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in Forest Land Use and Ownership
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By

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Current Status and Changes in Forest Land Use and Ownership in South Carolina

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About 12.6 million acres of South Carolina are forested (Conner 1993). This is approximately two thirds of the entire land area of the state. Compared to the U.S., which is about one third forested, and individual states which range from about 1% forested (North Dakota) to almost 90% forested (Maine), South Carolina can be thought of as a heavily forested state (Powell et al 1992).

Forests play a significant role in South Carolina's economic development. They provide revenue from the sale of timber products and jobs in the wood-using industry in the state. They provide recreation based revenues through activities such as lease hunting, camping, and picnicking. They define much of the natural amenities of the state and they contribute to tourism, particularly that which involves outdoor activities such as sightseeing, hiking, camping, etc.

Historically, however, much forest land has been valued based on revenue generated from the production of timber. Even hunting leases, which generate considerable income, were not considered in economic decisions by most forest industry firms until recently (Marsinko et al. 1998). Because timber does not generate as much income per acre per year as farming or most other activities, much of the land which remains in forest tends to be that which is least desirable for other uses.

The population of South Carolina has been increasing and parts of the state have undergone considerable development. As the state develops, land use changes occur. Because of its relatively low value and its abundance (two thirds of the state is forested) a loss of forest land (conversion to other uses) would be expected in the most rapidly developing areas of the state. This, along with ownership changes in the remaining forest land is precisely what has happened in South Carolina.

Data Source

All data used in this analysis are from forest inventories conducted periodically by the U.S. Forest Service. Although the inventory has been conducted for more than 30 years, comparable data are available for the period 1968-1993. Specifically, the 1968, 1978, 1986, and 1993 inventories are used (Cost 1968, Haines 1967, Welch 1968, Sheffield 1979, Tansey 1987, Conner 1993). The inventory is based on data collected from sample plots using aerial photography and ground checks. Data are expanded to provide estimates for counties and states. A considerable amount of data is collected about land class and ownership class, as well as detailed data about timber, including site productivity, species, volumes, and size and age classes. This analysis uses land class which is indicative of land use, and ownership class.

Land class consists of two broad categories, forest land and non-forest land. Forest land is broken down into the subcategories timberland, woodland, and reserved timberland. These classes are defined as follows (Conner 1993):

Forest land - Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for non-forest use.

Timberland - Forest land that is capable of producing 20 cubic feet of industrial wood per acre per year and not withdrawn from timber utilization.

Woodland - Forest land incapable of producing 20 cubic feet per acre per year of industrial wood under natural conditions, because of adverse site conditions.

Reserved Timberland - Forest land sufficiently productive to qualify as timberland, but withdrawn from timber utilization through statute or administrative designation.

Non-forest land - Land that has never supported forests and land formerly forested where timber production is precluded by development for other uses.

These definitions have remained relatively stable since 1968, although the names of some of the classes have changed. Currently there is no land classified as woodland in South Carolina. There was woodland in the past, which indicates that land productivity has increased somewhat or that land use has changed.

Ownership classes pertain to timberland, which makes up 98% of the forest land in South Carolina. Ownership classes include public, forest industry, and other private and are defined as follows (Conner 1993):

National Forest land - Federal land that has been legally designated as national forests or purchase units, and other land under the administration of the Forest Service, including experimental areas and Bankhead-Jones title III land.

Miscellaneous Federal land - Federal land other than National forests, land administered by the Bureau of Land management, and land administered by the Bureau of Indian Affairs.

State, county, and municipal land - Land owned by States, counties, and local public agencies or municipalities, or land leased to these governmental units for 50 years or more.

Forest Industry land - Land owned by companies or individuals operating primary wood-using plants.

Other private land - Privately owned land excluding forest industry land or forest industry-leased land. Also referred to as nonindustrial private forest (NIPF) land.

Farmer-owned land - Owned by farm operators, excluding incorporated farm ownership.

Corporate land - Owned by corporations, including incorporated farm ownerships.

Individual land - Owned by individuals other than farm operators.

Because only about 10% of the timberland is currently in all public ownership categories, the detailed (county) analyses in this paper focus on the private land ownership categories. The detailed analyses compare the earliest (1968) data to the most recent (1993). The analysis of this type of data is affected by methodological and time-related concerns. The U.S. Forest Service calculates forest land area estimates based on total land area and surface area estimates provided by the U.S. Bureau of the Census. The Census Bureau estimates are based on changing methodology and fluctuate over time. In addition, several reservoirs have been built in S.C. since the 1960's. These affected only a few counties but they tended to convert productive forest and agricultural land to water. Therefore, we used three approaches to analysis of the data. First, we used an index based on total surface area of counties. However, Census bureau estimates of total surface area changed drastically primarily in the coastal counties. We also used an index based on total land area which tended to underestimate the loss of forest land due to the building of reservoirs. We also used the change in acreage using the 1968 data as the basis. All three methods gave generally similar results. The results reported here are based on total land area because the focus of this study is land and land use and because they offer the most straight-forward interpretation.

Land Use

Table 1 shows the land classes for the four survey periods as a percent of total land for each period. The area of all land is shown in thousands of acres and it has decreased since 1968. Some of the decrease is due to the large reservoirs built in the state during the period. Some may be due to methodological changes. It is important to note that the forest inventories use the previous census data. For example, the 1968 inventory used land estimates from the 1960 census and the 1978 inventory used 1970 census data, etc. Most of the reservoirs were built in the 1960s and 1970s with one major reservoir built in the 1980s. For the State as a whole, forest land and timberland have actually increased slightly since 1968.

Within the state, however, significant changes have taken place. The first four maps show land use changes by county. The total amount of forest land increased in the rural counties and decreased in the counties undergoing the most development. The decrease would be expected as land changes from forest to non-forest use. Total forest land decreased along the coast, in the central part of the state and in the northwestern corner. The coastal counties have undergone considerable development over the past 30 years. The decrease in forest land in the central part of the state corresponds with growth around Columbia. The decrease occurring in the northwest corner of the state is most likely due to normal development of the area as well as the reservoirs created during this period. The reservoirs had two effects on forest land. They turned much forest land into water. Oconee County, for example, went from less than .001% water to 7% water. The forest land near the water became too valuable to remain forested and is continuing to be developed for non-forest uses. The development has increased the population, resulting in pressure for further development to provide services for the larger population. The map showing changes in non-forest land is a mirror image of the forest land map.

Total forest land is the sum of timberland, reserved timberland, and woodland. Since South Carolina no longer has land classified as woodland, forest land is comprised of timberland (98%) and reserved timberland (2%). Because most of the forest land is timberland, changes in timberland area follow closely the changes in forest land areas. In a few counties, timberland decreased somewhat more than forest land. This was the result of withdrawing land from timber production and reclassifying it as reserved timberland.

In many counties, forest land and timberland increased. Most of these counties are rural and it is likely that some farm land has been converted to forest. Some of this type of conversion may be due to forestry related incentive programs. In some of the rural counties where forest land has decreased, the opposite has probably occurred.

Ownership

This data set contains ownership information only for timberland. **Table 2** shows the ownership classes for the four survey periods as a percent of timberland for each period. The public ownership classes own less than 10% overall in South Carolina and these categories have been relatively stable over the study period. The private ownership classes have undergone considerable change. Farmer owned land dropped from 40.3% in 1968 to 21.8% in 1993 while other corporate land ownership increased from 2.7% to 13.1% over the same period. Some of these changes occurred across the state, but some were concentrated in areas of intense development.

The four ownership maps focus on private ownership and show the change in the percent of timberland owned by farmers, individuals, forest industry, and other corporate owners. It is clear that timberland ownership by farmers has decreased over almost the entire state, regardless of whether forest land was increasing or decreasing in any area. Farmers currently own 21.8% of the timberland in the state, considerably less than the 40.3% they owned in 1968.

Timberland ownership by individuals follows an interesting pattern, decreasing in most of the western part of the state and increasing in the east. This group currently owns 37% of the timberland in South Carolina, slightly more than the 31.9% they owned in 1968. In South Carolina, land is often passed down through families (Marsinko et al. 1987) and it is possible that farm ownership changed to individual ownership as families left farming or forest land was passed to a non-farming family member.

Forest industry timberland ownership increased or remained the same in most of the state. However, it decreased in the northern coastal counties and a few others. Forest industry owns 19.2% of the timberland in the state, a slight increase from the 16.5% they owned in 1968. Forest industry often owns land primarily to keep large paper mills running and to smooth out price fluctuations in the market. The lands are frequently regarded as a sort of insurance policy for the operation of the mill. Several years ago, many forest industry firms became corporate takeover targets when the value of their land increased considerably over its book value. Some firms sold land and some formed separate corporations and transferred ownership of the land to these corporations. Forest industry ownership increased statewide from 1968 to 1986 and then decreased somewhat from 1986 to 1993 (Table 2). Some of the decrease may be due to the sale and transfer of these lands.

One ownership category increased its holdings over almost the entire state. This is the corporate ownership category which excludes forest industry corporations. This group owned 2.7% in 1967 and now owns 13.1% of the timberland in the state. Corporate ownership has increased the most in some of the most highly developed counties in South Carolina. In fact, corporate ownership as a percent of timberland has increased in many counties in which forest land area has decreased. This ownership category includes farm corporations and some of this increase could be due to consolidation of farms. This consolidation would also explain some of the decrease in timberland ownership by farms. It is also possible that some of these lands are actually controlled by forest industry under another corporate name.

Conclusions

The results of this aggregate view of land use in South Carolina show a clear loss of forest land in the more populated areas of the state and areas in which tourism currently thrives. Although the losses in some counties are significant, most of these counties are still heavily forested. This study has shown that losses have occurred and there is no reason to believe that the trend will reverse itself. These data are probably best viewed as an early warning. They suggest more detailed analysis in selected counties to determine if and when action should be taken to preserve forest land.

In conjunction with the loss of forest land is the uncertainty associated with ownership changes. Farmers and individuals have emotional ties to the land. The decrease in farmer ownership coupled with the increase in corporate ownership casts a shadow of uncertainty over the future of these lands. Subject to legal constraints, land owners make the final decision concerning land use. Little is cur-

rently known about the corporate forest land owners. Additional information should be gathered about who these owners are as well as their objectives for their forest land. In addition, a more detailed examination of the linkages between different land uses and ownership would be useful.

TABLE 1. Area by land class, South Carolina, 1968, 1978, 1986, 1993

Date of Forest Inventory (Year)	Area of All Land (Thousand Acres)	-----Forest Land			-----Nonforest	
		Total	Timberland	Woodland	Reserved Timberland	Land
		----- % of All Land -----				
1968	19366	64.5	64.1	0.1	0.4	35.5
1978	19349.7	65.0	64.6	0.0	0.4	35.0
1986	19320.6	63.4	63.0	0.0	0.4	36.6
1993	19262.4	65.6	64.7	0.0	1.0	34.4

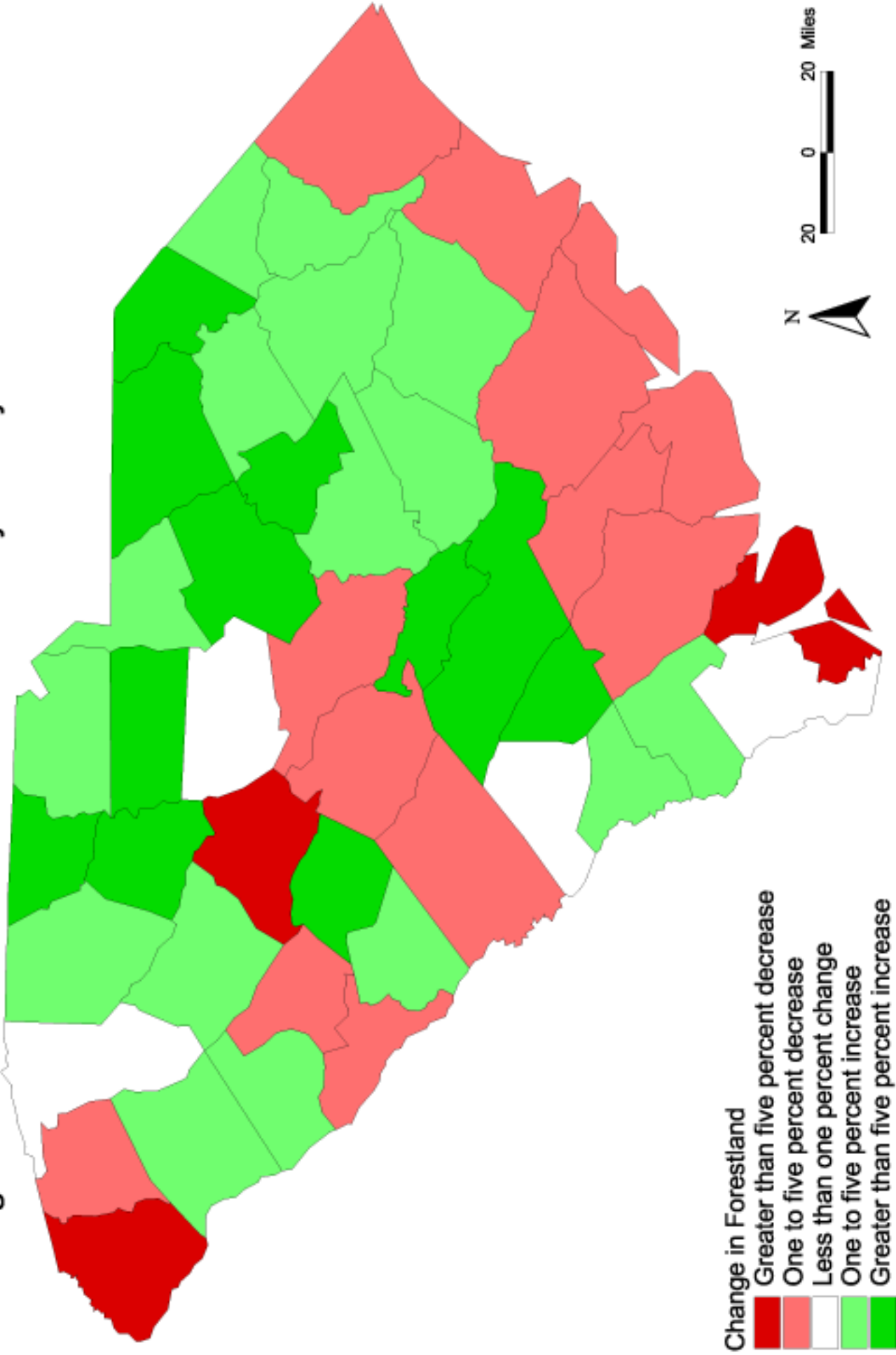
Source (Cost 1968, Haines 1967, Welch 1968, Sheffield 1979, Tansey 1987, Conner 1993)

Table 2. Area of timberland, by ownership class, South Carolina, 1968, 1978, 1986, 1993

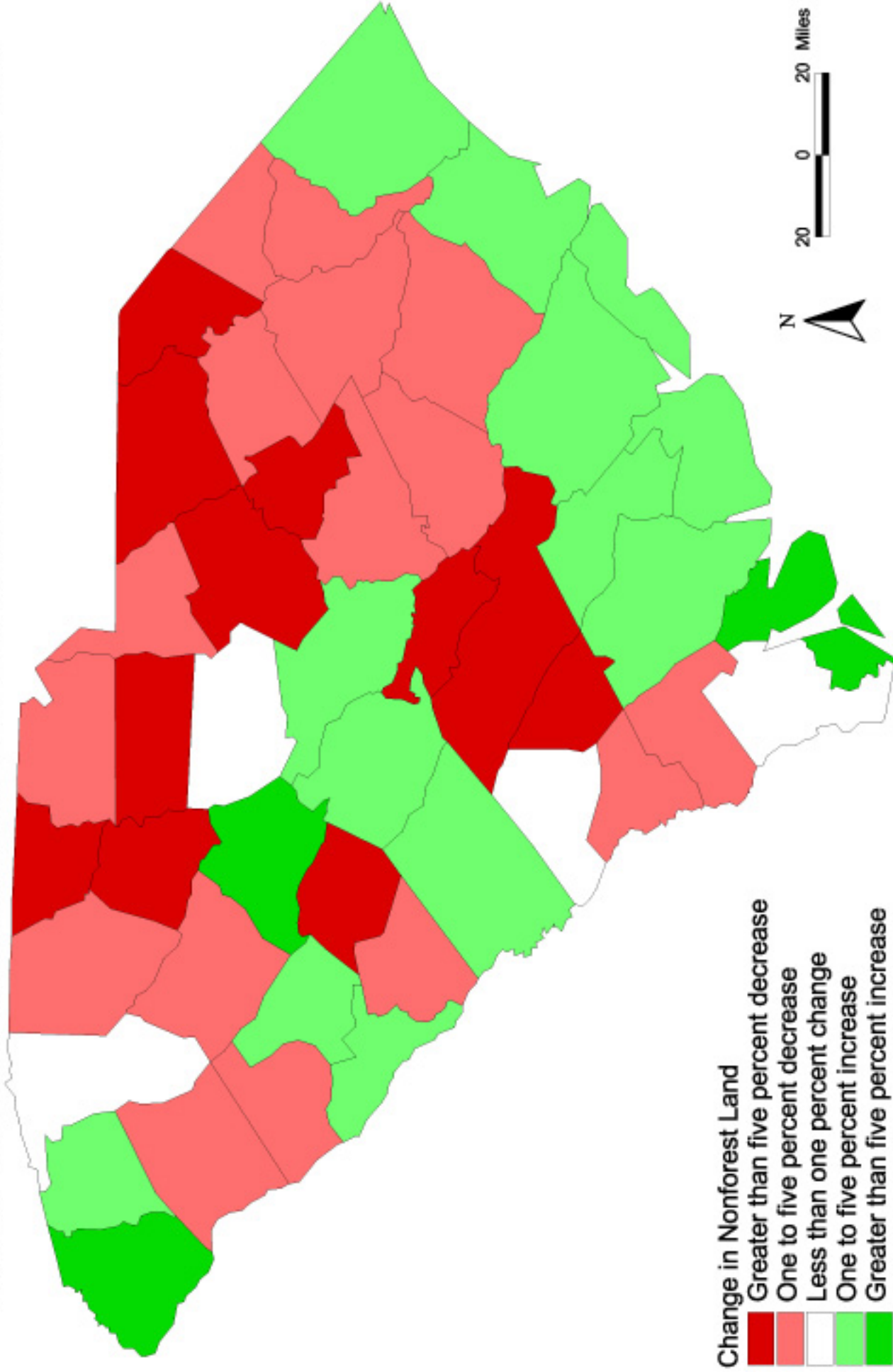
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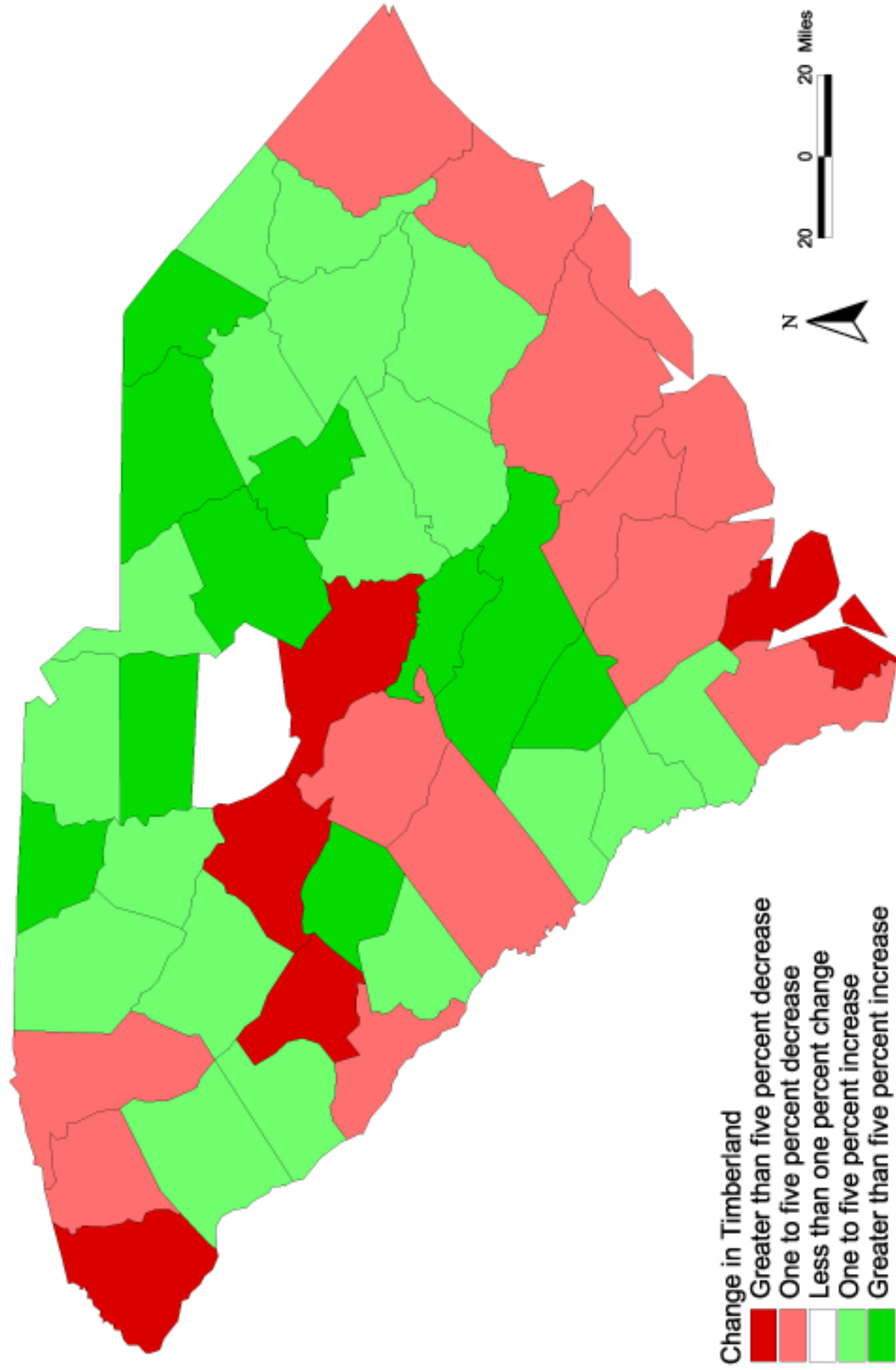
Change in South Carolina's Total Forest Land by County from 1968 to 1993



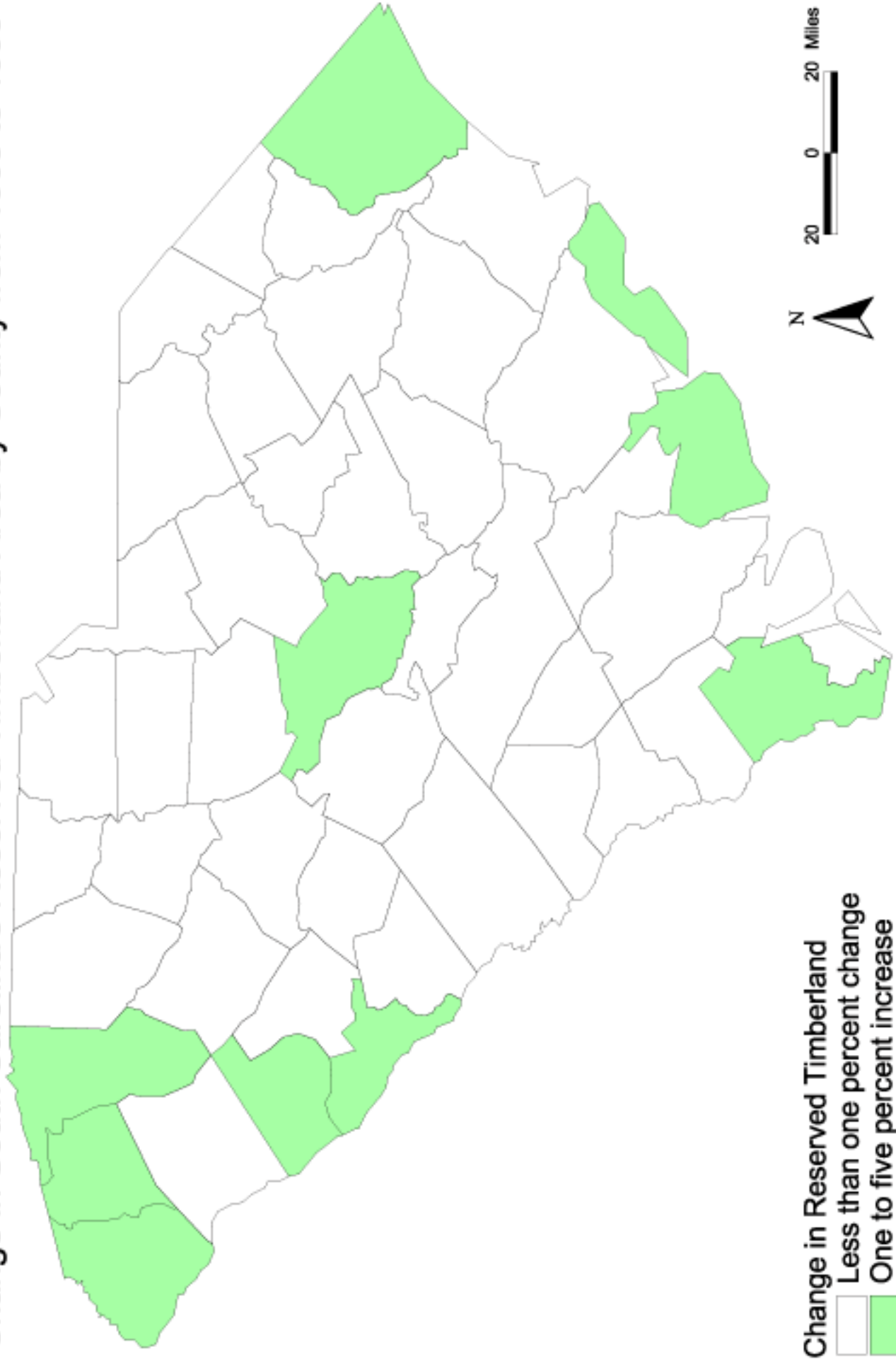
Change in South Carolina's Nonforest Land Area by County from 1968 to 1993



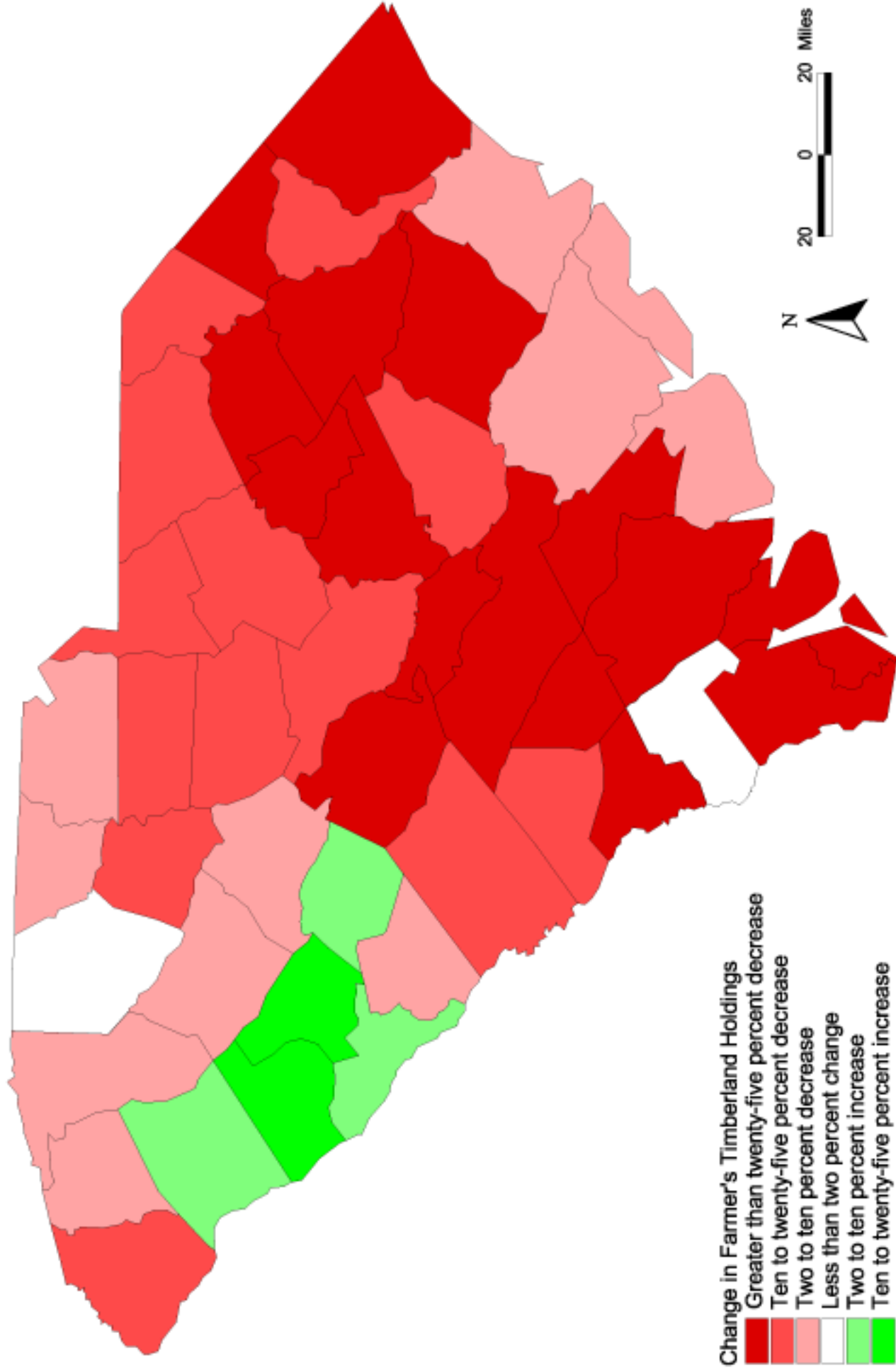
Change in South Carolina's Timberland Area by County from 1968 to 1993



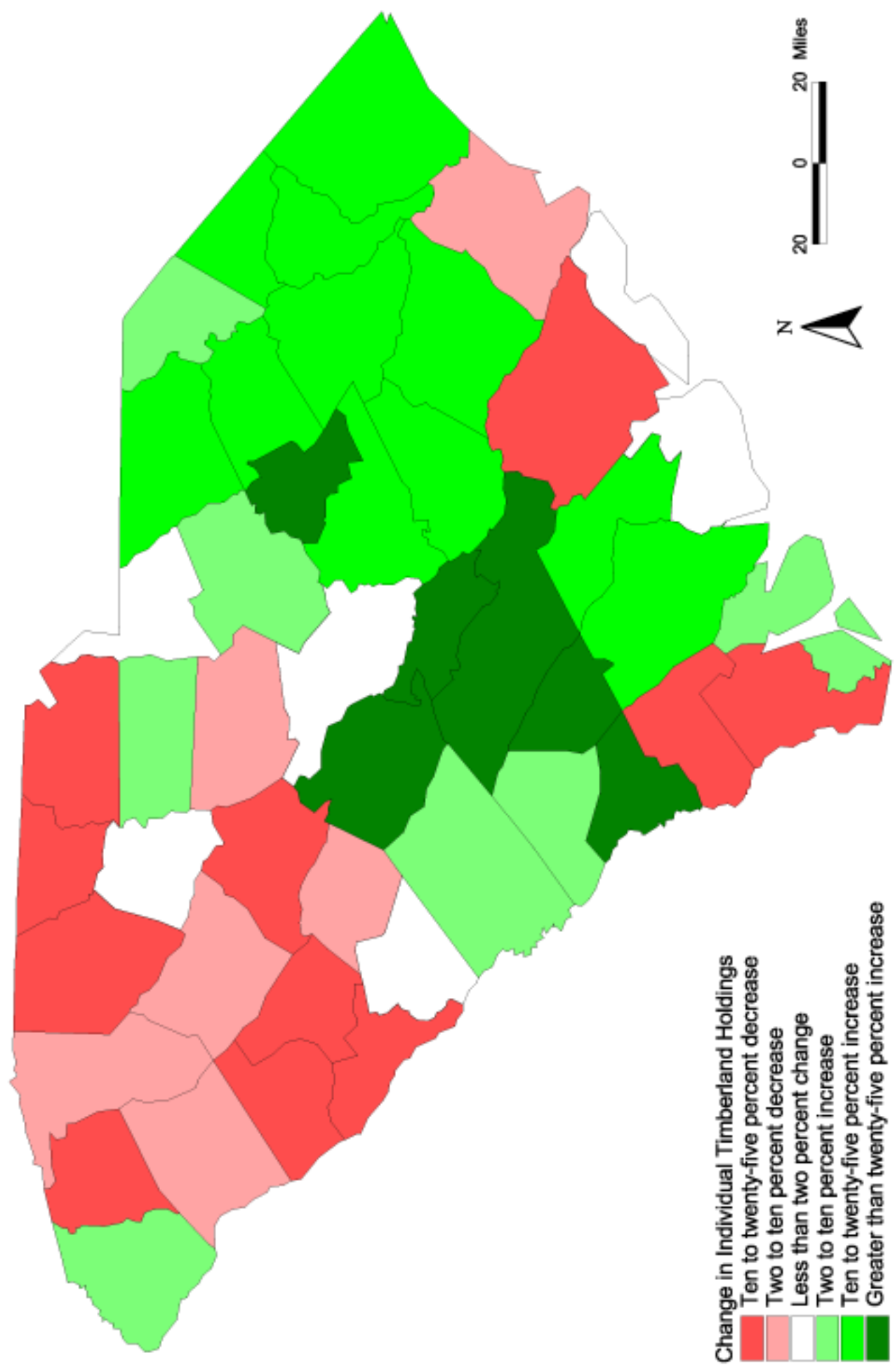
Change in South Carolina's Reserved Timberland Area by County from 1968 to 1993



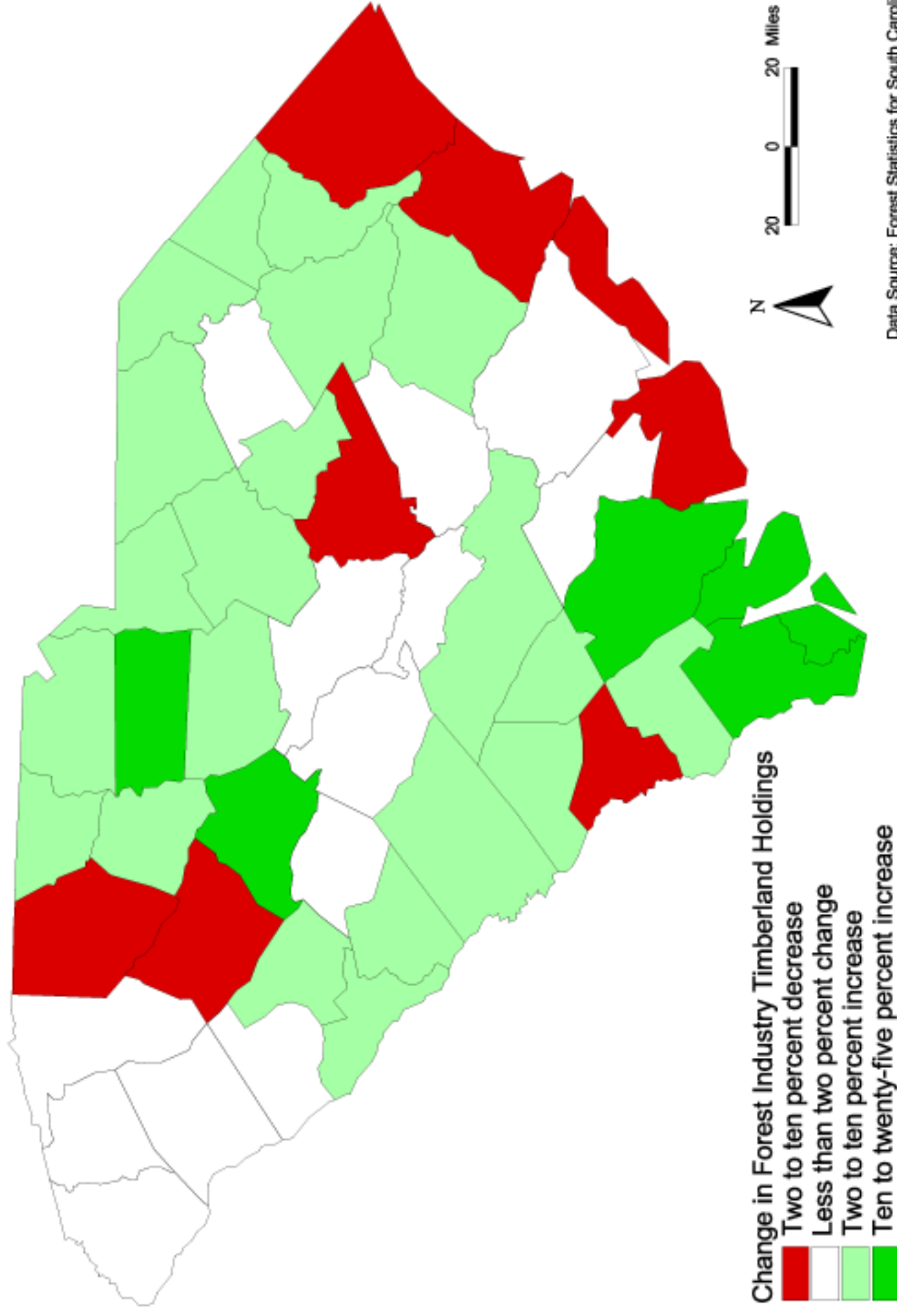
Change in Farmer's Timberland Ownership by County from 1968 to 1993



Change in Individual Timberland Ownership by County from 1968 to 1993



Change in Forest Industry's Timberland Ownership by County from 1968 to 1993



Change in Corporate Timberland Ownership by County from 1968 to 1993

