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Cover photo: Aspen, CO  
John B. Cromartie, USDA  
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## A Letter From the Deputy Secretary of Agriculture

The rural West, with its spectacular beauty and abundant natural resources, attracted my family over a century ago and is attracting many thousands of newcomers today. What I have observed happening in my home of Winters, California, is happening throughout the West. Small communities in scenic areas throughout the region that were dying just a decade ago are now experiencing rapid growth. While this is an indicator of the region's economic health, it is bringing ever-increasing rural attention to social and environmental issues—from sprawl to quality of life—that have until recently been thought of as “urban” problems. Pioneer families like my grandparents engaged in farming, mining, and forestry related activities that changed rural landscapes. Today's newcomers are more likely to want to preserve our scenic rural landscapes for their amenity value. After all, that is what attracted them to our small towns. Limits to population growth and urban and rural development are under intense debate in the West where migration rates are consistently higher than any other region.

I recommend that everyone read this issue of *Rural Development Perspectives*. A group of distinguished geographers, economists, and sociologists have done an excellent job of analyzing the problems and opportunities created by rural population increases. From water rights to quality of life issues, we need to understand the dynamics underlying the new West. Research like this will help frame constructive policy debates.

I am proud to call the rural West my home. I also welcome the opportunity to share it with other Americans in a sustainable way, in order to preserve the diverse agriculture and unique character of rural Western America.



Richard E. Rominger  
Deputy Secretary of Agriculture

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This issue of *Rural Development Perspectives* focuses on the rural West, an area that has dramatically changed in the past two decades. A previous issue on the Great Plains highlighted the struggle of communities grappling with the negative effects of outmigration. People in the West are familiar with that problem but are just as likely these days to be debating the costs and benefits of rapid immigration. While some issues are unique to this region—for instance, the heightened role of public lands in rural economic development—others are linked with problems confronting rural areas across the Nation.

The rural West added over 1 million people during 1990-97, a 15-percent gain compared with just 5 percent for other rural areas. John B. Cromartie and John M. Wardwell show that these new migrants are no longer concentrating in the highest amenity settings close to metro areas but are “settling for less” in terms of scenery and accessibility. Given the rapid growth of western cities, the coming retirement of so many Baby Boomers, and the region’s own youthful population, rapid growth in the rural West is likely to continue.

For many years, surveys of Americans have recorded a strong inclination for small-town and rural living. Gundars Rudzitis finds that people settling in the rural West attached much more importance to rural amenity characteristics than to employment opportunities or the disadvantages of urban life. Alex C. Vias confirms these findings in his analysis of population and employment growth, showing that the allure of amenities rose for both migrants and employers during 1970-95. In a reversal of the traditional pattern of people following jobs, the migrants themselves are fueling job growth with the businesses they bring and the infrastructure and services they demand. This new type of growth affects some areas more than others, as shown in the analysis of recent immigration to Oregon by Dean H. Judson, Sue Reynolds-Scanlon, and Carole L. Popoff. Metro areas are still attracting young professionals for employment reasons. Those moving to rural settings are more likely to credit quality-of-life factors for their move and be willing to take substantial pay cuts to obtain them.

On the other hand, some migrants to the rural West bring with them both financial and human capital. Peter B. Nelson draws a connection between rapid population growth and the concentration of income from self-employment and investments. Rural development policies need to take account of the way in which these migrants bring high-quality jobs into their new communities. William B. Beyers shows that job growth in the rural West, higher than elsewhere, was led by gains in health, business, and retail services, and was higher than can be explained by either growth trends nationally or the region’s mix of industries.

Environmental concerns heighten the demand for cooperative public and private initiatives in the rural West. Kevin Ingram and Jan Lewandrowski address the increasing value to economic development of wildlife resources and the ways in which traditional land uses such as agriculture offer a means to protect this resource. Keith Wiebe, Ababayehu Tegene, and Betsey Kuhn show that land ownership consists of partial interests that are being voluntarily unbundled to help balance competing economic, social, and environmental objectives. Finally, Noel R. Gollehon shows that the transfer of water rights out of irrigated agriculture—the most common method for Western States to meet new urban demands—is likely to have a negative economic impact on agriculturally dependent rural areas. Small communities across the region must deal with these emerging environmental issues in their struggle to maintain a high quality of life in the face of demographic change.

John B. Cromartie

# Migrants Settling Far and Wide in the Rural West

*The West led a rebound in nonmetro population growth from the mid-1980's through the early 1990's, caused mostly by changing patterns of net migration. Growth rates in the West have remained above other areas since 1970, but have fluctuated over time and shifted geographically. Scenic settings accessible to metro areas continued to attract a disproportionate share of new residents, but record numbers of recent migrants chose more sparsely settled and isolated areas with fewer natural amenities. The costs as well as the benefits of population-related development are being felt in a broader cross-section of rural places.*

Contrary to Frederick Jackson Turner's proclamation 100 years ago, the U.S. frontier is not dead. As in early days, the modern frontier offers wide open spaces, cheap land (compared with city prices), new types of economic opportunity, and a relatively young, rapidly developing population base. The ability to attract newcomers is both a key indicator of a region's economic health and a generator of future growth, and many frontier communities show new signs of life as attractive destinations, reversing patterns in the 1980's. But unlike the early days, frontier opportunity is not limitless. Old and new residents alike are discovering that unchecked growth can be a threat to the environmental and social amenities that attracted people in the first place.

Nowhere are limits to population growth and urban development being more hotly debated right now than in the West, where migration rates have been consistently higher than for other regions and migration patterns more widespread than during other growth periods. Small communities in high-amenity settings everywhere are grappling with the often conflicting goals of finding their place in an increasingly internationalized economic system and maintaining a high quality of life in the face of demographic change. While these critical environmental and social issues associated with rapid population growth have been around for some time, only recently have they captured the attention of a much larger audience in all

corners of the West. Such issues are not likely to go away any time soon.

Many of the growth-related issues in this region have cropped up in other high-amenity areas along the southern Atlantic seaboard; in the Appalachian, Cumberland, and Ozark uplands; and throughout the upper Great Lakes. Many of the lessons learned and solutions being formulated by rural Western communities to deal with growth-related problems may end up being usefully applied elsewhere.

This article examines changing population patterns in the nonmetro West since 1970. Placing the latest population rebound in a broader time frame shows that characteristics that attract migrants to specific types of places have become less defined. The recent nonmetro population upturn has been led by high-amenity settings accessible to metro areas, but has also penetrated less scenic and more isolated districts. This latest nonmetro population upturn may have already peaked—the highest recent annual rate of population growth in the nonmetro West was in 1993. However, several factors, including a young population and a burgeoning nearby metro population, point to continued high growth for the nonmetro West.

## Migrants Are Heading to the Nonmetro West

The frontier character of the rural West continues to appeal to migrants from all sections of the country, especially nearby urban residents. Despite having one-fourth of nonmetro territory, the West had less than one-seventh of the 51 million nonmetro residents in the United States in 1990 (table 1). But the area captured one-third of non-

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John Cromartie is a geographer in the Food and Rural Economics Division, ERS, USDA; John Wardwell, who died September 20, 1998, was a demographer and professor of rural sociology at Washington State University.

Table 1

**Nonmetro and metro population growth by region, 1990-97***Nonmetro West grew three times as fast as other nonmetro areas, mostly from net migration*

Region	Population		Change, 1990-97		Natural increase, 1990-97		Net migration, 1990-97	
	1997	1990						
	Thousands		Percent		Thousands		Percent	
United States:								
Nonmetro	54,235	50,867	3,369	6.6	1,327	2.6	2,042	4.0
Metro	213,401	197,898	15,502	7.8	11,393	5.8	4,109	2.1
Outside West:								
Nonmetro	45,965	43,704	2,261	5.2	948	2.2	1,313	3.0
Metro	162,370	152,348	10,022	6.6	7,615	5.0	2,407	1.6
West:								
Nonmetro	8,271	7,163	1,108	15.5	379	5.3	729	10.2
Metro	51,031	45,551	5,480	12.0	3,778	8.3	1,702	3.7

Notes: See box, "Defining the West," for definition of regions; natural increase is the surplus of births minus deaths; net migration is the difference between the number of people moving into a region and the number moving out.

Source: Calculated by ERS using data from the Bureau of the Census.

metro population growth since 1990, adding over 1 million people in 7 years. Two-thirds of the growth in the nonmetro West came from net migration (the number of people moving in minus those moving out), with the remainder accounted for by natural increase (the surplus of births over deaths).

Metro areas in the West also grew rapidly during this period, adding over 5 million people. Many of the metro areas outside California attracted large numbers of migrants from California and other parts of the country, but overall the metro West (dominated by California) depended much more on high births and immigration from abroad than on domestic migration. In fact, the metro West had more domestic outmigrants than immigrants, and retained a positive net migration only because of immigrants from abroad. In particular, metro California continues to lose migrants to other parts of the United States, though this net loss is more than compensated for by immigration and high births.

The recent history of the nonmetro West includes continuous population growth at rates higher than other nonmetro areas, but also severe fluctuations in growth rates due to economic restructuring and other causes (fig. 1). With a smaller population base and a less varied economy, the nonmetro West has been more volatile demographically than other regions since 1970, moving from 3 percent population growth in 1978-79 down to almost no growth in 1986-87 and back to 2.5 percent just 5 years later. The nonmetro West failed to develop a strong manufacturing base to complement its core natural resource industries. With the general nonmetro economic downturn of the 1980's, the gap between the population growth rates of the nonmetro West and the rest of the country nearly converged. Although the nonmetro West never lost population as did the rest of nonmetro America during a 3-year period in the mid-1980's, many areas in the West did lose population, especially those dependent on mining (including oil and gas).

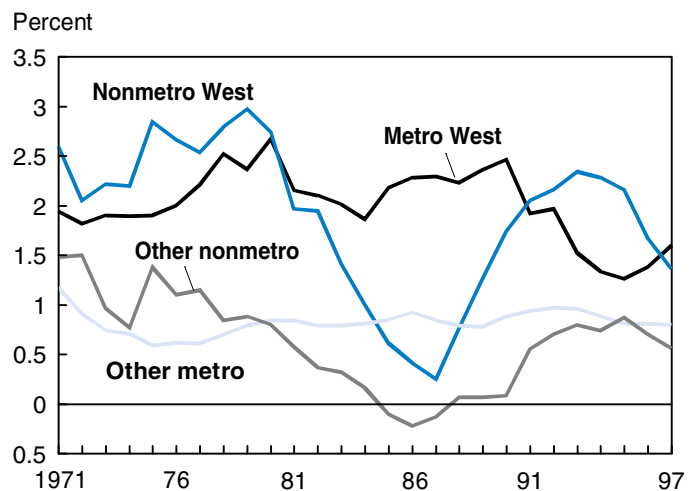
The recent rural revival started earlier in the West and was stronger there, so by the early 1990's the region was growing at triple the rate of other rural areas. This growth paralleled a downturn in the growth rates of the metro West from 1989 to 1995, when an economic recession struck California's metro economies hard.

Nonmetro areas have seen a steady drop in the share of population growth from natural increase, due both to an overall aging of the population and to the baby boom's transition out of its childbearing years (fig. 2). The nationwide trend toward more deaths and fewer births began earlier in nonmetro areas because the population is older, immigration is lower, and delayed childbearing among the youngest baby boomers is less common. With a younger population than other nonmetro areas and a high proportion of Mormons, Hispanics, and Native Americans (groups with higher than average fertility rates), the non-

Figure 1

**Annual rates of change in population, 1971-97**

*Nonmetro West growth rates have been consistently higher but more volatile than other nonmetro settings*

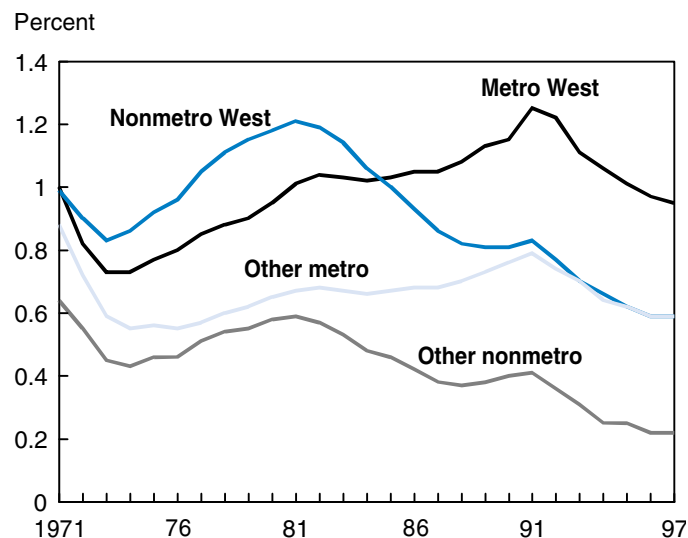


Source: Calculated by the Economic Research Service, USDA, using data from the U.S. Bureau of the Census' Annual Population Estimates.

metro West had the most to lose from this trend, dropping from 1.2 percent growth per year from natural increase in 1981 to half that in 1997.

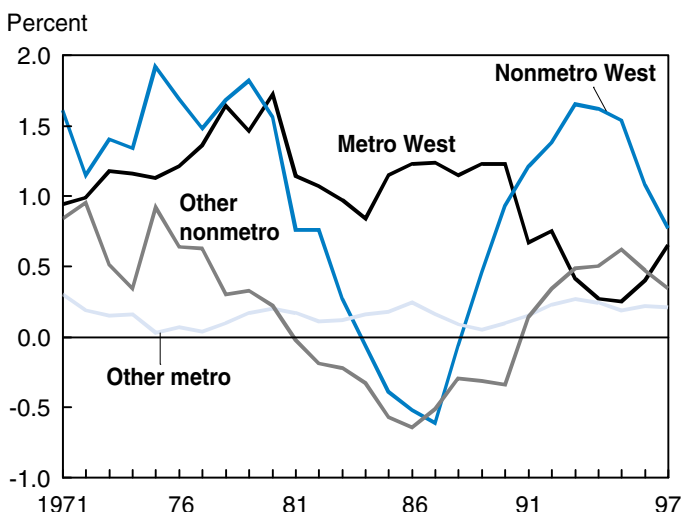
The latest nonmetro population rebound took place because patterns of net migration dramatically favored such areas at the expense of metro areas (fig. 3). Due to net migration, the nonmetro West lost 40,000 people in 1987 but gained 120,000 people in 1993. This recovery and

Figure 2  
**Annual rates of natural change, 1971-97**  
*The number of births over deaths in the nonmetro West has been declining since the early 1980's*



Source: Calculated by the Economic Research Service, USDA, using data from the U.S. Bureau of the Census' Annual Population Estimates.

Figure 3  
**Annual rates of net migration, 1971-97**  
*Net immigration in the nonmetro West increased dramatically after a period of outmigration during the mid-1980's*



Source: Calculated by the Economic Research Service, USDA, using data from the U.S. Bureau of the Census' Annual Population Estimates.

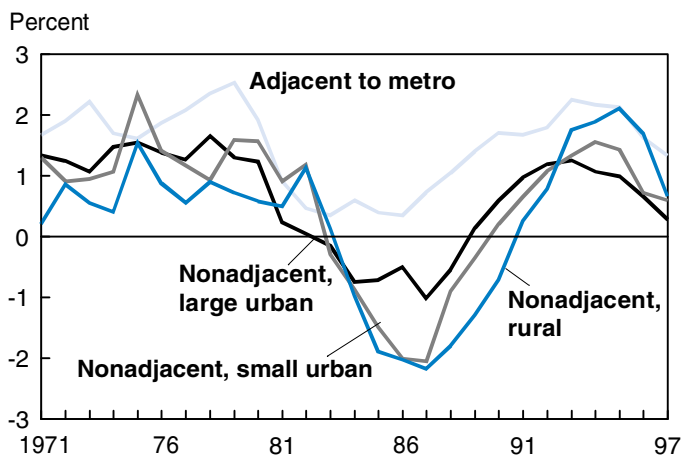
the subsequent moderation of net migration gains since 1993 coincide with a downturn and subsequent recovery of migration trends in Western metro areas. The economic booms and busts of the West's largest urban centers are felt throughout the region via migration.

### Nonmetro Growth From Migration Is More Geographically Dispersed

Overall, rates of nonmetro population growth from net migration during the early 1990's were still below those of the 1970's, but more counties participated. In the nonmetro West, county net migration rates averaged 1.5 percent a year during the 1970's, with 65 percent of counties having net immigration. Average rates were slightly lower (1.2 percent) during 1990-97, but the number of counties with net immigration rose to 73 percent. The deconcentrated migration is explained partly by a loosening of ties to certain place characteristics that traditionally attract migrants.

**Urban Areas Exert Less Pull.** People appear to be less tied to the urban hierarchy, moving to areas with less access to metro areas and with smaller cities or towns. The relationship between net migration and urban structure has fluctuated dramatically during 1971-97 (fig. 4). Metro areas appear to have a large "spillover" effect on adjacent counties, which typically have had higher growth rates throughout the period, especially during the recessionary period in the 1980's. The downturn in the 1980's was most severely felt in the most rural nonadjacent areas, so that a clear urban hierarchical pattern emerged during this time. Since then, the positive relationship between net migration and urban proximity mostly disappeared as rates converged and different types

Figure 4  
**Annual rates of net migration in the nonmetro West by rural-urban continuum, 1971-97**  
*Nonadjacent, rural areas grew rapidly from migration during the early 1990's*



Source: Calculated by the Economic Research Service, USDA, using data from the U.S. Bureau of the Census' Annual Population Estimates.

## Defining the West

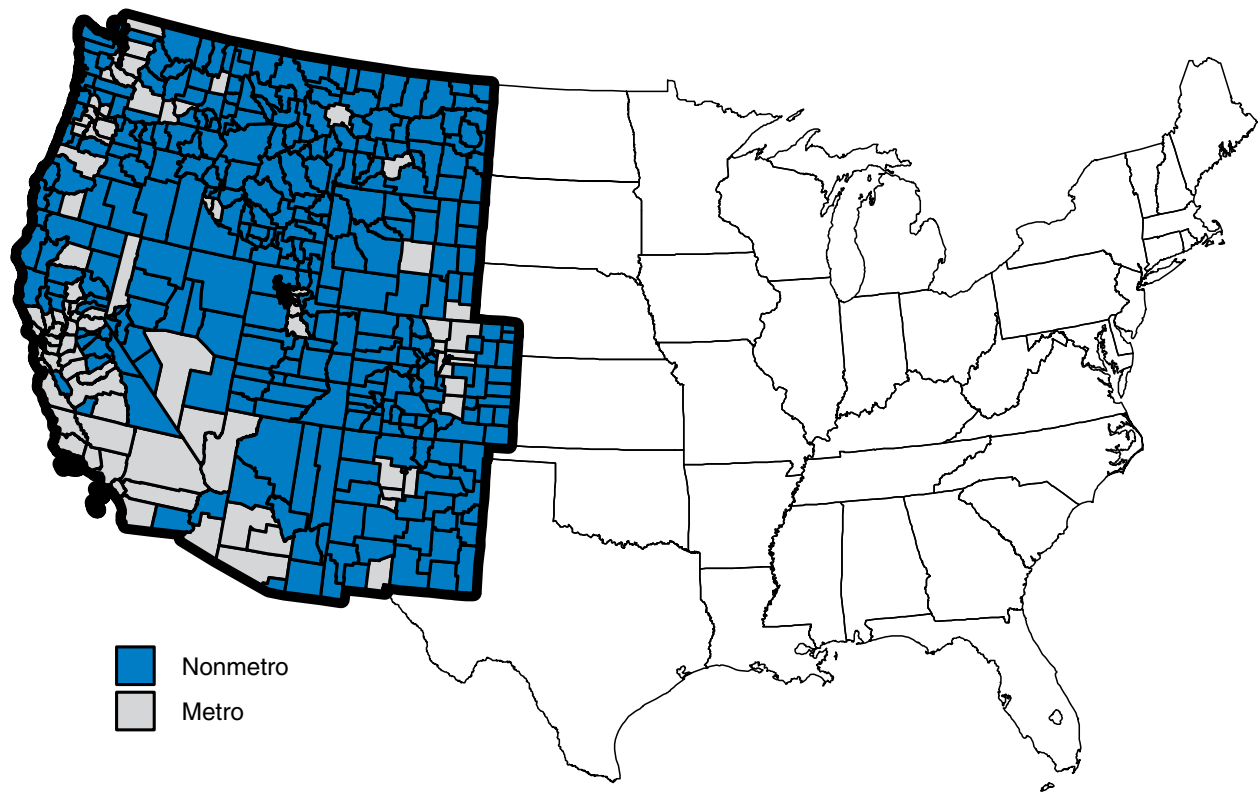
Unlike more fixed settings, such as New England or the Great Plains, the West, like the South and Midwest, is harder to stake out. The frontier line dividing East and West has shifted over time from the Appalachians to the Mississippi River to the 98th meridian, where lack of rainfall marks the western fringes of the Corn Belt. The image perhaps most conjured by Americans today is the Interior West, defined by William Riebsame in *Atlas of the New West* as stretching from the Front Range of the Rockies in the east to the Sierra Nevada and Cascades Ranges in the west. Even this subregion encompasses a diversity of landscapes other than spectacular mountains, ranging from deserts of the Great Basin to the canyonlands of the Colorado Plateau to the fertile valleys of the Columbia and Snake Rivers.

In this article, we use the Census Bureau's definition of the West, based on State boundaries and encompassing the Interior West along with the Pacific Coast and portions of the Great Plains (see figure). Alaska and Hawaii, also part of the Census West, are excluded from our analysis. Other articles in this issue use the entire region or a subregion within it. For instance, Vias uses the Census Bureau's Mountain division (excluding the three States on the Pacific coast), which closely resembles Riebsame's Interior West. Other articles use data from smaller subregions and individual States.

The rural West is also hard to pin down. Metropolitan Statistical Areas (MSA's), defined by the Office of Management and Budget, include core counties containing a city of 50,000 or more people and outlying counties that are economically integrated with the core through commuting. Nonmetro counties, those falling outside MSA's, define the rural West in this and other articles (see figure). We use 1993 definitions of metro areas, based on the 1990 census, which leaves as nonmetro five cities (Flagstaff, AZ; Corvallis, OR; Grand Junction, CO; Missoula, MT; and Pocatello, ID) that have since become metro.

### The West

*The definition of the West used here comprises 89 metro and 325 nonmetro counties in 11 States*



Source: Produced by ERS.

of areas attracted migrants. Especially striking is the post-1990 surge of immigration into the rural nonadjacent counties, which had higher rates of growth from net migration than in the 1970's. Rates for these counties equalled those of adjacent counties during 1995-96. In addition, small nonmetro cities and towns have been more attractive to migrants than larger ones since 1990, after experiencing much lower rates in the 1980's. Thus, the recent boom in

the nonmetro West was not limited to accessible, large communities but reached remote, sparsely populated settings as well.

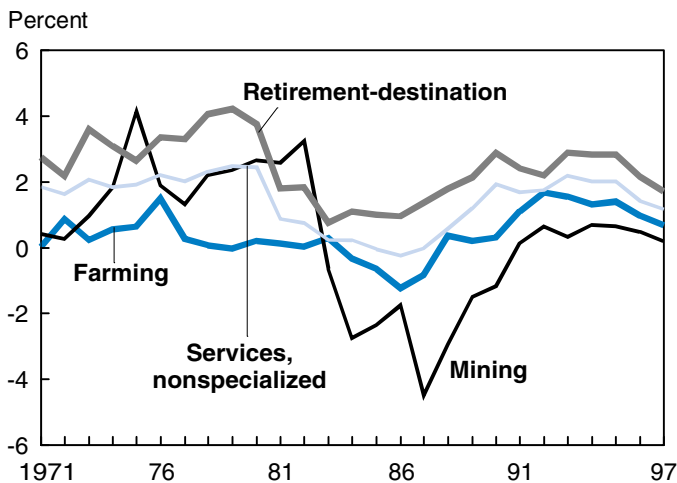
**Recent Migration Patterns Not as Closely Tied to Fluctuations in Farming or Mining.** Recent migrants are less tied to the dominant economic activity characterizing places. The boom in the mining industry, including oil



Figure 5

**Annual rates of net migration in the nonmetro West by dominant economic activity, 1971-97**

*Farming and mining counties rebounded from migration losses of 1980's, but remained below other economic types*



Source: Calculated by the Economic Research Service, USDA, using data from the U.S. Bureau of the Census' Annual Population Estimates.

and gas, caused high population growth in many parts of the nonmetro West during the 1970's. Downturns in mining during the 1980's usually entailed high levels of outmigration (fig. 5). In counties identified by ERS as mining-dependent (see "Data and Definitions"), rates fell from 3 percent net immigration to 3 percent net outmigration in just 2 years during the mid-1980's. This moved mining counties from rates above to rates far below the levels of other functional county types. But the recovery in these counties after 1987, back up to positive immigration by 1990, paralleled population upturns elsewhere. Similarly, the gap in migration rates between agricultural communities and those with a more diverse service economy is much smaller today than in the past.

Retirement destinations, characterized by high levels of immigration among those 55 years or older, attracted a surplus of migrants (of all ages) throughout the 1980's and approached growth rates of 3 percent a year during the early 1990's. The upturn in farming and mining areas had less to do with the traditional extractive industries that characterize those areas than with growth in the service-based jobs that fuel retirement destinations. Many farming and mining areas are making a dramatic transition to the "New West" economy of recreation, tourism, and retirement, while other such areas remain stalled.

**Migrants Broadening the Search for Natural Amenities.** Despite the consistently high growth of ski resorts, national park "gateway" communities, and retirement destinations, the relationship between natural amenities and net migration in the nonmetro West has changed recently in ways that suggest a deconcentration of population into new areas of growth. People are settling for less in terms of the number and quality of natural amenities, as meas-

ured by an index combining mild climate, rugged but accessible topography, and the presence of bodies of water (see "Data and Definitions"). During most of the 1980's, net migration was strongly correlated with natural amenities (fig. 6). Counties in the highest amenity quartile maintained net immigration for all but 2 years during 1971-97. But in the 1990's, not only have rates converged for all categories, but the highest net migration is now found in the second highest amenity quartile of counties. As real estate and other costs of living have soared in many of the best known settings in the West, other areas have come into their own as recreation, retirement, and second-home destinations. This progression represents a shift of high migration rates from areas near the Pacific coast, which score high on this particular measure of amenities, toward the region's interior, especially the northern Rockies (fig. 7). An earlier analysis indicated that the movement down the amenity hierarchy is spilling over into portions of the Great Plains as well (Cromartie).

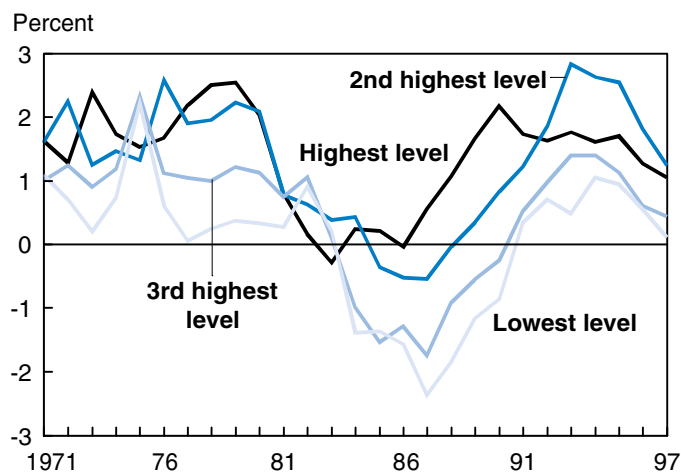
**Future Growth in Nonmetro West Population Likely To Remain High**

Although the recent nonmetro upturn may have already peaked in 1993, several factors point to continued high growth. First, the nonmetro West is still quite sparsely settled compared with nearby, rapidly growing metro regions. Three-quarters of the West's population growth during both the 1980's and early 1990's occurred in metro areas. Several counties have changed from nonmetro to metro in the last few years. Seven cities (Cheyenne, WY; Flagstaff, AZ; Grand Junction, CO; Merced, CA; Missoula, MT; Pocatello, ID; and Santa Fe, NM) have grown into metro status since 1980, and four existing metro areas

Figure 6

**Annual rates of net migration in the nonmetro West by level of natural amenities, 1971-97**

*Immigration is highest in counties with the second highest level of natural amenities*



Source: Calculated by the Economic Research Service, USDA, using data from the U.S. Bureau of the Census' Annual Population Estimates.

## Data and Definitions

The basic units of analysis were 89 metro and 325 nonmetro counties comprising the Census Bureau's West region minus Alaska and Hawaii (see "Defining the West" for a map). Annual estimates of county population, natural increase, and net migration were obtained from the Bureau of the Census for 1990-97 and from a special file created from Census Bureau data by Glenn Fuguitt at the University of Wisconsin-Madison for 1970-89. Annual net migration rates were expressed as the percentage change in population from net migration during the given year. Migration was measured from July to July except in the decennial census years (1970, 1980, and 1990) when migration was measured from April to July of the following year; rates were adjusted to account for the extended time period.

Location within the West's nonmetro settlement system was measured using the Economic Research Service's Rural-Urban Continuum Code, a 10-level refinement of the 1993 Metro Area system. The six nonmetro categories, based on adjacency to metro areas and size of the urban population, were combined into three for this analysis.

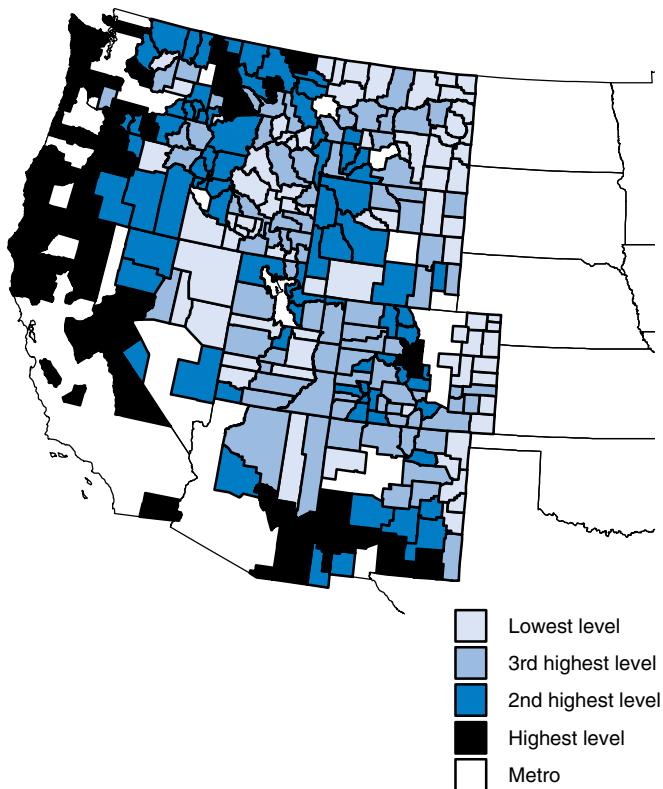
The county typology codes, described in Cook and Mizer (1994), are developed and periodically revised by ERS to group counties by economic and policy-relevant characteristics. Farming, mining, and services-dependent counties are classified based on a high proportion of total labor and proprietors' income over the 3 years 1987 to 1989. Nonspecialized counties (which were grouped here with services-dependent counties) were all nonmetro counties not classified as a specialized economic type. Retirement-destination counties were delineated based on high in-movement during 1980-90 of people age 60 or over.

Natural amenities are measured using a single index, also created by the Economic Research Service, combining normalized measures of climate, topography, and the presence of bodies of water. The index of climate attractiveness is defined using January temperature, number of days with sun in January, July temperature (expressed as a residual when regressed against January temperature), and July humidity. Topography is defined as the difference between an index of mountainous or rugged terrain and average elevation. The presence of bodies of water is measured using the percentage of land area covered by water. The updated version of the ERS natural amenities index, published in McGranahan (1999), differs slightly from the one used here because it excludes average elevation.

Figure 7

### Natural amenities index

*Highest values are found along southern rim of Rockies and Pacific coast*



Source: Produced by ERS.

(Albuquerque, NM; Boise, ID; Las Vegas, NV; and Phoenix, AZ) have added territory. Las Vegas as a metro area has tripled its territory and doubled its population since 1980, growing to over 1 million people today. Clearly, growth in the nonmetro West is closely tied to the region's large cities, with the number of potential immigrants from these cities rapidly growing.

Second, regional growth will come from an aging population nationally. The U.S. age profile is still dominated by the post-World War II rise in fertility rates known as the baby boom, whose members are currently age 36-54. Many of the older members of this cohort have finished raising families, have begun to change careers or consider early retirement, and are deciding where to invest significant nest eggs. The rural West offers tremendous incentives to such people, and their decisions already are having an impact on many communities throughout the region. This period of large-scale, long-term growth in early-retirement and second-home population patterns will blossom around 2006, when the oldest baby boomers reach the age of 60.

Third, the youthful age structure of the nonmetro West itself guarantees relatively higher growth rates. Net immigration of young families and higher fertility rates among resident populations have created built-in growth momentum. During the 1980's, while the population age 0-17 in other nonmetro areas declined (by as much as 9 percent in the Midwest), the same age group grew by 8 percent in the nonmetro West.



Fourth, once established, migration networks often assume a life of their own. Migration itself generates jobs, which in turn attract more migrants in a self-reinforcing pattern. The more people gain information through family, friends, and the media about the opportunities in a newly expanding area, the more likely they are to consider a move themselves. The skyrocketing number of recreational visits to the West's parks, forests, and wilderness areas adds to the pool of potential migrants. Recent non-metro growth due to net immigration and the more deconcentrated pattern of population growth throughout the region may establish more permanent migration networks than during the 1970's, when extractive industries pulled workers into sparsely settled regions for what often turned out to be temporary assignments.

Current population distribution and age structure suggest continued high population growth for the nonmetro West, but the extent of growth depends on economic and social factors that are impossible to predict. If future growth occurs at the high end of what is possible and the growth is not dealt with through more comprehensive planning strategies, especially at the local level, it will continue to challenge the quality of life and rural ambience that are attracting migrants in the first place.

#### **For Further Reading . . .**

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# Amenities Increasingly Draw People to the Rural West

*Recent migrants to the rural West increasingly cite both physical and social environment amenities as reasons why they moved. Job-related reasons are cited by only about 30 percent of the respondents in two surveys. People want to see greater environmental stewardship of the Federal lands surrounding their communities, and these sentiments do not vary greatly by rural/urban location, length of residency, occupation, or other demographic characteristics. The survey results suggest a need to incorporate noneconomic factors more directly into regional development theories and their applications.*

**M**ore people are moving to rural areas for reasons that have nothing to do with employment. Several surveys have explored why people in other regions of the country have moved to rural areas, but research regarding the rural West has been very limited. This is surprising because the rural West is one of the fastest growing regions in the United States. This article presents some findings from recent survey research, first from counties throughout the American West, and then with a specific focus on the Northwest region. My aim is not just to ascertain why people moved, but also to understand the attitudes these new residents bring with them.

## Earlier Surveys and Theories of Migration

Surveys in the 1970's began to show that, if given a choice, people prefer to live in small towns and even in rural areas. Amenities such as environmental quality and pace of life were becoming important in explaining why people move. The apparent sudden preference of people for rural life shocked many academics and planners because rural areas were thought to be at a major disadvantage compared with urban areas.

These findings also were a surprise because they conflicted with the major assumptions of migration theory, or

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Gundars Rudzitis is a professor of geography at the University of Idaho.

why people move. Simply put, people were thought to move because they wanted to increase or maximize their incomes. People, it was assumed, did a rough benefit-cost analysis in their heads; if the benefits, measured in terms of increased income, were greater than the costs, people moved. This approach, however, failed to explain why people moved out of cities into places like the rural West.

Most of the 1970's studies of why people were moving to rural areas were conducted in the Midwest, a region not expected to have population growth. But few studies were done in the rural West, an area with many counties even farther from traditional centers of growth. And few followup studies were done in the 1980's to see if the preferences for moving to rural areas were similar to those of the 1970's.

## 1980's Survey of High-Amenity Counties

In the late 1980's, I headed a study investigating why 1,800 people migrated into western counties with high levels of physical amenities (see "Survey Data and Methods"). People who migrate to high-amenity counties are often assumed to be retirees, as the growth and development of States like Arizona and Florida bears out. In our survey, however, only 10 percent of the new migrants were over 65 years of age. Instead, migrants were more likely to be young, highly educated professionals. This was unexpected since, according to the logic of the economic model, rural areas neither attract entrepreneurs nor provide jobs.

Table 1

**Dissatisfaction with previous location and importance of attributes of present county in decision to move***Pace of life is conspicuous as both a negative urban "push" factor and a positive rural "pull" factor*

Factors	Push		Pull	
	Dissatisfied	Satisfied	Important	Not important
	Percent			
Employment opportunity	16	67	30	56
Cost of living	14	64	14	58
Climate	22	57	47	28
Social services	7	85	10	69
Family access	11	76	19	64
Outdoor recreation	18	63	59	20
Crime rate	28	48	31	45
Scenery	20	62	72	13
Pace of life	31	47	62	18
Environmental quality	30	46	65	16

Source: Gundars Rudzitis and Harley E. Johansen, *Amenities, Migration and Nonmetro Development*, report to the National Science Foundation, 1989.

People also move out of dissatisfaction with their previous location, resulting from crime, congestion, pollution, or other "urban" ills. However, we found that most western migrants were not particularly dissatisfied with the places they had left (table 1). For example, 28 and 30 percent of the migrants said they were dissatisfied with the crime rate and environmental quality of their previous location. The lack of employment opportunity and cost of living were cited by 16 and 14 percent. When asked what "pulled" or attracted them to the western counties, 30 percent cited employment opportunities and 31 percent the lack of crime as important factors. Instead, they gave more importance to scenery (72 percent), environmental quality (65 percent), pace of life (62 percent), outdoor recreation opportunities (59 percent), and climate (47 percent).

When asked what single factor was the most important in their decision to move to their current county, 23 percent cited employment opportunities. Of the other attributes of the county, those contributing to the social environment accounted for 42 percent of the most important reasons for moving, while those specific to the physical environment made up 35 percent. Thus, amenity characteristics provided 77 percent of the reasons that people moved and employment-related reasons 23 percent.

The importance of employment opportunities did not vary much by age, except for persons over 65. For example, 31 percent of those age 20-35 gave employment opportunities as the major reason for moving, compared with 29 percent for persons age 36-50 and 16 percent for those 51-65. Family access, at 24 percent, was the single most important "pull" factor for people over age 65, followed closely by climate (21 percent) and outdoor recreation (21 percent). Outdoor recreation, pace of life, scenery, and climate were cited as the second and third most important factors by the younger age groups.

In this study, 45 percent of the western migrants came from metro areas and 55 percent from nonmetro areas. Migrants from metro areas were more likely to have grown up in a large city or suburban area, completed college, and be in a professional, technical, or managerial occupation. Even though levels of dissatisfaction with their previous residence were generally low, people from metro areas were more likely to be dissatisfied with the crime rate (39 percent vs. 19 percent), pace of life (39 percent vs. 24 percent), and environmental quality (38 percent vs. 24 percent).

People from metro areas were more likely to cite as "pulls" environmental quality (72 percent vs. 59 percent), scenery (77 percent vs. 67 percent), pace of life (69 percent vs. 55 percent), outdoor recreation (64 percent vs. 54 percent), and the crime rate (37 percent vs. 25 percent). People from nonmetro areas were more likely to cite employment opportunity (33 percent vs. 26 percent) and family access (21 percent vs. 16 percent).

So, although there are some differences between people based on whether they moved from a metro or nonmetro setting, both groups consistently emphasize the importance of noneconomic factors in their decision to move. Only 25 percent of all migrants had higher incomes after moving. Instead, 46 percent had decreases in income, while 28 percent had no significant change. People from metro areas were more likely (52 percent vs. 42 percent) to have lower incomes after the move. Most were relatively young people who found jobs in the places they moved to. This suggests either that the migrants' real adjusted incomes are the same in their present location or that declines in income are offset by environmental and quality-of-life considerations.

To indicate perceived change in quality of life, western migrants were asked if they felt life in their new places was less stressful, more enjoyable, happier, and healthier.

Table 2

**Three most important reasons for moving to or staying in area***Employment is cited as a primary factor in selecting a destination in one-third of all cases*

Factors	Reason		
	First	Second	Third
		Percent	
Employment opportunity	34.1	10.3	6.4
Access to family and friends (s)	23.9	15.0	6.3
Pace of lifestyle (s)	12.9	12.1	21.5
Outdoor recreation (p)	7.1	15.6	16.0
Landscape, scenery, and environment (p)	6.2	14.9	16.9
Climate (p)	4.8	11.2	10.8
Quality of schools (s)	3.5	6.0	3.7
Other	3.0	1.6	5.9
Cost of living (s)	2.3	9.1	6.1
Crime rate (s)	1.9	3.4	5.9
Social services (s)	.4	.7	.6

s = social environment; p = physical.

Source: G. Rudzitis, C. Watrous, H. Johansen, *Public Views On Public Lands: A Survey of Interior Columbia River Basin Residents*, Department of Geography, University of Idaho, 1995.

In each case, 70 to 80 percent of the migrants agreed that it was, with migrants from metro areas especially positive. Another indication of their satisfaction with their new places was their reluctance to move elsewhere anytime soon. Indeed, most of them indicated that they would look for employment where they lived or in the immediate region even if they lost their current jobs.

In summary, the survey clearly showed that economic motives do not explain why most people moved, that people were very satisfied with where they moved, and that they did not plan to move in the near future. The few other studies done in the West also showed that nonemployment amenities were the primary reasons for moving, with around 30 percent of migrants citing employment reasons.

### Public Lands Attract Environmentally Concerned Migrants

One of the attractive forces pulling people to areas in the more rural West is the presence of Federal lands. In 1995, my colleagues and I addressed motives for migration in a 100-county contiguous area in the interior Columbia River Basin, which included all of Idaho and parts of Washington, Oregon, Montana, Wyoming, Utah, and Nevada (see "Survey Data and Methods").

Anywhere from 25 to over 80 percent of this land is owned and managed by the Federal Government, so this study also looked at the importance of the major public lands amenities in the region and how people thought they should be managed.

Again, when asked to choose the most important reason for moving to or living in their county, just over 34 per-

cent of respondents cited employment opportunity (table 2). Forty-five percent considered the amenities related to the social environment as most important, and 18 percent the physical environment.

As second most important reason for moving, respondents cited outdoor recreation the most at 16 percent. Employment opportunities were sixth at 10 percent. The social environment captured 47 percent of second reasons for residence, and the physical environment 42 percent. The same trend is apparent for the third most important reason; pace of lifestyle leads at 22 percent, with employment opportunities only 6 percent. As further indication of the importance of the social/physical environment, 28 percent said they moved first and looked for/created a job after the move.

Much has been written about the distinctiveness and appeal of small-town life. In the rural West especially, the

### Survey Data and Methods

The data were obtained from two different surveys. The first survey, from a sample of 15 counties selected from 278 high-amenity counties, was mailed to respondents at random. The 3,754 respondents were evenly divided between migrants and residents. A person was considered a migrant if he or she had moved into the county within the last 10 years.

The second survey was designed to reach a scientifically representative sample of residents in a 100-county area in the interior Columbia Basin. A proportional cluster sampling method was used, with eight counties chosen to be in the sample. People were randomly selected and sent a mail survey. Of 571 respondents, 43 percent had migrated into the area in the last 10 years.

Table 3

**Most important public land uses cited by newcomers to the rural West***Newcomers prefer environmental protection over commodity production*

Land uses	Reason		
	First	Second	Third
		Percent	
Protect water/watershed (p)	20.2	14.4	13.2
Protect ecosystems (p)	18.3	8.4	10.4
Recreational uses (p/c)	16.9	13.1	22.2
Timber harvesting (c)	16.3	14.2	7.5
Preserve wilderness values (p)	9.6	16.0	9.3
Protect fish/wildlife habitat (p)	9.1	19.3	13.6
Grazing and ranching (c)	5.9	7.6	12.8
Protect endangered species (p)	1.4	3.8	6.4
Mineral exploration/extraction (c)	.5	3.1	4.6
Other (written in)	1.7	.2	n/a

p = protection; c = commodity production; n/a = not applicable.

Source: G. Rudzitis, C. Watrous, H. Johansen, *Public Views On Public Lands: A Survey of Interior Columbia River Basin Residents*, Department of Geography, University of Idaho, 1995.

physical environment is both a separate and highly inter-related component of where and how people live. Given the conflicts over the management of the Federal lands (that is for logging, recreation, wilderness preservation) that comprise a major portion of the 100-county survey area, people were asked if they cared how those lands were managed.

People moving to the region may do so for reasons related to the social environment and the physical landscape but not care about specific Federal land management practices. We found this not to be true, since 92 percent were concerned with how Federal lands were managed. The most frequent preferences for managing Federal lands were water/watershed and ecosystem protection (table 3). Timber harvesting was cited by 16 percent, grazing and ranching by 6 percent, and mineral exploration/mining by less than 1 percent. Overall, protective strategies made up 76 percent of the preferred management strategies and commodity-based strategies 23 percent. This same trend is evident for the second and third most stated preferences. These findings also contradict the longstanding view of the Federal lands as a public warehouse of commodities to be harvested and jobs to be filled. For newcomers in the rural West, the value of these public lands is related to protecting and preserving them.

It is often assumed that views on how Federal lands should be managed will vary greatly depending on where people live (urban vs. rural), how long they have lived there (migrants vs. old-timers), their occupations (loggers and other resource workers vs. professional occupations), as well as by age and sex. Although some differences were demonstrated in the survey between different groups, they were not large. For example, differences between urban and rural residents normally ranged from 5 to 10 percentage points. Whereas 76 percent in urban

areas thought managing for wilderness values was important, so did 66 percent in rural places. Water and watershed protection was considered important by 83 percent of urban residents and 81 percent of rural residents.

Rural and urban people differed more on commodity strategies. About 71 percent of rural persons favored some timber harvesting, compared with 62 percent of urbanites. The differences shrink over grazing and ranching, with 60 percent of people in rural areas favoring these uses compared with 54 percent of urban respondents. Both groups were in almost complete agreement on mineral exploration and development, with only 32 percent rural and 31 percent urban thinking it an important use of public lands.

Few differences exceeding 6 percentage points existed between recent migrants and long-term residents, though newcomers rated protection of endangered species higher (61 percent vs. 43 percent). Similarly, people in resource occupations were less likely than people in other occupations to rate the protection of endangered species as important (28 percent vs. 48 percent). They were also less likely to consider wilderness protection as important (59 percent vs. 74 percent). People in resource and other occupations held very strong and similar views regarding the importance of policies to protect water/watersheds, fish and wildlife habitat, ecosystems, and to provide recreational uses on Federal lands. Older people in the region were more in favor of extractive strategies, while females rated protective strategies higher. However, except for protecting endangered species and preserving wilderness values, the differences are around 5 percentage points.

These findings are important because surveys about attitudes toward Federal lands are even scarcer than surveys about why people move to and live in the American West. Regardless of demographic characteristics, rural or urban



residency, length of residency, or occupation, most western people favor protective strategies. The emphasis appears to be on good stewardship, with commodity production allowed only if the ecosystems of the Federal lands are not degraded.

### **Amenities Are the Key to Making Places Desirable**

In the rural West, and probably elsewhere, employment alone is insufficient to explain why people move and live where they do. Often, the amenities of places single them out as desirable living environments. Any rural development strategy should honor the simple notion of place and social/physical environments. We need to consider how and where people want to live the "good" life.

When faced with tradeoffs, people in the West expressed a preference for environmental protection of the public lands and their associated ecosystems. This preference seems to acknowledge the link between protection of the environment and long-term stability and growth of local economies. The "good" life is lived in a place, and what, in part, makes a place unique in the West is lots of public open space, a clean environment, wilderness, and friendly neighbors.

The economic value of many places and regions may well be enhanced by preserving, sustaining, and strengthening both the physical and social environment within which they exist. Maintaining a high-quality environment can become a development strategy.

Development strategies need to recognize the importance of place attachments, the value of good neighbors, social interactions, and the values people place on their social/physical environments. This kind of development theory would better represent the hopes and desires of the people who consistently cite the importance of noneconomic reasons for why they live in the rural West and often sacrifice economic gains in order to do so.

### **For Further Reading . . .**

Gundars Rudzitis, *Wilderness and the Changing American West*, New York: John Wiley & Sons, 1996.

John M. Wardwell and James H. Copp, editors, *Population Change in the Rural West: 1975-1990*, New York: University Press of America, 1997.

# Jobs Follow People in the Rural Rocky Mountain West

*Over the past 25 years, employment growth has followed population growth in the Rocky Mountain West. The allure of amenities to potential migrants and employers, especially for counties rich in pristine natural landscapes, has increased over time. As with other U.S. nonmetro counties, the service and trade sectors now dominate employment in the Rocky Mountains.*

The nonmetro areas of eight States of the Rocky Mountain West (Mountain Census Division: Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, and Wyoming) saw extraordinary growth in population and employment in 1970-95. The fundamental mechanism of regional change appears to differ from the rest of the United States, with population inducing employment growth rather than vice versa. This analysis shows that natural amenities now play a strong role in explaining which counties are growing the fastest. These findings are generally consistent with new ideas being developed by regional researchers studying changes in the rural West.

Several other notable population and employment trends have emerged recently in the Rocky Mountain West. The 1970's was marked by nonmetro employment growth much greater than national averages, especially in counties adjacent to metro counties. However, population growth was not as strong in the region as in the rest of the United States, while the economic downturn of the 1980's appears to have affected the region harder than other areas. This trend was reversed in the 1990's as several parts of the Rocky Mountain West started to grow at a faster rate than other nonmetro areas of the country. While the nonadjacent and more remote counties have fared well in some respects, they continue to lag compared with growth patterns seen in counties adjacent to metro areas.

Major changes in the social, economic, and demographic structure of the United States have modified the forces driving population and employment change in the region

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Alexander C. Vias is an assistant professor of geography at the University of Northern Colorado.

today. Economic restructuring has altered the locational constraints of many industries. Many economic activities once dependent on urban economies and resources can now locate in more remote areas because of transportation and technological advances. In addition, newly emerging residential preferences for areas with environmental amenities and rural lifestyles have influenced migration. Finally, demographic changes (a larger retiree population) and the increasing importance of nonemployment income have created a large body of potential migrants who are motivated to move for reasons other than work. All of these changes, when combined with unique natural and scenic resources, suggest that the Rocky Mountain West is capable of developing a much more stable and environmentally sound mechanism for long-term economic and population growth, especially compared with the volatile resource-based economy of the past.

This article outlines two important perspectives on regional population and employment change in the United States from 1970 to 1995, and reviews recent trends in employment and population change for the entire region using aggregate measures and county-level analysis. Results from a regression model are then discussed to examine factors influencing population and employment growth, especially the role of population/employment interactions and natural amenities.

## Researchers Offer New Views on Regional Growth and Change

The magnitude of the economic and population change that started in the 1960's and 1970's has elicited enormous research efforts in all the social sciences. This research shows that economic restructuring has been the primary driving force of socioeconomic change in the United States. Economic restructuring has resulted from a num-

ber of worldwide changes. Globalization of the world economy has increased competition for U.S. firms and has led to more volatile markets and the downsizing of many production processes. Economic restructuring has also involved a strong shift in employment toward the service and trade industries and away from the manufacturing and extractive industries.

Two perspectives on the nature of these changes are useful in understanding events taking place in the Rocky Mountain West. Each has its own view of how economic restructuring has affected population and employment change in the United States. The first, the *regional restructuring perspective*, focuses primarily on the changing location of economic activity in the United States. At the national level, these changes have precipitated (or hastened) the movement of existing industry out of the Rustbelt and into the Sunbelt. At the regional level, these changes have, in many circumstances, allowed firms and industries to move from cities into nonmetro areas in search of lower input costs (such as labor, land, and taxes). While the regional restructuring perspective argues that the nature of industrial location has radically changed over the last 30 years, the interaction between employment and population change has not. In short, people follow jobs.

The other explanation for regional change, the *deconcentration perspective*, contends that the new locational flexibility of many industries has fundamentally altered the interaction between employment and population change. Since firms are no longer tied to urban areas, and in fact may find it cheaper to move to nonmetro areas, other production requirements become more important. For example, many highly trained and specialized workers not tied to specific locations (such as software designers and other jobs that take advantage of communications advances) may find amenity-rich rural areas more desirable places to live. Hence, the primary contention of this perspective is that people—motivated by their desire to move to high-amenity locations—drive regional change. Jobs follow people.

Recent research supports the deconcentration perspective. For example, amenities and other location-specific attributes have become much more important in understanding why people move to particular places, especially since World War II. The types of amenities preferred by migrants have changed, and now include not only warmer climates but also rural lifestyles and a desire to be near scenic natural landscapes. The deconcentration perspective also captures the increasing role of retirees. Over the past 50 years, this group has grown in size as Americans live longer. Retirees are even more significant because their incomes (savings, pensions, dividends, and so forth) are not tied to jobs or particular places. In fact, nonemployment income as a whole has become more important as a source of income—up to 50 percent—

throughout the nonmetro areas of the United States. The effect of these income changes is that more Americans can now take advantage of new amenity preferences as well. Economic growth is then generated almost entirely by multiplier effects from increased consumer spending in the service and trade industries, and not by changing demand for exports.

These perspectives have been outlined without much reference to particular places or areas. However, every region has specific historical processes that have altered how these forces play out over time. The Rocky Mountain West region has always relied on its extractive industries—and the whims of natural resource markets—to drive the local economy. Heavy manufacturing simply has not played a major part in the region's economic history.

Today, however, remarkable improvements in communications have enabled entrepreneurs to succeed in remote locations. In addition, more leisure time and higher incomes have increased demand for homes close to scenic areas. Thus, there is now a demand for these natural environments that is *not* related to extracting resources from the ground—a demand that is able to take advantage of these resources without necessarily destroying them at the same time. The demand for environmental amenities, along with other rationales for population and employment change, is embodied in the *quality-of-life model*, a new explanation for the changes taking place in the Rocky Mountain West.

### **Service and Trade Gain Employment in the Rocky Mountain West**

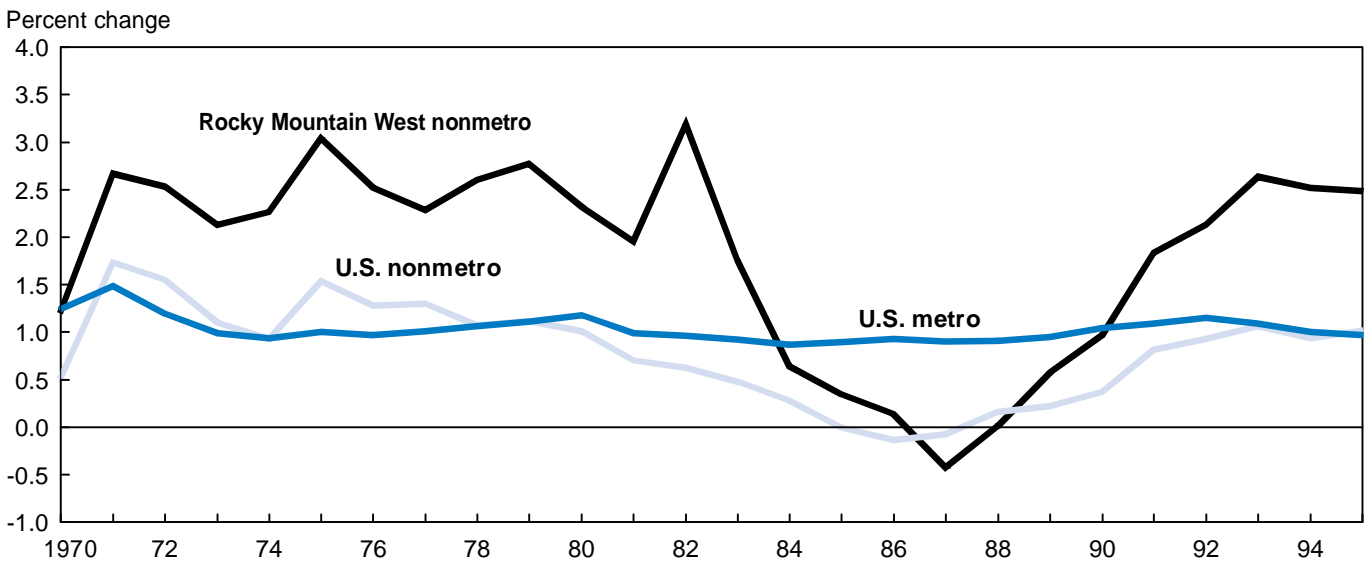
In terms of population, the Rocky Mountain West has seen patterns of growth and decline similar to those throughout the rural United States over the last 25 years, especially the remarkable growth of the 1990's. However, this region's changes were generally more extreme—growth was much greater in the 1970's, and more sustained. The downturn of the 1980's was quicker and more severe, while growth in 1990-95 was greater than for the nonmetro U.S. as a whole (fig. 1). In employment, the region has followed national trends more closely, experiencing patterns of growth and decline tightly linked to the business cycle. Here again, annual growth rates in the Rocky Mountain West have consistently outpaced those of the nonmetro U.S. (fig. 2).

For the region's nonmetro counties as a group, migration has been the most volatile component of population change. Net migration for 1990-95 (435,000) nearly equaled net migration for the entire 1970's, with 1980's negative net migration sandwiched between. It is apparent that migration is related to U.S. economic restructuring and changing residential preferences. Natural increase, on the other hand, has remained fairly constant (table 1).

Figure 1

### Annual rates of change in population, 1970-95

The Rocky Mountain West has followed national population trends to a degree, although changes in the region have been more extreme

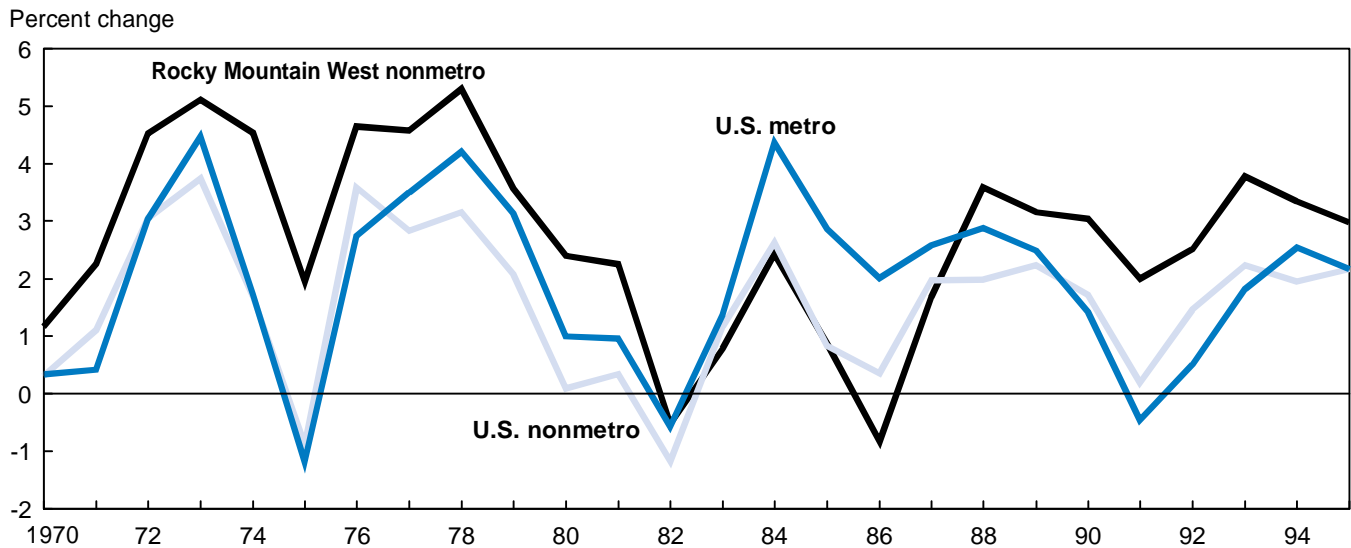


Source: Regional Economic Information System, 1997.

Figure 2

### Annual rates of change in employment, 1970-95

Employment growth has been tied to national business cycles, with the Rocky Mountain West showing little divergence from national trends



Source: Regional Economic Information System, 1997.

Metro counties have traditionally outpaced nonmetro counties in terms of population growth; those nonmetro counties that grew rapidly were almost all located adjacent to metro counties (at least 2 percent of the labor force commutes to metro counties). However, in the 1970's, very rural counties, or those nonadjacent to cities, saw rates of increase close to or greater than adjacent nonmetro counties. This anomaly bypassed the Rocky

Mountain West, where adjacent counties grew consistently faster over all three decades in terms of population and net migration. In the 1980's, four out of five nonadjacent counties suffered net migration losses, and over half lost population, a much higher percentage than for adjacent counties in the region (table 1).

Table 1

**Demographic components of change in the nonmetro Rocky Mountain West, 1970-95**

*The primary component of population change in all time periods has been migration; the more remote counties showed their strongest growth in the 1990's*

Demographic components, years, and county types	Absolute change	Percent change	Percent counties growing
	Number	Percent	
<b>Population:</b>			
1970-80—			
Adjacent	312,411	43.0	97.9
Nonadjacent	700,946	27.4	78.3
All	1,013,357	30.9	81.9
1980-90—			
Adjacent	265,856	25.6	76.6
Nonadjacent	234,148	7.2	45.9
All	500,004	11.6	51.6
1990-95—			
Adjacent	255,917	19.6	91.5
Nonadjacent	371,808	10.7	83.6
All	627,725	13.1	85.0
<b>Net migration:</b>			
1970-80—			
Adjacent	219,338	30.2	95.7
Nonadjacent	353,273	13.8	58.5
All	572,611	17.5	65.4
1980-90—			
Adjacent	150,208	14.5	53.2
Nonadjacent	-174,392	-5.4	14.0
All	-24,184	-0.6	21.3
1990-95—			
Adjacent	201,809	15.5	85.1
Nonadjacent	233,061	6.7	72.0
All	434,870	9.1	74.4
<b>Natural increase:</b>			
1970-80—			
Adjacent	93,073	12.8	97.9
Nonadjacent	347,673	13.6	97.6
All	440,746	13.4	97.6
1980-90—			
Adjacent	115,648	11.1	97.9
Nonadjacent	408,540	12.5	97.6
All	524,188	12.2	97.6
1990-95—			
Adjacent	54,108	4.1	80.9
Nonadjacent	138,747	4.0	83.6
All	192,855	4.0	83.1

Note: Based on 1980 metro/nonmetro classification, 254 nonmetro (47 adjacent and 207 nonadjacent) and 24 metro counties.

Source: U.S. Census, 1970, 1980, 1990, Current Population Survey, 1996, and other special tabulations.

Nonmetro employment growth in the region shows some similarities to population trends, but some interesting differences as well. Employment growth in the 1970's in nonadjacent counties was of the same magnitude as for adjacent counties (table 2), indicating sustained economic growth throughout nonmetro areas, a trend that corresponds with improved opportunities for industries in the

rural hinterlands. Population growth, however, did not match employment growth, which may be due to abundant and underused labor already in place. Over all three time periods, employment in adjacent and nonadjacent counties grew, with nonadjacent counties growing at a slower pace. However, differences between adjacent and



nonadjacent counties were smaller than those seen with respect to population change (table 1).

As in the rest of the United States, farming and mining in the Rocky Mountain West have diminished over time, with a brief respite for mining at the end of the 1970's. Likewise, there has been a strong surge in producer and consumer services, especially since 1980, and smaller increases in retail and wholesale trade (fig. 3). Nearly half

of the farming counties and over half of the mining counties in the region have changed their major economic activities from 1970 to 1995 (see box, "Classification of County-Level Economies"). Furthermore, four times as many counties (from 13 to 72) have service and trade as their primary economic activities (table 3).

County typology can differentiate the effect of economic structure on growth rates for population, employment,

Table 2

**Employment change in the nonmetro Rocky Mountain West, 1970-95**

*For the more remote counties, the 1970's was a time of increased employment growth, with growth rates nearly matching those found in counties adjacent to metro areas*

Years and county types	Initial employment level	Absolute change	Percent change	Percent counties growing
		Number	Percent	
<b>1970-80:</b>				
Adjacent	288,814	143,346	49.6	93.6
Nonadjacent	1,074,377	508,582	47.3	87.0
All	1,363,191	651,928	47.8	88.2
<b>1980-90:</b>				
Adjacent	432,160	155,782	36.0	87.2
Nonadjacent	1,582,959	235,970	14.9	67.1
All	2,015,119	391,752	19.4	70.9
<b>1990-95:</b>				
Adjacent	587,942	192,846	22.1	85.1
Nonadjacent	1,818,929	258,435	14.2	77.7
All	2,406,871	388,281	16.1	79.1

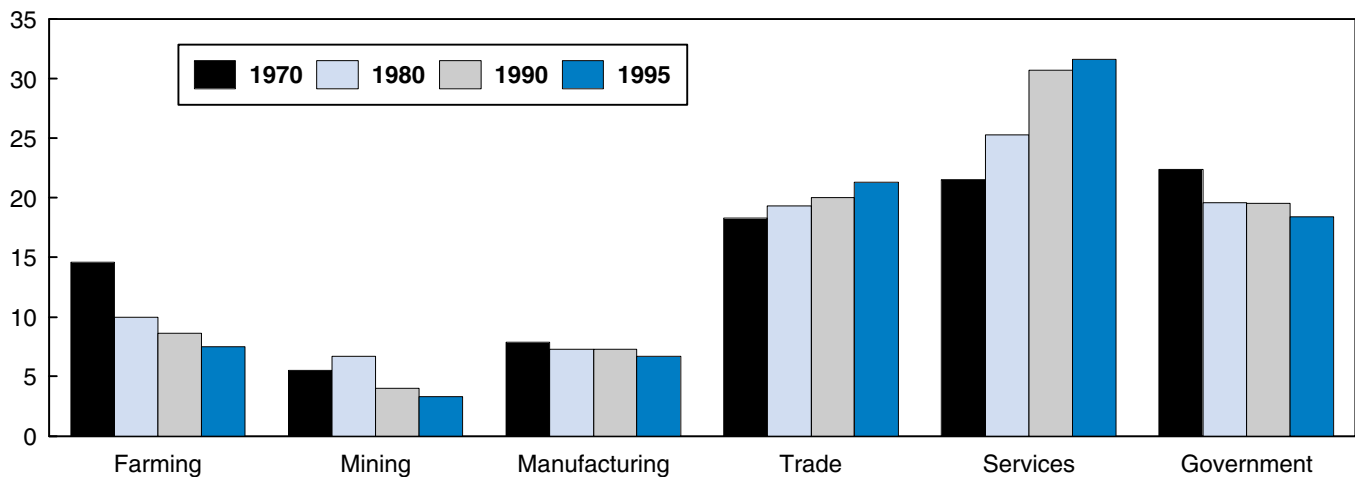
Note: Based on 1980 metro/nonmetro classification, 254 nonmetro (47 adjacent and 207 nonadjacent) and 24 metro counties.  
Source: Regional Economic Information System, 1997.

Figure 3

**Sectoral employment in the nonmetro Rocky Mountain West by sector, 1970-95**

*Employment has shifted away from the extractive sectors to the service and trade sectors*

Percent employed



Source: Regional Economic Information System, 1997.

net migration, and wages. In terms of population and employment growth, the service and trade counties have done the best through all three time periods (table 4). While farming and mining counties have had diminished population and employment growth since the 1970's, manufacturing counties rebounded in the 1990's. Average wages for service and trade counties have declined over time, while mining county wages remain very high. Overall, wage growth has been minimal across the board. This finding reinforces the notion that although the service and trade sectors are the fastest growing in the region, they may not necessarily be the best jobs for the local population.

### Population Is Driving Growth

While typologies provide insights into the role of economic structure, they offer little information on how population and employment interact in the growth process. Newly developed analytical techniques help sort out some of these important relationships (see box, "Regional Adjustment Models"). These new models tell us that increasing population is driving employment growth in all three time periods (table 5). However, the same is not true for employment with respect to population growth (table 6). In fact, employment growth was related to population decline for two time periods. This finding may be the result of using overall employment growth to describe a complex and dynamic employment structure. For exam-

Table 3

#### Number of nonmetro counties by economic type in the Rocky Mountain West, 1970-95

The number of counties dominated by service and trade jobs has gone from 13 to 59 over a 25-year period

Economic type	1970	1975	1980	1985	1990	1995	Absolute change, 1970-95	Percent change, 1970-95
Farming	111	93	77	79	71	64	-47	-42.3
Mining	31	29	37	22	16	13	-18	-58.1
Manufacturing	23	25	23	18	23	19	-4	17.4
Service trade	13	18	24	49	60	72	59	453.8
Government	25	23	20	17	17	17	-8	-32.0
Other	51	66	73	69	67	69	18	35.3

Source: Regional Economic Information System, 1997.

Table 4

#### Growth rates for nonmetro counties in the Rocky Mountain West by economic type, 1970-95

Service-oriented counties grew faster in population, employment, and migration, but lagged in average wages

Year and economic type	Population	Employment	Migration	Average wage <sup>1</sup>
	Percent			Dollars
<b>1970-80:</b>				
Farming	16.8	25.1	5.3	15,875
Mining	35.5	58.7	13.9	22,157
Manufacturing	28.6	36.2	13.2	19,770
Service and trade	65.5	83.0	36.6	21,188
Government	30.2	44.0	8.1	19,859
<b>1980-90:</b>				
Farming	-2.3	5.3	-10.0	16,638
Mining	0.9	10.0	-14.8	26,438
Manufacturing	2.0	12.4	-8.4	20,908
Service and trade	28.9	42.9	11.8	20,145
Government	7.3	18.2	-14.8	21,174
<b>1990-95:</b>				
Farming	6.3	2.7	4.2	15,066
Mining	3.8	5.0	-1.6	25,619
Manufacturing	13.5	13.6	8.7	18,963
Service and trade	16.1	31.5	11.0	18,735
Government	7.5	7.7	2.8	20,204

Note: All monetary figures are inflation-adjusted 1993 dollars.

<sup>1</sup> Average wage is a single-year figure for first year of the time period.

Source: Regional Economic Information System, 1997.

Table 5

**Factors related to employment growth in the nonmetro Rocky Mountain West, 1970-95**

*Employment growth is now being driven by population growth in counties dominated by service and trade industries; on the other hand, firms are still attracted to counties with lower wages*

Variable	Hypothesis	Expected effect	Actual effect on employment growth		
			1970-80	1980-90	1990-95
Employment <sup>1</sup>	Employment growth induces more employment growth	+		-	+++
Population <sup>2</sup>	Feedback effect of population	+	+++	+++	++
Average wage	Firms move to lower paying areas	-	-		--
Percent dividend income of total income	Nonemployment dividend income induces growth	+	+++	++	
Percent transfer income of total income	Nonemployment income in form of aid payments may (not) hinder growth	+ or -	--	---	---
Adjacent to metro county (1980)	Proximity to cities induces growth	+	-	++	+++
Agricultural county <sup>1</sup>	Declining importance of agriculture	-	--		
Mining county <sup>1</sup>	Declining importance of mining	-		--	
Manufacturing county <sup>1</sup>	Unknown effect—insignificant size of manufacturing sector	+ or -	-		++
Service and trade county <sup>1</sup>	Increasing importance of service and trade sectors on growth	+		+++	+++

Note: Table shows which variables were significantly related to population and employment growth for each of the three time periods used in this article. The signs indicate a positive or negative relationship, with the number of signs indicative of the strength of the relationship (more signs indicate a stronger relationship, with no signs indicating no relationship).

<sup>1</sup> Variable represents value for first year of time period.

<sup>2</sup> Variable represents value for last year of time period, estimated using the model in table 6.

Sources: Regional Economic Information System, 1997; U.S. Census, 1970, 1980, 1990; Area Resource File, 1995; USDA (Topographic Index).

ple, employment may be declining in the extractive sectors while increasing in the service sectors. Nevertheless, these findings support the quality-of-life model, which holds that population change and labor supply are the driving forces for change in a region, or that jobs follow people. This trend is opposite the national trend, where employment led population growth, at least through the 1980's. Because of its scenic landscapes and many recreational opportunities, the Rocky Mountain West may have spearheaded a trend toward regional socioeconomic change driven by migration and changing residential preferences.

Geographic location (adjacent to metro counties) remains an important factor in explaining population and employment growth for all time periods (the exception being employment growth in the 1970's). The model results

show that proximity to large urban centers and their economies has been crucial to the growth of nonmetro areas. Economic structure continues to play an important but changing role in differentiating growth patterns. For example, population growth in the region was not associated with any particular type of economy in the 1970's. In the 1980's, economic structure became more strongly associated with population change, especially the decreases in mining and the increases in service counties. The 1990's saw a further increase in the effect of economic structure, with positive growth associated with farming, manufacturing, and services counties. Employment growth in the 1970's and 1980's was associated with declines in farming, mining, and manufacturing. Service economies fare the best with regard to employment, as is the case nationwide. The emergence of these county types is a fundamental part of the quality-of-life model, which empha-

Table 6

**Factors related to population growth in the nonmetro Rocky Mountain West, 1970-95**

*Amenities have become increasingly related to population growth in the region; employment growth is not needed to drive or initiate migration into the region*

Variable	Hypothesis	Expected effect	Actual effect on population growth		
			1970-80	1980-90	1990-95
Employment <sup>1</sup>	Feedback effect of employment on population growth becomes less important	-		- - -	- - -
Population <sup>2</sup>	Population growth induces more population growth	+	+++	+++	+++
Topographic index	Scenic high-mountain areas are attractive to migrants	+			+
Percent Forest Service land	Scenic FS areas are attractive to migrants	+			++
Percent Bureau of Land Management land	Scenic BLM areas are attractive to migrants	+	+++	+++	+++
Average wage <sup>2</sup>	Proxy variable for amenities—people forgo higher wages for scenic areas	-		-	--
Gross rent <sup>2</sup>	Proxy variable for amenities—people willing to pay higher rents for scenic areas	+	+++	+++	+++
Adjacent to metro county (1980)	Proximity to cities induces growth	+	-	++	+++
Agricultural county <sup>2</sup>	Declining importance of agriculture	-			+++
Mining county <sup>2</sup>	Declining importance of mining	-		- - -	
Manufacturing county <sup>2</sup>	Unknown effect—insignificant size of manufacturing sector	+ or -			+++
Service and trade county <sup>2</sup>	Increasing importance of service and trade sectors on growth	+		+++	+++

Note: Table shows which variables were significantly related to population and employment growth for each of the three time periods used in this article. The signs indicate a positive or negative relationship, with the number of signs indicative of the strength of the relationship (more signs indicate a stronger relationship, with no signs indicating no relationship).

<sup>1</sup> Variable represents value for last year of time period, estimated using the model shown in table 5.

<sup>2</sup> Variable represents value for first year of time period.

Sources: Regional Economic Information System, 1997; Payments in Lieu of Taxes, 1996 (BLM and FS land); U.S. Census, 1970, 1980, 1990; Area Resource File, 1995; USDA (Topographic Index).

## Classification of County-Level Economies

Previous research suggests that economic structure is tightly linked to population and employment growth. A typology of counties was developed based on employment structure using six sectors: farming, mining, manufacturing, service and trade, government, and other (diversified). Four base years were used: 1970, 1980, 1990, and 1995, with sectoral employment for each year based on a 3-year average. Once employment had been calculated for each of the six sectors, counties were classified according to sectoral dominance. A cutoff or threshold point based around one standard deviation above the regional average for employment in a given sector was used to classify that county as dominated by that sector. This approach provides an understanding of the magnitude and character of county-level economic change. The aggregate measures used above, although useful, can be misleading because a small number of counties may be dominating the statistics. A more complex typology was developed by USDA in the 1980's to examine issues similar to those explored here.

sizes environmental and social amenities over brute sectoral swings.

Amenities—as measured by Forest Service and Bureau of Land Management (BLM) land, along with rugged/scenic terrain—have become increasingly important in explaining population growth. For example, in the 1970's, only BLM land was tied to population growth; by the 1990's, all three variables predicted population growth, indicating an increased demand for these amenities (table 6).

Two other economic variables (gross rent and average wage) provide indirect support for the greater value of amenities. Typically, migrants would be attracted to locations with lower rents and higher wages. However, the opposite was found in the Rocky Mountain West, where migration and population growth have been associated with counties that have lower wages and higher rents. In fact, this relationship has become stronger over time. Thus, migrants seem more willing to forgo lower rents and higher wages so that they can live in high-amenity areas. Rents actually go up and wages come down when people inundate a county for amenity reasons.

In terms of employment growth, different processes are at work (table 5). For example, average wage with respect to employment growth was more predictable, with firms (or employment) attracted to counties with lower wages in the 1970's and 1990's (with a recession accounting for the lack of a relationship in the 1980's). The effect of nonemployment income on employment growth was not expected. Overall, the positive effect of dividends and rents on employment change has declined over time, while the negative effect of transfer payments has diminished as well. The negative effect of transfer payments may be explained by the high percentage of income maintenance

## Regional Adjustment Models

Over the past 30 years, researchers have engaged in a difficult “chicken-or-egg” debate: does employment growth induce population growth (regional restructuring) or does population growth induce employment growth (deconcentration)? Analytical techniques have been developed to measure which mechanism is stronger, including regression models that simultaneously take into account the effect of population and employment growth. The regional adjustment models used here are a relatively new version of this “simultaneous equations” approach (Clark and Murphy). By using this type of model, it is possible to examine population and employment growth while controlling for the effects of population/employment interactions, economic structure, geographic location, environmental amenities, and nonemployment income. The variables used for the population and employment growth equations were chosen to specifically test the significance of factors researchers believe are associated with population and employment growth in the Rocky Mountain West. Additionally, since the data are available for 25 years, it will be possible to see how the influence of these factors has changed over time.

programs associated with this source of income (a sign of economic distress). However, the effects of dividends and rents cannot be easily reconciled with the expectations of the quality-of-life model because alternative sources of income are assumed to be one of the major factors associated with economic growth in the face of a decline in primary sector employment.

These findings validate many of the claims of the quality-of-life model, especially the positive role of the service sector in driving employment growth. Additionally, amenities have become more important since the 1970's, as indicated by the increasing importance of Federal lands and areas with topographic diversity, and the contrary effects on rents and average wages. Most important, the mechanism of change in the region does not support the traditional notion that people follow jobs into a region. In fact, evidence is strong that the opposite is true—jobs follow people.

## Conclusion

Population and employment changes taking place in the Rocky Mountain West show the importance of quality-of-life factors in an area rich in environmental amenities. The region's unique endowment of scenic landscapes can be used to drive growth, releasing the region from the volatility associated with economies reliant on natural resources. However, not all changes are positive, as evidenced by the relatively flat wages found in the region's nonmetro areas, especially in counties based on services. In general, policymakers in the region pushing for service sector growth and attracting migrants should find some comfort in these results, although they need to fully eval-



uate the wage effects of these policies as well. This means that any economic development policy should not neglect traditional sources of income in the resource industries if these can be maintained without destroying the environmental amenities sought by so many of today's migrants.

#### **For Further Reading . . .**

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Thomas M. Power, *Lost Landscapes and Failed Economies: The Search for a Value of Place*, Washington, DC: Island Press, 1996.

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# Migrants to Oregon in the 1990's

## Working Age, Near-Retirees, and Retirees Make Different Destination Choices

*The rate of immigration is high in Western States; hence, the characteristics of the immigrants are of great policy interest for both communities and States. Younger families need different services than older retirees and near-retirees, while middle-aged professional and managerial workers need still different services. Different regions in Oregon attract dramatically different kinds of migrants: metro areas attract young professionals, some retirement/recreation areas attract the often-wealthy "near-retirees," and still other retirement/recreation areas attract older retirees. Migrants who move primarily for quality-of-life reasons are willing to absorb substantial declines in income to do so, while migrants who move for job-related reasons will accept little or no income decline.*

From April 1990 to July 1998, Oregon netted nearly 260,000 domestic and over 58,000 international migrants, according to Census Bureau estimates (table 1). This unprecedented level of net immigration to Oregon (as well as many other Western States) has pushed the construction and service sectors of the State economy to new heights. Oregon's growing economy was an anomaly in 1991-92 when the rest of the country was in recession. Simultaneously, public policy in Oregon was hemmed in by the passage of "Measure Five," a strict limit on property taxes that restricted growth in State government budgets.

The potential costs of heavy immigration have often been the focus of State government discussions. For instance, a recent report concluded that migrants to Oregon were more likely to be poor than nonmigrants. Such analyses raise the specter of the "welfare migration" that caused such a stir in 1994 California politics. Of course, wealthy people also migrate to Oregon; taxes paid to the State from a new immigrant on just one estate equalled \$20 million.

The increasing stream of migrants to Oregon and other Western States since 1990 is of interest to demographers

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Dean H. Judson is the Nevada State Demographer at the University of Nevada, Reno. Sue Reynolds-Scanlon is a Ph.D. candidate in Aging Studies at the University of South Florida. Carole L. Popoff is President of Decision Analytics, Inc.

and other social scientists who study movements of populations and the consequences of such movements. An influx of new residents may create demand for improved infrastructure and greater services; these areas are of concern to State and local officials. Thus, the reasons for categorizing the destinations of immigrants and the characteristics of these new residents are both political and scientific. Some of the many questions that policymakers and researchers need to resolve are as follows:

- (1) Will this new population alter the composition of an area's population?
- (2) Will new migrants demand additions to infrastructure and new services?
- (3) Will they be a drain on available community services?
- (4) Is the socioeconomic profile of nonmetro migrants dramatically different than their metro counterparts?
- (5) Will the baby boom's future migration overwhelm the resources of the communities they join?
- (6) Are nonmetro immigrants finding job opportunities, or are they seeking to trade income for amenities?

Table 1

**Western domestic migration, 1990-98**

*California's population declined by 2 million from net migration while other Western States gained 2.7 million*

State	Net domestic migration
Arizona	518,820
California	-2,081,928
Colorado	359,054
Idaho	128,531
Nevada	396,647
New Mexico	55,265
Oregon	259,512
Texas	541,020
Utah	86,168
Washington	373,946
Total (excluding CA)	2,718,963

Source: U.S. Bureau of the Census, 1999.

(7) Are nonmetro areas growing because of aging baby boomers who want to leave urban areas?

This article examines the types of migration that have contributed to Oregon's net immigration since 1990. Using data from a special survey of migrants to Oregon, we examine three types of migrants by the types of areas they favor. Migrants move for distinctly different reasons, with younger migrants economically motivated, near-retirees moving for a mix of economic and lifestyle reasons, and older migrants choosing high-amenity areas (see box, "What Is an Amenity?").

### **Is Migration Driven by Economics or by Amenities? It Depends on the Migrant**

Domestic outmigration from California was nearly 2.1 million from April 1990 to July 1998. This unprecedented mass exodus seems now to be from all social and economic groups, with all other Western States net recipients. (1998 estimates from the Census Bureau indicate that the outmigration has now slowed substantially, although net domestic outmigration from California continues.) Western policymakers must consider whether Californians are moving to improve their human capital and economic condition, to escape challenges in Californian society, to search for more pleasant climates, or for some other reason or bundle of reasons.

Economic factors driving migration are often reduced to job opportunities and wages. One in four job-related moves are merely job transfers across the United States, motivated by little more than a decision to stay with the same employer. However, natural amenities can promote migration and further job growth, so the distinction may not be clear between economic and amenity migration, either in destination choice or in the changes migration brings to the area.

The cost of housing, both owned and rented, is an economic factor in the migration decision, but it can also be considered an amenity cost with some predictable patterns. The level of rural migration is more affected by rent and housing costs than is urban migration. Medium- and high-income migrants, both in the labor force and out, are less influenced in their choice of destination by rent levels than are low-income migrants who are not in the labor force.

Given that low-rent areas are often correlated with high unemployment, States with high levels of unemployment often have high levels of immigration. If amenity values are "paid for" by low wages, then the elderly migrant, who is less tied to wage levels, is better able than a younger worker to take advantage of destinations such as the Oregon coast or the San Juan Islands of Washington State. Labor force migrants tend to prefer higher wage destinations such as New York or Silicon Valley, which often have less to offer in terms of the usual "natural" amenities.

Amenity migration also has consequences for residents of the area, particularly the poor and working-class residents. In many high-amenity towns (Sedona, AZ, or Bend, OR, for example), low-wage workers catering to the tourist sectors typically commute from outside the town. This is because those who live in the natural beauty and cultural ambience pay almost twice as much for rent as those living outside of town. Workers in such towns cannot afford the rent there.

### **Different Locations Appeal to Different Types of Migrants**

Economic considerations interact with amenity concerns in migration. Wage levels tend to motivate those firmly in the labor force, rents matter to those with limited incomes, and amenities attract retirees or those near-retirees who can afford such locations. We present regions typical of Oregon and its multifaceted draw on migrants.

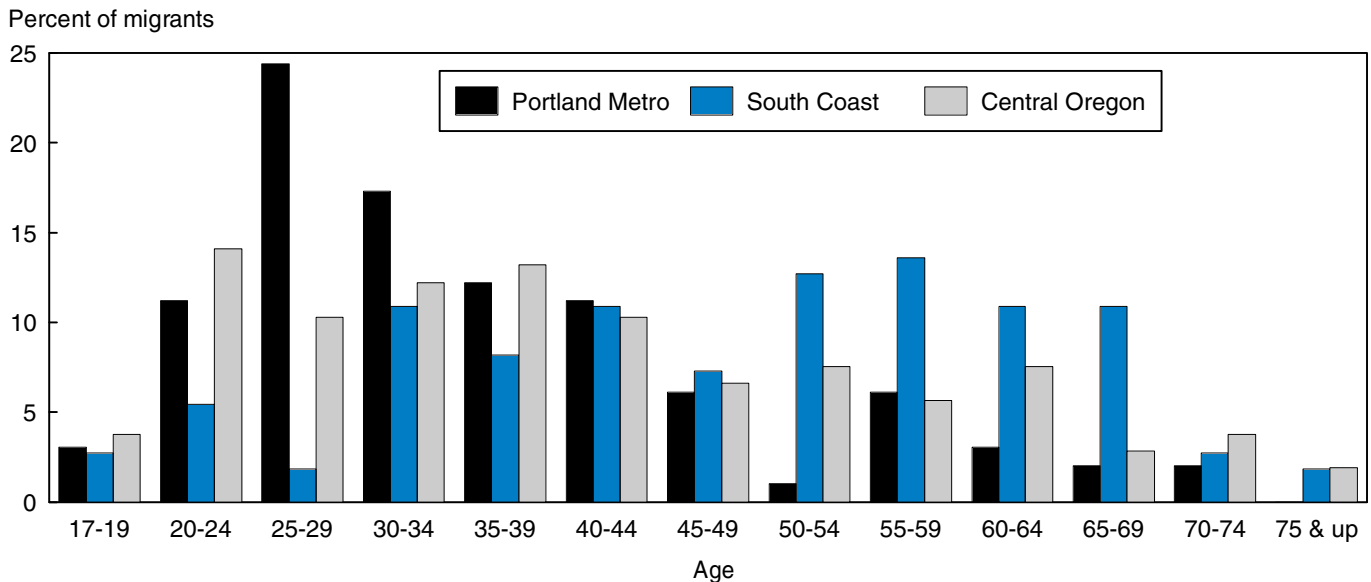
#### **What Is an Amenity?**

Migration researchers often talk about amenities, but the definition remains elusive. In some respects, an amenity is "in the eye of the beholder," with one person preferring cool and another preferring warm climates. Amenities come in many forms, and include low crime rates, warmer climate, topographic relief (that is, a room with a view), cultural activities, shopping, medical care, educational opportunities, etc. We consider an "amenity" to be any area feature for which the migrant would be willing to pay, either through a lower wage, a higher rent, long waiting lines, or some other cost. Most migration researchers claim that migrants trade economic rewards, like wages, for amenities.

Figure 1

### Age distribution of migrants to Portland Metro, South Coast, and Central Oregon

*Migrants to South Coast are older than migrants to Central Oregon, who are much older than migrants to Portland Metro*



Source: 1993 Oregon Immigration Survey.

**Portland Metro** (Multnomah and Washington Counties). The bulk of migrants to Oregon went to this region; its job growth was strongest of the three regions over the period covered by the survey (1991-93). The Portland metro area is an economically vigorous, high-density urban area set on the Willamette River, and is a center for shipping, manufacturing, and trade.

**South Coast** (Coos and Curry Counties). These two counties on the southern Oregon coast are noted for their rugged beauty. Anecdotal evidence and employment estimates suggest that this region has only limited job opportunities, but has experienced an influx of older migrants attracted by the lower cost of living, amenities, climate, and recreational opportunities. During the 1980's, this region was a major destination for older migrants from California.

**Central Oregon** (Crook, Deschutes, and Jefferson Counties). These counties contain several rural-amenity towns and are classified as retirement/recreation counties by USDA's Economic Research Service (ERS). Central Oregon is noted for its skiing, fishing, and hunting, and has grown rapidly in the past decade. Migrants to this area have been referred to as "lifestyle refugees."

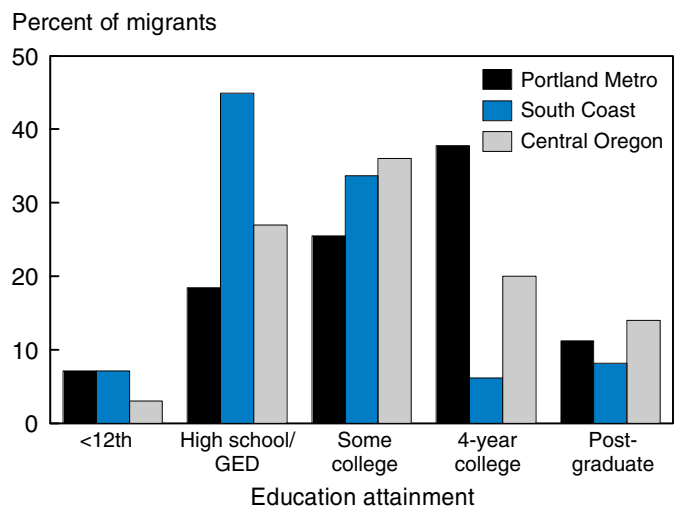
These three regions differed substantially in the age distribution of migrants coming to the region (fig. 1). Portland Metro had a typical employment-related age distribution, with a large share of younger (20-39) migrants and far fewer migrants near or past retirement. In contrast, the South Coast had a much older immigrant profile, especially age 50-69. Central Oregon had an "in-between" age dis-

tribution, with a large share of migrants age 30-64 years old.

The regions are also dramatically different in educational attainment (fig. 2). Portland Metro again illustrated the effect of employment immigration, with the largest share of college graduates and beyond (about 48 percent of immigrants). In contrast, only 14 percent of the immigrants

Figure 2  
**Educational attainment of migrants to Portland Metro, South Coast, and Central Oregon**

*Migrants to South Coast are more likely to have only a high school education, while migrants to Portland Metro are most likely to have a 4-year college degree*



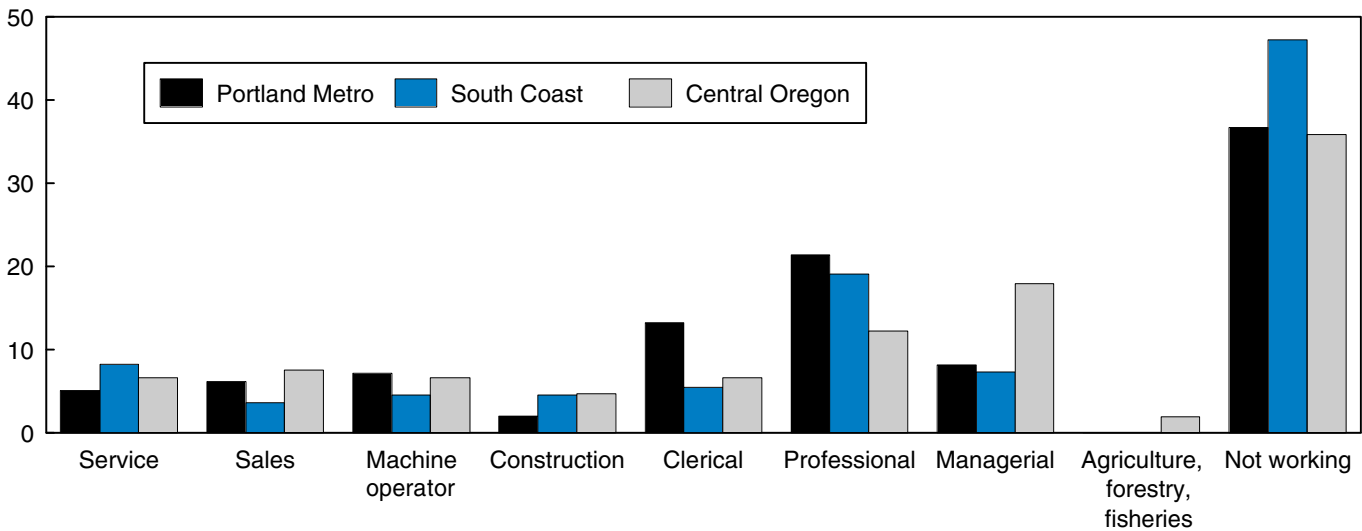
Source: 1993 Oregon Immigration Survey.

Figure 3

### Occupation of migrants who are working

Central Oregon attracts those with managerial occupations, while Portland Metro attracts those with professional or clerical occupa

Percent of migrants



Source: 1993 Oregon Immigration Survey.

to the South Coast had attained a 4-year degree or greater, while Central Oregon captured the most postgraduate degrees.

Portland Metro received a larger share of migrants whose occupation was professional and clerical than did the other regions (fig. 3). South Coast had easily the largest percentage not working prior to coming to Oregon, but also 20 percent in professional occupations. The most notable distinction was in Central Oregon, where a substantially higher proportion of the immigrants reported themselves as in managerial occupations, and 15 percent were self-employed. Likewise, Central Oregon had the lowest percentage not working prior to coming to Oregon.

Migrants to these three regions gave different reasons for migrating to Oregon (fig. 4). Of the multiple choices given them, responses were categorized as either job-related or as amenity-related. Portland Metro received the largest share of migrants who cited a job-related reason only and not an amenity-related reason, while South Coast migrants overwhelmingly cited amenities reasons only and not job reasons. All three regions had their largest share of migrants citing amenities reasons only.

#### Different Areas Attract Migrants With Different Income Levels

Income distributions for each of the three areas were dramatically different (fig. 5). Central Oregon gained more migrants in the higher income ranges than did Portland Metro or the South Coast, including a surprisingly high percentage of migrants with very high incomes (annual household incomes of \$95,000 and above). Portland

Metro received a larger share of lower income migrants (<\$25,000), while the South Coast region received a larger share of moderate-income migrants (\$25,000-\$65,000).

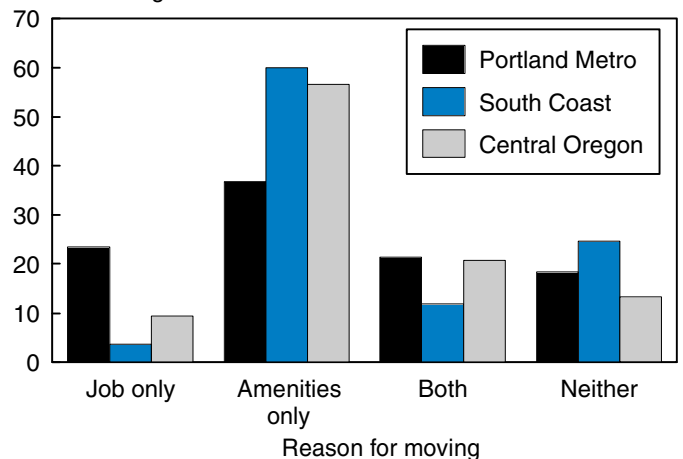
Other studies have shown that income declined for as many as half of all migrants to nonmetro areas after they migrated. In these studies, older migrants were more inclined to accept lower incomes than younger migrants; migrants who moved for employment reasons typically realized income gains, while people who migrated to amenity regions tended to lose income.

Figure 4

### Reasons cited by migrants for moving to South Coast, Central Oregon, and Portland Metro

Migrants to South Coast and Central Oregon are the most likely to indicate amenities only in their decision

Percent of migrants



Source: 1993 Oregon Immigration Survey.

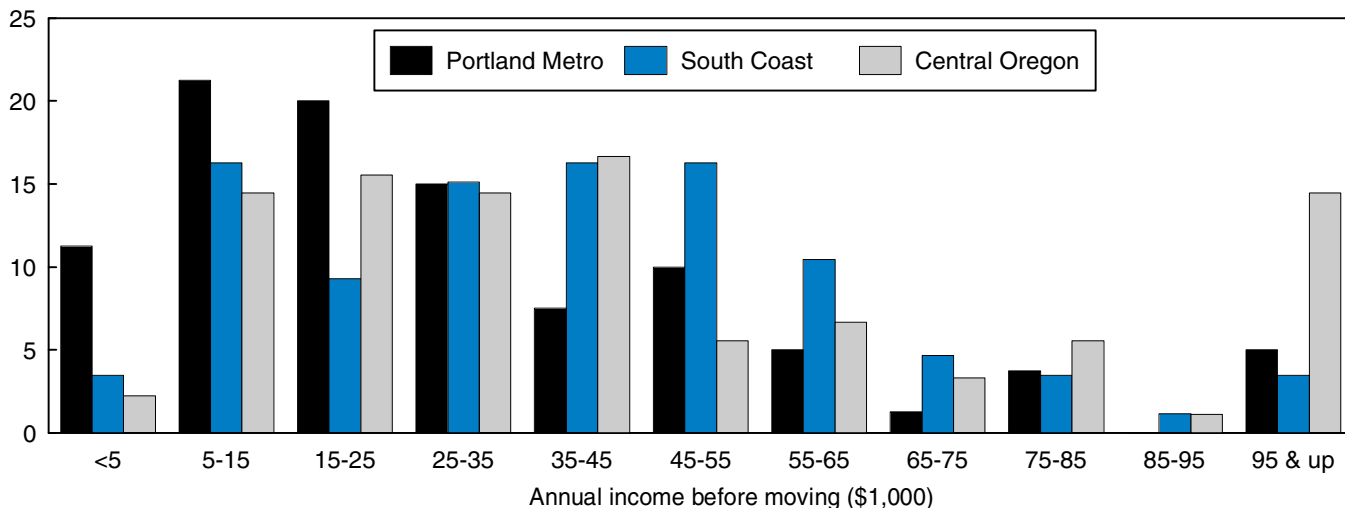


Figure 5

### Household income of migrants to South Coast, Central Oregon, and Portland Metro

Over 1 in 7 migrants to Central Oregon indicate a household income of \$95,000 or greater before moving; most migrants to Portland Metro indicate income in the \$5,000-\$15,000 and \$15,000-\$25,000 ranges

Percent of migrants



Source: 1993 Oregon Immigration Survey.

In Oregon, the income loss of migrants varied quite a bit by region in the early 1990's, reflecting patterns similar to these previous findings. Migrants to Portland Metro typically had a small income gain. Migrants to South Coast, where retiree migrants were most numerous, lost almost \$5,000 in annual household income, while migrants to Central Oregon lost \$3,500.

Given the age profile of migrants to South Coast, the income loss is likely accounted for partly by retirement. These results suggest that elderly migrants take an income loss, either because they can afford the income loss better than younger migrants or because they are more willing to trade income for amenities. However, some of the income loss may be a function of the desire for amenities and/or a near-retirement "trading down" of jobs.

Across all three regions, individuals who indicated only an amenities-related reason for migrating suffered income losses, those who indicated both job-related and amenity-related reasons had a mixed income gain/loss, and those who indicated only job-related reasons actually realized income gains, albeit not by the same amount across regions (fig. 6). Thus, the regional differences were more a result of the migrants' agenda than of anything inherent in the region itself.

#### Tradeoffs Faced by Migrants Depend on Their Age

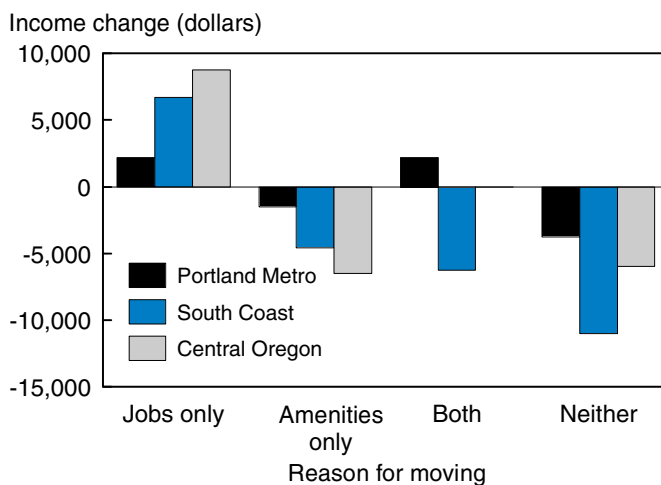
Characteristics of migrants into Oregon, including reasons for moving, differ by age. People face different tradeoffs as they age and hence choose different locations.

**Young Migrants.** Migrants younger than age 40 were the least likely to have moved from California; only 33 percent had moved from there. Thirty-six percent of young migrants moved into the Portland Metro region. Thirty-four percent cited amenities reasons only, while 19 percent cited job reasons and not amenities reasons (fig. 7). This group of migrants had the largest share with a college degree or beyond (37 percent), and their households averaged incomes of \$31,000 before moving. As is common in

Figure 6

### Change in household income by reason for migrating

Migrants who indicate a job-related reason for moving enjoy, on average, an increase in household income

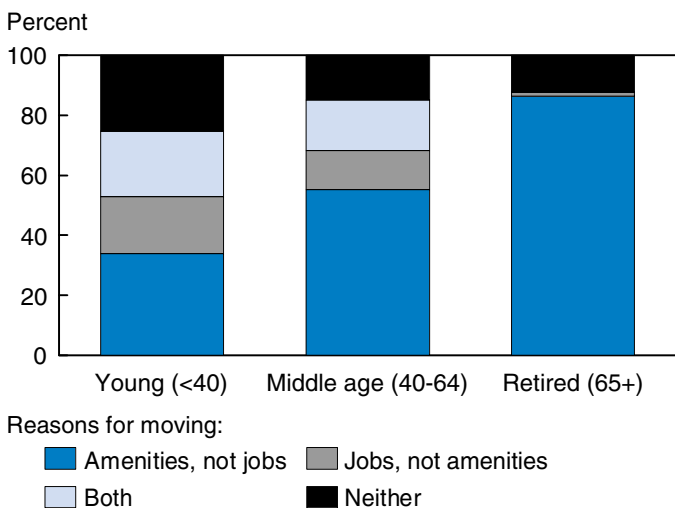


Note: "Income change" indicates the difference in annual household income reported from before the move and after the move, averaged over all migrants.  
Source: 1993 Oregon Immigration Survey.

the short term among migrants (especially those moving to amenity areas), they lost \$2,168 (the difference in their total household income before moving minus their total household income after moving)—the smallest income loss of any group in the sample. However, as with other age groups, those who cited amenities reasons for moving lost income (fig. 8). Most of them moved to metro areas

Figure 7  
**Reasons given for moving by age of migrant**

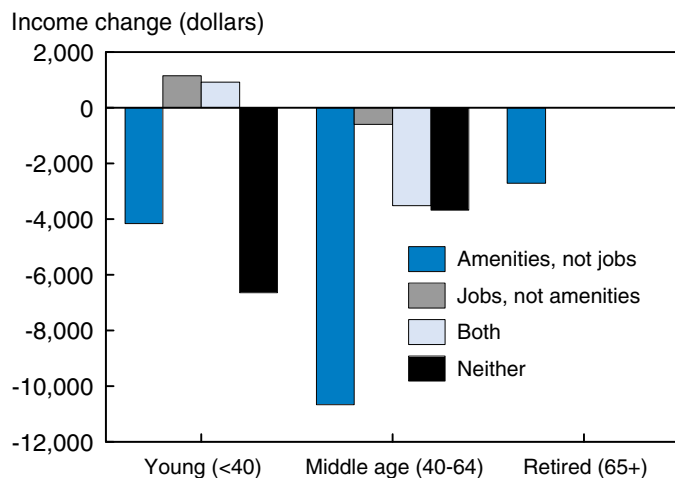
*Young migrants were least likely to indicate amenities only and most likely to indicate job only*



Source: 1993 Oregon Immigration Survey.

Figure 8  
**Average income loss by age of migrant and reason for moving**

*Middle-aged migrants lost income regardless of why they moved, but especially those who moved for amenities*



Note: There are too few cases to reliably estimate retirees' loss (except those who chose amenities and not jobs).

Source: 1993 Oregon Immigration Survey.

where their numbers had little impact on the much larger total population, both because their profile was similar to existing residents and because they were a small portion of the total population. The diverse and strong economy in metro areas absorbed this population without difficulty.

**Middle-Aged Migrants.** Fifty-four percent of migrants age 40-64 came from California, and 24 percent chose Portland Metro as their destination, with the next highest destination (southern Oregon) at 12.5 percent. Fifty-five percent cited amenities only, while 13 percent cited job reasons only and not amenities reasons for moving (fig. 7). This group had the highest proportion of managerial occupations and professional occupations (52 percent), and 34 percent had attained a college degree or more. This group's household income averaged \$48,117 before coming to Oregon, and a significant number reported incomes greater than \$95,000. However, on average, they suffered a household income loss of \$7,200, the largest of any age group. For those in this age group who cited amenities and not jobs as the reason for moving, their household income loss was even greater (over \$10,000), indicating a substantial income/amenity tradeoff. Those who cited jobs only lost the least.

This group of immigrants may affect education and infrastructure costs for their new host communities, as they and their children need educational opportunities and support for their lifestyle. Much has been made in the media of this wealthier professional population and its impact on a rural community. They can provide a pool of workers that are very attractive to "clean" (nonpolluting) and tourism-based industries looking to relocate into a State. They often bring substantial assets and incubate small businesses. This group also has the propensity to age in place in their new communities, a type of "pre-retirement" migration.

**Retiree Migrants.** Migrants who were 65 and older were predominantly from California (66 percent), and the largest share of them (21 percent) chose southern Oregon as their destination. Their destination choices were more likely to be away from urban areas than either young or middle-aged migrants. They were predominantly nonlabor migrants who almost entirely (86 percent) cited amenities only (just 1 percent cited job reasons). This group averaged a household income of \$32,000 before moving to Oregon, and lost an average of \$2,494 in household income upon migration to Oregon, probably associated with retirement and almost entirely based in amenities reasons (fig. 8). Their educational status, although representative for their generation, was the lowest of the migrating groups; 37 percent had a high school diploma, GED, or lower education. As their income stream tends to be portable and not dependent on the local economy, it generates local property and sales taxes, forms capital via housing and bank deposits, and creates jobs.

## The 1993 Oregon Immigration Survey

The study was sponsored by the Occupational Information Committee of the Oregon Workforce Quality Council, and funded by the National Occupational Information Coordinating Committee. In 1993, a team of Employment Department analysts developed the procedures for the survey, using model surveys performed in Maine from 1975 to 1988.

The survey was designed to answer policy questions about Oregon's new residents. The survey sampled from 15 regions in the State, covering all counties, and included 2,752 new residents over age 18. Respondents were contacted via mail, and approximately equal numbers responded in each region for a total of 1,412 respondents. Respondents were asked about their (1) labor force characteristics; (2) household characteristics and composition; (3) perceptions about the State, before and after coming; and (4) dissatisfactions with the State. We specifically asked about their reasons for moving to the State, including "job," "livability," "family," "company transfer," "other," and several other choices as reasons.

### Attracting Retired Migrants Can Be a Good Economic Development Strategy

In the early 1990's, 443 rural "retirement-destination counties" showed more rapid growth than any other type of nonmetro county (87 percent gained population), according to analyses using ERS county typologies. Elderly retirees tend to value services such as grocery stores, pharmacies, or hospitals, and seem to be fleeing perceived crime and congestion.

As the baby boom generation approaches retirement, these inducements have become the specific focus of some rural economic development strategies in the South and Southwest. Results from Oregon suggest that retirees (1) bring wealth into the community in the form of income and asset transfers; (2) stabilize the business cycle (due to diversification and stability of wealth and transfer payment income); (3) demand less State aid and less of costly public services (particularly education, welfare, and highways); and (4) add to the pool of available capital via equity and pension income and wealth. Communities in Oregon have grown rapidly because of the inflow of retirees and may also have had a concomitant growth of younger age groups.

However, not all of the effects of luring retiree migrants are positive. Since many of the retirees are homeowners, some researchers argue that they are resistant to property tax burdens, spend less on government services, desire lower overall tax burdens, and are less likely to support educa-

tion spending. As with other immigrants, an influx of retirees also causes increased pressures on land use, zoning, waste management, and other environmental issues. Retiree communities tend to develop a dual culture and economy: the affluent retirees and the lower paid service workers who cannot afford to live in the community.

### Policy Implications and Speculation on the Future

This study of immigration to Oregon has implications for the rest of the country. The recent migrants described in this survey are an economic benefit to both community and State in the short term. This is true of retirees as well as those who move with or for jobs. Most places' local and State services or infrastructure do not seem to be hurt by elderly migrants and, for the most part, the benefits have far outweighed the burdens.

Economic or wage migrants were usually younger, better educated, and saw gains in income from the move. They were less likely to cite amenities as the sole reason for moving. Middle-aged or pre-retiree migrants were more educated, had more professional status, had some assets and higher income levels, and supported families. These individuals more often cited amenities or lifestyle as reasons for moving and were willing to absorb income losses ranging from moderate (\$4,000) to substantial (\$10,000). Retiree migrants almost entirely cited amenity reasons for moving, and suffered an income loss of about \$3,000 annually. The relationship between reasons for moving and individual migrants' willingness to trade income for amenities was clear. Migrants who cited amenities-related reasons for moving lost significant income. Migrants who cited job-related reasons for moving lost little or no income. Migrants who moved for a mix of reasons fell in the middle and typically lost some income.

Are nonmetro migrants to Oregon finding nonmetro job opportunities or are they seeking to trade income for amenities? This study indicates that both are true. We speculate that this migration involves both a preliminary phase in which early migrants trade income for amenities, and a second phase in which later migrants come for job opportunities created by the early migrants. Because of their life stage and general affluence, middle-aged movers are uniquely able to afford the income loss they face in making amenities and lifestyle migration. In moving, they create opportunities for economically motivated migrants to follow them. Baby boomers make up a large share of these middle-aged movers and can enrich their new communities by injecting income and wealth, increasing job opportunities, and bringing their cultural and educational attainment with them.

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# Quality of Life, Nontraditional Income, and Economic Growth

## New Development Opportunities for the Rural West

*Areas with high levels of natural amenities have enjoyed growing populations and income levels in the past decade. Much of this growth has come from the immigration of people with income from self-employment or investments. These new migrants are usually well-educated and often work as executives or professionals or in such industries as finance, insurance, and real estate or business services. Communities may find that policies that enhance the quality of life (better schools, environmental protection, etc.) can attract more of these people who are in a financial position to act upon their residential preferences. This in turn can stimulate economic development.*

Over the last 10 years, the value of stocks held by investors has grown substantially, and recently, this growth has skyrocketed as employer-provided 401k plans and mutual funds have become increasingly popular investment tools. Small business development has concurrently proliferated, and the entrepreneurial spirit associated with such startups has brought dynamism to many local economies. These economic developments, however, are often overlooked when communities plan development strategies. Interest and dividend income generated from the rising tide of investments represents basic income to a local economy. When an individual buys shares of a company on the stock market or through a mutual fund, earnings from such investments can generate “new money” for the local economy. In a similar fashion, small businesses can and do generate basic income for community economies. When an investment advisor living in the San Juan Islands of Puget Sound receives a commission for a sale to a client in Seattle, money flows from Seattle into the San Juans. Export-oriented services are becoming increasingly important in advanced economies, and as technological developments reduce the costs of doing business from remote locations, these services are likely to expand in nonmetro areas.

Investment income and self-employment income are concentrating in coastal and mountainous areas of the

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Peter B. Nelson is a visiting assistant professor of geography at Middlebury College. This work was supported by a National Science Foundation Graduate Research Fellowship and a University of Washington Royalty Research Grant.

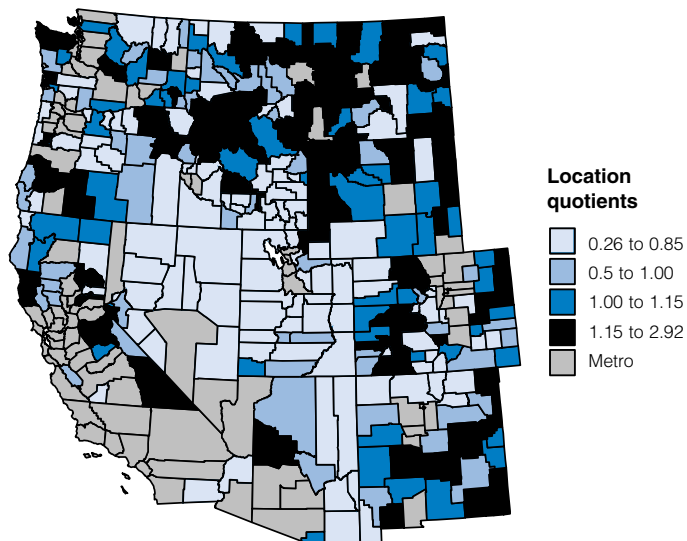
Western United States, noted for their high levels of natural amenities. The migration stream to these areas indicates a strong association between the influx of young professional migrants and rapid expansion in both investment and self-employment income. Areas attracting younger migrants with higher levels of education have the strongest competitive advantage when it comes to generating these nontraditional income sources. Therefore, while it is impossible to create coasts or mountains in any given community, policymakers may be able to create conditions that are attractive to a mobile segment of the population associated with the expansion of nontraditional income. As areas attract these younger and well-educated migrants, it is likely that nontraditional income sources will continue to grow.

Nonmetro counties with concentrations of nontraditional income have enjoyed robust population and economic expansion since the late 1980's. These income and growth trends suggest an alternative rural development strategy. Instead of recruiting big businesses to bring jobs to an area, an area may grow and develop if it is able to create conditions conducive to generating investment and self-employment income. But, what are the conditions that lead to or attract this income? Where are these nontraditional income sources lagging? Are they concentrating in a few high-amenity areas or dispersing throughout the countryside? And, are factors other than location-specific amenities, such as migration characteristics, associated with expansion of these income sources?

Figure 1

### Concentration of investment income, 1994

*Investment income is concentrated in geographically distinct areas*



Source: Regional Economic Information System Database, [www.lib.virginia.edu/socsc/interactives.html](http://www.lib.virginia.edu/socsc/interactives.html).

### Nontraditional Income Is Increasingly Concentrated in Areas With Natural Amenities

Rapidly growing nonmetro counties have higher than average concentrations of investment and self-employment income (see box, “Data and Methods”). Concentrations of investment income mark geographically distinct areas, such as the Pacific coast of the Olympic Peninsula in Washington (fig. 1). Investment income is also concentrated in the mountainous parts of the West, especially along the Rocky Mountains in Colorado and in the Northern Rockies along the Idaho-Montana border. Further concentrations appear around the Yellowstone and Teton National Parks and in the California Sierras. Higher than average concentrations of investment income on the plains of eastern Montana and Wyoming—areas heavily dependent upon extensive agriculture—are likely to be the product of local land-renting practices.

Self-employment income patterns are quite similar (fig. 2). Coastal and mountainous areas display even more pronounced concentrations of this income source. In addition to coastal Washington, the coast of northern California and southern Oregon also have relatively strong concentrations of income from self-employment. This source of income is further concentrated in virtually all of Idaho and Montana when compared with the United States as a whole. The widespread concentration of nonfarm self-employment income in eastern Montana and Colorado may be a result of the growing tendency for farm households to engage in some nonfarm economic activity to supplement household income, which is a phenomenon not unique to the West.

Shift-share analysis is used to highlight areas with a competitive advantage/disadvantage in a chosen socioeconomic measure (see box, “Data and Methods”). In this study, shift-share analysis identifies nonmetro areas that demonstrate a competitive advantage in the growth of both investment and self-employment income. These two income sources have been the most strongly linked to recent development trends. If a county has a competitive advantage in generating either or both types of income, it will likely be positioned to generate economic and population growth.

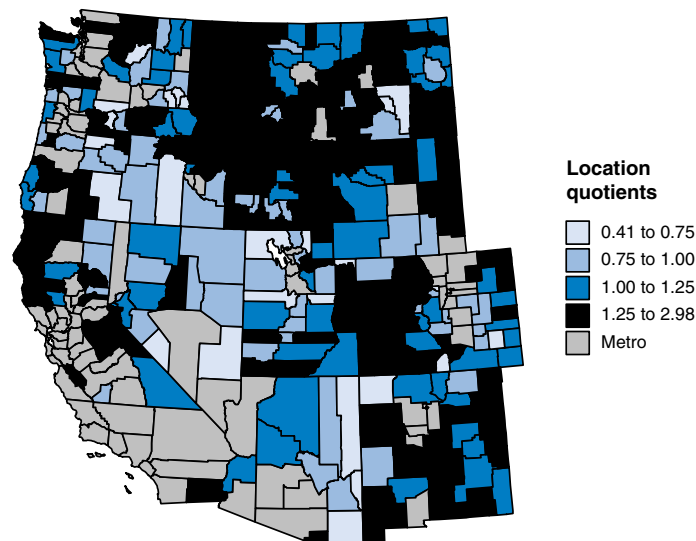
The same coastal and mountainous areas that have high levels of investment income (fig. 1) also have high *growth* of this income due to some competitive advantage (fig. 3). The most competitive counties are found once more within coastal Puget Sound, the Colorado Rockies, the Yellowstone-Teton region, and the northern Rockies along the Idaho-Montana border. This result suggests a mutually reinforcing relationship between investment income and economic development. Economic and demographic growth is most rapid in areas with high concentrations of investment income; such areas also have a competitive advantage generating this source of income. Thus, competitive advantage leads to further concentrations (as opposed to evening out differences across space), positioning these areas for continued growth in the future.

In a similar fashion, growth in self-employment income (fig. 4) overlaps with areas where it is most concentrated (fig. 2). The Colorado Rockies, Yellowstone-Teton region, northern Idaho, and western Montana all have strong and rapid growth in self-employment income, as do eastern Montana and eastern Wyoming. Once again, growth and

Figure 2

### Concentration of self-employment income, 1994

*Self-employment income is concentrated in coastal and mountainous areas*



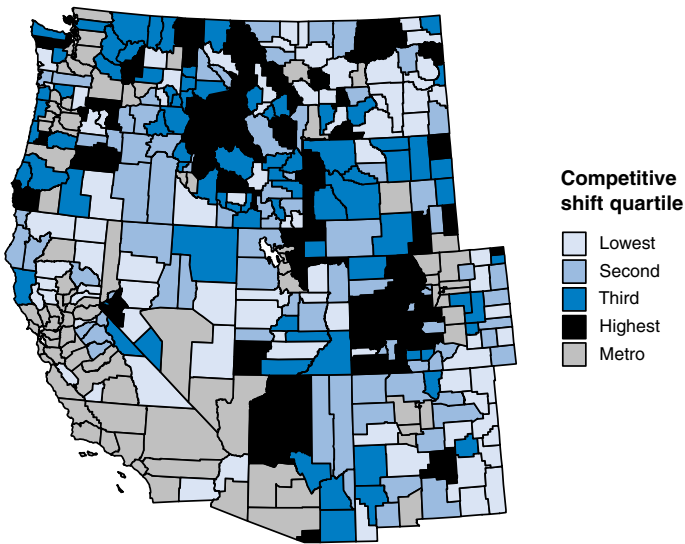
Source: Regional Economic Information System Database, [www.lib.virginia.edu/socsc/interactives.html](http://www.lib.virginia.edu/socsc/interactives.html).



Figure 3

### Competitive shifts in investment income, 1990-94

*Growth in investment income is more rapid in coastal and mountainous regions*



Source: Regional Economic Information System Database, [www.lib.virginia.edu/socsc/interactives.html](http://www.lib.virginia.edu/socsc/interactives.html).

concentration are mutually reinforcing. An exception is the coastal areas where a concentration of self-employment income has failed to sustain a strong positive competitive advantage in attracting such income. Perhaps a different dynamic is taking place in these areas, related to local economic specialization such as forestry.

The tendency for concentration and growth in investment and self-employment income to be mutually reinforcing is problematic for policymakers. If these income sources are tied to contemporary growth and development, it would be beneficial for variations across space to even out over time. The data suggest exactly the opposite. Concentrations are becoming more marked as growth in nontraditional income is most rapid in the areas where it is concentrated. Areas without such concentrations continue to suffer. Lea County, NM, provides an example of such a stagnating county. Lea County has very low relative levels of investment and self-employment income, and investment income actually declined nearly 18 percent in the late 1980's and early 1990's. Likewise, the county suffered through employment loss and very slow population growth. In fact, all the population growth between 1990 and 1995 is due to natural increase, as the county lost nearly 3,100 persons due to net outmigration. There are many other counties with experiences similar to Lea's.

#### Nontraditional Income Growth Follows Young, Well-Educated Professionals in Service Industries

Migration and the changing motivations of migrants play a pivotal role in recent rural development trends. Increasingly, household decisions to move to new places

are not based on strictly economic considerations, such as wage levels and employment opportunities, but rather on perceived improvements in the quality of life the new residences offer. The promise of better schools, less congestion, less crime, and scenic beauty attract relatively well-off individuals and families that are in a financial position to act upon residential preferences. When these people move to an area, they bring with them both financial and human capital that can stimulate local economic development. A strong relationship exists between immigrant characteristics and the competitive growth in self-employment and investment income.

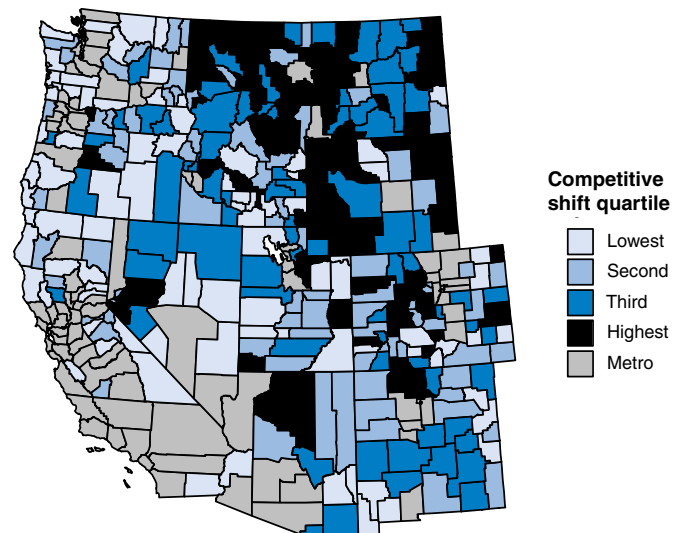
Migration during a previous period can lead to a current competitive advantage in certain economic development characteristics. The immigration of relatively well-off people results in more rapid growth than would be expected in investment and self-employment income. Areas with marked competitive advantages in self-employment and investment income attract more migrants working in executive or professional specialty occupations when compared with other areas (figs. 5 and 6). Likewise, these areas have higher shares of migrants employed in finance, insurance, and real estate (FIRE) or other business service industries.

The educational characteristics of migrants show the strongest relationships with the two income sources. Areas with a disadvantage in these income sources have slightly less educated immigrants. But, as the competitive advantage in both investment and self-employment income increases, so too does the educational attainment of the migration stream. This trend is most pronounced

Figure 4

### Competitive shifts in self-employment income, 1990-94

*Areas with natural amenities have competitive growth in self-employment income*



Source: Regional Economic Information System Database, [www.lib.virginia.edu/socsc/interactives.html](http://www.lib.virginia.edu/socsc/interactives.html).

for migrants with a bachelors degree to areas with high investment income (fig. 5).

There also appears to be an age dynamic in the relationship between the growth of nontraditional sources of income and migration. Intuition would suggest that investment income is related to the immigration of retirees. The analysis supports this statement, but explaining the growth of investment income is far more complex than

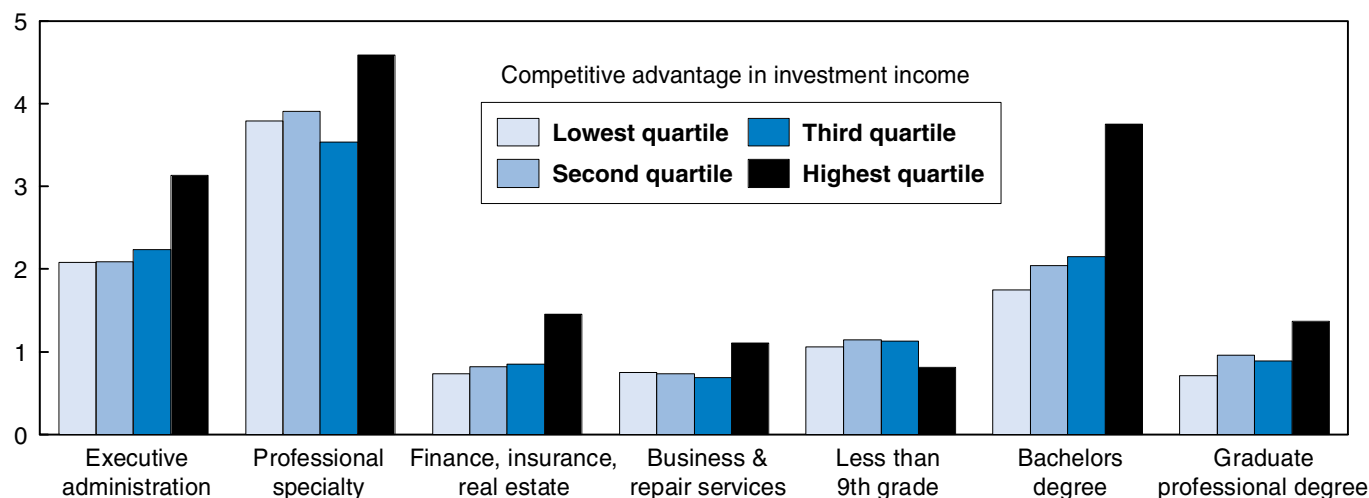
simply crediting retired migrants. At the upper end of the age range (ages 55+ in fig. 7), areas with stronger competitive growth in investment income do have higher levels of older immigrants. However, this relationship holds for all age categories, and is more pronounced for the younger age groups. Thus, the presence of both young and old migrants alike is associated with competitive growth of investment income. Areas with a competitive advantage in self-employment income show more differences across

Figure 5

**Immigration rates by migrant characteristics and area investment income**

*Areas with competitive advantages in investment income had higher concentrations of educated and professionally employed immigrants*

Percent of all residents



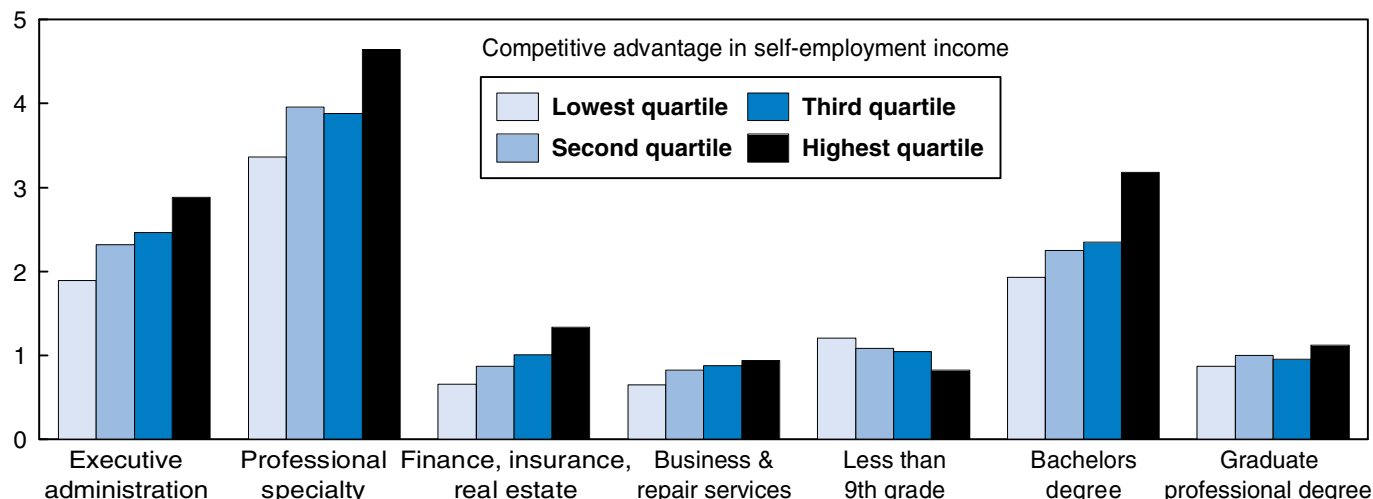
Source: 1990 County to County Migration Files, Regional Economic Information System.

Figure 6

**Immigration rates by migrant characteristics and area self-employment income**

*Areas with competitive advantages in self-employment income had higher concentrations of immigrants working in finance, insurance, real estate, and other business services*

Percent of all residents



Source: 1990 County to County Migration Files, Regional Economic Information System.



age groups, attracting higher levels of younger or middle-aged immigrants (fig. 8).

### Enhancing Quality of Life Offers Alternative Economic Development Strategy

Growth and development in the nonmetro West are linked to new sources of income. While employment levels in traditionally important sectors (mining, farming, forestry) of the nonmetro West's economy have been stagnant, other sources of income such as investment and self-employment are becoming increasingly important in

many nonmetro economies. These sources of income appear to be concentrated in areas with a certain level of natural amenities, such as mountains or coastlines. Areas where this income is concentrated are also the areas where investment and self-employment income are growing most rapidly. Thus, these places appear to have some competitive advantage.

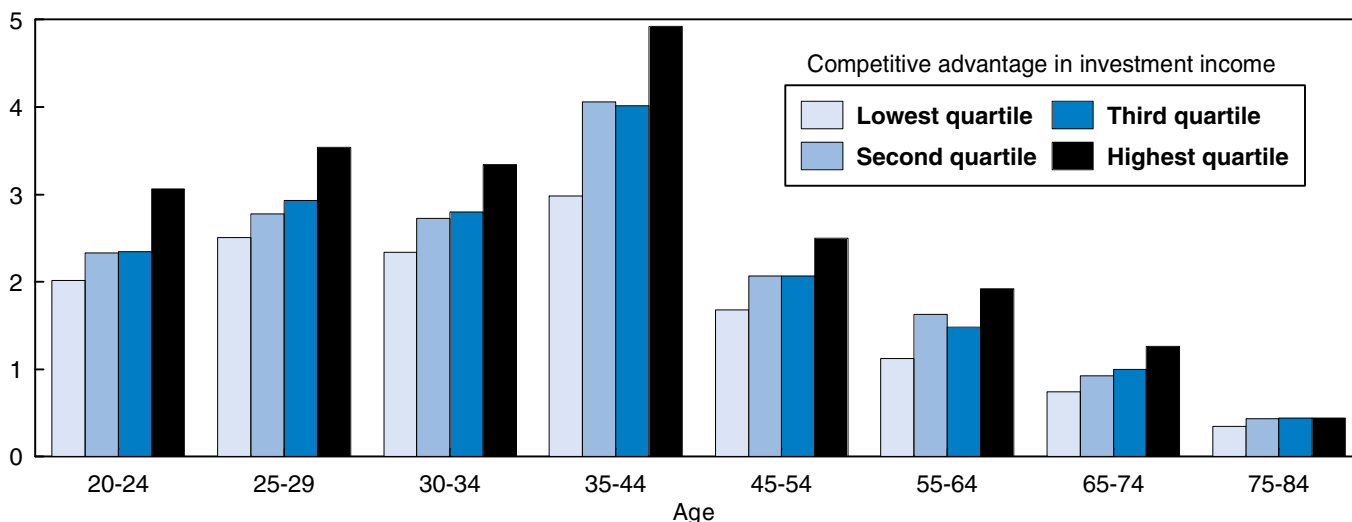
The results from this study indicate that a polarization is developing where certain areas enjoy self-reinforcing growth while other areas suffer. Self-employment and investment income is growing most rapidly where it is

Figure 7

#### Immigration rates by age of migrant and area investment income

Areas with competitive advantages in investment income attracted both old and young migrants alike

Percent of all residents



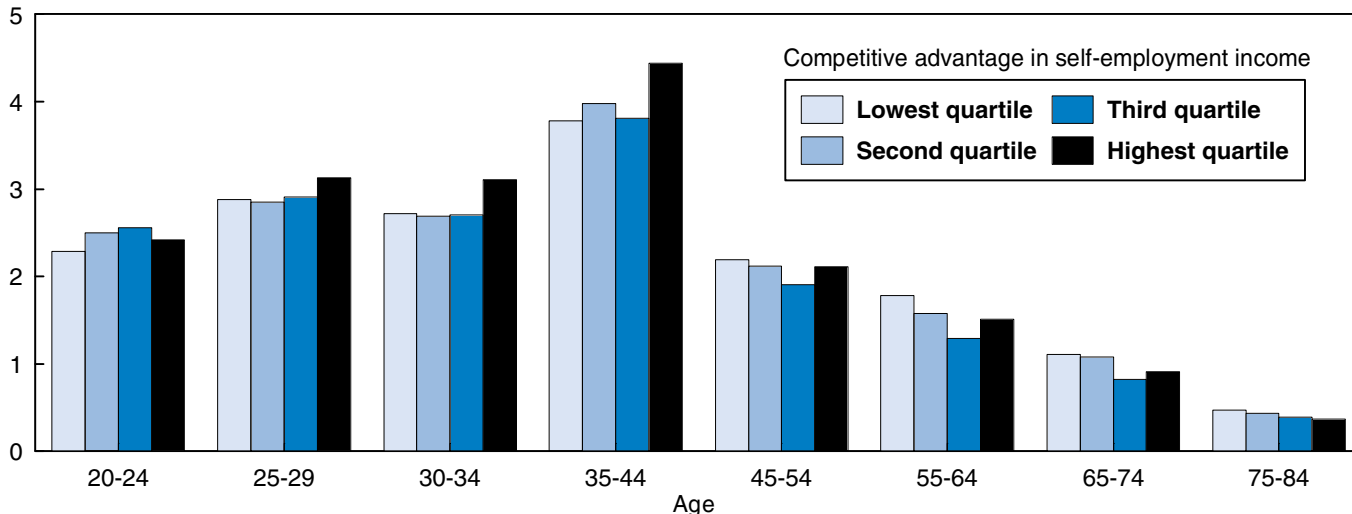
Source: 1990 County to County Migration Files, Regional Economic Information System.

Figure 8

#### Immigration rates by age of migrant and area self-employment income

Areas with competitive advantages in self-employment income attracted younger immigrants

Percent of all residents



Source: 1990 County to County Migration Files, Regional Economic Information System.

## Data and Methods

**Income Data Sources.** Income data are taken from the Regional Economic Information System maintained at the University of Virginia ([www.lib.virginia.edu/socsci/interactives.html](http://www.lib.virginia.edu/socsci/interactives.html)). Income generated by dividends, interest, and rent was used for investment income. Proprietor income is divided into two categories, farm and nonfarm proprietors. In this analysis, only nonfarm proprietor income was used, so self-employment income refers explicitly to earnings from self-employment outside of farming. These data were used to calculate location quotients that show relative concentrations of the income at the county level. The location quotients were indexed with the United States as the benchmark; therefore, a location quotient (see figs. 1 and 2) greater than one indicates that a particular county has a relative concentration of a particular source of income compared with the Nation as a whole. A location quotient less than one indicates a relative lack of income. These data were also used in the shift-share analysis.

**Migrant Data Sources.** Information about immigrants to the nonmetro West comes from the U.S. Census County-to-County Migration Files, and is used in conjunction with the competitive shift data (see methods below) to find relationships between migrant characteristics and income growth. The counties were divided into quartiles based on the values of competitive shifts (see below), with the highest quartile representing those counties with the largest positive competitive shift and the lowest quartile representing those counties with negative or very small positive competitive shifts. The migration data were used to quantify the presence of migrants with particular characteristics in each county relative to the resident population. Age, income, occupational, educational, and industry of employment information was taken from the County to County Migration Files, and measures of relative concentration were calculated for each county. For example, if Archuleta County in Colorado has a value of 5 for the variable "graduate/professional degree," then 5 percent of that county's 1990 population was made up of migrants with a graduate or professional degree that had moved to the county in the last 5 years.

**Using Shift-Share Analysis To Examine Income Growth.** Shift-share analysis is used to analyze growth. This is a fairly straightforward technique that breaks down gross change in some measure (typically employment growth) into components. The growth component is simply how much employment would expand if growth had followed overall growth patterns for some benchmark (often the Nation or State). The industry or income mix component is the difference between the expected growth component and the expected change, taking into consideration different growth rates for different industries. For example, if national employment grew 3 percent between 1990 and 1995, and employment in the insurance sector grew 5 percent nationally, you would expect employment in the insurance sector in the State of Washington to grow 3 percent (growth component) plus an additional 2 percent (industry mix component). Areas with concentrations of certain industrial sectors can experience positive industry mix values if those industries enjoyed robust growth in the benchmark region. Finally, the difference between actual amount of growth observed and that predicted by combining the growth component plus the industry mix component provides the competitive shift. The competitive shift can best be interpreted as a relative competitive advantage/disadvantage in a sector in an area. For example, if the actual observed growth of insurance in Washington was 8 percent, 3 percent of that growth would be the competitive shift.

already the most concentrated, leaving less favored areas (such as Lea County) behind. Areas with a higher share of young, well-educated migrants working in certain occupations and certain industries have significantly stronger competitive advantage in generating investment and self-employment income. Therefore, policy measures designed to enhance the attractiveness of communities to these types of individuals may serve to boost local economies. Such policy will nurture current nonmetro residents as well as lure potential migrants. Instead of mortgaging a community's future by rolling back taxes and providing cheap land in an attempt to land a single large employer, communities may benefit by focusing on improved quality of life (investment in schools, environmental protection, "greenbelts," parks, and social infrastructure). Thus, quality of life offers an alternative to traditional "smokestack chasing," and by pursuing such a development strategy, communities may be able to build a more solid foundation for years of growth and development.

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# Employment Growth in the Rural West From 1985 to 1995 Outpaced the Nation

*Employment growth was much stronger in the rural West between 1985 and 1995 than it was in all U.S. rural areas and in the United States as a whole. Although the bulk of this job growth was in services, the rural West gained manufacturing jobs, as was the case elsewhere in the rural United States. Counties adjacent to metro areas grew more rapidly than those not adjacent, with employment gains led by health services, producer services, and retailing.*

Job growth in the rural West outpaced U.S. job growth in 1985-95 by almost 60 percent. The pace of growth was more rapid in counties adjacent to metro counties than in more remote counties not adjacent to metro areas. Almost all job growth in the West occurred in service industries, led by retailing, health services, and producer services. Employment growth in producer services was especially strong in adjacent counties. Manufacturing employment in the rural West grew between 1985 and 1995, while nationally and in Western metro areas it declined. However, within the West, the loss of manufacturing employment occurred primarily in Los Angeles and San Francisco, while many other metro areas in the West had considerable growth.

Employment had a strong tendency to grow in rural and metro territory within each of the Bureau of Economic Analysis (BEA) Economic Areas in the West compared with total U.S. employment. (BEA Economic Areas are primarily urban-centered with rural territory functionally tied to their urban centers by commuting patterns or newspaper readership; see "Data Sources and Methodology.") Except in San Francisco and Los Angeles, employment growth in metro as well as adjacent *and* nonadjacent nonmetro territory has been at rates above the national average.

With the population resurgence in rural America in the 1990's, the need to document related changes in the economies of rural areas is heightened. This article describes these trends for 1985-95—a time frame long enough to determine which sectors contributed most to the current accelerated job growth in the West. While this

article does not fully cover sources of employment growth and change, it does point to the key sectors that rural western policymakers, regional development specialists, and scholars will want to focus on as they consider the development experience in their region. This article also demonstrates that the regional development experience of much of the rural West is intimately linked with trends in the metro West (which still captured most employment growth), suggesting that rural policymakers must keep apprised of nearby metro development.

## **Job Growth in Rural West Has Expanded More Rapidly Than in the Urban West and the Nation**

Employment growth in the West in recent years has been dominated by service industries. Over 1985-95, the region added 4.3 million private nonagricultural jobs; 97 percent of these jobs were in service industries. This trend was prevalent in both metro and nonmetro territory in the West. Moreover, the rate of growth in the West has outpaced national performance in both metro and nonmetro territory (table 1). Total employment growth in the West exceeded the national growth rate over the study period by about 4 percentage points, 27.5 percent in the West versus 23.4 percent nationally. The relatively rapid growth of the rural West occurred in both adjacent and nonadjacent counties. Employment growth was particularly rapid in counties adjacent to metro counties.

Manufacturing employment declined nationally by 5 percent between 1985 and 1995, while in the West, it declined by 2 percent. However, job growth in manufacturing continued in nonmetro America. Nonmetro manufacturing employment grew faster for the West than for the Nation. Manufacturing employment growth in the West outpaced

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William B. Beyers is a professor of geography at the University of Washington, Seattle.

that for the Nation in adjacent counties but lagged that for the Nation in nonadjacent counties (table 1).

A growing body of evidence suggests that producer services, like manufacturing, underlie the economic base of regions. The West, like the Nation as a whole, enjoyed growth in producer services at rates nearly double those for overall job creation. Western growth was especially rapid in adjacent nonmetro counties, but lagged the national rate in nonadjacent counties.

Employment change in industries other than manufacturing and producer services paralleled the trend of total employment. Employment growth in nonmetro counties in the West was relatively strong, with the growth rate in

nonadjacent counties, unlike the rate for manufacturing and producer services, outpacing the national growth rate.

Employment in the West grew from 15.7 million to 20 million persons between 1985 and 1995, expanding by 3.8 million jobs in metro areas and over half a million jobs in rural areas. Individual industries contributed to this growth in differing ways in metro and nonmetro parts of the West.

Within the extractive/transformational sector, metro losses in manufacturing were more or less offset by gains in construction and agricultural services (table 2). In contrast, nonmetro areas not only had relatively strong percentage

Table 1  
**Percentage change in employment, 1985-95**  
*Growth in the West has outpaced the Nation in metro and nonmetro areas*

Area	Total		Manufacturing		Producer services		Other	
	U.S.	West	U.S.	West	U.S.	West	U.S.	West
	Percent							
Total	23.4	27.5	-5.0	-2.0	45.0	46.5	28.9	31.9
Metro	22.9	26.6	-9.0	-3.3	45.2	46.7	28.4	30.7
Nonmetro	26.8	36.9	12.3	14.6	42.6	42.9	31.8	41.1
Adjacent	26.9	44.5	9.8	18.1	48.1	61.0	34.1	51.3
Nonadjacent	26.8	32.5	16.2	11.0	39.9	33.8	30.8	36.0

Source: U.S. County Business Patterns, Department of Commerce.

Table 2  
**U.S. West employment change: metro and nonmetro counties, 1985-95**  
*Adjacent and nonadjacent rural counties exhibit strong growth in health, producer, and retail services, as well as in construction*

Sector	Metro change		Adjacent change		Nonadjacent change	
	1,000	Percent	1,000	Percent	1,000	Percent
Extractive/transformational:						
Agricultural	56.4	56.7	4.3	66.5	6.5	89.5
Mining	-40.7	-43.5	-2.6	-20.1	-16.8	-24.7
Construction	111.9	12.7	23.4	86.3	32.1	62.8
Manufacturing	-99.0	-3.3	22.4	18.1	13.0	11.0
Distributive:						
Transportation	283.1	27.8	10.0	38.3	9.5	17.1
Wholesale	508.5	26.7	19.5	36.5	21.2	19.0
Retail	731.1	24.5	67.0	48.0	96.5	39.6
Producer services:						
FIRE <sup>1</sup>	169.6	15.2	7.9	30.1	7.1	13.9
Business/professional	901.9	79.7	19.2	127.9	20.8	62.1
Legal	54.3	39.3	0.8	27.8	1.6	25.4
Not-for-profit:						
Health	1,227.8	46.7	32.8	61.0	36.1	33.8
Education	683.7	67.8	38.2	90.6	60.3	95.1
Social	89.9	41.2	2.9	56.2	5.9	84.3
Consumer services	174.2	83.5	9.8	92.1	15.3	90.2
Unclassified	947.8	66.0	50.9	91.1	81.4	87.8

<sup>1</sup>FIRE = Finance, insurance, real estate.

Source: U.S. County Business Patterns, Department of Commerce.

growth in manufacturing, but also rapid expansion in construction and agricultural services. The rapid growth in construction employment follows from the rapid population growth in the rural West and its need for new housing, commercial structures, and public sector facilities. The manufacturing spurt occurred even in nonmetro parts of the West with strong dependence on timber, despite a downturn in public timber supplies.

Retail service growth reflects overall employment growth, while nonmetro distributive services grew at a rate below their metro growth rates. In contrast, producer services exploded (up 128 percent) in adjacent counties in the business and professional services, and grew very strongly in nonadjacent counties. Producer services jobs created in the nonmetro West represented less than 10 percent of total nonmetro job gain, while one-third of job creation in the metro West was in producer services.

Health services were the source of most new not-for-profit jobs, expanding rapidly in metro and nonmetro areas. Educational and social services also grew rapidly, although the number of jobs created was much less than in health services. Consumer services also grew at a higher-than-average rate in metro and nonmetro areas (table 2).

In the aggregate, services accounted for all the net job growth in the metro West and for 84 percent of total new jobs in the nonmetro West. These statistics are based on the coverage included in U.S. County Business Patterns, and exclude jobs created by proprietors, public sector jobs, and jobs within agriculture. The inclusion of these sectors would significantly increase the number of service workers.

The growth of services in the nonmetro West has been fueled partly by the migration of new residents who have demanded consumer services such as retailing, health, and utilities. Newcomers are spending more nonearnings

income (transfer payments and dividends, royalties, pensions, and rents) on these services. The importance of nonearned sources of income in the economic base of Western communities has grown (see "Quality of Life, Nontraditional Income, and Economic Growth" in this issue), and one consequence of households spending this income is the growing dominance of service employment in the rural West. However, these services also have "Lone Eagles" and "High-Fliers"—firms that are selling their services to distant clients. These include producer services, tourism/recreation, and marketing (such as wholesalers of agricultural commodities and transporters of agricultural, timber, or mining products).

### Rural Employment Growth in the West Widespread

Employment growth has varied dramatically within different subregions of the West. A shift-share analysis was conducted to summarize the performance of BEA Economic Areas in the West relative to the Nation, and to simultaneously capture trends in metro, adjacent, and nonadjacent counties within these areas. Three measures of job redistribution were calculated: net shift, industry shift, and competitive shift.

The *net shift* is the difference between growth in a region and growth expected given the national rate (23.4 percent in 1985-95, see table 1). Thus, the faster employment growth in the West than in the rest of the Nation led to a net shift of 644,000 jobs into the West over 1985-95. However, the aggregate net shift was almost 1.5 million jobs, roughly one-third of total employment growth. The difference derives from the slow growth of metro Los Angeles and San Francisco (table 3), which along with the relatively slow growth outside the West accounted for almost 97 percent of the negative net shift. In contrast, most BEA areas in the West grew faster than the national average, exhibiting positive net shifts.

Table 3

#### Shift-share analysis summary

*While the West as a whole added 644,000 more jobs than its share of 1985 employment, the two largest metro areas in the West had very slow employment growth*

Item	Net shift	Industry mix shift	Competitive shift
		Number of jobs	
Total +/- shift	1,464,438	233,100	1,334,905
Principal contributors to the negative shift:			
U.S. outside West	-644,405	-178,528	-465,966
Los Angeles metro	-560,822	27,992	-588,814
San Francisco metro	-208,791	36,851	-245,642
Percent of total negative shift	96.6	NA	97.4

NA (not applicable) here because there was no negative shift in the case of industry mix.

Source: U.S. County Business Patterns, Department of Commerce.

The net shift measure is based on the simple national growth rate. A more useful *industry mix shift* can be obtained by taking into account the varying rates of growth of specific industries at the national level. The actual pattern of growth in a given BEA region's metro, adjacent, or nonadjacent territory, when compared with the change expected using national growth rates for specific industries, leads to the *competitive shift* measure. The competitive shift describes how a region's economy actually fared, versus the share-based perspective of net and industry mix shifts. The Los Angeles and San Francisco metro areas that accounted for most of the negative net shifts in the West had a mix of industries that were growing more rapidly than the national average, resulting in a positive industry mix shift.

Competitive shifts in the West were mostly positive within both metro and nonmetro territory. One BEA Economic Area (San Diego) has no nonmetro territory—and it had a positive competitive shift. Seven BEA Economic Areas in the West do not have any counties designated as metro (Hobbs, NM/TX; Pendleton, OR/WA; Flagstaff, AZ/UT; Farmington, CO/NM; Missoula, MT; Idaho Falls, ID/WY; and Twin Falls, ID). The first two of these regions had negative competitive shifts, while the other five exhibited positive competitive shifts.

The most prevalent pattern is for nonmetro territory within each BEA Economic Area to mirror performance of the metro core. Only two regions have negative competitive shifts in both metro and nonmetro territory—Casper, WY/ID/UT, and Great Falls, MT—and only two regions had both nonmetro territory with a negative competitive shift and a positive competitive shift in metro territory (Pueblo, CO/NM, and El Paso, TX/NM). The regions with negative competitive shifts in nonmetro areas are located primarily on the western edge of the Great Plains. Elsewhere across the West, employment growth in nonmetro areas was relatively rapid, leading to positive competitive shifts. Even in Los Angeles and San Francisco, with large negative competitive shifts, overall nonmetro territory had a relatively strong growth rate, leading to positive competitive shifts. From the Rocky Mountains to the Pacific Ocean and from Canada to Mexico, positive competitive shifts in nonmetro areas prevail. The only exception is Pendleton, OR/WA.

Employment growth in both adjacent and nonadjacent rural territory in the West was above the national growth rate. Accordingly, adjacent and nonadjacent components of the BEA Economic Areas show a widespread pattern of positive competitive shifts. From Canada to Mexico, the trend west of the Great Plains is fairly consistent—both adjacent and nonadjacent territory grew relatively rapidly. Only in Eugene-Springfield, OR/CA, and Pendleton, OR/WA, were there negative competitive shifts, led in both regions by poor performance in manufacturing and health services. The sprawling distances between metro

cores and nonadjacent nonmetro regions in the West bring into question their functional connectivity. The relatively rapid growth of adjacent nonmetro territory in the rural West may be spillover from metro areas, but this seems less likely for nonadjacent parts of BEA Economic Areas. Instead, growth here has been driven by a surge in health services, producer services, consumer services, retailing, construction, and nonearnings income (table 2).

### **Key Growth Sectors Free Remote Areas From Metro Reliance**

The leading sectors contributing to the competitive shifts—whether positive or negative—in the rural West vary among the BEA Economic Areas (table 4). In the nonmetro territory of almost every area, retailing was among the leading contributors to the competitive shift. However, other leading sectors vary, with manufacturing, construction, health services, and other services entering frequently.

The most common pattern has been for adjacent and nonadjacent competitive shifts to be positive, as in the Denver BEA Economic Area, where the shift was 7,700 jobs in adjacent counties and 27,400 jobs in nonadjacent counties. Of these 35,000 jobs, 11,000 were in other services (mainly lodging), 8,200 were in retail, 5,900 were in manufacturing, 6,900 were in construction, and 2,000 were in health services. The BEA Economic Areas with competitive shifts in other services are largely in the Rocky Mountains (or the Sierra Nevada), reflecting the growth of tourist-oriented economic activities. A number of these regions are also recipients of rural manufacturing jobs. In some regions, there are offsetting trends, such as in Eugene-Springfield, OR/CA, where higher than expected declines in manufacturing and slower than expected growth in health services were offset by relatively strong construction and retail activity.

Strong positive or negative competitive shifts in manufacturing, mining, other services, producer services, and health services are evidence of changes in the economic base of these regions. For example, expanding producer services in Missoula, MT, or manufacturing in Flagstaff, AZ/UT, generate income that stimulates local services growth, which requires new construction in housing, commercial, and public structures to support the growing economy. In many of these regions, robust growth of local services is also related to the arrival of people who either are retired or live on assets or transfer income.

### **Research Needs**

The data base used for this article documented employment changes that are now 4 years old. With the continued expansion of commuter air service and the extension of document/small package courier service to the most rural places in the West, we should expect the trends doc-

Table 4

**Principal sector contributors to rural competitive shift**

Services lead the competitive shifts in all Western rural BEA Economic Areas, but growth or decline in manufacturing, construction, and mining also plays an important role in many of these regions

Area	Mining	Construction	Manufacturing	Transport <sup>1</sup>	Wholesale	Retail	Services		
							Producer	Health	Other
Hobbs, NM/TX						-X			
Santa Fe, NM						-X		X	
Pueblo, CO/NM			-X		-X	-X		X	
Denver, CO/KS/NE		X	X			X			X
Casper, WY/ID/UT			X			-X	-X		-X
Billings, MT/WY			X			X			X
Great Falls, MT						X			X
Missoula, MT		X				X	X		X
Spokane, WA/ID		X				X	X		X
Idaho Falls, ID/WY		X				X	-X	X	X
Twin Falls, ID		X				X	X		
Boise City, ID/OR			X						-X
Reno, NV/CA	X								-X
Salt Lake City, UT/ID		X	X	X		X			X
Las Vegas, NV/AZ/UT		X				X			
Flagstaff, AZ/UT		X	X			X		X	
Farmington, NM/CO			X	-X		X		X	
Albuquerque, NM/AZ					X		X		
El Paso, TX/NM						-X			-X
Phoenix-Mesa, AZ/NM	X	X	X			X		X	
Tucson, AZ						X		X	
LA-Riverside-Orange Co., CA/AZ	-X					X		X	
Fresno, CA						X			
SF-Oakland-San Jose, CA				X		X			
Sacramento-Yolo, CA				X		X			X
Redding, CA/OR			X	-X		X		-X	
Eugene-Springfield, OR/CA	X	-X			X		-X		
Portland-Salem, OR/WA		X	X			X	X	-X	
Pendleton, OR/WA			-X					-X	
Richland-Kennewick-Pasco, WA		-X			X		X		
Seattle-Tacoma-Bremerton, WA	X				X		X		

<sup>1</sup> Transportation, communications, utilities.

X = Large positive contribution to competitive shift.

-X = Large negative contribution to competitive shift.

umented here have continued into the late 1990's. Advances in telecommunications and information technologies have continued, and they have also probably fueled a continuing influx of people into the rural West. However, history teaches us that trends are never stable—the geography of economic development in the rural West in the late 1990's must also be documented. In doing so, it will be important to simultaneously track changes in non-earnings income, the growth of nonfarm proprietors' income, and characteristics of migrants in order to have a more complete understanding of the forces shaping the rural West.

**For Further Reading . . .**

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Glenn Fuguitt and Calvin Beale, "Recent Trends in Nonmetro Migration: Toward A New Turnaround," *Growth and Change*, Vol. 27, pp. 156-175, 1996.

Sven Illeris, *The Service Economy: A Geographical Approach*, Chicester, England: Wiley, 1996.

Joel Kotkin, "Why Wall Street Is Losing Out to 40 Acres and a Modem," *New York Times*, Dec. 27, 1998, p. 7.

## Data Sources and Methodology

The database used for this article excluded proprietors, as well as employees in the public sector and in agriculture. Nationally, the excluded employment is over one-third of the labor force. Thus, results reported here should be interpreted as partial. Clearly, agriculture is very important in the rural West, and nonfarm proprietors' income has risen strongly in recent years. If nonfarm proprietors had been included, however, it is unlikely that we would see differences in the broad trends.

I developed the data from 1985 and 1995 U.S. County Business Patterns data. The 1985 data were estimated for each county in the United States, using a biproportional matrix adjustment technique to estimate employment in sectors subject to suppression codes. This procedure involved estimating a matrix of reported values for each industry and county, and calculating the amount of employment in each county and industry that was suppressed to retain confidentiality. Data flags used by the Census Bureau to bound the magnitude of suppressed employment were replaced with initial values within the range of the given suppression code. Through an iterative balancing process, an estimate was developed for each industry and county that added up to the values of the suppressed employment. This file was then merged with the file of known values to yield the matrix of employment for each State. A similar procedure was used with the 1995 data now available on compact discs. The resulting county-level estimates were then grouped into (the 1995 definitions of) BEA Economic Areas. These are (primarily) defined as groupings of metro and nonmetro counties, with metro areas as their "core," and nonmetro counties joined by commuting or newspaper readership patterns. The definitions of adjacent and nonadjacent were developed using a file of urban influence codes obtained from the Economic Research Service, USDA.

The shift-share model developed in this article makes use of standard methodology for the calculations. In this analysis, the benchmark for calculations was the Nation as a whole. The national growth rate over 1985-95 was used as the benchmark, and was the base for calculating the expected shares of job growth, and the net shifts (defined as the difference between expected and actual growth). Thus, the 1985 employment level in each industry in each region was multiplied by this growth rate to estimate the expected shares of aggregate growth. A correction to these expected growth rates was made through the calculation of national industry-specific growth rates. The difference between these growth rates and the overall national growth rate was used to calculate the "industry mix" factor, derived by multiplying the 1985 employment level in each industry by this industry-specific growth rate.

The competitive shift was calculated as the difference between the actual change in an industry in a region and the magnitudes of the share and industry mix components. Where the industry growth rate in the region outpaced the Nation, the residual is positive; where it lags, the component is negative. Regionalization amounted to the metro, adjacent nonmetro, and nonadjacent nonmetro territory found in each BEA Economic Area.

Peter B. Nelson and William B. Beyers, "Using Economic Base Models to Explain New Trends in Rural Income," *Growth and Change*, Vol. 29, pp. 295-318, 1998.

Thomas M. Power, *Lost Landscapes and Failed Economies*, Washington, DC: Island Press, 1996.

Benjamin Stevens and Craig Moore, "A Critical Review of Shift-Share Analysis," *Journal of Regional Science*, Vol. 30, 1980, pp. 420-450.

Colin C. Williams, *Consumer Services and Economic Development*, London: Routledge, 1997.



# Wildlife Conservation and Economic Development in the West

*The economic expansion and population growth that have continued for almost a decade in many rural communities of the West are posing a new set of wildlife conservation issues for the region. Unlike economic development in the past, this expansion is not associated with the traditional economic base, but instead is tied to services sectors and wildlife amenities of the region.*

**W**ildlife conservation and economic development pose a complex set of issues for many rural communities in the West. Wildlife has the potential to provide many rural areas with significant benefits. In 1996, for example, outdoor sports enthusiasts spent an estimated \$33.3 billion on equipment and trip-related expenses in the 11 Western States. Rural communities captured a large part of this spending by providing lodging, meals, guides, and other goods and services. Studies have also linked the rapid economic and population growth in many Western communities since the late 1980's to the demand for wildlife amenities. Economic development is vital to rural communities because it generates jobs and income, but in the West it has been associated with the decline of many wildlife resources. Agriculture, logging, and mining were traditionally the economic base of many rural communities, and are now primary threats to endangered species.

Efforts to maintain or enhance habitat often include restrictions on the use of land and water resources. These restrictions can impose significant costs on traditional users of these resources and hence have economic consequences for rural communities. In northern Nevada, for example, some 4,000 farmers and ranchers have had to alter production practices after Federal and State officials required them to sell a portion of their rights to use water in the Truckee River. Similarly, the reintroduction of wolves into Yellowstone National Park is expected to result in depredation losses on cattle of between \$18,000 and \$34,000 annually. While these costs are not likely to affect regional cattle markets, they could hurt individual ranchers near the park.

Economic expansion in some rural and isolated communities is producing new pressures on land and water resources. Where those pressures reduce wildlife habitat, policy issues are addressing the protection of affected species. In this article, we discuss the evolving nature of human impacts on wildlife in the West, the factors affecting the value of Western wildlife resources, and how public policies can be used to make economic uses of land and water resources more compatible with wildlife.

## Impact of Economic Development on Wildlife in the West

Land use changes, farming practices, and other development during the past 150 years have helped shape the current distribution of wildlife in the West. Today, 57 percent of total land area in the West is in crop and livestock production, 26 percent is in forest uses (for example, forested grazing and timber harvesting), about 1.6 percent is urban, and the rest is other uses. Water resources have also been extensively developed. The Bureau of Reclamation (BOR) operates a water transfer system in the West that includes 343 storage reservoirs, 253 diversion dams, 15,899 miles of canal, and 36,962 miles of laterals. Each year, this system diverts about 28.5 million acre-feet of water from river systems in the 11 Western States. Most of the diversions are for irrigation, which accounts for over 90 percent of western water consumption, but increasingly important are transfers to urban areas. The current distribution of wildlife in the West, at least in part, reflects the ability of wildlife to cope with these changes.

Figure 1 shows the geographic distribution of federally listed threatened and endangered species across the country, illustrating areas in the West where wildlife species have had particular difficulty adapting to human uses of land and water resources. In another approach highlight-

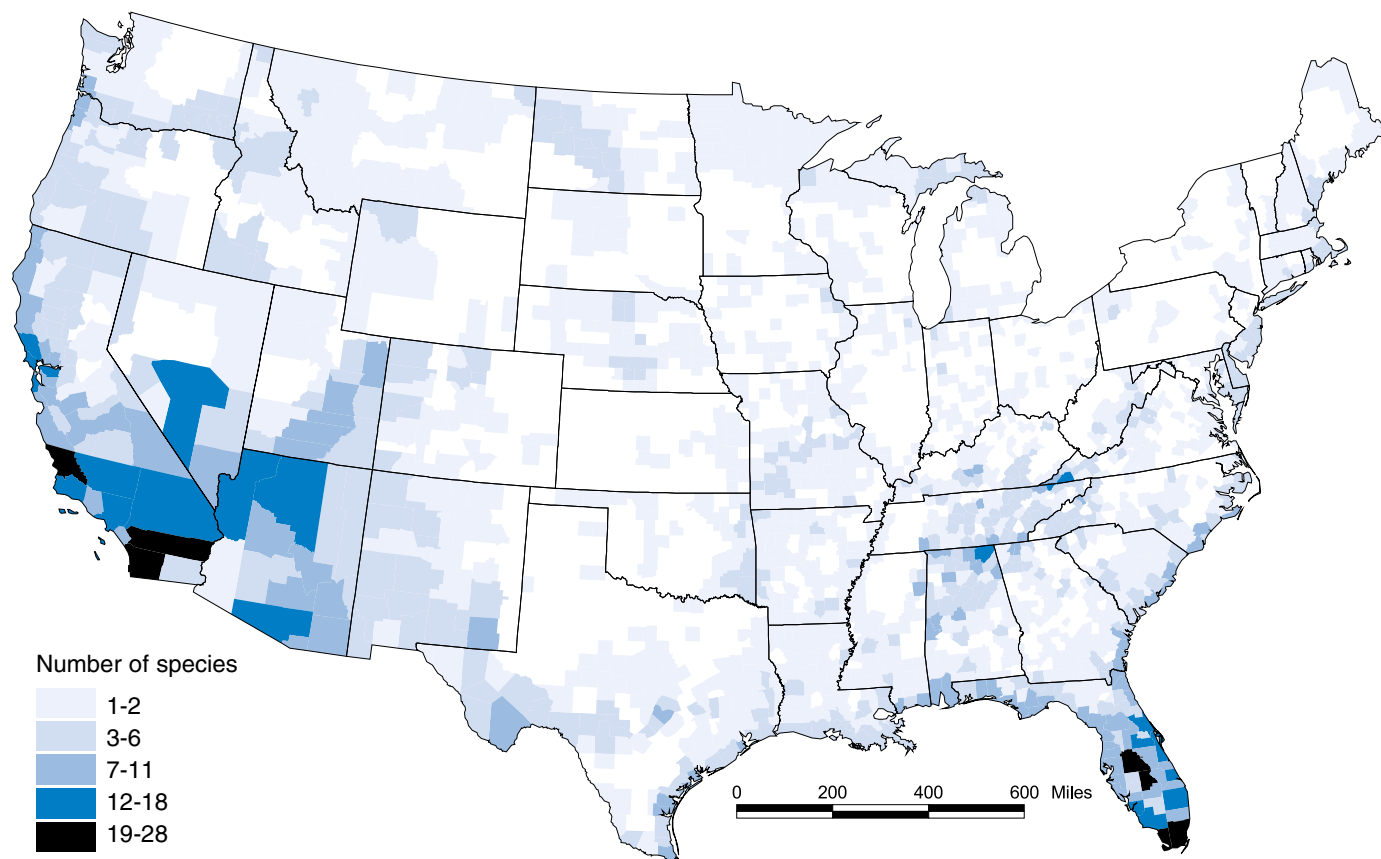
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Kevin Ingram and Jan Lewandrowski are economists in the Resource Economics Division, ERS, USDA.

Figure 1

### Distribution of endangered species, 1995

Desert environments in the Southwest have high levels of endangered species



Source: USDA, ERS, based on data supplied by Bio-data, Inc.

ing areas of endangerment, a USDA Forest Service (FS) report used biologic, climatic, soil, and vegetative characteristics to link similar regions, eventually identifying 10 high-endangerment regions in the country (meaning at least 25 percent of the species contained within the region face specific endangerment). Of the 10 regions identified, 8 are in the West. These regions generally correspond to areas where natural ecosystems are both fragile and unique (for example, alpine and desert systems). The fragility of many western ecosystems makes them vulnerable to disturbances associated with human activities, while their uniqueness explains the priority that conservation interests have placed on protecting these areas and their wildlife.

Although economic development in the West has generally been associated with the decline of wildlife resources (see table 1 for a summary of how western species have been affected by activities typically associated with agriculture), some aspects of development have protected wildlife and preserved high-amenity habitats. The low density of settlements in rural areas associated with agriculture was influenced by soil quality and climate conditions. Even today, the population densities in rural areas

of the West are among the lowest in the country. Because much of the West was unsuited to intensive agricultural production, millions of acres in the West remain in the public domain. At present, about 48 percent of the total land area of the West is federally owned land. Where development did occur, certain land use changes have actually favored some species of wildlife. Whitetail deer, for instance, have thrived in association with agriculture and now extend well beyond their historic range in the West. Other western species that have adapted well to agricultural systems include coyotes, raccoons, mule deer, and elk.

Current economic and population growth in the West (especially in nonmetro areas) are presenting new pressures on wildlife resources. Since 1990, the West has been one of the fastest growing regions of the country in terms of population. Population growth has been particularly high in Arizona, Colorado, Idaho, Nevada, and Utah. Population has grown in nearly 9 out of 10 nonmetro counties in the West this decade, with two-thirds at growth rates above the national average. In many places, population growth is not following the traditional pattern of concentrated growth in areas adjacent to urban centers.

Table 1  
**Federally listed threatened and endangered (T&E) species in the 11 Western States by source of agricultural threat as of September 30, 1995<sup>1</sup>**

*Grazing is the leading agricultural threat faced by T&E species in the West*

Species	All T&E species	Source of agricultural threat						
		Agriculture <sup>2</sup>	Agricultural development	Grazing	Fertilizers	Herbicides	Other pesticides <sup>3</sup>	Fertilizers & pesticides <sup>4</sup>
		Number of species						
All species	295	161	90	110	0	16	17	27
Vertebrates	124	73	45	47	0	7	13	16
Amphibians	4	2	2	2	0	1	1	1
Birds	25	17	12	11	0	3	6	7
Fish	62	35	20	21	0	2	2	4
Mammals	25	12	9	8	0	0	2	2
Reptiles	8	7	2	5	0	1	2	2
Invertebrates	34	18	12	11	0	2	2	2
Arachnids	0	0	0	0	0	0	0	0
Clams	0	0	0	0	0	0	0	0
Crustaceans	8	5	5	1	0	0	0	0
Insects	16	11	6	9	0	2	2	2
Snails	10	2	1	1	0	0	0	0
Plants	137	70	33	52	0	7	2	9
Angiosperms	136	69	32	52	0	7	2	9
Gymnosperms	1	1	1	0	0	0	0	0
Ferns	0	0	0	0	0	0	0	0

<sup>1</sup> Table excludes listed marine species and domestic species found only outside the contiguous United States. Some species threatened by nonfarm uses of pesticides and fertilizers are included.

<sup>2</sup> Column 2 does not represent the sum of columns 3-8 because many species face more than one threat from agriculture.

<sup>3</sup> With respect to agricultural production, the term "pesticides" generally refers to a wide range of chemical compounds that include herbicides, insecticides, fungicides, nematicides, rodenticides, and fumigants. Herbicides, insecticides, and fungicides account for the large majority of pesticide applications in agriculture.

<sup>4</sup> Column 8 does not represent the sum of columns 5-7 because many species are threatened by more than one type of chemical.

Source: Computed from data supplied by Bio-data, Inc., 1995.

Today, population growth extends to very remote locations, often bordering national forests and parks. For example, Teton County, ID, and Ouray County, CO, both far from metro areas, grew 37 percent and 32 percent in population between 1990 and 1995.

Evolving patterns of economic expansion in the region suggest an economic restructuring that is altering resource use. Traditionally, the economies of the rural West have been (and still are) based on extractive industries, such as agriculture, mining, and logging. Current job and income growth, however, are increasingly tied to service sectors, such as tourism. For example, in the area around Yellowstone National Park, where the economic base of many local communities has been changing, 80 percent of new job growth and 65 percent of the growth in labor income between 1969 and 1989 has been attributed to local services sectors. In a broad area of the West, home-based businesses and the desire for retirement and vacation homes are fueling an economic expansion unrelated to the traditional economy. This expansion will continue to bring more people to remote areas. For wildlife, the associated construction of homes, business, and infrastructure could rapidly diminish habitat. Where this is the case, agriculture and other traditional land uses may par-

tially protect certain wildlife resources from the pressures associated with more intensive development.

### Valuing Wildlife in the West

Wildlife resources are being increasingly valued, as evidenced by the increased effort being made to protect remaining habitat. For instance, between 1987 and 1995, the U.S. Fish and Wildlife Service (FWS) formally reviewed over 5,046 Federal actions (activities authorized, funded, or carried out by the Federal Government) to assess their potential impact on species listed as threatened or endangered. Of these, 600 were determined to present a credible threat to endangered species and required modifications to, or cancellations of, the proposed actions.

The value that society derives from wildlife goods and services consists of *use value* and *nonuse value*. *Use value* refers to the benefits wildlife provides directly to users, such as recreational hunting, fishing, wildlife viewing, pharmaceutical products, and pelts. People also benefit indirectly from wildlife. These *nonuse values* include the satisfaction from simply knowing a species or habitat exists (or *existence value*), the value of preserving a species

or habitat for possible future uses (*option value*), and the value placed on knowing certain wildlife resources will be available for future generations to enjoy (*bequest value*). The estimated nonuse value of wildlife often far exceeds use value.

Estimating the actual value of wildlife resources can be difficult, especially for nonuse values. Goods and services associated with wildlife species and habitats are often public in nature; once provided at some level, they are freely available at that level to all consumers. For example, a person may value knowing that a certain species exists, but enjoying this good requires no market transaction. The lack of markets for many wildlife goods and services means that conventional indicators of value, like prices, are often unobservable.

In the absence of formal markets, some wildlife benefits must be estimated indirectly. The three estimates most often used are travel costs, contingent valuation, and hedonic pricing. Travel cost techniques estimate the value of environmental goods as a function of costs people incur to get to sites where the goods are enjoyed. Contingent valuation methods employ survey procedures to elicit people's willingness to pay for goods that are not traded in formal markets. Hedonic pricing techniques value environmental resources by summing existing estimates relating to the values of distinct component goods and services. For example, real estate prices in a high-amenity area can be used to estimate the value of environmental resources by comparing changes in those prices to changes in the quality of environmental resources, while accounting for changes in other factors affecting real estate prices. While estimates from each of these approaches are open to question, such estimates of wildlife resources and other nonmarket natural resources have been used for litigation and planning purposes. Conceptually, the value of wildlife resources is determined by factors that affect the demand for and supply of associated goods and services. Understanding these factors and how they change over time must inform the process of developing wildlife conservation policy.

### **Factors Influencing the Demand for Wildlife Resources**

Knowledge about wildlife resources influences how society views and demands those resources. To illustrate, wetlands were once considered worthless except when converted to cropland or other economic uses. Scientific research, however, has now identified the role of wetlands in providing breeding habitats for many species of fish and wildlife, maintaining flood control, filtering pollutants from surface and ground waters, and controlling soil erosion. This new understanding has changed public perceptions and increased the demand for and efforts to protect these ecosystems. For example, swampbuster provisions of the last three Farm Bills (1985, 1990, 1996) restrict wetland con-

versions by farmers who participate in USDA's commodity or technical assistance programs. Similarly, the Wetland Reserve Program (WRP), authorized by the 1990 Farm Bill, encourages the restoration and long-term protection of wetlands that have been converted to farmland. These restrictions and programs mark a shift from earlier USDA policies that had provided assistance for the conversion of wetlands to commodity production.

Wildlife resources are also in demand for recreational purposes. The demand for wildlife-related recreation is positively correlated with population and income. According to the 1996 National Survey of Fishing, Hunting and Wildlife Associated Recreation (NSFHWAR), population growth alone accounted for a 41-percent increase in the total number of hunters between 1955 and 1996. As society has become more affluent, expenditures per hunter have also increased. The survey also shows that participation rates in outdoor-related activities are higher in rural areas than other areas. Rural residents, for example, are almost twice as likely to hunt or fish as urban residents.

Furthermore, the demand for wildlife resources is affected by institutional constraints that affect access to those resources. In the West, the information and transportation revolutions are allowing entrepreneurs and retirees to conduct business and live comfortably in more remote areas, and many are choosing areas with high wildlife amenity values.

### **Factors Influencing the Supply of Wildlife**

The supply of wildlife depends on the quantities and qualities of land and water resources available for habitats. Agricultural, industrial, and urban land-use conversions can significantly reduce habitats and diminish wildlife supplies. In the northern Great Plains, which include Montana and Wyoming, wetland losses to land conversions led to steep declines in duck populations between 1970 and 1985. The importance of this habitat extended both nationally and internationally because 50 percent of waterfowl reproduction in North America occurs in the Great Plains. In the Pacific Northwest, several salmon runs are now extinct, three species are listed as endangered, and several others are candidates for listing. The loss of salmon runs has been attributed largely to logging practices and hundreds of dams and other impediments that have been constructed in the Columbia River Basin to supply water for irrigation and hydropower. Logging can severely affect instream salmon habitats, and dams interfere with fish migration to and from the sea.

The quantity of wildlife habitats is generally determined by the opportunity costs of associated land and water resources (the highest alternative-use value of these resources). Urban uses constitute, on average, the highest valued land uses. The density of population and economic activity in urban areas bids up the price of land for resi-

## Wildlife in the 1996 Farm Bill

The Federal Agriculture Improvement and Reform Act of 1996 created or refocused several USDA conservation programs to encourage farmers and ranchers to protect important wildlife habitats. These programs employ economic incentives to induce landowners to put environmentally sensitive lands into conservation uses or under conservation management practices. Program participants must generally comply with 1996 Farm Act restrictions on farming highly erodible lands and wetlands.

### *Wildlife Habitat Incentives Program (WHIP)*

While relatively small, WHIP is the first USDA conservation program designed solely to protect and restore habitat. Priority is given to upland and wetland wildlife, threatened and endangered species, and fish. Participants must develop a farm habitat plan, for which WHIP provides cost-sharing of up to 75 percent to implement included habitat improvements. WHIP contracts must be for at least 10 years. The 1996 Farm Act specifies that WHIP receive \$50 million by FY 2002, of which \$30 million was appropriated in FY 1998.

### *Conservation Reserve Program (CRP)*

First authorized in the 1985 Farm Bill, the CRP provides farmers with annual payments and cost share assistance for retiring highly erodible or environmentally sensitive cropland for 10 years. The 1996 Farm Bill extends the CRP through FY 2002 and caps enrollments at 36.4 million acres. Because of the acreage involved, the CRP has the most potential of all USDA conservation programs for protecting wildlife resources associated with U.S. agricultural lands. To be eligible for the CRP, lands must now meet certain criteria indicating potential benefits for wildlife, water quality, or soil erosion. The principal wildlife criteria are that lands be in designated State or national conservation priority areas, cropped wetlands or adjacent upland buffers, filter-strips, riparian buffers, or permanent habitat. Eligible bids are ranked competitively based on an environmental benefits index (EBI) and allowing for the government's contract cost. Habitat, water quality, and soil erosion are the dominant (and equal) factors determining a tract's EBI score. While there are designated enrollment periods, lands in specific wildlife-friendly uses may be enrolled year round. As of October 1998, CRP enrollment was just under 30 million acres.

### *Wetlands Reserve Program (WRP)*

The WRP, first authorized in the 1990 Farm Bill, provides farmers with conservation easements and cost-share assistance for agreeing to restore and protect wetlands and associated areas. Contracts run for either 30 years or in perpetuity. The 1996 Farm Bill extends the WRP through FY 2002 and requires that new enrollments maximize wildlife benefits and wetlands values and functions. Priority is given to areas that (1) maximize wildlife values, (2) are least likely to be reconverted at the end of the contract, and (3) involve matching funds and participation from non-Federal partners. Bids are submitted during designated enrollment periods and are ranked to reflect contract cost, availability of matching funds, significance of wetland functions and values, probability of success, and duration of easement. The 1996 Farm Bill caps enrollment at 975,000 acres, of which a third must be in 30-year easements, a third in permanent easements, and a third covered by restoration cost-share agreements. As of July 1997, WRP enrollment was 443,556 acres.

### *Environmental Quality Incentive Program (EQIP)*

EQIP provides technical, educational, and financial assistance to encourage producers to adopt practices that reduce environmental and resource problems. Among EQIP's objectives are protecting wetlands and riparian areas, improving fish habitats in grazing areas, and protecting the quality and quantity of wildlife habitat. EQIP contracts run from 5 to 10 years, and participants must develop a farm or ranch conservation plan. Participants are given cost-share or incentive payments to apply needed conservation practices or make various land-use adjustments. Cost-share payments are limited to 75 percent of the projected cost for structural or vegetative practices. Incentive payments are limited to an amount needed to get participants to perform land management practices that would not otherwise be done. The 1996 Farm Bill stipulates that EQIP receive \$200 million in each of FY 1997-FY 2002.

dential housing, commercial buildings, and associated infrastructure. Since the end of WWII, population growth and economic development have helped quadruple the acreage of urban land in the contiguous United States. However, urban land is generally the least compatible with wildlife. Despite the growth in urban land, it still accounts for only about 3.1 percent of total land area in the United States and about 1.6 percent in the West.

Agriculture, on average, is the next highest valued land use. It is by far the largest single land use, and consequently has the greatest potential for affecting wildlife. Total agricultural land—including cropland, pasture, and

grazed forest—accounts for 63.3 percent of the total land area in the United States and 69.4 percent in the West. Because farmers operate under highly competitive market conditions, most cannot afford to allocate significant land and water resources to uses without a market value. Hence, economic constraints require that crop and livestock production be emphasized over supplying habitats. And because farm management decisions must focus on business success, the negative effects on wildlife of using agricultural chemicals and soil and water management practices generally do not enter production decisions (these effects are often located away from the farm itself).

To illustrate, migratory bird hunting is a major form of wildlife recreation both nationally and in the West. According to the 1996 NSFHWAR, migratory bird hunters numbered 3 million in the United States and 658,000 in the 11 Western States. In the West, migratory bird hunting accounted for 20 percent of total days spent hunting. Farmers, however, captured only a small fraction of the \$3.6 billion spent by hunters in the region. Individual farmers then will have little economic incentive to maintain habitats that support ducks, geese, doves, and other migratory birds.

Knowing the value of different wildlife amenities is required to develop economically efficient approaches to wildlife conservation. Knowing these values helps identify cost-effective strategies for achieving the optimal mix of species and habitat protection. For example, the Conservation Reserve Program (CRP) was restructured in 1991 to incorporate an environmental benefits index (EBI), which evaluates the environmental benefits of land offered for enrollment against the prices asked by landowners. The EBI was further modified for enrollments beginning in 1997 to better recognize enhanced covers for wildlife habitats. Since inclusion of the EBI, analysis of CRP enrollments shows significantly higher environmental and wildlife benefits per acre, while program costs have dropped an average of \$5 per acre.

To the extent that population and income in the Western States continue to rise, and given an expanding knowledge of goods and services derived from wildlife and its habitats, it is reasonable to expect that the demand for western wildlife resources will also continue to rise. At the same time, population and income growth will continue to increase the opportunity costs of allocating land and water resources to wildlife species. In many areas, this will reduce the supply of habitats. Shrinking habitats, combined with increasing demands for wildlife goods and services, suggest that the societal value of western wildlife resources will continue to rise for the foreseeable future.

### **Increasing the Compatibility Between Wildlife and Resource Use**

Making wildlife conservation more compatible with human uses of land and water resources requires policies that account both for the biological needs of species and the economic constraints faced by people with legal rights to use those resources. Habitat, which embodies the biological, physical, and climatic conditions that furnish species with food, water, cover, and interspersed, provides the basic needs of wildlife species. Because land and water resources are important features of habitat, wildlife conservation policies must emphasize preserving those resources. Economic considerations, however, often discourage farmers and others from allocating land and water resources to wildlife conservation. The benefits of

wildlife are often diffuse and/or hard to trade in markets. For farmers and other private landowners then, capturing the full value of benefits associated with wildlife conservation is often difficult. Conversely, the costs associated with enhancing wildlife tend to be localized. Asymmetry in the distribution of wildlife benefits and costs not only discourages private agents from allocating resources to wildlife, but can actually turn local support away from conservation efforts. This is evident in a number of conservation efforts in Western States where opposition has arisen from ranchers, farmers, timber companies, and other local groups. These groups and individuals argue that they are being asked to pay a disproportionate share of the costs of conservation efforts that benefit society generally.

For society then, an optimal level of wildlife resources requires that private incentives and local support lead to resource allocations that meet the growing demand for wildlife. Where this is the case, there is an economic rationale for developing policies that increase the compatibility between traditional resource uses and wildlife. Several policy approaches can be used to achieve this objective, including regulation, voluntary incentives, and technical assistance. Regulatory policies rely on mandatory restrictions to bring resource use in line with conservation objectives. The Endangered Species Act (ESA) and the Clean Water Act (CWA) are examples. The ESA, for example, allows for the designation of critical habitat areas (CHA) for endangered animal species. The CHA designation affects non-Federal lands, and use that degrades these habitats can be punishable by fines and/or imprisonment. In the West, the CHA designation has been used to protect both the spotted owl and desert tortoise.

While the ESA has been credited with protecting a number of species—including the bald eagle, peregrine falcon, and brown pelican—there are potential drawbacks to using regulations to protect wildlife and habitat, particularly on private lands. The CHA designations, for instance, may prompt landowners to consider endangered species a liability, especially in the face of increasing uncertainty about future land uses and possible reductions in land values. Landowners may avoid actions that could restore or enhance habitats or attract endangered species to their land. Furthermore, existing regulations cannot require private landowners to initiate actions that promote conservation efforts.

To address these issues, Congress amended the ESA in 1982 to allow for Habitat Conservation Plans (HCP) on private lands. And in 1995, FWS initiated a policy called Safe Harbors, which allows landowners who voluntarily enhance habitats that attract endangered species to engage in activities that could result in a “take” (defined to mean “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species” and may include habitat modifications and dam-

ages to nesting areas). Similarly, HCP allows landowners to engage in activities that might result in a taking of a listed species provided they implement agreed-upon measures to mitigate those effects. In recent years, HCP's have become increasingly popular with certain groups of private landowners (notably timber companies and real estate developers) as a means of making economic uses of land more compatible with wildlife species. Of approximately 365 HCP's in effect nationwide, over 90 percent have been signed since 1994. Five Western States—California, Washington, Utah, Oregon, and Nevada—account for about 4.93 million of the 6.05 million acres now covered by HCP's.

Voluntary and technical assistance approaches to wildlife conservation rely on incentives to coordinate resource use with conservation objectives. These policies allow resource owners to capture part of the value of conservation. USDA's CRP, WRP, Wildlife Habitat Incentives Program, and Environmental Quality Incentive Program are incentive-based wildlife and habitat protection programs. (See box, "Wildlife in the 1996 Farm Bill" for a brief description of these programs, including the incentives used to encourage landowner participation.)

Conservation policies that target the farm sector point to agriculture's unique role in wildlife conservation and resource use. Agriculture is an important source of potential habitat—particularly in areas with little public land. Also, past USDA commodity programs contributed, at least in part, to the pattern, scale, and intensity of current production practices. These programs offered price and income supports, as well as technical assistance, all of which increased the value of production and encouraged the conversion of large areas of habitat to agricultural production and the adoption of intensive cropping practices. Hence, USDA's incentive-based conservation policies are intended to counter some of the negative effects of past policies.

Another approach to habitat conservation is to encourage voluntary conservation activities among landowners and private groups. The Federal Government, for example, offers tax incentives to landowners who are willing to sell land or grant conservation easements to qualified non-profit conservation groups. This approach shifts the costs of acquiring knowledge about local wildlife needs and identifying landowners willing to participate in conservation efforts to these private groups. Furthermore, landowners who choose not to participate in, or are ineligible for, public conservation programs may buy into the incentives offered by a private land trust. Farmers may prefer conservation easements because they usually do not require land to be retired from production. Although many land trusts are initiated to maintain open spaces, a nationwide survey revealed that almost half had protecting habitat among their top priorities. Other priorities—

such as preserving farmlands and protecting wetlands, watersheds, and forest—also benefit wildlife.

In the West, about 7.4 million acres are currently protected by various land trusts. Of this, the Nature Conservancy, a private conservation group that emphasizes protecting natural habitats and native species, accounts for about 6 million acres. While the area covered by land trusts is relatively small (the Federal Government owns almost 380 million acres in the West), this understates their importance in overall conservation efforts. Because land trust organizations operate with private resources, they can move quickly to acquire parcels that are particularly valuable to wildlife, and particularly subject to economic development. For example, the recent purchase of the Simone Newman and Romero ranches by the Nature Conservancy withdrew some 61,000 acres (located about 30 miles east of San Jose, CA) from mounting development pressures. Land trusts offer a means of temporarily protecting valuable natural resources long enough to assemble public resources; ultimately, much of the land is transferred to the Federal, State, and local governments.

Whether associated with public or private organizations, conservation efforts need to reduce the often unequal distribution of costs and benefits when actions are taken to protect wildlife species and their habitats. In the Pacific Northwest, for example, the cumulative cost of actions taken to protect the spotted owl, which include a logging ban on large areas of federally owned forests, has been estimated at \$32.5 billion. Much of this cost consists of lost jobs and income in timber communities. While the benefits of protecting the owl have been estimated to be 3.5 times higher than the costs, they consist largely of existence values that accrue to people throughout the country. As a result, efforts to protect the spotted owl have generally enjoyed substantial national support but faced strong local opposition. Defenders of Wildlife, a private environmental group in Yellowstone National Park and Central Idaho, has tried to address some of the asymmetry in benefits and costs associated with wolf reintroduction by setting up a fund that compensates ranchers for cattle killed by wolves.

Conservation policies must also have enough flexibility to meet wildlife needs that vary by location, species, and public land versus private land. A study supporting the 1995 Farm Bill surveyed State and Federal biologists for their assessment of the CRP in their States. Although the program received universal support across regions for its contribution to wildlife, those surveyed criticized the rules within the program that were too restrictive to the needs of wildlife in particular regions. Another study indicated that the creation of large contiguous units (greater than 80 acres) of grassland, although favoring certain economically important bird species, such as ring-neck pheasants and sharptail grouse, does not favor other

economically important species like bobwhite quail and grey partridge.

Most wildlife in the West depend on both public and private land. Because those resources are managed under different sets of incentives, conservation policies that protect wildlife on public land, for example, will have to be extended or supported by policies that protect them on private land. The whooping crane, for instance, is migratory and depends on a system of public wildlife refuges and private land. Reductions of habitat on either public or private land would reduce the benefits of protecting habitat on either.

### Conclusions

Economic growth and restructuring in the West are attracting more people and development to remote areas. This growth is related to an increased demand for wildlife goods and services and for living space in high-amenity areas. It is also introducing new and additional pressures on the West's wildlife. Habitat is becoming more fragmented as development converts natural areas and agricultural lands to more urban uses. As habitat is reduced, the value of remaining wildlife resources is likely to increase. Efforts to protect these resources will need to focus on making traditional sectors of western economies, such as agriculture, as well as newly important sectors, such as housing construction, more compatible with wild species and their habitats. USDA's incentive-based programs to achieve various conservation goals offer potentially valuable lessons for getting private agents to adjust their use of land and water resources in ways that are favorable to wildlife. Farmers in the West have voluntarily enrolled over 8.2 million acres in the CRP, the WRP, and the Emergency Wetlands Reserve Program. To be successful, conservation programs must not only provide for the biological needs of species but also account for the economic constraints faced by local agents. This means designing programs that address the unequal costs and benefits associated with protecting wildlife resources and building into these programs the flexibility to deal with local wildlife needs and local economic conditions. Given the evolving nature of economic growth in the West, balancing the land and water needs of that growth with the land and water needs of wildlife will likely be an important policy issue for the foreseeable future.

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# Finding Common Ground on Western Lands

*Use of the Nation's 2.3 billion acres, including the half-billion acres in Western States, depends not simply on whether they are publicly or privately owned, but also on how the multiple interests in each acre, including rights to water and other resources, are distributed. This article describes how voluntary agreements between private landowners and a variety of public and private agencies increasingly influence how those interests are distributed and how social, economic, and environmental objectives are met.*

Recent years have seen rapid population growth and economic change in the American West. These changes have generated considerable debate about the ways in which the West's public and private lands are used. How can traditional claims on public range, forest, energy, and mineral resources be balanced with the recreational and environmental interests of new residents and the general public? What rights do property owners have to use their land as they choose and to enjoy the benefits of such use? What responsibilities do owners have to avoid land uses that cause harm to their neighbors or to the rest of society?

Such questions are matters of legitimate public debate, and can be expected to remain so well into the future. Nevertheless, reducing the scope of the debate is possible by focusing more clearly on the nature of landownership and, in so doing, identifying areas of potential agreement among landowners, environmental groups, and taxpayers in general. This article describes how the voluntary acquisition and conveyance of partial interests in western land can offer common ground on which to balance competing social, economic, and environmental objectives.

## Landownership Consists of Multiple Interests

Property and ownership are legal concepts rooted in social institutions. They refer not simply to material objects but to the relations between individuals and society that govern access to material objects. *Real property* refers specifically to interests in land, such as rights to draw water, graze livestock, produce crops, or build houses.

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Keith Wiebe and Ababayehu Tegene are economists in the Resource Economics Division, ERS, USDA. Betsey Kuhn is the Director of ERS' Food and Rural Economics Division.

Typically, many interests are defined in even a single parcel of land. Interests may arise from custom or tradition; may be defined by laws, regulations, and court decisions at the Federal, State, and local levels (as in zoning); or may be negotiated between private parties on a market basis (as in lease agreements).

The bundle of interests that comprise ownership of a particular parcel of land may remain largely intact in the hands of a single landowner, and indeed this is the way in which landownership is commonly understood. But those same interests may also be allocated among multiple parties, both public and private, as when a landowner leases land to a farmer or conveys a utility easement to a public agency, or when a private corporation acquires the right to extract minerals or harvest timber on public land.

The allocation of partial interests in land across multiple holders thus blurs the conventional distinction between what we think of as public and private land. It also presents opportunities for public agencies to balance resource use and conservation objectives on both public and private land without relying on the relatively blunt instruments of regulation (with its associated political costs) or outright land purchase or sale (with its associated financial costs). Use of partial interests as policy tools, however, is not without costs.

## Interests in Western Lands Have Changed in Important Ways

The evolution of landownership in the United States can be summarized in three overlapping phases. From 1776 through the mid-1800's, the Federal Government acquired lands through treaty, purchase, annexation, and cessions by the original 13 States. Beginning in the 19th century and lasting well into the 20th, the Federal Government

conveyed lands to States, settlers, railroad corporations, and others, and provided incentives for their conversion and use. In the final phase, the Federal Government has gradually withdrawn incentives for intensifying land use and replaced them with restrictions on land use and incentives for land conservation and restoration.

Between 1781, when the original 13 States began ceding territory west of their present boundaries to the United States, and 1867, when Alaska was purchased from Russia, the Federal Government acquired roughly 2 billion acres of land through cessions, treaties, purchases, and annexations. (The land within the original 13 States, comprising 305 million acres, never belonged to the Federal Government. Hawaii's 4 million acres were annexed in 1898.)

Even before territorial establishment was complete, the Federal Government began selling, granting, and otherwise conveying newly acquired lands to States, settlers, railroad corporations, and others to encourage westward expansion, settlement, and growth. A total of 328 million acres were granted to States for the construction of schools, roads, and for other purposes (U.S. Department of the Interior). Nearly 288 million acres were granted or sold on favorable terms to homesteaders, and another 61 million acres were granted to veterans as military bounties. Over 94 million acres were granted to railroad corporations. To date, a total of 1.1 billion acres have been conveyed by the Federal Government to States and other nonfederal entities.

In addition to the disposition of lands, the Federal Government influenced how State and private lands were used. In some cases, land grants were conditional on subsequent land conversion and use. For example, among the 328 million acres granted to States, 65 million acres of wetlands were transferred on condition that the proceeds from their sale to individuals be used to convert wetlands to farmland.

While most of the midwestern prairie was quickly brought into private ownership and converted for cultivation, the pattern was much different in the drier and more mountainous Western States. There, bottomlands with fertile soil and better access to water were often homesteaded while adjacent uplands were left in Federal ownership. Farmers and ranchers enjoyed virtually unrestricted access to these public lands for livestock grazing.

In time, it became apparent that the benefits of westward expansion, widespread land-use changes, and economic growth were not without cost. On private lands, for example, soil erosion became a national issue in the 1930's, when inappropriate cultivation practices and loss of vegetative cover were blamed for the Dust Bowl and unprecedented flooding along the lower Mississippi River. More recently, loss of wetlands and other natural areas—as well as conversion of farmland, rangeland, and other open

spaces to development—has generated concern at the local, State, and national levels.

### **Incentive-Based Policy Tools Have Become Increasingly Important on Private Lands**

Government policies to address these concerns have taken a variety of forms. Regulatory approaches restrict how land can be used, or when land can be converted from one use to another, in order to protect the interests of neighbors or society at large. Residential zoning is an example of the regulatory approach, as are some programs that protect wetlands and habitat for endangered species.

Due to concerns about the burden that such restrictions may impose on landowners, government policies include incentives to encourage private choices that yield broader public benefits. The preferential tax treatment of farmland provided by California's Land Conservation (or Williamson) Act, for example, is intended to slow conversion of farmland for development. Conservation easements, by which a landowner voluntarily agrees to specified restrictions on land use in exchange for incentives that may include cash payments or tax benefits, are increasingly common. (*Conventional* easements, by contrast, have been used for centuries to *permit* specified uses of the land by parties other than the landowner.) A variety of public and private agencies have begun using conservation easements in a broad range of resource policy contexts in recent decades (table 1).

USDA's Conservation Reserve Program (CRP) pays owners of environmentally sensitive land to retire the land from cultivation for 10 years and place it under a protective cover crop of grass or trees. Over 8 million acres are currently enrolled in the CRP in Western States (table 2). USDA's Wetlands Reserve Program (WRP) pays landowners to restore and protect wetlands for periods ranging from 10 years to perpetuity. A relatively small proportion of total lands protected under the WRP is located in the West. An increasing number of State and local governments nationwide now operate "purchase-of-agricultural-conservation-easement" (or PACE) programs, which pay farmland owners to relinquish their development rights and keep their land in agricultural production. Although these programs are concentrated in the Northeast, over 60,000 acres are now protected through PACE programs in California, Washington, and Colorado.

The Nature Conservancy (TNC) is a private agency that focuses on the preservation of natural habitats through conservation easements, land acquisition, and other voluntary agreements with private landowners. Acreage protected by TNC in Western States grew by nearly 50 percent between 1994 and 1998, and now totals over 6 million acres. An additional 1 million acres have been protected

through similar means by smaller land trusts operating at the local and regional level in Western States.

### Partial Interests Help Balance Multiple Uses on Public Lands as Well

Growing pressures on natural resources have also led to policy changes on public lands. Shortly after the turn of the century, the cumulative effects of drought and overgrazing raised concerns about the condition of Federal rangeland and led to regulation and management by the Forest Service (FS) and the Bureau of Land Management (BLM). A grazing permit and fee system was established on FS-administered land in 1906, and on BLM land in 1934. Laws passed in 1960 and 1976 established that public lands would be retained in Federal ownership and managed for sustained yields under multiple uses, includ-

ing timber, minerals, energy, grazing, water, recreation, and wildlife. Today, the Forest Service and BLM manage more than 250 million acres of Federal rangeland, most of it in Western States (fig. 1).

Even on federally owned land, private individuals and corporations hold a variety of partial interests, including rights of way, mineral leases, and oil and gas leases (Laitos and Westfall). Such interests are legally distinct from grazing permits and livestock-use permits, which are revocable licenses and “convey no right, title, or interest held by the United States in any lands or resources” (U.S. Department of Agriculture).

In economic terms, however, grazing permits share characteristics with conventional easements and other partial interests in land, defining the distribution of returns to

Table 1

#### Agencies involved in conservation easement acquisition

*A variety of public and private agencies, operating at the national, State, and local levels, acquire conservation easements*

	National	State and local
Public	Federal Government agencies (for example, the Natural Resources Conservation Service and the Forest Service)	State & local government agencies (for example, the Colorado Department of Natural Resources)
Private	National nonprofits (for example, The Nature Conservancy and the American Farmland Trust)	Land trusts (for example, the Montana Land Reliance and the Big Sur Land Trust)

Source: Wiebe, Tegene, and Kuhn.

Table 2

#### Land protected through voluntary agreements between private landowners and selected public and private agencies (cumulative acreage)

*Over 15 million acres in the West have been protected through voluntary agreements*

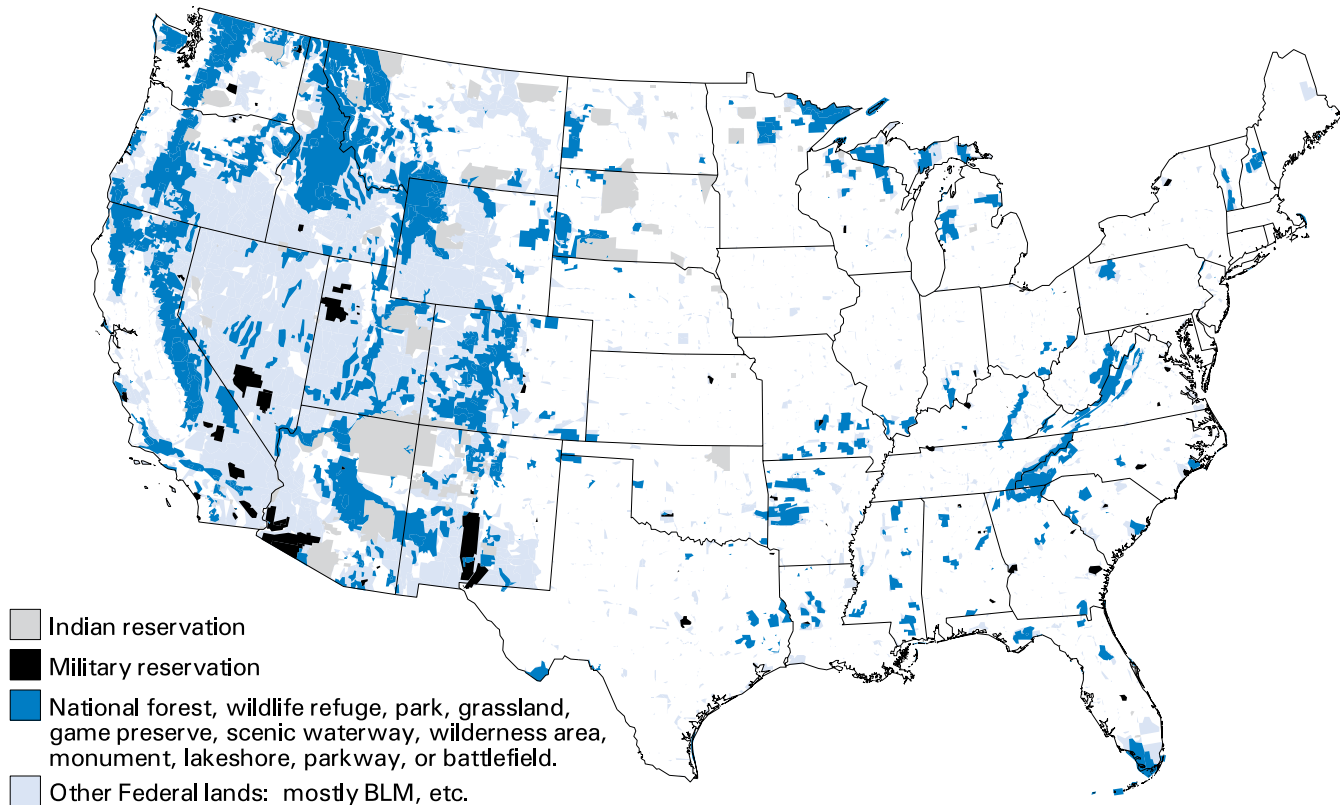
State	Conservation Reserve Program, 1998	Wetlands Reserve Program, 1997	State and local PACE programs, 1997	The Nature Conservancy, 1998	Local and regional land trusts, 1998
Acres					
Mountain	6,772,402	5,536	2,970	4,708,942	513,200
Arizona	33	0	0	769,110	3,339
Colorado	1,953,625	1,544	2,970	194,531	95,593
Idaho	740,434	1,861	0	140,236	23,042
Montana	3,052,339	1,994	0	336,676	296,840
Nevada	1,271	0	0	1,393,030	4,843
New Mexico	576,102	0	0	1,091,702	28,986
Utah	189,988	0	0	480,400	22,805
Wyoming	258,610	137	0	303,256	37,752
Pacific	1,420,308	33,803	61,715	1,316,636	575,863
California	132,023	25,335	48,354	822,240	536,922
Oregon	387,398	2,503	0	358,190	11,711
Washington	900,887	5,965	13,361	136,206	27,230
Other	21,717,814	493,687	426,952	4,442,536	2,094,507
U.S. total	29,910,524	533,026	491,637	10,468,114	3,183,570

Source: USDA program data, the American Farmland Trust, The Nature Conservancy, and the Land Trust Alliance.

Figure 1

## Federal Lands in the contiguous United States by type, 1992

*Federally owned lands are concentrated in the West*



Source: USDA, ERS, based on data from USGS and NRCS 1992 National Resources Inventory.

various permitted uses among multiple parties. Permittees pay annual grazing fees, currently set by a formula based on an index of rental charges for private rangeland and an index of livestock industry profitability. Federal fees are uniform across States, although private fees vary significantly by location (U.S. Department of the Interior). The permits themselves are free (at least when initially acquired from the government), and generally change hands with the base property to which they are attached. Nevertheless, the difference between the grazing fees paid by Federal permittees and the market value of the acquired forage yields a positive value to permits, which is capitalized into the value of base properties with Federal grazing permits attached.

The administration of Federal grazing permits is the subject of considerable controversy, much of it focused on the ways in which permits are allocated, the uses that permits allow and require, and the fees that permit holders are charged to graze livestock. Currently, permits may be held only by owners of private base properties capable of supporting a livestock operation, and the BLM gives preference to applicants who own base properties next to the public land on which grazing is to be permitted. Permits also prohibit nonuse or conservation use of grazing allotments for extended periods. Finally, Federal grazing fees

are considerably lower than fees charged on State-owned or private grazing land (U.S. Department of the Interior).

Critics argue that such preferential treatment, use requirements, and low fees reduce efficiency, contribute to environmental degradation, and deprive the public of increased revenues (Rylander). Indeed, calls for market-oriented reforms to address these issues have come from a wide variety of public and private organizations across the political spectrum, including the Cato Institute, the Natural Resources Defense Council, the Political Economy Research Center, and the Council of Economic Advisers.

The similarity between grazing permits and conventional easements suggests the possibility of a market-oriented institutional innovation that could provide benefits to landowners, environmental groups, and taxpayers alike. Specifically, proponents of reform (such as those noted in the previous paragraph) suggest that grazing permits be traded in an open market, allowing competition among ranchers, environmental groups, and others to determine the value and use of public grazing allotments. In effect, such a development would mirror the evolution of conventional easements to include conservation easements, such as those currently acquired from willing landowners through the programs described earlier. Similar argu-

Table 3

**Relative costs of alternative land policy strategies***Alternative land policy strategies involve differing costs*

Transaction	Regulation	Partial interest acquisition	Land acquisition
	Costs*		
Negotiation	Low	High	Medium
Acquisition	Low	Medium	High
Monitoring	Medium-high	Medium-high	Low
Enforcement	Medium-high	Medium-high	Low
Political	High	Low	Low

\* Relative magnitudes are intended to be comparable across columns, but not across rows.

Source: Wiebe, Tegene, and Kuhn.

ments have been made with regard to timber harvest permits, water diversion rights, and use of other resources on public lands.

### Partial Interests Involve Costs, Too

Partial interests offer a means to balance resource use and conservation objectives on public and private land without incurring the political costs of regulation or the full financial costs of outright land acquisition. As tradable instruments, partial interests also offer a means by which broader social objectives, such as the preservation of wetlands or habitat for endangered species, may find a market "voice" in voluntary transactions with private landowners. While this may provide important signals about public and private resource values, it is important to remember that insufficient weight may be given to other social objectives, including the support of resource-dependent communities in the West (Council of Economic Advisers). In fact, the Interior Department issued regulations in 1995 allowing conservation use of grazing allotments for the full 10-year permit period (*Federal Register*), but such changes have since been suspended in response to legal challenges by traditional resource users in Western States.

Finally, partial interests can be—and in fact must be—tailored on a case-by-case basis to meet specific program and landowner goals on specific parcels of land. As a result,

however, partial interests can involve significant costs in negotiation, monitoring, and enforcement. In some cases, these costs may even outweigh potential savings relative to regulation or land acquisition (table 3). These costs may increase in the future, as landowners not party to the original easement transaction either purchase or inherit easement-encumbered properties. Alternatively, such costs may be moderated by increasing experience with administering such programs. In either case, no single one of the three alternative land policy strategies—regulation, partial interest acquisition, or land acquisition—will be optimal or even sufficient in all situations. Given the costs of each strategy and the complexity of the resource policy issues that are to be addressed, it remains to be seen how these alternatives will be balanced in the ongoing debate over the management of public and private lands in the West.

### For Further Reading . . .

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# Water Markets

## Implications for Rural Areas of the West

*Market transfers of water from irrigated agriculture are viewed as one of the most likely ways to accommodate new demands for water supplies. Market transfers generally improve statewide economic efficiency by shifting water to higher valued uses. However, case studies find the impact of these transfers on agriculturally dependent rural communities to be significant because the costs accrue to the area of origin and the benefits to the area of new water use.*

Water is one of the West's most important and limiting resources. Historically, areas with limited water supplies built dams and other supply-enhancing infrastructure, often with willing Federal assistance. However, the strategy of expanding available water supplies is increasingly less tenable since it is unlikely that society (from local communities to Federal agencies) will incur the increasing monetary and environmental costs of major new storage and conveyance facilities. Thus, current unmet demands and future needs for water will need to be accommodated within the existing supply system. Some demand may be met with unclaimed water reserves, but most will require transfers from existing uses. Since agriculture is the dominant water user, water transfers have important implications for irrigated production and agriculture-based rural communities.

Much attention has focused on development of a compensated transfer system for water or water rights termed a "water market." This transfer process involves a market transaction in which water use or ownership rights are exchanged for money. Water market exchanges are increasingly being used to adjust water allocations in the West. While some transfers involve water moving to agriculture, most involve a substantial and growing net outflow of water from agriculture. The few studies that examine the rural community impacts of water market transfers show that income lost to rural farming communities can be as much as 20 percent at the completion of the water transfer. The negative impacts are local since

water transfers almost always increase economic activity in the area receiving water. This article focuses on current market activities and the potential impacts of water markets on rural communities in the West.

### **Recent Water Transfers Usually Involve a Temporary Shift from Agriculture**

Irrigation is the major use of most of the current water supplies in the 11 Western States (Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Utah, Colorado, Arizona, and New Mexico). Agricultural irrigation accounted for 92 percent of total consumptive water use in these States in 1995 (fig. 1), down from 95 percent in 1960. The simple fact that agriculture is the dominant out-of-stream water user means that most transfers will involve water used for irrigated production.

Additionally, water transfers will involve agriculture because irrigation is a "lower valued" water user in many locations. While irrigation may be used to produce the most profitable crops for the area, the last units of water applied will rarely return more than \$30 per acre-foot, and in most cases, much less. Industrial, commercial, domestic, and environmental restoration applications can, in most cases, pay much more.

Urban and industrial users may also seek transfers from agriculture due to the relatively stable allocation of many irrigation water supplies. In almost all cases, water users do not own the water they use. (States generally maintain ownership of their waters.) What irrigators own is the right to withdraw a specified water quantity, at a specific location, for a specified use. This water right is conditional upon withdrawals not infringing on the water rights of

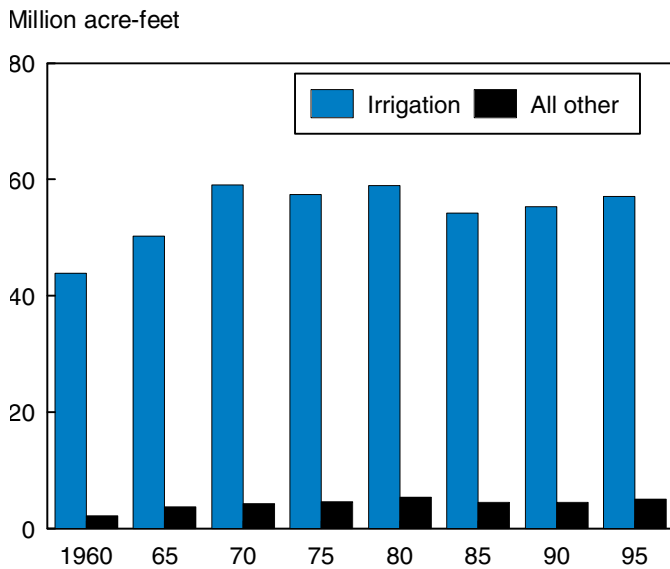
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Noel R. Gollehon is the Water Use and Management Program Leader, Resource Economics Division, ERS, USDA.

Figure 1

**Consumptive water use in the West**

*Irrigation dominates all other water uses in the West*



Source: Calculated by ERS based on U.S. Geological Survey, Water Use Program data.

a senior right holder. This system of rights based on “first in time, first in right” is termed the prior appropriation doctrine. Under this system, the most senior right has the greatest assurance of receiving water in dry years and is the most valuable to seekers of stable water supplies. Irrigated agriculture holds many of the senior water rights in the West, making transfers from agriculture to other users more attractive to those seeking stable supplies.

There are two broad types of water market transfers. A water sale involves a temporary transfer of water, with the water seller continuing to hold the water right. This type of transfer takes many forms, including single-year rentals, multiyear leases, transfers contingent on water levels, and transfers involving water banks or marketing pools. A permanent transfer of annual water supplies occurs with the ownership change of the water right, whereby an irrigator gives up all future access to the water. (In some cases, water rights purchased by urban areas are leased back to the selling irrigators until the water conveyance infrastructure is built, which can take many years.)

In 1996 and 1997, 282 water-market transactions were recorded in Western States (Smith and Vaughan). The water volume associated with the market transfers over 2 years totaled 2.7 million acre-feet—virtually all from agriculture—almost 2.5 percent of the annual irrigation consumptive use shown in figure 1. Of the 282 transactions, permanent transfers accounted for 78 percent of reported transactions but only 7 percent of the total water quantity; the temporary transfers (22 percent of the contracts) accounted for 93 percent of the water movement.

Colorado had the most market activity with 194 transfers, most (189) being relatively small (average of 135 acre-feet) permanent water sales from agriculture to urban areas. California moved the greatest amount of water with 33 transfers, most being relatively large (average of 57,000 acre-feet) temporary water sales from agriculture to environmental purposes. Average water prices depend on the type of transfer. Permanent transfer prices averaged \$1,360 per acre-foot, ranging from \$77 (ID) to \$4,950 (NV) per acre-foot. Temporary transfer prices averaged \$233 per acre-foot, from \$3 (MT) to \$979 (UT) per acre-foot (table 1).

Since water rights usually represent a use right and not an absolute ownership right, most water transfers are generally subject to State approval. Most States have a water management authority to solicit and evaluate comments from other water-right holders on the proposed transfer, and will allow the transfer only if the impact on other water-right holders, both junior and senior, is insignificant. The major protection offered to downstream water right holders involves limiting the quantity of water transferred to the amount actually consumed (lost to system), not the amount diverted. Water diversion quantities contain return flow—water lost to individual irrigators but retained in the regional hydrologic system. Return flow water is available to downstream diverters and may be important to many uses (instream flow, wetlands, hydropower, aquifer recharge) as it moves through the basin. If the amount transferred was based on the entire diversion—including runoff to water channels and seepage to aquifers—downstream water-right holders would contest that too much water was removed from the hydrologic system. For example, if the water right specifies a withdrawal of 3 acre-feet per acre, only the portion of the withdrawal that is actually consumed can be transferred, say 2 acre-feet per acre. The portion of the right that is actually consumed, and spatial and temporal adjustments in return flows, are often contentious issues that result in appeals of State rulings through the court system.

Most water transfers involve surface-water resources (fig. 2), although transfers of both groundwater and groundwater rights do occur. Surface water is easily conveyed through existing natural channels and existing infrastructure, as long as the destination is downstream. Surface waters are renewable, which is consistent with the long planning horizons of urban areas.

**Water Allocations Affect More Than Just Buyers and Sellers**

Several parties are affected by water transfers. The most obvious are the buyer and seller of water or water rights. These parties have direct control over the outcome of the transaction and would presumably not enter into a transfer if it were not mutually beneficial.



Table 1

**Water market activity in Western States, 1996 and 1997**

*While most contracts were for permanent sales, most water moved on annual contracts*

State	Water-right sales (permanent)				Water sales (temporary)			
	Total contracts	Contracts	Water quantity	Average price	Contracts	Water quantity	Average price	
	Number	Number	Acre-feet	Dollars per acre-foot	Number	Acre-feet	Dollars per acre-foot	
Arizona	10	6	23,212	2,753 <sup>1</sup>	4	83,821	463	
California	33	3	38,260	1,947	30	1,715,532	319 <sup>1</sup>	
Colorado	194	189	25,517	4,395	5	93,360	20	
Idaho	7	2	41,500	77	5	504,100	20	
Montana	2	0	0	0	2	25,392	3	
Nevada	2	2	1,928	4,950	0	0	0	
New Mexico	7	6	1,621	3,462	1	44,760	50	
Oregon	13	4	18,018	130	9	24,350	42 <sup>1</sup>	
Utah	8	6	3,409	1,270 <sup>1</sup>	2	20,791	979	
Washington	3	1	40,320	32	2	202	11 <sup>1</sup>	
Wyoming	3	1	253	0	2	1,484	45 <sup>1</sup>	
Total	282	220	194,037	1,360	62	2,513,792	233	
Percent of total	100	78.0	7.2	NA	Percent	22.0	92.8	NA

NA = Not applicable

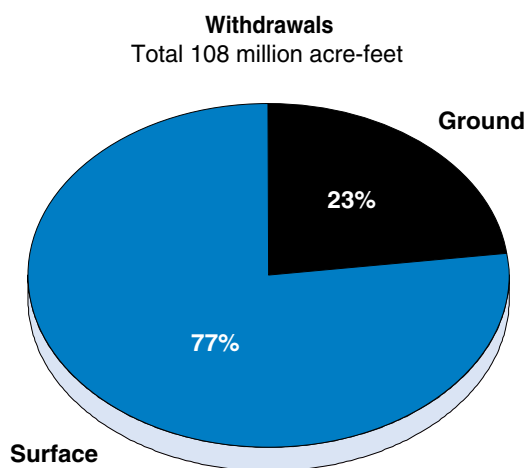
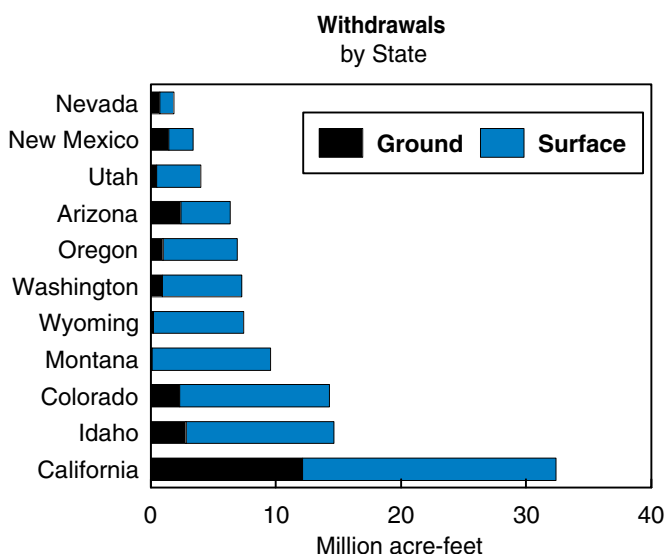
<sup>1</sup>Values based on a reduced number of observations due to missing data.

Source: USDA, ERS based on *Water Strategist* data.

Figure 2

**Sources of irrigation water in the West, by State, 1995**

*California withdrawals are more than those of Idaho and Colorado combined*



Source: Calculated by ERS from U.S. Geological Survey, Water Use Program data.



Other (nontransferring) water-right holders may also be affected. Most States allow other water-right holders to protest the transfer because their rights are protected from adverse impacts. The State authority may cancel or modify protested transfers. In some cases, the water buyer may pay compensation to prevent a protest from being filed.

Other parties that may be affected by water transfers include many elements of a rural community—agricultural supply and processing industries and local businesses, nonagricultural local businesses and communities, environmental protection groups, local government officials, and taxpayers. Most States do not have a formal process to consider the impacts (both benefits and costs) imposed on this broader segment of society within the transfer review process.

Clearly, transfers of water from irrigated agriculture have impacts beyond the farmgate in rural communities. For 1992, the average sales per irrigated acre was estimated at \$740 per cropped acre in the 11 Western States. For nonirrigated cropped agriculture in the same region, estimates averaged only about 25 percent of the irrigated value, as irrigated yields are higher and most high-valued crops grown in the West require irrigation. The increased crop

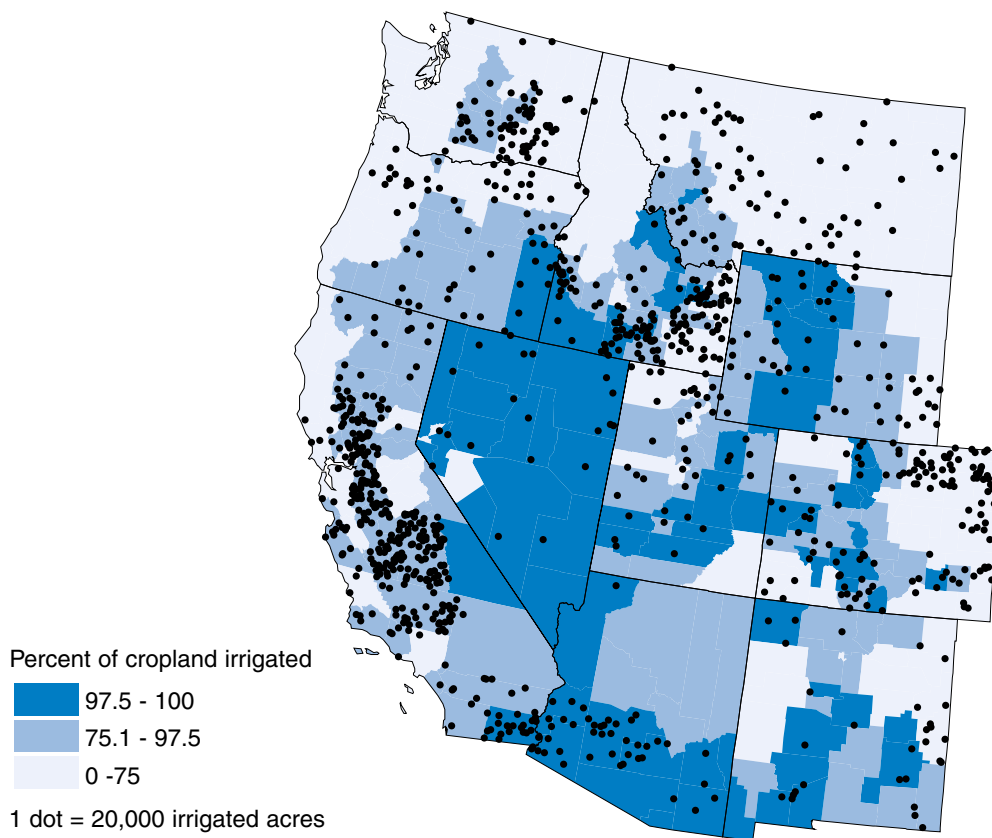
sales associated with irrigation translate into increased input use and output processing requirements that benefit the broader agricultural service economy and rural economies in general. Figure 3 shows the location of irrigated land and the dependence on irrigation by counties in the West. Some areas are wholly dependent on irrigation, while other areas' irrigation water only supplements natural precipitation. In general, the share of cropland irrigated shows the suitability of land to remain in cultivation if water is not available for irrigated agriculture. Areas with few nonirrigated crop options provide even less in terms of sales to support rural communities.

Water transfers may also benefit irrigated agriculture and the rural communities that depend on high-valued irrigated production. In many cases, surface-water rights are held by the irrigation district providing the water. Water may be freely exchanged among farmers in that district as long as the diversion point or total use do not change. There is virtually no published record of these transfers, but they may occur often in some agricultural districts. Agriculture is also a major water purchaser from other irrigators in the water market. Water transfers for 1996 and 1997 indicate that about 19 percent of the purchases were for irrigation purposes, 72 percent for urban uses, 10

Figure 3

**Location of Western irrigated croplands and their dependence on irrigation, 1992**

*The West's harvested cropland depends heavily on irrigation*



Source: USDA, ERS, based on USDC 1992 Census of Agriculture data.

percent for environmental purposes, and 3 percent for other purposes. (Sum totals to more than 100 percent due to multi-use transfers.)

### Water Transfers Show Losses in Rural Communities

While water transfers within agriculture are important, the net outflow of water from irrigated agriculture to other uses is substantial and increasing. The cumulative impact on agriculture and rural communities of water transfers to meet urban and environmental uses is an important policy question. Several studies have addressed elements of this question, but only a few studies comprehensively estimate the impacts of water transfers on agriculture and rural communities considering the direct (agricultural), indirect (related agricultural service industries), and induced impacts (broader economic activity associated with the direct and indirect impacts, including income and consumption effects). Studies that have examined the issue indicate that overall economic efficiency is improved at the State level. The benefits of providing relatively low-cost water to major population centers far exceed the monetary cost to agriculture and the rural areas. However, the benefits and costs usually fall on different populations, and environmental impacts are typically not documented. For example, the compensated sellers of the water often cease irrigation and the input- and output-related industries that serviced those formerly irrigated acres may lose that income.

Case studies are the usual approach used to examine the impacts of water transfers on rural areas, due to the difficulty of isolating hydrologic and economic consequences of transfers across a broad region. The complexity of water use and hydrologic links makes it difficult to measure impacts of water transfers on instream flow, habitat, aquifer recharge, and downstream supplies. And, if the hydrologic impact is predicted accurately, the amount of time required to negotiate and execute a water transfer makes it difficult to attribute changes in economic activity to the water transfer. Water transfers generally occur with multi-year advance notice, which may signal a several-year decline in the economic activity in the rural communities servicing that region. Many rural communities have been in economic decline for some time, and attributing the reduced economic activity to the water transfer may be difficult. Finally, transfers may limit economic development since new agriculturally related businesses may locate in areas where there is less uncertainty about water supplies for irrigation. In a few regions, the timing and measurement problems have been overcome to provide case studies of water transfers on rural communities.

**Arizona.** One well-documented case study examined by Charney and Woodward involves large transfers of water from Arizona “water farms.” Arizona passed a comprehensive Groundwater Management Act in 1980 that

required municipal areas in “groundwater management areas” to have a 100-year assured water supply in order for new development to occur. While not all urban areas are included, greater Phoenix and Tucson are in designated groundwater management areas. The act set off a round of water acquisitions in Arizona. While conditions that prompted the series of Arizona transfers are unique, impacts are instructive.

In Arizona, because of the regional nature of groundwater management areas and lack of available surface-water supplies, groundwater supplies located some distance from urban areas became the preferred source of water to meet the 100-year supply requirement. Urban areas sought large quantities of high-quality water located close to the main Central Arizona Project (CAP) canal. The CAP canal provides a reliable means of transporting water through existing facilities, lowering the final cost relative to water supplies that were closer but required new infrastructure. Urban areas concentrated purchases of irrigated land for the associated water rights—hence, the “water farms” term—in rural areas along the CAP canal in La Paz County. These purchases of land and associated water did not follow an orderly, staged retirement of the least productive land first, with the better quality land continuing in production. Most of the water purchased was groundwater, and since most groundwater pumped in Arizona is recharged very slowly, the incentive of the purchasing urban areas was to conserve water by immediately ceasing irrigation. In this case, the usual long time-frame of water transfers was compressed. The impacts were also spatially concentrated, since purchases were dictated by proximity to the water conveyance infrastructure.

The water farm purchases in the late 1980’s totaled about 450,000 acres, including over 48,000 acres of irrigated farmland (most land was nonirrigated, grazing land). The analysis assumed that about 40,000 acres of irrigated land would soon be idled by the water purchases. (The remaining 8,000 acres continue to operate with surface water until needed by the urban areas.) One key assumption of the analysis was that all crops were retired in proportion (higher valued crops were not transferred to the remaining acreage). This assumption is important because (1) about half the land produced higher valued crops, and (2) impacts are greater with declines in high-valued crops relative to forage-type crops. The analysis estimated a decline in employment by 17 jobs and personal income by \$363,000 for each 1,000 acres of farmland retired. This translates into a total employment loss of 340 jobs, about 14 percent of La Paz County’s 1987 employment. The personal income loss was about 10 percent of the county’s income. But even these significant numbers understate the impact, because the loss is concentrated on one side of the 4,400-square-mile county. In addition, the county government lost an estimated 5 percent of its tax revenue base as a result of the water transfer.

Beyond the revenue, income, and jobs lost from the water transfers, a greater loss may be the loss of the region's character, as well as future development options for La Paz County. The study cites a survey wherein almost all of the La Paz County residents interviewed agreed with the statement, "The losses to the community associated with the transfer of water are of such a nature that they cannot be compensated."

**Colorado.** Colorado has a well-developed, if relatively expensive, water-transfer system. Transaction costs of water transfers in Colorado are significantly more than in other States because no State authority reviews proposed transfers; all transfers go through the court system. Colorado's front-range urban areas have grown significantly and have actively pursued water for continued growth despite the transaction costs. One of the renewable water sources tapped by urban areas is irrigated agriculture in the Arkansas River Valley. A case study by Howe and others examined the impacts of water transfers in a seven-county area of the Arkansas River Valley in southeastern Colorado. This area of Colorado has over 300,000 acres of irrigated crops and 700,000 acres of nonirrigated field crops, despite the dry, variable climate. Only about 3 percent of the irrigated acres are devoted to specialty crops (melons, onions, tomatoes, and flower seeds), but these crops have strong links to the agricultural processing sector. Irrigated feed grains and forage also support a regional cattle-feedlot industry.

Prior to 1990, surface-water transfers from the Arkansas Valley to urban areas had totaled almost 100,000 acre-feet of consumptive use from about 48,000 acres of irrigated land. In addition, transfer applications on file but not yet approved totaled over 320,000 acre-feet of consumptive use from about 130,000 acres of irrigated land. While all the proposed transfers have not occurred on schedule, the approved and pending transfers account for over 60 percent of the study area's water, with an associated idling of almost 60 percent of the irrigated land in the study area.

Howe and others estimated the impact of the historic water transfers, considering only the retirement of the land idled by 1990. They assumed that the relatively small acreage of high-valued crops would not be affected by the loss of irrigated area. The high-valued crops were assumed to be produced on other farms in the area with continued water supplies. They found that each 1,000 acres of farmland retired reduces employment by 3.2 jobs and personal income by \$100,000.

To bracket the range of potential impacts of the current plus proposed transfers, the analysis provides two scenarios of impacts on the local economy based on agriculture sector adjustments to the transfers. The less extreme scenario assumes that the high-value crops remain on the shrinking irrigated area until water is no longer provided. This scenario estimates a 10-percent reduction in both farm employment and value added by the agriculture sec-

tor in 2020, when compared with 1982 levels. Regional employment and personal income loss estimates were a modest 1 percent. The more extreme scenario assumes that, in addition to the high-value crop loss, there would be an 80-percent decline in feedlots in the area from increased feed and forage costs due to the reduction in irrigated production. This scenario posits a 20-percent or greater reduction in both farm employment and value added by the agriculture sector in 2020, when compared with 1982 levels. Regional employment and personal income would decline 2 to 3 percent. The impacts of both scenarios on the economy of Colorado were also estimated and found to be insignificant.

These studies from Arizona and Colorado lead to similar conclusions. Both recognize the economic gain to the State as a whole, given the much higher costs of water supply alternatives. In both cases, the impacts of water transfers are severe on local agricultural economies and the related agricultural support and processing industries. The impact on related industries is sensitive to the rate at which high-value crops move to areas outside the region. Both studies conclude that impacts measured over a larger area or at the State level are insignificant, but that local impacts fall heavily on small rural areas. In both cases, the costs accrue to the area of origin and the benefits go to the area of new water use.

### **Challenges for Markets in the Future**

Water transfers will continue in the West, perhaps at an accelerated rate as population growth continues and efforts are made to address environmental issues through increased instream water flows. In the larger regional and State economy, water transfers are almost always economically efficient, given the relatively high willingness to pay for urban and environmental water supplies. Unfortunately, the costs and benefits usually accrue to different populations. Agriculture will be the source of most water that is transferred to urban and instream flow uses.

The impacts of water transfers on agriculture and rural communities tend to be very concentrated, often within subcounty areas. Impacts are difficult to measure because of the complexity of hydrologic and economic interactions, the long-term gradual nature of transfers, and the lead time involved in transfers. Long lead times allow capital and population migration in anticipation of income losses associated with water transfers. In addition to hastening population loss, water transfers make it increasingly difficult to justify capital improvements in irrigation technology, farming operations, and agriculture-related industries, thus accelerating declines in farming-dependent rural communities. While water transfers from irrigation usually have a negative impact in these rural areas, there may be a positive impact when water is purchased by other agricultural producers growing more

valuable crops or when the rural economy has recreation-based industries dependent on instream flow levels.

Policies and institutions that regulate water transfers tend to evolve slowly unless there is a severe water shortfall. As transfer pressures increase, there is a need to be more creative in providing for both rural-based economies and urban demands. Several concepts need more evaluation, for example, dry-year transfers (temporary transfers to meet drought needs), transfers of water conserved through technology adoption, and public/private financing of transfers. The institutions governing transfers need to develop a framework that considers costs and benefits of all stakeholders. This would recognize (1) that water has value to segments of society beyond just those holding water rights, and (2) that transfers need to be structured to minimize the costs on economic, environmental, and community stakeholders. While the issue of water marketing remains contentious, most agree that expanding water markets represent a largely positive development in western water management. Operating water markets provides an opportunity to affect the allocation of water within the existing water supply system through improved management. Given the difficulty in meeting future water needs in other ways, water markets may be the best option available.

#### **For Further Reading . . .**

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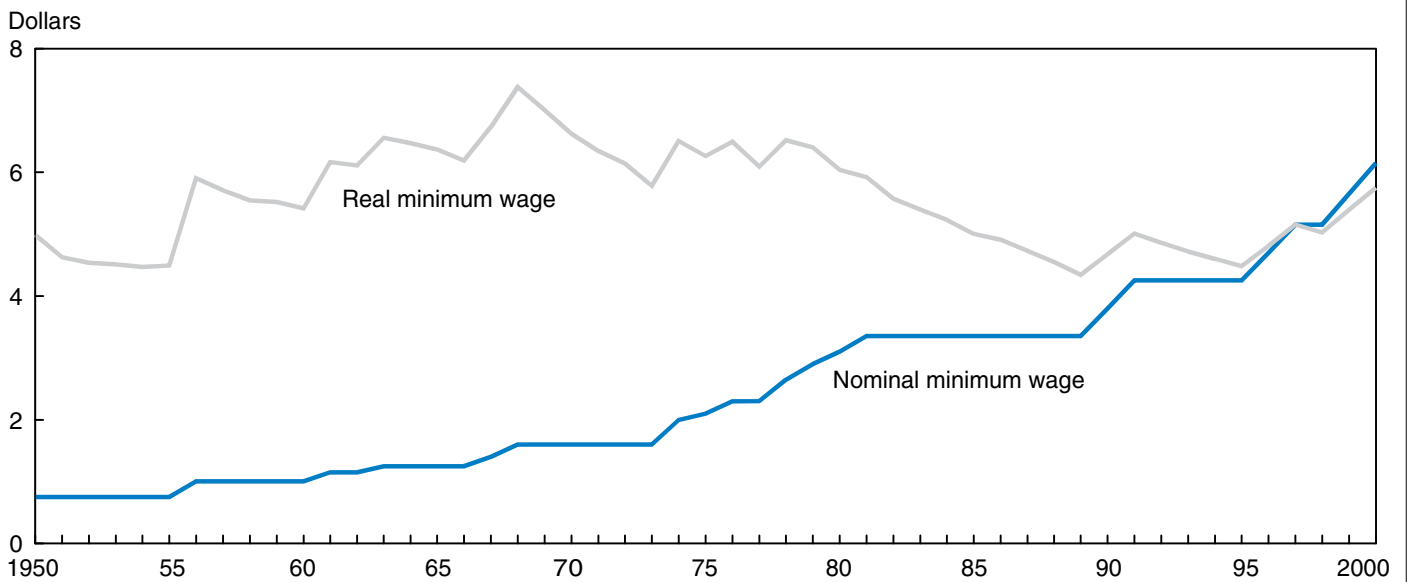
Rodney T. Smith and Roger Vaughan, eds., *Water Strategist*, Stratecon, Inc., Claremont, CA.

# ERRATA

In the previous issue of *RDP* (vol.14, no. 1), the figure located in the box on page 4, entitled "The Minimum Wage," should appear as follows:

## Minimum wage, 1950-2000, in current and 1997 dollars

*The minimum wage has not kept pace with inflation*



Note: Real wage rates in 1997 dollars adjusted with Consumer Price Index; 1999-2000 data are projected.

Source: U.S. Department of Labor.