


IRIS
Internet Research
Information
Series



Natural Resource Amenity Service Values and Impacts in the U.S.

A DEMOGRAPHIC Research Report in the IRIS Series¹

April, 2009

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¹ The Internet Research Information Series (IRIS) is an internet accessible science report series covering outdoor recreation statistics (**RECSTATS**), wilderness research (**WILDERNESS**) and other human-dimension and demographics research (**DEMOSTATS**) related to natural resources. This research is a collaborative effort between the USDA Forest Service's Southern Research Station and its Forestry Sciences Laboratory in Athens, Georgia; the University of Georgia in Athens; and the University of Tennessee in Knoxville, Tennessee.

<http://warnell.forestry.uga.edu/nrrt/nsre/IrisReports.html>

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Final Report Prepared in Fulfillment of
Cooperative Research Agreement SRS 05-CA-11330144-220
Entitled “Assessment of Preferences, Demand and Supply for U.S.
Natural Resource Policy and Planning”
Between The University of Georgia
Department of Agricultural & Applied Economics and
The USDA Forest Service, Southern Research Station

Report also Prepared as a Component of the
2010 Renewable Resources Planning (RPA) Assessment
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Section I: Introduction

Since the 1970s, structural changes have been occurring in rural America, which have led to significant economic, social, and environmental changes (McGranahan, 1999; Green, 2001). This restructuring has been defined by the rapid inflow of migrants that is occurring in some, but not all, rural communities. Although people's choices of where to migrate may appear spatially erratic, they are not, with a significant relationship existing between rural population growth and the presence of natural amenities.

There are dozens of ways to define what a natural amenity is.³ For example, Power (1988) defined an amenity to be a quality of a region that makes it an attractive area to live and work in. McGranahan (1999) takes this definition further by stating that an amenity is "...an attribute that enhances a location as a place of residence" and that "natural amenities pertain to the physical rather than social or economic environment and are meant to exclude what are meant to be man-made, such as historical buildings or casinos." Other definitions, such as that by Beale and Johnson (1998), are described in more detail in Section II. Stewart (2000) points out that despite differences in the definition of amenity, significant correlation exists between in-migration and natural amenities in rural counties in both McGranahan's and Beale and Johnson's studies. This implies that both definitions are accepted, however, a majority of studies have opted to use McGranahan's (Rasker and Hansen, 2000; Vias and Carruthers, 2005).

So why are so many Americans suddenly being attracted to amenity-rich areas? The most widely cited reason is that they value the higher quality of life that natural amenities offer; yet this is not the only reason. In a broad sense, reasons that people are migrating to amenity-rich areas include changes in: retirement norms, technological advancements, and recreation and tourism experiences (Stewart, 2000). What makes this situation so fascinating is that these factors are constantly changing and are being manifested by unprecedented economic prosperity in the United States. Because of this, studies focusing on population change in amenity-rich areas are interdisciplinary, with major works being contributed by the fields of economics, sociology, anthropology, ecology, psychology, and geography, to name a few. Such an integrated approach has allowed for experts to gain a comprehensive viewpoint and understanding of why this phenomenon is occurring and what possible future social trends may emerge.

The reason that amenities are demanded is because natural amenities provide direct and indirect benefits to people. These benefits are referred to as amenity services, and they are produced in a variety of ways and from a variety of sources. For example, a beach, which is considered a natural amenity, provides sunbathing as a recreation-related amenity service. A beach can also drive household and business location decisions, which are amenity services in the sense that being located in an amenity-rich area provides some people with happiness (or utility, economically speaking). There are other forms of amenity services as well, all of which hold value. For example, people hold a positive willingness to pay for a whitewater rafting trip or a mountain view from their home (Song and Knapp, 2003; English and Bowker, 1996 cited in McKean et al., 2005).

The demand that an individual places on natural amenities varies from person to person. This is partially due to personal preference, but is also influenced by the type of amenity service being demanded and on the proximity, quality, and quantity of the amenity in question (Marcouiller and Green, 2000; Gonzalez-Abraham, 2007; Benson, 1998). Since people generally put a higher value on nearness to high quality, high quantity amenities, shortages of land available to develop

³ From here on out, 'amenity' will refer only to natural amenities, unless stated otherwise.

that's close to natural amenities have begun to take place in some areas. This has led to in-migrants moving to houses that are around "second best" amenities, where development is more affordable (Cromartie and Wardell, 1999; Beyers and Nelson, 1997 cited in Rasker and Hansen, 2000).

Many amenity-rich communities have become dependent on their natural amenities, in terms of marketing the amenity services they provide, to potential visitors, residents, and businesses. In some cases, communities have done a complete 180 regarding their economic development strategy, switching from historically resource-extractive sectors to retail- and service-based sectors (Green, 2001). Although this form of development can provide substantial economic benefits, it has also been cited for creating negative long-term effects on economic, social, and environmental well-being.

Measuring Natural Amenities

Measuring the presence of amenities is a difficult task, due to the inherent ambiguity of the definition of a natural amenity. Ad hoc indices used to measure amenities could lead to the downfall of effective policy creation, making it imperative that a consistent and well-defined system be designed and accepted. Therefore, in order to provide meaningful, consistent, and reliable results, continual improvements are being made in research in order to better the methods and tools used to define natural amenities.

In acknowledging that natural amenities play a role in where some individuals decide to live, McGranahan (1999) created an amenity scale (from here on out referred to as McGranahan's natural amenity scale) which measures the relative appeal of a county in terms of its enduring physical characteristics. The scale consists of six key measures, which includes the average number of days of sun in January, average temperature in January, lowness of average humidity in July, temperateness of weather in July, topography, and water area. This index is by far the most popular natural amenity index and has been used extensively in recent studies (Henderson and McDaniel, 2005; Vias and Carruthers, 2005). However, McGranahan (1999) pointed out that, "physical beauty arising from combinations of topography, water, flora, and fauna" are also considered natural amenities, but would be difficult to measure. To date, no such study has been conducted.

Another well-accepted amenity index was created by Deller et al. (2001). It accounts for five measures of attributes, including climate, developed recreational infrastructure, land, water, and winter sports. The findings from this study support the hypothesis that relationships exist between these five amenities, rural quality of life and economic well-being (in terms of tax burdens, income, and job growth rates). However, McGranahan (2005) points out that these studies are not complete measures for landscape and do not differentiate between landscapes that may be more aesthetically pleasing than others.

Of course, in order to measure the presence of natural amenities, a unit of measure must be defined. Most studies use counties as the unit, since data is plentiful and less error-prone than for smaller areas, such as census tracts or neighborhoods. However, it is common for several different types of amenities to exist in differing quality and quantities within a county, which can lead to problematic results. This is especially true in frontier Western States, where counties can be quite large and encompass a wide variety of natural amenities (Rasker and Hansen, 2000; Clark and Murphy, 1996).

The value of amenity services that natural amenities provide has heavily influenced decisions regarding recreation and tourism, household location, and business location. Therefore, this report will concentrate on major studies and techniques used regarding these three principle areas. Specifically, Section II will focus on recreation and tourism as an amenity service. Section

III will explore amenity-driven household location and activities, and Section IV will look at amenity-driven business location and activities. Each of these sections will focus on the key issues related to amenity-driven growth including the economic, social, and environmental changes that it entails. Finally, Section V will present a brief summary of the findings presented in this report.

Section II: Recreation And Tourism

With an increase in leisure demand and disposable incomes, rural areas in the United States have been experiencing an increase in tourism (Marcouiller and Deller, 1996). Many types of recreation and tourism are dependent on the presence of natural amenities (Beale and Johnson, 1998; English et al., 2000), such as beaches, lakes, forests, and mountainous terrain. Natural amenities that are owned by public agencies are especially prone to tourism and recreation (English et al., 2000). Comparing McGranahan's natural amenity scale to Johnson and Beale's (2002) recreation index (*Figure A1* and *A2*) provides evidence of this trend.⁴ The naked eye can detect overlap between these two indices, with 37 percent of recreational counties ranking in the top 25 percent of McGranahan's natural amenity index. These amenity-rich recreational counties make up nearly 15 percent of all non-metropolitan lands in the United States.

Although recreational counties are scattered across the country, significant concentrations occur in mountainous regions of the West, the Upper Great Lakes, the Northeast, the Southern Appalachians, the Ozarks, Alaska, Hawaii, and portions of the East and West Coast (Beale and Johnson, 1998). Table 1 provides an overview of the population change from 1990-2000 in particular recreational subgroups, many of which depend on natural amenities.

Personal Well-Being

Focusing on those who decide to migrate to an area for its natural amenities and recreational opportunities rather than occasional visitors, improved personal well-being has been recognized as one of the top reasons for migration to amenity-rich communities (Rasker, 1995; Rudzitis, 1996, 1993 cited in Beyers and Nelson, 2000). Of course, quality of life is both multidimensional and difficult to define, which can make measuring it problematic (Beyers and Nelson, 2000). Therefore, most studies take a more subjective approach to it, highly depending on surveys to provide information on the influence of quality-of-life on the migration decision-making process.

Broadly speaking, there are four main dimensions of quality-of-life. They include economic, environmental, health, and social well-being (Nelson, 1999 cited in Beyers and Nelson, 2000; Moore et al., 2006). Economic well-being is characterized by job type and availability, wages, and cost of living. Changes from traditional to non-traditional business sectors, such as the service sector, have led to changes in economic well-being for permanent residents in amenity-rich communities (Nelson, 1999). Much of this is being driven by tourism and recreation demand. Visitors have been found to go through several stages of natural amenity draw, in which day or overnight visits can eventually turn into full-on migration.⁵ Throughout this stage, increased visitation to the amenity-rich area creates demand for local goods and services. As visitors' expenditures increase, so does local jobs and income. This can lead to an improvement in permanent residents' well-being (English and Bergstrom, 1994).

⁴ There are a variety of ways to measure whether or not a county is characterized as being recreational. Johnson and Beale's (2002) method is based on economic dependence of the county on the recreational sector.

⁵ See Section III for more information.

Table 1: Population Change, Net Migration, and Natural Increase for Recreation Subgroups, 1990-2000

Recreational subgroup	Population change			Net migration		Natural increase	
	Number of counties	Percent change	Percent growing	Percent change	Percent growing	Percent change	Percent growing
Midwest Lake & 2nd Home	70	15.7	93	14.8	96	0.8	51
Northeast Mtn, Lake, and 2nd Home	21	11.5	90	9.6	81	2.0	71
Coastal Ocean Resort	38	18.7	95	14.9	92	3.8	66
Reservoir Lake	27	26.0	89	27.6	89	-1.7	41
Ski Resort	20	34.3	95	26.9	95	7.4	90
Other Mountain (with ski)	17	23.6	100	17.9	94	5.5	76
West Mountain (exc. ski and Nat'l Park)	47	32.3	89	27.6	89	4.6	74
South Appalachian Mtn Resort	17	17.0	88	16.4	100	0.6	53
Casino	21	17.5	95	11.4	67	6.1	95
National Park	21	16.7	76	8.0	52	8.7	90
Miscellaneous	28	26.5	89	22.2	82	4.3	71
Total Recreation	327	20.2	91	16.9	87	3.3	68

Three Alaska counties excluded because of missing data prior to 2000.
Notes: Recreation types are mutually exclusive and reflect the primary recreation activity, though many support multiple leisure activities.
Percent change is aggregate change for all cases in category.

Source: Johnson and Beale (2002) (originally created from Census 2000 PL-94, 1990 Census, and Federal-State Cooperative estimates).

Quality of life gains from environmental well-being can also be incurred by tourists and recreationists. For example, an increase in people's demands for adventure, peace, and the opportunity to be surrounded by natural beauty has been cited as being some of the main drivers behind recreation and tourism growth in amenity-rich areas (English et al., 2000). In Southern Appalachia, over 57 percent of migrants indicated that the quality of life the area offered was the most important reason for their migration to this amenity-rich, recreational hotspot. Nearly two-thirds of respondents cited that mountains, rivers, landscapes, wildlife, and low population density were the main features of Southern Appalachia that made them perceive the area as a place offering a high quality of life (Jones et al., 2003). In another study by Nelson (1999, cited in Beyers and Nelson, 2000) surveyed households indicated that they placed a higher weight on environmental quality and recreational opportunities than on economic well-being, which historically has been the case. In some cases, households are willing to accept a lower wage or income in exchange for the higher quality of life that amenity-rich areas offer (Stewart, 2000). Beyers and Nelson (2002) encountered an interesting example of this in their research, as described here: "A pipefitter had recently returned to [an amenity-rich, rural community] to be at the birth of his child. He was making a decent income working as a pipefitter in a nonlocal pulp mill, but after coming home, he decided to go to work for a local outfitter paying a fraction of the wages he could have made fitting pipes. Working for the outfitter, however, enabled him to spend more time in the woods, an environment he felt connected with."

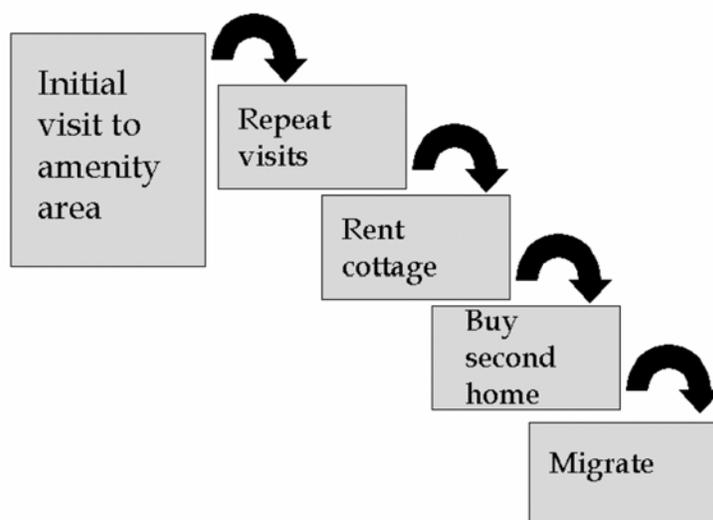
A third dimension that makes up quality-of-life is health. Recreational activities and some forms of tourism that improve physical fitness can potential health benefits (Rosenberger, 2002). Of course, certain types of recreation require the presence of certain amenities. For example, recreationists and tourists seeking light physical activity may head for the beach, while more strenuous recreationists may opt to go to the mountains for a weekend of rock climbing. Those who seek recreational sports, such as rock climbing, that are physically strenuous and often require a high-skill set are referred to as adventure tourists. Amenity migration has been correlated with these types of in-migrants typically being young entrepreneurs who want the

ability to access outdoor recreation while maintaining and high-paying job (Buckley, 2005). Given that place that migrants who tend to favor certain areas for their visual amenities, such as mountains, often overlaps with areas of recreational value is likely the reason that significant overlap between the destinations for these two groups exists. However, it is not only young people who seek recreational opportunities; retirees have cited it as one of the main qualities they look for when considered where they wish to retire (Rowles and Watkins, 1993).

Finally, social aspects can affect an individual's quality of life. Social well-being primarily comes in two forms, the availability of services and social interaction. Access to services such as schools, hospitals, restaurants, and retail areas (McGranahan and Beale, 2002; Beyers and Nelson, 2000). Although this is usually not a problem in metro areas, it may be more difficult to access these services in recreation-based areas, which may be located in more rural parts of the country (McGranahan and Beale, 2002). These services are conscious of the role that they play in attracting in-migrants. In one study, enrollment in one school located in an amenity-rich rural community increased 28 percent over a period of six year, with many parents indicating that they chose to move to the area so that their children could grow up in a 'wholesome' community, where they are less likely to get mixed up in or exposed to problems such as gangs, drugs, and crime (Beyers and Nelson, 2000). Also, with retirees indicating that recreational opportunities improve their quality of life, and a significant overlap in recreation- and retirement-based counties, recreation-based communities may incur an increase in the demand for health services, such as hospitals and doctors (Siegal and Leuthold, 1993).

Social interaction can also influence the quality of life and be a driving factor in the migration decision process. Many individuals are first introduced to an area by ties to friends or family that live in the area (Stewart, 2000; Beyers and Nelson, 2000). It can also be driven by tourism related visits, especially for individuals seeking specific activities that are location specific, such as hunting or rock climbing (Beyers and Nelson, 2000). In both cases, the more and more an individual visits an amenity-rich, area, the more likely they are to permanently migrate to the area, as seen in Figure 1 (Stewart, 2000).

Figure 1: Stages Representing Increased Levels of Commitment to a Place



Source: Stewart, 2000

Specific natural amenities are also correlated with quality of life indicators. For example, forests can provide economic well-being to timber harvesters, while recreationists primarily

derive environmental and social well-being from forests. However, businesses that provide recreational services could also economically benefit from forests. The quality of life benefits of course are not limited to one group, with everyone having the ability to derive well-being from the economic, social, health, and environmental benefits that forests can provide. This is true for all natural amenities, and is not limited to forests alone. However, with respects to forests, studies have indicated that using forests for activities that result in the protection of the forest result in a higher level of social welfare than uses that result in timber consumption (Garrod and Willis 1997, Boyle and Teisl 1999 cited in Holmes, 2005).

Deller et al. (2001) proposed that economic growth in rural communities is influenced by the quality of life that natural amenities and their recreational services provide. Regarding water, the percent of land covered in bodies of water, along with the number of recreational opportunities were used to measure water's total contribution to quality of life. It was found that water does, in fact, influence economic growth by improving the quality of life.

Climate has also been found to influence quality of life (Rehdanz and Maddison, 2005). Temperate climates are often found to provide the highest quality of life, as reflected by regional population growth (Rehdanza and Maddison, 2005); however, certain recreational activities, such as skiing, demand a tradeoff between recreational opportunity and climate. The loss in quality of life from colder climates supporting activities, such as skiing, may, at in part, be offset by the gains in well-being that mountains and topographic variation provide. Of course, at some point, too much development or opportunities for recreation may result in marginally less, or even a negative effect on a person's overall quality of life. This creates the need for rural communities to consider sustainable growth policy regarding their natural amenities in relation to economic and population growth (Deller et al., 2001).

Regional Economic Impacts and Community Development

Areas that offer climatic, scenic, and recreational-supporting amenities have long been recognized for their ability to attract tourists, which in turn enhances growth and economic development (Johnson, 1989). Recent literature has provided ample evidence that amenity-rich areas in rural parts of the United States are experiencing higher rates of economic growth than other rural areas (McGranahan, 1999). This is attributed to services and tourism, which are supported by the presence of natural amenities (Bergstrom et al., 1990).

Recreation is a unique sector in that it acts as an export industry. This means that instead of producing goods that are sold to the local population, primary consumer spending typically comes from sources outside the area (Bergstrom, 1990; Gibson, 1993). Many rural counties are embracing this form of growth and are allowing themselves to rely economically on the recreation and tourism sectors. In some ways, this may be beneficial in term of economic growth, since improving a community's recreation sector has the potential to better local income, employment, and income distribution (Marcouiller et al., 2004). Historically, rural areas as a whole tended to have lower levels of well-being in comparison to urban communities. This has been traced to two primary problems—a lack of economic growth and a lack of diversification within the local economy (Marcouiller and Green, 2000; Deller et al., 2001). Promoting the recreation sector can provide both economic growth and diversification, although it may not be in ways that are intended or beneficial to the community.

All recreation counties are to some extent tourism dependent. The actual degree to which this is true is a function of recreational sites and natural amenities (Marcouiller and Prey, 2005). As pointed out by Marcouiller and Prey (2005) “a supply perspective of tourism dependence reflects a complex combination of natural amenities and recreational sites which are influenced by an array of factors that act to provide opportunities which satisfy leisure-based needs and desires”,

and that “key determinants of [recreation] location build from a combination of factors that involve both the endowment of natural amenities and the presence of recreational demand markets”. Furthermore, both the quantity and the quality of natural amenities have been cited as driving factor with respects to the success of recreation/tourism dependent communities and businesses (Marcouiller and Green, 2000).

Demand for recreation opportunities is reflected in consumer’s willingness to pay, with higher prices correlating to more heavily demanded activities. Several studies have been conducted that estimate the value of recreational activities. These values can widely differ by study, activity type, and region. Therefore, in order to obtain a “best guess” for the estimated value of recreational activities, Kaval and Loomis (2003) conglomerated a database of 1,239 estimates of outdoor recreation values, spanning from 1967 to 2003. Summary statistics for thirty recreational activities and the consumer surplus that users derive from them is shown in Table 2. These findings can also be seen by region in Table 3.

The U.S. Forest Service’s Input-Output Modeling System provides an overview of the dynamics of this change by defining the aggregate economic effects of amenity-based recreation. In a general sense, the aggregate economic effects from growth in the recreation sector are defined as the summation of the effects from three types of recreational spending: direct, indirect, and induced. Direct effects are defined as on-site transactions that occur when a visitor is at a recreational/tourism site. For example, transportation, lodging, food and beverage, and other supplies (such as gasoline) that are incurred by a tourist/recreationist during their visit are typical forms of consumption that lead to direct effects on the community’s economy. This payment creates both indirect and induced effects on the economy. Increased spending in a tourism/recreationally-based community means that there is an increase in demand for goods and services. This means that suppliers (i.e. restaurants, gas stations) will need to purchase more inputs (i.e. food, gasoline) to meet the increasing demands of visitors. Ultimately, this creates an inter-industry spending chain, which works its way through the supply chain, which in an economic sense has *indirect effects* on all suppliers involved in the creation of the good. Finally, those directly supplying the goods and services to visitors (i.e. fast food employees, business owners) experience *induced effects* from the visitor’s spending. This is because of an income effect, in which suppliers are making more income and therefore are able to spend more money locally. Like visitor spending, local spending created by an induced effect has both direct and indirect effects on industry sectors. The total economic effects (direct, indirect, and induced) from visitor spending is referred to as secondary economic benefits, since it is created from sources that are outside of the local market (Bergstrom et al., 1990; Mulkey and Hodges, 2000).⁶

In terms of government spending, recreation counties have been found to collect more revenue than other rural counties; but in turn, they spend more as well. This tradeoff has become even more pronounced as the gap between recreation revenue and spending widens (Beale and Johnson, 1998). This is partially due to the increased demands that are necessitated by population growth and accessibility in recreation-based counties. For example, in order for a community to be able to accommodate for more recreationists and tourists, expansions in personnel, communication availability, and infrastructure (i.e. airports, roads) are necessary. However, these developments can be quite costly and can put a great deal of pressure on recreation-based communities in terms of fiscal spending (Gibson, 1993; Beale and Johnson, 1998). Many amenity-rich, rural communities who cannot support an initial outlay of capital may not be able to meet these demands.

⁶ For more information on the Input-Output Model Created by the U.S. Forest Service, refer to <http://edis.ifas.ufl.edu/FE168>.

Table 2: Average Consumer Surplus Values by Activity per Person per Day, 1967-2003 (1996 dollars)

Activity	Number of Studies	Number of Estimates	Mean	Std. Error	Range of Estimates	
Backpacking	1	6	\$43.42	\$7.74	\$22.35	\$66.95
Birdwatching	4	8	\$24.67	\$6.96	\$4.83	\$65.38
Camping	29	48	\$30.99	\$4.81	\$1.69	\$187.11
Cross Country Skiing	8	12	\$26.15	\$2.84	\$11.71	\$40.32
Downhill Skiing	5	5	\$27.91	\$7.07	\$12.54	\$52.59
Fishing	129	177	\$39.30	\$4.01	\$1.73	\$464.02
Floatboating/ Rafting/ Canoeing	20	81	\$84.09	\$7.97	\$2.25	\$329.02
General Recreation	15	39	\$29.25	\$7.24	\$1.18	\$214.59
Going to the Beach	5	33	\$32.86	\$4.22	\$3.15	\$98.18
Hiking	21	68	\$25.70	\$3.61	\$0.33	\$218.37
Horseback Riding	1	1	\$15.10		\$15.10	\$15.10
Hunting	192	277	\$39.10	\$1.83	\$2.17	\$209.08
Motorboating	15	32	\$38.56	\$6.19	\$3.15	\$169.68
Mountain Biking	7	32	\$61.48	\$10.09	\$17.38	\$246.41
Off Road Vehicle Driving	4	10	\$19.10	\$3.29	\$4.37	\$34.05
Other Recreation	15	16	\$40.58	\$9.64	\$4.76	\$172.35
Picnicking	8	13	\$34.55	\$8.91	\$7.45	\$118.95
Pleasure Driving (which may include sightseeing)	4	11	\$49.36	\$15.70	\$2.52	\$139.78
Rockclimbing	4	27	\$46.88	\$5.72	\$22.18	\$113.18
Scuba Diving	2	24	\$26.97	\$9.34	\$2.34	\$208.37
Sightseeing	15	28	\$30.70	\$7.33	\$0.54	\$174.81
Snorkeling	1	9	\$25.26	\$12.80	\$4.36	\$112.74
Snowmobiling	3	8	\$30.24	\$11.03	\$8.99	\$103.70
Swimming	11	26	\$35.57	\$5.12	\$1.83	\$111.95
Visit Environmental Education Center	1	1	\$5.01		\$5.01	\$5.01
Visiting an Arboretum	1	1	\$11.28		\$11.28	\$11.28
Visiting Aquariums	1	1	\$23.59		\$23.59	\$23.59
Waterskiing	1	4	\$40.85	\$10.60	\$12.61	\$58.39
Wildlife Viewing	69	240	\$35.30	\$2.20	\$2.00	\$289.90
Windsurfing	1	1	\$329.56		\$329.56	\$329.56

Source: Kaval and Loomis (2003)

Table 3: Average Consumer Surplus Values by Activity and Region per Person per day, 1967-2003 (1996 dollars)

Activity	Alaska		Intermountain		Multiple Area Studies		Northeast		Pacific Coast		Southeast	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Backpacking									6	\$43.42		
Birdwatching							3	\$29.05			5	\$22.05
Camping			21	\$28.93	2	\$9.85	10	\$27.59	4	\$86.96	11	\$21.49
Cross Country Skiing			7	\$24.90	1	\$12.67	3	\$28.83	1	\$40.32		
Downhill Skiing			3	\$33.02	1	\$19.61			1	\$20.90		
Fishing	4	\$51.66	48	\$41.31	14	\$39.61	69	\$27.17	15	\$36.97	27	\$66.01
Floatboating/ Rafting/ Canoeing	1	\$15.13	22	\$56.42	1	\$28.34	6	\$73.60	4	\$23.20	47	\$106.22
General Recreation	1	\$12.37	12	\$40.38	3	\$3.33	5	\$14.06	9	\$26.96	9	\$35.64
Going to the Beach							22	\$35.50			11	\$27.60
Hiking	1	\$12.93	7	\$32.11	1	\$20.87	3	\$62.65	49	\$19.37	7	\$50.32
Horseback Riding					1	\$15.10						
Hunting	7	\$54.73	109	\$40.46	12	\$51.41	87	\$39.54	18	\$37.91	44	\$29.47
Motorboating			7	\$44.73	1	\$28.63	3	\$24.73	8	\$22.45	13	\$49.10
Mountain Biking			6	\$153.73	1	\$17.61	1	\$34.11	16	\$41.40	8	\$41.35
Off Road Vehicle Driving			7	\$19.01	1	\$19.94			1	\$33.64	1	\$4.37
Other Recreation			10	\$46.96	1	\$17.36			1	\$62.06	4	\$25.06
Picnicking			5	\$23.56	1	\$15.69	2	\$47.04	3	\$53.52	2	\$30.52
Pleasure Driving	3	\$7.01	4	\$58.12	1	\$30.38	1	\$17.79			2	\$120.65
Rockclimbing			3	\$42.04	12	\$22.35	1	\$85.74			11	\$71.42
Scuba Diving							14	\$14.93	10	\$43.83		
Sightseeing	1	\$13.20	11	\$19.65	1	\$14.86	2	\$101.19	4	\$16.89	9	\$38.38
Snorkeling								9	\$25.26			
Snowmobiling			8	\$30.24								
Swimming			1	\$24.62	1	\$19.63	7	\$18.51	4	\$22.74	13	\$50.77
Visit Env. Education Center							1	\$5.01				
Visiting Arboretum											1	\$11.28
Visiting Aquariums											1	\$23.59
Waterskiing			2	\$47.47	1	\$55.83	1	\$12.61				
Wildlife Viewing	8	\$41.11	61	\$31.03	29	\$46.97	65	\$26.08	23	\$60.40	54	\$33.42
Windsurfing											1	\$329.56
Totals	26	\$38.20	354	\$39.58	86	\$36.61	306	\$32.04	186	\$34.96	281	\$52.42

Source; Kaval and Loomis 9(2003)

Given that a county is able to attract recreation- or tourism-based growth, problems can arise if this growth occurs too quickly. Studies have suggested that rapid economic development can lead to serious fiscal problems, especially regarding funding for necessary operating activities, such as education and health care. To make matters worse, the inherent fluctuations and seasonality of recreation demand can derail the precision and feasibility of a government's budget, especially with respects to long-term capital projects/improvements (Beale and Johnson, 1998).

As mentioned, although amenities can add to an individual's quality of life, so do services, such as schools and hospitals (Deller et al., 2001; McGranahan and Beale, 2002; Beyers and Nelson, 2000). Health care is a particularly important contributor to the social aspect of quality of life, and is one of the hardest services for local governments in recreation- and tourism-based counties to plan for. This is because even though a county may be marketing themselves towards recreation and tourism, their natural amenities may also attract retirees,

with 35 percent of retiree counties also designated as recreation counties (Beale and Johnson, 1998). With an increasing number of Baby Boomers retiring to amenity-rich areas, a lack of funding in health care could become a significant problem, since "older adults require more government services and contribute less to the local economy than the working age population" (Beale and Johnson, 1998, paraphrasing Mullins and Rosentraub, 1992). School systems may also incur significant funding problems, with more and more families wanting their children to grow up in a 'wholesome' community (Beyers and Nelson, 2000).

Employment and Diversification across Sectors

The expansion of the recreation and tourism sectors in rural communities has influenced not only employment rates, but also what types of employment opportunities are offered. The employment rate refers to the number of persons employed versus the working-age population in the local community, which is expressed as the percent of the working-age population. Regarding employment rates and growth, recreational and tourism opportunities have led to increased employment and opportunities of long-terms residents. This increase in economic prosperity has even led to a decrease in out-migration of permanent residents (Beale and Johnson, 1998; Green, 2001).

This increase in employment growth rates is usually thought of as occurring across the entire workforce, regardless of age. However, from 1990-2000, only persons aged 18-64 saw an increase in the employment rate within recreation counties—persons 65 and older did not experience this gain. Despite this, the overall growth rate was so substantial that overall, recreational counties saw a significantly higher employment growth relative to other nonmetropolitan areas (24 percent and 10 percent, respectively). In addition to differences in employment based on age, certain recreation-based counties saw more growth than others during this time period. These differences are attributed to the degree to which specific counties are recreationally-oriented, with counties that are classified as being more recreationally-oriented tending to have a higher rate of employment growth than counties that are less recreationally-oriented (Reeder and Brown, 2005).

Changes in employment diversification across sectors are another effect of growth in the recreation sector. The ERS typology assessment indicates that "more recreational counties are included in the service, nonspecialized, or government dependent categories" (Beale and Johnson, 1998). Nonspecialized indicates that a more diversified economy exists, since it is not dependent on only a few industries. The ERS typology assessment also suggests that recreational counties tend to have significantly less employment in traditional sectors such as manufacturing, farming, and mining (Beale and Johnson, 1998).

Overall, the most notable change in the economic dependency of amenity-rich, rural counties is that traditional business (i.e. manufacturing, resource extractive industries) sectors are being replaced by service and retail sectors (Marcouiller and Deller, 1996; Deller et al., 2001). Yet the loss of traditional businesses in exchange for a recreation-based economy doesn't just affect employment and the economic make-up of a community; it also changes the land. Of these resource-extractive land uses, timber production has been hit the hardest, with much of the land

being converted over to multi-use and ecosystem-based land management (Marcouiller and Deller, 1996).

This massive change in economic dependency is undoubtedly the largest contributor to the change in the economic quality of life dimension for permanent residents, with the long-term effects of this transformation yet to be fully understood. For example, despite the benefits that this new recreation and tourism dependency offers regarding short term employment growth and sector diversification, newcomers who have moved to a recreation- or tourism-based community may be willing to accept a lower wage than long-term residents, therefore making it more difficult for them to find a job. Furthermore, limitations on how far an employee can advance is inhibited in the service and retail sectors. This problem is exacerbated by the lower earning power and benefits that these sectors tend to offer to their employees (Reeder and Brown, 2005). This was typically not the case with traditional businesses, which paid higher wages and offered more benefits than retail and service sectors (Marcouiller et al., 2004).

Earnings and Income

No matter what the community, the total economic effects from visitor spending contribute to regional economic development and may even aid in a more equitable distribution of income throughout a community (Bergstrom, 1990). For this reason, some communities have opted to exploit their natural amenities by taking an “amenities strategy” in which they market themselves based on the values that can be derived from their local amenities (Gottlieb, 1994). However, just because visitor spending increases economic development, it doesn’t mean it comes without a price. Repercussions such as negative externalities that affect the environment, changes in the cost of living, and decreased community well-being may be so costly that they trump any gains that expanding the recreational sector supplies. Marcouiller and Deller (1996) note that “many rural residents argue that jobs in the tourism sector are seasonal, dead-end, and of lower wage compared to those in resource-extractive industries”.

In light of these issues, many studies have provided evidence that although some forms of growth are gained from tourism and recreation, they are not sustainable growth sectors in the long-run. For example, although in the short-run increased tourism and recreation leads to an increase in income and employment growth, focusing only on these two factors is a naïve approach to economic policy since it ignores the characteristics of a community’s economic development. Of primary concern is a divide in income distribution and the effect that this inequality has on overall social well-being (Marcouiller et al., 2004). Such problems have led to a divide in growth policy tactics within amenity-rich communities. On one side of the argument, communities may choose to focus their efforts on increasing the amount of tourism in the area, which has been shown to lead to fast, aggregate economic growth. Opponents of this view believe that rural, amenity-rich communities need to focus on more traditionally-based business sectors, since they tend to offer higher wages, benefits, and opportunities for advancement than tourism- and recreation-based jobs. Putting more weight on the preservation of traditional business sectors is believed to help to alleviate the unequal distribution of benefits that influxes of tourism- and recreation-based jobs create (Marcouiller et al., 2004). Marcouiller et al. (2004) estimates that income inequality was, in fact, significantly correlated with areas of high levels of tourism and recreation within the States of the Great Lakes Region of the United States. Specifically, recreationally-related natural amenities, including land-based (terrain and open-spaces available for outdoor recreation), river-based, and lake-based amenities were found to create a “hollowing out” in income distribution.

Relating wages back to natural amenities, McKean et al. (2005) investigated whether amenities that offer high-value recreation results in cumulative wage effects for the recreation

sector being comparable to other sectors in the area. The study focused on amenity-rich central Idaho, which offers high-value river recreation opportunities (i.e. whitewater rafting). Using an input-output model, the study found that the annual cumulative wage rate from working a job related to river recreation (\$17,294) was 40 percent less than the average personal income for Central Idaho (\$29,034). Thus, high-value recreation supported by high quality amenities does not support higher wages. Two explanations for this were cited. One, tourism does not support high-wage sectors, such as those in the extractive, professional, scientific, and technical industries. Second, the seasonality of the recreation sector can lead to a reduced income, with second jobs being a large source (1/3 for guides and outfitters) of income during the off-season (Leidner and Krumpel, 1995, cited in McKean, 2005). This finding provides additional evidence that development policy which solely supports economic development is faulty, and other indicators of community well-being should be considered before economic growth in the form of tourism and recreation is promoted.

Cost of Living and Income Distribution

Yet another issue that can affect the economic well-being of a community is income inequality created by tourism and recreation growth. The seasonality and low-wages associated with tourism are the most likely culprit for the ‘hollowing out’ of income distribution, in which only the rich and extremely poor benefit from growth. Unlike recreation and tourism sectors, traditional industries were not found to suffer from this inequality in income distribution (Marcouiller and Green, 2000).

Related to income inequality are changes in the cost of living for residents, which may cause economic gains from the recreation sector to be unsustainable in the long run. The main reason for changes in costs of living is that tourists tend to have a higher willingness to pay than permanent residents in non-metro areas. This higher willingness to pay leads to businesses tapping out demand by supplying their goods and services at higher prices.

Housing prices are also subject to higher prices as the cost of living increased. Proximity to natural amenities or recreational structures has been found to housing prices, where those that are closer often sell at a premium due to their being in relatively higher demand (English et al., 2000; Landford and Jones, 1995). These houses are usually inhabited by upper-income households, but low- and middle-income residents feel pressures from increased costs of living as well. On average, rent in recreation counties is 23 percent higher than in non-recreation counties. This rent premium increases relative to the degree of recreation dependency a county faces (Reeder and Brown, 2005). In some cases, communities characterized by high-amenity/quality recreation sites are characterized by housing prices so steep that permanent residents are forced to leave the community or commute to work from outside of town, where housing is more affordable. However, it has been found that in some cases, average income gains from a county’s increased recreation-dependency, at least in the short run, can outweigh the subsequent increase in rent, although this may not always be true (Reeder and Brown: 2005b). In any case, increased cost of living provides supporting evidence that overexploitation of natural resources for the sake of recreation-based economic development may not be as advantageous as it initially appears.

Community Development from a Social Perspective

Amenity-rich counties are not only affected economically from recreation and tourism—they also experience social impacts. Studies that explore this topic provide differing opinions concerning whether or not such changes are beneficial for a community. Regardless, one thing is universally agreed upon—a social restructuring is occurring in recreation-dependent counties,

which not only affects growth but also the well-being and quality of life of residents in the community, for better or for worse (Green, 2001).

Several social indicators shed light on the state of community development, which is influenced by amenity-based recreation. The indicators focused on here include population growth, poverty, education, health, and crime (Reeder and Brown, 2005).

Population Growth

In recent years, non-metro recreational counties have tended to have higher populations and population growth than the average non-metro county (Beale and Johnson, 1998; Reeder and Brown, 2005; English et al., 2000). From 1990-1998, more than 40 percent of population gains in nonmetropolitan areas occurred within recreational counties (Beale and Johnson, 1998). From 1990-2000, recreation-dependent counties experienced more than a 20 percent jump in population growth, which made the 7 percent population growth in other non-metro areas look almost trivial (Reeder and Brown, 2005).

This explosive growth has not always been the case, with growth rates historically fluctuating. In the 1970s, average population growth rates in recreation-based counties were twice that in other rural areas. This growth waned in the 1980s, but was still stronger than that in non-metro areas, which at that time were losing population. In fact, almost 80 percent of recreation-based counties gained population during this time period (Beale and Johnson, 1998).

Relating these findings to population growth in amenity-rich counties may help to shed some light on where future growth in recreation-dependent counties will occur. Locations with temperate climate, water bodies (especially lakes), and specific regions (i.e. Midwest and Northeast) tend to experience high population growth (McGranahan, 1999; Deller, 2001). These amenities and regions also tend to be hotspots for recreation development, which may imply population growth will be particularly high in these regions. Shumway and Otterstrom (2001) examined this trend in a study that focused on “the New West”, which is defined as counties in the West that tend to have an abundance of natural amenities, recreation-dependency, and retirement communities. Using a cluster analysis, they found that, in comparison to areas not typified as being in the New West (i.e. government, mining/manufacturing, agricultural, and diversified economies), New West counties were characterized by greater population sizes, population changes, net migration, and median incomes. They also tended to have the highest ranking on McGranahan’s natural amenity scale (1999), percentage of federal land, and income created from the service and retail sector.

Local governments in these areas should be wary, however, since uncontrolled population growth and the promotion of recreation development can have consequences on the economy and social well-being of a community (Beale and Johnson, 1998; Shumway and Otterstrom, 2001). The likelihood of population growth having social implications “...is particularly true if growth occurs rapidly and haphazardly, contributing to sprawl, traffic congestion, environmental degradation, increased housing costs, school overcrowding, a decrease in open land, and loss of a ‘sense of place’ for local residents” (Reeder and Brown, 2005). The social implications from sudden, un-tethered population growth are also of special concern for communities who were previously dependent on resource extractive industries (Green, 2001).

Poverty

As mentioned, the increased cost of living in amenity-rich, recreation- and tourism-based communities has the potential to degrade the economic well-being of residents. However, other factors can contribute to poverty in these areas. For instance, changes in the demographic norms within rural counties can be a determinant of the poverty rate. Studies have found that female-

headed and Hispanic households, which are more likely to be indigent, are increasing relative to male-headed household in nonmetropolitan areas (Green, 2001; McGranahan and Beale, 2002). However, Hoppe (1993) suggests that poverty-stricken households in these areas are more likely to be married families, rather than those in which the woman is the head of the household. It also found that extreme poverty is more centralized in the South, which on average tends to have less recreational and amenity values than other parts of the country.

Discrepancies exist regarding whether recreation counties have higher rates of poverty. English, et al. (2000) found no difference in poverty rates or income distributions in recreation-dependent counties versus non-recreation dependent counties from 1990-2000. This conflicts with the findings of Leatherman and Marcouiller (1995) and Reeder and Brown (2005), who found that the poverty rates were significantly lower in recreation counties in comparison to other rural counties. However, a higher percentage of income (61 percent) was found to be allocated to high-income households (>\$40,000/year in 1992 dollars) in tourism-based communities, which was only surpassed by rural counties that are characterized by agricultural processing (Leatherman and Macouiller, 1995).⁷ Again, this provides evidence of an income gap existing in amenity-rich, recreation-based counties, with residents being worse off than they would be if they worked in traditional resource-extractive industries (Reeder and Brown, 2005).

Education

Studies regarding education have tended to focus more so on migration to recreational/tourism dependent communities rather than on visitors/recreationists in these areas. Through these studies, however, projections on the educational attainment of permanent residents exists. In the amenity-rich recreational-dependent region of Southern Appalachia, nearly 70 percent of in-migrants, compared to 45 percent of nonmigrants, had more than a high school diploma (Jones et al., 2003). This finding is supported by Rasker and Hansen (2000), who found that in-migrants into amenity-rich areas tended to be well-educated individuals.

Overall, in comparison to other rural areas, recreation/tourism-dependent counties tend to have better educated residents that are less likely to be employed in the agricultural sector or other resource extractive industries (English et al., 2000; Reeder and Brown, 2005; Jones et al., 2003). This average is likely being driven up by the higher education levels of in-migrants, and although differences in education may lead to differences in values towards, say, policies in the environment (Jones et al., 2003), this is not necessarily a bad thing. From a social perspective, having a population with a more education can be incredibly beneficial in terms of economics and residents' quality of life. Education not only opens the doors to individuals in terms of more opportunities, it may also help alleviate poverty in the area since better jobs can be attained (Reeder and Brown, 2005). Of course, the availability of high-wage jobs in recreation-based counties may be lacking, and without the in-migration of businesses that can provide these jobs, there may be an exodus from the community of young adults searching for higher wage jobs outside of the community (McGranahan and Beale, 2002). This becomes even more likely given the predisposition of educated individuals to migrate (Basker, 2003). This may have economic and social repercussions on rural counties, especially those that are recreation-dependent, given its large proportion of the aging population (Shumawy and Otterstrom, 2001).

⁷ Low-income families (<\$20,000/year in 1992 dollars) received six percent of the total income. In this study area (the Kickapoo River Valley, WI, 44 percent of the population was considered low-income, while 22 percent were high income.

Health

The presence of natural amenities, such as clean air and water, in recreation-based areas may have positive health benefits. Furthermore, as the name implies, recreational activities tend to offer activities that are physically exerting, which may help to improve the overall health and well-being of individuals. In fact, over a three year period, the death rate in recreation-dependent counties has been found to be nearly ten percent less than that in non-dependent rural counties.

In terms of health services provided, since many recreational-dependent counties are characterized by retirees, whose demand for health services may increase the number of physicians and facilities in the area, which could lead to better health care. For example, “in 2003, recreation counties had 123 physicians per 100,000 residents, compared with 83.4 per 100,000 residents in other nonmetropolitan counties (Reeder and Brown, 2005).

Longer lives and increased health services can also have negative impacts on society. This is because retirees tend to contribute a less taxes to the community than the working-age individuals, which means younger residents may be burdened by higher taxes that may be going towards services, such as health care, they are unequally benefiting from. This could create a disincentive for the younger population to live in the community, and could have serious social and fiscal long-term impacts (Shumway and Otterstrom, 2001; Siegal and Leuthold, 1993).

Another way in which community health can be diminished it through overdevelopment. Mallin et al. (2000) found that land development in coastal watersheds led to increase in the amount of harmful bacteria, such as fecal coliform and E.coli, in the water. Specifically, fecal coliform was found to have a significant, positive relationship with watershed population, percent of land development, and most importantly the percent of impervious surface. Threats such as this to human and wildlife health occurrences can decrease the quality of life in two ways. First, it can have a direct effect in which a human becomes sick, which diminishes the value they place on being a recreationist or tourist in a specific area. Even the threat of illness could prevent a significant amount of tourism or recreational altogether. Second, illnesses from these bacteria or other harmful elements could lead to decreased wildlife habitat quality and therefore habitat well-being. This could lead to decreased viewings and result in a lower willingness to pay for tourists and recreationists to visit the area.

For all of these reasons, although health risks are often considered less noteworthy than other social factors, it can have a significant influence the quality of life and general attractiveness of an area. Therefore, fiscal planning for health care and growth policies aimed at disease prevention should be among an amenity county’s top priorities with respects to social well-being.

Crime

Many rural communities have historically been characterized as having low crime rates and a “leave the front door unlocked” attitude. Exploitation of local amenities for recreation and tourism purposes can potentially change this norm and have negative effects on social well-being.

There are two possibilities for increased crimes. First, tourists and recreationists often carry more money on them than an average resident, which can attract the attention of pickpockets (Reeder and Brown, 2005). This form of crime tends to occur during the tourist season (McPeters and Stronge, 1974). Unoccupied second homes during the offseason are another prime target for crime, not only because of the ease of breaking in but also because these residents tend to be more affluent than local residents (Reeder and Brown, 2005). Howsen and Jarrell (1987) found that poverty, low family ties, and tourism increase in property crime rates, where property crimes include burglary, larceny, and robbery rather than crimes against life, such as murder and

assault. In general, any activity, such as tourism, that increases the number of transient individuals or strangers in a community increases the property crime rates in rural communities (Jarrell and Howsen, 1990). It has also been found that a significant and positive correlation exists between counties characterized as recreation-dependent and overall crime rate for serious crimes (crimes against both property and life). For instance, in 1999, the overall rate of serious crimes in recreation dependent counties was 2.8 per 100, while in other rural communities the rate was 2.4 per 100 residents (Reeder and Brown, 2005).⁸

Since crime is a negative externality, it can have serious repercussions on a society's well-being (McPeters and Stronge, 1974). In addition to an increased number of transient individuals in recreation- and tourism-dependent counties, crime has also been found to be driven by rapid population growth and increased service sectors in a community, both of which characterize amenity-rich recreation and retirement communities (Rephann, 1998; Beale and Johnson, 1998; Marcouiller and Deller, 1996).

Relationships between Natural Resource Conditions, Regional Economic Impacts, and Community Development

There will always be tradeoff between land development for urban uses and the well-being of natural resources. Communities that market their natural amenities and exploit excessive growth may lead to their natural amenities being irreversibly destroyed or degraded (ASPO, 1976 cited in Marcouiller et al., 2002; Esparza and Carruthers, 2000 cited in Marcouiller et al., 2002). This is especially true with recreational land development, which tends to occur in critical habitat and environmentally sensitive areas where water and wildlife are especially vulnerable (ASPO, 1976 cited in Marcouiller et al., 2002). Therefore, amenity-rich rural communities must find a balance between population growth and natural resource conservation such that development can be sustained in a way which ensures the ongoing well-being of a community's residents and the environment (Galston and Baehler, 1995).

Natural resource conditions are also indirectly affected by policy implications created by the differing views that in-migrants and permanent residents hold towards the environment. Although both permanent residents and in-migrants both tend have low environmental knowledge, Southern Appalachians in-migrants were found to have behavior and concerns for the environment that were higher than that of permanent residents. One reason for this may be that in-migrants tend to be better educated and more affluent, which is positively correlated with environmentalism. This implies that policies aimed at natural resource preservation may be subject to conflicting opinions and points-of-view from incoming and local residents (Jones et al., 2003).

Forest

As mentioned, many rural communities see timber production and forest-based recreation as competing industries that are mutually exclusive from one another. The main reason for this mindset is that inherent differences between the products that these two sectors produce. The output produced by timber production is considered a private market-based good, while the output produced by the recreation sector (recreation) is considered a non-market good that is public and common pool (consumed by a variety of groups, such as recreationists, local supporters, and nonlocal environmentalists). Problems in determining whether or not timber production or recreational land uses should be established can arise due to the difficulty in

⁸ Here, the term *residents* exclude tourists and seasonal residents. Accounting for this difference may significantly influence these findings.

obtaining the economic value of recreation. However, nonmarket valuation techniques such as contingent valuation, hedonic pricing, and the travel-cost method can be used to help determine the optimal policy with respects to recreation and resource-extractive needs. Moreover, a variety of frameworks exist to help in accomplishing this task, such as input-output models, social accounting matrices, and products analysis sequence for outdoor leisure planning (PASOLP) (Marcouiller and Deller, 1996; Marcouiller, 1997).

Policy implications regarding the use of forests can lead to heavy debates within a community. For example, the ongoing battle in the Pacific Northwest between loggers and recreationists for use of the forest space has led to economic, social, and environmental implications. Both development from increased recreational activities and logging in this region is wide-spread, which can have serious environmental consequences. For instance, logging of old-growth forests can permanently prevent their regeneration, which can lead to degraded water quality and soil erosion (Galston and Baehler, 1995). This issue is further complicated by the presence of species, such as the endangered spotted-owl, which require large expanses of old-growth forests for their habitat. Although this preservation compliments recreationists' demands for large expanses of pristine wilderness, it has severe economic consequences on loggers in the area whose livelihoods depend on land available for timber harvesting. This exacerbated by the fact that the local economy is heavily dependent on the timber industry, with little industry diversification into other sectors, which would help to cushion the effect of reduced lands for logging (Marchak, 1990).

Water

Many communities have embraced recreation as their main industry not just for economic reasons, but also because it is popularly perceived as being environmentally friendly in comparison to traditional resource extractive industries (Green et al., 2001). Agriculture and silviculture have long been recognized for their impacts on water quality, which in turn can affect recreational opportunities. However, these are not the only activities that degrade water quality—so does the development of land, which can lead to problems such as sedimentation and eutrophication (Michael et al., 1996). This means that as amenity-rich areas with recreational opportunities experience higher rates of population growth, they will also incur higher rates of land development. Given that water bodies, such as coast and lakes, are considered valuable natural amenities, this means that development may occur more densely around water bodies, which heightens the risk for them to be degraded (Carroll, 2002; Gonzalez-Abraham, 2007). The primary reason for water bodies to be such valuable amenities is because of the recreational opportunities they provide (Green, 2001). For example, on the Salmon River in Idaho, whitewater rafters spent an average of \$1,284 per person per trip (English and Bowker, 1996 cited in McKean et al., 2005); another study found in central Idaho, \$2,390 was spent annually why nonresidents on river recreation (McKean et al., 2005).

The degradation of water quality from runoff during development does not just affect water quality; it also affects the opportunities and value of recreation (Michael et al., 1996). For example, sedimentation can reduce the size of a lake and its clarity, which may reduce the utility a person derives from water-based recreation. Fishing can also be affected, since eutrophication can lead to decreased oxygen in the water, ultimately degrading aquatic habitats. Nutrients from runoff can also lead to excessive algae and weeds, which have been found to decrease the value of scenic amenities (Bejanonda et al., 1999). Decreased water quality can also lead to decreased willingness to pay for housing proximity to water bodies, since overall scenic beauty and recreational opportunities have a positive relationship with sales prices (Landford et al., 1995; Bejanonda et al., 1999).

Wildlife

Resource extractive industries such as logging are not the only entities that can have an impact on wildlife well-being. Development from recreation and tourism can also have an impact. Recall that recreation output is dependent on both recreation sites and natural amenities. As recreation sites increase, however, so does habitat fragmentation, which can be detrimental to wildlife well-being. Fragmentation also can decrease the quality of recreation, which can lead to less demand for recreation in the area. Furthermore, since a positive relationship exists between the number of recreation sites and tourism dependence of a community, loss of recreation demand in counties with a large number of recreation sites could lead to economic hardship for recreation-dependent communities (Marcouiller, 2005).

Recreation that is dependent on the presence of natural amenities poses a larger threat to wildlife than recreation in areas that lack natural amenities. This is because biodiversity tends to be greater in areas that are characterized by natural amenities. For example, mountain regions support a variety of ecological niches which are threatened by forms of recreation such as skiing (Nepal and Chipeniuk, 2005). Furthermore, recreation in such sensitive areas doesn't just have an effect on wildlife, it also has an effect on the community, since ecological well-being can affect community well-being (Wilkenson, 1991 cited in Brehm et al., 2004).

Topography and Minerals

Being a resource-extractive industry that is often located in amenity-rich areas, mining is often hit hard by the influx of recreation-based industries into a community. This is because there is a competition for land in which the resources that supports these two industries exist (Rasker and Hansen, 2000; Hansen and Rasker, 2002). Furthermore, mining is heavily dependent on affordable labor in order to make a profit. With the recreational industry offering higher wages than mining jobs, it is expected that mining industries located in amenity-rich counties will tend to relocate to areas with few or no natural amenities (McGranahan, 1999).

With an increased demand from recreation, lands that were historically used for mineral extraction are being bid out for recreational use. This means that mineral extractive industries are moving, with destinations tending to be in rural areas that have few natural amenities. Environmentally speaking, this reduction in mining could be beneficial in terms of reduced surface and groundwater contamination, increased biodiversity, and less erosion that is created during mining activities (Marcus, 1997). The environmental effects of mining in mountain regions is of special concern, given the biodiversity that such areas support (Gonzalez-Abraham, 2007). However, development from increased recreation and tourism can lead to similar problems, which can lead to net benefits from less mining and more recreational industries being insignificant, or even negative. For example, elk have been found to significantly decrease in areas that are using for skiing (Morrison et al., 1995). In a general sense, however, recreation tends to be sprawling and create a wide disturbance area, which can have negative effects on a wide variety of species and environmental factors (Knight and Gutzwiller, 1995). However, this loss must be weighted by the fact that recreational use is less severe than say, industrial use, and may help in preserving wildlife. Population growth may even help wildlife, since humans may be able to help maintain and support the ongoing preservation of the area for recreation, and therefore, at least in part, wildlife habitat (Green, 2001).

Climate

Climate plays a large role in recreation in tourism, since climate itself is recognized as a natural amenity. However, this relationship is not well-studied, with most focusing on climate change (Lloyd and Auld, 2001).

One of the most notable roles of climate in relation to recreation however is its regionalism. For example, the rainy coasts of Seattle are generally not the first place that people consider when deciding where to go on vacation, nor is Black Mountain in Georgia, where average temperatures are above freezing year round. This means that growth is regional, along with the environmental effects that this growth brings. However, climate doesn't just influence the types of recreation that is attracts—it is also a determinant for other natural amenities. For example, biodiversity, species endemism, water resources, and forests are all supported and determined by climate, and disturbances in the climate can lead not only to decreased recreation, but also the decreased well-being of the natural amenities that rely on it (Gonzalez-Abraham, 2007; Dale et al., 2000; Varis, 2004).

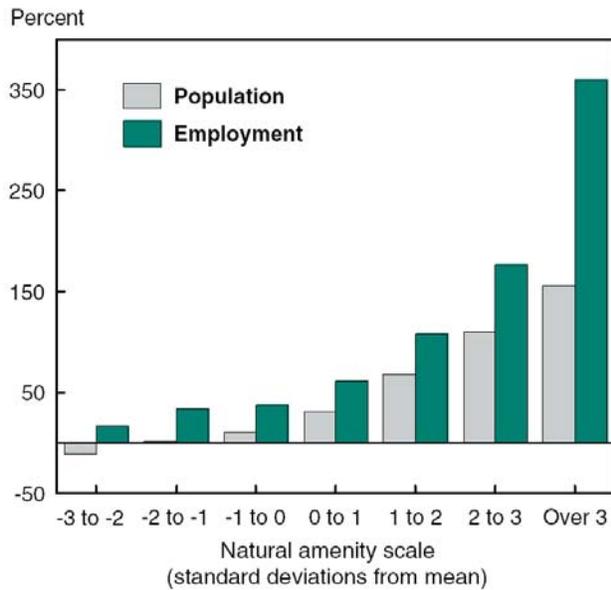
Section III: Amenity-Driven Household Location Decisions And Activities

The previous section focused on the relationships between natural amenities, recreation, and tourism. Some of these individuals choose to permanently move to the area; however, they are not the only ones that derive enough value from natural amenities enough to move to an amenity-rich area, and these values not necessarily being tied to tourist- or recreation-based services. Therefore, the following section will consider amenity migrants as a whole with respects to their location decisions, as well as their economic and environmental impacts and how they relate to natural resource conditions.

Household Location Decisions

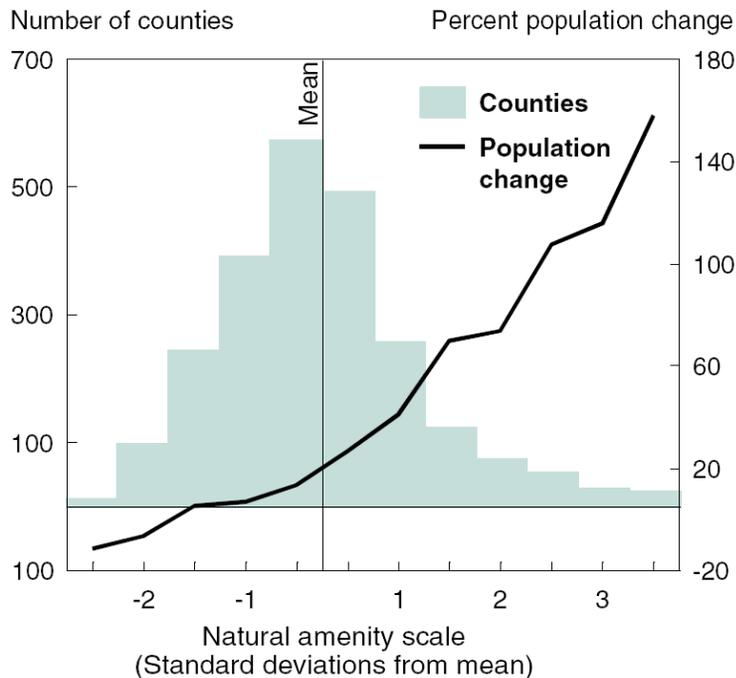
From 1970-1990, two types of rural areas presented themselves as being popular spots for migration destinations: those that had a high proportion of retirees and those that offered exceptional environmental amenities (Sutton and Day, 2004). Often, these two areas overlap significantly. With respects to growth from the presence of environmental amenities, *Figure A1*, in the Appendix, which uses McGranahan's natural amenity scale, provides evidence that, on average, counties who scored higher on the amenity scale relative to an average county in the U.S. are primarily located in the western half of the country, in what are called the frontier counties (McGranahan, 1999). This map provides valuable information in terms of relating a county's score on the amenity scale to an accurate reflection of spatial trends in population growth. To explore this, McGranahan (1999) used population data from 1970 to 1996 to provide evidence that a county's amenity score is, in fact, correlated with a county's population growth and employment, as seen in *Figure 1*. Evidence of this relationship can be gathered through comparing the amenity scores in *Figure A1* to the population growth trends in *Figure A3* in the Appendix. For example, the scale shows that counties who scored highly on the amenity scale more than tripled their population during a 32 year time period, while low-scoring counties lost population, and in some cases this loss was quite significant (greater than 20 percent loss). *Figure 2* graphically illustrates this, where counties with an amenity score of -1.5 or less, on average, lost population.

Figure 2: Average Changes in Nonmetropolitan Employment, 1969-96, and Population, 1970-1996, by Natural Amenity Score



Source: McGranahan, 1999

Figure 3: Average Nonmetropolitan County Population Change, by Natural Amenity Score



Source: McGranahan, 1999

Second Homes

Most Americans at some point in their lives will travel to a location primarily for its natural amenities, may it be to relax at the beach or go skiing in the mountains. Of these travelers, some will stay in a motel for the weekend, while others may retreat to their second home for part of the year. A few may even choose to permanently pick up and move to these areas to improve their

quality of life through the presence of natural amenities (Stewart, 2000). Stewart (2000) points out that repeat visits, especially for people who have more direct experiences by staying with family and friends, are often the first steps to a family or individual deciding to make some sort of permanent investment into the area, may it be a permanent relocation or the purchase of a second home for seasonal use.

Second homes, or seasonal homes, include cottages or recreational homes that are privately owned (typically by urban or suburban households) and are used for weekends, vacations, or holidays (Green and Clendenning, 2003). In fact, during the past twenty years, the number of seasonal homes in the United States more than doubled from 1.7 million in 1980 (1.87 percent of all housing units) to 3.6 million in 2000 (3.09 percent of all housing units) (U.S. Census Bureau, 2000 cited in Carroll, 2002). In 2005, a staggering 39.9 percent of homes purchased were second homes (3.34 million), with 12.2 percent of the total housing market being purely for vacation purposes (1.02 million) (Molony, 2006). This may, at least in part, be due to historically low interest rates since it's less of a commitment than permanently relocating to an area (Stewart, 2000; Molony, 2006). This growth may also be stemming from a 1997 change in tax laws (Carroll, 2002). Moreover, despite homes sales drastically dropping from 2005 to 2006 (i.e. investment homes sales decreased 28.9 percent from 2005 to 2006) vacation home purchases increased 4.7 to 1.07 million, making up 14 percent of the market share (Molony, 2007).

To make this trend even more interesting, studies show that in comparison to areas that are composed primarily of migrants and established residents, second home owners are often detached from the community and its needs for investment. Green et al. (1996) found that permanent residents were more likely to support activities that promoted local economic development, with less of a tendency to support land use planning than seasonal residents. This lack of commitment can lead to serious problems in the community and degrade its overall wellbeing and condition in comparison to areas that are primarily composed of permanent residents (Stewart, 2001; Green et al., 1996). Green et al. (1996) also found that as seasonal residents spend more and more time at their second home, their interest in supporting land use planning declines.

A majority of natural amenities tend to be located in more remote areas of the country (McGranahan, 1999), and due to property taxes and other costs related to maintenance of a second home, homeowners have financial incentives to eventually make their second home their primary (Stewart, 2000). This permanent relocation to amenity-rich areas is called amenity migration. It's usually a gradual process, and most people don't acknowledge migrating as being a real possibility unless there are direct experiences that would lead them to consider it. Stewart (1994) found that people who were considering migration were one of three groups: (1) they had grown up in the area, (2) they had repeat tourist visits to the areas, or (3) they had friends or family they visited there.

In comparison to primary homes in amenity-rich areas, second homes tended to have certain characteristic attributes that set them apart from primary home choices. On average, migrants tend to prefer to areas that are sparsely populated, within 30 miles of a major city, and in an open country setting (Brown et al., 1997). Topography also should be considered; for example, mountainous areas in the Yellowstone Region have experienced higher rates of population growth than landscapes predominated by plains (Rasker and Hansen, 2000).

Such preferences have led to rural sprawl, in which people move to open country despite the fact that their profession is not a resource-based activity such as agriculture or forestry (McGranahan and Beale, 2002). Studies have found that second homes tend to be further away from cities that are less densely populated than in areas where primary homes are located. Furthermore, a close but not too close approach was often taken with respects to main roads and

proximity to cities (Cho et al., 2003, 49; Bidwell, 2004). This is of concern since such development patterns in lands that were previously undeveloped can have negative effects on natural amenities and ecosystem well-being and its functions (Bidwell, 2004).

Bidwell (2004) conducted a study in Okanogan, WA, which examined land use trends related to second home development. It found that second homes tended to be on small parcels with housing attributes that were similar to a homeowner's primary home. Second home owners also tended to move there for visual amenities rather than recreational opportunities; however, this is not necessarily true for all regions of the country.

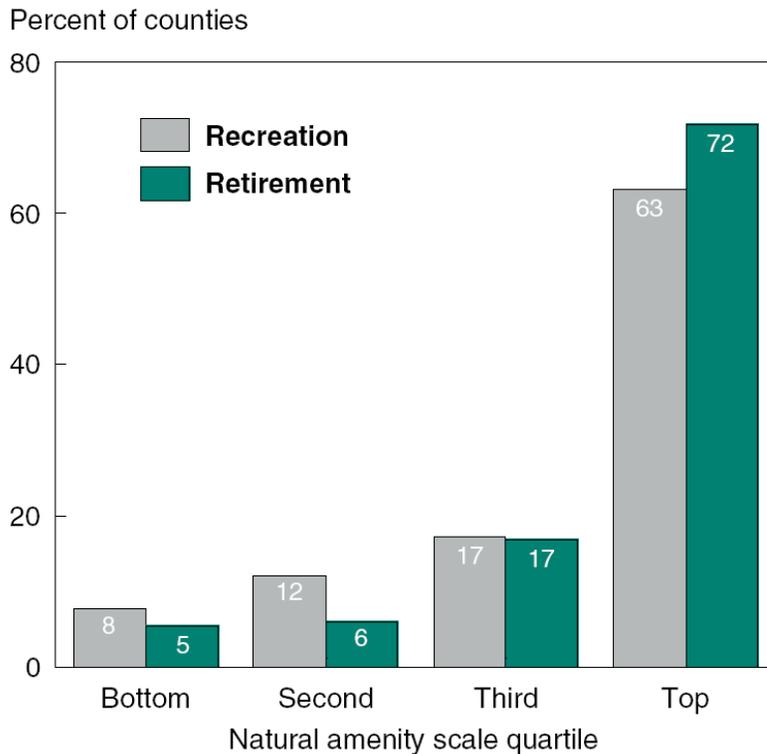
Research has found that development will tend to become denser around amenities as they become more accessible. For example, development occurs more heavily around access points near beaches. This can lead to problems however, since there is a fixed amount of land to supply, and increased demand may lead to encroachment of development on the amenities that attracted development in the first place. Hot spots, such as greenways and parks, that are located in areas with few natural amenities, are especially subject to overdevelopment of surrounding lands, and require well-thought-out growth management strategies (Wu, 2001).

Retirees

Retirees who were once dependent on family and friends to take care of them in retirement years now have the ability to move wherever they please, partly because of the financial freedom that government entitlement programs and pension plans have given them (Stewart, 2000; Thrush and Wilder, 1999).

In a national survey conducted by the American Association of Retired Persons (AARP), Baby Boomer participants indicated that they were planning to relocate after they retired (AARP, 1998 cited in Stewart, 2000). Stewart (1994) also found that there was a strong link between second homes and retirement, with many of the people reporting interest in buying a second-home when they retire (cited in Stewart, 2000). This is a cause for concern since more than 70 percent of retirement counties are located in the top quarter of amenity-rich counties, providing evidence that retirees tend to migrate to areas that are high in natural amenities. These areas are usually located around plentiful scenic amenities, mild climates, and national parks, such as in the Ozarks, Appalachians, and the Upper Great Lakes (Beale and Johnson 1998; Haas and Serow, 1993; McGranahan, 1999). The rate of growth in retirement counties even exceeds the population growth in recreational counties, although both tend to be more heavily based in amenity-rich counties, as seen in Figure 4. Retirement and recreational areas are not mutually exclusive, however, and 35 percent of counties are indexed as being both. This is because places that retirees tend to prefer are also popular locations for recreational activities (Beale and Johnson, 1998; Heaton et al., 1981).

Figure 4: Rural Recreation and Retirement Counties, by Natural Amenity Score



Source: McGranahan, 1999

Knowledge Workers

As mentioned, technology is one of the three main factors driving amenity migrations (Stewart, 2000). Of most importance regarding this driver is the influence that the telecommunication revolution has had on enabling individuals to live in places that are segregated from their place of work. Just a few decades ago, it wouldn't have been feasible for persons to conduct business in one area and live in another, but telecommunication has made it possible—and specifically, these workers are heading to amenity-rich areas (McGranahan and Wojan, 2007). This trend can be seen by comparing Figure A4 in the Appendix, which shows where these workers are primarily located to McGranahan's natural amenity scale in Figure A1 in the Appendix. Significant overlap between knowledge worker and amenity location is evident.

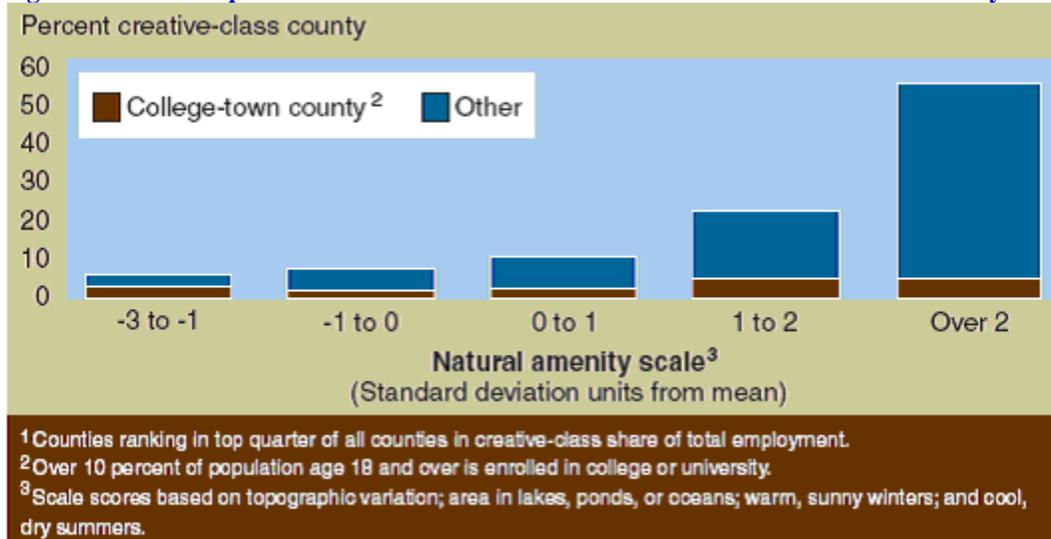
This group of in-migrants is called the knowledge workers (also referred to as the creative class), which is defined as a labor force that promotes economic growth through new ideas and innovations that increase productivity and technology to support new products. Typical creative class occupations include, but are not limited to, engineers, architects, artists, lawyers, computer programmers, and health service providers (Henderson and Abraham, 2004; McGranahan, 2007). It is estimated that half of the gross domestic product in Western industrialized counties is created by knowledge workers (Henderson, 2004).

It has been found that natural amenities tend to attract knowledge workers, and is increasingly playing a stronger role in where these workers decide to locate (Rappaport, 2003; McGranahan and Wojan, 2007). Eleven percent of non-metropolitan counties in the United States have been deemed creative class counties.⁹ Of the top quarter of these counties in terms of

⁹ Refer to McGranahan (2007) for information on creative class county codes or visit the ERS website at, www.ers.usda.gov/data/creativeclasscodes/. Florida (2002) also provides insight into modern methods used to define the creative class.

prevalence of knowledge workers, approximately 60 percent scored as having a high number of natural amenities on McGranahan’s Amenity Scale.¹⁰ Twenty-six percent of counties that have low to medium proportions of knowledge workers were also located in amenity-rich counties (McGranahan, 2007a). Knowledge workers prefer areas that are mountainous, have sunny

Figure 5: Nonmetropolitan Creative-Class Counties are More Prevalent Where Amenity Scores are High



Source: USDA Economic Research Service and Census of Population 2000 cited in McGranahan and Wojan, 2007a.

Figure 6: High Creative-Class Nonmetropolitan Counties Gained Jobs Faster than Other Nonmetropolitan Counties

High creative-class nonmetro counties gained jobs faster than other nonmetro counties		
County type	Creative class counties, 1990	
	Low/middle	High ¹
	Percent change in jobs, 1990-2004	
Metropolitan	31	39
Nonmetropolitan	18	44
Not adjacent to metro	16	40
High-amenity county ¹	26	60
Recreation county	32	61
Not recreation county	16	28
Percent college graduates ¹	16	46

¹ Ranked in top quarter of all counties.

Source: Bureau of Economic Analysis, Regional Economic Information System files cited in McGranahan and Wojan, 2007a.

winters, and contain a mix of forest and open space (not including land use dedicated to row crops). Furthermore, they tend to be even more drawn to these natural amenities than net migrants are in general (McGranahan and Wojan, 2007b). To a nearly identical degree, knowledge workers prefer recreation counties, especially those that have specialized recreation

¹⁰ See Figure A.6 in Appendix for illustration of McGranahan’s Amenity Index.

(McGranahan and Wojan, 2007a; McGranahan and Wojan, 2007b).¹¹ Figure 5 and 6 show that the creative-class is attracted to natural amenities, and are hotspots in terms of employment growth (McGranahan and Wojan, 2007a).

Relationship between Natural Resource Conditions, In-migration Patterns, and Socioeconomic Trends

It is widely acknowledged that in-migration trends and patterns can be, and usually are, correlated to the presence of natural amenities (Beale and Johnson, 1998; McGranahan, 1999). Vacation homebuyers in 2005 indicated that they valued amenity services provided by amenities in their general vicinity. Water is the biggest draw (Carroll, 2002), and in portions of the Upper Great Lakes and the Northeast, one-third of seasonal homes tended to locate around lakes that offered recreational activities (Beale and Johnson, 1998). Nationally, two-thirds of homebuyers in 2005 wished to be near water (ocean, river, or lake), while 39 percent wanted to be near areas that offered recreational or sport activities, and 31 percent wanted to be near mountains or other natural amenities (Molony, 2006). Comparing Figure A1 and A5 in the Appendix shows evidence of the relationship between a county's amenities, as defined by McGranahan's natural amenity scale, and its percent growth in second homes.

Other studies have also recognized the influence that water has on in-migration (Stewart, 2000; McGranahan, 1999; Marcouiller et al., 2002; Gustafson et al., 2005). Gonzolez-Abraham (2007) found that buildings tended to become denser as lakes get larger. Since people often value larger lakes more than smaller ones, this result implies that as the value a people place on lakes increases, the more accepting they are to be close to neighbors. In fact, in Gonzolez-Abraham's study site, 41 percent of building were within 100 meters of the lakes, and clustering tended to occur such that houses were on average 50 meters away from each other. This type of sprawling development may be indicative of the preferences of in-migrants, as suggested in the previously mentioned study of Brown et al. (1997). Certain regions in the U.S. have also experienced high rates of population growth due to their water resources. The Northern portion of Midwestern U.S. and coastal areas are generally at the top of the list, as seen in Figure A6, Map 6 (McGranahan, 1999).

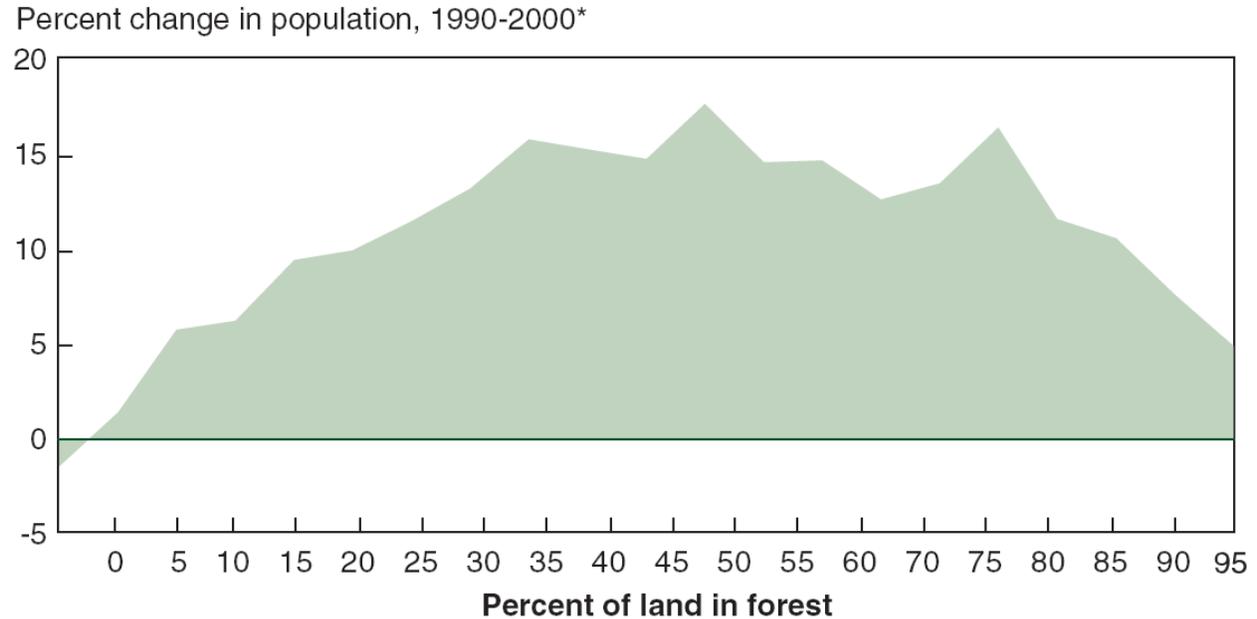
Forests are another particularly attractive place for in-migration. Although more water is considered better in terms of migrant preferences, the same does not hold for forests (English et al., 2000; Deller et al., 2001). However, newer studies have found that on average, recreational uses of forests only tend to occur in extensive forest located in mountainous areas, while residential land use tends to occur in areas that have a mix of forests and open land (Rasker and Hansen, 2000; McGranahan, 2005). Figure 7 provides evidence of this, showing that counties whose percentage of lands covered in forests ranged from 45-60 percent experienced 11 percent in-migration from 1990 to 2000, while counties with greater than 80 percent experienced lower rates of growth (McGranahan, 2005; McGranahan and Sullivan, 2005). This finding is further supported by Gonzolez-Abraham et al. (2007) who found that as the density of deciduous forests increased in counties in Northern Wisconsin with 60 percent forest cover or more, housing density decreased. (McGranahan and Sullivan, 2005). This does not mean that dense forests are not valued, however, since these areas hold the potential for recreational opportunities. For example, from 1990-2000, counties with no significant forest tended to have net out-migration, while counties with 90 percent or more of their land covered in forest had approximately four

¹¹Of the top quarter of these counties in terms of prevalence of knowledge workers, approximately 61 percent were deemed recreational counties, while 32 percent of counties that have low to medium proportions of knowledge workers are located in recreational counties.

percent net in-migration (McGranahan, 2005). Therefore, although demand for a higher forest cover is less than the demand for mixed cover, it is higher than if there were no forests at all.

Topographic variation, such as mountains and hills, is also correlated with amenity migration, as seen in Map 5, Figure A6 in the Appendix (McGranahan, 1999; Rasker and Hansen, 2000). This may partially explain why the Mountain West is one of the most prominent areas of amenity migration in the United States. In the mountainous areas of the Yellowstone Region, population growth rates have tended to be higher than in landscapes predominated by plains. It has also been suggested that amenity migrants are willing to make a tradeoff for increased variation in

Figure 7: The More Forest in a Rural County, the Greater the Population Growth, but Only Up to a Point



*Averages calculated at intervals of 5 percentage points.

Source: McGranahan and Sullivan, 2005

topographic terrain in exchange to colder climates in the Intermountain Region of the United States (Rasker and Hansen, 2000). Booth (1999) found that although in-migrants like to be located near mountains for aesthetic beauty and quality of life benefits that they offer, many in-migrants still hold ties to nearby metropolitan areas, may they be social or economic in nature. This means that mountain communities offering accessibility and proximity to metropolitan areas experience higher population density than communities that are not characterized by mountains.

Wildlife is also considered a natural amenity, and given that it is a biotic amenity, it is especially unique in comparison to other natural amenities. Although wildlife is not included in McGranahan's natural amenity scale (McGranahan, 1999), wildlife can provide utility. Wildlife is often abundant in high-amenity counties, since the ecosystems that these amenities provide support wildlife habitat. Since the late 1980's, demand for wildlife amenities has led to substantial growth in Western parts of the U.S. since the 1980s. Residents in amenity-rich areas are often cited for the nonuse values that they place on wildlife, but consumptive values are also derived (Ingram and Lewandrowski, 1999). For example, in rural areas, where natural amenities predominately are located, residents are twice as likely to hunt or fish. From 1955 to 1996, the number of hunters has significantly increased, with 41 percent of this growth being attributed to population growth (Fish and Wildlife Service, 1997 cited in Ingram and Lewandrowski, 1999).

Lastly, climate is one of the strongest amenities driving in-migration. McGranahan's natural amenity index accounts for several climatic factors, as seen in Maps 1,2,3, and 4 in Figure A6 in

the Appendix. Temperate climates, with little variation between January and July temperatures, is one desired feature driving in-migration. Warm winters are also desired; however, as mentioned above, amenity migrants are willing to make a trade off in exchange for topographic variation (Rasker and Hansen, 2000). Sunny skies with few clouds in the winter and low summer humidity are also desired climate characteristics (McGranahan, 1999). It has also been suggested that population growth is slower in drier counties (Rasker and Hansen, 2000). A specific attraction for the elderly, represented by migration, is shown for temperate climates (Rappaport, 2007).

Economic Impacts of New Amenity-Driven Residents

Broadly speaking, housing price premiums, property tax revenues, and increased demand in the service sector are the three primary economic aspects that population growth influences. For amenity-rich rural communities, this growth is perceived as being highly valuable, since historical growth in these areas has tended to be meager (Deller et al., 2001).

Inevitably, population growth will lead to an increase in demand for residential development. In amenity-rich counties, land used for housing is often converted from either previously undeveloped land or land used for resource-based industries, such as agriculture or mineral extraction (Dramstad et al., 2006). This can lead to intense environmental and economic changes, which may not be for the best. Focusing on economic changes from initial home building, one of the main reasons that there has been a substantial increase in housing units in amenity-rich areas is the demand for the scenic amenities they offer (Stewart, 2000). This is implied through houses with a generic view of amenities (ocean, lakes or mountains) selling at a 25.9 percent premium relative to houses without views of natural amenities (Benson et al., 1998).

Since many people derive value from being in the presence of natural amenities, it should be no surprise that they have a positive willingness to pay (WTP) to live in such areas. This WTP is usually reflected through the acceptance of lower wages and higher rents incurred from living in an amenity-rich area. Reichert and Rudzitis (1994) provide evidence that wage levels do, in fact, have an effect on in-migration to amenity locations. Non-labor force in-migrants tended to move to areas with low wages where amenities are capitalized in the labor market, but labor force in-migrants chose to move to areas with higher wages and less amenities. Furthermore, income cuts were accepted by migrants who chose to move to amenity-rich locations. Non-labor force migrants tended to not be affected by rents, while lower income migrants had a propensity to move to low-rent areas and high income migrants moved to areas with higher rents. Graves et al. (1999) provides evidence that in order to fully understand how much people are willing to pay for access to amenities in terms of wages and rents, studies should also account for fringe benefits that employees receive, which in some cases can account for as much as 40 percent of a person's total wage payments. Therefore, WTP is even higher than when solely accounting for WTP through wages and rents when fringe benefits are also accounted for.

In light of this, locating in or within commuting distance of an amenity-rich area can have substantial benefits for businesses. Since people derive value from being in close proximity to these amenities, businesses are able to compensate workers at wages that are lower than in areas that are not rich in natural amenities. This is often because of rent and wage effects which occur when amenities are capitalized into the land and labor markets, respectively. The acceptance of a lower wage by the labor force in turn creates a production amenity for businesses, since they are able to employ individuals at wages that are lower than typical wage rates. Economic theory would suggest that as more and more migrants move to areas that are highly demanded for their amenities, decreasing wages and higher rents will lead to less demand, and eventually a point of equilibrium will be established (Graves et al., 1999). However, disequilibrium in these land and

labor markets is still occurring and provides evidence that migration into amenity-rich areas is far from over.

A difference in real wages due to compensation from amenities does not necessarily mean that an individual has to live where the amenities are located. Schmidt and Courant (2006) found that individuals are willing to accept lower wages and live outside urbanized areas in exchange for proximity to accessible amenity-rich areas. However, as an individual gets farther and farther away from amenities that they desire to be near, higher compensation in the form of wages required.

Migrants also aid in increasing the value of properties in an area. In the southern Appalachian highlands, the effect of second homes on housing prices in rural areas was significant, with second homes impacting home value by an estimated \$2,378, or approximately 4.2% of the average value of a rural home in that area (Knapp and Graves, 1989). The study also found relationships between second homes and factors that enhance their value. For example, decreased population density, decreased travel time to work, distance to large cities, stream access, closeness to open areas, and increased elevation all increased the value of second homes (Cho et al, 2003).

Amenity migrants can also have a positive economic effect, since it has been shown that in-migration helps prevent long-time residents from leaving. This aids in providing a stable base for a community's economic well-being, although the same cannot be said for all rural counties, with low- or no-amenity counties losing five percent or more of their population from 1990-2000 (Rasker and Hansen, 2000; McGranahan and Beale, 2002).

Often, amenity communities sell the idea of marketing their community towards new development by discussing the monetary benefits associated with their presence. For example, migrants who move to amenity-rich rural areas on average have a higher income than long-term residents of the area. This has a two-fold effect, however. First, having higher income individuals move into historically low-income areas promotes the economy and results in higher incomes for long-term residents. However, having higher-income individuals in an area also results in higher costs-of-living, which unseats the gains (if any) in income (Clark et al., 2005). Furthermore, research suggests that in some high-amenity areas, the in-migration of high-income individuals has forced local, low-income individuals to move to less expensive areas that are further away, since they can no longer afford to live in their own communities (Loeffler and Steinicke, 2007).

The presence of knowledge workers in a community can be economically lucrative since they are known to pump money into an economy, and therefore they can improve the well-being of an economy (Florida, 2002). Some of these gains are experienced through the direct employment of knowledge workers. For example, non-metro counties that have manufacturing plants employing ten or more workers on average had knowledge workers account for 13 percent of their working class population (Wojan and McGranahan, 2007). This is because manufacturing plants often required skilled workers such as engineers in their operations.

Some economic gains to the community from the presence of the knowledge class are more direct in nature. For example, the knowledge class is often recognized for its high levels of consumption, especially in the service sector. They also support the community financially by increasing their property tax base. However, communities must also meet their demand for infrastructure that supports knowledge activities, such as broadband and other high-tech communication services. Rappaport (2007) suggests that technological development in areas with a high quality of life is one of the main driving factors behind in-migration. For example, in areas with high quality of life amenities experience 0.3 percent faster growth than localities with otherwise identical characteristics.

One of the main fiscal requirements associated with attracting the knowledge class is that there must be an adequate infrastructure present to accommodate their needs. In fast growing communities, the cost associated with new development may outweigh the fiscal benefits of new taxpayers (Faushold and Lilieholm, 1999; Altshuler et al., 1993 cited in Faushold and Lilieholm, 1999). This can be quite expensive, especially in counties that are less accessible, such as mountain communities. As pointed out by Faushold and Lilieholm (1999), population growth leads to the need for fiscal impact analyses (also known as cost-revenue analysis) in order to approximate the net fiscal impact from new population growth on a community.¹² Residential development usually incurs a net fiscal deficit; however, communities may be able to extract out additional revenues from activities related to the amenities they house, such as expenditures related to fishing, hiking, skiing, and biking. This, however, requires in-depth impact analyses due to the possibility that it may lead to furthered environmental degradation and destruction of the amenity that attracts residents in the first place.

Faushold and Lilieholm (1999) illustrate that the land use socioeconomic changes that inherently come with this form of amenity migration include land fragmentation and political pressure, which not only can have significant ecological effects but can also lead to the bidding out of lands traditionally used for forestry, farming, or ranching. These areas are especially vulnerable, given that many of these rural landowners are senior citizens. This is because in-migrant demand has led to an increase in estate taxes, which may pressure older, low-income individuals, who cannot afford these taxes, into having to sell their land (Small, 1996 cited in Fausold and Lilieholm, 1999).

Relationships between the Economic Impact of Household Location Decisions and Natural Resources

Forests.-- Economically speaking, forests can offer a variety of economic benefits. Direct use values, indirect use values, option values, and existence values can all be derived from forests. Examples of direct use values include timber, fuel wood, biodiversity, tourism and recreation values, and amenity values. Indirect use values include watershed protection and carbon storage and sequestration. More abstractly speaking, option value for a forest refers to a person's willingness to pay for the option to use the forest in the future, while existence value (a form of nonuse value) represents a person's willingness to pay to just know that the resource exists (Pearce, 2001). For a more in-depth overview and examples of these economic benefits, refer to Pearce (2001).

One of the most popular techniques used to determine the nonmarket values of forests is the hedonic method, in which housing prices and control variables can be used to determine the premium that homebuyers willing to pay for the presence of forests (Pearce, 2001). For example, Tyrvaenen and Miettinen (2000, 209) found that a 5.9 percent decrease in sales price of houses occurred for every 1 km increase in distance away from forest lands, while houses that had a view of forest land gained 4.9 percent premium over houses that didn't. Kim and Johnson (2000) took an approach to valuing forest land that considered specific characteristics of the stands as well as distance from the house to the forest. The study found that for every foot closer to forest land in general, the sales price will increase by approximately \$2.87. Furthermore, the study differentiated between different types of stands and their ages, finding that people tend to prefer areas composed of 85 percent or more conifer stands, and that overall, conifer and shelterwood stands are the most preferred forest characteristics. Timber on agricultural lands and clear cutting practices diminish the premium paid, as do even-aged industrial forested growth stands;

¹² Refer to Faushold and Lilieholm (1999) for a selection of fiscal impact analyses.

however, uneven aged growth stands are valued the same as shelterwood stands characterized by tall trees.

Water.-- Water is one of the most valuable amenities for residential properties to be located on or near to. This is not only because of the recreational opportunities that it may provide, but also because of its aesthetic value. In a study by Benson (1998), houses near high quality ocean views sold for approximately 60 percent more than houses without a high quality ocean view, and homes with a low quality view of the ocean sold at an eight percent premium. The market price for lakefront houses was found to sell at 126.7 percent premium relative to houses without a view, and being in proximity added 18.1 percent to the sales price. Distance to water bodies also plays an economic role, with housing prices exponentially decreasing as distance from the water is increased (Benson, 1998).

Lansford and Jones (1995) found that homes within 4,000 feet of the lake in their study area received a premium in their housing sales price for being near the lake, but houses that were greater than 4,000 feet away did not experience such benefits. Furthermore, houses that were within 2,000 feet of the lake received 75 percent of the sales prices premium created by the lake's recreation and aesthetic benefits, which accounted for 15 percent of the total sales price of these houses.

This provides some valuable insight into the previously reviewed findings of Gonzolez-Abraham (2007), which found that houses tended to be more densely packed near large lakes. The main reasons for this value are the recreational and aesthetic benefits that nearby households receive from the lake. In terms of amenities in general, unexpectedly high population growth can lead to poor land use planning and subsequent economic losses for amenity-rich communities. For example, older houses that have views of natural amenities may lose their view as the area is further developed, and the premium they originally received for their view is decreased, therefore leading to lower property taxes. Planning for the maximum view possible for the greatest number of people has the potential to make a significant economic contribution to amenity-rich counties who wish to promote residential growth (Correll et al., 1978, 30-9).

Wildlife.-- Areas that are rich in natural amenities, especially those that are in more pristine locations, can offer extensive habitat that supports the presence and well-being of many wildlife species, some of which that are extremely rare or endemic to the area. Two types of value can be derived from wildlife--use values and existence values. Use values include consumptive activities such as hunting and fishing, while existence values accrue not only to wildlife viewers, but to people who are interested in the ongoing survival and presence of wildlife. Existence values have been found to outweigh use values regarding wildlife; however, difficulties arise in valuing wildlife, given that the controversial Contingent Valuation Method (CVM) is the most widely-used technique to do so. Use of the CVM is especially ambiguous regarding wildlife valuation, since many people believe that their existence is priceless or are unsure of how much monetary value to place on something that doesn't have a price tag (Stevens et al., 1991). However, new methods are being examined that would improve the nonmarket valuation of public goods (i.e. wildlife) (Kalof and Satterfield, 2005). Table 4 provides the results from a meta-analysis analyzing WTP for several rare and endangered species, many of which are located in amenity-rich areas that are being threatened by in-migration.

Table 4: Annual Values per Household: Rare, Threatened and Endangered Species

Summary of Economic Values of Rare, Threatened, and Endangered Species			
<i>Studies Reporting Annual WTP</i>	Low value	High value	Average of all studies
Northern spotted owl	\$44	\$95	\$70
Pacific salmon/Steelhead	\$31	\$88	\$63
Grizzly bears			\$46
Whooping cranes			\$35
Red-cockaded woodpecker	\$10	\$15	\$13
Sea otter			\$29
Gray whales	\$17	\$33	\$26
Bald eagles	\$15	\$33	\$24
Bighorn sheep	\$12	\$30	\$21
Sea turtle			\$13
Atlantic salmon	\$7	\$8	\$8
Squawfish			\$8
Striped Shiner			\$6

<i>Studies Reporting Lump Sum WTP</i>	Low value	High value	Average of all studies
	\$17		
Bald eagle	8	\$254	\$216
Humpback whale			\$173
Monk seal			\$120
Gray wolf	\$16	\$118	\$67
Arctic grayling/Cutthroat trout	\$13	\$17	\$15

Source: Loomis and White, 1996

Topography and Minerals.--Regions with high topographic variation, especially in the Rock Mountain West, have experienced significant in-migration in recent years (Carruthers and Vias, 2005; Vias and Carruthers, 2005). However, it is not just the region that is demanded—homes with a mountain view have also been found to sell at a premium. Song and Knapp (2003) found that homes with a mountain view sold at a six percent premium in comparison to homes without a mountain view. This may not be true for all mountainous regions however, given that Bensen et al. (1998) found significant results for residential views of snow-capped mountain in Bellingham, Washington. This may indicate that mountain views, like lake views, can lose their premium as housing density increases (Gonzalez, 2007). It also may indicate that all mountains are not created equal, and that different views offer different premiums.

Climate.--Population change due to migration to places with warm climate has a large economic effect on people in the area, since such migrants, often retirees, have high disposable incomes. This can also lead to changes in education levels, since persons with higher incomes are often well educated (Rappaport, 2007). Like other forms of amenity migration, this can have substantial economic effects on a county, leading to increased dependency on the service sector, higher costs of living, and increased housing prices (Clark et al., 2005).

Environmental Impacts of New, Amenity-Driven Residents

Homeowners have been found to accrue private benefits from developing in and around natural amenities; however, this private benefit can result in environmental degradation, which is a public cost (Phaneuf et al., 2005). This means that controlling land use and development around natural amenities not only has environmental effects, but economic ones as well. Another way to think about this is that amenities add to the value of properties, since people are willing to pay to be next to or within proximity to these natural amenities. This willingness to pay is reflected in housing values, and by degrading or destroying such natural amenities, negative effects on the value of these and surrounding properties will be felt. The same holds for businesses, which can make separating the environmental effects from housing development and business development difficult, if not impossible. Ambiguity in reviewing this problem becomes even more pronounced when accounting for the interrelatedness of amenities with one another—for example, cutting down forests can also lead to diminished water quality and wildlife habitat.

Increased housing can have a variety of effects on the environment. Water pollution, decreased biodiversity, and habitat loss and fragmentation are primary concerns (Groom et al., 1996; Groom et al., 2006). However, in-migrants have been recognized as being concerned about environmental protection, much more so than they are about continued production in resource extractive industries, as seen in Table 5 (Rudzitis, 1999).

Table 5: Most Important Public Land Uses Cited by Newcomers to the Rural West

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: Rudzitis et al. (1995) cited in Rudzitis (1999)

The types of view typically have not been found to hold for permanent residents, which possibility could lead to conflict and disagreement between permanent and seasonal homeowners (Clendenning et al., 2005; Marcouiller et al., 1996b). Green et al. (1996) found that "...seasonal residents are much more supportive than permanent residents of land use controls and zoning. Permanent residents are more likely than seasonal residents to believe that use of private land should be based on individual rather than on community preferences." However, as seasonal residents spent more time in the community, their support for land use controls and zoning decreased. Permanent residents were also found to believe that economic development contributed to quality of life, while the same view was not held by seasonal homeowners.

Environmental Impacts on Specific Resources

Forests.-- Environmentally, fragmentation of forests puts incredible pressure on plants and animals, therefore resulting in a loss of suitable habitat and ecosystem well-being (Fausold and

Lilieholm, 1999). Since many amenity migrants are specifically attracted to forests, the pressure on resources from fragmentation could be quite significant, although a lack of knowledge concerning the total effects of fragmentation on intricate forests systems exists (Stewart, 2000).

However, increasing the housing stock in amenity-rich areas is a double-edged sword for in-migrants, since forests attract in-migrants to the area in the first place, but subsequent housing development degrades the quality of this amenity that they value (Radeloff et al., 2005). Studies have found that housing development tends to occur with a mix of open space and forest (Rasker and Hansen, 2000; McGranahan, 2005). Although this is a better situation than if homebuyers preferred completely forested areas, it still implies that habitat and ecosystem well-being are in jeopardy. What makes growth in amenity-rich areas even more troubling is that it is sprawling in nature, with sprawl more prevalent in areas with a high percentage of forested land. Although this may seem better than dense population, it is actually worse because greater expanses of land are more likely to experience habitat fragmentation compared to high-density population. Figure 8 graphically depicts fragmentation trends in the Midwest related to housing density and the subsequent quantity of forest cover in partial block groups (PBGs) (Radeloff et al. 2005).¹³ It is evident that as housing density becomes less dense, contiguous blocks of undisturbed forest cover become less frequent.

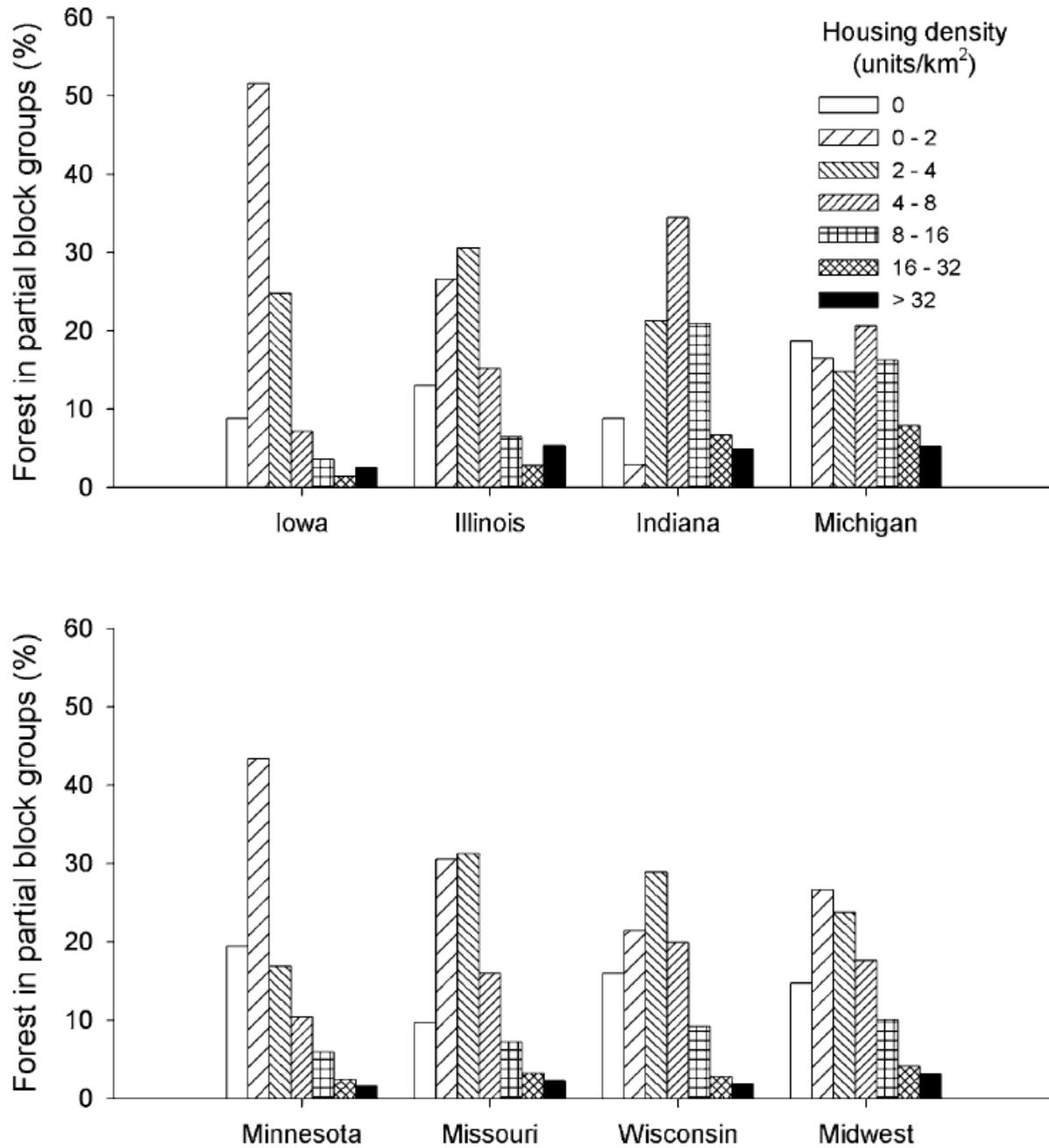
Water. -- Water quality also suffers from development, which can be difficult and costly to improve (Cho et al., 2005). The aggregate effects from such disturbances can be devastating, especially in areas that historically have been undisturbed (Radeloff et al., 2005). Development from coastal population growth is especially harmful to water resources, with riparian impacts from development affecting high concentrations of threatened and endangered species (Bartlett, Mageean, & O'Connor, 2000). In-migration can also lead to an increased number of dams, dikes, and levees, which prevent the natural flow of water and can have devastating effects on fish spawning, migration, and survivorship (Reisner, 1993).

As previously mentioned, Gonzalez-Abraham et al. (2007) found that as lakes become larger, people are more accepting of being closer to their neighbors. Building density was found to be higher in closer proximity to lakes, with 41 percent of houses within 100 meters of lakeshores, as seen in Figure 9. This location preference can have significant effects on the environment, since land fragmentation and edge effects lead to habitat loss and decreased habitat patch size. Lakeshore habitat is often considered critical, making development particularly devastating to its ecosystem wellbeing. For example, for every house within a 250 m disturbance zone of a lake, potential habitat is reduced by 20 percent. However, advantages of clustering around lakes is that if houses are clustered close together (in the study area used in Gonzalez-Abraham et al., 2007, buildings in close proximity to the lake were, on average, 50 m from each other) then the disturbance zones of houses overlap one another, therefore affecting less habitat as a whole. This study suggests that preserving riparian vegetation and careful planning of development patterns and zoning may aid in protecting the surrounding environment and critical habitat.

Homeowners have been found to be subject to economic loss from decreased water quality. As previously mentioned, willingness to pay for housing proximity to a water body decreases as water becomes more degraded, since the scenic beauty and recreational opportunities, which positively influence sales prices, are diminished (Landsford and Jones, 1995; Bejranonda et al., 1999). Nutrients from runoff can also lead to excessive algae and weeds, which have been found to decrease the value of scenic amenities (Bejranonda et al., 1999).

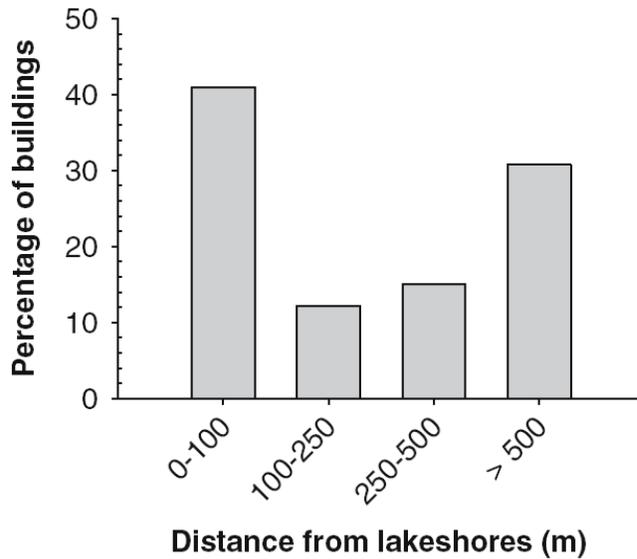
¹³ The mean PBG in this study was 3.4 km²

Figure 8: The Percentage of Forest that Occurs in Partial Block Groups (PBGs) in Each State and Across the U.S. Midwest



Source: Radeloff et al. (2005).

Figure 9: Distribution of Building at Different Distances from Lakeshores



Source: Gonzalez-Abraham et al. (2007)

The degradation of water quality from runoff during development does not just affect water quality; it also affects economic opportunities and the value of recreation (Michael et al., 1996). This means that economic hardship can accrue to businesses as well. For example, sedimentation can reduce the size of a lake and its clarity, which may reduce the utility a person derives from, say, boating. This could result in hardships for recreation-based businesses that economically depend on boat rental demand. Fishing can also be affected, since eutrophication can lead to decreased oxygen in the water, which can lead to degraded aquatic habitat and even fish kills. This could create problems for recreation-based businesses and fishermen whose livelihoods depend on ample fish stocks.

Some economic benefits can be reclaimed through the restoration of water-based amenities. For example, Earnhart (2001) found that in a sample from Fairfield, CT, restoration of a marsh that had been degraded by human activity led to a gain in welfare equal to \$6,684, which is on average approximately 2.7 percent of the median price of a house in that study area. This is a significant finding, and provides evidence that policymakers in amenity-rich areas may have economic incentive to restore the well-being of their water quality. However, policymakers should not approach this problem as a fix-all, since some things cannot be replaced, no matter how much restoration takes place. For example, an endemic species to a lake that has gone extinct will never return, nor will services that it provided to the ecosystem. These services also hold value, and often the extents of these services are not realized until the species producing them is lost.

Wildlife.-- The effects on wildlife from in-migration and subsequent land development are extensive, given that land development tends to occur in preexisting ecosystems (Hanson et al., 2002). Most of these problems stem from low density, rural development, which as previously mentioned is characteristic of development in high-amenity counties (Cho et al., 2003; Bidwell, 2004). Common problems created by land development include habitat fragmentation, edge effects, nest predation, source-sink dynamics, alterations to disturbance regimes (i.e. wildfire), increased disease, and changes in wildlife dispersal and movement patterns (Glennon and Kretser, 2005; Hansen et al., 2002; Valery and Schullery, 1997 cited in Hanson et al., 2002). Increasing housing stock is not the only contributing source to the problems: roads, domestic

pets, human actions, and effects from recreational activities also threaten the well-being of wildlife (Glennon and Kretser, 2005).

This dilemma is exacerbated by the fact that amenity-rich areas, which hold a higher premium for housing development, also tend to be areas of critical habitat. One defense that developers have against this claim is that development occurs on private lands, not on protected lands, and therefore does not have a significant effect on species well-being and diversity. Hansen et al. (2002) approached this question by analyzing the biodiversity and population dynamics of bird species in GYE. The study found that rural residential development areas, which are highly exposed to predation and nest parasitism, tended to be where bird species hot spots were located (60% of maximum species richness and abundance). Furthermore, species richness and abundance tended to occur in areas with more natural amenities, which implies that population growth in amenity-rich communities will incur a disproportionately greater species loss than in other areas. Birds are not the only ones being affected by residential development, though. For example, mammals, such as the endangered grizzly bear, have been found to suffer from high mortality rates in GYE due to the loss of seasonal habitats. The introduction of invasive and exotic fish and weeds have led to extinction and near extinction of many endemic species. In Figures A1 and A7, McGranahan's natural amenity scale is compared to counties that are recognized as hotspots for endangered species. It is evident that there is significant overlap between these two layers and that endangered species are especially vulnerable to environmental degradation created by land development in amenity-rich counties. Furthermore, population growth has found to be significantly correlated with higher distributions of endangered species. This implies is amenity-rich, high growth communities want to protect their wildlife, policies to protect the fragile and vulnerable habitat on which they depend are necessary (Ingram and Lewandrowski, 1999).

However, not all species are suffering from increased rural residential development, some species, such as the cow bird, are thriving. The problem is that thriving species tend to be those can adapt well to changes in their environment, which typically includes those that are invasive, predatory, or even parasitic, as in the case of the cow bird. The advantage that these species have furthers the hardship on endemic species, who cannot adapt to changes in their habitat as it becomes more and more prone to nest predation and competition for food.

In order to alleviate the environmental and economic hardships associated with losses in wildlife, policymakers need to recognize and incorporate sustainability into their long-term growth. Examples of sustainable actions include "improving understanding of the interactions between ecosystems and economics...integrating assessment and management of public and private lands...developing and using decision-support tools for land management...making land-use designations on the basis of ecological and socioeconomic goals...[and] educating the public" (Hansen, et al., 2002). The problems and proposed solutions suggested by Hansen et al. (2002) are not limited to the GYE; similar findings have been found throughout the country. Ultimately, these losses could have considerable effects on the ecosystem, since as mentioned, species loss, and the subsequent loss of their ecosystem services, can result in massive economic loss, since such services would have to be reproduced by man or may not be reproducible at all (Groom et al., 2006).

[Topography and Minerals](#). -- The mining industry, along with other resource-extractive industries, has been diminishing over the past few decades, while the service sector has slowly been replacing these jobs as population and tourism increase (Hansen et al., 2002). This shift in economic dependency may lead to changes in the surrounding environment. For example, mineral extraction is dependent on roads, which have been found to fragment habitat, create edge effects, and support invasive species (Strittholt and Dellasala, 2001). Less mining means that

less roads are necessary for mineral transportation, which can have a positive influence on watersheds, species diversity, and ecosystem functioning (Lorah and Southwick, 2003). However, replacing this industry with residential, commercial, and retail land uses may eliminate any potential net environmental benefits that few mining roads would create. It could even leave the area worse off, given that population growth rates continue to grow.

Although mountains themselves are durable, they play an important role in land development. For example, in areas that contain lakes and mountain amenities, roads are cheaper and easier to build around lakes rather than across mountains. This is because land around lakes tends to have more homogeneous terrain; however, as mentioned, such areas are often critical habitat for plants and wildlife, meaning that increased development in such areas can have negative effects on the overall ecosystem (Gonzalez-Abraham, 2007).

Climate.-- Deller et al. (2001) found that favorable climates drive population growth, especially for retirees. Environmentally speaking, there are consequences to such an attraction, since climates that attract amenity-migrants also tend to support hotspots that are characterized by rare and endemic species. The same is true for other natural amenities, such as coastal regions and mountains, both of which attract in-migrants. Comparing Figure A1 and A8, it is evident that areas that are rich in natural amenities also tend to have warm climates (McGranahan, 1999), and given that population growth is correlated with warm climates, biodiversity may be at high risk in these areas (Rappaport, 2006; Ingram and Lewandrowski, 1999).

Section IV: Business Location Decisions

The preceding sections examined the effect that natural amenities and their values have on household, tourism, and recreational location choices; however, business location choices can also be influenced by the presence of natural amenities. This has led to significant changes in the makeup of amenity-rich counties, which has led to subsequent effects on the social, economic, and environmental characteristics and well-being in these areas.

The quintessential development concerning business direction in amenity-rich communities is that a massive shift in economic dependency is occurring, with non-resource based businesses, such as high-tech and service-oriented businesses, replacing resource-based businesses, such as agriculture, mining, lumber, and wood products (Duffy-Deno, 1998; Henderson and McDaniel, 2005; Rasker and Hansen, 2000). This is because, like resource-extractive industries, non-resource-extractive industries place value on being located within areas that are rich in amenities.

Comparing Figures A1 and A9 in the Appendix help to illustrate this point. Although not all service-dependent counties score highly in terms of their natural amenities, there is considerable overlap of service-dependency and high amenity scores.

Quantitatively speaking, McGranahan's Amenity Index shows that, as seen in Table 6, from 1990-2000, non-resource based business sectors located in high amenity counties, on average, experienced a 2.7 percent annual growth. By sector, retail, services, and government grew 2.30, 3.86, and 1.90 percent, respectively from 1990-2000. However, in rural counties with low levels of amenities, population growth, on average, only increased by 1.4 percent; by sector, retail, services, and government grew 1.02, 2.27, and 0.49, respectively from 1990-2000 (Henderson and McDaniel, 2005).

Table 6: Related McGranahan's Natural Amenity Scale to Rural Employment Growth, by Sector (1990-2000)

Rural Employment Growth by Sector (Average % Annual Growth, 1990-2000)						
Amenity Rank	Total	Retail	Service	Government	Manufacturing	
1 (Low)	1.43	1.02	2.27	0.49	3.98	
2	1.52	1.76	2.41	1.06	1.22	
3	1.48	1.75	3.01	1.11	0.19	
4	1.7	2.12	3.21	1.49	-0.66	
5	2.77	2.96	4.16	1.72	0.47	
6	3.02	2.81	4.3	2.52	0.3	
7 (High)	2.67	2.3	3.86	1.9	-0.31	
Totaled Average, Ranks 1-3	1.48	1.51	2.56	0.89	1.80	
Totaled Average, Ranks 4-7	2.54	2.55	3.88	1.91	-0.05	
Totaled Average, all Ranks	1.73	2.02	3.15	1.36	0.12	
Amenity Rank=Deviations from the Mean						
1 = Less than -2	2 = -1 to -2	3 = -1 to 0	4 = 0 to 1			
5 = 1 to 2	6 = 2 to 3	7 = Over 3				

Calculations based on Bureau of Economic Analysis data.

Disclosure problems limit the availability of sector-level data for some rural counties.

Source: Henderson and McDaniel, 2005

There is no question that higher amenities lead to growth; however, even marginally valuable amenities led to comparable growth from 1990-2000. Specifically, retail, service, and government sectors in counties with a positive amenity rank had 2.55, 3.89, and 1.91 percent average annual growth, respectively. Total annual growth was 2.54 percent. In contrast, counties with a negative amenity score experienced total growth of 1.51, with retail, service, and government sectors having an average annual growth of 2.56, 0.89, and 1.80, respectively. Table 6 shows that the higher average annual sector growth tends to occur in areas scoring between five and six on the amenity scale (one to three deviations from the mean).

McGranahan (1999) also approached the issue of changes in the economic makeup of amenity-rich counties, showing that variation in employment growth rates was quite pronounced in counties who scored highly on the amenity index. For example, from 1969-1996, two recreation counties in Colorado had a 20-fold increase in jobs, while an adjacent mining county had employment decrease by a quarter during that same time period. Population loss in mining counties is quite common, even though they are often located in high-amenity areas. This is interesting, since mining counties often have above average amenity-scores, which indicates areas that are not subject to losing population (McGranahan and Beale, 2002)

Some research has found that businesses tend to migrate to places that they had previously traveled to, may it be either through pleasure or business travel. This occurrence is referred to as travel-simulated entrepreneurial migration. Snepenger et al. (1995) found that four out of ten businesses that relocated to amenity rich areas did so because they had visited the area beforehand and later decided to locate their business there. Business location decisions may also be dictated by travel-simulated household migration. In particular, business strategies that take into account the importance of place attachments in amenity-rich areas may realize profit maximizing opportunities (Ruditiz, 1999).

Although natural amenities can play a role in where businesses decide to locate, other factors also influence business location decisions. Examples of influential factors include market location and access, presence of natural resources, transportation and telecommunication availability, wages, tax structure, workforce characteristics and training, urbanization, localization of industries, and access to interstate highways or major roads (Stewart, 2000;

Rasker and Hansen, 2000); McGranahan, 1999). The extent to which these resources are demanded is unique for each community, and it is also influenced by industry type.

There is a variety of non-resource-extractive business types whose business location choices are correlated with natural amenity locations. Although some overlap exists, these industries tend to fall into three primary categories: knowledge, manufacturing, and high-wage service businesses. Although some overlap exists between what categories specific businesses fall into, studies have tended to focus on sub-categories within these three groups.

The Knowledge Industry

It may seem odd that non-resource-extractive businesses choose to move to amenity-rich areas, since such locations often lack the resources needed to successfully run large businesses.

Historically, this point was relevant, but modern technological advancements, especially those in the field of telecommunications, have changed this norm. This is because rural communities, which previously lacked the necessary infrastructure, are now able to affordably attract businesses through alleviating technological barriers to entry (McMahon and Salant, 1999).

Businesses that have taken advantage of this new location-choice freedom are called “footloose” businesses, which are “firms that, due to changes in technology, and the increased demand for service industries, are able to locate anywhere” (Johnson and Rasker, 1995). Examples of jobs supported by footloose businesses include those in the knowledge sector, such as engineers, architects, and software programmers, who are able to carry out most of their work from an office setting through the use of high-speed telecommunication (Johnson and Rasker, 1995; Rasker and Hansen, 2000). This means that amenity-rich rural communities who have a comparative advantage in attracting such businesses need well-established telecommunication infrastructure to be readily available. In addition, Rasker and Hansen (2000) point out two additional points that give amenity-rich communities a comparative advantage with respects to attracting footloose businesses. First, service businesses need fast and reliable ways to reach their clients and markets. Because of this need, footloose businesses tend to locate in amenity-rich counties that are relatively close to airports. Second, footloose businesses require the presence of a highly educated workforce which works in business or producer services. This translates into such businesses often seeking the presence of creative capital in the labor force, which is also associated with businesses that adopt advanced technologies.

The question of whether the creative class attracts knowledge industries or if knowledge industries attract the creative class presents itself, with this relationship yet to be fully understood. In any case, the creative class is attracted to the presence of forestland and amenities, as defined by McGranahan’s Amenity Scale, and rural areas with a higher percentage of creative capital employment opportunities in 1990 faced faster employment growth from 1990 to 2000, with such workers tending to be located in areas with high amenities. (Wojan and McGranahan, 2007; McGranahan and Wojan, 2007).

High Tech Industries

Recall that a specific subset of knowledge industries is high-tech industries. Goetz and Rupasingha (2002, 506) found that using McGranahan’s Amenity Scale, communities which are amenity-rich tended to have growth in high-tech industries from 1990-1999. Support of this finding is provided by Gottlieb (1994, 80), who shows evidence that environmental quality is not valued equally across all business sectors. Specifically, as seen in Table 7, technologically based businesses have a particular attraction to locations that have high environmental quality, and rated it the most important driver in their business location choice.

Since high tech businesses are attracted to environmental quality, then communities may wish to use their natural amenities to entice High Technology businesses. However, Gottlieb's finding implies that sustainable growth that supports environmental quality will help to ensure continued high tech business attraction in the long run.

Manufacturing and Industrial

For many business sectors, land factors into their production function. Given that high demand in amenity-rich communities drive up the cost of land in the region, land intensive industries may not be attracted to high-amenity areas. Referring to Table 6, this may be one reason that the manufacturing sector on average had a negative annual percent growth in high amenity counties, despite the fact that it grew nearly four percent between 1990-2000 (Henderson and McDaniel, 2005).

Evidence supporting the idea that manufactures are seeking affordable land and labor outside of amenity-rich rural communities can be gathered from the findings of Henderson and McDaniel (2005) and Beyers and Lindahl (1995). Henderson and McDaniel (2005) found that manufacturing is not influenced by the presence of natural amenities. Beyers and Lindahl (1995) found that manufacturing employment decreased by about nine percent nationwide from 1985-1995, but increased by 12.3 percent in non-metropolitan counties in the U.S and 14.6 percent in the West. This implies that employment in the manufacturing sector is not tapering out, but that losses are simply occurring in specific locations, and as supported by Henderson and McDaniel (2005), those places are not in amenity-rich areas.

Table 7: High Technology Firm Location Decisions in Relation to McGranahan's Natural Amenity Scale

High Technology Firms		All Firms	
<i>Amenity</i>	<i>Average Rank</i>	<i>Amenity</i>	<i>Average Rank</i>
Environmental Quality	3	Good Schools	2.11
Cost of Housing	3.24	Public Safety	3.89
Cost of Living	3.38	Environmental Quality	4.22
Good Schools	3.5	Cultural Amenities	4.56
Easy Commute	3.5	Proximity of Housing	4.89
Recreational Amenities	3.63	Easy Commute	4.89
Climate	3.75	Cost of Housing	5
Cultural Amenities	4.13	Recreational Amenities	5.22
Government Services	4.5	Climate	5.89
CEO Preference	4.5	Government Services	6.22
Public Safety	5.25	Cost of Living	6.67
Proximity of Housing	5.25	CEO Preference	6.78

Source: Gottlieb, 1994

Wojan and McGranahan (2007) examined whether or not manufactures were attracted to rural, high-amenity counties.¹⁴ The idea behind this is that creative class workers are attracted to areas that have high quality-of-life factors, including natural amenities. Manufacturers, who

¹⁴ Only manufacturers with greater than ten employees were included in the sample. See Wojan and McGranahan (2007) for details on the pros and cons surrounding this sampling method. Also, the study used the 1996 ERS Rural Manufacturing Survey, a telephone survey of 3,900 manufacturing entrepreneurs. See Gale et al. (1996).

depend on creative class workers for labor, follow these amenity migrants, who are willing to accept less wage compensation in exchange for living in an amenity-rich area. This hypothesis is supported by Gale et al. (1996), who reported that in 1996, 60 percent of non-metropolitan manufacturers had trouble locating qualified potential employees for production positives, while 70 percent reported local labor quality was affecting their ability to compete. Wojan and McGranahan's study reported, "Results from the analysis provide empirical evidence for the posited creative capital link: both the start of entrepreneurial manufacturing plants and the adoption of advanced technologies and management practices in rural areas are strongly associated with the share of the local workforce employed in highly creative occupations after controlling for other county characteristics." This study also found that creative capital has a propensity to locate near natural amenities, as defined by the USDA amenity index.

Service and Retail Sectors

As said by Henderson and McDaniel (2005), differences in business sector growth in relation to natural amenities "...may also be apparent within non-extractive resource industries due to variations in local markets or the industry's production function. By serving as recreation or retirement destinations, high amenity areas may have stronger local demand for personal service than other areas. Thus, the impact of amenities on growth in local demand sectors—retail or service—may be stronger than other industries."¹⁵ Shumway and Otterstrom (2001) support this claim with their finding that recreation, second homes, and retirement feeds the demand for the service sector. This study also reveals another trend—that sustained growth and initial attraction to areas for their activities is dependent on the conservation of the natural amenities that attracted these groups to the area in the first place.

Growth in service and retail sectors is not equal across all natural amenities. Henderson and McDaniel (2005) found that the annual percent growth in the service and retail sectors were significantly influenced by being located in amenity-rich counties, with the degree of influence varying between different types of amenities. Specifically, growth in these two sectors was more prevalent in areas with large bodies of water and a high degree of topographic variation, as defined by the USDA amenity index. However, only the retail sector held a positive relationship with temperate weather.

High-wage Service Sector

Previous research has established that high-wage service industries (such as finance, insurance, real estate, and business services) tend to locate in areas that have populations that are on average, well-educated (Nelson, 1999; Rasker and Hansen, 2000, 23-15). There is a question though of whether service industries are attracted to areas because long-term residents are well-educated or because well-educated in-migrants are raising the average education in amenity-rich areas. Studies such as Nelson (1999), lean towards the latter, but in any case, economic development does have ties to improved services such as education, and will likely result in the quality of education rising community-wide (Green, 2001).

Another group of high-wage services that are tending to expand into amenity-rich areas are rural producer services, a sector which mainly provides services to businesses and government entities. Beyers and Lindahl (1995) approached this issue, using a telephone survey to determine what motivators drive rural producer service business locations. The term "High Flier" was used to describe export-oriented firms who had a least one person employed. This group tended to provide their services solely to manufacturers. "Lone Eagles", on the other hand, is used to

¹⁵ Paraphrasing Duffy-Deno (1998).

describe sole proprietors who are export-oriented firms. Unlike High Fliers, Lone Eagles were primarily found to supply consumer services to households. The location decisions that both these business types make have been found to be correlated with quality of life amenities and environmental conditions, in areas that were far from urban areas. For example, one respondent was in the works to relocate to an area in North Carolina where his family had just bought a second home. His reasoning behind these decisions was that he and his family enjoyed the high quality-of-life they experienced there. In another example, a rural producer wished to move from New York to take two new residences, one in Martha's Vineyard during the winter and one in Montana during the summer season. This decision was based on the quality-of-life and health benefits associated with these amenity-rich areas. Such examples are not surprising, given that service producers are considered part of the knowledge class and portray the same lifestyle choices and characteristics that other members of his social group exhibit. Further analysis showed that 73 percent of Lone Eagles considered high quality-of-life amenities as being highly important in their location decision, while 66 percent of High Fliers felt this way. However, only 44 percent of locally oriented firms considered this factor. These firms instead tended to report that family ties and the draw to their hometown were the drivers in their decision to operate in rural areas.

Economic Impacts of New Amenity-Driven Business

The in-migration of businesses into amenity-rich communities can lead to significant economic impacts, both good and bad. Overall, communities who implement well thought out policies that consider all possible growth scenarios and their consequences may help them to avoid potential pitfalls associated with an increased number of businesses and their demands.

As mentioned, one reason that firms are attracted to amenity-rich areas is that they realize that the presence of quality amenities leads to a lower wage bill (Schmidt and Courant, 2006). Having to pay less wages for the same supply of labor reduces the total wage bill and can lead to the firm demanding a more labor and the attraction of more businesses to the areas, both of which potentially can lead to employment growth in the community (Henderson and McDaniel, 2005). McGranahan and Beale (2002) noted this trend in rural parts of America, where unemployment rates are at a historic low, with wages low enough to attract more employment sources.

Certain firms may also migrate to amenity-rich areas given the high level of education or skills that individuals may possess. Again, areas that have high concentrations of individuals in their labor force with these characteristics show higher employment growth (Henderson and McDaniel, 2005).

Third, businesses migrate to amenity-rich areas because they, like households, derive value from the presence of natural amenities. In a telephone survey, Johnson and Rasker (1995) interviewed a variety of business owners and managers within the Greater Yellowstone Ecosystem who were familiar with their business's location decision. The study found that presence of amenities, with no regards to type, influenced business location decisions. Table 8 provides the overall results from this study, with scenic beauty and environmental quality topping the list of business location values.

Table 8: Overall Results Regarding Business Location Values by Business Owners in the Greater Yellowstone Ecosystem (GYE)

N = 43		Mean Response: (1 = Not Important. 5 = Very Important)	
Location Factor	Overall Score (n = 473)	Overall Rank	
Economic Values			
Overall Tax Structure	1.91	15	
Cost of doing business	2.46	14	
Proximity to the university	2.71	13	
Qualitative Values			
Quality Environment	4.41	2	
Scenic Beauty	4.47	1	
Proximity to public lands	3.78	10	
Community Values			
Overall community attributes	3.34	12	
Low crime rate	3.95	9	
Small town atmosphere	4.08	5	
Desire to live in a rural setting	4.21	4	
Good place to raise a family	4.25	3	
Recreational Values			
Recreation opportunity in general	4.21	6	
Summer based recreation	4.15	7	
Winter based recreation	3.69	11	
Wildlife based recreation	3.9	8	

Source: Johnson and Rasker, 1995

Johnson and Rasker took their study a step further and investigated the difference between responses from long-time businesses (old-timers) and new businesses (newcomers). Table 9 shows that, although values were very similar between these two groups, old-timers indicated that the number one value they placed on their business location decision was that they believed the area was a good place to live, while newcomers on average most valued the scenic beauty of the amenity-rich area. This suggests that old-timers appreciate the value of a ‘sense of place’ more than newcomers. Although it has been found that business climate is less influential in business location decisions than quality of life factors such as natural amenities (Snepenger et al., 1995), maintaining a well-balanced business climate comes with its benefits; therefore, steps should be taken by policymakers to preserve the integrity of growth and land uses, especially in terms of preventing overcrowding and environmental degradation.

Table 9: Old-Timers vs. Newcomers: Values Place on Natural Amenities

N = 473		Mean response: (1 = Not important, 5 = Very important)				
Location Factor	Old-timers	Old-timers	Newcomers	Newcomers	F-Value	P-Value
	Score (n=248)	Rank	Score (n=245)	Rank		
Economic Values						
Overall Tax Structure	2.14	15	1.66	15	22.19	0
Cost of doing business	2.65	14	2.25	14	11.91	0
Proximity to the university	2.92	13	2.48	13	10.02	0.001
Qualitative Values						
Quality Environment	4.5	2	4.32	2	3.97	0.04
Scenic Beauty	4.48	3	4.44	1	0.18	0.67
Proximity to public lands	3.9	11	3.63	10	5.45	0.02
Community Values						
Overall community attributes	3.93	10	2.68	12	134.46	0
Low crime rate	4.13	8	3.73	9	10.92	0.001
Small town atmosphere	4.16	7	3.98	5	3	0.08
Desire to live in a rural setting	4.23	4	3.91	7	8.61	0.003
Good place to raise a family	4.51	1	3.96	6	21.47	0
Recreational Values						
Recreation opportunity in general	4.22	6	4.11	3	0.16	0.69
Summer based recreation	4.23	4	4.05	4	3.05	0.08
Winter based recreation	3.79	12	3.57	11	3.19	0.07
Wildlife based recreation	4.02	9	3.75	8	5.17	0.02

Source: Johnson and Rasker, 1995

The Service and Retail Sector

The presence of natural amenities undoubtedly influences the employment level in the service sector. As said by Shumway and Otterstrom (2001), “one of the most important discussions now occurring in the West concerns one such transformation: the evolution of the rural economy from one oriented around extractive industries (ranching, farming, mining, and logging) to one based on preservation of environmental amenities (tourism, retirement, and second homes and services that go along with these economic activities)”.

Looking at the Greater Yellowstone Region, there has been more than a 96 percent increase in jobs in the area from 1969 to 1992, while average income grew by over 120 percent. Of these jobs, 95 percent were in non-extractive and non-manufacturing industries. In 1969, one out of every three jobs and 23 percent of total income were created from farming, mining, or the

manufacturing industries. By 1992, only 1/7 of the region's jobs were in one of these sectors, comprising less than ten percent of total income. However, the service sector in 1992 accounted for 70 percent of employment, with more than 50,000 jobs being added since 1969, with service sector jobs accounting for 75 percent of newly created jobs in the area from 1969 to 1992 (Bureau of Economic Analysis, 1995, as cited in Johnson and Rasker, 1995). This trend is not just occurring in the West, however; it is occurring in amenity-rich counties as a whole.

The growth created by increased businesses and jobs in the service sector is often greeted with open arms from rural communities, since such areas tend to experience less economic growth than urban areas (Stewart, 2002). However, problems can arise from promoting this type of growth since typically, service-based businesses offer lower wages and fewer benefits to its employees than traditional resource extractive industries. In-migrants that are driving growth in the service sector exacerbate this problem since they often have higher income than permanent residents, especially those that work in low-wage service sectors. This can lead to the cost of living being so high that long-term residents ultimately experience a decreased quality of life, or in some cases, leave the area in search of a better job (Shumway and Otterman, 2001; McGranahan and Beale, 2003).

Despite the stigma surrounding the creation of service sector jobs as being economic dampers on a community, this is not always true. This is because the service sector consists of both low-wage and high-wage jobs. Florida (2002) stresses that the presence of the creative class is vital for sustained economic growth; however, Wojan and McGranahan (2007) update this study by restructuring Florida's definitions concerning the creative class and what industries are including in analysis, as shown in Table 10.

With a specific focus on manufacturing, Wojan and McGranahan (2007) provide evidence that amenity-rich communities that stress high quality education will tend to see more growth in creative industries, rather than in low-wage, low-skill service and manufacturing industries. However, amenity-rich areas that offer a less educated workforce have seen employment growth at rates that are much higher than that of their well-educated counterpart. Therefore, communities face a tradeoff, having to choose between high employment growth with a poorly educated workforce or low employment growth with a highly educated workforce.

The Chicken and the Egg

One of the biggest questions surrounding business location theory is whether or not "people follow jobs or jobs follow people". There are two very different approaches that characterize this argument, both of which have relevant points (Partridge and Rickman, 2003). Those who believe that people follow jobs support the demand-driven approach, which suggests that the in-migration of households to specific locations is a function of wages and employment. In other words, people move to areas where businesses are demanding labor and therefore are willing to pay higher wages than an employer would be receiving at a different location. This, in turn, drives demand for retail and service industries within high-amenity counties and results in economic growth. On the other hand, those who believe that jobs follow people defend the supply-side approach. This supports the claim that the first step in development is that households migrate to an area, which in turn raises the supply of labor. This increase in the labor supply leads to firms having to pay a lower wage rate, thus attracting businesses to these locations. The main difference between these two theories is that, unlike the demand-driven approach, the supply side approach accounts for the presence of amenities, including natural

Table 10: Florida's (2002) Original Creative Class Occupations and a Recast Creative Class, Excluding Economic Reproduction Occupations and Occupations Requiring Little Creativity

STF4 Occupation Title	Florida	Recast	Excluded from Recast
Management Occupations	<i>Summary</i>		
Top executives	x	x	
Advertising, marketing, promotions, public relations, and sales managers	x	x	
Financial managers	x	x	
Operations specialties managers, except financial managers	x	x	
Farmers and farm managers	x		x
Other management occupations, except farmers and farm managers	x	x	
Business and Financial Operations Occupations	<i>Summary</i>	x	
Business operations specialists	x	x	
Accountants and auditors	x	x	
Other financial specialists	x	x	
Computer and Mathematical Occupations	<i>Summary</i>	<i>Summary</i>	
Architecture and Engineering Occupations	<i>Summary</i>	<i>Summary</i>	
Architects, surveyors, and cartographers	x	x	
Engineers	x	x	
Drafters, engineering, and mapping technicians	x	x	
Life, Physical, and Social Science Occupations	<i>Summary</i>		
Life and physical scientists	x	x	
Social scientists and related workers	x	x	
Life, physical, and social science technicians	x		x
Legal Occupations	<i>Summary</i>		
Lawyers	x	x	
Judges, magistrates, and other judicial workers	x		x
Legal support workers	x		x
Education, Training, and Library Occupations	<i>Summary</i>		
Post-secondary teachers	x	x	
Teachers: primary, secondary, and special education	x		x
Teachers: preschool, kindergarten, elementary, and middle school	x		x
Teachers: secondary school	x		x
Teachers: special education	x		x
Librarians, curators, and archivists	x	x	
Other teachers, instructors, education, training, and library occupations	x		x
Arts, Design, Entertainment, Sports, and Media Occupations	<i>Summary</i>	<i>Summary</i>	
Health Care Practitioners and Technical Occupations	<i>Summary</i>		
Physicians and surgeons	x		x
Registered nurses	x		x
Therapists	x		x
Other health diagnosing and treating practitioners and technical occupations	x		x
Health technologists and technicians	x		x
High-End Sales—Part of Sales Occupation Summary Category			
Sales representatives, services, wholesale and manufacturing	x	x	
Other sales and related occupations, including supervisors	x	x	

Source: McGranahan and Wojan (2007).

amenities. This is because in order for a household to be motivated enough to move to specific areas, there must be an initial draw, or pull factor. In the case of natural amenities, workers are willing to accept a lower wage for the higher quality of life they'll receive from living in an amenity-rich area. (Johnson and Rasker, 1995).

A more refined question concerning natural amenities and their relation to economic growth is how to differentiate the effects from economic factors driving migration versus the presence of amenities promoting growth. Until recently, only two studies examined this concept (McGranahan, 2005). Williams (1981) focused on what factors drove the first era of migration turnaround in the 1970s to rural areas. A survey conducted in this study provides evidence that economic motivations are necessary but not sufficient factors influencing in-migration to rural areas. Based on individual quality-of-life preferences, however, different types of amenities can hold different levels of significance regarding a person's choice to migrate to non-metropolitan areas.

More recently, Carruthers and Vias (2005) conducted a study analyzing sprawl in urban, suburban, and exurban sprawl in the Rocky Mountain West, using a regional adjustment model. Although it did account for interactions between McGranahan's amenity index, population and employment and their influence on communities, no clear evidence was provided that separated the effects of employment driven migration from amenity migration.

A recent, unpublished study by McGranahan (2005) provides an explanation of the difference between changes in population due to migration and changes in population due to changes in jobs.¹⁶ The model used in this study accounted for landscape, climate, industry, labor market, demography, and population growth, and control variables. In addition to McGranahan's previous amenity measures, a new amenity, percent of forest, was included as well as explanatory variables to account for employment by industry sectors, labor market indicators, and other key factors that have been found to influence in-migration. Results highlighting the importance of accounting for both net migration and economic growth conclude that high incomes and employment rates are factors that lead to gains in-migration but result in less job growth. Furthermore, areas with a high proportion of youth results in less in-migration, but higher job growth. Landscape variables influenced net migration, but did not seem to affect job migration—yet areas with high population density did. In addition, housing price is revealed as a determinant, not a cause, for net migration.

Impacts of Business Amenity-Migration on Resource-Extractive Industries

Migration into amenity-rich communities not only affects permanent residents, but influences the prevalence and makeup of long-time businesses in the surrounding area, especially those that are resource-extractive, such as agriculture, timber, and mining (Shumway and Otterstrom, 2001). Mining-dependent counties, like agricultural counties, experience less population growth than other rural areas, primarily because of the lack of recreational industries that tend to locate in mining-dependent areas (McGranahan and Sullivan, 2005). Changes in manufacturing were previously discussed in this section. Therefore, the following is a brief overview of the two remaining resource-extractive industries, agricultural and timber production. Consideration is to be given towards the economic effect of amenity migration and the potential long-term repercussions of decline in these rural economic bases that communities historically have been dependent upon.

[Agriculture](#).-- Farms historically have been the economic fiber of many rural counties. In the United States, 121 million ha (300 million acres) of agricultural land are harvested annually, with

¹⁶ Two simultaneous equations were used to represent these effects.

an estimated value of \$170 billion, with the food and fiber sector of the economy accounting for 16 percent of the total value added and three million jobs as of 1992¹⁷ (American Almanac , 1993-1994 as cited in Faushold and Liliholm, 1999). However, “over the past 25 years, the number of farms have declined in counties with few amenities—counties with cold, wet winters and hot, humid summers, flat land, and few, if any lakes. Loss of agricultural land is a concern due to the inevitable effects on future agricultural production, and the possibility of the United States becoming a deficit producer in the food and fiber sector (Rosenberger, Gebremedhin, and Hailu, 2002).

Generally, amenity migrants do not compete with agriculture for land due to the lack of amenities and recreational industries that agriculture lands tend to have (McGranahan and Beale, 2002; McGranahan and Sullivan, 2005). There are exceptions to this, however. Specifically, high-amenity areas in western parts of the country that historically were predominately ranch and pastoral operations are being converted to residential and commercial uses (Walker et al, 2003). In a ten county sample of the Greater Yellowstone Ecosystem, Gosnell, Haggerty, and Travis (2006) reviewed 582 sales transactions of lands greater than 400 acres between 1990 and 2000 (1,479,046 acres total). Of these sales, 23 percent were large agricultural operations. The number one group (39 percent) of buyers in these transactions was amenity buyers, while developers accounted for six percent of buyers. Table 11 and Figure 10 provide more detailed information concerning the types of buyers and the proportion of land sales for each group. In an interview with these buyers, more than ½ of the purchases were attributed to the buyer’s appeal for natural amenities or for investment purchases—not for ranching or livestock production. This finding suggests that areas like the Greater Yellowstone Ecosystem, which are characterized by natural amenities and abundant, large agricultural operations are in fact areas in which amenity migrants and agriculture are competing for the same lands. Another example can be seen in West Virginia, where agricultural lands are developed on flat lands, which often are few and far between in this amenity-rich, mountainous region. This land however, is being bidded out by developers, since houses are much easier to build on stable, flat, well-drained soils. This means that over time, agricultural production is being pushed out to areas that are less productive (Rosenberger, Gebremedhin, and Hailu, 2002).

Some may argue that farm payments will help to alleviate the hardship that farmers are facing with respects to amenity-migration of businesses and households. Although these payments have been shown to help individual farmers, they do not support farm-based communities as a whole. Population loss is also occurring in farm-based communities. From 1990-2000, high-farm-payment counties lost an average of three percent of their population, while other rural areas gained approximately 11 percent. Half of the growth in non-high-farm-payment counties has been attributed to natural amenities and climate, with high-farm-payment counties tending to have cold winters, flat terrain, a sparse number of trees, and twice the number of farms than other rural areas (McGranahan and Sullivan, 2005). In frontier counties, three out of four counties labeled as having below-average natural amenities also are considered to be farming dependent (McGranahan and Beale, 2002). This may provide some evidence as to why amenity-rich communities are also seeing high rates of population and employment growth. This is because economic growth is not stunted by the availability of agricultural jobs or income, but by the level of natural amenities that the areas possesses, its remoteness from major cities, access to services, and the sparse nature of settlement density (McGranahan and Sullivan, 2005). Figure 11 shows

¹⁷ Employment excluding indirect employment from expenditure and services.

Table 11: Working Typology for Large Agricultural Landowners

Traditional rancher: generally a full-time owner-operator raising livestock for profit without the aid of a ranch manager; may engage in some off-ranch work (or on-ranch work unrelated to livestock, e.g., outfitting) but derives the majority (or at least in many years a significant portion) of his or her income from the ranch

Part-time rancher: does his or her own ranching but often has a full-time job off the ranch; ranch income is generally less than the off-ranch income; usually smaller operations

Amenity buyer: purchases a ranch for ambience, recreation, and other amenities, not primarily for agricultural production; often an absentee owner; may have some interest in ranching but generally hires a ranch manager who makes most day-to-day decisions and does the majority of the work; or, might lease the majority of his or her land and/or cattle to a “real rancher”; majority of an amenity buyer’s personal income is by definition from off-ranch sources; economic viability of the ranch is usually not an issue

Investor: buys primarily for investment, often with intent to resell in the short term.

Corporation: typically purchases ranch to function as one unit in a large network of related operations and holdings elsewhere; ranch is operated by a manager.

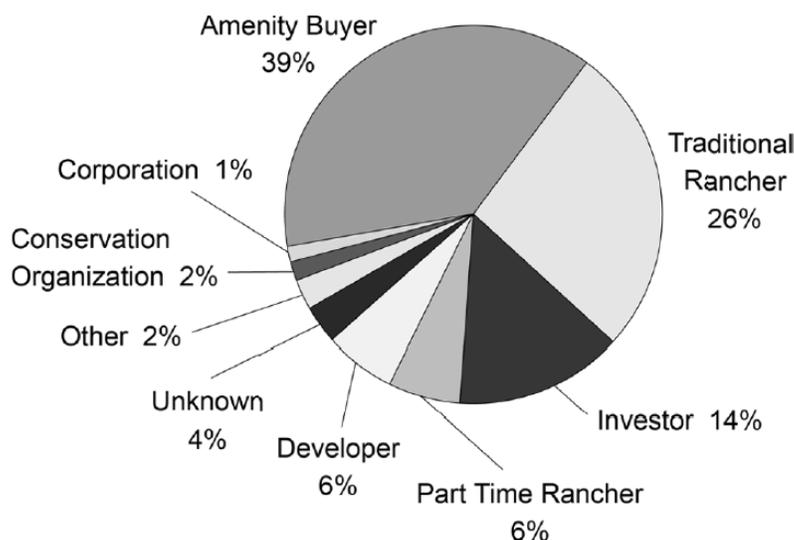
Developer: buys the land with intention to subdivide and sell off to others, with profits from that sale the main objective

Conservation organization: buys ranch with intent to manage for habitat, wildlife, etc.

Other: includes state and federal land management agencies, churches, independent loggers, grazing co-ops, dude ranches, etc.

Source: Gosnell, Haggerty, and Travis (2006)

Figure 10: Percentage of Ranch Sales (>400 Acres) to Buyer Types, 10-County GYE Study Area, 1990–2001



Source: Gosnell, Haggerty, and Travis (2006)

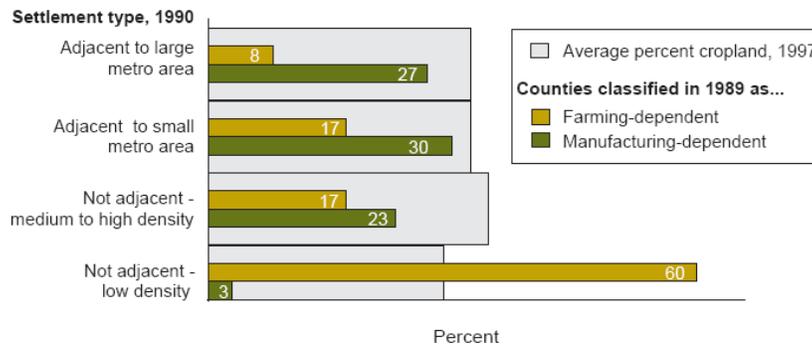
that areas with a high percent of cropland tend to lack natural amenities, which are correlated with population loss in these areas (McGranahan and Beale, 2003).

Despite these farm losses, the number of farms is actually increasing in counties with high levels of natural amenities” (McGranahan and Sullivan, 2005). One reason for this trend is believed to be that young farmers are choosing to farm in amenity-rich areas which offer a higher quality of life. From 1990-2000, so many young people migrated away from amenity-poor, traditional agricultural communities that incoming retirees and young families were not great enough in number to replace them. However, the most suitable cropland tends to be in areas that are low in natural amenities, with flat terrain, minimal fragmentation from water bodies, wet winters, and hot, humid summers (McGranahan and Beale, 2002). Choosing to farm in less suitable areas has the potential of lessening crop yields and therefore the total value added from the food and fiber sector. Figure 12, which graphically shows the difference between counties with high farm payments versus counties with low population density and high natural amenities, especially with respect to young adults.

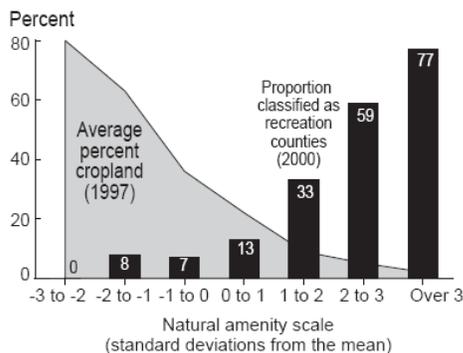
Timberland.-- Forests cover nearly 1/3 of the United States, with 2/3 designated for commercial use. In 1992, 1.7 million people were employed in timber and other wood-based industries (American Almanac, 1993-1994 as cited in Faushold and Lillieholm, 1999). Only 14 percent of commercial forests are controlled by forest industries, while 18 percent are located within national forests. Yet nearly 60 percent of commercial forests are private operations managed by farmers and small, independent owners are primarily located in the eastern United States (Faushold and Lillieholm, 1999).

Figure 11: Relationship between Farming Dependence, Natural Amenities, and Population Loss

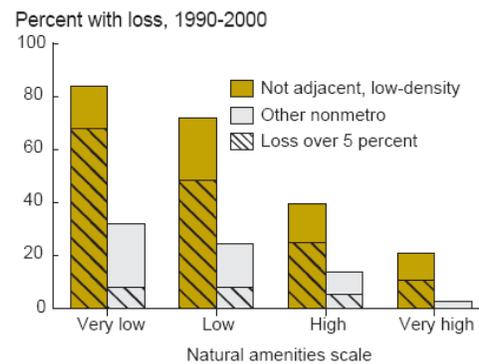
County dependence on farming correlates with rural isolation...



And a lack of natural amenities...



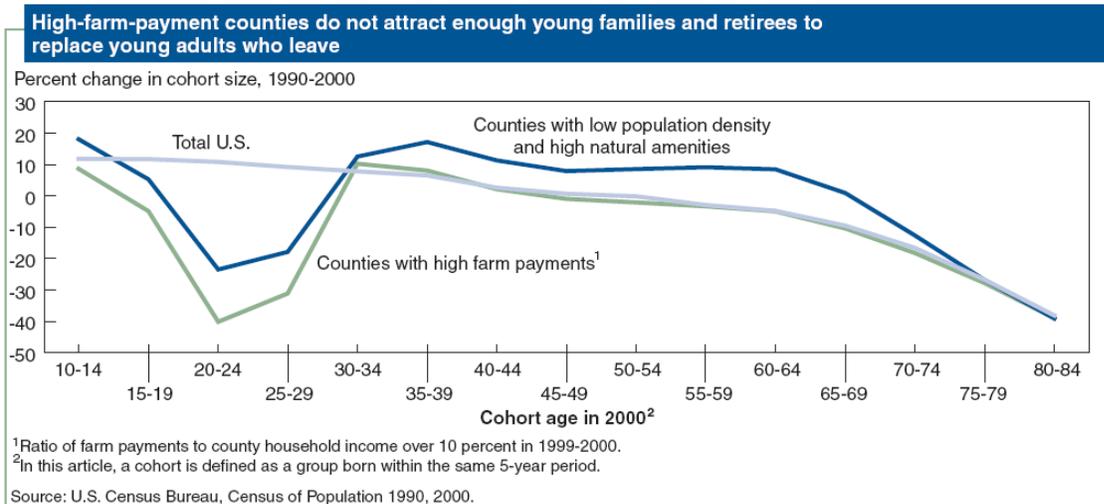
Which lead to population loss



Note: Amenity scale categories "low" and "high" are within a standard deviation of the mean.

Source: McGranahan and Beale, 2003

Figure 12: High-Farm-Payment Counties do not Attract Enough Young Families and Retirees to Replace Young Adults who Leave



Like agriculture, timber companies are facing pressure from amenity-migrating businesses and households. The effects of land use changes to urban uses are one reason for this trend, and as stated by Barlow et al. (1998),

“almost all measures of urbanization examined in this study are associated with lower harvesting possibilities. Proximity to urban land uses, higher population densities, and proximity to urban centers all lead to lower harvesting rates on forest plots”, and that “...as more and more forestland on the urban fringe is converted to urban uses, the nontimber amenity value of the remaining forestland increases, resulting in less management for timber production and more management for nontimber values. For both of these reasons, the frequency of silviculture harvests on the remaining forestland is likely to decrease”.

Furthermore, once population density has reached between 20 and 70 persons per square mile (psm), the probability of land use being commercial timberland is significantly reduced, since urbanization is occurring to a degree that timber harvesting is no longer efficient (Wear, 1999). In addition to urbanization, pressures on timberland arise through the presence of the recreation industry. This pressure exists since forestlands meet the needs of both timber producers and outdoor recreation (Marcouiller et al., 2004).

These competing demands for forestland from urbanization and recreational uses can create a diseconomy for private timber forestland owners. This is because once the value of the forestland is greater than the returns from timber harvesting, private timberland owners have a great incentive, in terms of both profits and taxes, to sell their land (Greason, 1989). This eventual selling of timberland parcels, however, leads to forest fragmentation, which reduces the size and continuity of forestland tracts, which eventually results in heightened management costs (Harris and Deforest, 1993 cited from Barlow, 1998). Generally, private forestland owners require a 100-acre tract or more of timberland in order to effectively manage and profit from their timber.

The difference in viewpoints between long-term residents and urban migrants may also play a role in the support for sustaining the timber industry, with 71 percent of long-term residents propounding timber harvesting, while only 62 percent of urban migrants supported it (Ruditz, 1999). Multi-use management of forestland is one possible solution regarding this issue. A problem arises, however, in the compatibility of different activities. For example, Clawson (1974) points out the incongruity between using timberland for timber harvesting, wilderness use, and intensive recreation. This is a deeply researched topic, which extends beyond the scope of this paper; for further information refer to Stevens and Montgomery (2002).

Environmental Impacts of New Amenity-Driven Business

In an ecological sense, variation in landscape is a driving factor behind biodiversity (McGranahan, 2005). In terms of human population growth, natural amenities are a driving factor behind amenity-migration and business location decisions (McGranahan, 1999; Gottlieb, 1994). This can lead to pressures on the environment and clashes in the priorities that amenity-rich counties set for themselves regarding environmental protection versus economic growth. In relation to amenity-driven business, amenity-rich counties may attempt to increase their economic vitality by attracting large firms to their areas, which can have negative consequences for the environment (Pagoulatos, 2004). For example, in a statement based on the findings of Schlosser (2002), “like other parts of the country, the Rocky Mountain West has become overrun by big-box stores, fast food chains, and other corporate-owned businesses that embody many of the negative aspects of urban sprawl” (Carruthers and Vias, 2005). Carruthers and Vias’s study provides additional evidence to support the claim that amenity-rich communities, in supporting environmental integrity, should show equal favor towards small business growth as they do to large, since the promotion of high density land uses that small businesses provide supports environmental well-being.

Forests.--Protecting the presence of forests is critical in terms of maintaining the integrity of internal and surrounding habitat that is dependent on its preservation. Fragmentation of forestlands due to land use changes, especially that of low-density development, which is characteristic of rural retail and commercial land uses, is of main concern in remote wildlands. This problem is magnified when taking into consideration the explosive population growth in these areas (Shands, 1991).

Low-density development is not the only land use concern. Inherently, timber harvesting and loss from development is environmentally problematic, since it stresses and destroys critically endangered ecosystems and biodiversity (Noss et al., 1995, as cited in Marcouiller, 2002). Limiting or managing timberlands to preserve environmental integrity has also been accused of being anti-business, as it may hinder the economic well-being and growth of the lumber and wood products sector. However, Lewis et al. (2003) found timber harvest declines associated with preservationist management or multiple uses of national forest lands did not affect wage growth. New amenity-driven businesses have also been found to locate in amenity-rich areas specifically for the environmental quality that contiguous forests provide; this location decision in turn provides economic growth that is greater than that provided by timber extraction (Rasker and Hansen, 1995). This may be one reason that “over the past three decades, public lands in the United States have been increasingly managed for non-commodity outputs such as wildlife habitat, wilderness recreation, and environmental benefits such as watershed protection” (Lewis et al., 2003). Note that although there has been an increase in the management of such resources, it does not necessarily mean that all communities are practicing it. For example, in the Northern Forest Region, land managed for preservationist uses ranges from zero to over 70 percent at the county level, while multiple-use management ranges from zero to 55 percent (Lewis et al., 2003).

Water.--Given that many of the same environmental effects on water are felt from both residential and business development, refer to the previous section for a more detailed review of the effects of development on water. However, in the lake states, it was found that the presence of water-related amenities tended to lead to a higher income distribution that was seen in other parts of the lake states. This implies that businesses, specifically those that profit off providing recreational access and services, are attracted to the area (Marcouiller et al., 2004). Technically, recreation is regarded as “environmentally friendly” in comparison to traditional resource extractive industries (Green et al., 2001). This may be true, but tourism and recreation tend to

lead to an increase in intensive land uses, especially commercial land uses to support services such as hotels and gas stations, which have the potential to degrade environmental quality. This is because such land uses tend to have higher proportions of impervious surface in comparison to residential land use, which can lead to nitrogen and phosphorus runoff that degrades water quality and the integrity of aquatic biota (Tong and Chen, 2002; Arnold and Gibbons, 1996).

Wildlife.--The influx of businesses into amenity-rich areas into amenity-rich areas can have devastating effects on wildlife, since their existence is dependent on the presence of acceptable habitat. The consequences of business development on wildlife well-being are similar to that of residential, but may be more severe due to the intensity of land development associated with non-residential land uses. However, extractive industries can also affect the well-being of wildlife. Recalling that there has been an increase in agricultural lands in amenity-rich areas, (McGranahan and Beale, 2003), agriculture is recognized for its correlation with dispersed building patterns. This can have consequences on the landscape, and lead to fragmentation and edge effects on critical habitat for species (Gonzalez-Abraham et al., 2007). However, there are benefits of agricultural land, since it restricts intense land development, therefore buffering critical habitat from forms of development that are more devastating for an ecosystem and biodiversity than agricultural land use, such as residential, industrial, or commercial use (Groom et al., 1999). Gosnell, Haggerty, and Travis (2006) suggest that changes in land ownership from the hands of agricultural producers to amenity migrants in amenity-rich and environmentally sensitive areas such as GYE may lead to devastating affects for core projected areas that were previously buffered by ranches and pastoral operations.

Another risk to wildlife associated with the loss of agricultural lands is changes in policies that support the well-being of ranchers. For example, in GYE, amenity-oriented land owners were found to be more likely to support changes in policies which would maintain current land uses, such as reductions in grazing permits (Gosnell, Haggerty, and Travis, 2006). It may be more beneficial for ecosystem health to convert these lands over to land designated for recreational uses or wildlife habitat, which would increase the environmental condition and aesthetic values of the land; however, grazing permit buyouts could have devastating effects on an ecosystem as well, most notably massive habitat fragmentation, since ideal uses are not guaranteed. Furthermore, farmers who are subject to permit buyouts have great economic incentive to sell their permit than to stay in business, with more than 17 percent of ranchers in the Rocky Mountain region indicating that they would, in fact, participate in a buyout (Steinbach and Thomas, 2007).

Climate.--Deller et al. (2001) found that climate does not influence income or employment growth, but instead only influences population growth. This finding may reflect that areas with favorable climates tend are dominated by retiree in-migrants driving population growth but not adding employment growth. Despite this, evidence suggests that climate influences business activity, with warm temperatures being the most desired by businesses (Kusmin, 1994). Studies have also examined whether this influence differs between industry sectors. Granger and Blomquist (1999) found that climate in urban counties does influence manufacturing, with favorable, climate climates having a positive relationship with the quantity of manufacturing entities. In defining what a favorable climate is, the study used seven components derived from a quality-of-life index proposed by Blomquist et al. (1988). Six of these components account for climatic conditions, including average annual precipitation, humidity, heating degree days, cooling degree days, wind speed, and sunshine. An additional factor in their climate index, which also was derived from Blomquist et al. (1988), was whether or not an urban county bordered an ocean or one of the Great Lakes. This index differs from the aforementioned USDA amenity index, which measures climate using warm weather (average January temperature), winter sun

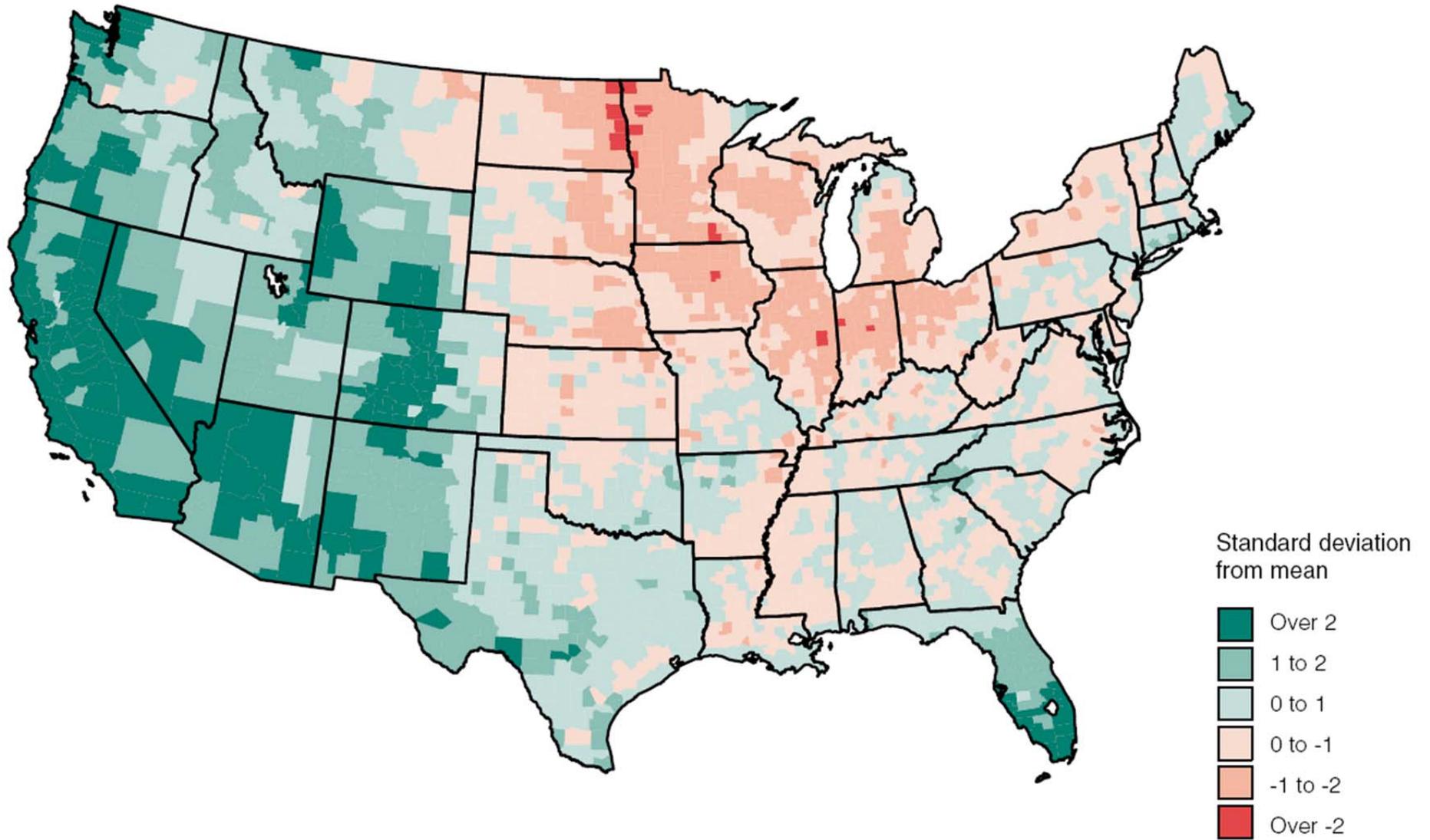
(average days of sun in January), temperate summer (low winter-summer temperature gap), and summer humidity (lowest average humidity in July) as climatic factors (McGranahan, 1999).

Granger and Blomquist (1999) took these findings a step further and broke down the manufacturing sector by labor intensity, which is measured by payroll as a percentage of value added (PPVA). Climate was found to be positive and significant in the top six labor-intensive industries and overall three quarters of the 20 industries reviewed held a positive and significant relationship to favorable climate. Furthermore, as labor intensity decreased, insignificant relationships between it and climate became more prevalent. This suggests that industries that are more labor intensive tend to be attracted to better climates. Payroll is a high percentage of value-added in labor-intensive industries, which may shed light on patterns pertaining to specific industries' preferences.

Regarding the environment, this attraction to specific regions for their climate could lead to environmental consequences similar to those seen with residential land development. For example, moderate climates tend to support forest growth, which means land development will lead to deforestation, and therefore habitat loss, water degradation, and global warming (Mladenoff et al., 1992; Vitousek, 1994). Again referring to Figures A1, A7, and A8, biodiversity, climate, and natural amenities are spatially overlapping and interdependent, which could lead to significant and far reaching consequences.

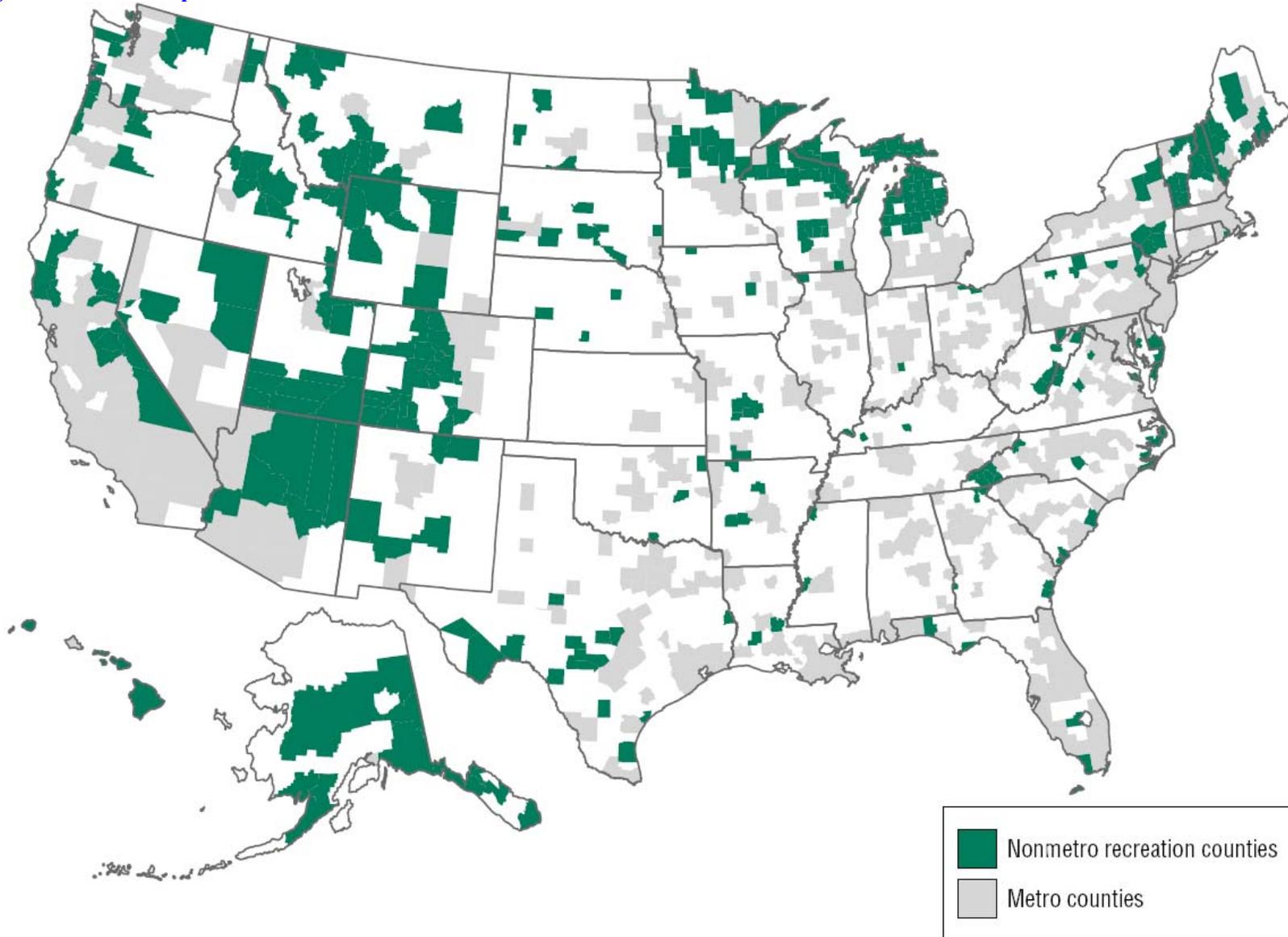
Appendix

Figure A 1: Amenity scale by county, 1970-96 (Using McGranahan's Amenity Scale)



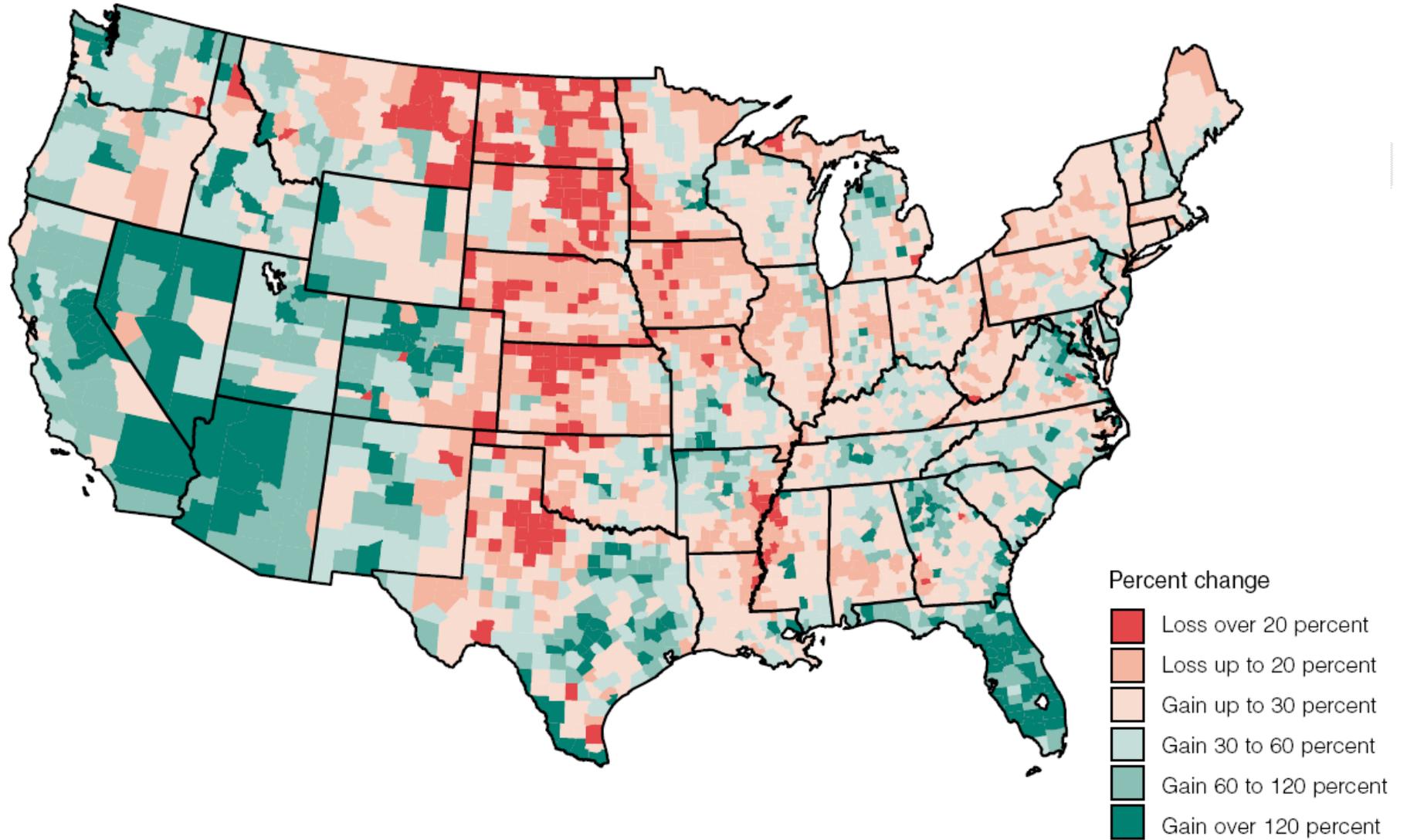
Source: McGranahan, 1999

Figure A 2: Nonmetropolitan Recreational Counties



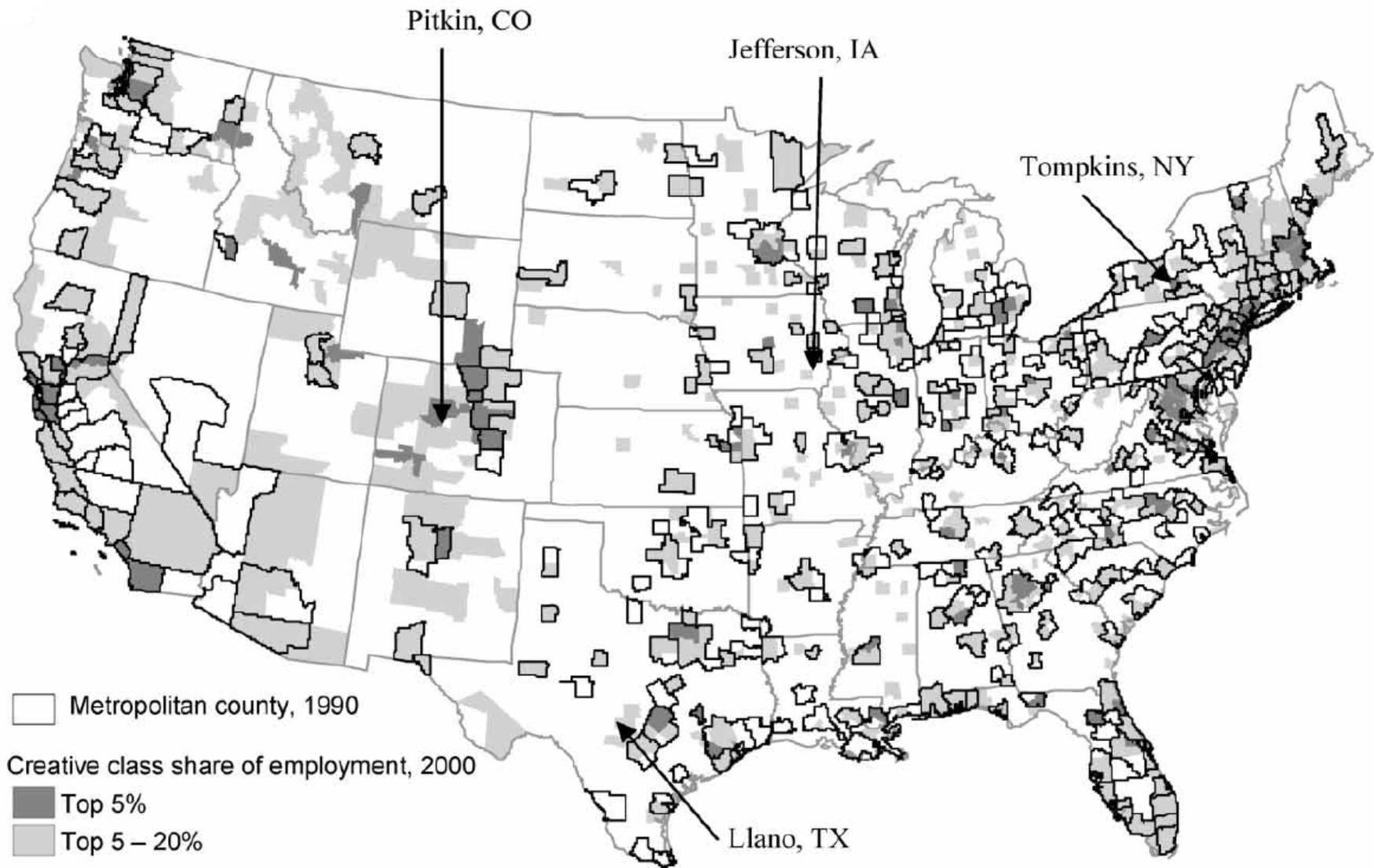
Source: Beale and Johnson, 2002

Figure A 3: Population Change by County, 1970-96



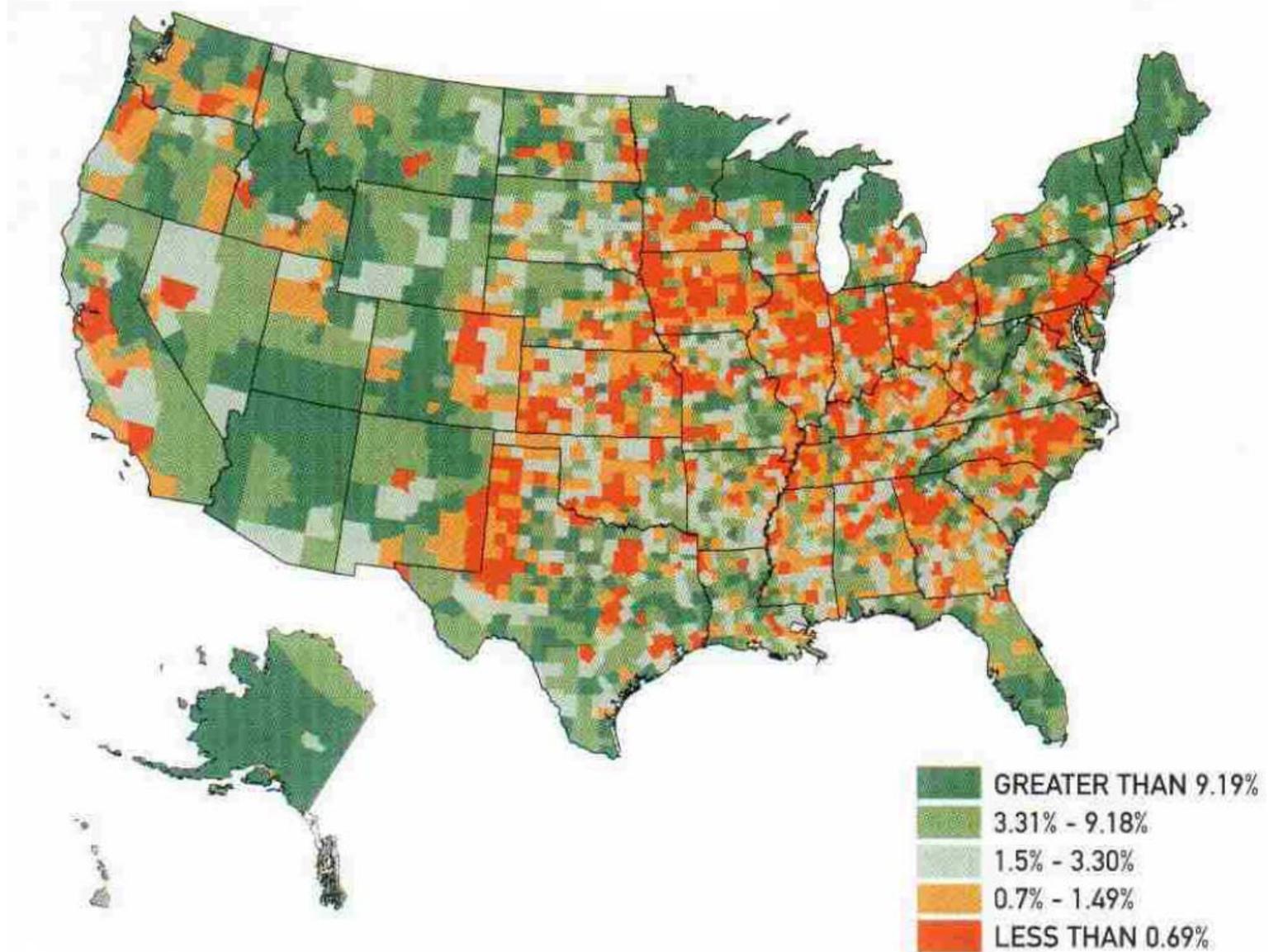
Source: McGranahan, 1999

Figure A 4: Counties with High Shares of Creative Class Employment, 2000



Source: McGranahan and Wojan, 2007

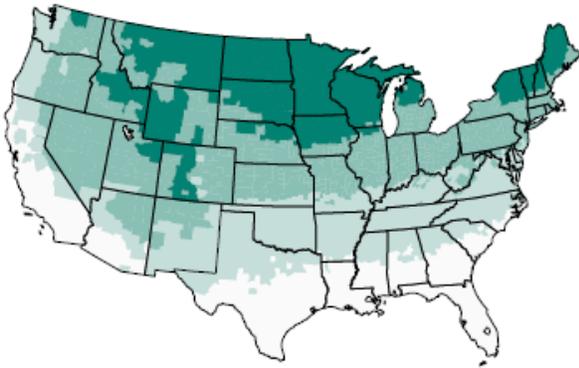
Figure A 5: Percentage of Second Homes by County, 2000



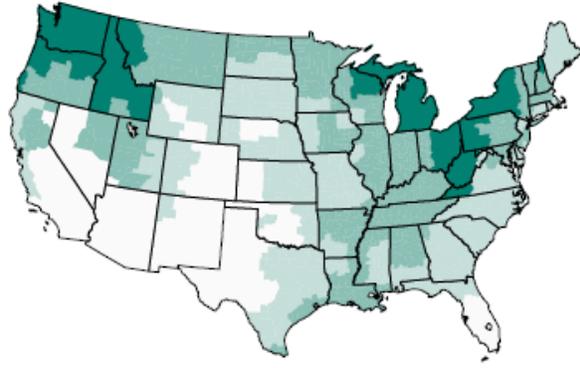
Source: Carroll, 2002, from GeoLytics' analysis of Census 2000 data for American Demographics.

Figure A 6: Maps of Natural Amenity Measures

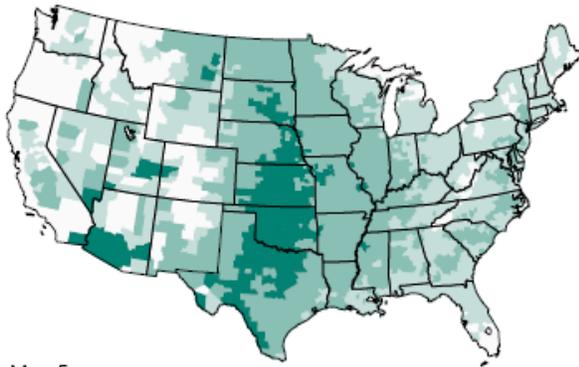
Map 1
Warm winter



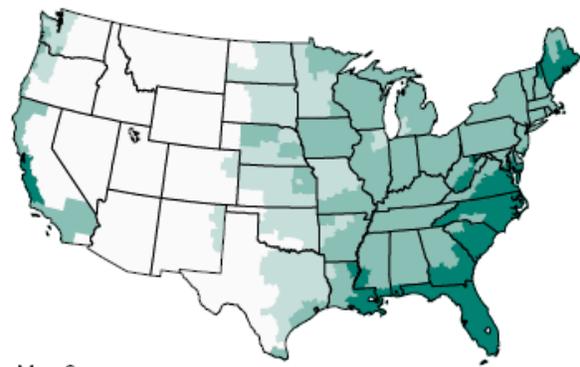
Map 2
Winter sun



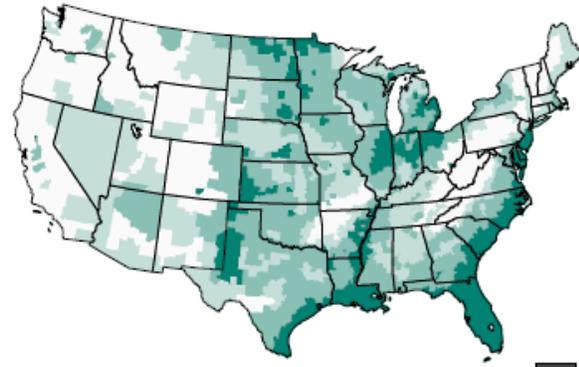
Map 3
Temperate summer



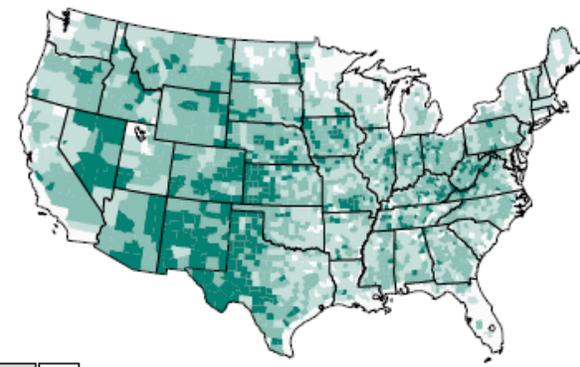
Map 4
Low summer humidity



Map 5
Topographic variation



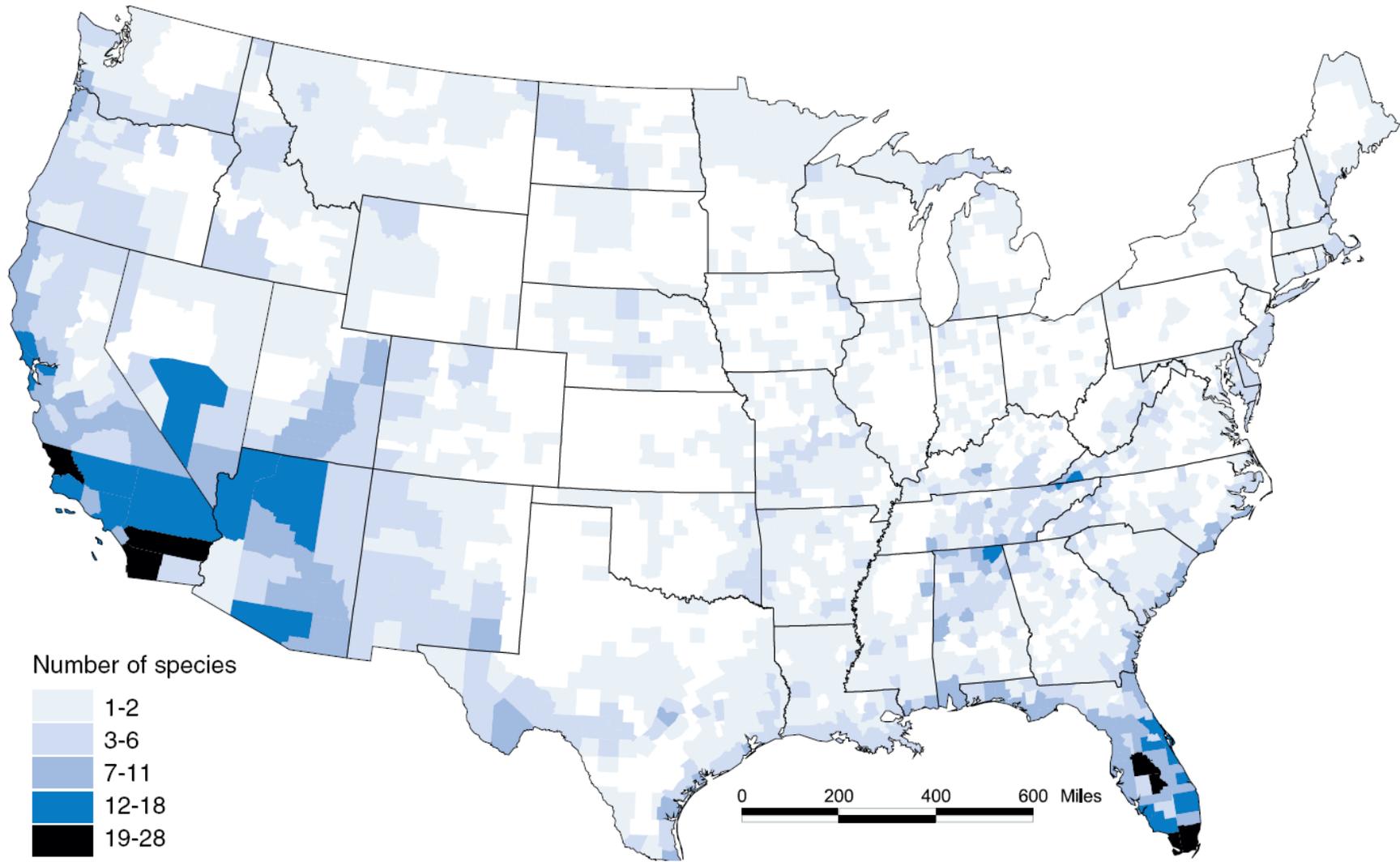
Map 6
Water area



Low scores  High scores

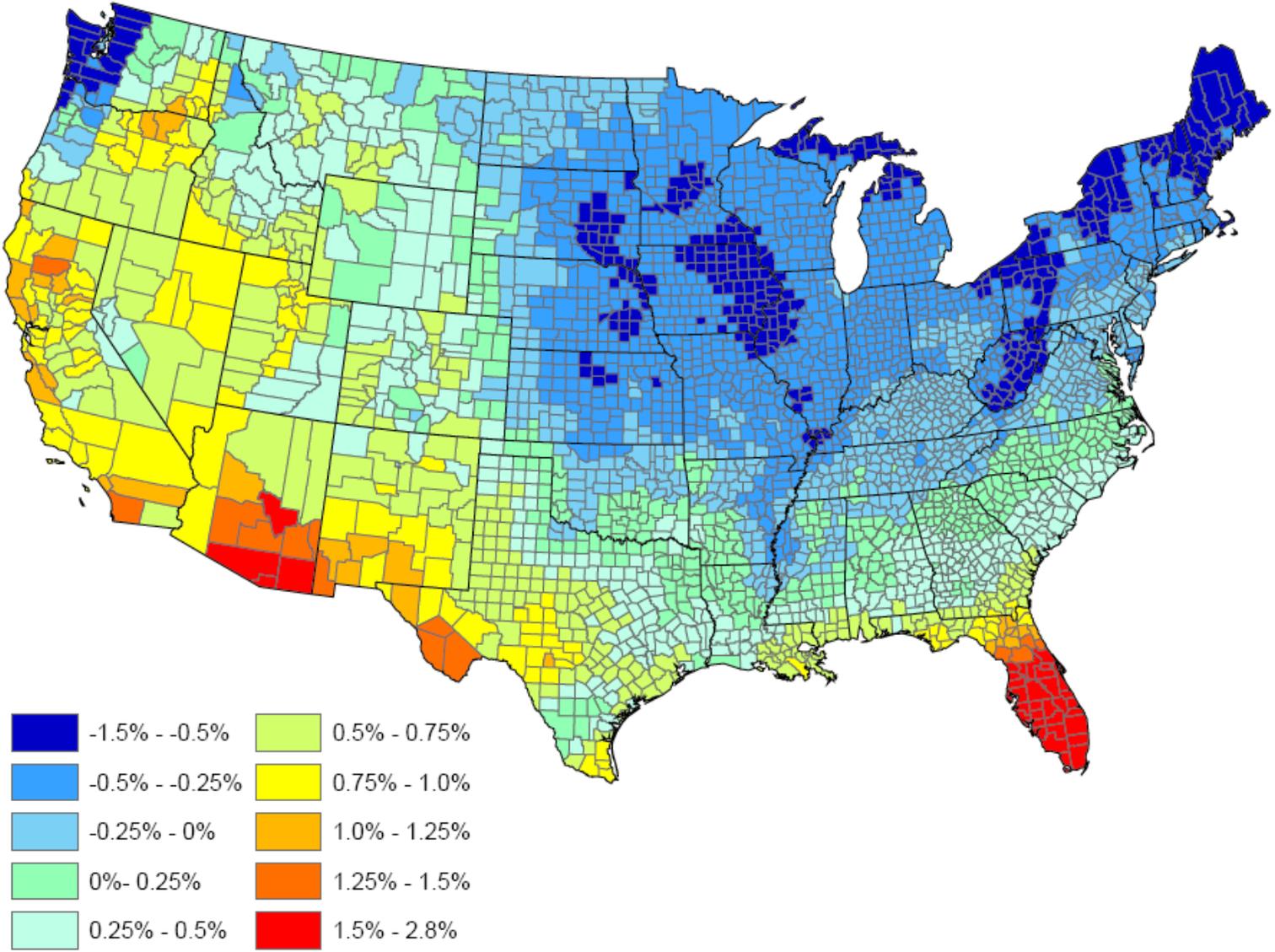
Source: McGranhan, 1999

Figure A 7: Distribution of Endangered Species, 1995



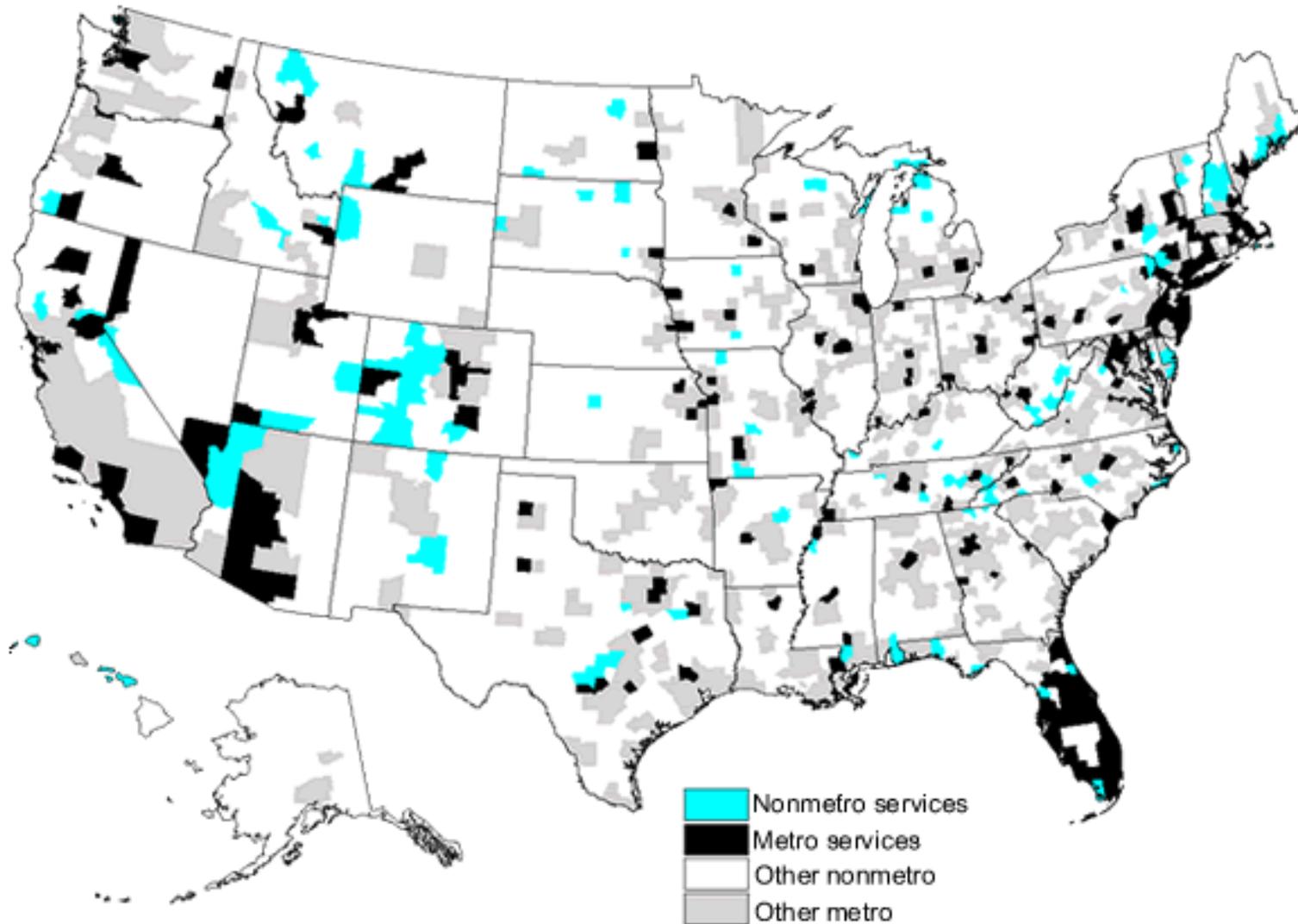
Source: Ingram and Lewandrowski, 1999

Figure A 8: Expected Population Growth from Weather (1970-2000)



Source: Rappaport, 2006

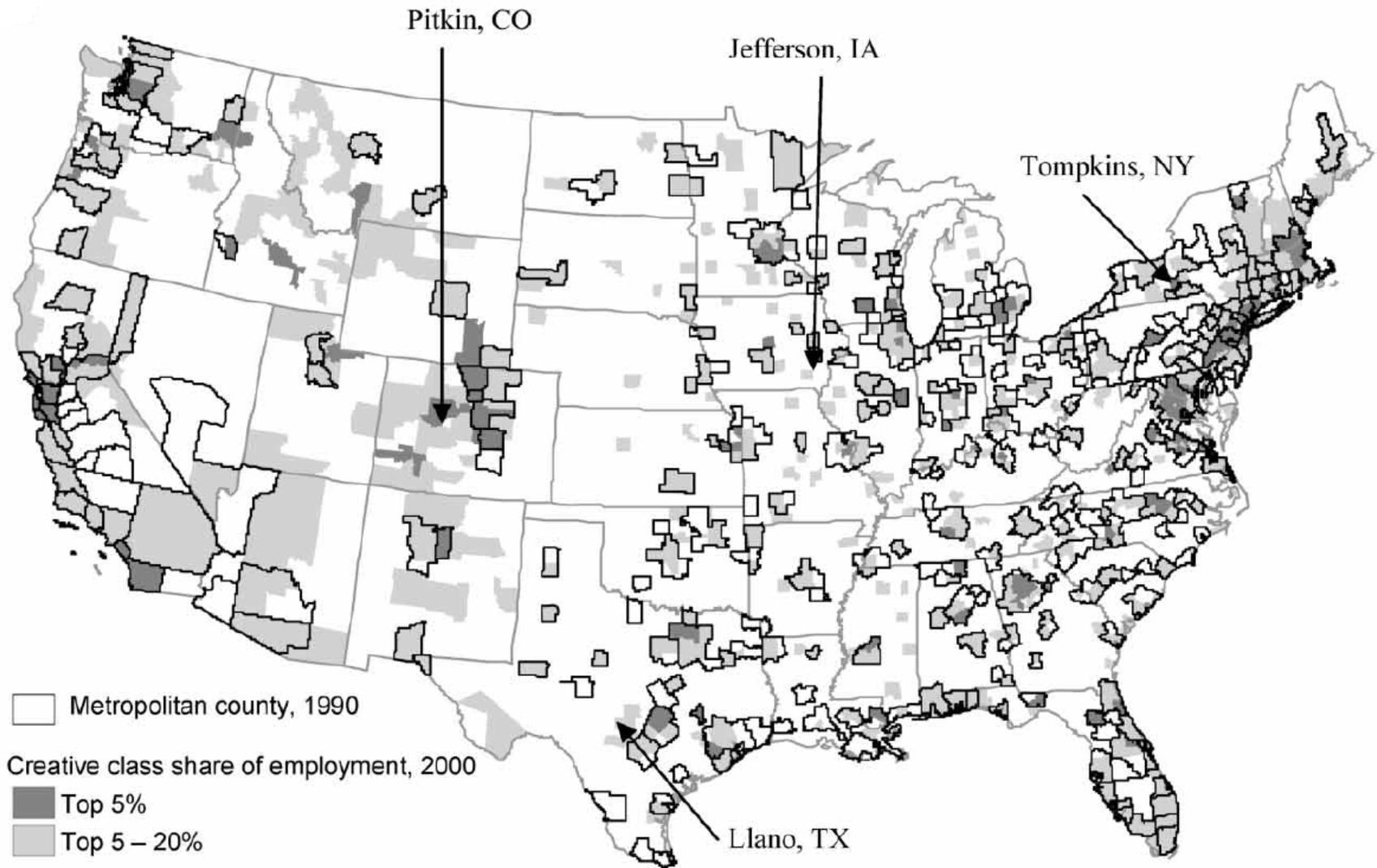
Figure A 9: Service-Dependent Counties, 1998-2000



Services-dependent counties--an annual average of 45 percent or more of total county earnings derived from services (retail trade; finance and real estate; and services) during 1998-2000.

Source: Economic Research Service, USDA.

Figure A 10: Counties with High Shares of Creative Class Employment, 2000



Source: McGranahan and Wojan, 2007

References

- (ASPO), A. S. o. P. O. (1976). *Subdividing Rural America: Impacts of Recreational Lot and Second Home Development*. Washington, D.C. , Council on Environmental Quality, and the Office of Policy Development and Research, Department of Housing and Urban Development.
- Almanac, A. (1993-1994). *Statistical Abstract of the United States*. Austin, Texas, The Reference Press.
- Altshuler, A. A., J. Gomez-Ibanez, et al. (1993). *Regulations for Revenue: The Political Economy of Land Use Exactions*. Washington, DC, The Brooking Institution: 175.
- Analysis, B. o. E. (1995). *Regional Economic Information Systems* (unpublished data disks on file with BEA). Washington, DC.
- Barlow, S. A., I. A. Munn, et al. (1998). "The Effect of Urban Sprawl on Timber Harvesting " *Journal of Forestry* 96(12): 10-14.
- Bartlett, J. G., D. M. Mageean, et al. (2000). "Residential Expansion as a Continental Threat to U.S. Coastal Ecosystems " *Population and the Environment: A Journal of Interdisciplinary Studies* 21(5): 429-468.
- Basker, E. (2003). *Education, Job Search and Migration*. Columbia University of Missouri.
- Beale, C. L. and K. M. Johnson (1998). "The identification of recreational counties in nonmetropolitan areas of the USA." *Population Research and Policy Review* 17: 37-53.
- Bejranonda, S., F. J. Hitzhusen, et al. (1999). "Agricultural Sedimentation Impacts on Lakeside Property Values." *Agricultural and Resource Economics Review*: 208-218.
- Benson, E. D., J. L. Hansen, et al. (1998). "Pricing Residential Amenities: The Value of a View." *Journal of Real Estate Finance and Economics* 16(1): 55-73.
- Beyers, W. B. and D. P. Lindahl (1995). "Lone Eagles and High Fliers in Rural Producer Services " *Rural Development Perspectives* 11(3): 2-10.
- Beyers, W. B. and P. B. Nelson (2000). "Contemporary Development Forces in the Nonmetropolitan West: New Insights from Rapidly Growing Communities." *Journal of Rural Studies* 16: 459-474.
- Beyers, W. B. and P. B. Nelson. (1997). *A Tale of Four Places: Economic Growth in Rural Western Communities*. Association of American Geographers Meeting, Forth Worth, Texas.
- Bidwell, R. D. (2004). *Explaining the Spatial Distribution of Second Homes in Okanogan County, WA*, University of Washington.
- Blomquist, G. C., M. C. Berger, et al. (1988). "New Estimates of Quality of Life in Urban Areas." *The American Economic Review* 78(1): 89-107.
- Booth, D. E. (1999). "Spatial Patterns in the Economic Development of the Mountain West." *Growth and Change* 30: 384-405.
- Boyle, K. J. and M. F. Teisl (1999). *Public Preferences for Timber Harvesting on Private Forest Land Purchased for Public Ownership in Maine*. Orono, ME, Maine Agricultural and Forest Experiment Station 18.
- Brehm, J. M., B. W. Eisenhauer, et al. (2004). "Dimensions of Community Attachment and Their Relationship to Well-Being in the Amenity-Rich Rural West." *Rural Sociology* 69(3): 405-429.
- Brown, D. L., G. V. Fuguitt, et al. (1997). "Continuities in Size of Place Preferences in the United States, 1972-1992." *Rural Sociology* 62(4): 408-428.
- Buckley, R. (2005). "Social Trends and Ecotourism: Adventure Recreation and Amenity Migration." *Journal of Ecotourism* 4(1): 56-61.
- Carroll, J. (2002). "My (Other) House." *American Demographics* 24(6): 42.

- Carruthers, J. I. and A. C. Vias (2005). "Urban, Suburban, and Exurban Sprawl in the Rocky Mountain West: Evidence from Regional Adjustment Models." *Journal of Regional Science* 45(1): 21-48.
- Cho, S.-H., D. H. Newman, et al. (2005). "Measuring Rural Homeowners' Willingness to Pay for Land Conservation Easements." *Forest Policy and Economics* 7: 757-770.
- Cho, S.-H., D. H. Newman, et al. (2003). "Impacts of Second Home Development on Housing Prices in the Southern Appalachian Highlands " *Review of Urban and Regional Development Studies* 15(3): 208-225.
- Clark, D. E. and C. A. Murphy (1996). "Countywide Employment and Population Growth: An Analysis of the 1980s." *Journal of Regional Science* 36(2): 235-256.
- Clark, J. K., R. McChesney, et al. (2005). Spatial Characteristics of Exurban Settlement Pattern in the U.S. 52nd Annual North American Meetings of the Regional Science Association. Las Vegas, NV.
- Clawson, M. (1974). Conflict, Strategies, and Possibilities for Consensus in Forest Land Use and Management. *Forest Policy for the Future: Conflict, Compromise, Consensus*. M. Clawson. Washington, Resources for the Future.
- Cledenning, G., D. R. Field, et al. (2005). "A Comparison of Seasonal Homeowners and Permanent Residents on their Attitudes Toward Wildlife Management on Public Lands." *Human Dimensions of Wildlife* 10: 3-17.
- Cromartie, J. B. and J. M. Wardwell (1999). "Migrants Settling Far and Wide in the Rural West." *Rural Development Perspectives*, 14(2-8).
- Dale, V. H., L. A. Joyceb, et al. (2000). "The Interplay Between Climate Change, Forests, and Disturbances." *The Science of the Total Environment* 262: 201-204.
- Deller, S. C., T.-H. S. Tsai, et al. (2001). "The Role of Amenities and Quality of Life in Rural Economic Growth " *American Journal of Agricultural Economics* 83(2): 352-365.
- Dramstad, W. E., M. S. Tveit, et al. (2006). "Relationships Between Visual Landscape Preferences and Map-based Indicators of Landscape Structure." *Landscape and Urban Planning* 78: 465-474.
- Duffy-Deno, K. T. (1998). "The Effect of Federal Wilderness on County Growth in Intermountain Western United States." *Journal of Regional Science* 38(1): 109-136.
- Earnhart, D. (2001). "Combining Revealed and Stated Preference Methods to Value Environmental Amenities at Residential Locations." *Land Economics*, 77(1): 12-29.
- Energy Information Administration (2003, July 13, 2005). "U.S. Climate Zones for 2003, CBECS." Retrieved January 2, 2007, from http://www.eia.doe.gov/emeu/cbecs/climate_zones.html.
- English, D. B. K. and J. C. Bergstrom (1994). "The Conceptual Links Between Recreation Site Development and Regional Economic Impacts." *Journal of Regional Science* 34: 599-611.
- English, D. B. K. and J. M. Bowker (1996). "Economic Impacts of Guided Whitewater Rafting: A Study of Five Rivers." *Water Resources Bulletin* 32(6): 1319-1328.
- English, D. B. K., D. W. Marcouiller, et al. (2000). "Tourism Dependence in Rural America: Estimates and Effects." *Society and Natural Resources* 13: 185-202.
- Esparza, A. X. and J. I. Carruthers (2000). "Land Use Planning and Exurbanization in the Rural Mountain West." *Journal of Planning Education and Research* 20(1): 23-36.
- Faushold, C. J. and R. J. Lilieholm (1999). "The Economic Value of Open Space: A Review and Synthesis." *Environmental Management* 23(3): 307-320.
- Florida, R. (2000). *Competing in the Age of Talent: Quality of Place and the New Economy*. Pittsburgh, R.K. Mellon Foundation, Heinz Endowments

- Florida, R. (2002). *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life* Perseus Books Group.
- Gale, H. F., D. A. McGranahan, et al. (1999). *Rural Competitiveness: Results of the 1996 Rural Manufacturing Survey*. E. R. S. U.S. Department of Agriculture. Food and Rural Economics Division. Agricultural Economic Report No. 776.
- Galston, W. A. and K. J. Baehler (1995). *Rural Development in the United States* Washington, D.C, Island Press.
- Garrod, G. D. and K. G. Willis (1997). "The Non-Use Benefits of Enhancing Forest Biodiversity: A Contingent Rank Study." *Ecological Economics* 21: 45-60.
- Gibson, L. J. (1993). *The Potential for Tourism Development in Nonmetropolitan Areas*. Boulder, CO, Westview Press.
- Glennon, M. and H. Kretser (2005). *Impacts to Wildlife from Low Density, Exurban Development*, Technical Paper No. 3, Adirondack Communities & Conservation Program: Wildlife Conservation Society.
- Goetz, S. J. and A. Rupasingha (2002). "High-Tech Firm Clustering: Implications for Rural Areas." *American Journal of Agricultural Economics* 84(5): 1229-1236.
- Gonzalez-Abraham, C. E., V. C. Radeloff, et al. (2007). "Building Patterns and Landscape Fragmentation in Northern Wisconsin, USA." *Landscape Ecology* 22: 217-230.
- Gosnell, H., J. H. Haggerty, et al. (2006). "Ranchland Ownership Change in the Greater Yellowstone Ecosystem, 1990–2001: Implications for Conservation." *Society and Natural Resources* 19: 743-758.
- Gottlieb, P. (1994). "Amenities as an Economic Development Tool: Is There Enough Evidence?" *Economic Development Quarterly* 8(3): 270-285.
- Granger, M. D. and G. C. Blomquist (1999). "Evaluating the Influence of Amenities on the Location of Manufacturing Establishments in Urban Areas " *Urban Studies* 36(11): 1859-1873.
- Graves, P. E., R. L. Sexton, et al. (1999). "Amenities and Fringe Benefits: Omitted Variable Bias." *American Journal of Economics and Sociology* 58(3): 399-404.
- Greason, M. C. (1989). "Here a Parcel, There a Parcel—Fragmented Forests." *The Conservationist* 44(1): 46-49.
- Green, G. P. (2001). "Amenities and Community Economic Development: Strategies for Sustainability." *The Journal of Regional Analysis and Policy* 31(2): 61-75.
- Green, G. P. and J. G. Clendenning (2003). *Second Homes*. *Encyclopedia of Community: From the Village to the Virtual World*. K. C. a. D. Levinson. Thousand Oaks, CA, Sage Publications.
- Green, G. P., D. Marcouiller, et al. (1996). "Local Dependency, Land Use, Attitudes, and Economic Development: Comparisons Between Seasonal and Permanent Residents." *Rural Sociology* 61(3): 427-445.
- Groom, M., D. B. Jensen, et al. (1999). *Buffer Zones: Benefits and Dangers of Compatible Stewardship*. *Continental Conservation: Scientific Foundations of Regional Reserve Networks* M. E. Soulé and J. Terborgh, Island Press 171-185.
- Groom, M. J., G. K. Meffe, et al. (2006). *Principles of Conservation Biology* Sunderland, MA, Sinauer.
- Gustafson, E. J., R. B. Hammer, et al. (2005). "The Relationship Between Environmental Amenities and Changing Human Settlement Patterns Between 1980 and 2000 in the Midwestern USA." *Landscape Ecology* 20: 773-789.
- Haas, W. H., III and W. J. Serow (1993). "Amenity Retirement Migration Process: A Model of Preliminary Evidence." *The Gerontologist* 33(2): 212-220.

- Hansen, A. J., R. Rasker, et al. (2002). "Ecological Consequences of Demographic Change in the New West." *BioScience* 52(2): 151-162.
- Hansen, A. J. and J. J. Rotella (2002). "Biophysical Factors, Land Use, and Species Viability in and around Nature Reserves " *Conservation Biology* 16(4): 1112-1122.
- Harris, T. and C. DeForest (1993). Policy Implications of Timberland Loss, Fragmentation, and Urbanization in Georgia and the Southeast. 1993 Southern Forest Economics Workshop, Durham, NC: Duke University.
- Heaton, T. B., C. W.B., et al. (1981). "Temporal Shifts in the Determinants of Young and Elderly Migration in Nonmetropolitan Areas." *Social Forces* 60: 41-60.
- Henderson, J. and B. Abraham (2004). "Can Rural America Support a Knowledge Economy?" *Economic Review, Third Quarter*: 71-95.
- Henderson, J. and K. McDaniel (1998). "Do Scenic Amenities Foster Economic Growth in Rural Areas?" *Regional Economic Digest(QI)*: 11-16.
- Henderson, J. R. and K. McDaniel (2005). "Natural Amenities and Rural Employment Growth: A Sector Analysis " *The Review of Regional Studies* 35(1): 80-96.
- Holmes, T. P. (2005). Forests and the Quality of Life. Southern Forest Resource Assessment: General Technical Report SRS-53. D. Wear and J. Griels, Southern Research Station, USDA Forest Service: 283-295.
- Hoppe, R. (1993). Poverty in Rural America: Trends and Demographic Characteristics Washington, D.C. Economic Research Service (DOA).
- Howsen, R. M. and S. B. Jarrell (1987). "Some Determinants of Property Crime: Economic Factors Influence Criminal Behavior but Cannot Completely Explain the Syndrome." *American Journal of Economics and Sociology* 46(4): 445-457.
- Ingram, K. and J. Lewandrowski (1999). "Wildlife Conservation and Economic Development in the West." *Rural Development Perspectives* 14(2): 44-51.
- Jarrell, S. and R. M. Howsen (1990). "Transient Crowding and Crime: The More 'Strangers' in an Area, the More Crime except for Murder, Assault and Rape." *American Journal of Economics and Sociology* 49(4): 483-494.
- Johnson, J. D. and R. Rasker (1995). "The Role of Economic and Quality of Life Values in Rural Business Location." *Journal of Rural Studies* 11(4): 405-416.
- Johnson, K. M. (1989). "Recent Population Redistribution Trends in Nonmetropolitan America." *Rural Sociology* 54(3): 301-326.
- Johnson, K. M. and C. L. Beale (2002). "Nonmetro Recreation Counties: Their Identification and Rapid Growth." *Rural America* 17(4): 12-19.
- Jones, R. E., J. M. Fly, et al. (2003). "Green Migration into Rural America: The New Frontier of Environmentalism?" *Society and Natural Resources* 16: 221-238.
- Kalof, L. and T. Satterfield (2005). *The Earthscan Reader in Environmental Values* Earthscan Publications Ltd.
- Kaval, P. and J. Loomis (2003). Updated Outdoor Recreation Use Values with Emphasis on National Park Recreation. Cooperative Agreement CA 1200-99-009. N. P. Service. Fort Collins, CO, Cooperative Agreement CA 1200-99-009.
- Knapp, T. A. and P. E. Graves (1989). "On the Role of Amenities in Models of Migration and Regional Development " *Journal of Regional Science* 29(1): 71-87.
- Knight, R. L. and K. Gutzwiller (1995). *Wildlife and Recreationists: Coexistence Through Management And Research*. Washington, D.C, Island Press.
- Kusmin, L. D. (1994). Factors Associated with the Growth of Local and Regional Economies: A Review of Selected Empirical Literature. U. S. D. o. Agriculture, Agriculture and Rural Economy Division, Economic Research Service. Staff Report No. AGES 9405.

- Landford, N. H. and L. L. Jones (1995). "Recreational and Aesthetic Value of Water Using Hedonic Price Analysis." *Journal of Agricultural and Resource Economics* 20(2): 341-355.
- Leidner, S. R. and E. Krumpel (1995). Idaho Outfitters and Guides Economic Contribution to the Idaho Economy 1993. Bulletin 775. Moscow, Idaho Forest, Wildlife and Range Experiment Station, University of Idaho.
- Lewis, D. J., G. L. Hunt, et al. (2003). "Does Public Lands Policy Affect Local Wage Growth?" *Growth and Change* 34(1): 64-86.
- Lloyd, K. M. and C. J. Auld (2002). "The Role of Leisure in Determining Quality of Life: Issues of Content and Measurement " *Social Indicators Research* 57: 43-71.
- Loeffler, R. and E. Steinicke (2007). "Amenity Migration in the U.S. Sierra Nevada." *The Geographical Review* 97(1): 67-88.
- Lorah, P. and R. Southwick (2003). "Environmental Protection, Population Change, and Economic Development in the Rural Western United States." *Population and Environment* 24(3): 255-272.
- Mallin, M. A., K. E. Williams, et al. (2000). "Effect of Human Development on Bacteriological Water Quality in Coastal Watersheds." *Ecological Applications* 10(4): 1047-1056.
- Mallin, M. A., K. E. Williams, et al. (2000). "Effect of Human Development on Bacteriological Water Quality in Coastal Watersheds." *Ecological Applications*, 10(4): 1047-1056.
- Marchak, P. (1990). *Forest Industry Towns in British Columbia. Community and Forestry: Continuities in the Sociology of Natural Resources.* R. G. Lee, D. R. Field and J. William R. Burch. Boulder, Colorado Westview Press.
- Marcouiller, D. W. (1997). "Toward Integrative Tourism Planning in Rural America." *Journal of Planning Literature* 11(3): 337-357.
- Marcouiller, D. W., J. G. Clendenning, et al. (2002). "Natural Amenity-Led Development and Rural Planning." *Journal of Planning* 16: 515-542.
- Marcouiller, D. W. and S. C. Deller (1996). "Natural Resource Stocks, Flows, and Regional Economic Change: Seeing the Forest and the Trees." *The Journal of Regional Analysis and Policy* 26(2): 95-116.
- Marcouiller, D. W. and G. P. Green (2000). *Outdoor Recreation and Rural Development National Parks and Rural Development: Practice and Policy in the United States* G. E. Machlis and D. R. Field. Washington, D.C, Island Press: 34-48.
- Marcouiller, D. W., G. P. Green, et al. (1996). *Recreational Homes and Regional Development: A Case Study from the Upper Great Lake States.* Madison, WI, University of Wisconsin Board of Regents 38.
- Marcouiller, D. W., K.-K. Kim, et al. (2004). "Natural Amenities, Tourism, and Income Distribution." *Annals of Tourism Research* 31(4): 1031-1050.
- Marcouiller, D. W. and J. Prey (2005). "The Tourism Supply Linkage: Recreational Sites and their Related Natural Amenities." *The Journal of Regional Analysis and Policy* 35(1): 23-32.
- Marcus, J. J. (1997). *Mining Environmental Handbook: Effects of Mining on the Environment and American Environmental Controls on Mining.* London, Imperial College Press.
- McGranahan, D. (1999). "Natural Amenities Drive Rural Population Change." *Agricultural Economic Report No. (AER781)*
- McGranahan, D. and P. Sullivan (2005). "Farm Programs, Natural Amenities, and Rural Development." *Amber Waves* 3(1): 28-35.
- McGranahan, D. and T. Wojan (2007a). "The Creative Class: A Key to Rural Growth " *Amber Waves* 5(2): 16-21.
- McGranahan, D. and T. Wojan (2007b). "Recasting the Creative Class to Examine Growth Processes in Rural and Urban Counties." *Regional Studies* 41(2): 197-216.

- McGranahan, D. A. (2005). Landscape Influence on Recent Rural Migration in the U.S. 11th International Symposium on Society and Resource Management Östersund, Sweden.
- McGranahan, D. A. and C. L. Beale (2002). "Understanding Rural Population Loss " *Amber Waves* 17(4): 2-11.
- McGranahan, D. A. and C. L. Beale (2003). "The Roots of Rural Population Loss." *Amber Waves* 1(1): 10-11.
- McKean, J. R., D. M. Johnson, et al. (2005). "Can Superior Natural Amenities Create High-Quality Employment Opportunities? The Case of Nonconsumptive River Recreation in Central Idaho." *Society and Natural Resources* 18: 749-758.
- McKean, J. R., D. M. Johnson, et al. (2005). "Can Superior Natural Amenities Create High-Quality Employment Opportunities? The Case of Nonconsumptive River Recreation in Central Idaho." *Society and Natural Resources* 18: 749-758.
- McMahon, K. and P. Salant (1999). "Strategic Planning for Telecommunications in Rural Communities." *Rural Development Perspectives* 14(3): 2-7.
- McMahon, M. A. (1995). *The Role of Attributes in Community Choice* (Thesis)
- McPheters, L. R. and W. B. Stronge (1974). "Crime as an Environmental Externality of Tourism: Miami, Florida." *Land Economics* 50(3): 288-292.
- Michael, H., K. J. Boyle, et al. (1996). *Water Quality Affects Property Prices: A Case Study of Selected Maine Lakes, Maine Agricultural and Forest Experiment Station.*
- Michael, H., K. J. Boyle., et al. (1996). *Water Quality Affects Property Prices: A Case Study of Selected Maine Lakes, Maine Agricultural and Forest Experiment Station.*
- Mladenoff, D. J., M. A. White, et al. (1992). "Comparing Spatial Pattern in Unaltered Old-Growth and Disturbed Forest Landscapes." *Ecological Applications* 3(2): 294-306.
- Molony, W. (2006). *Second Home Sales Hit Another Record in 2005; Market Share Rises.* Washington, National Association of Realtors.
- Molony, W. (2007). *Vacation-Home Sales Rise to Record, Investment Sales Plummet in 2006.* Washington, National Association of Realtors.
- Moore, S. R., P. W. Williams, et al. (2006). *Finding a Pad in Paradise: Amenity Migration Effects of Whistler, British Columbia The Amenity Migrants: Seeking and Sustaining Mountains and Their Cultures.* L. A. G. Moss, CAB International
- Morrison, J. R., W. J. d. Vergie, et al. (1995). "The Effects of Ski Area Expansion on Elk." *Wildlife Society Bulletin* 23(3): 481-489.
- Mulkey, D. and A. W. Hodges (2000). *Using Implan to Assess Local Economic Impacts,* University of Florida, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences Extension
- Mullins, D. R. and M. S. Rosentraub (1992). "Fiscal Pressure? The Impact of Elder Recruitment on Local Expenditures." *Urban Affairs Quarterly* 28: 337-354.
- Nelson, P. B. (1999). *Hegemony and the Rural West,* Unpublished Ph.D. Dissertation. Seattle Department of Geography, University of Washington.
- Nelson, P. B. (1999). "Quality of Life, Nontraditional Income, and Economic Growth: New Development Opportunities for the Rural West." *Rural Development Perspectives* 14(2): 32-37.
- Nepal, S. K. and R. Chipeniuk (2005). "Mountain Tourism: Toward a Conceptual Framework." *Tourism Geographies* 7(3): 313-333.
- Noss, R. F., E. T. L. III, et al. (1995). *Endangered Ecosystems of the United States: A Preliminary Assessment of Loss and Degradation.* U. S. D. o. t. I. National Biological Service. Biological Report 28.

- Notie H. Lansford, J. and L. L. Jones (1995). "Recreational and Aesthetic Value of Water Using Hedonic Price Analysis." *Journal of Agricultural and Resource Economics* 20(2): 341-355.
- Pagoulatos, A., S. J. Goetz, et al. (2004). "Interactions Between Economic Growth and Environmental Quality in U.S. Counties." *Growth and Change* 35(1): 90-108.
- Partridge, M. D. and D. S. Rickman (2003). "The Waxing and Waning of Regional Economies: The Chicken–Egg Question of Jobs Versus People." *Journal of Urban Economics* 53: 76-97.
- Persons., A. A. o. R. (1998). *Boomers Approaching Midlife: How Secure a Future?* Washington, D.C., AARP Public Policy Institute.
- Phaneuf, D. J., V. K. Smith, et al. (2005). *Choice Margins and Ecosystem Services: Measuring the Environmental Costs of Development*, North Carolina State University, EPA STAR grant program.
- Power, T. (1988). *The Economic Pursuit of Quality Armonk*.
- Radeloff, V. C., R. B. Hammer, et al. (2005). "Rural and Suburban Sprawl in the U.S. Midwest from 1940 to 2000 and Its Relation to Forest Fragmentation." *Conservation Biology* 19(3): 793-805.
- Rappaport, J. (2006). *Moving to Nice Weather (Draft)*. Kansas City, Federal Reserve Bank of Kansas City, Research Division
- Rappaport, J. (2007). "Moving to Nice Weather." *Regional Science and Urban Economics* 37: 375-398.
- Rasker, R. (1995). *A New Home on the Range: Economic Realities in the Columbia River Basin*. Washington, D.C. , The Wilderness Society,.
- Rasker, R. and A. Hansen (2000). "Natural Amenities and Population Growth in the Greater Yellowstone Region." *Human Ecology Review* 7(2): 30-40.
- Reeder, R. and D. Brown (2005b). "Rural Areas Benefit From Recreation and Tourism Development." *Amber Waves* 3(4): 28-33.
- Reeder, R. J. and D. M. Brown (2005a). *Recreation, Tourism, and Rural Well-Being U. S. D. o. Agriculture, Economic Research Service*.
- Rehdanz, K. and D. Maddison (2005). "Climate and Happiness " *Ecological Economics* 52(1): 111-125.
- Reichert, C. v. and G. Rudzitis (1994). "Rent and Wage Effects on the Choice of Amenity Destinations of Labor Force and Nonlabor Force Migrants: A Note." *Journal of Regional Science* 34(3): 445-455.
- Reisner, M. (1993). *Cadillac Desert: The American West and Its Disappearing Water*, Penguin.
- Rephann, T. J. (1999). "Links Between Rural Development and Crime." *Papers in Regional Science* 78: 365-386.
- Rosenberger, R. S., T. G. Gebremedhin, et al. (2002). *An Economic Analysis of Urbanization of Agricultural Land in West Virginia*, Division of Resource Management, West Virginia University
- Rosenberger, R. S., Y. Sneh, et al. (2002). *Recreational Opportunities and Health Status in West Virginia*. Northeastern Agricultural and Resource Economics Association Annual Meeting. Camp Hill, PA, West Virginia University.
- Rowles, G. D. and J. F. Watkins (1993). "Elderly Migration and Development in Small Communities " *Growth and Change* 24: 509-538.
- Rudzitis, G. (1993). "Nonmetropolitan Geography: Migration, Sense of Place, and the American West." *Urban Geography* 14: 574-585.
- Rudzitis, G. (1996). *Wilderness and the Changing American West*. New York Wiley.
- Rudzitis, G. (1999). "Amenities Increasingly Draw People to the American West." *Rural Development Perspectives* 14(2): 9-14.

- Rudzitis, G., C. Watrous, et al. (1995). *Public Views On Public Lands: A Survey of Interior Columbia River Basin Residents*, Department of Geography, University of Idaho.
- Rutledge, D. T., C. A. Lepczyk, et al. (2001). "Spatiotemporal Dynamics of Endangered Species Hotspots in the United States." *Conservation Biology* 15(2): 475-487.
- Schlosser, E. (2001). *Fast Food Nation: The Dark Side of the All-American Meal*. Boston, Houghton Mifflin.
- Schmidt, L. and P. N. Courant (2006). "Sometimes Close is Good Enough: The Value of Nearby Environmental Amenities." *Journal of Regional Science* 46(5): 931-951.
- Shands, W. E. (1991). "Problems and Prospects at the Urban-Forest Interface: Land Uses and Expectations are in Transition " *Journal of Forestry* 89(6): 23-26.
- Shumway, J. M. and S. M. Otterstrom (2001). "Spatial Patterns of Migration and Income Change in Mountain West: The Dominance of Service-Based, Amenity-Rich Counties." *Professional Geographer* 53(4): 492-502.
- Siegel, P. B. and F. O. Leuthold (1993). "Economic and Fiscal Impacts of a Retirement/Recreation Community: A Study of Tellico Village, Tennessee." *Journal of Agricultural and Applied Economics* 25(2): 134-147.
- Small, S. J. (1996). "Preserving Family Lands." *Land and People* 8(1): 14-15.
- Snepenger, D. J., J. D. Johnson, et al. (1995). "Travel-Stimulated Entrepreneurial Migration." *Journal of Travel Research* 34(1): 40-44.
- Song, Y. and G.-J. Knaap (2003). "New Urbanism and Housing Values: A Disaggregate Assessment." *Journal of Urban Economics* 24: 218–238.
- Steinbach, M. S. and J. W. Thomas (2007). "Potential Outcomes and Consequence of a Proposed Grazing Permit Buyout Program." *Rangeland Ecological Management* 60: 36-44.
- Stevens, J. A. and C. A. Montgomery (2002). *Understanding the Compatibility of Multiple Uses on Forest Land: A Survey of Multiresource Research with Application to the Pacific Northwest*. F. S. United States Department of Agriculture, Pacific Northwest Research Station General Technical Report, PNW-GTR-539.
- Stewart, S. I. (1994). *The Seasonal Home Location Decision Process: Toward a Dynamic Model*. Unpublished doctoral dissertation East Lansing, MI, Michigan State University, Dept. of Park, Recreation, and Tourism Resources.
- Stewart, S. I. (2000). "Amenity Migration." *Trends*: 369-378.
- Strittholt, J. R. and D. A. Dellasala (2001). "Importance of Roadless Areas in Biodiversity Conservation in Forested Ecosystems: Case Study of the Klamath-Siskiyou Ecoregion of the United States." *Conservation Biology* 15(6): 1742-1754.
- Sutton, P. D. and F. A. Day (2004). "Types of rapidly growing counties of the U.S., 1970–1990." *The Social Science Journal* 41: 251-265.
- Thrush, G. and D. Wilder (1999). "When I'm 64." *American Demographics* 21(1): 66-72.
- U.S. Department of the Interior, F. a. W. S. and B. o. t. C. U.S. Department of Commerce (1997). *1996 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*.
- Varis, O., T. Kajander, et al. (2004). "Climate and Water: From Climate Models to Water Resources Management and Vice Versa " *Climatic Change* 66: 321-344.
- Varley, J. D. and P. D. Schullery (1998). *Yellowstone Fishes: Ecology, History, and Angling in the Park*. New York, Stackpole Books.
- Vias, A. C. and J. I. Carruthers (2005). "Regional Development and Land Use Change in the Rocky Mountain West, 1982-1997." *Growth and Change* 36(2): 244-272.
- Vitousek, P. M. (1994). "Beyond Global Warming: Ecology and Global Change." *Ecology* 75(7): 1861-1876.

- Walker, P. A., S. J. Marvin, et al. (2003). "Landscape Changes in Nevada County Reflect Social and Ecological Transitions." *California Agriculture* 57(4): 115-121.
- Wear, D. N., R. Liu, et al. (1999). "The Effects of Population Growth on Timber Management and Inventories in Virginia." *Forest Ecology and Management* 118: 107-115.
- Wilkinson, K. P. (1991). *The Community in Rural America*. Middleton, WI, Social Ecology Press.
- William, H. H., III and W. J. Serow (1993). "Amenity Retirement Migration Process: A Model and Preliminary Evidence." *The Gerontologist* 33(2): 212-220.
- Williams, J. D. (1981). "The Nonchanging Determinants of Nonmetropolitan Migration." *Rural Sociology* 46: 183-202.
- Wojan, T. R. and D. A. McGranahan (2007). "Ambient Returns: Creative Capital's Contribution to Local Manufacturing Competitiveness." *Agricultural and Resource Economics Review* 36(1): 133-148.
- Wu, J. (2001). "Environmental Amenities and the Spatial Pattern of Urban Sprawl " *American Journal of Agricultural Economics* 83(3): 691-697.