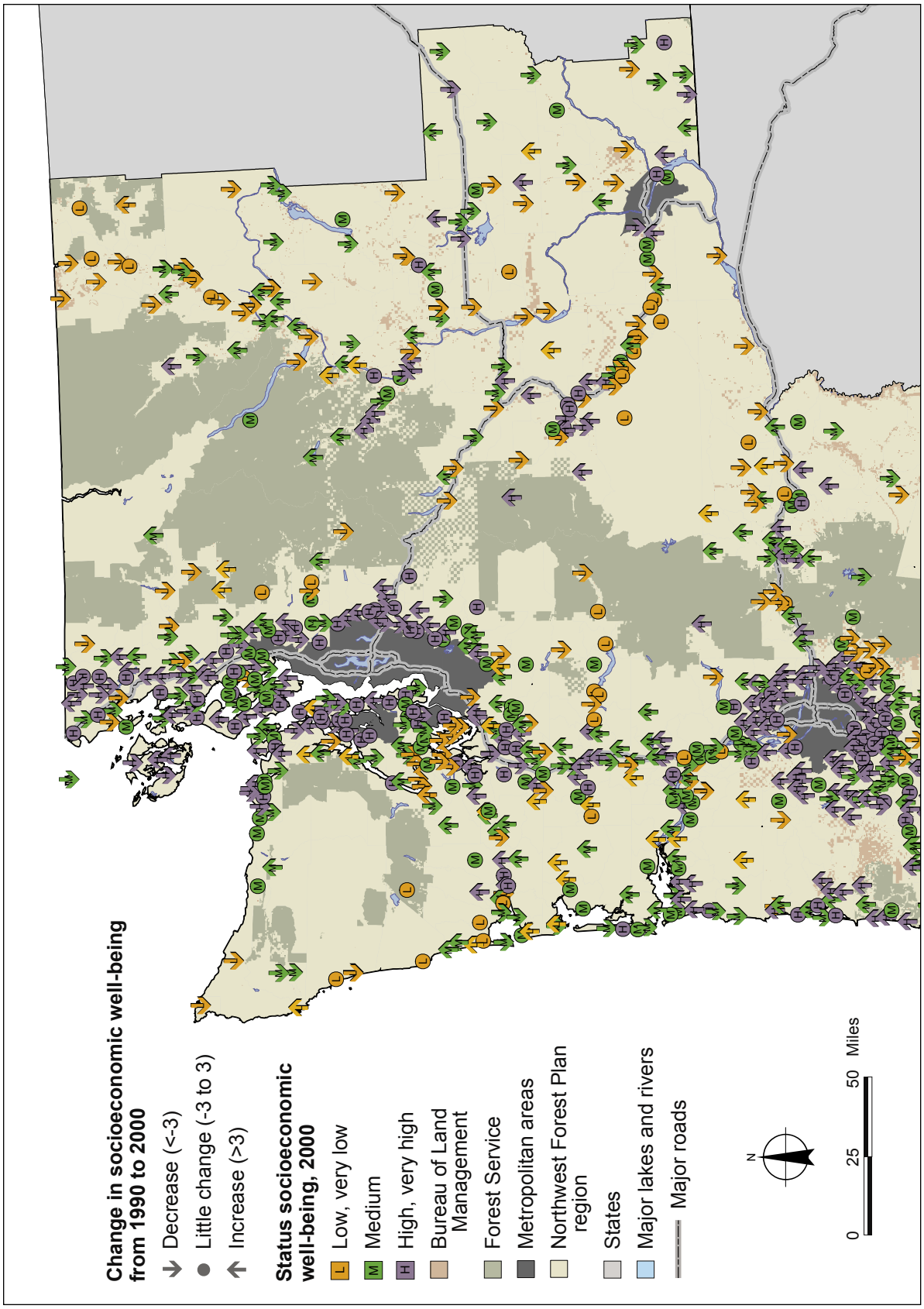

Figure 2-10—Change in community socioeconomic well-being, western Washington.

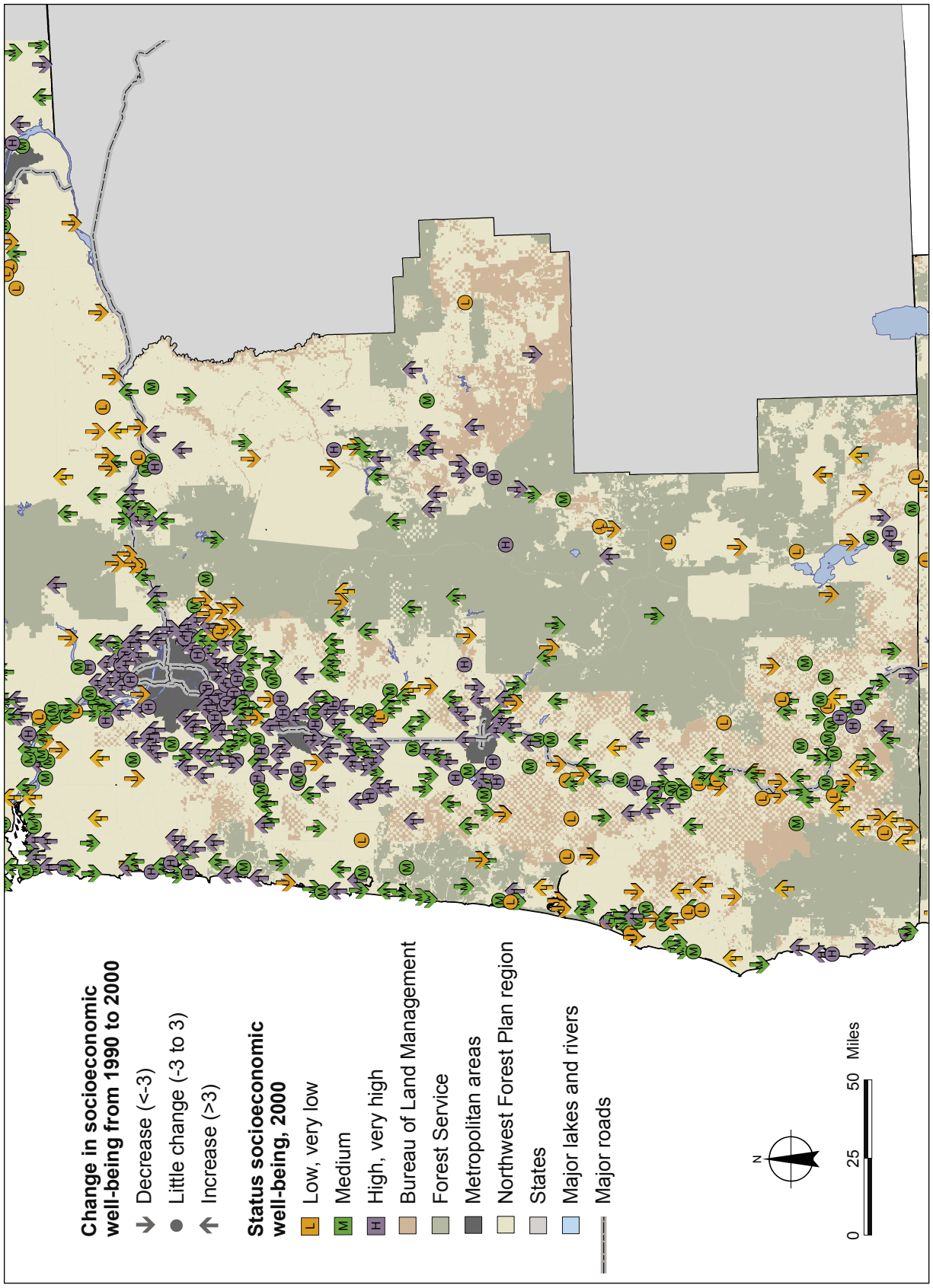

Figure 2-11—Change in community socioeconomic well-being, western Oregon.

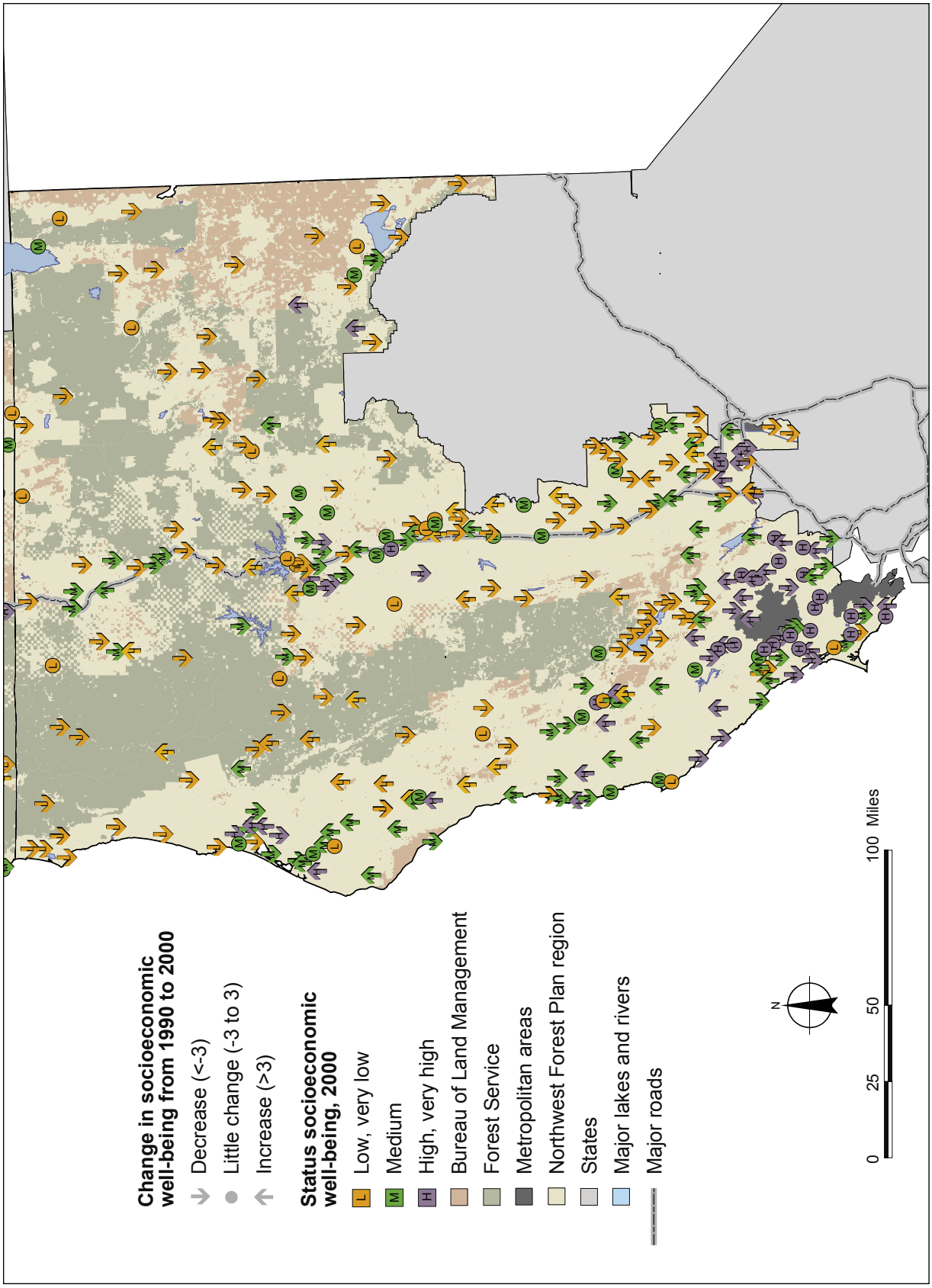

Figure 2-12—Change in community socioeconomic well-being, northern California.

Table 2-6—Communities in socioeconomic well-being categories, 1990 and 2000

Socioeconomic well-being category	2000						
	Very low	Low	Medium	High	Very high	Total	Percent
1990							
Very low	40	34	17	7	2	100	7.6
Low	42	100	91	16	1	250	19.1
Medium	26	121	272	115	9	543	41.3
High	6	10	111	202	39	368	28.0
Very high	0	0	4	28	21	53	4.0
Total	114	265	495	368	72	1,314	
Percent	8.7	20.1	37.7	28.0	5.5	100	100

Movement of individual communities across categories was considerable, however. About 50 percent of the communities increased their socioeconomic well-being scores between 1990 and 2000, and 50 percent decreased. Specifically, 42 communities went from low to very low, 26 communities went from medium to very low, 121 communities went from medium to low, 6 communities went from high to very low, 10 communities went from high to low, 111 communities went from high to medium, 4 went from very high to medium, and 28 went from very high to high. On the positive side, 34 communities moved from very low to low, 17 moved from very low to medium, 7 moved from very low to high, 2 moved from very low to very high, 91 moved from low to medium, and 16 moved from low to high, 115 communities went from medium to high, 9 went from medium to very high, and 39 went from high to very high.

A t-test was performed to compare means for the overall regional average socioeconomic well-being scores for communities in 1990 and 2000; it showed no statistically significant difference between the means. This finding was to be expected, given that the index consisted of normalized values of the distance of each community score from the mean community score. Statistically significant differences are evident, however, when we consider how the communities in each of the five 1990 socioeconomic well-being categories changed between 1990 and 2000 (table 2-7). Socioeconomic scores for the 350 communities that in 1990 had very low or low scores increased between 1990 and 2000 ($p < 0.001$), and socioeconomic well-being for the 964 communities that had medium, high, and very high scores in 1990 decreased between 1990 and 2000. Additionally, t-tests for comparing means between 1990 and 2000 for each of the six indicators of the socioeconomic index were statistically significant ($p < 0.001$) for all indicators except unemployment. The tests showed that, at a regional scale, the percentage of the population in communities with bachelor's degree or higher went up, the percentage of the population in poverty went down, and employment diversity increased slightly. Income inequality and average commute time to work increased, however.

Table 2-7—Communities organized by 1990 socioeconomic well-being categories and their change in average socioeconomic well-being score between 1990 and 2000

1990 socioeconomic well-being category	Number of communities	Well-being score		
		1990	2000	Difference
Very low	100	40.5	53.0	12.5*
Low	250	55.9	58.8	2.9*
Medium	543	67.7	66.2	-1.5*
High	368	78.3	75.8	-2.5*
Very high	53	89.5	84.3	-5.2*

* Significant at $p < 0.05$ level.

Population and Community Socioeconomic Well-Being

Empirical and theoretical work in rural sociology suggest that complex, interdependent factors shape communities, and that interactions among residents, not just the physical place, define a community (Carroll 1995, Machlis and Force 1988, Wilkinson 1979). Nonetheless, the size of a community is often considered an important factor influencing whether a community has the institutional structure to meet the needs of its residents (Wilkinson 1991). Population and population density have been used as proxies for civic infrastructure and have been included in composite measures of socioeconomic resiliency, viability, and adaptability (Haynes 2003, Horne and Haynes 1999). Recent regional social assessments have concluded that the higher the population in a rural community, the greater the infrastructure and the higher the socioeconomic resilience (Harris et al. 2000).

In the Plan region, the average population size for communities in the very low and low socioeconomic well-being categories was less than those in the medium, high, and very high categories for 1990 and 2000 (fig. 2-13). What is notable, however, is that communities in the very high category were not communities with the highest average population, suggesting that population size may not be the best proxy for socioeconomic well-being or other related constructs, such as community resiliency.

The number of people living in communities in the very low or low categories almost doubled between 1990 and 2000, an increase well above the average 20.6 percent increase in population for the region (table 2-8). In 1990 and 2000, about 80 percent of the population was living in communities that had medium, high, or very high socioeconomic scores. Considering only those people living in Plan-area communities (i.e., not counting the metropolitan population), in 1990, 13.1 percent of the population was in communities with very low and low well-being scores, and 39.4 percent of the population lived in communities with high and very high scores. In 2000, 21.0 percent of the population was in the very low and low categories, and 37.5 percent of the population lived in communities in the high and very high categories.

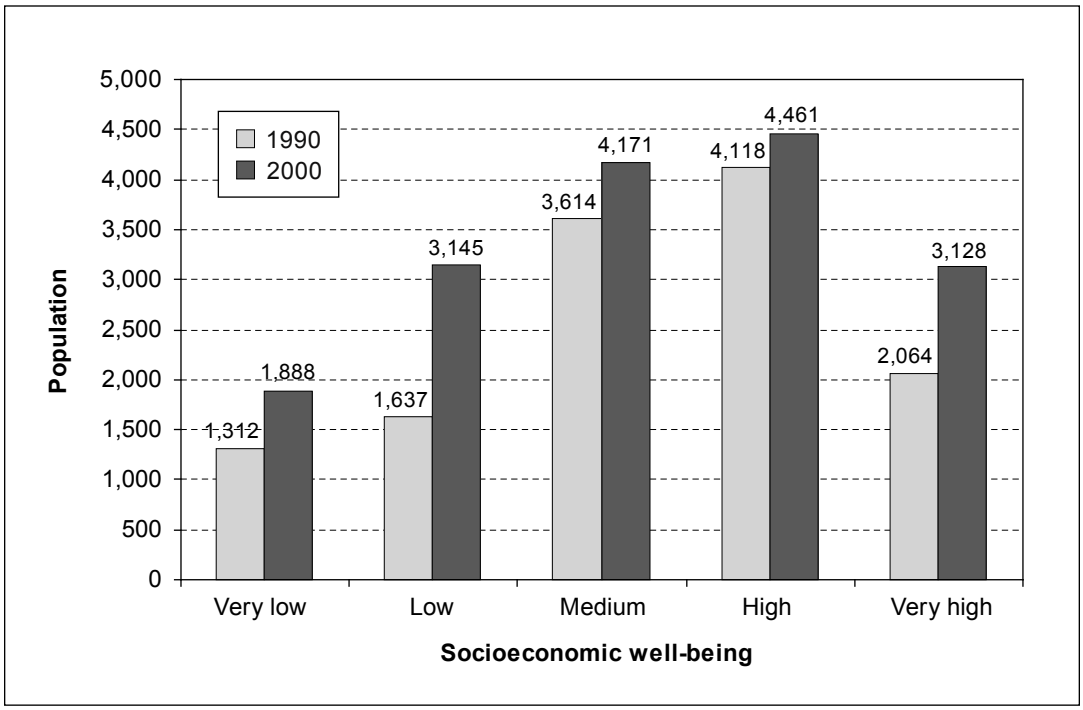

Figure 2-13—Average size of community population by socioeconomic well-being category, 1990 and 2000.

Table 2-8—Regional population in socioeconomic well-being categories, 1990 and 2000

Socioeconomic well-being category	1990 population		2000 population	
	Number	*Percent*	*Number*	*Percent*
Very low	131,211	3.2	215,191	4.3
Low	409,336	9.9	833,340	16.7
Medium	1,962,201	47.5	2,064,668	41.5
High	1,515,526	36.7	1,641,515	33.0
Very high	109,385	2.7	225,197	4.5
Total	4,127,659	100	4,979,911	100

Proximity to Public Forest Lands and Community Socioeconomic Well-Being

Evolving Concept of Forest-Based Communities

We were interested in how socioeconomic well-being of communities in the Plan region differed for those communities that were close to public forest land compared to those communities that were farther away. We begin by briefly discussing the concept of forest-based communities. The past two decades have seen an evolution of terms used to depict communities that have distinct connections to forest resources: community stability, forest dependence, forest based, community capacity, community resiliency, and the recent emphasis on sustainable forest management (Montréal Process Working Group 1998), community viability and adaptability. This evolution of terms shows a growing emphasis on the complex, dynamic, and interrelated aspects of rural communities and the natural resources that surround them. The earliest terms dealt with the limits between forest management and stable communities achieved through stable employment in the forest sector. By the late 1980s, however, the notion of community stability as reflecting sustained-yield timber management was being called into question (Lee 1990, Schallau 1989). Although the use of the term "stability" continued to endure in policy debates, concern was raised about the lack of a clear definition of stability and how it might be measured (Fortmann et al. 1989, Lee 1989, Machlis and Force 1988, Richardson 1996). Some researchers began looking beyond employment indicators to other aspects of community life to assess community well-being (Doak and Kusel 1996, Kusel and Fortmann 1991). In addition to economic measures, indicators for poverty, education, crime, and other sociodemographic measures have been used to assess conditions in communities.

Concurrent with discussions about stability and community well-being were discussions about the term "forest dependence." Forest and timber dependence were initially defined in terms of commodity production as well. Research has suggested, however, that communities are more complex than traditional measures of timber dependency would imply (Haynes et al. 1996). Most communities have mixed economies, and their vitality is often linked to other factors besides commodity production. Some communities thought of as timber dependent have been confronted with economically significant challenges, such as mill closures, and displayed resilient behavior as they have dealt with change. The term "forest dependence" has since evolved in recognition that some economic ties that communities have to forests are not wood-product based, but result from recreation and other amenities (FEMAT 1993, Kusel 1996). And the term has also evolved to reflect the noneconomic connections to forests, such as the symbolic living traditions that people have with the forested places in which they live—the sense of place (Hiss 1990, Kusel 1996, Stedman 2003, Tuan 1993).

Although commonly used, the word "dependence" may not sufficiently reflect all connections between communities and forests, suggesting that the term "forest dependence" may not be appropriate. Dependence tends to be unidirectional—a community depends on a forest—but does not reflect ways that forests depend on nearby communities. For example, in fire-prone areas, forests may depend on fire-wise behavior and preparedness by local residents. Thus, the term "forest-based" community is increasingly being accepted as reflecting the complex, multidimensional, and multidirectional connections between communities and forests. A community may be forest based, but will have social and economic links to geographic scales larger than the community. Because of the scale of this project, we were limited in how we could characterize the connections that

communities have to nearby forests. We concur with the perspective that many communities in the region maintain diverse, dynamic, and multiscale connections to nearby forests.

Socioeconomic Well-Being and Proximity to FS and BLM Lands for the Plan Region

Recognizing that communities not immediately adjacent to public forest lands may have connections to the forests, we thought it would be informative to characterize the 1,314 communities based on proximity to FS and BLM lands and compare socioeconomic well-being scores. We chose proximity as a means to characterize the communities because census data that reflect connections between community members and forests were limited and because collecting and analyzing primary data to assess the relations all communities in the region had to forests was beyond the scope of the project. Proximity to FS and BLM lands in the plan region was one way to examine, at a regional scale, some of the relations that communities have to forests.

Accepting that we were limited to spatial analysis, we defined proximity to FS and BLM lands by creating 5-mile buffers around the lands. Community points that fell within the 5-mile buffer were considered close to FS and BLM lands. Community points that fell outside the 5-mile buffer were considered farther away from FS and BLM lands. We tried many different buffer sizes. Five miles was chosen because during discussions with FS managers, in preparation for the case-study component of this project, the managers concluded that communities 10 miles away from a particular FS or BLM unit, in general, were not considered as having primary connections to a particular forest. Some communities greater than 5 miles from FS and BLM lands have connections to the forest, such as through watersheds, or regional recreation or forest-product economies. However, because of the high percentage of public lands in the Plan region, buffers much larger than 5 miles captured a high percentage of communities in the region, which limited our ability to use proximity as a way to characterize communities in the region.[8]

Thus, this analysis of community socioeconomic well-being is based on two types of communities, determined by the proximity to FS and BLM lands (≥5 miles, <5 miles). Of the 1,314 communities in the Plan region, 750 of them—or about 2.26 million people in 2000—were within 5 miles of FS or BLM lands, which is just under half the population of communities in the Plan region (48 percent in 1990, and 47 percent in 2000). Of these communities close to public forest lands, 71 percent had relatively low population density (0 to 100 people per square mile on nonpublic lands). Indeed, many of the communities in the Plan region (59 percent) were in this low-population-density category. In general across the region, smaller communities (less than 2,000 people) tended to have lower densities, and tended to have lower than average increases in population or declines.

The socioeconomic well-being scores in 2000 for communities that were close to public forest lands (within 5 miles of FS and BLM lands) and farther away (≥5 miles) are shown in table 2-9. A greater percentage of communities close to these public lands had scores in the very low or low categories (36 percent) compared to the communities that were farther away from the public lands (19.3 percent). In contrast, a greater percentage of communities farther away

[8] When a buffer of 10 miles was placed around FS and BLM lands, 963 communities, or 66 percent of the population of communities in the Plan region in 2000, were within 10 miles of FS and BLM lands.

Table 2-9—Community socioeconomic well-being and proximity to Forest Service (FS) and Bureau of Land Management (BLM) lands, 2000

Socioeconomic well-being category, 2000	Communities within 5 miles of FS or BLM land		Communities farther than 5 miles from FS or BLM land	
	Number	*Percent*	*Number*	*Percent*
Very low	87	11.6	27	4.8
Low	183	24.4	82	14.5
Medium	291	38.8	204	36.2
High	156	20.8	212	37.6
Very high	33	4.4	39	6.9
Total	750	100	564	100

from FS and BLM lands had scores in the high or very high category (44.5 percent) compared to communities close to FS and BLM lands (25.2 percent).

Of the communities that had high or very high scores in 2000, 43 percent (189 of 440) were located farther than 5 miles from FS and BLM lands. In contrast, of the communities with very low or low socioeconomic well-being scores in 2000, 71 percent (270 of 379) were close to FS or BLM lands. With respect to population, of the 1 million people in communities in the Plan region that had very low or low socioeconomic well-being scores in 2000, 61 percent were living close to FS and BLM lands.

Similar to the regional comparison of average community socioeconomic well-being scores between 1990 and 2000, no statistical difference was found between years for average socioeconomic well-being scores for either communities close to FS and BLM lands or communities farther away. Individual community scores increased and decreased between the years, however, and there was a difference in how the two types of communities changed. For instance, 40 percent of communities close to FS and BLM lands (within 5 miles) decreased in socioeconomic well-being, compared to 33 percent of the communities farther away.

A closer examination of the five socioeconomic well-being categories (very low, low, medium, high, and very high) reveals other differences between the two types of communities. For both community types, average socioeconomic scores for communities in the very low and low categories increased between 1990 and 2000, but the scores of communities in the medium, high, and very high categories decreased. However, although the trends are similar for both types of communities, in all categories, communities close to FS and BLM lands consistently had lower socioeconomic scores across the five categories than communities farther away. Although the average score for the very low and low communities, in both community types, increased between the years, some communities had decreased scores. In particular, of the communities close to FS and BLM lands in the very low and low categories in 1990, 22 percent decreased in socioeconomic well-being scores, but only 11 percent of the communities farther away (in the same category) had decreases in scores. Conversely, most of the communities in high and very high categories in 1990, for both community types, decreased, although a small percentage increased. Of the communities close to FS and BLM lands in very high and high categories in 1990, 16 percent increased, whereas 21 percent of the communities farther away had increases in these categories.

Examination of the six indicators composing the socioeconomic well-being index showed that changes were similar for communities close to and farther way from FS and BLM lands, with one exception. Both types of communities had increases in the percentage of population with bachelor's degrees or higher, decreased poverty, increased employment diversity, and an increase in travel time to work (t-test, $p < 0.05$) between 1990 and 2000 (change in the unemployment indicator was not statistically significant). Change in income inequality, however, was not statistically significant for communities greater than 5 miles away. In contrast, income inequality increased for communities close to FS and BLM lands ($p < 0.001$). This finding suggests that the regional increase in income inequality appears to be driven by increases in income inequality in communities close to public forest lands.

Several differences emerge between the two types of communities when socioeconomic scores are compared within a single year. Two-sample t-tests for comparing means (assuming unequal variance) were performed to assess socioeconomic well-being scores for communities close to FS and BLM lands compared to communities farther away. For both 1990 and 2000 data, the difference in the means was statistically significant ($p < 0.001$). On average, communities farther away had higher socioeconomic well-being scores than did communities close to FS and BLM lands.

Also, means were compared for each of the six indicators for both community types. Means were statistically different ($p < 0.001$) for all indicators for both 1990 and 2000 data, except for diversity of employment by industry in 2000, suggesting that, on average, communities that were farther away had a higher percentage of the population with bachelor's degrees or more, less poverty, less unemployment, less income inequality, and higher 1990 diversity of

employment by industry. Communities farther away from FS and BLM lands also had higher commute times. However, for all communities, we found a positive correlation between average travel time and median household income in both 1990 and 2000 ($r = 0.26$ in 1990, $r = 0.32$ in 2000, $p < 0.0001$), indicating that the higher the average travel time, the higher the median income. We also found that the lower the average travel time in a community, the higher the percentage in poverty ($r = -0.23$ in 1990, $r = -0.28$ in 2000, $p < 0.0001$).

Summary

In general, communities in the Plan region experienced change in socioeconomic conditions between 1990 and 2000. Total population in the region grew at a faster rate than in the rest of the United States (20.6 percent in 2000). Almost 5 million people lived in communities in the Plan region in 2000.[9] And many of these communities were relatively small. In 2000, more than 60 percent of the 1,314 communities identified through the block group-aggregation process had between 250 and 2,000 people, for a total of 857,000 people, or 17.2 percent of the total population of communities in the Plan region. Although the population is increasing in the region as a whole, about one-fifth of the communities lost population between 1990 and 2000. These communities tended to be fairly small, about 80 percent of them having populations between 250 and 2,000 in 2000. Almost a half million people in the region live in these communities. Smaller communities, in general, also tended to have lower population densities. Communities with the highest percentage increase in population between 1990 and 2000 span the spectrum of small and large communities, and low and high densities.

The population in the Plan region is aging in ways similar to the rest of the United States, with the baby-boomer cohort (born 1946 to 1964) showing the greatest percentage increase in age. Although the racial composition of Plan communities cannot be compared between 1990 and 2000, the census does collect information on Hispanic or Latino origin that can be compared: the percentage of Hispanics and Latinos in Plan region communities increased from 5.8 percent to 8.5 percent, although the overall percentage remains less than in the United States as a whole (12.5 percent in 2000).

Plan communities have had sizable increases in the percentage of the population with bachelor's degrees or higher between 1990 and 2000. Poverty has decreased at a higher rate than the rest of the United States, with a lower percentage of the population in poverty (11.8 percent in 2000 for the Plan region and 12.4 percent for the United States). The lower poverty measures in the region are consistent with the increase in median household income and the increases in the percentage of the population in the highest income brackets. Median household income increased 20.3 percent between 1990 and 2000 to $42,351, just above the national median household income of $41,994 in 2000.

The four industry sectors that remain dominant in 1990 and 2000 among community residents in the Plan region were education, health, and social services; professional and other services; manufacturing; and retail trade. The manufacturing sector, however, had the highest percentage decrease of any sector, and the education, health, and social services sector had the greatest increase.

Twenty-seven percent of the communities in the region had little change in socioeconomic well-being, but 37 percent increased and 36 percent decreased. The indicators making up the socioeconomic well-being index showed that, for the communities in the region, the percentage of the community population with a bachelor's degree or more increased, the percentage of the population in poverty decreased, and employment diversity increased slightly. Income inequality and average commute time to work increased, however. Although smaller communities in the Plan region tended not to be doing as well as before, based on the socioeconomic well-being index, some relatively small communities were doing quite well. Twenty-one percent of the population of communities in the Plan region (1.05 million people) lived in communities with very low or low socioeconomic well-being in 2000, compared to 13 percent of the population (0.54 million people) in 1990.

[9] Again, "communities in the Plan region" refers to the 1,314 communities identified through the census block group aggregation process and that exist in 72 counties of western Washington, western Oregon, and northern California. The report does not focus on the 10 metropolitan areas (listed elsewhere) in the region.

This 94 percent increase is 4.6 times the regional average increase in population of 20.6 percent. In contrast, 37 percent of the population (1.8 million people) lived in communities with relatively high socioeconomic well-being in 2000. Communities with very high socioeconomic scores were not, on average, communities with the highest average population. The low correlation between population size and socioeconomic well-being scores suggests that population may not be a useful proxy for socioeconomic well-being or for related constructs such as resiliency and adaptability.

Because of the high percentage of FS and BLM lands in the Plan region, it is not surprising that many people live close to public lands. What may be less apparent, however, is that about 2 million people, or just under half of the total population of communities in the Plan region (47 percent) in 2000, live in communities within 5 miles of FS and BLM lands. Most of the communities (70 percent in 1990, 71 percent in 2000) with very low or low socioeconomic well-being scores in 1990 and 2000 were communities within 5 miles of FS and BLM lands. With respect to population, of the 1.05 million people living in Plan-area communities with very low or low socioeconomic well-being scores in 2000, about 61 percent were living close to public forest lands. Forty-three percent of the communities that received high or very high socioeconomic well-being scores, however, were also close to FS and BLM lands. Thus, some communities close to public forest lands were doing very well relative to other communities in the region. Although the specific social and economic connections that these communities have with nearby forests (recreation, tourism, wood products, retirement amenities) were not determined for this report, understanding the social and economic connections of these communities to the forests may provide useful information for other forest-based communities. Socioeconomic well-being measures are limited, however, and do not adequately address the abilities of a community to take advantage of social and economic development opportunities and meet the needs of residents. In general, communities farther away from FS and BLM lands had higher socioeconomic well-being.

Conclusions

Are communities in the Plan region doing better or worse since the Plan was implemented? Although finding direct connections between changes in forest policy and changes in socioeconomic conditions is difficult, we have provided information on status and change of a variety of indicators at several scales, including one that focuses specifically on proximity to FS and BLM lands. The socioeconomic data confirm that communities in the Plan region are changing. At a regional scale, the population is growing, educational attainment and household income are increasing, and poverty is decreasing. At the same time, the manufacturing sector of the economy is declining in many communities in the Plan region.

Socioeconomic well-being increased for more than a third of the communities in the Plan region and decreased for about the same percentage. Between 1990 and 2000, however, 40 percent of communities within 5 miles of FS and BLM lands decreased in socioeconomic well-being, whereas only 33 percent of communities farther away decreased in well-being. Generally, communities with lower socioeconomic well-being tended to be close to public forest lands. Some communities close to FS and BLM lands had relatively high socioeconomic well-being, but income inequality also increased for many of these communities. Drivers of socioeconomic change, such as increasing income inequality, inmigration, shifts in dominant industry sectors, and aging populations, affect community socioeconomic well-being. From the data available to us, we were unable to determine how much public forests contribute to these drivers of socioeconomic change. What we know from this report is that over 2 million people live in communities close to FS and BLM lands in the Plan region. Many of these communities maintain unique social, economic, cultural, environmental health, aesthetic, and other connections to the forests that surround them. Changes in forest policy and changes in ways that people relate to forests likely interact with other forces of change to affect the socioeconomic well-being of forest-based communities.

Metric Equivalents

When you know:	Multiply by:	To find:
Miles	1.609	Kilometers
Square miles	2.59	Square kilometers

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