

## Demographic Change in the Northern Forest

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The Northern Forest spans more than 26 million acres across Maine, New Hampshire, New York, and Vermont.<sup>1</sup> With densely settled urban cores, sprawling suburbs, struggling industrial and forest products towns, fast growing recreational areas, and isolated rural villages, the region includes many of the diverse strands that together compose the demographic fabric of the nation. Population and housing growth between 2000 and 2010 in this long-settled region has been modest, but there is considerable internal variation, with some places growing rapidly while nearby communities diminish. Because it is a place where people and forests are intermixed, demographic change in the Northern Forest will have significant implications for the region's forests and other natural resources.

The future of the Northern Forest and the communities embedded in it depends on the ability to anticipate change and respond appropriately. This is a particular concern for resource managers because natural resources respond to change slowly and benefit from long-range planning and management. Our demographic analysis provides a powerful tool for advancing integrated research and, ultimately, finding sustainable solutions for the communities of the Northern Forest.

### Population Redistribution in the Northern Forest

The Northern Forest includes thirty-four counties scattered across northern and central Maine, New Hampshire, New York, and Vermont (hereafter Forest counties).<sup>2</sup> Because demographic trends should be examined in a broader context, the analysis includes fifty-eight counties in the four states that are not part of the Northern Forest for comparisons (hereafter Forest proximate counties). Counties included in the New York metropolitan region are excluded. In 2010, 2.3 million people resided in the Forest counties and about 8 million resided in the Forest proximate counties. Population gains between 2000 and 2010 were greater in the Forest counties (3.4

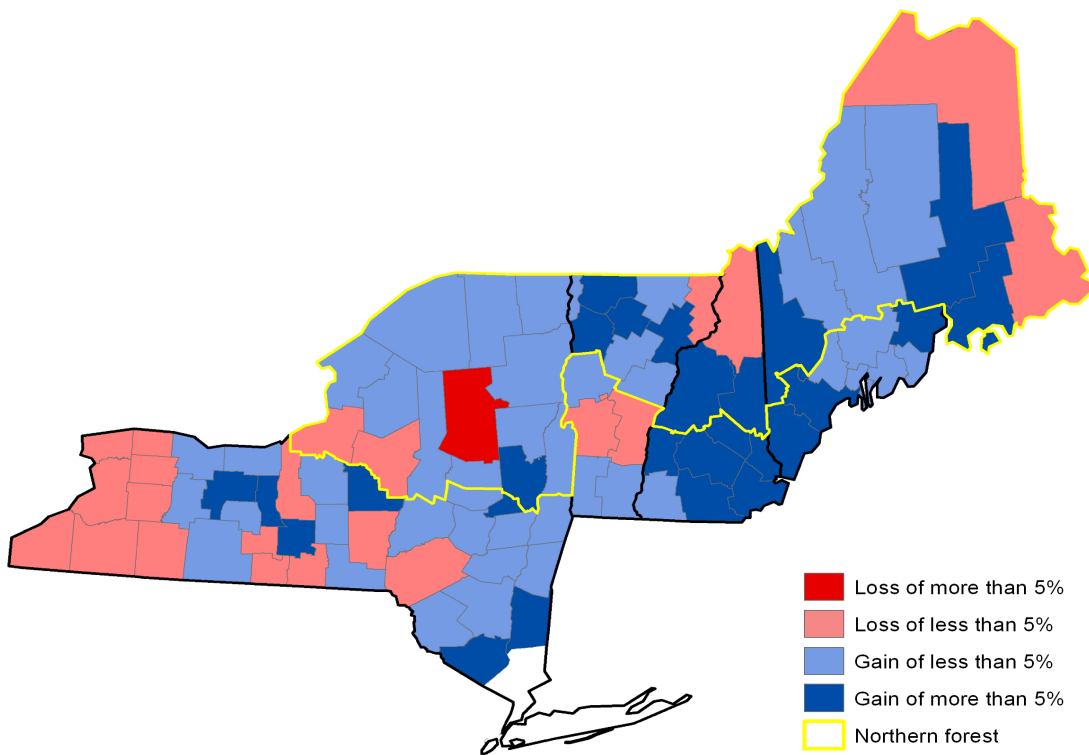
### Key Findings

- The population of the Northern Forest grew modestly between 2000 and 2010.
- Population gains were greatest in recreational areas and least in manufacturing areas.
- Racial and ethnic diversity is growing in the communities of the Northern Forest.
- The population of the Northern Forest is aging.
- Modest housing growth has produced widespread intermixing of forests and housing.

percent) than in the Forest proximate counties (2.3 percent). These gains were modest compared with those in the United States overall (9.7 percent) or rural America (4.5 percent). As Figure 1 shows, within the Northern Forest, growth was greatest along the southern edge of the region in Maine and New Hampshire, and it was also widespread in Vermont. In New York, growth was also widespread, but gains were generally smaller than in the other three states.

Population change in the Northern Forest reflects the interaction between fertility, mortality, and migration over a protracted period. Both natural increase (births minus deaths) and migration contributed to the modest population gain in the Northern Forest. Migration is becoming particularly important to future growth in the area because natural increase is diminishing. The proximity of 23.5 million people in the New York and Boston metropolitan areas increases the potential for urban residents to migrate to the scenic communities of the Northern Forest. The influence of migration is clearly evident in the region's recent demographic trajectory. The larger population gains in the Forest counties occurred because the excess of births over deaths was supplemented by a migration gain. Between 2000 and 2010, 37,000 (1.7 percent) more people

FIGURE 1. POPULATION CHANGE IN NORTHERN FOREST AND PROXIMATE COUNTIES, 2000 TO 2010



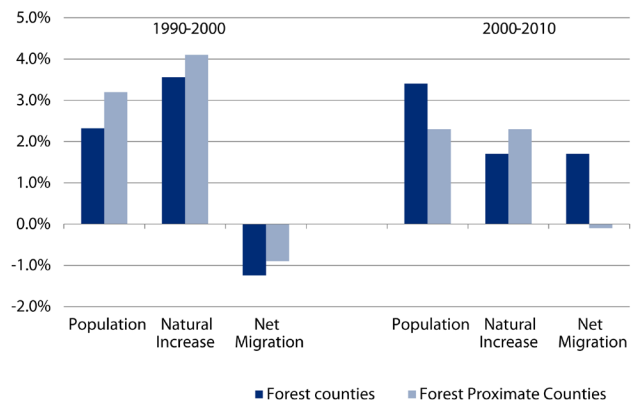
Source: U.S. Census 2010

moved into Forest counties than moved out (Figure 2). Natural increase contributed an additional 1.7 percent (38,000) to the population gain in the Northern Forest. This net migration gain is opposite of what occurred in the 1990s, when there was a net migration loss. Without these recent migration gains, growth would have slowed in the Forest counties. Population gains in the Forest proximate counties were proportionally smaller because they were entirely due to natural increase.<sup>3</sup>

### Demographic Change Varies by Economic Type

The Northern Forest has long been economically diverse, and this diversity has important implications for recent demographic trends. Some Northern Forest counties have long histories as seasonal centers for winter skiing and as summer lake destinations. Such recreational counties have become increasingly attractive as year-round residences for seniors and professionals attracted by the natural beauty and amenities of the region. The arrival of “amenity migrants” encourages working-age residents to stay in the area and attracts others to it.

FIGURE 2. PERCENT CHANGE IN DEMOGRAPHIC COMPONENTS IN NORTHERN FOREST STATES, 1990-2010

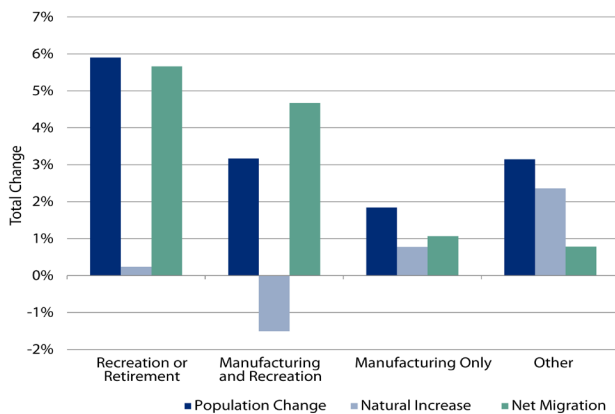


Source: U.S. Census 1990, 2000, 2010

Population gains have been greatest in the eight Forest counties that are centers for recreation and retirement. Here the population grew by 5.9 percent, a rate nearly twice that of any other type of county (Figure 3). This growth was fueled almost entirely by migration. The significant net migration gain in these high-amenity counties is consistent with national trends, which show net migration fueling virtually all the growth in such communities.<sup>4</sup>

Manufacturing has long been a mainstay of the New England economy. However, the four manufacturing counties in the Northern Forest have faced significant competition both from southern regions of the United States and globalization

**FIGURE 3. DEMOGRAPHIC CHANGE FOR SELECTED COUNTY TYPES IN THE NORTHERN FOREST, 2000-2010**



Source: U.S. Census 2000 and 2010 and Population Estimates, 2010

trends in paper and wood products, as well as other manufacturing industries.<sup>5</sup> Growth was slowest in these counties; they grew by just 1.8 percent between 2000 and 2010. This modest population gain was fairly evenly balanced between natural increase and migration.

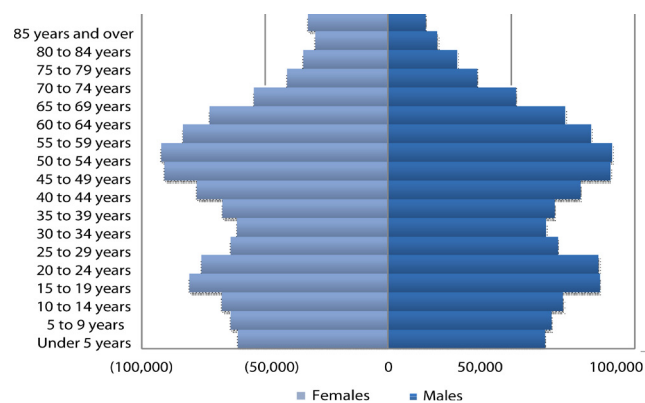
Manufacturing and amenity activities coexist in four counties in the Northern Forest. This blending of a fading manufacturing base with a growing recreational sector has produced an interesting demographic dynamic. The long-term loss of manufacturing jobs has caused young adults to leave, while the older generation remains. At the same time, the growing recreational appeal of the region is attracting older amenity migrants. As a result, few young people remain to have children, while mortality is growing among the larger older generations. Population gains in these four counties were small (3.2 percent) and entirely due to migration. In fact, deaths in these counties exceeded births, resulting in natural decrease.

In seventeen Forest counties (“other”), the local economy is more diverse, with no single economic sector dominating. The population gain (3.1 percent) in these counties was also modest (Figure 3) and natural increase accounted for most of the growth, though it was supplemented by some net in-migration.

## Changes in the Age Structure

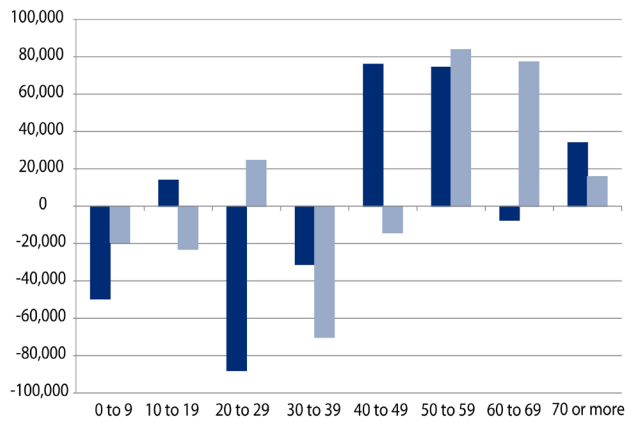
The growing prominence of recreation and retirement destinations and the diminishing role of manufacturing are reflected in the age structure shifts underway in the Forest counties. The Northern Forest has an older population than the United States as a whole because the baby boom population (age 45–65) is a larger part of the region’s population (Figure 4). Changes in this age structure have been influenced by two demographic forces: aging in place among current residents, and net outmigration among younger populations. Aging in place is the more influential factor. For example, the increase in the population age 50–59 (+84,000) and 60–69 (+77,000) between 2000 and 2010 is a harbinger of future age structure shifts (Figure 5) as baby boomers in the area age. In contrast, the sharp decline in 30- to 39-year-olds (-70,000) reflects the departure of the youngest baby boomers from this age group.

**FIGURE 4. AGE STRUCTURE IN THE NORTHERN FOREST COUNTIES, 2010**



Source: U.S. Census 2010

**FIGURE 5. POPULATION CHANGE BY AGE 1990 TO 2010 FOR FOREST COUNTIES**



Source: U.S. Census 1990, 2000, 2010

Age specific net migration is also influencing the age structure of Forest counties. Such migration has resulted in a modest loss of young adults. In contrast, there has been a net inflow of older adults to the Forest counties due to the concentration of retirement and recreational counties there. The net effect of these migration patterns has been to accelerate the aging process by reducing the young adult population, while increasing the number of older adults. These trends are consistent with those in similar recreational counties elsewhere in the United States.<sup>6</sup>

In planning for the future, the population concentration among those age 45–64 signals a substantial increase in the number of older adults in the Forest counties over the next two decades. Currently there are 184,000 65- to 74-year-olds in the Forest counties, yet there are 311,000 55- to 64-year-olds, and 364,000 45- to 54-year-olds in the area. These cohorts will experience modest mortality losses in the coming years, but there will certainly be a significant increase in the age 65 and older population in the Forest counties during the next two decades.

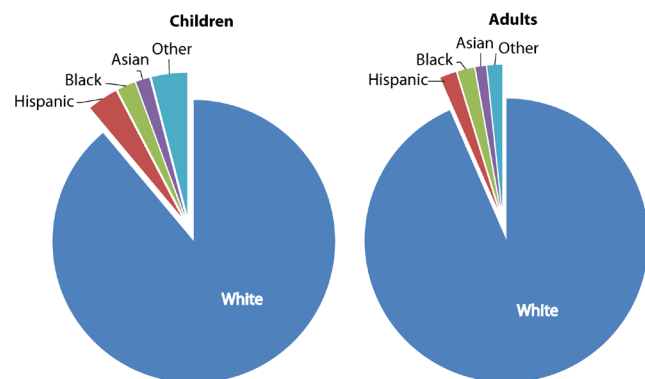
## The Northern Forest Is Becoming More Diverse

Any analysis of recent demographic trends in America must include the growing demographic impact of minority populations. Compared with the United States as a whole, the Northern Forest has far fewer minority residents, but diversity is increasing. Non-Hispanic whites represent 92.5 percent of the Northern Forest population, with Hispanics (2.2 percent), African-Americans (1.9 percent), Asians (1.2 percent), and Native Americans (0.7

percent) present in modest numbers. The most striking evidence of the region's growing diversity is reflected in recent population changes by race and Hispanic origin.

The non-Hispanic white population grew by 1.5 percent (30,600) between 2000 and 2010. Percentage gains were larger for each minority group, though the absolute gains in the number of people were smaller. However, the combined minority population gain exceeded that of non-Hispanic whites. The largest gains were for Hispanics, at 44.7 percent (15,400), and Asians, at 70.9 percent (11,800). Gains were smaller for African Americans, at 11.8 percent (4,700), and for Native Americans, at 9.8 percent (1,400). The overall effect has been to modestly increase diversity in the region. Both the white and the minority population grew, but diversity increased because the minority gains were greater than those to non-Hispanic white population.

**FIGURE 6. FOREST COUNTIES BY RACE AND HISPANIC ORIGIN, 2010**



Source: U.S. Census 2010

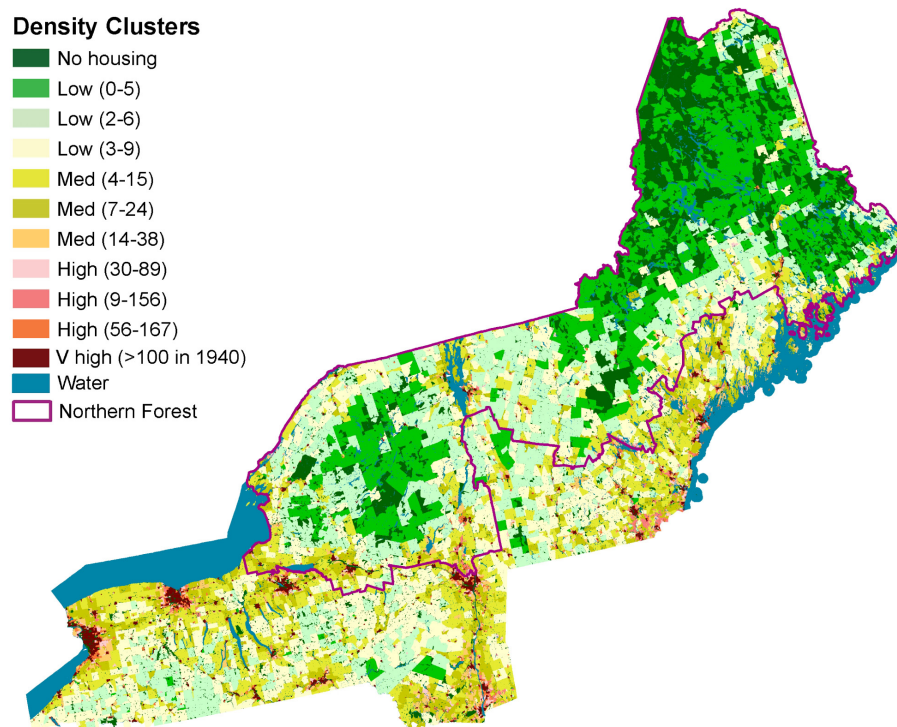
Children are in the vanguard of this growing diversity. Minority children represented 11.1 percent of the child population in the Northern Forest in 2010. In contrast, minorities represent just 6.6 percent of the adult population there (Figure 6). Among adults, the non-Hispanic white population gain exceeded the combined gain of all adult minorities. In contrast, the minority child population grew during the period, while the non-Hispanic white child population declined sharply. The diminishing white child population coupled with the growing minority child population accelerated the diversity of the area's youngest residents.

## Housing Change

Population change is altering housing growth trajectories and the spatial distributions of housing. Overall, housing density has increased in the region through time, but housing densities remain lower than in surrounding counties. The density patterns vary, however, by specific area. Figure 7 shows housing areas with high, medium, or low housing density. It also shows change in housing density by comparing the average housing density in 1940 with that in 2000.<sup>7</sup> Housing densities are lowest in the northern regions of Maine, Vermont, and New Hampshire, and these areas have seen the least density change. In contrast, housing densities are greatest and growth has been most pronounced in recreational areas within the Forest and along its southern periphery, especially near the large urban concentrations to the south.

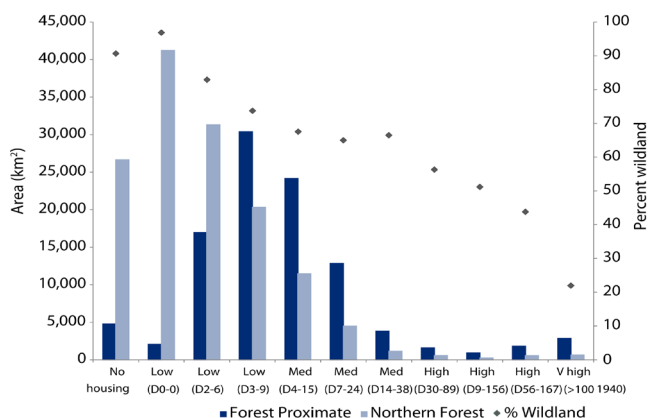
Even with these greater housing densities, the region continues to have considerable forest land intermixed with this housing.<sup>8</sup> For example, in medium density cluster D4-15, where housing density more than tripled, from an average of four houses per square kilometer in 1940 to an average of fifteen in 2000, nearly 65 percent of the land remains in areas where dwellings and forests are intermixed (Figure 8). This extensive wildland-urban interface, where houses, human infrastructure, and development coincide with forest vegetation is characteristic of the Northern Forest. Prior research suggests that an extensive wildland-urban interface area of this type shares characteristics both with urbanized regions—where human settlement patterns have significant impact on vegetation, hydrology, and ecosystem services—and with wildland forests with their extensive canopy cover, wildlife habitat, and vegetative types. Residential forest areas such as those in the Northern Forest,

FIGURE 7. DISTRIBUTION OF HOUSING DENSITY CLUSTERS IN THE NORTHERN FOREST REGION



Source: Miranda Mockrin et al., "Spatial and Temporal Residential Density Patterns from 1940 to 2000 In and Around the Northern Forest of New England," *Population and Environment*, forthcoming

**FIGURE 8. AREA AND PERCENT WILDLAND VEGETATION FOR HOUSING CLUSTERS IN NORTHERN FOREST REGION**



Source: Miranda Mockrin et al., "Spatial and Temporal Residential Density Patterns from 1940 to 2000 in and Around the Northern Forest of New England," *Population and Environment*, forthcoming

where housing and forest intermix, provide many ecosystem services including the production of food and water, regulation of the environment, support of the nutrient cycle, and provision of recreation areas. However, such residential forests remain heterogeneous and unstable over time and are subject to considerable risk if development continues.<sup>9</sup>

## Conclusion

The Northern Forest population grew by 3.4 percent between 2000 and 2010, a gain considerably smaller than that for the United States as a whole. Within the region, the population gain was greater in the thirty-four Forest counties than in the fifty-eight Forest proximate counties. Population growth in the Forest counties was fueled by both migration and natural increase, whereas during the 1990s these counties lost migrants. Population gains were greatest in Forest counties with amenities that attracted recreational activity and retirees. Nearly all of the growth in these counties was fueled by migration. Population gains were smallest in Forest counties that specialized in manufacturing. These trends reflect the growing importance of natural and built amenities, as well as the waning influence of manufacturing.

The Northern Forest population is growing older due to aging in place among current residents and because it is losing young adults and gaining older adults from migration. The net result is an aging population and an age structure likely to generate even more older adults in the coming two decades. Racial diversity is on the increase in the region as well, with children at the forefront of this change.

The housing stock has grown modestly over the last several decades, though changes in housing density and timing have been spatially uneven. Yet forests remain widespread,

even in areas with moderately high housing densities. These changes have produced an extensive intermix of people and forest that resource managers, planners, and policymakers must be cognizant of in planning for the future of the Northern Forest, its people, and institutions.

This report contributes to a better understanding of the role that demographic change plays in transforming the Northern Forest. Understanding current demographic trends is important to planning for the region's future because that future depends in part on the size, composition, and distribution of its population. This research documents the interplay between amenities and population concentration that together contribute to migration, population change, and housing density shifts in the region. This information delineates differential patterns of population redistribution and housing density and in so doing contributes to a better understanding of land use change and its implications for the working landscape. It also contributes to a more comprehensive understanding of the social and economic changes that Northern Forest communities face. The research quantifies the benefits and challenges that recreation and tourism provide to the Northern Forest. If the region is to remain a vibrant area, planners need to consider how these demographic trends are likely to impact the future needs of its people and the numerous institutions, organizations, and firms that support and enhance the lives of this population.

## Data and Methods

Most of the data in this brief are from the 2010, 2000, and 1990 Decennial Census, supplemented with information from the American Community Survey five-year data set from 2005 to 2009. Additional data are from the Federal-State Cooperative Population Estimates program (FSCPE), which provides information on births and deaths in each county for April 1990 to July 2009.<sup>10</sup> Births and deaths from July 2009 to April 2010 were estimated at .75 of the amount from July 2008 to July 2009. The estimates of net migration were derived by the residual method, whereby net migration is what is left when natural increase (births minus deaths) is subtracted from total population change. Data for the racial and Hispanic origin of the population are from the 2000 and 2010 census. We identify five ethnoracial groups: (1) Hispanics of any race, (2) non-Hispanic whites, (3) non-Hispanic blacks, (4) non-Hispanic Asians, and (5) all other non-Hispanics, including those who reported two or more races.

Counties are the unit of analysis because they have historically stable boundaries and are a basic unit for reporting fertility, mortality, and longitudinal demographic and economic data. Counties are classified using a typology developed by the Economic Research Service of the U.S. Department of Agriculture that groups counties along economic and policy dimensions.<sup>11</sup> Partial block groups were used to examine longitudinal housing cluster change and forest characteristics.<sup>12</sup>

## ENDNOTES

1. An online final report from the project is available at: [www.nsrcforest.org/fullprojectpdfs/johnson07full.pdf](http://www.nsrcforest.org/fullprojectpdfs/johnson07full.pdf).
2. The Northern Forest encompasses over twenty-six million acres in New York, Vermont, New Hampshire, and Maine. Northern Forest counties are defined as any county that includes land delineated as being in the Northern Forest under the enabling legislation that created the Northeastern States Research Cooperative. See <http://www.nsrcforest.org/about.php>.
3. As a group, Forest proximate counties grew entirely from natural increase between 2000 and 2010. However, some individual Forest proximate counties did have migration gains, particularly those in southern Maine, New Hampshire, and New York.
4. Kenneth M. Johnson and S. I. Stewart, "Amenity Migration to Urban Proximate Counties," *Amenities and Rural Development: Theory, Methods and Public Policy*, edited by G. P. Green, D. Marcouiller, and S. Deller (Cheltenham, UK: Edward Elgar Publishing, 2005), pp. 177-196.
5. Manufacturing, recreational, and retirement counties are defined using a typology developed by the Economic Research Service of the U.S. Department of Agriculture. See the "Methods" section for more information. The typology and additional explanations about how county types are delineated are available at [www.ers.usda.gov/Data/TypologyCodes/](http://www.ers.usda.gov/Data/TypologyCodes/).
6. Kenneth M. Johnson et al., "Temporal and Spatial Variation in Age-Specific Net Migration in the United States," *Demography*, vol. 42, no. 4 (2005): 791-812.
7. Housing density and trajectory are reflected in the legends for Figure 7. The classification as low, medium, or high specifies the housing density in 2000. The values associated with the housing density reflect the changes in housing density between 1940 and 2000. Thus, the cluster labeled Med (D7-24) had medium housing density in 2000. Partial block groups in this cluster had an average housing density of seven housing units per square kilometer in 1940, which increased to an average housing density of 24 housing units in 2000. For a more detailed discussion of this methodology, see Miranda Mockrin et al., "Spatial and Temporal Residential Density Patterns from 1940 to 2000 In and Around the Northern Forest of New England," *Population and Environment*, forthcoming.
8. Mockrin, et al. "Spatial and Temporal Residential Density Patterns."
9. Volker C. Radeloff et al., "The Wildland-Urban Interface in the United States," *Ecological Applications*, vol. 15 (2005): 799-805.
10. Federal-State Cooperative Population Estimates are available at: <http://www.census.gov/popest/data/counties/totals/2009/index.html>.
11. The USDA Economic Research County code typology is available at <http://www.ers.usda.gov/Data/TypologyCodes/>.
12. Mockrin et al., "Spatial and Temporal Residential Density Patterns; Radeloff et al., "The Wildland-Urban Interface."

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