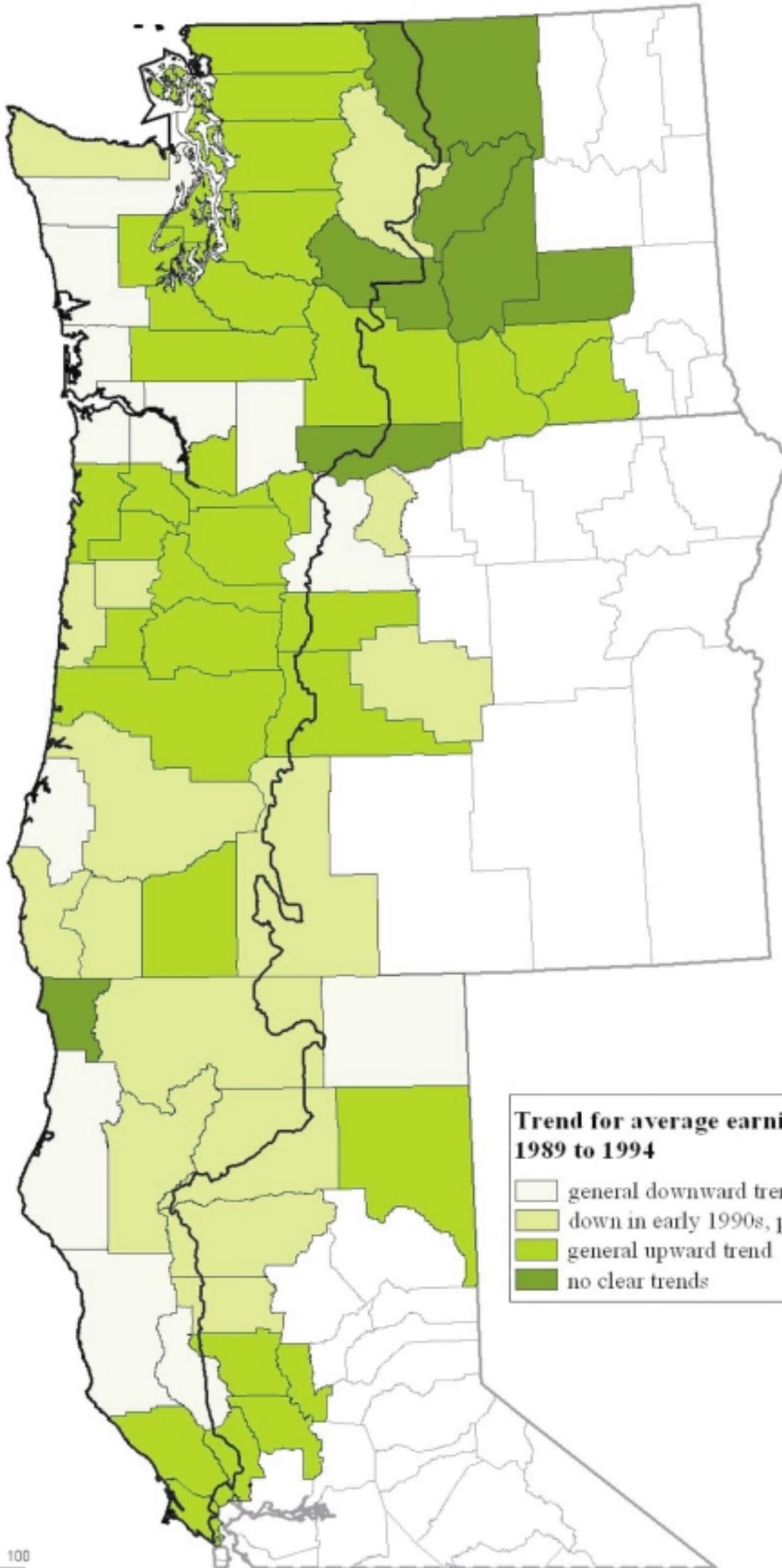


Figure 6—Metropolitan and nonmetropolitan wage trends in 1992 dollars compared to the Nation, 1969-93: (A) California, (B) Oregon, and (C) Washington.

# Map 10-Wage Trends



Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

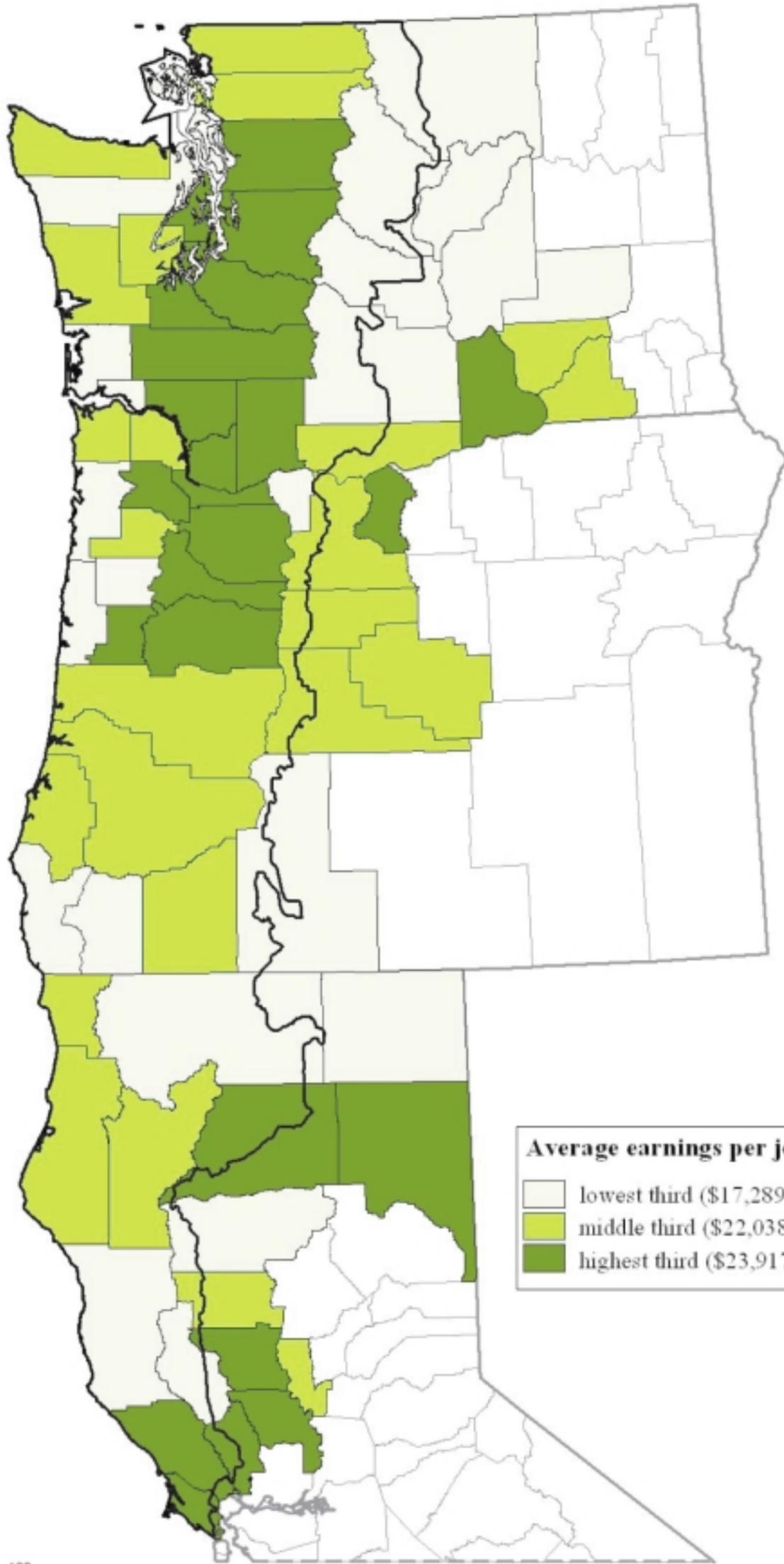
## Wage Level

Map 10 focuses on the pattern of wage changes in the early 1990s but does not portray areas of high and low wages relative to the NWFP region. For a broad relative ranking of wages, map 11 divides the counties into three groups based on their 1994 average annual earnings per job. These earnings within a county are based on place of employment and are from the BEA regional economic information system (REIS; U.S. Department of Commerce, Economics and Statistics Administration 1997). Two-thirds of the counties fall within a narrow range between \$17,000 and \$23,835 per year. This group encompasses most (80 percent) of the nonmetropolitan counties and 40 percent of the metropolitan counties. These metropolitan counties tend to contain the smaller metropolitan areas or be on the fringe of larger metropolitan areas; high-wage jobs may not be present in the county, but residents may commute to high-wage jobs in the nearby city.

A large group of the highest wage counties are located along the Interstate 5 corridor roughly from Edmonds, Washington, to Salem, Oregon, in the Willamette, Southwest Washington, and Western Washington Cascades provinces. The higher wage group is dominated by metropolitan counties, though eight nonmetropolitan counties also fell into this category. Another area of higher wage jobs is in the northern California counties adjacent to the San Francisco and Sacramento metropolitan areas. These two areas accounted for 20 of the 24 high-wage counties in the plan region. Twenty-one of the 24 lowest wage level counties are nonmetropolitan counties and are dispersed across the region with particular concentrations in the Eastern Washington Cascades, Yakima, and Klamath provinces. There also are low-wage counties scattered at intervals along the Pacific coast of all three states.

When the map of wage levels (map 11) is compared with the map of wage trends (map 10), it can be seen that only four of the counties with the lowest wage levels had a generally upward trend in wages between 1989 and 1994, and two of these are island counties in Puget Sound. Wage trends do not indicate that important changes in the relative rankings of the lowest wage counties are likely in the immediate future. Wage levels also can be compared with changes in wood products employment. Sixteen of the 24 counties with the lowest wage level also lost 6 percent or more of wood products employment, and only one of the lowest wage level counties had a 6 percent or greater increase in wood products employment. Many other factors affect the relative wage level for a county including the mix of industrial sectors in the county, the relative seasonality of employment in important industries in the county, the distance to higher wage level metropolitan areas, labor abundance or scarcity, and international markets for major industrial commodities and products from the county.

# Map 11-Wage Level



Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

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## **Section 4:**

### **Structural Economic Change**

**Economic Diversity**

**Fastest Growing Nonfarm Industries**

**Slowest Growing Nonfarm Industries**

## Economic Diversity

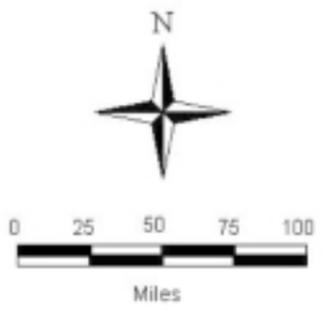
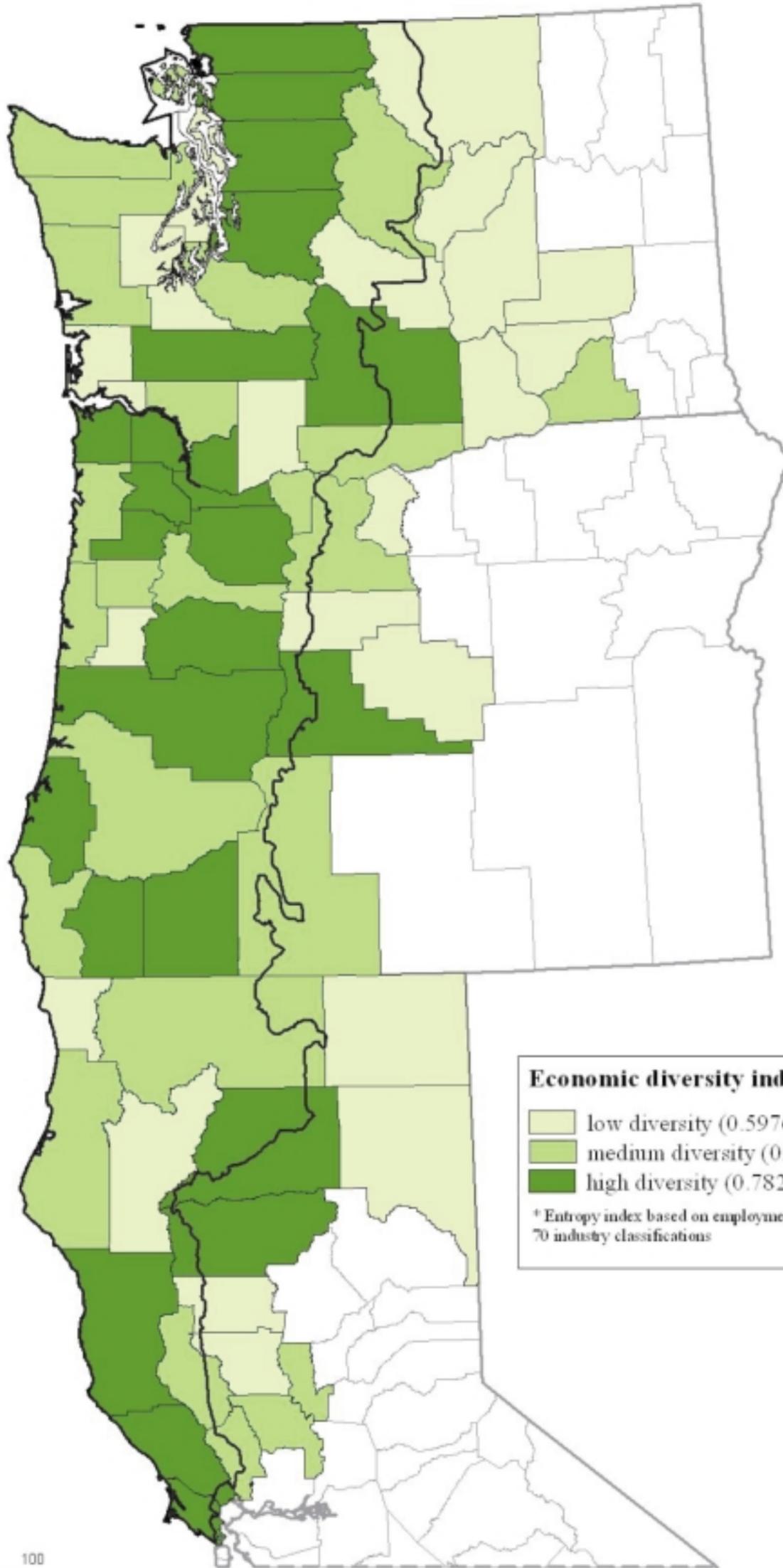
Another way to assess how the structure of an economy is changing is to look at the distribution of jobs across industries. Economies based primarily on one or a few industries are thought to be more vulnerable to exogenous changes (those beyond the control of the local area) than those that are more diversified. An increase in economic diversity therefore is generally interpreted to be desirable. Achieving greater economic resiliency is more complex than simply increasing industrial diversity and requires that vulnerability to various exogenous changes be distributed such that only a small proportion of jobs in the economy will be impacted by any particular change. An increase in industrial diversity that occurs as a consequence of attracting new industries may not make an economy any more resilient if the new industries are as sensitive to the same outside forces as were the old industries. In rural counties with small economies, the entry or exit of a single firm may have a large influence on the diversity index.

Although industrial diversity data must be used with qualification, tracking industrial diversity potentially can provide useful information about how economies are changing. For map 12, we measured industrial diversity by using an index of employment in 70 industries for each county. Employment data are at the two-digit SIC level of detail and are from the IMPLAN (a proprietary regional economic system for calculating employment impacts) database (Minnesota IMPLAN Group, Inc. 1997). This index, called a Shannon-Weaver entropy index, is equal to 0 when all employment is in one industry (no diversity) and equal to 1 when employment is equally distributed across all 70 industries (maximum diversity). The counties in map 12 are shaded by the value of their 1993 industrial diversity index. This map differs from many of the others in that it is a snapshot. It identifies areas of low and high diversity in 1993 but does not show how the index has changed through time.

Examination of data from 1990 to 1993 (the most recent available) revealed that there were counties with both increases and decreases in the index, but that the magnitude of the changes in either direction was very small in all but a few cases. Portraying these changes on a map would tend to overexaggerate them; therefore, just the 1993 index value is displayed. The counties with relatively large changes in diversity index, Benton and Klickitat in Washington and Sherman in Oregon, are all on the east side of the NWFP region and had relatively low industrial diversity indices in 1990. In contrast to the small changes in the 1990-93 period, industrial diversity index changes for three other periods—1977-82, 1982-85, and 1985-90—were generally much greater, especially the latter two periods, and were usually toward more industrial diversity. These trends may indicate that the pace of industrial diversification in the local economies of the Pacific Northwest has slowed.

Except for an apparent concentration of low-diversity counties in eastern Washington, there were few patterns to the distribution of counties in the region by industrial diversity. The diversity of a county's economy did not seem to be related to either the distribution of public timber harvests or employment in the wood products industry. Economic diversity, as calculated for map 12, was insensitive to changes in timber harvest in the NWFP region. In Washington, there were low-diversity counties reflecting the concentration of government workers, such as Thurston (state government), Kitsap (military bases), and Benton (U.S. Department of Energy at Hanford). There has been a general trend of increasing industrial diversity over time in the region and the Nation. The relatively small changes in diversity between 1990 and 1993 may be a result of more mature economies, and continued monitoring of industrial diversity may provide useful indications of future economic changes.

# Map 12-Economic Diversity



Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

**Fastest Growing Nonfarm Industries**

During the first half of the 20th century, manufacturing was the fastest growing industry in the United States (Council of Economic Advisors 1991). Since the 1950s, the country and the region have undergone a fundamental shift toward a knowledge-based economy with expanding service and finance, insurance, and real estate sectors (Council of Economic Advisors 1991; U.S. Department of Commerce, BEA 1998). This shift is apparent in map 13 which shows the fastest growing (based on increased wages) nonfarm industries in the NWFP region between 1989 and 1994. Services was the fastest growing industry sector for 17 counties; finance, insurance, and real estate (which covers producer services) was the fastest growing sector for six others. Population growth and high-tech industrial expansion were two of the main drivers behind the growth in the construction industry, which was the fastest growing industry in 20 counties, all in Oregon and Washington. Population growth also contributed substantially to the growth in real estate. The pace of expansion in the construction industry in the region is expected to slow in the coming years (Marple's Business Newsletter 1997).

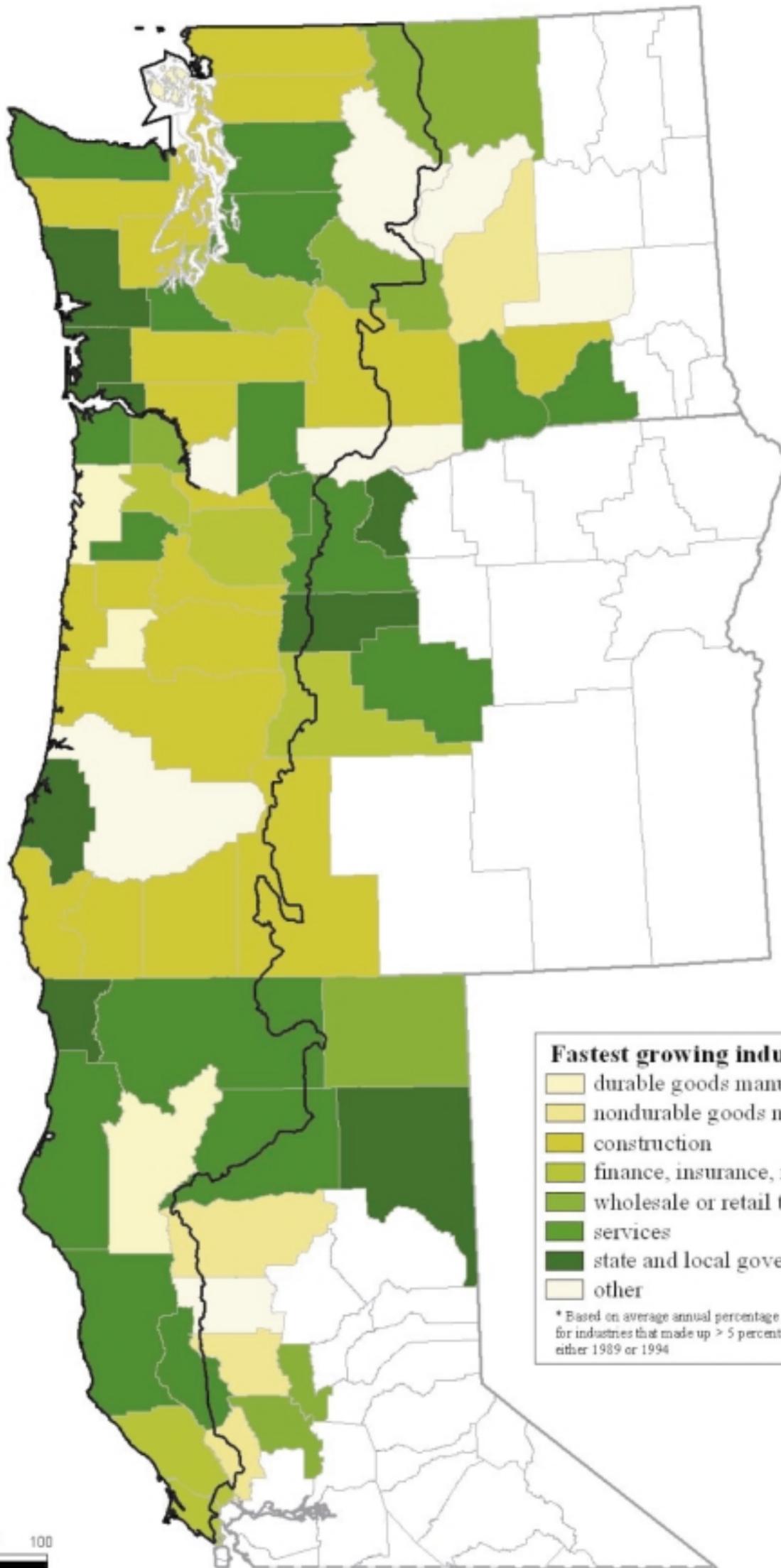
An array of industrial sectors provided the fastest growing industries in the remaining counties of the NWFP region. Durable manufacturing was the fastest growing sector in four counties, and nondurable manufacturing was the fastest growing sector in an additional four counties. Wholesale and retail trade, and state and local government were the fastest growing sectors in 14 counties. Transportation and utilities; agricultural services, forestry, and fishing; and Federal civilian government were the fastest growing sectors in seven counties classified as "other" in map 13 (see table 3). The industrial sectors for map 13 are at the one-digit SIC level of detail; a wide variety of specific industries thus are included in each aggregated sector in map 13, and it is impossible to determine exactly which industry within the sector is accounting for the growth in a county.

**Table 3—Fastest growing industry by county**

County and state	Fastest growing industry <sup>a</sup>
Glenn, CA	Agricultural services, forestry, fisheries
Douglas, OR	Civilian, Federal Government
Adams, WA	Agricultural services, forestry, fisheries
Chelan, WA	Agricultural services, forestry, fisheries
Clark, WA	Transportation and public utilities
Douglas, WA	Transportation and public utilities
Klickitat, WA	Transportation and public utilities

<sup>a</sup> "Other" designation on map 13.

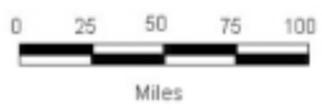
# Map 13-Fastest Growing Nonfarm Industries



**Fastest growing industries, 1989 to 1994\***

- durable goods manufacturing
- nondurable goods manufacturing
- construction
- finance, insurance, real estate
- wholesale or retail trade
- services
- state and local government
- other

\* Based on average annual percentage of change, 1989 to 1994, for industries that made up > 5 percent of nonfarm earnings in either 1989 or 1994



Spotted owl region boundary    
  State boundaries    
  County boundaries    
  Counties outside study area

**Slowest Growing Nonfarm Industries**

Employment and earnings in manufacturing industries have been providing a decreasing share of total employment and earnings in the national economy since the 1960s (Council of Economic Advisors 1991). This same trend has been evident in the NWFP region where manufacturing provides only 16 percent of total nonfarm labor earnings, down from 25 percent in 1969. In map 14, for 56 of the 72 counties in the region, the “slowest growing industry” is, in fact, an industry declining in relative terms.

The relative decline of manufacturing was evident at the county level in the NWFP region, and manufacturing was the “slowest growing industry” in 38 of 72 counties. Durable goods manufacturing, which includes wood products manufacturing, was the slowest growing industry in 75 percent of these 38 counties. The counties where manufacturing was the slowest growing industrial sector are distributed across the region, with concentrations in the lumber- and wood products-producing counties of the Klamath, Southwest Oregon, Deschutes, Western Washington, and Eastern Washington Cascade provinces. The construction sector was the slowest growing industrial sector in 10 counties; 8 are in northern California, an area hard hit by the recession of the early 1990s.

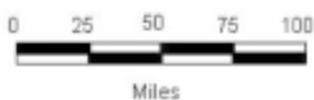
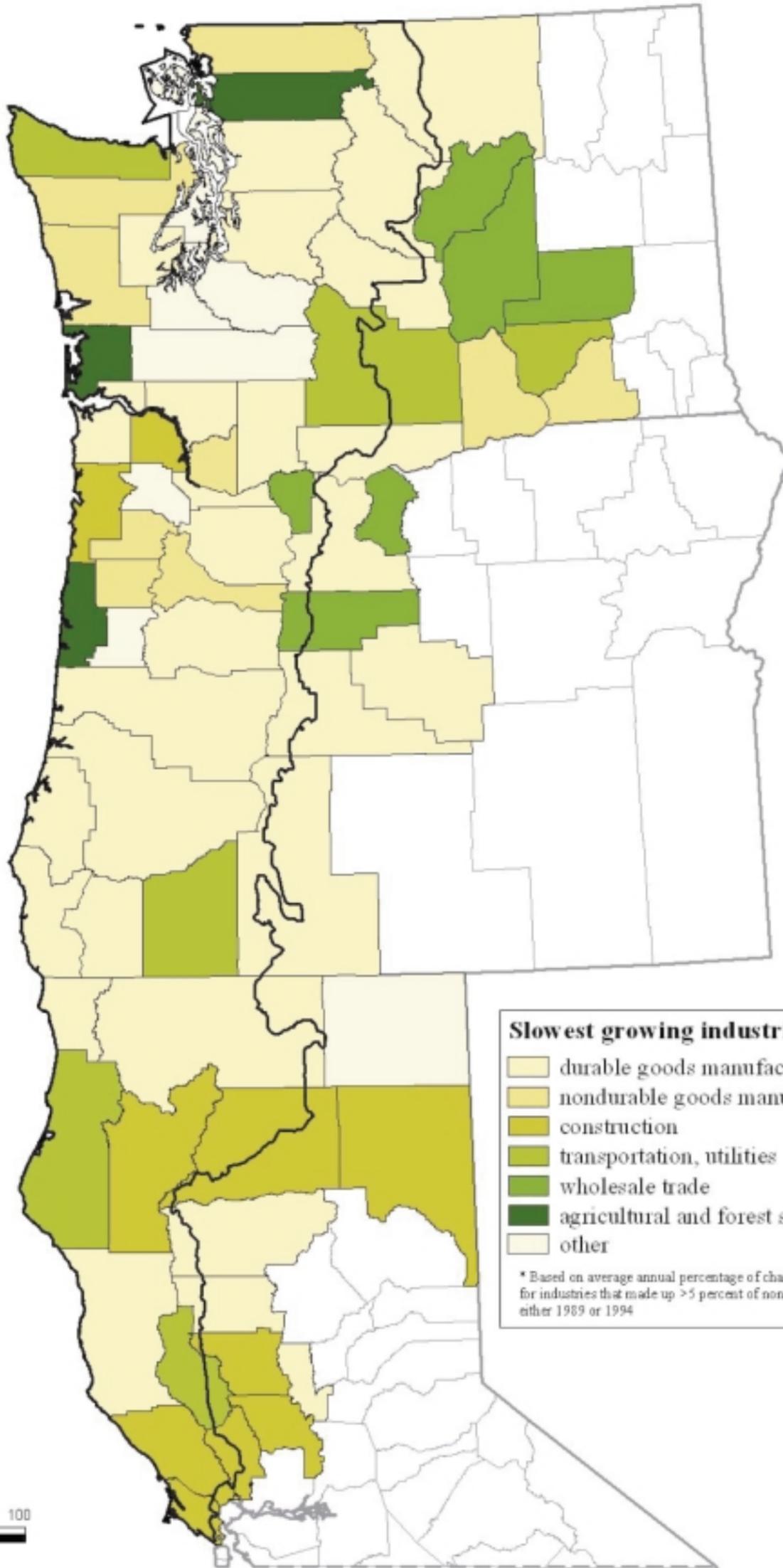
Transportation and utilities, wholesale trade, and agricultural services, forestry, and fishing also were categorized under slowest growing industries and were distributed across the region with little evidence of concentration. The “other” category of slowest growing industries was concentrated in the Puget Sound area of Washington and included such diverse industries as retail trade, military, and state and local government (see table 4). As is true with the fastest growing nonfarm industry map (map 13), the industrial sectors shown on map 14 are at the one-digit SIC level of detail so that each category can include a wide variety of specific industries.

**Table 4—Slowest growing industry by county**

County and state	Slowest growing industry <sup>a</sup>
Modoc, CA	Services
Benton, OR	Retail trade
Washington, OR	State and local government
Island, WA	Military
Lewis, WA	Mining
Pierce, WA	Military
San Juan, WA	Retail trade
Thurston, WA	State and local government

<sup>a</sup> “Other” designation on map 14.

# Map 14-Slowest Growing Nonfarm Industries



Spotted owl region boundary
  State boundaries
  County boundaries
  Counties outside study area

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## **Section 5:**

### **Characteristics of the Population**

**Change in County Population**

**Change in Unincorporated  
and Incorporated Population**

**Migration Status and Trends**

**Change in Ethnicity**

**Educational Attainment**

## Change in County Population

Population growth or decline—in particular, the portion resulting from migration—often parallels changing economic conditions. It also can be a result of economic change or a factor leading to economic change. Between 1989 and 1994, the economy of the Pacific Northwest outperformed the economy of the United States by a wide margin. But when economic indicators for specific counties were examined, it was apparent that the economic growth of the larger urban areas had not extended to many of the more rural, resource-based counties. Growing economic opportunity may ultimately lead to increased in-migration and population growth, but there are many exceptions. Some locations possess lifestyle amenities that attract migrants whether or not the economy is providing new employment opportunities, and some in-migrants, such as retirees and specialized consultants, are not dependent on local employment opportunities. Conversely, some regions with abundant economic opportunities, but a less attractive environment, may not attract enough new workers to fill vacant jobs. It is likely that some people are moving to various parts of the Pacific Northwest because of perceived economic opportunities and other people are moving for noneconomic reasons and then finding or creating economic activity when they get there.

In the 1960s, urbanization occurred throughout the United States, and the 1970s saw rapid population growth in the country's nonmetropolitan areas. The deep recession of the early 1980s and subsequent economic restructuring led to a population retrenchment back to the cities. Nationwide, the early 1990s was a time of renewed population growth for nonmetropolitan areas in general (Fuguitt and Beale 1996). The reasons for this most recent turnaround are not well understood. People's dissatisfaction with urban life, increased opportunities for telecommuting, and a lack of attractive opportunities in metropolitan areas (especially during the California recession of the early 1990s) are all possible factors, but little is known about the relative importance of these and other factors in determining the current trend. At the same time, this region experienced job losses in extractive and primary processing industries, which are concentrated in rural areas. So, have rural areas experienced the national trend of population growth and retention? or were population losses due to local structural economic change? Probably both, but map 15 shows that the net result for most counties was population gain.

The entire west coast, including the Pacific Northwest, has grown faster in population than the United States as a whole since 1980. The population growth persisted even through the economic downturn in California. Only one county (map 15) had fewer people in 1995 than in 1990 (and it is not a county with significant timber resources). Contrast this to the 1980s when there were job losses in extractive and primary processing industries and when, nationwide, nonmetropolitan areas were experiencing out-migration and population declines and the Pacific Northwest suffered economic declines. This is an indication that different forces have been at work in the 1990s, because although we have seen job losses akin to those of the early 1980s in one of the region's largest industries, similar losses in population have not occurred. Both the early 1980s and early 1990s had declining timber jobs, but the general economic conditions were worse in the 1980s, as reflected by the decline in population for 14 counties (nine in Oregon) between 1980 and 1985. Because of the similarities of the two periods, 1980 to 1985 was used for a comparison period for population loss.

That is not to say that population has grown at a high rate uniformly across the region, or that people have not left the region. Many western counties, considered to be high-amenity counties, are experiencing high migration turnover, namely where there is high in-migration and high out-migration (U.S. Department of Agriculture 1996; see map 17 below). The colors in map 15 correspond to the percentage of change in county population between 1990 and 1995 (i.e.,  $[1995-1990]/1990$ ). Northern California counties tended to exhibit slow to medium growth during this period. In Washington, the Puget Sound area, Tri-Cities area, and northern Cascade counties exhibited fast growth. In Oregon, the metropolitan areas and the Crook-Deschutes-Jefferson area had the fastest growth. As compared to the regional population growth, the U.S. population grew by 5.6 percent between 1990 and 1995. Thus, 59 of the 72 counties grew faster than the Nation as a whole. Thirteen counties in the region experienced population growth rates three times or greater than the population growth rate for the United States.

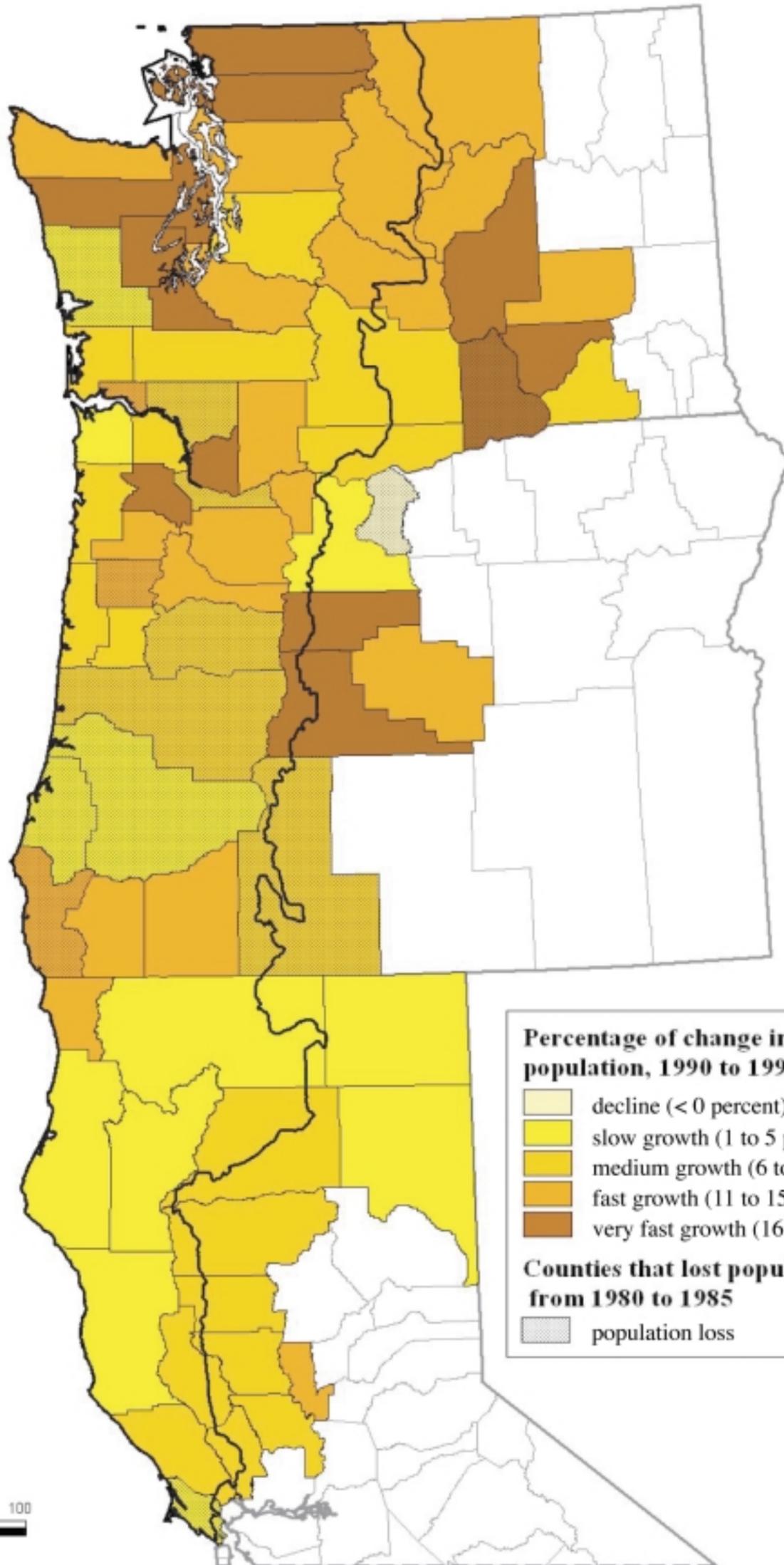
County data may not show, however, what is happening in the more rural parts of counties, especially in geographically large, heterogeneous counties. Some communities could be growing very slowly, possibly even declining, while others in the same county are growing fast enough to more than compensate for slower growing places. Population growth rates of incorporated places by size class (table 5) show that, in Oregon, growth was nearly uniform across the different size classes: small places on the whole did not decline as larger places grew. For Washington, the table shows that the smaller size classes grew faster than the larger size classes (northern California has too few incorporated places to be representative of growth by size.) This is not to say that all small incorporated places grew at these rates, but on the whole, smaller places grew as fast or faster than large places during the early 1990s in Oregon and Washington (24 of 460 incorporated places lost population between 1990 and 1995; in most of these, the population loss was low). Many people in the Pacific Northwest live in unincorporated areas, though. What happened to the unincorporated population during this period? We explore this issue next.

**Table 5—Population growth rates of incorporated places, by state and size, Pacific Northwest, 1990 to 1995**

Size class and state	Population change
	<i>Percent</i>
Oregon:	
Under 2,500	14.7
2,500 to 9,999	15.2
10,000 to 49,999	14.8
50,000 to 99,999	14.3
100,000 to 499,999	12.2
500,000 and over	NA
Washington:	
Under 2,500	16.5
2,500 to 9,999	22.1
10,000 to 49,999	10.5
50,000 to 99,999	12.9
100,000 to 499,999	5.5
500,000 and over	3.2

NA = not applicable.

# Map 15 - Change in County Population

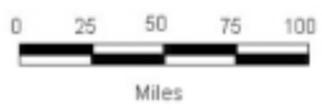


**Percentage of change in county population, 1990 to 1995**

- decline (< 0 percent)
- slow growth (1 to 5 percent)
- medium growth (6 to 10 percent)
- fast growth (11 to 15 percent)
- very fast growth (16 to 26 percent)

**Counties that lost population from 1980 to 1985**

- population loss



Spotted owl region boundary    
  State boundaries    
  County boundaries    
  Counties outside study area

**Change in Unincorporated and Incorporated Population**

**Table 6—Percentage of population living in unincorporated areas in 1990, Pacific Northwest and northern California**

County and state	Percent
Colusa, CA	56
Del Norte, CA	82
Glenn, CA	56
Humboldt, CA	53
Lake, CA	68
Lassen, CA	74
Marin, CA	28
Mendocino, CA	68
Modoc, CA	67
Napa, CA	33
Shasta, CA	50
Siskiyou, CA	53
Sonoma, CA	42
Sutter, CA	51
Tehama, CA	63
Trinity, CA	100
Yolo, CA	16
Benton, OR	31
Clackamas, OR	57
Clatsop, OR	37
Columbia, OR	54
Coos, OR	41
Crook, OR	62
Curry, OR	64
Deschutes, OR	62
Douglas, OR	58
Hood River, OR	67
Jackson, OR	41
Jefferson, OR	67
Josephine, OR	70
Klamath, OR	65
Lane, OR	35
Lincoln, OR	45
Linn, OR	39
Marion, OR	32
Multnomah, OR	11
Polk, OR	31
Sherman, OR	42
Tillamook, OR	63
Wasco, OR	43
Washington, OR	48
Yamhill, OR	33
Adams, WA	48
Benton, WA	25
Chelan, WA	44
Clallam, WA	57
Clark, WA	73
Cowlitz, WA	40
Douglas, WA	76
Franklin, WA	39
Grant, WA	48
Grays Harbor, WA	39
Island, WA	68
Jefferson, WA	65
King, WA	40
Kitsap, WA	73
Kittitas, WA	39
Klickitat, WA	65
Lewis, WA	60
Mason, WA	81
Okanogan, WA	58
Pacific, WA	66
Pierce, WA	58
San Juan, WA	85
Skagit, WA	48
Skamania, WA	81
Snohomish, WA	56
Thurston, WA	58
Wahkiakum, WA	85
Walla Walla, WA	30
Whatcom, WA	46
Yakima, WA	47

One approach for looking at rural and urban population changes is to compare how the unincorporated and incorporated portions of a county's population are changing. This is only a rural-urban proxy, because many smaller incorporated places are rural in character and some unincorporated areas are, for all practical purposes, economically and socially integrated with a nearby urban center. This data set nevertheless offers an inclusive way to examine within-county population changes between decennial censuses, whereas the incorporated place data alone (see table 6) exclude many people. Many of the counties in the NWFP region experienced fairly rapid population growth in the early 1990s, and we can examine whether the unincorporated portions experienced the same growth rates as the incorporated areas.

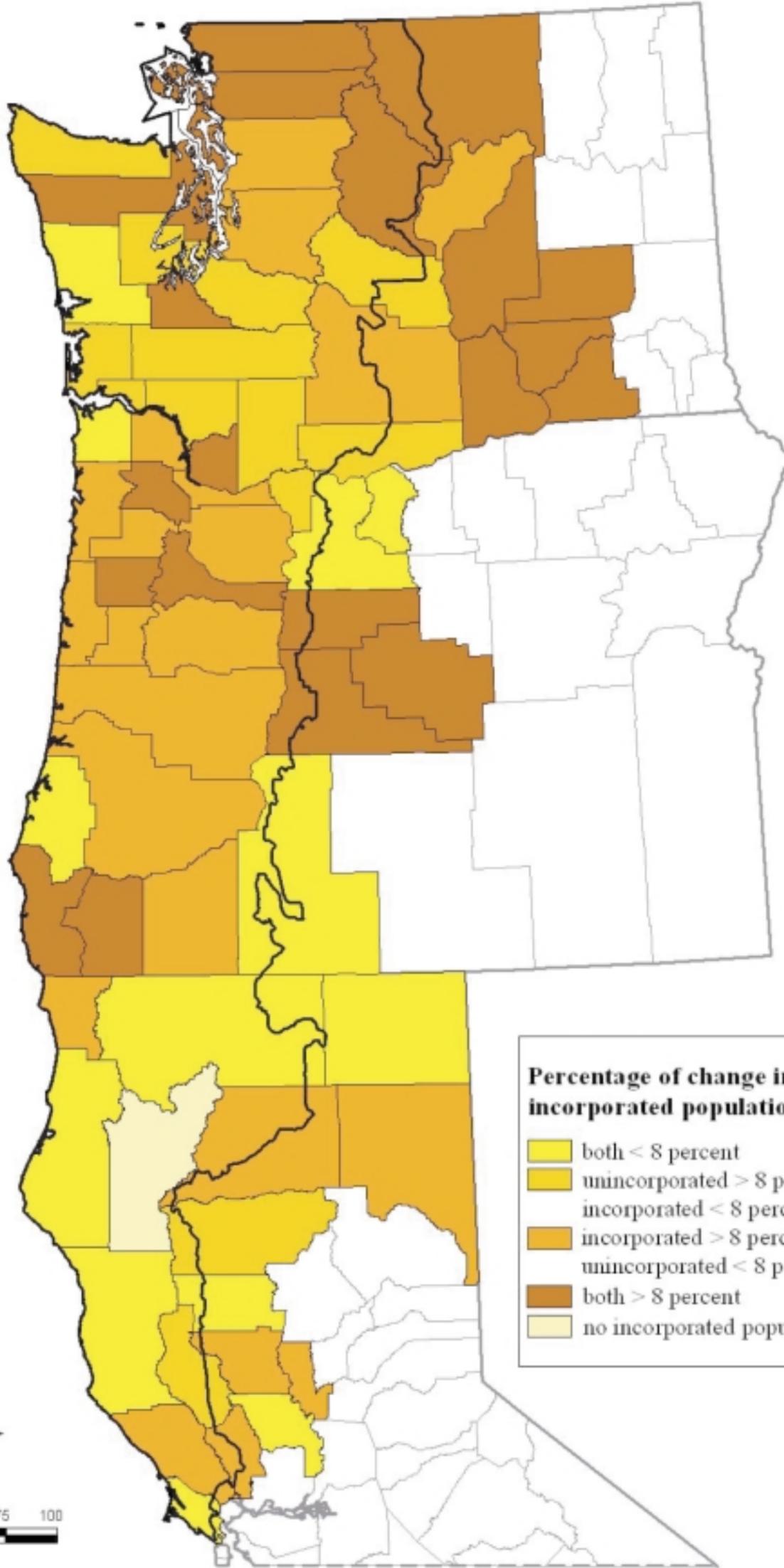
Even a small change in a small population can be a large percentage change. In some areas, most people live in unincorporated areas, while in other places few live outside incorporated areas. For the Washington counties in the NWFP region, about 46 percent of the population lives in unincorporated places; in the Oregon counties, 36 percent; and in the northern California counties, 41 percent. In one county, Trinity in California, all the residents live in unincorporated areas. Table 6 shows the percentage of the population living in unincorporated areas for all counties.

Map 16 displays the relative population change of the incorporated and unincorporated populations of each county between 1990 and 1995. The purpose of this map is to show differences in the unincorporated and incorporated growth rates, especially for the relatively faster growing counties. Counties are color-coded by whether their unincorporated and incorporated populations grew more or less than 8 percent during the 5-year period. This comes out to roughly 1.5 percent per year—a modestly high rate of growth in comparison to the U.S. growth rate of just over 1 percent per year during this period. Places with growth rates of less than 8 percent may not be declining or growing extremely slowly; they just are not growing faster than 1.5 percent per year. Also, annexation is one factor that explains shifts from rural to urban growth.

Two categories may indicate slower growing rural areas. One category shows areas where the incorporated population grew by more than 8 percent while the unincorporated population did not. There were 22 counties in the map area in this category. These are counties possibly experiencing uneven growth and that perhaps have rural areas not participating in the growth; however, in several of these counties, the incorporated population grew in large part from annexations. Further investigation thus would be required to determine the spatial growth pattern of each county. There also were 13 counties where neither the unincorporated nor incorporated population grew by more than 8 percent. Most of the counties in these two categories were in Oregon and northern California.

In 23 counties, growth appeared to be widespread, and in 13 counties the rate of growth of unincorporated areas actually exceeded that for the incorporated population. Many of these counties are in Washington or near the greater Portland area in Oregon. Thus, there are places where rural areas appear to be participating in growth, yet others where they are not. Most likely there is a diversity of conditions within the unincorporated and incorporated portions of individual counties that this aggregated display cannot account for. Unfortunately, we did not have a good way to measure and display these changes for unincorporated areas between the decennial censuses.

# Map 16-Change in Unincorporated and Incorporated Population



**Percentage of change in unincorporated and incorporated population, 1990 to 1995**

- both < 8 percent
- unincorporated > 8 percent, incorporated < 8 percent
- incorporated > 8 percent, unincorporated < 8 percent
- both > 8 percent
- no incorporated population



Spotted owl region boundary
  State boundaries
  County boundaries
  Counties outside study area

## Migration Status and Trends

**Table 7—Net in-migration and natural increase effects on population growth, Pacific Northwest and northern California, 1990 to 1994<sup>a</sup>**

County and state	Population growth
	Percent
Colusa, CA	*
Del Norte, CA	21.5
Glenn, CA	*
Humboldt, CA	6.6
Lake, CA	56.1
Lassen, CA	9.4
Marin, CA	*
Mendocino, CA	*
Modoc, CA	11.5
Napa, CA	14.1
Shasta, CA	43.7
Siskiyou, CA	18.2
Sonoma, CA	15.5
Sutter, CA	31.5
Tehama, CA	27.9
Trinity, CA	39.6
Yolo, CA	*
Benton, OR	30.3
Clackamas, OR	63.4
Clatsop, OR	**
Columbia, OR	**
Coos, OR	72.1
Crook, OR	76.1
Curry, OR	50.9
Deschutes, OR	80.4
Douglas, OR	59.1
Hood River, OR	*
Jackson, OR	74.1
Jefferson, OR	26.0
Josephine, OR	96.9
Klamath, OR	38.6
Lane, OR	43.0
Lincoln, OR	**
Linn, OR	71.5
Marion, OR	48.0
Multnomah, OR	8.2
Polk, OR	69.1
Sherman, OR	***
Tillamook, OR	**
Wasco, OR	62.7
Washington, OR	47.4
Yamhill, OR	52.8
Adams, WA	51.7
Benton, WA	62.4
Chelan, WA	39.5
Clallam, WA	65.0
Clark, WA	60.0
Cowlitz, WA	48.3
Douglas, WA	53.0
Franklin, WA	20.6
Grant, WA	49.9
Grays Harbor, WA	48.5
Island, WA	49.7
Jefferson, WA	69.6
King, WA	.7
Kitsap, WA	64.0
Kittitas, WA	64.6
Klickitat, WA	55.1
Lewis, WA	77.1
Mason, WA	89.2
Okanogan, WA	43.1
Pacific, WA	85.5
Pierce, WA	29.2
San Juan, WA	51.7
Skagit, WA	67.1
Skamania, WA	32.1
Snohomish, WA	44.4
Thurston, WA	63.2
Wahkiakum, WA	75.5
Walla Walla, WA	46.7
Whatcom, WA	54.5
Yakima, WA	33.3

The migration trend in this region from 1990 to 1994 has been compared to the “rural turnaround” of the 1970s where nonmetropolitan growth predominated. It is likely that the shift to nonmetropolitan net in-migration from 1990 to 1994 came as much from reduced outflow of people to the metropolitan areas as it did from an increased inflow of newcomers (U.S. Department of Agriculture 1996). Map 17 shows high and low levels of in-migration and out-migration. The data are relative to the region, whereby one county may be categorized as having low in-migration, it still may have a higher in-migration rate than other regions of the country. An average annual immigration rate of 6.6 percent divides counties into high and low immigration categories, with about 50 percent in-migrants in each category. A 5.6 percent average annual outmigration rate divides counties into high and low out-migration with 50 percent of out-migrants in each category. The migration data used in map 17 were compiled by the Internal Revenue Service and were calculated by comparing the county of residence given on tax returns in the current and previous year. If the county of residence was different in the previous year, members of that family were considered migrants. Although they should be considered estimates, the data cover an estimated 85 to 87 percent of the migrating population and thus offer a window into detailed annual population dynamics not available elsewhere (U.S. Department of Agriculture 1996). Because most people file tax returns in early to mid-April, it should be noted that the period of map 17 is April 1990 to April 1994.

Of the 36 counties with high in-migration, 27 also had high out-migration relative to the rest of the counties in the region. One explanation for this pattern was the rapidly expanding labor markets generating a good deal of employment turnover. Increasing employment opportunity encourages in-migration but also encourages upward mobility, including the search for better jobs outside the area. In addition, migrants tend to be more prone than others to migrate again; thus areas of high in-migration have a more footloose population. Higher migration turnover contributes to economic and social problems often associated with rapid population growth, such as difficulties projecting school enrollments and higher crime rates (U.S. Department of Agriculture 1996). On a national level, counties categorized as retirement-destination counties (though the majority of in-migrants are not necessarily retired people) and counties comprised mostly of Federal lands have the highest in-migration rates among county types. Federal lands counties also have the highest out-migration rates as well, reflecting high turnover and instability commonly associated with fast-growing, recreation- and tourism-based economies (U.S. Department of Agriculture 1996).

Net migration is an estimate of the difference between the number of people moving into an area (in-migration) and the number of people moving out (out-migration). In addition to net migration, natural change (the difference between births and deaths) and, to a lesser extent, international immigration affect population dynamics. As map 15 displays, population in the region is growing, with only one county (Sherman, Oregon) showing a population decline. Including Sherman, only seven counties experienced net out-migration from April 1990 to April 1994. Hood River was the only county in Oregon with net out-migration; the other five counties with net out-migration were Glenn, Mendocino, Marin, Colusa, and Yolo in California.

Across the Nation, from 1990 to 1995, increase in population in nonmetropolitan areas has depended primarily on migration, while most metropolitan growth has come from the surplus of births over deaths (U.S. Department of Agriculture 1996). In the NWFP region, 16 of the 26 metropolitan counties showed that the majority of the population growth was attributed to natural increase, most notably Yolo and Marin Counties in California, which simultaneously experienced net out-migration (see table 7).

The northern Oregon coast was a region where some natural decrease (more deaths than births) occurred. Natural decrease of a population may occur when people of childbearing age move away or retired people move in. The latter is probably the case for three of the four counties experiencing natural decrease: Clatsop, Lincoln, and Tillamook. Relative to the state, a larger proportion of the residents of these counties was 50 years and older (McGinnis and others 1996).

Table 7 shows how net in-migration and natural increase contributed to population growth in the region during this period. With the exception of 11 counties, all the counties experienced both net in-migration and natural increases, meaning more people were moving in than leaving and more people were being born than dying. The percentage associated with each county refers to the percentage of population growth attributable to net in-migration. To derive the percentage of population growth attributable to natural increase, simply subtract the percentage in table 7 from 100. For instance, 78.5 percent of the population growth occurring in Del Norte, California, can be attributed to natural increase (100 - 21.5 = 78.5). Thus, counties with less than 50 percent of their population growth attributable to net in-migration had the majority of their population growth attributed to natural increase. Keep in mind that these are estimates and they use 1990 census data for the base population and IRS income tax data to denote migrants.

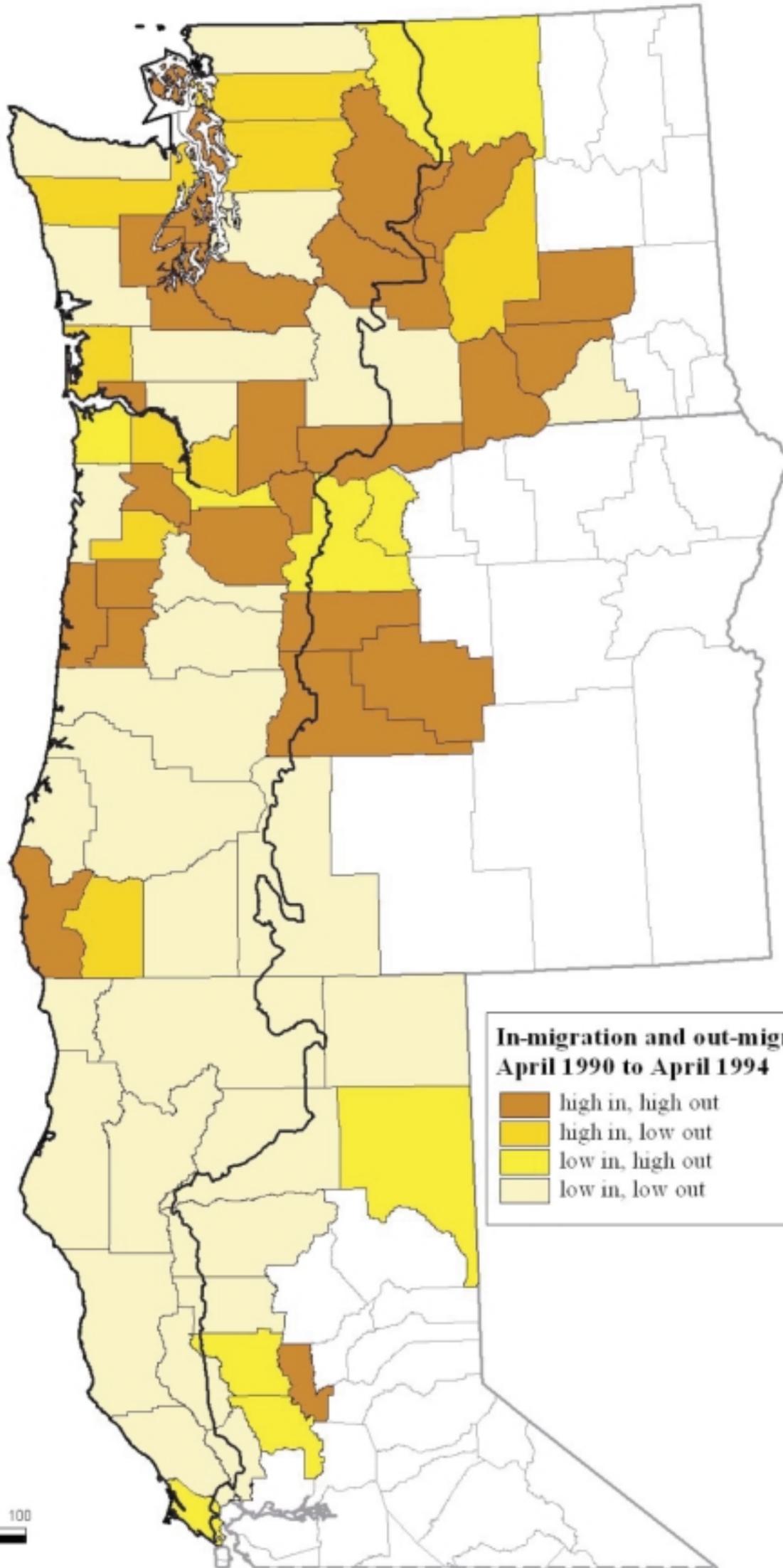
\* Counties experiencing out-migration during this period. Population growth attributed to natural increase.

\*\* Population is growing, but counties are experiencing natural decreases during the period (i.e., more deaths than births); in-migration offsets this.

\*\*\* Population is declining; natural increase is not high enough to offset net out-migration.

<sup>a</sup> Percentage of population growth attributed to natural increase equals 100 minus the percentage attributable to net in-migration, unless otherwise indicated.

# Map 17-Migration Status and Trends



Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

## Change in Ethnicity

**Table 8—Percentage of change of Hispanic origin, Pacific Northwest and northern California county populations, 1980 to 1990**

County and state	Population growth
	<i>Percent</i>
Franklin, WA	14.7
Colusa, CA	13.8
Adams, WA	10.5
Hood River, OR	9.7
Yakima, WA	9.1
Glenn, CA	8.1
Douglas, WA	7.5
Okanogan, WA	6.3
Chelan, WA	6.2
Grant, WA	5.9
Napa, CA	5.7
Tehama, CA	4.8
Mendocino, CA	4.8
Del Norte, CA	4.7
Sutter, CA	4.7
Walla Walla, WA	4.3
Jefferson, OR	4.3
Lassen, CA	3.9
Marin, CA	3.7
Sonoma, CA	3.7
Benton, WA	3.5
Marion, OR	3.3
Modoc, CA	3.1
Yamhill, OR	3.0
Yolo, CA	2.9
Wasco, OR	2.7
Klickitat, WA	2.6
Skagit, WA	2.3
Polk, OR	2.2
Klamath, OR	2.2
Washington, OR	2.0
Lake, OR	2.0
Pacific, WA	1.3
Kittitas, WA	1.3
Crook, OR	1.3
Skamania, WA	1.1
Lewis, WA	1.1
Siskiyou, OR	1.1
Jackson, OR	1.1
Clackamas, OR	1.1
Multnomah, OR	1.1
Whatcom, WA	1.0
Mason, WA	.9
Clark, WA	.9
Thurston, WA	.9
King, WA	.8
Pierce, WA	.8
Shasta, OR	.8
Humboldt, CA	.8
Josephine, OR	.8
Clallam, WA	.7
Cowlitz, WA	.7
Benton, OR	.7
Snohomish, WA	.7
Tillamook, OR	.7
Kitsap, WA	.7
Island, WA	.7
San Juan, WA	.6
Linn, OR	.6
Trinity, CA	.6
Clatsop, OR	.5
Curry, OR	.5
Grays Harbor, WA	.5
Douglas, OR	.5
Coos, OR	.4
Lincoln, OR	.4
Lane, OR	.4
Deschutes, OR	.3
Columbia, OR	.3
Sherman, OR	.1
Wahkiakum, WA	.1
Jefferson, WA	-.1

Ethnicity is an indicator of population diversity. Ethnic composition will affect the identity of a community and is a significant characteristic of the human "ecosystem." The diversity in human populations in states, counties, and communities has implications for forest management as well as school systems, health providers, and other public services. Diversity also has significant implications in terms of social and economic well-being. For instance, minorities, with the exception of many Asian groups, are disadvantaged in labor markets, Native American men have high rates of joblessness, and black men face pay discrimination (Swanson 1996).

Natural resource managers need to be aware of who their customers are and how their culture might affect the use of natural resources. Recent Asian migrants, for example, have a cultural history of extensive use of nontimber forest products. Natural resources are a major force in Native Americans culture as well. Other cultures also have culture-specific ways of using and relating to natural resources.

These data are from the decennial censuses for 1980 and 1990 and are subject to self-reporting error and processing errors associated with census estimates.<sup>3</sup> Minority populations are (1) black; (2) American Indian, Eskimo, and Aleut; (3) Asian and Pacific islander; and (4) other.<sup>4</sup> The "other" category includes a number of people with write-in entries such as multiracial, multiethnic, and Spanish-Hispanic origin group names such as Cuban, Mexican, Puerto Rican, and others.

Hispanic origin is not a subset of race. A person of Hispanic origin can be of any race. Hispanics may be Hispanic Asian, Hispanic American Indian, and so forth. Few persons remain in the "other" category when persons of Hispanic origin are placed in a separate category.

Asian or Pacific islanders showed the largest percentage of increase between 1980 and 1990 in the major metropolitan areas of Oregon, Washington, and northern California. This includes the Puget Sound region, Portland-Vancouver area, and the San Francisco area. The "other" category was dominant among minorities in eastern Washington.

Refer to map 18 for the county interpretation. The percentage of change in specific minority populations was small and ranged from no change to 18 percent (Adams, Washington). Only three counties had double-digit change (Colusa, California, Douglas, Oregon, and Adams, Washington). The remainder of the counties increased from less than 1 percent to 9.7 percent, and the majority of counties had increases in minority populations from 0.2 to 3 percent. In addition to the Asian or Pacific islander change as noted above, Native Americans increased in several counties, many on the coast of Oregon and Washington. Lane, Benton, and Linn, Oregon, showed an Asian or Pacific islander increase. Two universities and state government offices reside in this area.

In Washington, blacks increased from 2.5 to 3.0 percent of the total population from 1980 to 1990. American Indian population grew from 1.5 to 1.6 percent. The Asian population produced the largest increase: from 2.6 to 4.2 percent of the state's population. Persons of Hispanic origin grew from 2.9 and 4.4 percent (Cook and Jordan 1994a).

In table 8, we display the names of counties and the percentage of change for Hispanic populations. The values are ranked from a high of 14.7-percent change to a low of -0.1-percent change.

For a listing of specific values for each county, refer to McGinnis and others (1996, 1997). Also see a selected set of publications by Cook and Jordan (1994a, 1994b, 1995a, 1995b, 1995c, 1995d). These documents assess county change in Washington by subregions.

Figure 7 shows a projection from the 1990 census and the dominant minority in the West to be Hispanic; in the South, Midwest and Northeast it is black. Table 9 displays the projections for numbers of people and projected changes by 2010. Projections show relatively large increases in minority and Hispanic origin populations in the United States and the region. White populations are projected to remain relatively stable.

**Table 9—Population projections, by the Nation and states, 2000-2010**

Entity	Hispanic origin		White		Black		American Indian, Eskimo, Aleut		Asian, Pacific Islander	
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
----- Thousands of people -----										
United States	31,366	41,138	197,062	202,390	33,569	37,466	2,055	2,321	10,585	14,402
Washington	360	519	4,881	5,346	179	203	95	112	342	477
Oregon	195	278	2,990	3,253	59	71	45	53	110	147
California	10,657	14,214	15,562	15,394	2,138	2,268	170	165	4,006	5,603

Source: U.S. Department of Commerce, Bureau of Census 1997a.

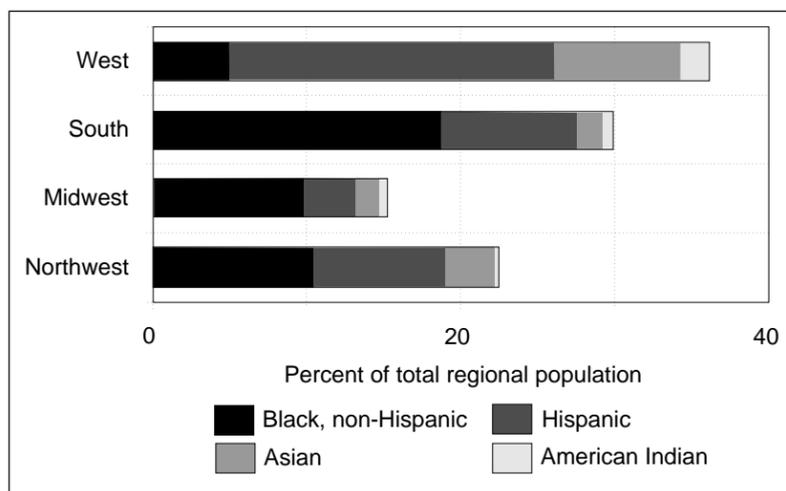
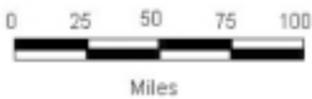
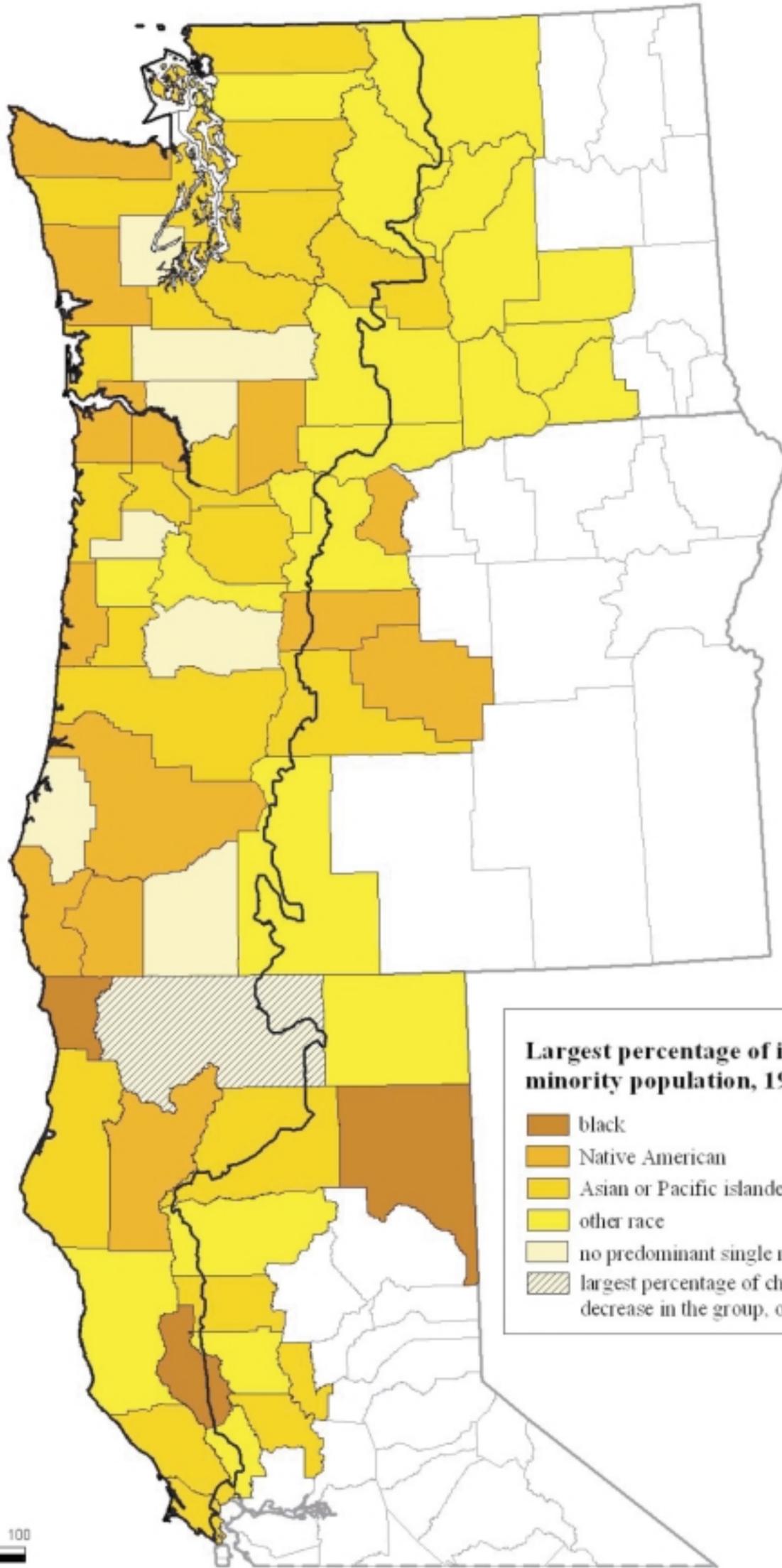


Figure 7—Dominant minority populations in the United States during 1995 (source: Council of Economic Advisors 1998).

<sup>3</sup>The 1980 estimates came from the U.S. Department of Commerce, Bureau of the Census (1992), and the 1990 estimates are from the U.S. Department of Commerce, Bureau of the Census (1991a, 1991b).

<sup>4</sup>The Office of Management and Budget revised the standards of classifying Federal data on race and ethnicity in October 1997. The new standards allow respondents to mark one or more race categories on Federal reporting forms. Also, the Asian and Pacific islander category is divided into Asian and Native Hawaiian or other Pacific islander. The black category has been changed to black or African American. A separate question on Hispanic origin will continue and will have two categories: "Hispanic or Latino" and "not Hispanic or Latino."

# Map 18-Change in Ethnicity



Miles

Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

## Educational Attainment

**Table 10—Percentage of the population with no high school diploma, Pacific Northwest and northern California, 1990**

County and state	Percent
Colusa, CA	37.1
Yakima, WA	33.9
Adams, WA	33.6
Glenn, CA	33.1
Franklin, WA	31.9
Klickitat, WA	29.6
Lake, CA	29.1
Del Norte, CA	29.1
Okanogan, WA	28.7
Hood River, OR	28.7
Grant, WA	28.4
Crook, OR	28.2
Tehama, CA	27.8
Modoc, CA	27.8
Sutter, CA	27.7
Lassen, CA	27.2
Jefferson, OR	26.1
Grays Harbor, WA	26.0
Trinity, CA	25.8
Pacific, WA	25.8
Chelan, WA	25.7
Douglas, OR	25.5
Josephine, OR	24.8
Lewis, WA	24.6
Coos, OR	24.5
Douglas, WA	24.1
Klamath, OR	23.8
Linn, OR	23.8
Tillamook, OR	23.7
Cowlitz, WA	22.7
Siskiyou, OR	22.6
Wasco, OR	22.6
Skamania, WA	22.6
Wahkiakum, WA	22.2
Columbia, OR	22.0
Curry, OR	21.9
Shasta, CA	21.6
Mendocino, CA	21.3
Marion, OR	21.3
Yamhill, OR	20.9
Yolo, CA	20.9
Walla Walla, WA	20.9
Mason, WA	20.8
Clallam, WA	20.3
Polk, OR	20.0
Jackson, OR	19.9
Lincoln, OR	19.5
Humboldt, CA	19.5
Napa, CA	19.3
Skagit, WA	19.0
Kittitas, WA	18.8
Clatsop, OR	18.2
Jefferson, WA	17.3
Multnomah, OR	17.1
Lane, OR	17.0
Sherman, OR	16.9
Whatcom, WA	16.8
Pierce, WA	16.8
Deschutes, OR	16.8
Clark, WA	16.1
Benton, WA	16.1
Sonoma, CA	15.6
Clackamas, OR	14.3
Snohomish, WA	14.3
Thurston, WA	13.5
Kitsap, WA	13.4
Washington, OR	11.8
King, WA	11.8
Island, WA	11.7
Benton, OR	10.7
San Juan, WA	8.8
Marin, CA	8.1

Educational attainment is one of the most important indicators of lifetime economic opportunities. Higher education is associated with lower unemployment and higher wages, better health for families, and higher family income.

Map 19 displays a snapshot of educational attainment for 1990 rather than depicting change as in most other maps. The variable, “percent of population 25 years and older with postsecondary degrees for 1990,” was selected for display because it reflects a measure of community investments in education and the capability for more technologically advanced workforce participation.

For comparisons of states to national levels, refer to figure 8, which displays educational attainment for 1990. Nationally, individuals without a high school diploma accounted for 25 percent of the total population in 1990 that was 25 years and older. The three states in the region fell below the national figure, with California at 24 percent, Oregon at 19 percent, and Washington at 16 percent (see table 10 for county level data). The percentage of individuals in 1990 that were high school graduates or had some college was 49 percent nationally, 45 percent for California, but 53 and 54 percent, respectively, for Washington and Oregon. The percentage of individuals in 1990 with postsecondary degrees was 26 percent nationally and higher for all three states: 31 percent each for California and Washington, and 28 percent for Oregon.

For an interpretation of the provinces, see map 19. Postsecondary degrees at the provincial level were high (30 percent or more of the population 25 years and older) in the following provinces: Western Washington Cascades province, a portion of the Southwest Washington province, eastern Yakima province, northern Willamette province, a portion of the southwestern Willamette and eastern Oregon Coast provinces, southern Northwest Sacramento province, and southern California Coast province.

The values in the Puget Sound region in Washington, Benton County, Oregon, and Marin County, California, were high with 40 to 52 percent of the population in 1990 reporting postsecondary degrees. A few counties reported 30 to 40 percent of the population having postsecondary degrees: Yolo and Napa in California, the Portland metropolitan counties of Oregon, and Thurston and Benton Counties, Washington.

In summary, the higher educational attainment was found in the major metropolitan areas such as Puget Sound, Portland, and San Francisco suburban areas. Likewise, counties with many state government workers or large postsecondary educational institutions had high educational attainment. In contrast, the lowest educational attainment in the region was found in counties traditionally dependent on natural resources, and that creates a challenge for economic and community development efforts focusing on diversifying the economy.

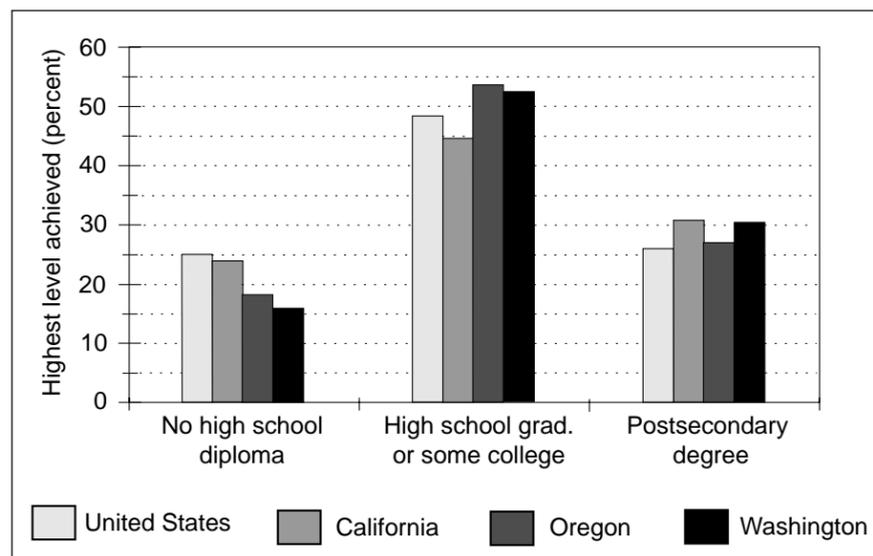
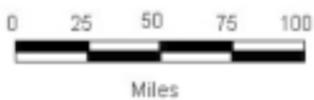
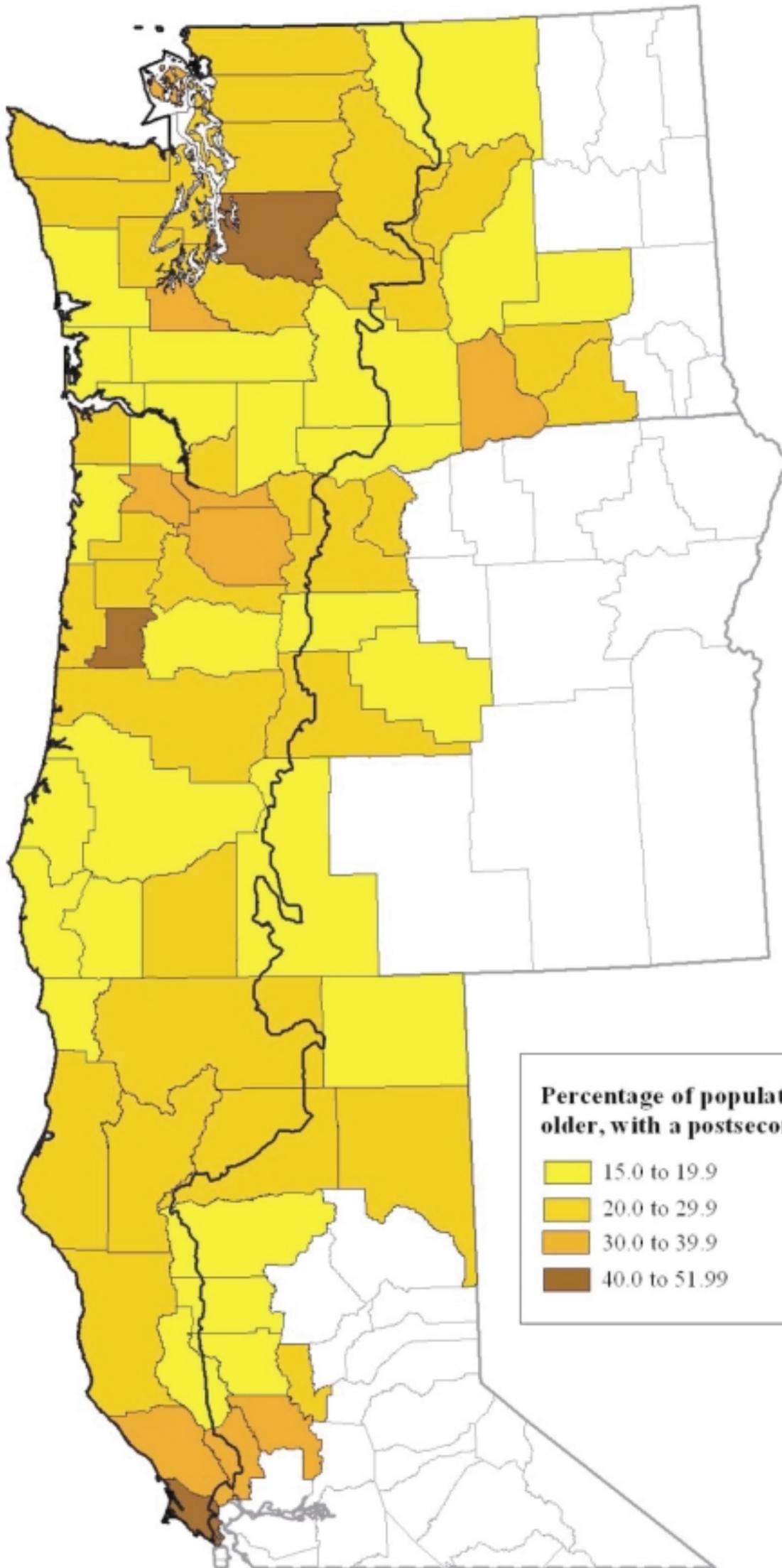


Figure 8—Level of educational attainment, Pacific Northwest and northern California, compared to the Nation, 1990.

# Map 19-Educational Attainment



Miles

Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

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## **Section 6:**

### **Social Issues**

**Change in Income Maintenance**

**Change in Poverty Rate**

**Change in Violent Crime Rates**

**Change in Property Crime Rates**

**Alcohol-Related Incidences**

## Change in Income Maintenance

**Table 11—Average annual per capita income maintenance, Pacific Northwest and northern California, 1989 to 1994**

County and state	Dollars
Lake, CA	713
Del Norte, CA	675
Modoc, CA	653
Humboldt, CA	634
Siskiyou, CA	631
Shasta, CA	611
Tehama, CA	585
Trinity, CA	583
Mendocino, CA	582
Glenn, CA	551
Lassen, CA	526
Yakima, WA	472
Sutter, CA	468
Klickitat, WA	451
Yolo, CA	451
Grays Harbor, WA	448
Okanogan, WA	439
Franklin, WA	429
Adams, WA	423
Colusa, CA	377
Grant, WA	357
Cowlitz, WA	357
Lewis, WA	354
Skamania, WA	351
Josephine, OR	347
Pacific, WA	347
Pierce, WA	316
Jefferson, OR	309
Coos, OR	307
Mason, WA	298
Clallam, WA	296
Walla Walla, WA	289
Multnomah, OR	285
Linn, OR	283
Sonoma, CA	281
Klamath, OR	278
Chelan, WA	275
Douglas, OR	271
Sherman, OR	264
Marion, OR	260
Clark, WA	258
Napa, CA	254
Lane, OR	253
Skagit, WA	245
Wahkiakum, WA	242
Thurston, WA	240
Jackson, OR	235
Lincoln, OR	233
Jefferson, WA	232
Wasco, OR	224
King, WA	218
Clatsop, OR	217
Curry, OR	208
Kitsap, WA	207
Whatcom, WA	204
Kittitas, WA	199
Snohomish, WA	196
Benton, WA	194
Crook, OR	192
Yamhill, OR	189
Marin, CA	184
Tillamook, OR	184
Polk, OR	172
Douglas, WA	171
Hood River, OR	165
Columbia, OR	165
Deschutes, OR	162
Benton, OR	130
Island, WA	110
Washington, OR	105
Clackamas, OR	103
San Juan, WA	101

Income maintenance is an indicator of economic stress and poverty. The number of people on Federal welfare rolls has dropped below 10 million for the first time in almost 27 years (The New York Times 1998). Fewer than 4 percent of Americans are now on welfare; more than 30 percent of the decline has come from changes in Federal and state welfare policies and laws. In January 1997, there were 11.4 million people on welfare, 2.8 million fewer than in January 1993. From January to August 1997, the rolls declined by about 1.4 million people. Map 20 displays the change in dollar amounts of an income maintenance indicator that combines supplemental security income (SSI), food stamps, aid to families with dependent children, and "other" income maintenance (U.S. Department of Commerce, Economics and Statistics Administration 1997).

What do the categories of income maintenance mean? Supplemental security income benefits consist of payments received by the disabled, aged, and blind from both the Federal and state governments. Aid to families with dependent children is a state-administered program that receives Federal matching funds to provide payments to low-income families such as single mothers with children. One social issue is the potential intergenerational permanence of welfare recipients. This category of recipients may not be affected by economic fluctuations. Food stamp benefits are issued to qualifying low-income individuals to supplement their ability to purchase food. Eligibility is determined by the state's interpretation of Federal regulations; the U.S. Department of Agriculture pays the cost of the stamps. The "other" income maintenance payments consist of general assistance benefits, emergency assistance benefits, foster care payments, and so forth.

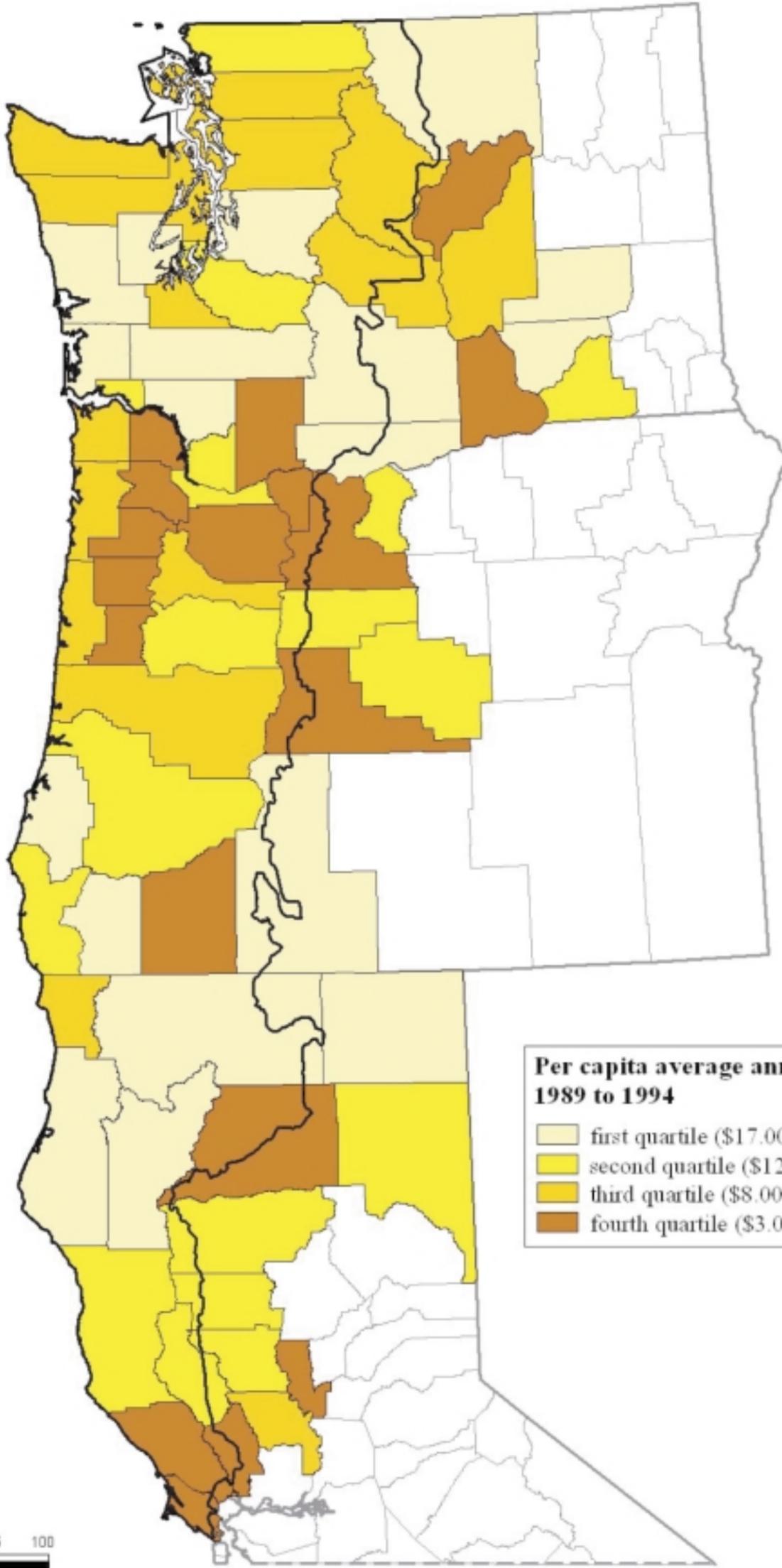
Map 20 indicates that the largest (first quartile) per capita average annual change from 1989 to 1994 occurred in the following provinces: Klamath and portions of Southwest Oregon, Yakima, Southwest Washington, Olympic Peninsula, Western Washington Cascades, and Eastern Washington Cascades. This means that the annual per capita change averaged between \$17.00 and \$30.00. The smallest (fourth quartile) average annual change occurred in all provinces except Oregon Coast, Olympic Peninsula, and Western Washington Cascades. The change averaged between \$3.00 and \$7.99.

The county analyses demonstrate that the largest (first quartile) per capita average annual change from 1989 to 1994 occurred in northern California and southern Oregon, in the Puget Sound region, and counties of eastern Washington. The smallest (fourth quartile) change occurred in Jackson and Deschutes Counties, Oregon, the San Francisco Bay area, and Shasta County, California. Douglas and Benton Counties in Washington demonstrated a small change (\$3.00-7.99).

Table 11 shows the average annual per capita income maintenance payments over 6 years. San Juan, Washington, for example, shows an average of \$101, and Lake, California, shows \$713. The average per capita income maintenance payment of \$713 is controlled by state policy and is not associated with geographical differences in economic fluctuations. All qualified recipients receive the same amount of money. In Washington, the base rate is \$339. If children are added, Washington may give \$100 to the first child; another state may give \$0 while another state may give \$50. California pays higher benefits than other states. Because states control policy for income maintenance, it is less meaningful to compare among states. County data, however, do tell a story and reflect differences in the number of children and the relative number of recipients compared to the total population.

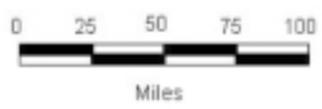
As previously mentioned, SSI goes to the aged, to the permanently disabled, and as survivors' benefits for children whose parents have died. None of these categories is directly affected by local economic circumstances. Immigrants may be in a vulnerable position due to social policy changes. The majority of these immigrants are elderly or permanently disabled. The compassionate concern is how this population is to be supported given that they cannot join the labor force. Churches, social organizations, and states are scrambling to determine what can be done in terms of assistance. Changes in SSI policy can adversely affect an already distressed county by creating additional burdens on local resources. It is not possible to separate the effects of social policy changes, local economic conditions, and demographic changes on average annual per capita income maintenance payments.

# Map 20-Change in Income Maintenance



**Per capita average annual increase, 1989 to 1994**

- first quartile (\$17.00 to 30.00)
- second quartile (\$12.60 to 16.99)
- third quartile (\$8.00 to 12.50)
- fourth quartile (\$3.00 to 7.99)



Spotted owl region boundary
  State boundaries
  County boundaries
  Counties outside study area

## Change in Poverty Rate

**Table 13—Change in percentage of poverty, Pacific Northwest and northern California, increase (+) or decrease (-) by county, 1979 to 1989 and 1989 to 1993**

County	1979-89	1989-93
Colusa, CA	+	+
Del Norte, CA	+	+
Lake, CA	+	+
Skamania, WA	+	+
Modoc, CA	+	+
Yakima, WA	+	+
Tehama, CA	+	+
Mendocino, CA	+	+
Siskiyou, CA	+	+
Lassen, CA	+	+
Glenn, CA	+	+
Shasta, CA	+	+
Multnomah, OR	+	+
King, WA	+	+
Grays Harbor, WA	+	+
Clark, WA	+	+
Washington, OR	+	+
Curry, OR	+	+
Marion, OR	+	+
Lewis, WA	+	+
Pierce, WA	+	+
Adams, WA	+	+
Skagit, WA	+	+
Klickitat, WA	+	+
Josephine, OR	+	+
Linn, OR	+	+
Jackson, OR	+	+
Chelan, WA	+	+
Clackamas, OR	+	+
Clallam, WA	+	+
Yamhill, OR	+	+
Douglas, OR	+	+
Cowlitz, WA	+	+
Coos, OR	+	+
Hood River, OR	+	+
Klamath, OR	+	+
Thurston, WA	+	+
Mason, WA	+	+
Lane, OR	+	+
Lincoln, OR	+	+
Kitsap, WA	+	+
Sutter, CA	+	+
Walla Walla, WA	+	+
Sonoma, CA	-	+
Snohomish, WA	-	+
Napa, CA	-	+
Marin, CA	-	+
San Juan, WA	-	+
Sherman, OR	-	+
Island, WA	-	+
Wahkiakum, WA	-	+
Crook, OR	+	-
Wasco, OR	+	-
Pacific, WA	+	-
Humboldt, CA	+	-
Clatsop, OR	+	-
Deschutes, OR	+	-
Douglas, WA	+	-
Okanogan, WA	+	-
Jefferson, WA	+	-
Franklin, WA	+	-
Benton, WA	+	-
Yolo, CA	+	-
Jefferson, OR	+	-
Polk, OR	+	-
Grant, WA	+	-
Columbia, OR	+	-
Trinity, CA	+	-
Tillamook, OR	+	-
Benton, OR	+	-
Kittitas, WA	+	-
Whatcom, WA	-	-

The poverty rate reflects, in part, the distribution of income and is an indicator of economic distress. The poverty thresholds are established by the U.S. Office of Management and Budget and are based on income for specific family sizes, age of the household head, and the number of related children under age 18 in the household. Poverty status is determined for families rather than individuals. Refer to the *Statistical Abstract of the United States 1997*, Section 14, (U.S. Department of Commerce, Bureau of the Census 1997c) for additional information on money income, poverty index, and measurement. Changes in how poverty is defined and measured over time may limit comparability.

Poverty thresholds in the United States in 1990 ranged from \$6,268, for a family of one person 65 years old or older, to \$26,848 for a family of nine or more. The average household size in 1995 was 2.6 persons. The poverty level for a unit of three persons was \$12,158 (U.S. Department of Commerce, Bureau of the Census 1997c). When we compared state to national poverty levels in 1995, California had a higher percentage (16.7 percent) of persons below poverty level than the national average of 13.8 percent. Oregon at 11.2 percent and Washington at 12.5 percent were lower than the national average. Use caution with these figures. The percentages of poverty levels for the three states are representative of entire states and not just the portion within the NWFP region. For trends, see table 12 for persons below poverty level by state from 1990 to 1995.

Most of the provinces in California and the Southwest Washington, Yakima, and Western Washington Cascade provinces reflected increases in poverty rates from 1989 to 1993 (see map 21). Most of western Oregon and Washington showed increases but not to the level for the provinces listed above. Many provinces experienced decreases in poverty rates. Those included portions of the Klamath, California Coast, and Northwest Sacramento provinces; all of the Deschutes province; and some of the other provinces in western Oregon and Washington. Poverty rates in California in the 1990s reflected a nationwide recession that was particularly evident in California.

Most counties in California experienced a large increase in percentage of change in poverty except for Humboldt, Trinity, and Yolo Counties. Two-thirds of the counties in Oregon had a modest increase in poverty rates, and two-thirds of the counties in Washington had a modest-to-large increase.

Table 13 (left) compares the percentage of people in poverty in each county between two periods—the 1980s and 1989-93. The percentage of poverty in over one-half of the counties increased during both periods. Interestingly, some counties went from an increase in poverty to an increase in poverty rate. Whatcom County, Washington, experienced a decrease in poverty rate for both periods.

See the appendix for method of calculation used to determine changes in poverty rates.

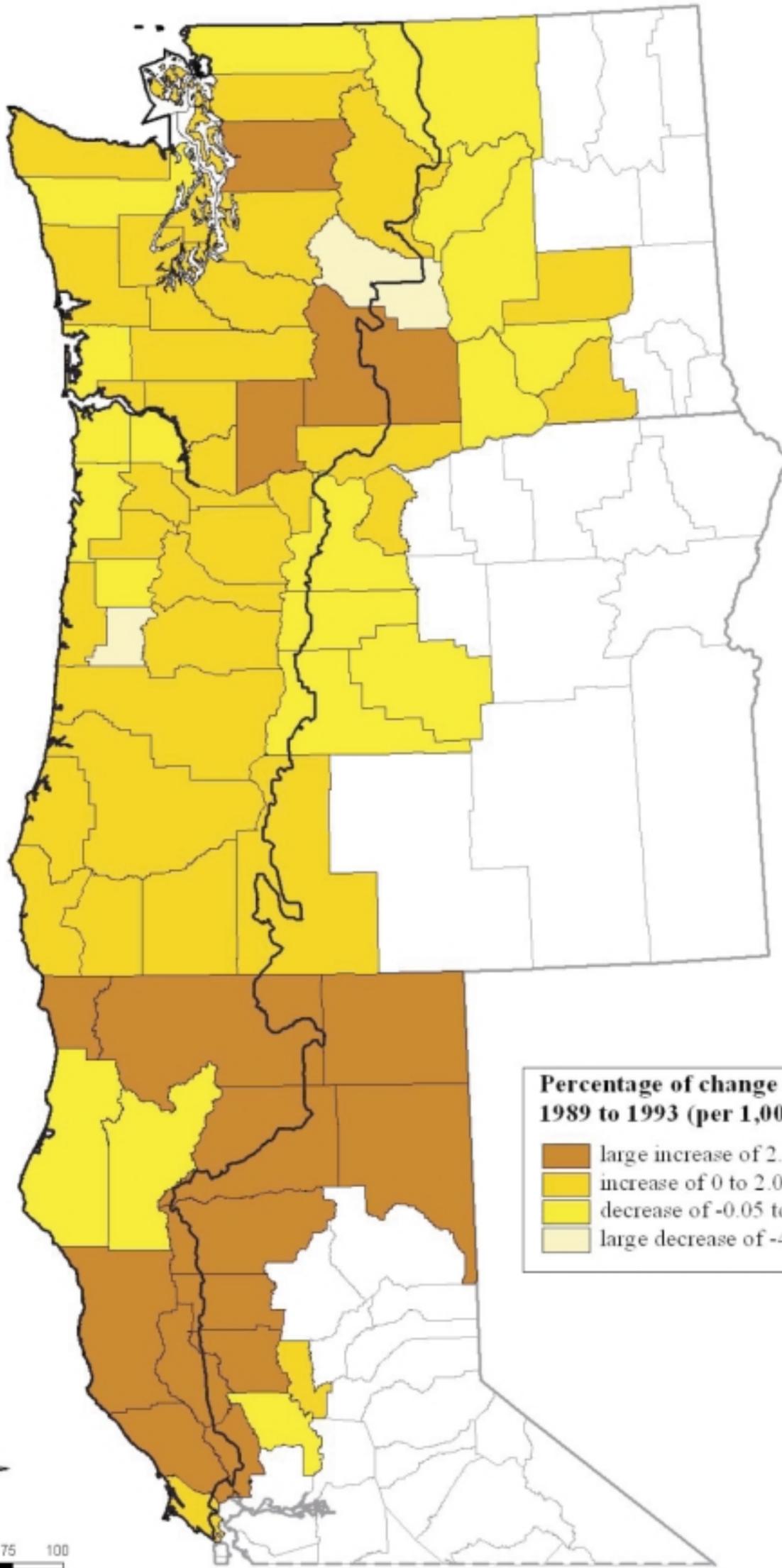
**Table 12—Persons below poverty level, for the Nation and by state, 1990 to 1995**

Entity <sup>a</sup>	1990 <sup>b</sup>	1993	1994	1995
	----- Percent -----			
United States	13.5	15.1	14.5	13.8
California	13.9	18.2	17.9	16.7
Oregon	9.2	11.8	11.8	11.2
Washington	8.9	12.1	11.7	12.5

<sup>a</sup> Limitations: Values reflect all of California, Oregon, and Washington rather than the western or northern portion of the states.

<sup>b</sup> Prior to 1990, data were based on different procedures and therefore are not comparable.  
Source: U.S. Department of Commerce, Bureau of the Census 1997c.

# Map 21-Change in Poverty Rate



Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

## Change in Violent Crime Rates

High crime rates and increasingly violent crimes reflect social and economic distress. The Federal Bureau of Investigation (FBI) collects data on eight types of crimes from state agencies, county sheriff offices, police precincts, and other law enforcement agencies. The FBI continually updates this information, such that, even if a county sheriff's office submits only 10 months of data for 1995, but a year later submits data for the missing 2 months for 1995, the FBI will update its records. Not all agencies, precincts, and other agencies file reports with the FBI for all months. Occasionally, an agency will report data to the FBI for only 11 months, sometimes fewer. On these occasions, fewer crime incidents will be reported than have actually occurred. We alert the reader to this and note that the data are suggestive only. A list of counties where this occurred, along with the years, appears in the appendix. Also, 12 counties have one agency (sometimes two) that counts data for more than one county, and some possibility of overcounting may exist (see appendix). Differences in violent crime rates for different counties may be affected by different reporting practices and differences in law enforcement and protection activities.

We divided the eight types of crime into two categories and created indices on violent crime and property crime. The violent crime index included four crimes, as classified by the FBI: murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault. The property crime index combined burglary, larceny-theft, motor vehicle theft, and arson. Specific definitions of the eight crimes are given in the appendix.

The number of violent crimes in the United States fell by more than 9 percent in 1995, continuing a downward trend that began in 1994. An improved economy and the aging population potentially are reasons for the reduction (Rosenthal 1996). The national violent crime rates for 1995 were 5,278 per 100,000 citizens; 6,564 for Oregon; 6,270 for Washington, and 5,831 for California (U.S. Department of Commerce, Bureau of the Census 1997a). All three states exceeded the national crime rates, but the reader is cautioned that these statistics reflect the entire state and not just the NWFP region.

The analyses of rates (per 100,000 population) of violent crime in provinces suggested that the majority of the NWFP landscape showed no primary trend—neither an increase nor a decrease in violent crime. Pockets of change were evident, however. Violent crime rates along certain areas of the Oregon coast suggested a “clear downward trend,” whereas the Willamette province showed a “probable upward trend” in the southern area, “probable downward trend” in the central area, and a “clear upward trend” in the northeastern portion of the province, with a “probable upward trend” in the northwest area (map 22). Some “clear downward trend” was showing on the west side of the province.

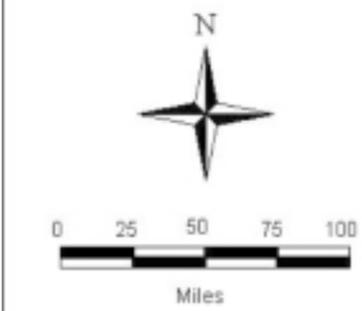
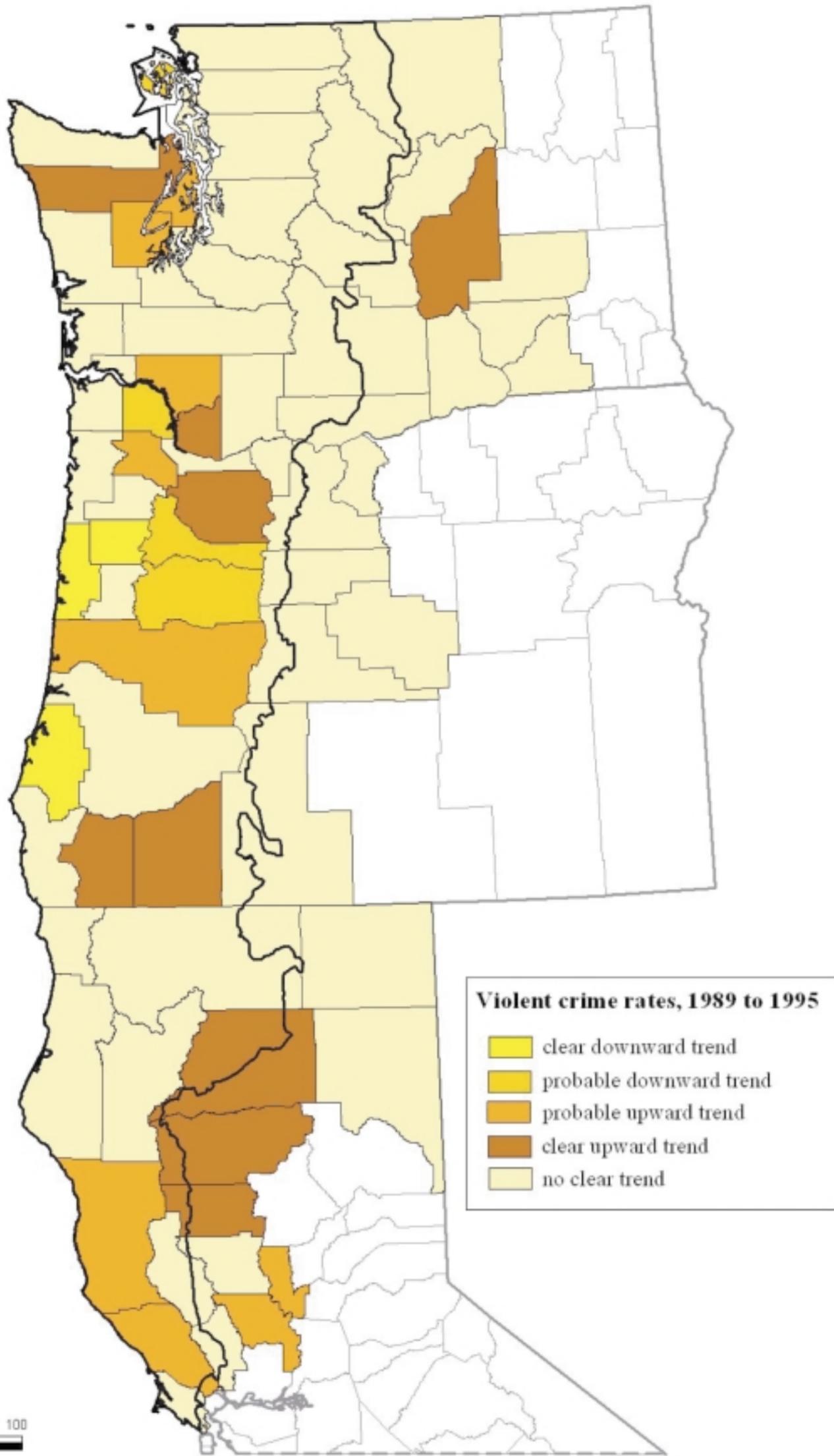
The data suggested “probable upward trends” and “clear upward trends” in the Southwest Washington province. Numbers were indicative of similar trends for the Olympic Peninsula province. The Northwest Sacramento province suggested a “clear upward trend” and the California Coast province suggested a “probable upward trend” in violent crime rates. Deschutes, Yakima, Western Washington Cascades, Klamath, and Eastern Washington Cascades provinces were suggestive of “no clear trend.”

Data for Washington basically suggested that the majority of counties had “no clear trend.” A few scattered counties demonstrated “clear upward trends,” “probable upward trends,” and “probable downward trends.” Table 14 gives a list of counties with upward or downward trends. Oregon numbers suggested “no clear trend” in 14 out of 25 counties; yet counties on the coast had “clear downward trends” as did Columbia, Marion, and Linn Counties with “probably downward trends” in violent crime rates. The northern section of California suggested “no clear trend,” yet seven of the counties indicated some form of upward trend.

**Table 14—Violent crime trends, Pacific Northwest and northern California, 1995**

Clear downward trend	Probable downward trend	Probable upward trend	Clear upward trend
Coos, OR	Columbia, OR	Marin, CA	Glenn, CA
Lincoln, OR	Linn, OR	Mendocino, CA	Tehama, CA
Polk, OR	Marion, OR	Sonoma, CA	Clackamas, OR
	San Juan, WA	Sutter, CA	Jackson, OR
		Yolo, CA	Josephine, OR
		Lane, OR	Shasta, OR
		Washington, OR	Clark, WA
		Cowlitz, WA	Grant, WA
		Kitsap, WA	Jefferson, WA
		Mason, WA	

# Map 22-Changes in Violent Crime Rates



Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

**Change in Property Crime Rates**

An increase in rates of property crime is an indicator of economic or social stress. The flip side is that a decrease in rates may suggest several factors: a healthy economy, aging population, and increased well-being in communities and counties. Nationally, the number of property crimes declined 5.6 percent in 1995, down 1.7 million to 29.3 million. The rate of burglaries, theft, and theft of motor vehicles was 288 per 1,000 households, down from 308 per 1,000 in 1994 (Rosenthal 1996). Property crime rates for 1995 are displayed in table 15 for the three states and the United States. The statistics for each state reflected the entire state and not just the portion in the NWFP region.

The analysis of provinces showed that the property crime rates (U.S. Department of Justice 1996) from 1989 to 1995 did not change for most of the region; however, the central and northern provinces indicated downward trends as well as some upward trends. No clear pattern exists.

The county analysis (see table 16) suggested downward trends for King and Franklin Counties and possibly Snohomish, Clallam, and Yakima Counties in Washington. Curry County in Oregon and Trinity and Napa Counties in California indicated probable downward trends.

Upward trends appeared in Skagit and Adams Counties, Washington, and Clatsop and Clackamas Counties, Oregon. Upward trends were probable in Cowlitz County, Washington, and in Wasco, Marion, Linn, and Jackson Counties and along the Oregon coast. In Humboldt, Tehama, and Glenn Counties, California, property crime rates appeared to be in an upward trend.

When results of the violent crime map (map 22) are compared to those of the property crime map (map 23), the provinces and counties in Washington with upward and downward trends in violent crimes do not always show up on the property crime map (see table 17). King County, for instance, showed “no clear trend” in violent crime and showed “probably downward trend” in property crime. One exception was Cowlitz County, Washington, which showed “probably upward trend” on both maps.

Similar trends were found in California. Two counties—Tehama and Glenn—having clear upward trends in violent crime had probable upward trends in property crime rates. Other counties showed up on only one map. In Oregon, Clackamas County experienced clear upward trends in both violent and property crime rates.

**Table 15—Property crime rates, for the Nation and by state, 1995**

Entity	Property crimes per 100,000 population
United States	4,593
Oregon	6,042
Washington	5,786
California	4,865

Source: U.S. Department of Commerce, Bureau of the Census 1997a.

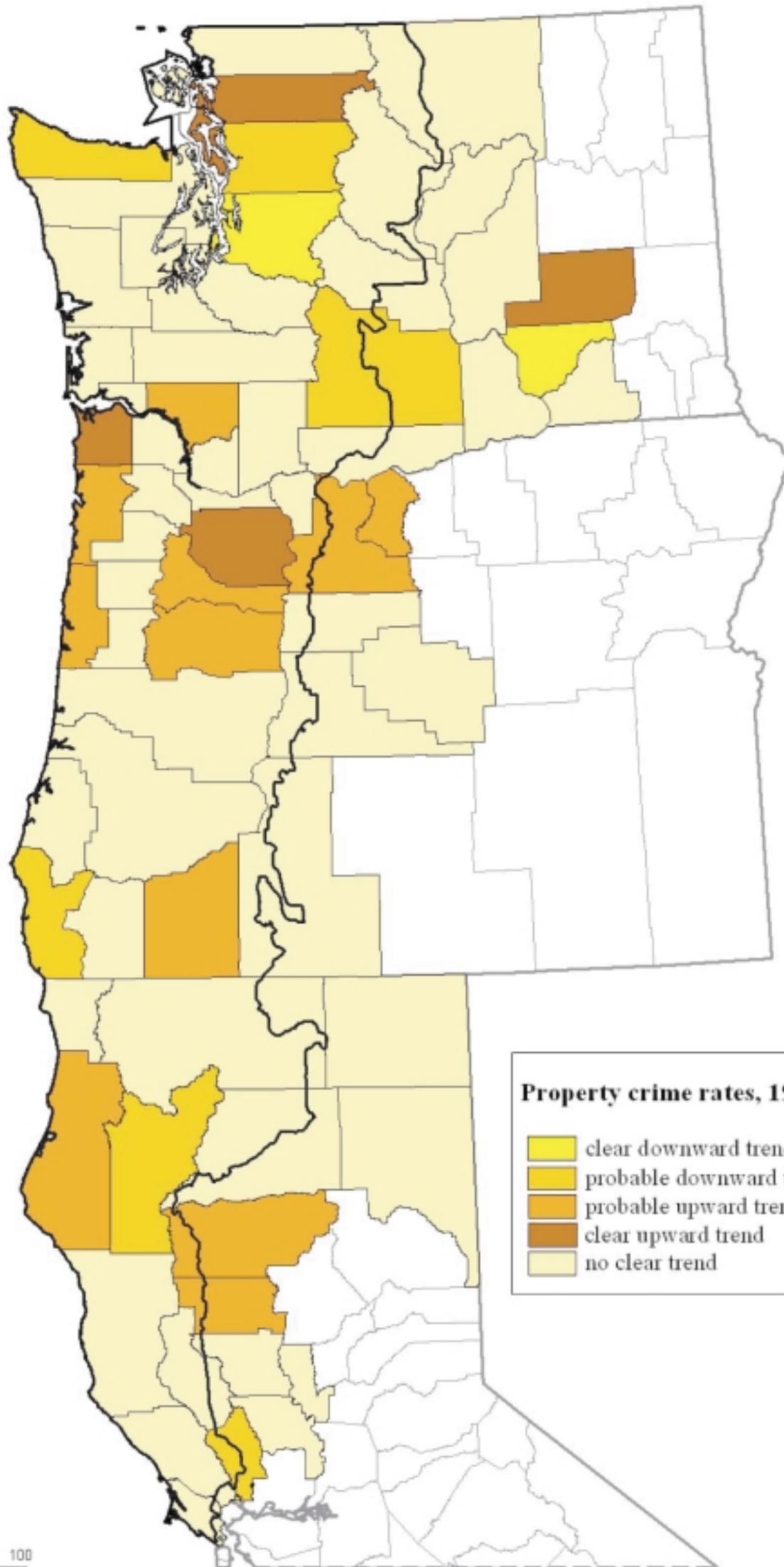
**Table 16—Trends in property crime rates, Pacific Northwest and northern California**

Clear downward trend	Probable downward trend	Probable upward trend	Clear upward trend
Franklin, WA King, WA	Napa, CA Trinity, CA Curry, OR Clallam, WA Snohomish, WA Yakima, WA	Glenn, CA Humboldt, CA Tehama, CA Jackson, OR Lincoln, OR Linn, OR Marion, OR Sherman, OR Tillamook, OR Wasco, OR Cowlitz, WA	Clackamas, OR Clatsop, OR Adams, WA Skagit, WA

**Table 17—Trends in both violent and property crime rates, Pacific Northwest and northern California**

Probable upward trend	Clear upward trend	Probable downward trend in violent crime and probable upward trend in property crime	Clear upward trend in violent crime and probable upward trend in property crime
Cowlitz, WA	Clackamas, OR	Linn, OR Marion, OR	Glenn, CA Tehama, CA Jackson, OR

# Map 23-Changes in Property Crime Rates



Miles

Spotted owl region boundary    State boundaries    County boundaries    Counties outside study area

## Alcohol-Related Incidences

Alcohol-related incidences are indicators suggesting stress in a person, family, and community. Map 24 is a one-time snapshot of alcohol-related incidences. This proxy indicator needs to be monitored over time to determine its viability as an indicator of stress. The division between low, medium, and high counties was determined to highlight extreme highs and lows. Thus, there is an appearance of a greater number of counties in the medium categories. Refer to tables 18 and 19 for specifics. The reader is cautioned that the interpretation is suggestive.

Certain limitations of the data require comment. The method of collecting data was different between Washington and Oregon; consequently, comparison is not possible. The Oregon data indicate adult arrests for driving under the influence of intoxicants at a rate per 1,000 population for 1993. The Washington data indicate a different dimension—the percentage of alcohol-related collisions out of the total number of collisions in 1993. We were unable to obtain data for California.

Most of the region resulted in a medium rate: 6 to 10 people per 1,000 population experienced alcohol-related arrests in Oregon; between 10 and 15 percent of the total collisions in 1993 were alcohol-related in Washington.

The provincial interpretation suggested relatively high rates of arrests and percentages of alcohol-related collisions in the coastal provinces. Most of the provinces, however, were in the medium range; some provinces, in particular the Western Washington Cascades, Eastern Washington Cascades, Yakima, and Willamette provinces, were comparatively low.

Some Washington counties exhibited a high percentage of alcohol-related collisions in 1993 (Washington State Police 1993). It is recognized that this is subjective and suggestive, however. Waikikum, Pacific, Mason, and Okanogan Counties in Washington appear to be high; that is, they apparently had 15 to 25 percent of the total number of collisions labeled as alcohol related.

In interpreting the rates of arrests for driving under the influence of intoxicants in 1993 in Oregon counties, the data suggested that some of the coastal counties were high along with Columbia, Hood River, Sherman, and Jefferson Counties.

Local differences may reflect variations in enforcement activities as well as absolute differences in the rate of incidences. The lower rates in the largest metropolitan areas may be related to several factors including the availability of alternative transportation, the prevalence of nonalcohol drug problems, and the close proximity of alcohol sources in urban areas. In the coastal counties, one possible factor is the relatively large number of tourists (San Juan and Pacific, Washington; Clatsop, Lincoln, Coos, and Curry, Oregon). Hood River, Oregon, is also a recreation and tourist county and was high in incidences.

**Table 18—Percentage of alcohol-related incidences out of total number of collisions, Washington, 1993**

County	Number of collisions	Alcohol related
<i>Percent</i>		
Adams	396	12.9
Benton	2,621	8.9
Chelan	1,407	10.9
Clallam	1,125	11.6
Clark	5,165	11.1
Cowlitz	2,126	11.7
Douglas	467	14.6
Franklin	861	13.6
Grant	1,215	13.3
Grays Harbor	1,517	14.4
Island	826	12.1
Jefferson	478	10.7
King	43,785	7.7
Kitsap	4,035	13.8
Kittitas	1,256	8.4
Klickitat	365	14.5
Lewis	1,658	12.0
Mason	970	17.9
Okanogan	686	15.5
Pacific	413	19.4
Pierce	15,247	11.1
San Juan	164	23.2
Skagit	2,067	14.5
Skamania	255	12.9
Snohomish	10,795	11.9
Thurston	4,068	10.2
Wahkiakum	74	20.3
Walla Walla	999	10.1
Whatcom	2,923	12.6
Yakima	4,627	13.2

Source: Washington State Police 1993.

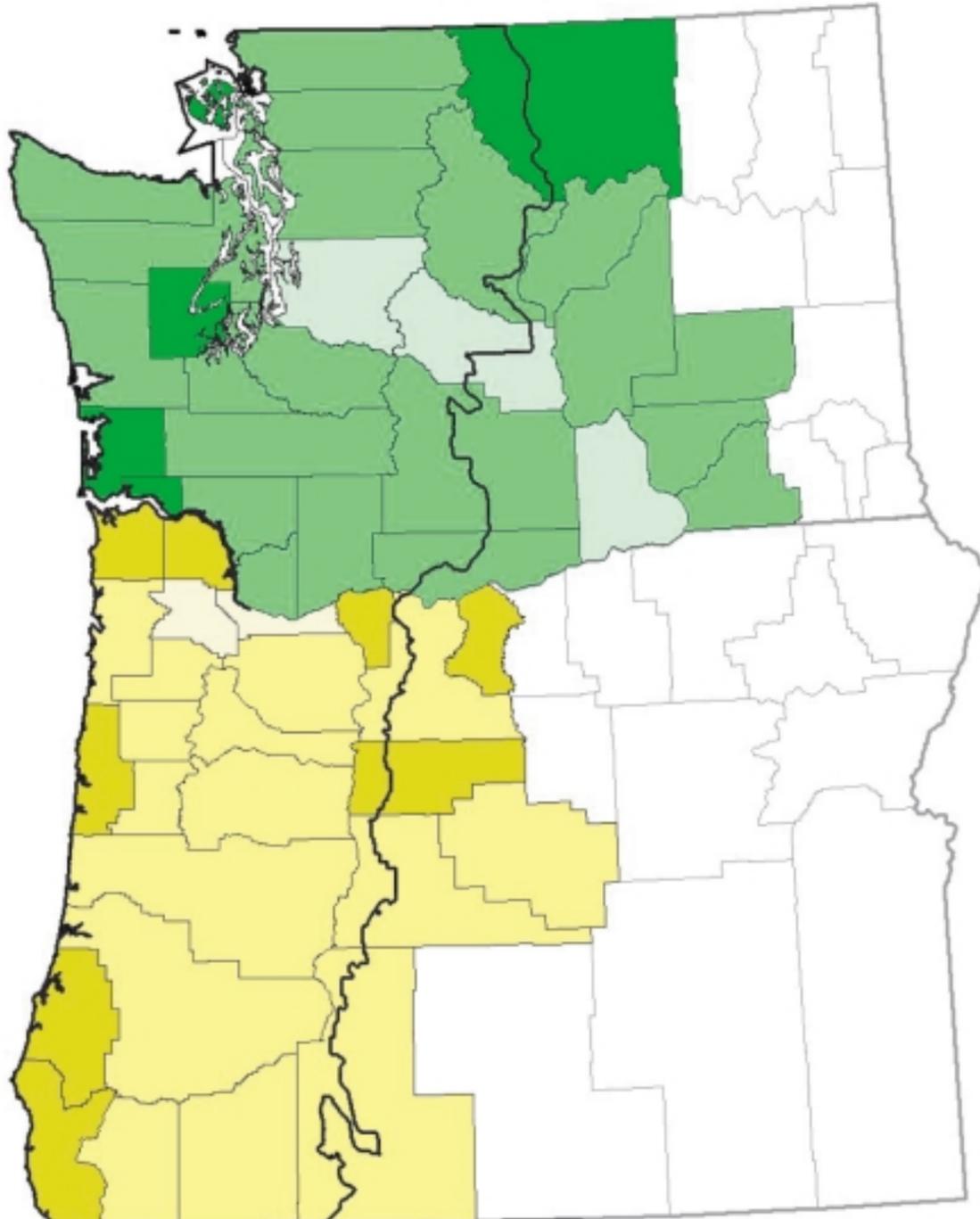
**Table 19—Rate of adult arrests for driving under the influence of intoxicants (DUI), Oregon, 1993**

County	Population <sup>a</sup>	Rate per 1,000 population <sup>b</sup>
Benton	73,300	6.59
Clackamas	302,000	6.75
Clatsop	33,700	16.62
Columbia	38,800	13.87
Coos	62,500	10.27
Crook	15,300	7.78
Curry	21,300	12.49
Deschutes	86,800	9.57
Douglas	96,400	9.40
Hood River	17,900	21.01
Jackson	157,000	9.39
Jefferson	14,900	18.52
Josephine	66,600	9.98
Klamath	60,300	6.35
Lane	298,000	7.26
Lincoln	40,000	16.18
Linn	96,100	7.46
Marion	247,400	8.25
Multnomah	615,000	5.45
Polk	53,600	7.31
Sherman	1,850	14.05
Tillamook	22,900	7.77
Wasco	22,500	8.93
Washington	351,000	4.97
Yamhill	70,900	8.11

<sup>a</sup> Source: McGinnis and others 1996.

<sup>b</sup> Source: Oregon Department of Transportation 1993.

# Map 24-Alcohol-Related Incidences

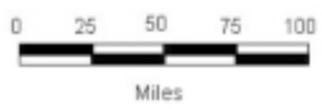


**Washington—percent of alcohol-related collisions, 1993**

- low (5.0 or 9.9)
- medium (10.0 to 14.99)
- high (15.0 to 25.0)

**Oregon—rate of arrests for driving under the influence of intoxicants, 1993 (rate per thousand population)**

- low (6.0 or under)
- medium (6.1 to 9.9)
- high (10 to 21.0)



 Spotted owl region boundary  
  State boundaries  
  County boundaries  
  Counties outside study area

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## **Section 7:**

### **Federal Assistance**

#### **Northwest Economic Adjustment Initiative**

**Northwest Economic Adjustment Initiative**

Changing social values, subsequent legal gridlock, and natural resource management policies have had a profound impact on the forest products industry in rural timber-based communities in the Pacific Northwest. The NWFP is an innovative approach to ecosystem management, economic development, and agency coordination. The Northwest Economic Adjustment Initiative (NWEAI) is one part of the NWFP intended to support the region's people and communities during the economic transition and ensure that Federal, state, and local agencies work together to assist the most affected parts of the region. The NWEAI, through innovative policy and "adaptive management," allocated \$1.2 billion over 5 years, beginning in fiscal year 1994. Sixteen Federal programs helped to finance community and economic development.

The NWEAI provided assistance to a variety of recipients, as indicated by the four categories of assistance, namely workers and families, business and industry, communities and infrastructure, and ecosystem investments (see table 20). Projects included rural infrastructure projects, such as waste water and drinking water grants and loans, business and industry loan guarantees, Jobs in the Woods programs,<sup>5</sup> and others. With few exceptions, the proportion of NWEAI funding provided by each department or agency has been relatively consistent over the period of the initiative shown in map 25 (table 21).

One of the innovative aspects of the NWEAI is the coordinating structure and responsibilities of the Federal and non-Federal partners in the NWEAI. From Washington, DC, the multiagency command has policy oversight responsibilities and works to resolve barriers and remove red tape that cannot be overcome in the region. The Regional Community Economic Revitalization Team (RCERT) is composed of Federal representatives from the participating agencies and non-Federal representatives of the three State Community Economic Revitalization Teams (SCERTs). The RCERT is responsible for ensuring an equitable distribution of funds within the region, for identifying and addressing barriers and red tape, and for sharing information and innovative approaches across the region. The three SCERTs are responsible for overseeing the day-to-day operations of the initiative within their states.

**Table 20—NWEAI funding, by category of assistance**

Category of assistance	Fiscal year		
	1994	1995	1996
	----- <i>Percent</i> -----		
Workers and families	7	9	6
Business and industry	31	23	29
Community and infrastructure	37	53	50
Ecosystem investment	25	15	15
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Tuchmann and others 1996.

**Table 21—NWEAI Federal funding, by department, 1994 through 1996**

Department or agency	Fiscal year		
	1994	1995	1996
	----- <i>Percent</i> -----		
Department of Agriculture:			
Forest Service	28.4	12.1	12.7
Rural Development	45.6	58.3	60.1
Subtotal, USDA	74.0	70.4	72.8
Department of Housing and Urban Development	1.5	9.3	8.2
Department of Labor	6.6	8.8	6.0
Department of Commerce	8.5	1.6	4.6
Department of the Interior	5.5	7.9	5.9
Environmental Protection Agency	3.9	2.0	2.5
<b>Total, all departments and agencies</b>	<b>100</b>	<b>100</b>	<b>100</b>

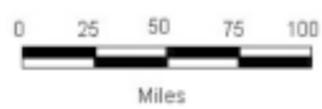
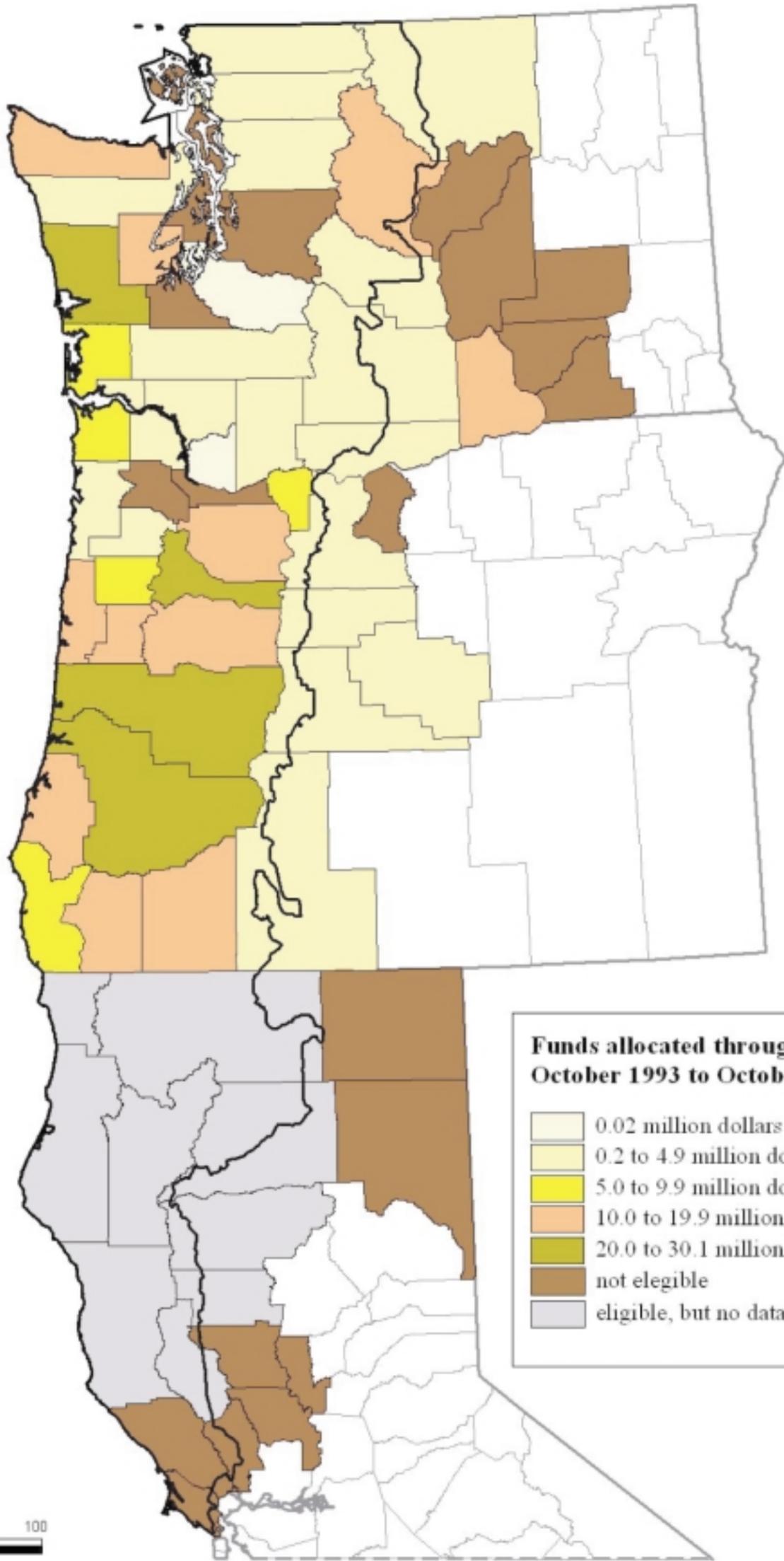
Source: Tuchmann and others 1996.

Not all counties eligible for assistance under the NWFP are depicted in map 25, because they fall outside the range of the northern spotted owl (e.g., Columbia, Ferry, Pend Oreille, and Stevens, Washington; Crook, Oregon; and Lake, California). Some counties within the range of the northern spotted owl have experienced relatively minor impacts from timber harvest reductions because they are largely urban or suburban and therefore excluded from assistance (e.g., King, Kitsap, and Thurston, Washington; Multnomah and Washington, Oregon). Other counties (such as Yakima, Washington) were eligible in one year but not in others. Compatible data were not available for California, thus the NWEAI's Federal assistance to counties in California is not depicted in map 25.

The NWEAI funding was related not only to changes in timber harvest and loss in wood products employment but also to other factors, such as opportunities for community and rural economic development. Map 25 shows a general pattern in the counties that received NWEAI funding and also had relatively high losses in wood products employment.

<sup>5</sup> Jobs in the Woods is a federally funded program intended to achieve ecosystem management goals and provide employment for displaced timber workers.

# Map 25-Northwest Economic Adjustment Initiative



Spotted owl region boundary    
 State boundaries    
 County boundaries    
 Counties outside study area

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Unincorporated communities are not included in map 2.

## Appendix

### Population Distribution: 1990 Census Places

#### Change in Poverty Rate

- Poverty rate and method of calculation:

Percentage of change in persons living below poverty level divided by the number of persons for whom poverty status has been determined:

$$A (PV02079) \div B (PV01079) \qquad C (PV 02089) \div D (PV01089)$$

where:

=	A ÷ B	AND	C ÷ D
=	Poverty rate 1979		Rate change in 1979
=	Poverty rate 1989		Rate change in 1989
=	the difference between 1979 and 1989		

where:

PV01079D = B: represents persons for whom poverty status has been determined in 1979.  
 PV01089D = D: represents persons for whom poverty status has been determined in 1989.  
 PV02079D = A: represents persons below poverty level in 1979.  
 PV02089D = C: represents persons below poverty level in 1989.

Calculation is similar to determine the difference between 1989 and 1993.

The data source used in this analysis for 1979 and 1989 was as follows: U.S. Department of Commerce, Bureau of the Census 1994.

**Change in Violent Crime Rates**

1. Source of data for map 22 is U.S. Department of Justice 1996.
2. Definitions for the crimes are taken from the Uniform Crime Reports (FBI), though not all jurisdictions reporting incidents of crime to the FBI use the same definitions. Uniform Crime Report definitions are as follows: (1) murder and nonnegligent manslaughter is the willful (nonnegligent) killing of one human being by another (as determined by police investigation, not the courts, medical examiner, a jury, etc.); (2) forcible rape is the carnal knowledge of a female (or male for some states) forcibly and against her/his will—attempts to commit rape by force or threat also included; (3) robbery is the taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence and/or by putting the victim in fear; (4) aggravated assault is an unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily injury, usually accompanied by the use of a weapon; (5) burglary is the unlawful entry of a structure to commit a felony or theft; (6) larceny-theft is the unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another; (7) motor vehicle is the theft or attempted theft of a motor vehicle; and (8) arson is defined as any willful or malicious burning or attempt to burn, with or without intent to defraud, a dwelling house, public building, motor vehicle or aircraft, personal property of another, etc. Not all states define these crimes in the same way, and the data reflect only how the agencies, states, etc., report the crime incidents. Some states, for instance, do not count a crime of rape against a male victim as part of their rape crime data.
3. Counties with one agency (on rare occasion, two) that report data to more than one county:

<p>Oregon</p> <ul style="list-style-type: none"> <li>Clackamas</li> <li>Marion</li> <li>Multnomah</li> <li>Polk</li> <li>Yamhill</li> </ul>	<p>Washington</p> <ul style="list-style-type: none"> <li>Clark</li> <li>Cowlitz</li> <li>Douglas</li> <li>King</li> <li>Okanogan</li> <li>Pierce</li> <li>San Juan</li> </ul>
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4. Table 22 shows the counties with one agency (sometimes, but rarely, two to four agencies) reporting less than 12 months of crime data for specified number of years. Some counties have only 6 agencies reporting crime data and other counties have over 20. The number of agencies reporting for each county is not included.

**Table 22—Counties with 1 to 4 agencies reporting less than 12 months of crime data for a specified number of years between 1989 and 1995**

1 year	2 years	3 years	4 years	5 Years	6 Years	7 Years
Humboldt, CA	Benton, OR	Coos, OR	Jefferson, OR	Marion, OR	Jackson, OR	Yamhill, OR
Lassen, CA	Clackamas, OR	Douglas, OR	Polk, OR	Snohomish, WA	Washington, OR	
Mendocino, CA	Clatsop, OR	Multnomah, OR	Okanogan, WA			
Napa, CA	Klamath, OR	Grays Harbor, WA				
Shasta, CA	Lane, OR	King, WA				
Sonoma, CA	Linn, OR	Lewis, WA				
Sutter, CA	Clark, WA					
Yolo, CA	Cowlitz, WA					
Curry, OR	Thurston, WA					
Josephine, OR	Whatcom, WA					
Lincoln, OR	Yakima, WA					
Tillamook, OR						
Benton, WA						
Pacific, WA						
San Juan, WA						
Skagit, WA						

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