Northern Forest Sustainable Economy Initiative

SOCIAL AND ECONOMIC OVERVIEW OF THE

NORTHERN FOREST REGION

The Carsey Institute

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Executive Summary

The Northern Forest is at a unique and important point in its history. The dynamics of large-scale global economic change and new demographic shifts are creating tremendous challenges in many parts of the Northern Forest, while the same forces bring new opportunities to other communities. This overview report examines social and economic trends and conditions in the Northern Forest in order to deepen our understanding of the region, and to inform the development of innovative, sustainable economic development strategies.

The Northern Forest Today

There are very few simple descriptions of social and economic circumstances in the Northern Forest that adequately convey its diversity, and generalizations about the region as a whole can be deceptive. While the region maintains many common ecological and cultural features and is united by strong ties to the forest landscape, it is highly diverse with respect to social and economic trends and conditions, settlement patterns, and industrial structure. For example, just under a third of the region's counties contain or are near large population centers, while just over a third are very remote. For every county that is losing population, there are two that are growing. For every county that depends on manufacturing for its economic well-being, there are two that either depend on services or do not rely on any one industrial sector. And roughly a third of Northern Forest counties are heavily dependent on recreation-related industries.

While it is diverse, the region as a whole is faring better than many rural parts of the United States. But the Northern Forest's challenges become apparent when it is compared to the more-prosperous and less-isolated region to its south. This report discusses in detail the variation across the region, and also identifies some of the common elements that continue to define the Northern Forest as a region. Some of the more important findings and their implications for sustainable development strategies include:

Demographic Transitions

- **A county's population trajectory is linked to its economic base**, with service-dependent and recreation-dependent counties growing at nearly twice the rate of non-specialized- and government-dependent counties and nearly three times the rate of manufacturing-dependent counties between 1980 and 2005.
- **Recreation and high amenity areas are booming**, bringing new people, resources and jobs to previously more rural and remote areas, but growth also contributes to sprawl, rising housing costs and increased property taxes.
- **The region's population is relatively old and getting older**, a dynamic that affects the composition of the labor force as well as the planning and resource requirements for future services such as health care and transportation.

Changing Social and Economic Conditions

- **Long-term industrial trends in the Northern Forest parallel those of the US,** with the once-dominant manufacturing sector declining as employment in services (including health care) and retail trade continues to increase.
- **But the decline of the manufacturing sector has not played out evenly across the region.** Places like Chittenden County, VT and Grafton County, NH gained manufacturing jobs from 1990 to 2000, while several counties in western New York each saw manufacturing employment losses number in the thousands. More fine-grained analysis is needed to **identify the types of firms that have done well** and to understand better the elements of their success.
- **Huge employment growth in service and retail industries,** and although real earnings per job in these industries either declined slightly (retail) or stagnated (service) from the 1970s to 2000, the rising tide from this growth has allowed counties where these industries dominate to lead the region in terms of population growth, household income growth, poverty reduction, and improvements in employment rates and educational attainment.
- **The eastern and western ends of the region face different economic challenges than the central part of the Northern Forest**. These sub-regions are also different in terms of industrial structure, with much of New York dependent on federal and state government, much of Vermont and New Hampshire dependent on services or non-specialized, and northeastern Vermont, northern New Hampshire, and much of Maine dependent on manufacturing. Sustainable development strategies will need to emerge from and build on these differences.
- **Economic well-being tends to be geographically clustered around Saratoga Springs, NY; Burlington, VT; central NH; and Bangor, ME, while social/community well-being is somewhat more widely distributed.** This suggests that the social resources inherent even in some of the region's economically disadvantaged places can play a role in new development strategies. Places such as Coos County, NH; Lewis County, NY; and Orange County, VT are facing distinct economic difficulties, but the attractiveness and benefits of these places marked by high levels of social interaction and low crime may be tapped to facilitate future development.

- **Educational attainment is improving, but the Northern Forest continues to lag behind the region to its south and the rest of the U.S.,** particularly in terms of residents with Bachelor's degrees or higher, even as the skills gained through college education are increasingly required by a diversifying global economy.

Opportunities for the Future

That the Northern Forest is economically disadvantaged relative to the region to its south does not come as much of a surprise in light of what is known about the challenges many Northern Forest communities are facing. But there are also new sets of opportunities in the region. While the most rural Northern Forest counties are struggling in many ways, these counties are also seeing higher in-migration than less-isolated places. This suggests that community and economic development strategies in the most rural counties should attempt to capitalize on the resources new residents bring, including new human and financial capital.

Low labor force participation rates in manufacturing counties suggest that an able-bodied and relatively skilled workforce can be tapped to fuel new forms of economic growth. Development strategies in manufacturing areas should work to make these places more attractive to their young people so that existing skills and manufacturing infrastructure can be taken advantage of in fresh ways.

The growth in service-dependent counties reflects the universal trend of increasing importance of service work, and illustrates the need to cultivate high skill and high wage jobs in that sector, rather than letting low skill, low wage work predominate as it frequently does in rural areas. The proximity of the region's main population centers, where high-wage service industries tend to be concentrated, to major transportation routes and to the more-affluent southern tier suggests that there may be opportunities to build high-wage service employment in these areas.

The relatively high well-being in recreation-dependent counties brings into focus the ways in which the region's natural resources present economic opportunities beyond those of traditional extraction, and highlights the need to carefully cultivate the tourism sector. Despite points of economic difficulty, the Northern Forest as a whole is growing, and much of this growth appears to be due to the attractiveness of the region's natural amenities. While it is not a challenge unique to the Northern Forest, the region must balance the preservation of what makes the region attractive with the gains to be made from successful integration of newcomers. And the differences in circumstances across the region suggest that a single region-wide development strategy, or even a set of strategies, may be very difficult to formulate. Whatever the overall approach to development, its implementation must address the different realities that exist on the ground from place to place.

I. Introduction

A. Purpose of Study

The Northern Forest is at a unique point in its history, one carrying with it uneven fortunes from one place to another. The large-scale dynamics of global economic change and new demographic shifts are creating tremendous challenges in many parts of the Northern Forest, while the same dynamics are simultaneously bringing new sets of opportunities to communities across the region. This report reviews social and economic trends and conditions in the Northern Forest with the goal of providing the Northern Forest Sustainable Economy Initiative (NFSEI) with information that helps to deepen and quantify the understanding and awareness of social and economic conditions and general trends in the Northern Forest region. The goal is to develop a comprehensive overview of the changing economy in the region, including how shifts in the forest products, manufacturing, recreation/tourism, energy, and knowledge sectors, among others, are affecting Northern Forest communities. With a more comprehensive understanding of the social and economic realities of life in the Northern Forest, NFSEI is better placed to identify the region's strengths and challenges, both of which are fundamental to the Initiative's next step of identifying sustainable economic development strategies that are based on achievable outcomes. The intent is to inform the development of new, innovative and sustainable economic development strategies that can help move the Northern Forest from a region trying to manage slow decline to one that is building a bright, sustainable future and providing residents with a high quality of life.

There are very few simple descriptions of social and economic circumstances in the Northern Forest that adequately consider its diversity, and generalizations about the region as a whole can be deceptive. Although the region maintains many common ecological and cultural connections and is united by strong ties to the forest landscape, it is highly diverse with respect to social and economic trends and conditions, settlement patterns, and industrial structure. For example, just under a third of the region's counties contain or are near large population centers, while just over a third are very remote. For every county that is losing population, there are two that are growing. For every county that depends on manufacturing for its economic well-being, there are two that either depend on services or are not reliant on any one industrial sector. And roughly a third of Northern Forest counties are heavily dependent on recreation-related industries.

While it is diverse, the region as a whole is faring better than many other rural parts of the United States. But, its challenges become apparent when it is compared to the more-prosperous and less-isolated region to its south. This report discusses in detail the variation apparent across the region. It also identifies some of the common elements that continue to define the Northern Forest as a region. Understanding the region's commonalities and the intra-regional differentiation is an important first step toward the identification and development of sustainable economic development strategies for individual parts of the Northern Forest and the region as a whole.

B. Overview of Methodology

This report, which builds upon previous Carsey Institute work, describes and analyzes the socio-economic structure of the Northern Forest region. It expands the overall understanding of the recent past, present, and future of the region through the presentation of a wide array of available secondary data on the region. Data sources include the US Census of Housing and Population, the Economic Census, the Quarterly Census of Earnings and Wages, and various state agencies. The report provides details of conditions and trends in the Northern Forest, information that enhances our understanding of the changes the region has experienced in recent decades. This descriptive presentation is useful to identify the problems that exist in the region, as well as many of the region's strengths and advantages. In many ways, this analysis confirms much of what has been anecdotally known about the challenges facing the region. However, it also emphasizes the social and economic diversity of the Northern Forest, and takes a fresh look at the structure of the region's economy.

The description of the Northern Forest region includes several levels of comparative analysis to better understand what is happening in the region. The demographic trends and characteristics of the Northern Forest region are examined in relation to corresponding information on the nation as a whole and on a neighboring area of the northeastern United States, specifically the "southern tier" comprised of those parts of New York, Vermont, New Hampshire, and Maine not included in the Northern Forest. The Northern Forest is different from the southern areas of its four states in many ways, and comparing the two regions places conditions and trends in the Northern Forest into the context of those in a generally more prosperous region, thereby bringing challenges and points of opportunity unique to the Northern Forest into focus. County-level data for the Northern Forest and southern tier are further broken down and presented by degree of remoteness/rurality, and form of economic dependence. In doing so, this report emphasizes the different sets of challenges and opportunities present in counties with different geographical locations and economic foundations.

While it is informative to view recent social and economic trends as they have unfolded in the region as a whole and in comparison to other regions to understand the Northern Forest's positions and places of advantage, it is also vital to explore the social and economic similarities and differences within the region. To accomplish this, data specific to each of the region's counties, and in some cases the region's Census tracts, are presented to illustrate the ways the region itself is differentiated. Throughout this report, data are mapped at the county and tract level to identify spatial patterns in demographic and economic trends and conditions. This research also begins to identify different "types" of Northern Forest counties, examining the ways in which groups of counties exhibit similarities and differences. These typologies are formulated with the goal of identifying clusters of regional and sub-regional challenges and opportunities.

II. Social and Demographic Trends and Characteristics of the Northern Forest Region, 1990–2005

This section of the report outlines recent sociodemographic shifts in the Northern Forest, using county-level data primarily from the US Census Bureau, though Bureau of Economic

Analysis data are also used. It is designed to complement the data presented in a previous report done for the Northern Forest Center in 2006.[1] Throughout this section, findings for the Northern Forest are compared with those for the US as a whole, and to the southern tier of the four-state Northern Forest region. The figures for the southern tier do not include the five counties comprising New York City in order to maximize the comparability of the two regions. The five counties that were excluded substantially influence the aggregate figures for the southern part of the four-state region, and result in misleading comparisons in some cases.

Findings are presented several ways. First, several tables with summary statistics for the Northern Forest, southern tier, and US are presented. Second, these tables show figures for Northern Forest and southern tier counties by metropolitan status[2], by economic dependence type, and for recreation-dependent counties.[3] For the purposes of this report, "nonmetropolitan rural" counties can be interpreted as the most geographically remote group; "nonmetropolitan small city" counties can be viewed as counties with small city population centers; and metropolitan counties can be viewed as those containing or very close to large population centers. Third, statistics for individual Northern Forest counties are shown through a series of tables in the Appendix. Fourth, each indicator is mapped across the Northern Forest region at the county level; these maps are also located in the report's Appendix. While groupings of counties are discussed, such an approach masks county-level variation within these groupings; data for individual counties are presented in the Appendix and briefly discussed in this section.

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[1] *Northern Forest Region: An Overview of Selected Social and Economic Trends* by Priscilla Salant with Chris Colocousis

[2] The US Office of Management and Budget classifies counties as follows. Metropolitan counties are those with an urbanized area of at least 50,000 people along with counties that are economically tied to the urbanized county by virtue of commuting levels of at least 25 percent. Micropolitan ("nonmetropolitan small city") counties are those with an urbanized area of between 10,000 and 49,999, and that are not linked to metropolitan counties. Noncore ("nonmetropolitan rural") counties are those that meet neither of these criteria. Metropolitan, micropolitan, and noncore counties are shown in Figure 1 of the Appendix.

[3] The USDA Economic Research Service has developed several typologies of nonmetropolitan US counties. Two that are used here are Economic Type and Policy Type.
Economic Types are exclusive categories. Manufacturing dependent counties had at least 25 percent of average annual income from manufacturing in the period 1998–2000. Federal/state government dependent counties had an annual average of 15 percent or more of total county earnings derived from federal and state government during 1998–2000. Services dependent counties had at least 45 percent of total county earnings derived from services (retail trade; finance and real estate; and services) during 1998–2000. Nonspecialized counties meet none of these criteria.
Policy Types are nonexclusive groupings of counties. For the purposes of this report, we have calculated and presented figures for recreation-dependent counties. Nonmetro recreation counties had a high share of: employment or earnings in recreation related industries in 1999; seasonal or occasional use housing in 2000; and per capita receipts from hotels and motels in 1997. Twelve counties in the Northern Forest are categorized as recreation-dependent in addition to their position in the USDA ERS economic dependence scheme outlined above.
For more on the USDA County Typology Codes, see http://www.ers.usda.gov/Briefing/Rurality/Typology/

A. Overview of Trends and Conditions

Population and Net Migration, 1990–2005

Table 2.1 shows the Northern Forest and southern tier populations broken down by county type. About half of the Northern Forest population is in metropolitan counties, and roughly one-quarter each are in nonmetropolitan small city and nonmetropolitan rural counties. Looking at the population by economic dependence type, just under one-sixth are in manufacturing counties, one-fifth are in government-dependent counties, and one-third each are in services-dependent and nonspecialized counties. Just under one-fifth of the region's residents live in recreation-dependent counties. The southern tier population is much more concentrated in metropolitan and services-dependent counties.

Figures 2.1–2.6 in the Appendix depict Northern Forest county types geographically. Metropolitan counties are located around: Bangor, ME; Burlington, VT: Albany, NY; and through the southwestern edge of the region near Syracuse, Utica, and Rome, NY. nonmetropolitan small city counties are located in northwestern NY, in the southern part of Vermont's Northern Forest territory and the northeastern corner of that state, and in the north and northwestern part of NH. Nonmetropolitan rural counties are located predominantly in ME, with a few in the Adirondack Park and western NY, in the north-central part of VT, and one in NH.

Table 2.1: Northern Forest and Southern Tier Population by County Metropolitan Status and Economic Dependence/Policy Type, 2005

	Northern Forest			Southern Tier		
	# Counties	Population	%	# Counties	Population	%
TOTAL	34	2,263,696	100	63	12,102,232	100
METRO	10	1,116,987	49.3	32	10,217,478	84.4
NM Small City	10	630,199	27.8	18	1,238,011	10.2
NM Rural	14	516,510	22.8	13	646,743	5.3
MAN	9	349,305	15.4	18	2,732,227	22.6
GOV	6	458,998	20.3	7	570,877	4.7
SERV	7	724,814	32.0	22	6,134,632	50.7
NONSP	12	730,579	32.3	16	2,664,496	22.0
REC	12	426,109	18.8	12	979,449	8.1

Manufacturing-dependent counties form a contiguous swath from northeastern VT to central ME, and are also located north of Albany, and in the western part of New York's Northern Forest territory. Government-dependent counties form a contiguous group across the northern part of NY, with another located near Montpelier, VT. Services-dependent counties are spread across the region. They can be found in parts of Downeast ME, central NH, north-central VT, and around Saratoga Springs, Utica, and Rome, NY. Nonspecialized counties are also spread around the region, comprising much of eastern ME, almost all of Vermont's Northern

Forest territory, and parts of central and western NY. Recreation-dependent counties comprise much of the central part of the region, as well as those counties contained in Adirondack Park, and parts of and central and Downeast ME.

Table 2.2: Population Change, 1980–2005

POPULATION CHANGE 1980-1990				POPULATION CHANGE 1990-2000			
NF	7.0	**ST**	*NA*	**NF**	2.3	**ST**	4.1
METRO	7.3	**METRO**	*NA*	**METRO**	2.7	**METRO**	4.3
NM Small City	7.3	**NM Small City**	*NA*	**NM Small City**	1.7	**NM Small City**	2.9
NM Rural	6.0	**NM Rural**	*NA*	**NM Rural**	2.1	**NM Rural**	3.8
MAN	4.9	**MAN**	*NA*	**MAN**	0.3	**MAN**	3.1
GOV	7.4	**GOV**	*NA*	**GOV**	0.9	**GOV**	2.5
SERV	8.8	**SERV**	*NA*	**SERV**	4.7	**SERV**	5.9
NONSP	6.2	**NONSP**	*NA*	**NONSP**	1.9	**NONSP**	1.6
REC	9.2	**REC**	*NA*	**REC**	7.0	**REC**	7.2
US			7.6	**US**			13.2

POPULATION CHANGE 2000-2005				POPULATION CHANGE 1990-2005			
NF	2.2	**ST**	1.9	**NF**	4.6	**ST**	6.1
METRO	2.4	**METRO**	2.0	**METRO**	5.2	**METRO**	6.3
NM Small City	2.1	**NM Small City**	1.6	**NM Small City**	3.8	**NM Small City**	4.6
NM Rural	2.1	**NM Rural**	2.2	**NM Rural**	4.2	**NM Rural**	6.1
MAN	1.4	**MAN**	1.2	**MAN**	1.8	**MAN**	4.4
GOV	1.6	**GOV**	0.9	**GOV**	2.6	**GOV**	3.4
SERV	3.6	**SERV**	2.7	**SERV**	8.4	**SERV**	8.7
NONSP	1.6	**NONSP**	1.2	**NONSP**	3.6	**NONSP**	2.8
REC	3.4	**REC**	3.8	**REC**	10.7	**REC**	11.3
US			5.4	**US**			19.2

POPULATION CHANGE 1980-2005			
NF	11.9	**ST**	*NA*
METRO	12.9	**METRO**	*NA*
NM Small City	11.4	**NM Small City**	*NA*
NM Rural	10.5	**NM Rural**	*NA*
MAN	6.8	**MAN**	*NA*
GOV	10.1	**GOV**	*NA*
SERV	18.0	**SERV**	*NA*
NONSP	10.0	**NONSP**	*NA*
REC	20.9	**REC**	*NA*
US			28.3

Table 2.2 shows trends in population change for several time periods and county types.[4] The Northern Forest population grew faster in the 1980s than in the 1990s, although the Northern Forest population growth rate was less than that for the US in both periods and less than the southern tier in the 1990s. Northern Forest population growth remained positive between 2000 and 2005 and although the region continued to lag behind the nation, growth in the Northern Forest from 2000 to 2005 was greater than that in the southern tier. Johnson (2006)[5] points out that, nationally, rural population growth accelerated after 2001, and population dynamics in the Northern Forest are generally consistent with this dynamic. These trends are mapped at the county level in Figures 2.7–2.10 in the Appendix.

In each period, growth in Northern Forest metropolitan counties was greater than in nonmetropolitan small city or nonmetropolitan rural counties. However, nonmetropolitan rural counties grew at a greater rate than nonmetropolitan small city counties from 1990 to 2005. This general trend is apparent for the southern tier as well, and likely reflects the growing appeal and drawing power of many rural places. In both regions, services-dependent and recreation counties grew most substantially from 1990 to 2005. Indeed, Carroll County, NH and Lamoille County, VT were the two fastest-growing counties (with population greater than 20,000) in the region during this time; both counties were services and recreation-dependent. Manufacturing counties were the slowest-growing counties in the Northern Forest over this time period, and the lag is more apparent as longer time periods are examined, likely reflecting the declining manufacturing base of the region. Though they are not manufacturing-dependent counties, Oneida County, NY and Aroostook County, ME saw the largest population losses of all counties in the Northern Forest. All but two of the region's manufacturing counties were below the median figure for population change from 1990 to 2005.

Table 2.3: Net Migration and Rates, 1990–2005

NET MIGRATION 1990-1999				NET MIGRATION 2000-2005			
NF	-53,978	**ST**	-271,734	**NF**	30,643	**ST**	36,225
METRO	-27,013	**METRO**	-262,322	**METRO**	15,392	**METRO**	6,167
NM Small City	-25,631	**NM Small City**	-10,658	**NM Small City**	2,329	**NM Small City**	17,650
NM Rural	-1,334	**NM Rural**	1,246	**NM Rural**	12,922	**NM Rural**	12,408
MAN	-3,681	**MAN**	-89,016	**MAN**	6,727	**MAN**	-1,695
GOV	-24,612	**GOV**	-6,906	**GOV**	-4,802	**GOV**	3,136
SERV	-9,377	**SERV**	-74,158	**SERV**	20,636	**SERV**	32,472
NONSP	-16,308	**NONSP**	-101,654	**NONSP**	8,082	**NONSP**	2,312
REC	10,532	**REC**	7,267	**REC**	16,099	**REC**	33,062
US			7,478,078	**US**			6,445,343
NET MIGRATION RATE 1990-1999				**NET MIGRATION RATE 2000-2005**			
NF	-2.5	**ST**	-2.4	**NF**	1.4	**ST**	0.3

[4] Data for the southern tier were not available in an electronic format for 1980.
[5] *Demographic Trends in Rural and Small Town America* by Kenneth Johnson. Carsey Institute Report on Rural America Volume 1, Number 1.

METRO	-2.5	**METRO**	-2.7	**METRO**	1.4	**METRO**	0.1
NM Small City	-4.2	**NM Small City**	-0.9	**NM Small City**	0.4	**NM Small City**	1.4
NM Rural	-0.3	**NM Rural**	0.2	**NM Rural**	2.6	**NM Rural**	2.0
MAN	-1.1	**MAN**	-3.4	**MAN**	2.0	**MAN**	-0.1
GOV	-5.5	**GOV**	-1.3	**GOV**	-1.1	**GOV**	0.6
SERV	-1.4	**SERV**	-1.3	**SERV**	2.9	**SERV**	0.5
NONSP	-2.3	**NONSP**	-3.9	**NONSP**	1.1	**NONSP**	0.1
REC	2.7	**REC**	0.8	**REC**	3.9	**REC**	3.5
US			3.0	**US**			2.3

Population trends to a large degree embody the trends in migration depicted in Table 2.3. Through the 1990s, more people moved out of the Northern Forest than moved in. Net migration rates were lower for nonmetropolitan small city Northern Forest counties than for metropolitan or nonmetropolitan rural counties in both 1990–2000 and 2000–2005. Recreation counties were the only group to see positive net migration in the 1990s, in both the Northern Forest and southern tier. However, net migration was positive for the region as a whole from 2000–2005. Recreation counties had the highest net migration rate in 2000–2005, when government-dependent counties were the only group to show negative net migration.[6] Proportionally more people moved into the Northern Forest than the southern tier between 2000 and 2005.

Migration trends are mapped in Figures 2.11–2.13 of the Appendix. In the 1990s, almost the entire central part of the region, and areas around Adirondack Park and Saratoga Springs, NY, had positive net migration. Areas of net outmigration are visible in western NY and eastern ME, though Downeast ME saw net inmigration in this period. Trends for the 2000–2005 period are slightly different, with western NY become more distinct as a contiguous region of net outmigration. Aside from this group of counties, Washington County in ME and Chittenden County in VT were the only counties to experience net outmigration during this time. From 2000–2005, Saratoga County, NY and Carroll County, NH had the highest levels of net migration, while Jefferson and Oneida counties in NY had the lowest levels of net migration.

Age Distribution, 1990–2005

As measured as the percentage of residents over age 65, the Northern Forest as a whole is slightly older than the southern tier, and its population is aging more significantly. These trends are shown in Table 2.4. Both regions are older and aging more significantly than the US. However, the decline in the number of 25–34 year-olds was proportionally less in the Northern Forest than in the southern tier from 1990 to 2005. In the overall US the share of the population 25–34 years old also declined, but at less than half the rate in both northeastern regions. Trends for this age group across the country reflect a general demographic shift as baby-boomers aged out of this cohort through the 1990s, but it is also apparent that the Northern Forest and the southern tier are having difficulties retaining young people.

In the Northern Forest, nonmetropolitan rural counties are oldest, and aging most quickly. Nonmetropolitan small city counties saw the smallest decrease in the number of 25–34 year-olds from 1990–2005, despite having the lowest net-migration rates in that period. However, in the

[6] With the exception of Washington County, VT, all government-dependent counties in the NF are in New York.

southern tier, metropolitan counties saw a larger loss of young people than did nonmetropolitan small city or nonmetropolitan rural counties. Northern Forest manufacturing and nonspecialized counties were particularly hard-hit, each losing over one-third of residents in this age group; manufacturing counties saw the largest loss in the southern tier.

Trends in age distribution are mapped in Figures 2.14 and 2.15 in the Appendix. In 2005, the only counties in the region that were not substantially older than the US were around Burlington, VT and in far western NY near Lake Ontario. The counties with the largest losses of young people were Aroostook and Piscataquis in northern ME, though a decline in the overall size of this age group was a widespread phenomenon. Only Grand Isle[7] and Orleans counties in VT saw increases in this age group over this fifteen year period.

Table 2.4: Select Components of Overall Age Distribution and Change 1990–2005

% AGE 65+ 2005				CHANGE IN % AGE 65+ 1990-2005			
NF	13.9	**ST**	13.6	**NF**	1.2	**ST**	0.6
METRO	13.2	**METRO**	13.4	**METRO**	0.9	**METRO**	0.6
NM Small City	13.5	**NM Small City**	15.1	**NM Small City**	1.1	**NM Small City**	0.5
NM Rural	15.9	**NM Rural**	14.6	**NM Rural**	1.9	**NM Rural**	0.7
MAN	15.3	**MAN**	13.7	**MAN**	0.8	**MAN**	0.7
GOV	12.9	**GOV**	13.8	**GOV**	1.2	**GOV**	-0.3
SERV	14.6	**SERV**	13.4	**SERV**	1.0	**SERV**	0.7
NONSP	13.2	**NONSP**	14.1	**NONSP**	1.5	**NONSP**	0.4
REC	15.7	**REC**	14.8	**REC**	1.4	**REC**	0.9
US			12.1	**US**			-0.5
CHANGE IN POPULATION AGE 25-34 1990-2005							
NF	-22.2	**ST**	-27.0				
METRO	-22.3	**METRO**	-27.7				
NM Small City	-17.1	**NM Small City**	-23.1				
NM Rural	-28.6	**NM Rural**	-22.7				
MAN	-34.9	**MAN**	-27.8				
GOV	-18.3	**GOV**	-21.6				
SERV	-25.0	**SERV**	-27.2				
NONSP	-37.1	**NONSP**	-26.8				
REC	-28.1	**REC**	-24.7				
US			-10.2				

Education, 1990–2000

[7] Grand Isle County is an exceptional case in many respects, and is not focused on much in this report owing to its small size and very unique qualities that set it apart from the rest of the region.

Table 2.5 shows trends in educational attainment for the three regions. The percentage of adults over 25 without a high school diploma was higher in 2000 in the Northern Forest than in the southern tier, but both were below the figure for the US as a whole. However, declines in this percentage were greater in the Northern Forest, reflecting convergence on this educational issue between the Northern Forest and southern tier. Perhaps more importantly, the Northern Forest lags behind both the southern tier and US with respect to college education, and the increase in percentage of adults over 25 with a Bachelor's degree or higher was larger in the southern tier than in the Northern Forest from 1990 to 2000. Here, we see the human capital gap growing larger between these two regions, although the percentage of residents with a college education did increase more quickly in the Northern Forest than in the US over the same period.

Just as nonmetropolitan rural counties are oldest group in the Northern Forest, they show the lowest levels of college education in both the Northern Forest and southern tier, and the discrepancy between nonmetropolitan rural and metropolitan counties appears to be growing larger over time despite outright improvements in this form of human capital. Manufacturing, government, and service-dependent Northern Forest counties are all notably behind their counterparts in the southern tier. Low levels of college education in Northern Forest manufacturing counties likely reflect historically easy entry into employment in that sector, but also appear to leave those counties at a particular disadvantage as the manufacturing base of the region continues to erode and high skill work becomes more important to what remains of that sector.

Table 2.5: Educational Attainment 2000 and Change 1990–2000

PERCENT W/O HS 2000				CHANGE IN PERCENT W/O HS 1990-2000			
NF	17.4	**ST**	15.1	**NF**	-6.0	**ST**	-4.8
METRO	16.2	**METRO**	14.8	**METRO**	-5.5	**METRO**	-4.5
NM Small City	19.4	**NM Small City**	16.4	**NM Small City**	-5.4	**NM Small City**	-6.4
NM Rural	17.8	**NM Rural**	18.2	**NM Rural**	-6.4	**NM Rural**	-6.0
MAN	19.6	**MAN**	15.9	**MAN**	-6.5	**MAN**	-5.6
GOV	20.2	**GOV**	16.6	**GOV**	-4.9	**GOV**	-5.5
SERV	15.3	**SERV**	14.1	**SERV**	-5.3	**SERV**	-3.8
NONSP	16.8	**NONSP**	16.3	**NONSP**	-6.1	**NONSP**	-6.0
REC	16.0	**REC**	16.2	**REC**	-6.0	**REC**	-6.0
US			24.8	**US**			-5.2
PERCENT W/BACHELOR'S+ 2000				**CHANGE IN PERCENT W/BACHELOR'S+ 1990-2000**			
NF	21.0	**ST**	28.2	**NF**	3.5	**ST**	4.3
METRO	23.3	**METRO**	29.7	**METRO**	3.8	**METRO**	4.5
NM Small City	19.7	**NM Small City**	21.4	**NM Small City**	3.0	**NM Small City**	3.4
NM RurSal	18.6	**NM Rural**	19.1	**NM Rural**	3.2	**NM Rural**	3.0
MAN	19.6	**MAN**	24.9	**MAN**	2.2	**MAN**	3.8
GOV	18.5	**GOV**	25.6	**GOV**	2.6	**GOV**	3.7
SERV	25.6	**SERV**	31.8	**SERV**	4.4	**SERV**	4.7

NONSP	21.9	**NONSP**	23.9	**NONSP**	3.6	**NONSP**	3.9
REC	22.6	**REC**	23.0	**REC**	4.1	**REC**	3.5
US			24.4	**US**			3.1

These trends are shown in Figures 2.16–2.19 of the Appendix. Counties with high percentages of adults with Bachelor's degrees include those around Burlington and Montpelier in VT, Saratoga County in NY, Grafton County in NH, and Hancock County in ME. These counties also show the highest increases in college education over time, indicating that they are pulling away from the rest of the region in this respect. In 2000, the lowest four counties in terms of college education were all manufacturing-dependent ones (Coos, NH; Somerset, ME; Lewis, NY; and Essex, VT).

Work and School Enrollment, 1990–2000

In assessing the overall well-being of any region, it is important to examine trends in the degree to which young and old people are integrated with major institutions such as schools and the labor market. These trends are shown in Table 2.6 and depicted geographically in Figures 2.20–2.23 of the Appendix. Idle teens are residents age 15–17 who are not working and not enrolled in school. In 2000, the percentage of idle teens was about the same for the Northern Forest and southern tier, and both regions were doing better than the US overall. And over time, the improvement in the idle teen rate has been greater in the Northern Forest than the southern tier or US, by over a two-to-one margin. However, nonmetropolitan rural counties remain particularly disadvantaged on this indicator, and the gap between nonmetropolitan rural, and metropolitan and nonmetropolitan small city counties in the Northern Forest appears to be growing. Among economic types, the idle teen percentage is highest in manufacturing counties in the Northern Forest; the counties with the highest idle teen rates are both manufacturing dependent (Washington, NY and Piscataquis, ME), and these counties also saw the worst change over time. Again this likely reflects economic hardship related to the decline of the manufacturing sector, although Coos County, NH and Lewis County, NY, both manufacturing dependent, were among those counties with the greatest improvement in idle teen rates over time.

Trends in the labor force participation rate reflect the degree to which the population over age 16 is employed or actively looking for work, and can also be influenced by retirees making up a greater or lesser proportion of the total population. The labor force participation rate for the Northern Forest lags just behind that for the US, but notably behind that for the southern tier. However, while the labor force participation rate increased for the Northern Forest from 1990 to 2000, it declined in the southern tier and US, indicating a modest move toward parity between the Northern Forest and the other two regions. In both the Northern Forest and southern tier, metropolitan counties had the highest labor force participation rates in 2000, reflecting relatively higher levels of economic opportunity around larger population centers. Northern Forest nonmetropolitan small city counties were notably worse off than their southern tier counterparts, and Northern Forest nonmetropolitan small city counties declined slightly from 1990 to 2000 while southern tier nonmetropolitan small city counties saw an improvement during this period.

In the Northern Forest, manufacturing and government counties had the lowest labor force participation rates in 2000.

Another way to examine how strongly the population is attached to labor markets is to calculate the percentage of people age 16–64 who are employed. Here again, in 2000 the percentage of the working age population who were employed was lower in the Northern Forest than in the southern tier or US. However, while labor force participation rates went up overall for the Northern Forest, the percentage of the working age population who were employed fell for all three regions, though the decline was lowest in the Northern Forest, again reflecting a slight move toward parity. Nonmetropolitan small city counties were most disadvantaged relative to metropolitan and nonmetropolitan rural counties in the Northern Forest, but in the southern tier, nonmetropolitan small city counties were slightly better off than metropolitan counties. Also, the overall decline in this indicator for the Northern Forest was comprised largely of declines in nonmetropolitan small city counties, while the southern tier decline was smallest in this group. This reflects a fundamentally different, and more promising economic reality in counties with small population centers in the southern tier of the four state region than in the Northern Forest. In both regions, however, government-dependent counties had the lowest percentages of working age population employed, and the decline was greatest in this group of counties, likely a manifestation of a shrinking public sector. However, because nonmetropolitan small city and government-dependent Northern Forest counties are disproportionately located in northwestern and northern New York, trends observed in these groups may have more to do with location in a particular part of the Northern Forest than with the distribution of the population or the underlying economic base.

Table 2.6: Idle Teens, Labor Force Participation, Working Age Employed, 1990–2000 and Change 1990–2000

% IDLE TEENS 2000				CHANGE IN % IDLE TEENS 1990-2000			
NF	6.5	**ST**	6.4	**NF**	-2.3	**ST**	-0.9
METRO	5.9	**METRO**	6.1	**METRO**	-2.2	**METRO**	-0.9
NM Small City	6.6	**NM Small City**	7.1	**NM Small City**	-2.9	**NM Small City**	-1.2
NM Rural	7.6	**NM Rural**	8.9	**NM Rural**	-1.8	**NM Rural**	-0.4
MAN	8.1	**MAN**	6.5	**MAN**	-2.1	**MAN**	-1.6
GOV	7.1	**GOV**	8.4	**GOV**	-2.8	**GOV**	1.6
SERV	5.4	**SERV**	5.8	**SERV**	-3.0	**SERV**	-0.8
NONSP	6.4	**NONSP**	6.9	**NONSP**	-1.6	**NONSP**	-1.0
REC	6.4	**REC**	7.7	**REC**	-2.4	**REC**	-0.9
US			9.0	**US**			-1.0
LABOR FORCE PARTICIPATION RATE 2000				**CHANGE IN LABOR FORCE PARTICIPATION RATE 1990-2000**			
NF	63.4	**ST**	64.7	**NF**	0.8	**ST**	-0.7
METRO	64.9	**METRO**	64.9	**METRO**	1.3	**METRO**	-0.9

NM Small City	61.1	**NM Small City**	64.4	**NM Small City**	-0.2	**NM Small City**	0.8
NM Rural	61.8	**NM Rural**	62.2	**NM Rural**	1.3	**NM Rural**	-0.5
MAN	61.8	**MAN**	65.1	**MAN**	1.8	**MAN**	-0.3
GOV	59.0	**GOV**	63.2	**GOV**	-1.2	**GOV**	-1.3
SERV	64.2	**SERV**	65.0	**SERV**	0.5	**SERV**	-1.5
NONSP	65.2	**NONSP**	64.0	**NONSP**	1.9	**NONSP**	0.6
REC	63.6	**REC**	64.3	**REC**	1.4	**REC**	-0.6
US			63.9	**US**			-1.3

% AGE 16-64 EMPLOYED 2000				**CHANGE IN % AGE 16-64 EMPLOYED 1990-2000**			
NF	68.9	**ST**	71.7	**NF**	-0.6	**ST**	-1.6
METRO	71.2	**METRO**	71.8	**METRO**	0.1	**METRO**	-1.7
NM SMALL CITY	64.8	**NM SMALL CITY**	72.0	**NM SMALL CITY**	-3.0	**NM SMALL CITY**	-0.4
NM RURAL	69.1	**NM RURAL**	69.1	**NM RURAL**	1.0	**NM RURAL**	-2.0
MAN	69.6	**MAN**	72.2	**MAN**	1.2	**MAN**	-15.6
GOV	61.1	**GOV**	69.2	**GOV**	-5.0	**GOV**	-4.2
SERV	71.8	**SERV**	72.0	**SERV**	-0.2	**SERV**	-1.8
NONSP	70.8	**NONSP**	71.0	**NONSP**	1.0	**NONSP**	-0.8
REC	71.3	**REC**	72.0	**REC**	1.4	**REC**	-1.2
US			70.2	**US**			-1.0

Poverty, Income by Source, and Wages, 1992–2004

Table 2.7 depicts trends in poverty, income from transfer payments,[8] and average wage per job.[9] These trends are also depicted geographically in Figures 2.24–2.29 of the Appendix. Poverty is more widespread in the Northern Forest than it is in the southern tier, but both regions are better off than the US as a whole. Yet, poverty declined in the Northern Forest, and increased in the southern tier from 1990 to 2003. Poverty was lowest in metropolitan counties in the Northern Forest and southern tier in 2003, yet the biggest decline in poverty in the Northern Forest took place in nonmetropolitan rural counties. Figure 2.24 shows the distribution of poverty in the region, and areas of relative disadvantage can be seen at the western and eastern ends of the Northern Forest. Interestingly, poverty rates were lowest in services-dependent counties in both the Northern Forest and southern tier; this likely reflects an availability of low-wage service work sufficient to keep families and individuals above the federal poverty line, alongside the higher-paying, high-skill service jobs that are becoming increasingly important for

[8] Transfer payments are payments to persons for which no current services are performed. They consist of payments to individuals and to nonprofit institutions by federal, state, and local governments and by businesses. They include retirement and disability insurance benefits, medical payments, income maintenance benefits, unemployment insurance benefits, veterans' benefits, liability payments for personal injury, and corporate gifts to nonprofit institutions.

the well-being of rural places. Indeed, the two lowest-poverty counties in 2003 were both services-dependent (Grafton, NH and Saratoga, NY).

Trends in the percentage of personal income from transfer payments provide an indication of the degree to which people are relying on sources of income other than employment. This may indicate shifts in economic hardship, or shifts in the percentage of the population comprised of retirees or other non-working groups. Transfer payments make up a considerably greater percentage of income in the Northern Forest than they do in the southern tier or US, and while transfer payments are increasing in all three regions, the increase is greater in the Northern Forest. In both the Northern Forest and southern tier, nonmetropolitan rural counties have the highest percentages of transfer payments, and this group has seen the largest increase relative to metropolitan and nonmetropolitan small city counties. In the Northern Forest, manufacturing counties had over a quarter of personal income from transfer payments in 2004, and the change over time was greatest in this group. Here again, we can likely see the result of a declining manufacturing base. Figures 2.26 and 2.27 show that the south-central part of the Northern Forest (from Grafton County, NH up to Chittenden County, VT) and Saratoga County, NY stand out as having a relatively low percentage of income from transfer payments. These counties are predominantly services-dependent and nonspecialized.

Table 2.7: Poverty, Income from Transfer Payments, and Average Annual Wage per Job, and Change over Time

% IN POVERTY 2003				CHANGE IN % IN POVERTY 1990-2003			
NF	11.2	**ST**	9.5	**NF**	-0.4	**ST**	1.3
METRO	10.3	**METRO**	9.2	**METRO**	0.0	**METRO**	1.5
NM Small City	12.1	**NM Small City**	10.8	**NM Small City**	-0.6	**NM Small City**	0.2
NM Rural	12.1	**NM Rural**	11.7	**NM Rural**	-1.1	**NM Rural**	0.3
MAN	12.1	**MAN**	10.8	**MAN**	-0.3	**MAN**	1.2
GOV	13.3	**GOV**	11.1	**GOV**	-0.3	**GOV**	1.4
SERV	9.2	**SERV**	7.9	**SERV**	-0.2	**SERV**	1.6
NONSP	11.5	**NONSP**	11.5	**NONSP**	-0.7	**NONSP**	0.8
REC	10.0	**REC**	10.2	**REC**	-1.3	**REC**	0.9
US			12.5	**US**			-0.6
% INCOME FROM TRANSFER PAYMENTS 2004				**CHANGE IN % INCOME FROM TRANSFER PAYMENTS 1990-2004**			
NF	20	**ST**	15.1	**NF**	5.1	**ST**	3.5
METRO	18.3	**METRO**	14.5	**METRO**	4.7	**METRO**	3.3
NM Small City	20.3	**NM Small City**	19.6	**NM Small City**	4.8	**NM Small City**	4.5
NM Rural	23.6	**NM Rural**	21.4	**NM Rural**	6.5	**NM Rural**	5.6
MAN	25.2	**MAN**	17.6	**MAN**	7.1	**MAN**	4.5

[9] Wage per job figures for county types are estimates based on averages across counties in each group due to data limitations.

GOV	21.8	**GOV**	17.9	**GOV**	5.7	**GOV**	4.6
SERV	17.4	**SERV**	13.1	**SERV**	4.0	**SERV**	3.0
NONSP	19.6	**NONSP**	18.8	**NONSP**	5.3	**NONSP**	4.3
REC	19.6	**REC**	19.1	**REC**	4.5	**REC**	5.1
US			14.7	**US**			2.5
AVERAGE ANNUAL WAGE 2004 (2005 $)				**% CHANGE IN AVERAGE ANNUAL WAGE 1992-2004**			
NF	$29,984	**ST**	$33,983	**NF**	6.5	**ST**	7.3
METRO	$31,602	**METRO**	$36,949	**METRO**	3.3	**METRO**	6.9
NM Small City	$31,533	**NM Small City**	$31,144	**NM Small City**	9.6	**NM Small City**	7.1
NM Rural	$27,543	**NM Rural**	$30,614	**NM Rural**	6.8	**NM Rural**	8.8
MAN	$28,696	**MAN**	$34,228	**MAN**	3.3	**MAN**	3.6
GOV	$31,906	**GOV**	$32,609	**GOV**	8.4	**GOV**	12.1
SERV	$31,334	**SERV**	$35,937	**SERV**	10.0	**SERV**	9.7
NONSP	$28,993	**NONSP**	$31,622	**NONSP**	5.9	**NONSP**	6.2
REC	$28,541	**REC**	$31,494	**REC**	9.1	**REC**	7.2
US			$40,114	**US**			13.0

The average annual wage per job is lower in the Northern Forest than in the southern tier, though this difference is likely offset to some degree by differences in cost of living between the two regions. However, wages increased more slowly in the Northern Forest than they did in the southern tier, suggesting a growing wage gap between the two regions, and both regions lagged behind the US in wage increases from 1992 to 2004. In both the Northern Forest and southern tier, wages were lowest in nonmetropolitan rural counties. In fact, only one nonmetropolitan rural county (Essex, NY) is in the top half of the distribution, and it just barely. The increase in wages was lowest in manufacturing counties for both regions. The increase in wages was highest in service and recreation-dependent counties in Northern Forest, even though the two groups are at opposite ends of the wage spectrum. Here, we may be seeing wage increases taking place in both high-skill, high-wage service jobs, and also in the lower-skill, lower-wage service jobs that make up much of the employment in recreation-dependent places. When using these aggregate trends, however, they often mask the fact that most of the service-sector wage increases tend to be due to increases among higher-skill, higher-wage jobs.

Income Distribution, 1990–2000

One commonly discussed trend of the past few decades is that of the "shrinking middle class." While the middle class is notoriously difficult to define, one way of broadly doing so based on income is to calculate the percentage of all households earning between 50% and 200% of the US median household income.[10] The Northern Forest is advantaged relative to the southern tier and US in the sense that proportionally more households fall into this broad middle

[10] The figures for US median household income were $30,056 and $41,994 in 1990 and 2000, respectively.

income category, especially in metropolitan areas. However, the decline in middle-class households was steeper in the 1990s for the Northern Forest than the southern tier or US.

Table 2.8: Percent of Households with Middle-Class Income 2000 and Change 1990–2000

% HH BETWEEN 50%-200% OF US MEDIAN INCOME 2000				CHANGE IN % HH BETWEEN 50%-200% OF US MEDIAN INCOME 1990-2000			
NF	59.7	**ST**	54.9	**NF**	-3.2	**ST**	-2.6
METRO	60.0	**METRO**	53.7	**METRO**	-3.2	**METRO**	-2.5
NM Small City	59.8	**NM Small City**	60.9	**NM Small City**	-2.7	**NM Small City**	-3.0
NM Rural	58.7	**NM Rural**	60.5	**NM Rural**	-3.8	**NM Rural**	-3.9
MAN	60.0	**MAN**	58.1	**MAN**	-3.2	**MAN**	-3.1
GOV	59.2	**GOV**	59.3	**GOV**	-3.0	**GOV**	-3.8
SERV	60.2	**SERV**	51.4	**SERV**	-2.9	**SERV**	-1.7
NONSP	59.2	**NONSP**	57.9	**NONSP**	-3.6	**NONSP**	-3.7
REC	60.3	**REC**	60.4	**REC**	-2.8	**REC**	-4.2
US			56.7	**US**			-2.4

Nonmetropolitan rural counties are doubly disadvantaged with respect to the middle class. First, the middle income group is smallest in these counties. Second, the decline in middle-class households was most precipitous in this group of counties. Five of the bottom six counties in 2000 were nonmetropolitan rural (Hamilton, NY; Piscataquis, ME; Aroostook, ME; Washington, ME; and Franklin, ME), and five of the bottom six are located in ME. Trends in nonmetropolitan rural counties likely reflect both increasing economic hardship and an influx of affluence in the form of relatively advantaged residents, though the former appears to account for a greater proportion of the decline in the nonmetropolitan rural middle class. Yet because nonmetropolitan rural counties are located disproportionately in ME, nonmetropolitan rural trends in the size of the middle class may have as much to do with conditions in that state as they do with settlement patterns. Trends in the size of the middle class are shown in Table 2.7, and in Figure 2.30 of the Appendix.

Second Homes, 1990–2000

It is difficult to find a perfect definition of what a "second home" is when using Census data, but one way is to examine trends in housing units that are for seasonal, recreational, or occasional use. These data are summarized in Table 2.8. The percentage of total housing units for seasonal, recreational, or occasional use was much higher in 2000 in the Northern Forest than it was in the southern tier or US. But, this figure is declining slightly in the Northern Forest, likely reflecting conversion of units from seasonal use to full-time residences as retirees move into the region. Indeed, if we look at trends in housing units for "retirement" counties[11], the decline in the percentage of total housing units for seasonal use was largest through the 1990s. Recreation counties had the highest percentage of total housing units for seasonal use of any

[11] Retirement counties, another USDA ERS policy type not focused on in this report, are those in which the number of residents 60 and older grew by 15 percent or more between 1990 and 2000 due to inmigration. Carroll County in NH, and Orleans and Grand Isle Counties in VT are the only three retirement counties in the Northern Forest.

county group in 2000. However, the total number of seasonal units is increasing in many places in Northern Forest, largely reflecting new construction of second homes across the region. Interestingly, the change in number of seasonal units was proportionally lower in the Northern Forest than in the southern tier, and the figures for both regions were well below that for the US, suggesting that more substantial second home building booms are taking place in other parts of the country. Trends in second homes are mapped in Figures 2.31–2.33 of the Appendix.

Not surprisingly, second homes are more common in nonmetropolitan rural and recreation counties in both the Northern Forest and southern tier, reflecting the desirability of many rural areas. While second homes are making up less of the total housing stock in most of the Northern Forest, they comprised more of the housing stock in manufacturing counties in 2000 than they did in 1990. Manufacturing counties also saw the largest proportional increase in the number of housing units for seasonal use from 1990 to 2000, though it is not clear if this trend is due primarily to new construction or the purchase and conversion of once-permanent residences to second homes. This trend can be viewed as part of the changing economic base of historically manufacturing-dependent places in the Northern Forest. Taken together, the above trends indicate a moderate second home building boom taking place alongside the conversion of many former second homes to full-time residences.

Table 2.9: Housing Units for Seasonal, Recreational, or Occasional Use 2000 and Change 1990–2000

% TOTAL HOUSING UNITS FOR SRO USE 2000				CHANGE IN % TOTAL HOUSING UNITS FOR SRO USE 1990-2000			
NF	15.2	**ST**	5.0	**NF**	-0.6	**ST**	0.0
METRO	7.2	**METRO**	3.0	**METRO**	-0.6	**METRO**	0.1
NM Small City	15.8	**NM Small City**	11.3	**NM Small City**	-0.7	**NM Small City**	-0.3
NM Rural	27.2	**NM Rural**	18.4	**NM Rural**	-0.6	**NM RURAL**	-1.1
MAN	22.2	**MAN**	3.6	**MAN**	0.3	**MAN**	0.0
GOV	14.8	**GOV**	6.7	**GOV**	-0.6	**GOV**	-0.4
SERV	15.0	**SERV**	5.2	**SERV**	-1.3	**SERV**	-0.1
NONSP	11.7	**NONSP**	5.5	**NONSP**	-0.5	**NONSP**	0.2
REC	30.3	**REC**	18.6	**REC**	-1.7	**REC**	-1.2
US			3.1	**US**			0.1

% CHANGE IN HOUSING UNITS FOR SRO USE 1990-2000			
NF	3.6	**ST**	5.4
METRO	0.7	**METRO**	8.4
NM Small City	1.1	**NM Small City**	3.7
NM Rural	6.3	**NM Rural**	1.8
MAN	10.4	**MAN**	6.7
GOV	2.1	**GOV**	0.3
SERV	-1.0	**SERV**	3.8

NONSP	4.2	**NONSP**	9.2
REC	1.8	**REC**	2.4
US			16.1

B. Indices of Community and Economic Well-Being and County Typology

This section uses year 2000 county-level data from a variety of federal and state data sources to create indices of county well-being and typologies of Northern Forest counties to better understand how different social and economic circumstances in Northern Forest counties affect overall community and economic well-being in each county. Counties are grouped according to their social and economic characteristics, emphasizing similarities and differences across the region.[12] In order to simplify the results of cluster analysis, factor analysis was undertaken beforehand to reduce the complexity of the data included in the cluster analysis. Knowledge of county-level variation in the Northern Forest can be used to inform sustainable development strategies that address the different trends and conditions that exist across the region.

Index of Community Well-Being

Nine variables were chosen to measure several aspects of community life and these were grouped via factor analysis to elicit four underlying dimensions of community well-being. The four dimensions were: 1) a "social capital" component constructed from variables measuring number of civic organizations, small retail firms, and voter participation rate; 2) a "healthcare access and low-risk behavior" component measured by the number of local physicians, teen birth rate, and idle teen rate; 3) a "crime" component measured by crime rate and juvenile arrest rate; and a "maternal health" component using the percentage of births with low birthweight as an indicator. By combining each county's scores on the four factors identified above, scores on an overall index of community well-being were created.

Table 2.10: County Scores on Index of Community Well-Being

County	Community Index Score
Washington, VT	4.41
Hamilton, NY	3.03
Grand Isle, VT	2.97
Grafton, NH	2.64
Carroll, NH	2.07
Hancock, ME	1.99
Coos, NH	1.59
Caledonia, VT	1.38
Orange, VT	1.15

[12] While cluster analysis is an increasingly common method of classifying data cases, many decisions about how to group cases are arbitrary, and different methods can yield different results depending on the choices of the researcher. The findings presented here reflect results that are acceptably stable across different methodologies.

Lewis, NY	1.09
Warren, NY	1.06
Piscataquis, ME	0.98
Chittenden, VT	0.97
Saratoga, NY	0.84
Oxford, ME	0.24
Orleans, VT	0.12
Essex, NY	0.09
Franklin, VT	-0.11
Aroostook, ME	-0.16
Franklin, ME	-0.67
Franklin, NY	-0.91
Herkimer, NY	-0.93
Penobscot, ME	-0.95
Lamoille, VT	-1.19
Somerset, ME	-1.79
Oswego, NY	-1.83
Washington, NY	-1.84
St. Lawrence, NY	-2.06
Washington, ME	-2.06
Jefferson, NY	-2.16
Oneida, NY	-2.17
Clinton, NY	-2.93
Fulton, NY	-4.86
Essex, VT*	-5.00

Northern Forest counties are ranked by their scores on this community index in Table 2.10. Counties at the top of the list generally have high social capital, low risk behavior, low crime, and high maternal health, while the opposite is true for counties at the bottom of the list. Figure 2.34 in the Appendix shows the geographical distribution of this compound measure of community well-being in the Northern Forest. While many of the region's less isolated counties score highly on the index, and the opposite is true for the region's more isolated counties, there does not appear to be a particularly strong relationship between location and community well-being. In fact, nonmetropolitan rural counties' average score on the community index is higher than that for metropolitan or nonmetropolitan small city counties (see Table 2.16). This suggests that, though they may be challenged in some ways, in many cases the region's remote places possess important social resources to complement their natural amenities.

Cluster analysis yielded a five-group typology of Northern Forest counties as shown below in Table 2.11. The first group of counties, the most numerous, shows average social capital, slightly low healthcare access and high risk behavior, slightly high crime, and slightly low maternal health, all relative to other Northern Forest counties. This group can be viewed as the most typical of Northern Forest counties with respect to community well-being, but it is a fairly diverse grouping with respect to geography, size of population centers, and economic dependence. Many of these counties are among the most remote and economically

* Essex County's value of -5 was established by the researcher due to the suppression of juvenile arrest data. The value was arrived at based on the county's low scores across the other community variables.

disadvantaged in the region; however, several in this group are relatively well-off from an economic perspective.

Table 2.11: Groupings of Counties across Community Well-Being Variables in 2000

Group 1	Group 2	Group 3	Group 4	Group 5
Aroostook, ME	Carroll, NH	Grafton, NH	Hancock, ME	Essex, VT
Franklin, ME	Coos, NH	Chittenden, VT	Hamilton, NY	
Oxford, ME	Lewis, NY		Washington, VT	
Penobscot, ME	Saratoga, NY			
Piscataquis, ME	Washington, NY			
Somerset, ME	Grand Isle, VT			
Washington, ME	Orange, VT			
Clinton, NY				
Essex, NY				
Franklin, NY				
Fulton, NY				
Herkimer, NY				
Jefferson, NY				
Oneida, NY				
Oswego, NY				
St. Lawrence, NY				
Warren, NY				
Caledonia, VT				
Franklin, VT				
Lamoille, VT				
Orleans, VT				

The second group of counties shows average social capital, average healthcare access and risk behavior, low crime, and slightly low maternal health. These counties, while not most typical based on sheer size, are similar to the first group, but with slightly lower levels of crime. And, as is the case with Group 1, Group 2 is a diverse group with respect to size of population centers and economic dependence. However Carroll and Coos counties in NH, and Saratoga and Washington counties in NY form two contiguous areas of the same community type.

The third group of counties shows moderately low social capital, very low risk behavior and high healthcare access, slightly high crime, and moderately high maternal health. These two counties are among the most economically prosperous, populous, and least isolated in the NF.

The fourth group of counties shows high social capital, average healthcare access and risk behavior, slightly high crime, and high maternal health. This is a geographically diverse group of counties where people are highly civically engaged, pregnant mothers are healthy, yet crime is slightly higher than elsewhere in the Northern Forest. Two of these counties (Hamilton, NY and Hancock, ME) are recreation-dependent.

Essex County, VT stands alone with low social capital, high risk behavior and low healthcare access, average crime, and low maternal health. This county thus appears to be the most disadvantaged county in the region from a community well-being perspective.

Index of Economic Well-Being

In the same way that many variables were combined to get a picture of social well-being, combining nine economic indicators yielded two underlying dimensions measuring economic well-being. The two dimensions are: 1) "income and human capital" composed of percent of population age 35–54, size of the middle class, poverty rate, median household income, working-age employment rate, and percent w/Bachelor's or higher; and 2) "economic opportunity" was measured by degree of industrial diversification, recent in-migration, and wage per job.

Table 2.12: County Scores on Index of Economic Well-Being

County	Economic Index Score
Chittenden, VT	3.86
Saratoga, NY	2.95
Grafton, NH	2.51
Washington, VT	2.28
Grand Isle, VT	1.38
Carroll, NH	1.34
Franklin, VT	1.30
Warren, NY	1.28
Orange, VT	1.18
Lamoille, VT	1.00
Hancock, ME	0.76
Penobscot, ME	0.52
Washington, NY	0.43
Caledonia, VT	0.31
Oswego, NY	0.07
Oneida, NY	-0.01
Jefferson, NY	-0.09
Oxford, ME	-0.11
Clinton, NY	-0.13
Franklin, ME	-0.28
Coos, NH	-0.31
Essex, NY	-0.36
Fulton, NY	-0.54
Herkimer, NY	-0.75
Orleans, VT	-0.92
St. Lawrence, NY	-1.07
Somerset, ME	-1.38
Franklin, NY	-1.43
Aroostook, ME	-1.92
Hamilton, NY	-1.94
Essex, VT	-2.02
Lewis, NY	-2.08

Piscataquis, ME	-2.17
Washington, ME	-3.65

An overall measure of economic well-being was achieved by combining each county's factor scores on these three dimensions, and scores on this index are shown in Table 2.12. Counties at the top of the list generally have high income and work, high economic opportunity, and high financial resources and inequality. Counties at the bottom of the list, on average, have the opposite characteristics. The geographical distribution of these economic index scores is depicted in Figure 2.36 of the Appendix. Scores on the index of economic well-being appear to exhibit a stronger relationship to geographical location and isolation than do those on the index of community well-being. The average economic index score is highest for metropolitan counties and lowest for nonmetropolitan rural counties, with nonmetropolitan small city counties in the middle. In general, the more isolated the county, the poorer its economic prospects were in 2000.

Table 2.13: Groupings of Counties across Economic Well-being Variables in 2000

Group 1	Group 2	Group 3	Group 4	Group 5
Washington, ME	Aroostook, ME	Franklin, ME	Hancock, ME	Grafton, NH
	Piscataquis, ME	Oxford, ME	Caroll, NH	Chittenden, VT
	Somerset, ME	Penobscot, ME	Saratoga, NY	
	Hamilton, NY	Coos, NH	Warren, NY	
	Lewis, NY	Clinton, NY	Franklin, VT	
	Essex, VT	Essex, NY	Grand Isle, VT	
	Orleans, VT	Franklin, NY	Lamoille, VT	
		Fulton, NY	Orange, VT	
		Herkimer, NY	Washington, VT	
		Jefferson, NY		
		Oneida, NY		
		Oswego, NY		
		St. Lawrence, NY		
		Washington, NY		
		Caledonia, VT		

Cluster analysis yielded five types of counties, which are mapped in Figure 2.37 of the Appendix. Washington County, ME scores quite low on both dimensions of economic well-being considered here, suggesting a unique level of economic disadvantage within the region. This is consistent with what is known about the economic hardship faced by many downeast Maine communities. This degree of disadvantage is possibly linked to the doubly resource-dependent nature of Washington County, which has historically been tied to both forest and marine resources.

The second group of counties scores moderately low on both dimensions of economic well-being, and can be considered as the second-most economically disadvantaged group in the region. Counties in this group are predominantly nonmetropolitan rural and manufacturing-dependent, and in many ways they represent the economic hardships of remote rural communities across the nation. The third group of counties is the most numerous and is geographically and economically diverse, though the majority of its counties are located in New

York. These counties score moderately low on the income and human capital dimension, and average on the economic opportunity dimension of economic well-being.

The fourth group of counties scores high on the income and human capital dimension and average on the economic opportunity dimension. These counties are primarily located in the central part of the region, particularly in Vermont, and all but one are either services-dependent or nonspecialized. The fifth group is comprised of the two most economically advantaged counties in the region, which score highly on both dimensions. Scores on the index of economic well-being appear to exhibit a stronger relationship to geographical location than do those on the index of community well-being. The average economic index score is highest for metropolitan counties and lowest for nonmetropolitan rural counties, with nonmetropolitan small city counties in the middle. In general, the more isolated the county, the poorer its economic prospects were in 2000.

Overall County Well-Being in the Northern Forest

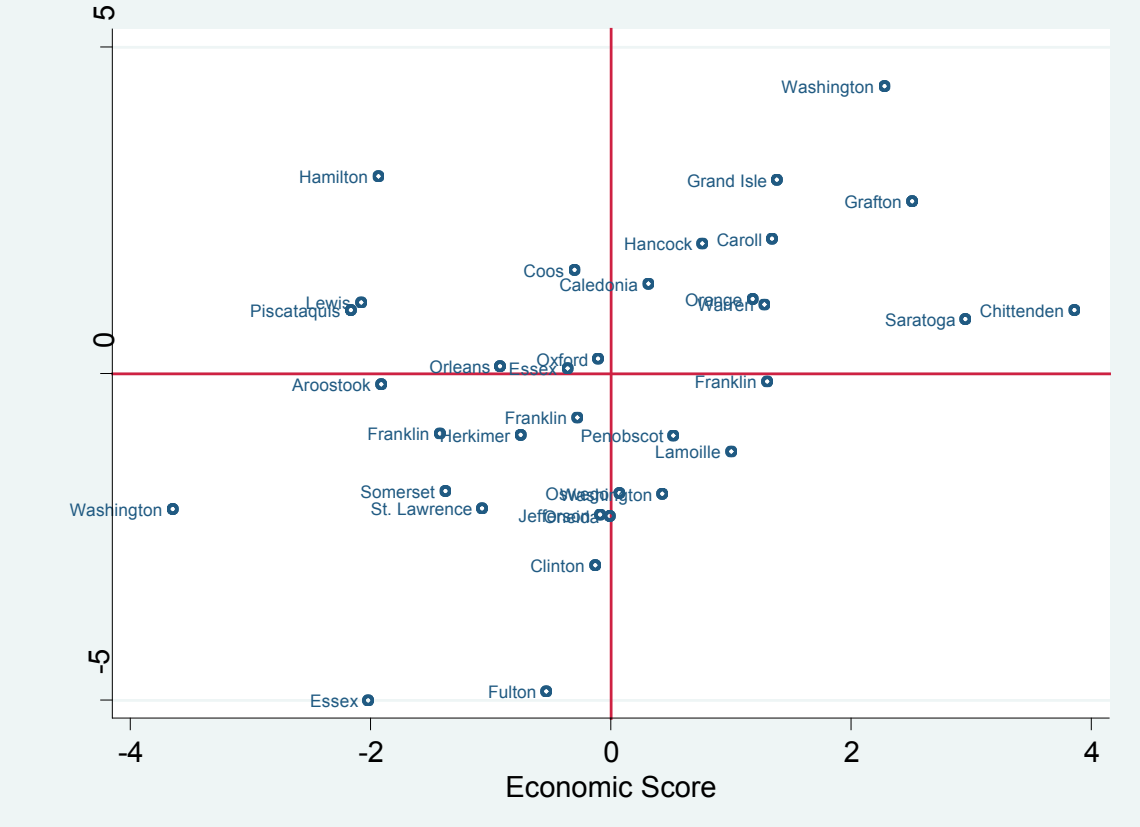
Combining the indices of community and economic well-being produces a rough measure of overall county well-being. This list, shown in Table 2.14, makes a great deal of sense in light of much of what is known anecdotally about the region. Nonmetropolitan rural and remote counties tend to score low on the overall index, and the region is book-ended by areas of particular disadvantage at the eastern and western edges. Metropolitan areas score much higher on average than do nonmetropolitan small city or nonmetropolitan rural ones. Much of New York scores low, as do more remote regions of Maine. With the exception of Essex County, all Vermont counties are in the top half of the distribution. Overall index scores are mapped in Figure 2.38 of the Appendix.

Table 2.14: Combined Scores on Combined Community and Economic Indices

County	Overall Index Score
Washington, VT	6.69
Grafton, NH	5.15
Chittenden, VT	4.83
Grand Isle, VT	4.35
Saratoga, NY	3.79
Carroll, NH	3.41
Hancock, ME	2.75
Warren, NY	2.34
Orange, VT	2.33
Caledonia, VT	1.69
Coos, NH	1.28
Franklin, VT	1.19
Hamilton, NY	1.09
Oxford, ME	0.13
Lamoille, VT	-0.19
Essex, NY	-0.27
Penobscot, ME	-0.43
Orleans, VT	-0.80

Franklin, ME	-0.95
Lewis, NY	-0.99
Piscataquis, ME	-1.19
Washington, NY	-1.41
Herkimer, NY	-1.68
Oswego, NY	-1.76
Aroostook, ME	-2.08
Oneida, NY	-2.18
Jefferson, NY	-2.25
Franklin, NY	-2.34
Clinton, NY	-3.06
St. Lawrence, NY	-3.13
Somerset, ME	-3.17
Fulton, NY	-5.40
Washington, ME	-5.71
Essex, VT	-7.02

Figure 2.39: Economic versus Community Index Scores for NF Counties in 2000



The graph above depicts county scores on the community and economic indices plotted against one another. This graph gives us an idea of how counties group together across both measures of well-being. Counties in the lower-left quadrant score low on both measures; these could be considered the most-disadvantaged counties in the region. Conversely, counties in the

upper-right quadrant score high on both measures, and could be considered the most advantaged areas of the Northern Forest.

Index Scores by County Type

Table 2.15: County Index Scores by Metropolitan Status and Economic Dependence Type

	Community Index Score	Economic Index Score	Overall Index Score
METRO	-0.20	1.10	0.90
NM Small City	-0.81	0.04	-0.77
NM Rural	0.37	-0.81	-0.45
MAN	-0.70	-0.96	-1.67
GOV	-0.59	-0.13	-0.73
SERV	0.75	1.40	2.15
NONSP	-0.03	-0.03	-0.06
REC	0.49	-0.21	0.28

Table 2.15 completes our look at how levels of county well-being differ across the region. Differences in index scores across metropolitan, nonmetropolitan small city, and nonmetropolitan rural counties were discussed at some length above. But in general, when looking at conditions in the year 2000, nonmetropolitan rural counties are advantaged with respect to social resources, while they are disadvantaged in terms of economic opportunity. Metropolitan counties are economically advantaged, while nonmetropolitan small city counties are disadvantaged primarily with respect to social resources. With respect to change over time, metropolitan counties are doing better than nonmetropolitan small city ones, which are in turn doing substantially better than nonmetropolitan rural counties.

If we look across the region by type of economic dependence, manufacturing counties emerge as the only group to be substantially and uniformly disadvantaged. Again, this points to the shifting structure of the Northern Forest economy. Government-dependent counties appear to be disadvantaged socially and in terms of change over time, though this likely reflects their geographic concentration in northern NY, rather than something intrinsic to government-dependence generally.[13] In fact, if Washington County, VT is left out, the index scores for government-dependent counties are similar to those for manufacturing-dependent ones. Services-dependent counties appear to be the most uniformly advantaged group, and scores for those counties that are simultaneously services and recreation-dependent are even higher. Nonspecialized counties constitute a group that is remarkably average in terms of social and economic conditions and change over time. Recreation-dependent counties, while slightly disadvantaged economically, appear to have much in the way of social resources, and are doing reasonably well over time.

[13] These northern NY counties may be government-dependent precisely because of conditions that result in limited opportunity in other sectors.

III. Economic Trends and Characteristics of the Northern Forest Region

A. Super-Sector Industry Performance in the Northern Forest, 1969 – 2000

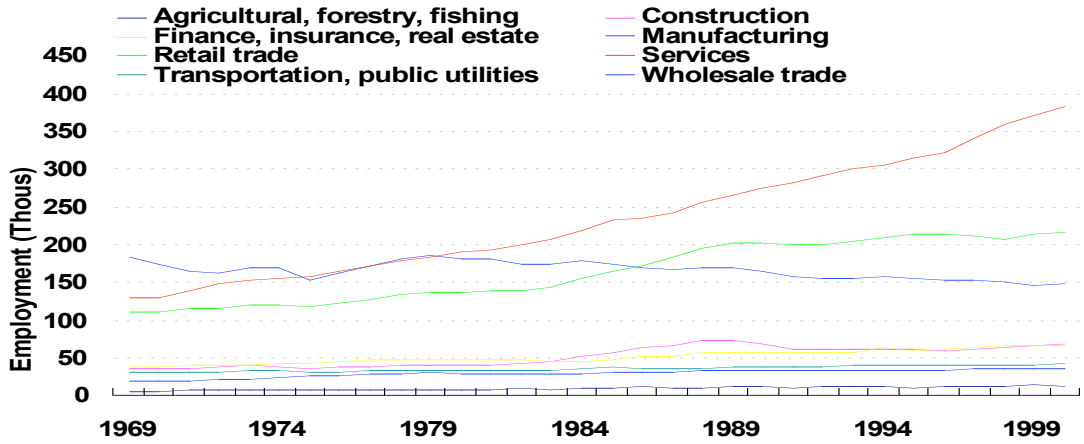
The data used in this section come from the US Bureau of Economic Analysis Regional Economic Information System, using the Standard Industrial Classification (SIC) scheme. Over the past 30 years, the sharp increase in the service and retail trade industries relative to manufacturing and other industries is one of the most significant economic trends in the Northern Forest; these are similar to changes that took place throughout the United States. Manufacturing employment ranked first, accounting for about 33% of total employment, until the mid seventies. By 2000, the manufacturing sector had lost 35,000 jobs leaving the sector ranking third in terms of number of people employed and accounting for only 15% of total employment. The manufacturing decline was significantly more pronounced in the Northern Forest than in the United States, however, indicating considerable weaknesses in this sector in the region.

Table 3.1: Employment Change in Manufacturing, Retail Trade, and Services Super-Sectors, US and Northern Forest, 1969–2000.

Employment Change 1969-2000

Super Sector	US	Northern Forest
Manufacturing	-7%	-18%
Retail trade	102%	97%
Services	217%	197%

Figure 3.1: Northern Forest Employment by Industry Super-Sector, 1969–2000



The large employment increases in services and retail trade, while significant, were not matched by wage growth for the region's inhabitants. In Figures 3.2–3.4 of the Appendix, average earnings are displayed on the right hand axis and are measured in real 2000 calendar year dollars. While employment in the retail trade super sector has sharply increased, real average earnings have declined significantly. The average wage in service industries remained

mostly flat over the 1969-2000 period. Manufacturing employment declined significantly over the time period while real average earnings increased, reflecting both the emergence of relatively high paying high technology manufacturing industries in some parts of the region and, to some extent, productivity growth. For the purposes of identifying strategies that can lead to sustainable economic development for the region, therefore, it is important to dissect these super sectors to identify the strategically important detailed industries within them. Some of this work is done in the shift share analysis below.

Figure 3.5 of the Appendix examines the five smallest industries represented in Figure 3.1. Together these industries accounted for roughly 24% of total Northern Forest employment throughout the time period. Two of these five sectors, Finance, Insurance and Real Estate (FIRE) and Construction, account for more than half of this 24%.

Figures 3.6 through 3.10 of the Appendix illustrate the growth in the numbers of people employed in the different sectors in comparison with the change in the average wages in those sectors over the same period. Wage growth in Wholesale Trade and FIRE kept pace with overall Northern Forest employment growth over the 1969–2000 period. During the Construction employment boom in the 1980s, wage growth was flat and by 2000 had declined to below the 1969 level. Movements in real average earnings in both the Transportation and Agriculture, Forestry and Fishing sectors displayed a high degree of volatility.

The trends presented in this brief, summary analysis of employment and wages in the region from 1969 to 2000 indicate that the changes in the Northern Forest economy over the period are similar to changes that took place throughout the United States. The erosion of manufacturing over the past half century and the sharp increase in both service and retail trade industries are all national trends. The manufacturing decline was significantly more pronounced in the Northern Forest than in the United States, however, indicating considerable weaknesses in this sector in the region. Retail trade and service industries experienced significant employment growth in the both US and the Northern Forest from 1969-2000, although in both industries Northern Forest growth was slightly slower than the national average.

While Service industries employ more and more people, average earnings in many of these industries have stagnated or even declined over time. Retail Trade, Construction, and Transportation all saw employment increase and earnings decline from the 1970s to 2000. Service industries and Wholesale trade saw employment increase and earnings stagnate over this period. Wage growth in Wholesale Trade and Finance, Insurance, and Real Estate (FIRE) kept pace with overall Northern Forest employment growth from 1969 to 2000, though wages in FIRE were remarkably lower than those in manufacturing. Manufacturing employment declined significantly over the time period while real average earnings increased, reflecting both the emergence of relatively high paying high technology manufacturing industries in some parts of the region and, to some extent, productivity growth. These trends are outlined in the series of graphs below.

B. Super-Sector Industry Performance in the Northern Forest, 1990–2000

Thus far we have considered the performance of super sectors or high level aggregations of more detailed industry data. For the purposes of identifying strategies that can lead to sustainable economic development for the region it is important to dissect these super sectors to identify the strategically important detailed industries within them. The trends become more regionally specific and divergent from the national trends, however, when we examine more closely the performance of the more detailed industries that combine to create the super sectors. This section examines key super sectors in a slightly less aggregated format to identify the specific industries in the Northern Forest that are maintaining a competitive status on a national and regional scale. This is done using the North American Industry Classification (NAICS) employment data, which reflects the emerging importance of new industries in the U.S. economy. In what follows, employment change in Northern Forest super sectors between 1990 and 2000 is compared to employment change in those super sectors in the United States as a whole. Then the performance of super sectors in specific counties is compared to the performance of those super sectors in the Northern Forest as a whole in order to identify counties that are most competitive in these industries. This is known as shift share analysis. This analysis is shown in Figure 3.11 of the Appendix and Table 3.2 below provides the actual employment and wage data for the particular industries analyzed.

In the Northern Forest, the super sectors with the greatest number of employees such as health care, retail trade and manufacturing all performed roughly at the national average over the 1990-2000 period. The most competitive industries in the region are relatively small in terms of number of people employed. Management of companies, the most competitive super sector in the Northern Forest region, accounted for less than 1% of total employment. However, with the second highest average earnings in the region, these jobs are obviously valuable to the Northern Forest and the competitiveness of the region in this sector is a possible strength to build upon. The services provided by this particular super sector foster growth in key knowledge economy industries such as Professional and Technical Services, Broadcasting, Real Estate, Internet Service Providers and Data Processing Services and Publishing.

Table 3.2: Super-Sectors Employment Change and Average Annual Wage, 1990–2000

Super Sector	Emp 2000	Avg Ann Wage 2000	Establishments 2000	Emp Change 1990-00
Utilities	1,124	51,004	97	-256
Management of Companies	5,674	40,396	186	3,634
Professional, Scientific, and Technical Services	26,465	38,650	4,222	7,212
Manufacturing	129,056	37,749	3,033	-11,291
Mining	1,007	35,893	66	-95
Finance and Insurance	28,432	35,541	2,644	1,584
Wholesale Trade	19,123	35,356	1,942	320
Information	18,175	32,458	1,082	2,609
Construction	37,817	31,595	6,293	-1,029
Public Administration	59,661	30,375	1,904	2,440
Transportation and Warehousing	17,830	29,339	1,931	959
Educational Services	51,841	28,834	979	7,278
Health Care and Social Assistance	108,951	27,720	4,732	28,138
Agriculture, Forestry, Fishing, Hunting	2,785	23,327	427	663
Real Estate and Rental and Leasing	8,584	20,808	1,873	1,367
Retail Trade	125,617	18,603	10,823	8,598
Administrative, Support and Waste Management	25,940	18,106	1,866	14,190
Other Services	28,725	17,810	6,037	4,994
Arts, Entertainment, and Recreation	13,259	16,647	1,202	2,427
Accommodation and Food Services	76,896	12,440	5,779	8,565

The most competitive industry super sectors in terms of job growth employ few workers, and the competitiveness of these sectors tends to be geographically concentrated. However, these industries—Management of Companies, and Administrative, Support, Waste Management and Remediation Services—are central to the much-touted "knowledge economy." Places like Saratoga Springs and Utica-Rome, Burlington, and Bangor saw employment growth in these industries outpace growth in the US from 1990 to 2000. Employment and competitiveness in two other important industry super sectors—Professional, Scientific, and Technical Services; and Finance and Insurance— also tend to be concentrated in these more populous parts of the Northern Forest. These four sectors together employ about 80,000 people, and have relatively high wages. Though employment in these super sectors is concentrated to a degree, it is also fairly widespread in the central part of the Northern Forest and along the major transportation routes. The existence of a concentration of such industries and the close links between these sectors and the growing knowledge economy provide a foundation for future economic opportunity in significant portions of the Northern Forest.

Although the decline of the manufacturing sector is arguably the most important economic issue of the past few decades for the Northern Forest, this decline has not played out evenly across the region. Places like Chittenden County, VT and Grafton County, NH gained manufacturing jobs from 1990 to 2000, but, unfortunately, these gains were more than offset by losses in other parts of the region such as in western New York where several counties each saw manufacturing employment losses number in the thousands.

C. Selected Super-Sector Industry Performance, Individual Northern Forest Counties Compared to the Northern Forest Region, 1990 – 2000

Management of companies, the most competitive super sector in the Northern Forest region, accounted for 5,674 jobs, less than 1% of total employment. However, with the second highest average earnings in the region, these jobs are obviously valuable to the Northern Forest and the competitiveness of the region in this sector is possible strength to build upon. The services or outputs associated with this particular super sector foster growth in key knowledge economy industries. The five industries nationally which use the services provided by the management of companies and enterprises sector most intensively are Professional and Technical Services, Broadcasting, Real Estate, Internet Service Providers and Data Processing Services and Publishing[14].

Although the management of companies sector is very small, with only 186 establishments throughout the entire Northern Forest, there are specific areas in the region where this super sector is more competitive than the regional average. Figure 3.12 is another shift share analysis, methodologically the same as Figure 3.11, except in this figure the performance of the management of companies sector in individual Northern Forest counties is compared to overall regional performance in the same sector. The purpose of this analysis is to determine which counties are more competitive in specific industries than the Northern Forest average for the same industries.

[14] National Input Output accounts

The management of companies sector in Fulton NY grew almost 10 percentage points more than the Northern Forest average, however, in 2000 this sector represented only 73 jobs in Fulton. Penobscot ME, the second largest employer in this sector with 945 jobs, was significantly more competitive than the Northern Forest average. Chittenden VT, ranking last in competitiveness, accounted for the largest number of jobs in the management of companies sector. Table 3.3 shows the number of employees, the number of establishments and the average annual wages in the management of companies sector in 2000 in the counties graphed in Figure 3.12.

Table 3.1 Management of Companies Super-Sector, 2000

	Employment 2000	Establishments 2000	Average Ann Wage 2000
Grafton-NH	540	23	54,374
Fulton-NY	73	7	52,798
Penobscot-ME	945	30	49,518
Warren-NY	159	14	48,353
Saratoga-NY	613	19	42,809
Chittenden-VT	951	32	40,960
Oneida-NY	902	25	38,216
Jefferson-NY	792	13	24,425
Caroll-NH	188	6	23,281

Administrative, Support, Waste Management and Remediation Services, the second most competitive super sector in the Northern Forest from 1990 to 2000, accounted for 25,940 jobs in 2000, over 3% of total employment (see Figure 3.13). The average annual earnings in this sector ranks 17th among the other 20 sectors. Although the dollar value of these jobs is low in relation to other sectors in the Northern Forest, Administrative and Support Services is an important input to all of the industries in the knowledge economy sectors.

The Administrative, Support, Waste Management and Remediation Services sector comprises establishments performing routine support activities for the day-to-day operations of other businesses and organizations such as office administration, hiring and placing of personnel, document preparation, security and surveillance services, cleaning, and waste disposal services. Industries in this sector provide services to the full array of industries in all of the sectors. This sector is dispersed throughout the northern forest without any significant employment clusters. Saratoga NY, the top ranked county for competitiveness in this sector, grew over 3 percentage points more than the regional average and ranked second after Oneida NY in number of employees in this sector in 2000 with 4,486 jobs. These trends are depicted in Figure 3.13 of the Appendix and Table 3.4 below.

Saratoga, Oneida, Chittenden and Penobscot are economically diverse counties and this is reflected in their relatively high employment numbers in this sector. Significant employment in this sector reflects a developed industrial support infrastructure which a wide array of businesses and organizations require for growth and development. Because this sector's fundamental

function is to provide support activities for the operation of other businesses, it is dependent on macroscopic trends in both the national and regional economy and is therefore vulnerable.

Table 3.4: Administrative, Support, Waste Management and Remediation Services Super-Sector, 2000

	Employment 2000	Establishments 2000	Average Ann Wage 2000
Grafton-NH	931	130	23,482
Chittenden-VT	3516	257	20,147
Penobscot-ME	2667	204	19,191
St. Lawrence-NY	936	49	18,921
Saratoga-NY	4486	215	18,746
Warren-NY	828	75	17,772
Oneida-NY	6810	189	16,833
Clinton-NY	853	71	15,228
Oswego-NY	816	71	14,448

Agriculture, Forestry, Fishing and Hunting in the Northern Forest is the third most competitive sector compared to the performance of this super sector in the United States from 1990 to 2000. The sector is very small in relation to the overall Northern Forest economy, representing less than a half of a percentage of overall employment (see Table 3.5). Average annual wages in this sector are in the fourth quintile at 23,372. The Agriculture, Forestry, Fishing and Hunting sector comprises establishments primarily engaged in growing crops, raising animals, harvesting timber, and harvesting fish and other animals from a farm, ranch, or their natural habitats[15]. Although the industry is historically very important to the region, given its small size it is not a significant driver of economic growth for the Northern Forest region as a whole. The positive ranking of this sector in terms of the Northern Forest's competitiveness vis-à-vis the rest of the U.S., however, indicates that there are specific areas within the Northern Forest where this industry is vibrant and given the historical importance it continues to have a crucial role in strategic economic development planning.

The regional shift effects, comparing counties in the Northern Forest to the regional average, for this sector are displayed in Figure 3.14. On average the Northern Forest, in terms of job growth, was more competitive in Agriculture, Forestry, Fishing and Hunting than the US over the 1990-2000 period. Seven out of the eleven counties with establishments in the sector out preformed US job growth. Out of the seven counties outperforming the US, five were located in New York.

[15] Definition from NAICS code book

Table 3.5: Agriculture, Forestry, Fishing and Hunting Super-Sector, 2000

	Employment 2000	Establishments 2000	Average Ann Wage 2000
Grafton-NH	207	41	33,487
Somerset-ME	533	62	29,003
St. Lawrence-NY	279	39	24,314
Oxford-ME	319	70	24,153
Essex-NY	110	35	22,000
Essex-VT	42	16	21,148
Washington-NY	272	35	20,293
Oneida-NY	435	40	20,037
Washington-VT	93	15	19,460
Herkimer-NY	98	16	18,761
Jefferson-NY	193	28	17,420
Lewis-NY	204	30	17,320

Average annual wages are low in this sector. Four of the five lowest wage counties in table 5 are in New York, the state with the most competitive Agriculture, Forestry, Fishing and Hunting employment growth. In much of New York employment growth in this sector has a small impact on the overall economy. Considering both employment competitiveness and earnings potential St. Lawrence New York, Grafton New Hampshire and Somerset Maine stand out as the regions most strategically important counties in the Agriculture, Forestry, Fishing and Hunting sector.

Figure 3.15 examines the spatial distribution of Agriculture, Forestry, Fishing and Hunting in more detail. There are not significant employment clusters in this sector. However, areas in northern Maine, northern Vermont and western New York depend heavily on employment in Agriculture, Forestry, Fishing and Hunting.

In 2000 the Health Care sector represented over 13 percent of the regions employment and was the third largest employer in the Northern Forest. Between 1990 and 2000 the sector was slightly more competitive than the national average in job growth (Figure 3.16). Growth in the Health Care sector is expected to out pace all other sectors over the next thirty to forty years and will remain a large employer in the Northern Forest. Average earnings in the Health Care sector were relatively low but grew faster than the national average between 1990 and 2000.

All of the counties in the Northern Forest preformed close to the regional average in Health Care sector job growth. Penobscot Maine had the largest employment in this sector out of the counties that preformed better than the regional average. Oneida NY and Chittenden VT, each with significant Health Care employment, performed slightly below the regional average. Table 3.6 lists the ten counties with the largest number of jobs in the Health Care sector. Twenty-Five of the thirty four counties in the Northern Forest had over one thousand jobs in the Health Care sector in 2000.

Table 3.6: Health Care Super-Sector, 2000

	Employment 2000	Establishments 2000	Average Ann Wage 2000
Oneida-NY	18,257	9	21,865
Penobscot-ME	11,399	63	24,644
Chittenden-VT	10,226	93	25,071
Grafton-NH	7,830	85	22,000
Saratoga-NY	6,057	369	23,096
Aroostook-ME	5,676	121	20,291
Jefferson-NY	4,901	249	22,391
Warren-NY	4,832	416	29,120
St. Lawrence-NY	4,563	54	24,186
Clinton-NY	4,169	95	21,354

The four detailed sub sectors that make up the broader Health Care sector are listed in Table 3.7. Employment in each of these sectors grew faster than the national average between 1990 and 2000. Ambulatory Health Care Services outpaced national employment growth by fourteen percentage points. This sub-sector also had the highest average annual wage and employment in 2000.

Table 3.7: Sub-Sectors in Health Care Super Sector, 2000

Sub-Sector	Regional Shift 1990-2000	Average Ann Wage 2000	Employment 2000
Ambulatory Health Care Services	0.14	35,002	30,803
Hospitals	0.02	34,147	12,493
Nursing and Residential Care Facilities	0.20	18,487	24,311
Social Assistance	0.18	17,719	13,442

Professional, Scientific and Technical Services employment grew at the national average between 1990 and 2000 (Figure 3.17). The sector represented 3.3 percent of Northern Forest employment in 2000 and had the third highest average annual wage at 38,650. The activities carried out by industries in this sector require specialized training and education.

Table 3.8: Professional, Scientific and Professional Services Super Sector 2000

	Employment 2000	Establishments 2000	Average Ann Wage 2000
Chittenden-VT	6,834	491	42,906
Saratoga-NY	3,378	73	34,338
Oneida-NY	3,150	63	25,792
Penobscot-ME	1,934	742	45,790
Grafton-NH	1,892	151	31,529
Hancock-ME	1,476	268	38,295
Washington-VT	1,105	101	31,769
Warren-NY	905	70	32,752
Jefferson-NY	674	313	37,709
Oswego-NY	648	128	36,854

Table 3.8 presents the ten counties with the largest number of jobs in the Professional, Scientific and Technical Services sector. Saratoga and Chittenden both preformed well above the regional average in employment growth. Saratoga, the top ranked county in terms of regional competitiveness in this sector, outpaced regional employment growth by over one hundred and fifty percentage points. Employment growth in Chittenden grew twenty two percentage points faster than the regional average.

The Manufacturing sector has steadily lost jobs over the past thirty years in both the Northern Forest and the nation; a trend that is expected to continue over the next two decades. Average earnings in this sector are high. Retaining Northern Forest jobs and fostering growth in competitive industries within the manufacturing sector is crucial to the Northern Forest economy. Manufacturing employment underperformed the national average between 1990 and 2000 by five percentage points. During this period the Northern Forest lost over 11,000 manufacturing jobs. Average annual wages in the manufacturing sector ranked fourth, at 37,749, in 2000 just behind Professional, Scientific and Professional Services.

Washington VT was the most regionally competitive county in manufacturing employment growth. The county outpaced regional manufacturing employment change by more than fifty percentage points (Figure 3.18). In 2000 Washington had 3,679 manufacturing jobs or 2.8% of the regional total. In this county 2000 average annual wages in the manufacturing sector were 32,343. Chittenden VT ranked third in regional manufacturing employment competitiveness, outperforming regional employment growth by thirty five percentage points. In 2000 Chittenden had the largest manufacturing workforce in the Northern Forest, representing over twelve percent of the regional total. Average annual earnings in the manufacturing sector in Chittenden were 34,755.

Table 3.9: Manufacturing Super Sector, 2000

	Employment 2000	Establishments 2000	Average Ann Wage 2000	Employment Change 1990-2000
Grafton-NH	7,164	237	50,331	872
Herkimer-NY	4,020	141	46,961	-1,335
Fulton-NY	3,381	86	45,823	-1,288
Oxford-ME	3,933	111	42,965	-571
Franklin-ME	2,529	45	42,201	-569
Washington-NY	3,615	93	37,725	-1,223
Saratoga-NY	6,759	104	36,807	144
Somerset-ME	4,777	60	35,855	219
Chittenden-VT	16,669	157	34,755	3,567
St. Lawrence-NY	5,006	157	33,831	-780
Aroostook-ME	4,394	80	33,089	-766
Hancock-ME	2,652	116	32,711	50
Washington-VT	3,679	58	32,343	1,145
Clinton-NY	5,455	63	30,392	1,156
Oswego-NY	5,263	111	30,201	-1,938
Warren-NY	3,810	51	29,844	-1,327
Penobscot-ME	7,377	15	29,019	-2,908
Oneida-NY	14,225	58	28,492	-3,401
Jefferson-NY	3,688	45	26,807	-1,335
Franklin-VT	2,886	32	26,567	346

Grafton NH had the highest wages in the manufacturing sector in the Northern Forest at 50,331 and outperformed the region in employment change by 22 percentage points. Manufacturing employment in Grafton represented 5.5 percent of the regional total. Saratoga NY, also a competitive manufacturing county, outperformed the regional average in employment growth by ten percentage points. Average earnings in Saratoga were high at 36,807. Oneida NY, with the second largest manufacturing workforce in the region, underperformed regional employment change by 11 percentage points, with a loss of 3,401 jobs between 1990 and 2000.

D. Spatial Distribution of Industry Employment

This section examines the spatial distribution of employment in the Northern Forest at the Census tract level. Moran's I is a statistical measure of spatial correlation ranging between 1 and -1 where 1 represents the highest degree of concentration. Maps depicting the location of employment in conjunction with Moran's I are used to identify employment-based industry clusters in the Northern Forest. Employment clusters are identified first at the super sector level and then at the more detailed sub-sector level. After reviewing employment clusters at the sub-sector level, a procedure involving a local version of Moran's I is used to identify industries that are correlated to the most clustered sub-sectors.

Super-Sector Level

The table below presents Moran's I for key super sectors in the Northern Forest. Higher values are associated with the presence of employment based industry clusters in the Northern Forest. Percentages of employment at the Census tract level are mapped in Figures 3.19–3.25 of the Appendix. Professional, Scientific and Technical Services was the most highly clustered super-sector in 2000 and also had significant employment relative to other industries in the Northern Forest region. Employment-based industry clusters in Professional, Scientific and Technical Services are located primarily in metropolitan centers of the Northern Forest region such as Burlington, Saratoga Springs, Utica-Rome, and Bangor. Finance and Insurance employment clusters are also associated with economic centers primarily along the southern border of the region in New York. Both of the top employment based industry clusters are closely linked to the knowledge economy and dependent on economic and population centers.

Table 3.10: Level of Spatial Concentration for Key Super Sectors

Super Sector	Moran's I	Employment 2000
Professional, scientific, and technical services	0.584	39554
Finance and insurance	0.509	39252
Agriculture, forestry, fishing and hunting	0.469	28953
Manufacturing:	0.445	147695
Information:	0.405	23892
Wholesale trade:	0.372	29485
Construction	0.364	67119
Educational services	0.360	119139
Accommodation and food services	0.358	67364
Arts, entertainment, and recreation	0.338	14933
Real estate and rental and leasing	0.303	12769
Administrative and support, and waste management services	0.292	23209
Health care and social assistance:	0.271	136246
Management of companies and enterprises	0.125	359

Manufacturing, the fourth most clustered super sector in the region, was the largest in terms of employment. Employment clusters in the manufacturing super sector are dispersed throughout the region and at the same time are linked to economic centers such as Burlington and Utica-Rome. Employment in several of the region's largest industry super sectors, such as Educational Services, Health Care and Social Assistance, and Construction is distributed relatively evenly across the region. Despite employing large and increasing numbers of people, these sectors generally exhibit moderate to low wage levels,.

Sub-Sector Level

When more specific groups of industries are examined, higher degrees of spatial concentration emerge. While industry super sectors generally do not group tightly in space, employment in groups of closely related industries is concentrated in a few parts of the region. The table below presents the top twenty sub sectors with the most pronounced employment industry clusters based on the Moran's I statistic. While the manufacturing sector as a whole is not very highly clustered, the most highly concentrated industries tend to be in that sector. Sixteen of the 20 most highly clustered industry sub-sectors are manufacturing industries. Areas with high manufacturing employment generally share proximity to major highways and are located on the fringes of the region.

Table 3.11: Level of Spatial Concentration for Top 20 Sub Sectors

NAICS Code	Sub Sector	Moran's I	Employment 2000
334	Computer and electronic products	0.811	13785
316	Leather and allied products	0.663	4595
313	Textile mills and textile products	0.621	4309
321	Wood products	0.614	10179
331	Metal	0.554	17540
337	Furniture and related products	0.511	5678
325	Chemical	0.504	6421
333	Machinery	0.488	8654
323	Printing and related support activities	0.468	5758
339	Miscellaneous manufacturing	0.457	14092
327	Nonmetallic mineral products	0.436	4510
335	Electrical equipment, appliances, and components	0.427	5391
311	Food	0.413	10382
336	Transportation equipment	0.393	8358
322	Paper	0.377	20031
511	Publishing, and motion picture and sound recording industries	0.352	8625
513	Broadcasting and telecommunications	0.349	10550
448	Clothing and apparel including shoes	0.304	4820
326	Plastics and rubber products	0.286	4224
491	Other transportation	0.281	10206

Industry Clustering

Computer and Electronic Products Manufacturing is the most spatially concentrated industry sub-sector in the Northern Forest, located almost entirely around IBM's Essex Junction,

VT plant, but also with a small presence around Rome/Utica, and Syracuse, NY (Figure 3.26). This sub-sector employed almost 14,000 people in 2000 and is closely linked to Miscellaneous Durable Goods Manufacturing, Management of Companies and Enterprises, and Information.

The second-and third-most concentrated industry sub-sectors are Leather and Allied Products, and Textile Mills and Textile Products. While each of these sub-sectors employed less than 5,000 people in the year 2000, they are concentrated in the same parts of the region and are thus spatially linked to one another. These industries are located primarily in and around Fulton County, NY, and Lewiston/Auburn and Waterville, ME (Figures 3.27 and 3.28). While Leather is not very closely linked to other industries, Textile Products are strongly linked to Warehousing and Storage, and Apparel manufacturing.

Wood Products is the fourth-most tightly clustered sub-sector. This industry group employed over 10,000 people in 2000, and was closely associated with Fuel Dealers and Paper Manufacturing. Employment in this sub-sector is concentrated primarily along major highways in New York, throughout eastern Vermont and northern New Hampshire, and across much of Maine (Figure 3.29).

Metal Products Manufacturing is the fifth-most tightly concentrated sub-sector, employing almost 18,000 workers primarily around Rome/Utica and Massena, NY and Littleton, NH. This industry group is closely linked to Transportation, Warehousing, and Utilities, and Department and Other General Stores (Figure 3.30).

IV. Summary

The Northern Forest is a highly diverse region, but it is nonetheless useful to examine trends and conditions across aggregates of counties to get a sense of how different types of places are doing as the region moves into the future. A few key themes emerge from the overview above. First, the Northern Forest is disadvantaged vis-à-vis the southern tier of the four-state region in some important ways, such in educational attainment, the availability of work, and the presence of poverty. This does not come as much of a surprise, knowing what we do about the challenges many Northern Forest communities are facing. The Northern Forest is much more rural than the southern tier, and the issues facing the Northern Forest reflect those of rural America writ large such as the loss of young residents, the vulnerability of manufacturing jobs, and the difficulties for development posed by geographical remoteness.

Second, nonmetropolitan rural counties, or the most rural places in the Northern Forest, are generally disadvantaged compared to counties in the Northern Forest that contain or are linked to larger population centers (i.e., metropolitan counties). These counties, on average, are older, have lower rates of educational attainment, have jobs that pay lower wages, have more idle teens, have a smaller middle class, and have higher poverty rates than do metropolitan or nonmetropolitan small city counties. At the same time, these counties are seeing higher in-migration than metropolitan or nonmetropolitan small city counties in recent years. This suggests that community and economic development strategies in the most rural counties, whatever their sectoral focus, should attempt to capitalize on the resources inherent in new and often socioeconomically advantaged populations that likely bring them new human and financial capital. However, these counties should at the same time work to integrate young people with schools and the workforce, and to address the negative effects of poverty. Yet, while nonmetropolitan rural areas of the Northern Forest generally lag behind their metropolitan and nonmetropolitan small city counterparts, they compare favorably to rural areas of the US as a whole, reminding us that while the Northern Forest region faces its own sets of challenges, it is more prepared to address them than are many other parts of rural America.

Third, counties that depend on manufacturing have been particularly hard-hit by declines in the region's manufacturing base. These places include remote areas like Piscataquis County, ME, but also places near large population centers, like Herkimer County, NY. While low labor force participation rates in these areas suggest that an able-bodied and relatively skilled manufacturing workforce can be tapped to fuel new forms of development, manufacturing counties are at a crucial point at which young people are being lost, potentially draining them of a valuable resource when it comes to the formulation and implementation new forms of development. Development strategies in manufacturing areas should work to make these places more attractive to their young people so that existing skills and infrastructure can be taken advantage of in fresh ways.

However, two groups of counties, those that are dependent on services and/or recreation are doing comparatively well, despite low average wages in the latter. The well-being of service-dependent counties calls attention to the universal trend of increasing importance of service work, and illustrates the need to cultivate high skill and high wage jobs in that sector, rather than letting low skill, low wage work predominate as it frequently does in rural areas.

And increasingly, high wage service sector work is tied to the flow of information around the globe. Here, the importance of telecommunications infrastructure is paramount. For example, Hancock County, ME is dependent on both services and recreation industries, and scores quite highly in terms of overall well-being despite being a nonmetropolitan rural county. The well-being of recreation-dependent counties calls attention to the ways in which the region's natural resources present economic opportunities beyond those of traditional extraction, and highlights the need to carefully cultivate the tourism sector for maximum economic benefit.

Further, from a demographic and socioeconomic perspective the Northern Forest region may be most usefully thought of as a grouping of sub-regions, each with its own set of opportunities and challenges. Most notably, while there is a good deal of variation between neighboring counties, much of the central part of the region forms an area quite distinct from the region's eastern and western ends. Levels of community and economic well-being tend to be notably higher in the central part of the region than in the western and eastern areas. These sub-regions are also different in terms of industrial structure, with much of New York dependent on federal and state government, much of Vermont and New Hampshire dependent on services or nonspecialized, and northeastern Vermont, northern New Hampshire, and much of Maine dependent on manufacturing. The differences in circumstances across the region suggest that a single, region-wide development strategy may be very difficult to formulate. Therefore the approach that will perform most effectively will be to devise a number of different strategies that address the different realities that exist on the ground from place to place.

While economic well-being tends to be geographically clustered around Saratoga Springs, Burlington, central NH, and Bangor social well-being is somewhat more widely distributed. This suggests that the social resources inherent even in some of the region's economically disadvantaged places can play a role in new development strategies. While places such as Coos County, NH; Lewis County, NY; and Orange County, VT are facing acute economic difficulties, the attractiveness and benefits of these places, marked by high levels of social interaction and low crime, may be tapped into to facilitate future development.

Finally, the region as a whole is growing, and much of this growth appears to be due to the attractiveness of the region's natural amenities. While it is not unique to the Northern Forest, the main challenge here is to balance the preservation of what makes the region attractive with the gains to be made from successful integration of newcomers. Indeed, the long-term future of the region appears to be tied as much to the arrival of newcomers as it is to the retention of its young people. As demographer Kenneth Johnson points out, communication and transportation innovations have allowed people and businesses to locate in areas where once they could not. Often, these decisions about where to relocate are driven by the presence of natural amenities. Nationally, high-amenity, recreation, and retirement counties have been the fastest-growing nonmetropolitan counties since the 1970s, and it is likely that we will see future population growth in these counties. Parts of the Northern Forest may thus be faced with increasing environmental stress and strains on an existing infrastructure in coming years.