

# Losing Our Natural Heritage:

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Development and Open Space Loss  
in North Carolina

Environment North Carolina  
Research & Policy Center

April 2007

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Environment North Carolina Research & Policy Center

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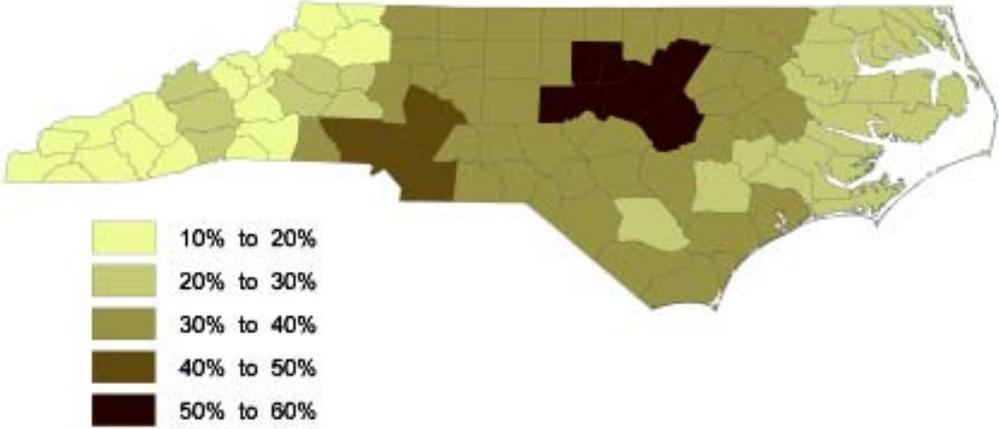
# Executive Summary

North Carolina's signature woodlands, farmlands, and open spaces are disappearing at an alarming rate. If these trends continue, the state's treasured natural areas will disappear as vast tracts of land are developed into urban areas in the next twenty years.

This report examines development rates in North Carolina over the last twenty years, and uses those results to make conservative predictions about loss of cropland and forestland over the next twenty years. Among the report's findings:

Between 2007 and 2027:

- North Carolina will lose nearly two million acres of forest land and cropland.
- The Triangle will lose 37 percent of its natural areas; cropland will disappear altogether.
- The Charlotte area will lose 30 percent of its natural areas, including nearly a quarter of its forest land, the highest rate of forest loss in the state.



Projected Increase in Developed Land, 2007-2027

- Developed area in the state will increase by 38 percent, compared to a 30 percent increase in population.

In the last twenty years, North Carolina has lost 2.37 million acres of cropland and forest land, an estimated 325 acres every day.

In the last twenty years:

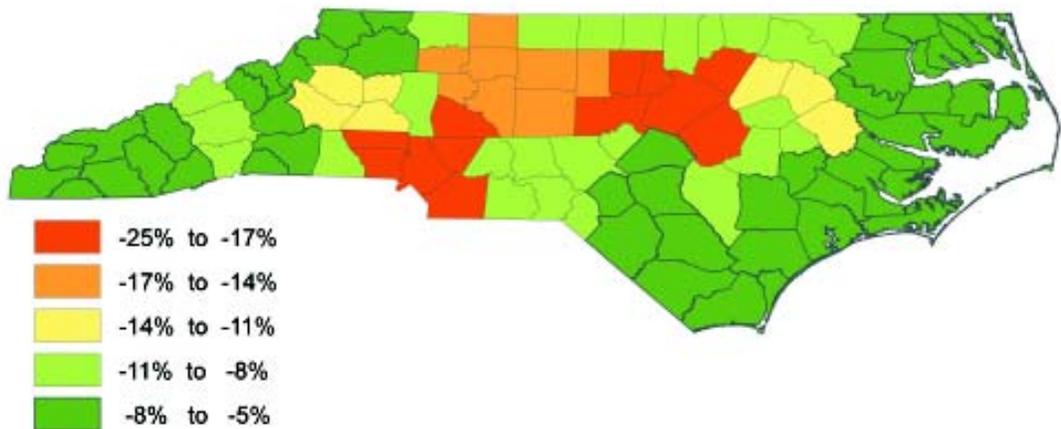
- Charlotte, the state's largest metro area, lost 25 percent of its total cropland and forest land for a total of 270,000 acres, the highest percentage loss in the state.
- The Triangle region saw 24 percent of its cropland and forest land transformed. The region lost 283,000 acres of cropland and 123,000 acres of forestland.
- The Triad region (Greensboro, Winston-Salem, and High Point) lost 14

percent of its cropland and forest land, a total of 236,000 acres.

From 1987 to the present, developed land in the state has grown by 1.86 million acres.

- The Triangle region has more than doubled its developed acreage, adding 327,000 acres.
- Rural counties in the Piedmont region have added an estimated 322,000 acres of development.
- The Charlotte area has added 321,000 acres of developed land, an increase of 88 percent.

Over the same period, population has grown by 40 percent- remarkably fast, but slowly in comparison to the growth of developed acreage, which has increased 65 percent.



**Percent Loss of Forest and Crop Land, 1987-2007**

## Solution

The report's projections for loss of natural areas over the next twenty years are based only on the trends of the past. North Carolina's leaders have the power to alter projections for the future.

In 2006, the North Carolina General Assembly established the Land and Water Conservation Study Commission to examine ways to finance a significant increase in funding for the state's existing land conservation programs—the Clean Water Management Trust Fund, the Natural Heritage Trust Fund, the Parks and Recreation Trust Fund, and the Agricultural Development and Farmland Preservation Trust Fund—as well as to fund new initiatives to capitalize on economic opportunities associated with land conservation.

After numerous meetings and three public hearings, attended by more than 1000 citizens, the Commission recommended \$1 billion in additional funds over the next five years—roughly 1 percent of the state's budget—for land conservation programs.

This increase in funding, if approved by state leaders, can ensure the protection of additional 260,000 acres of forests, farmlands, trails, parks, gamelands, and other natural areas, and more than 6000 miles of river and stream buffers across the state. The recommendations of the Land and Water Conservation Study Commission, if adopted, would go a long way towards protecting the state's natural areas in the face of rapid development.



# Introduction

**N**orth Carolina is known for its beautiful natural areas. Our forests, wetlands, and other natural areas restore our rivers and lakes. They provide crucial wildlife habitat and chances for recreation, and bolster a vibrant tourist economy. Our farmlands sustain a way of life for tens of thousands of families.

But rapid development across the state is contaminating our rivers and streams, destroying fish and wildlife habitat, and making the state more susceptible to damaging floods. What's more, development threatens the future of some of the state's best-known and best-loved green spaces.

## Serenity Point

This southern tip of Topsail Island in Pender County is home to native and threatened plants and wildlife, including the Loggerhead Sea Turtle. One of the few unspoiled beaches left along the state's rapidly developing coast, the 50-acre area that makes up Serenity Point attracts anglers and nature-lovers, and has inspired more than 1700 citizens, along with the Coastal Land Trust of North Carolina, to "Save the Point."

In November 2006, state officials

approved \$1 million to protect The Point from development. But more funds are needed to permanently protect this treasured coastal area.<sup>1</sup>

## Morrow Mountain

In 2006, the Aluminum Company of America (Alcoa) announced plans to sell much of its land in the Uwharries, and gave the state the chance to buy land adjacent to Morrow Mountain State Park. A popular spot for hikers, boaters and history buffs, the park would benefit from the addition of 1,400 acres along the Pee Dee River. State officials estimate they need \$25 million to purchase the land in the Uwharries.

## Chimney Rock Park

Forged by Hickory Creek and the Broad River, Hickory Nut Gorge in Western North Carolina provides home to rare wildlife and spectacular vistas. Today, the Gorge's Chimney Rock and Hickory Nut Falls attract hikers, rock-climbers and botanists from across the state and across the globe.

In 2006, the owners of the privately-

owned Chimney Rock Park announced they would put the 1,000 acre property on the open market. State leaders scrambled to find funds to purchase the property. In January of 2007, they announced an agree-

ment to add the land to its park system. But conservation groups have identified more than 1,000 acres more of property in the Hickory Nut Gorge area in need of permanent protection.<sup>2</sup>



# Understanding the Data

This report uses the Natural Resource Conservation Service's (NRCS) Natural Resource Inventory (NRI) data to document trends in North Carolina land use over the last twenty years and to make predictions for future trends over the next twenty years.

The NRI is a survey of land use nationwide. The NRI was conducted on a five-year cycle during the period 1982 to 1997, but is now conducted annually. NRI data were collected every five years for 800,000 sample sites; annual NRI data collection now occurs at slightly less than 25 percent of these same sample sites. Thus, the annual NRI survey, with many fewer data points, does not serve the purpose of this report. Data from 1997 through 2027 are our own projections.

The survey categorizes land into one of several land use types. From the survey, the NRCS is able to make a statistically relevant estimate of the number of acres of various land use types in an area as small as a multiple-county region.

## Understanding the Geography

Because the NRI is a survey and thus only an estimate, it is not statistically relevant at the county level. Groups of counties are the smallest geographical area for which the NRI can accurately portray land use acreages.

For this reason we combined North Carolina counties into eleven separate groups in order to investigate land use trends at a statistically relevant level. Eight of the eleven county groupings are made up of counties surrounding major metropolitan areas—which we refer to as urban metro area counties. The remaining three groups are the rural counties of the mountains, the Piedmont, and the coast. For example, when the report mentions Charlotte, or the Charlotte area, the actual geographic area being referenced is the grouping of Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, and Union counties, not the actual geographical city of Charlotte.

The following is a list of the county groupings and counties included in each group:

<b>The Piedmont Region</b>	
<b>Charlotte</b>	Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Union
<b>Fayetteville</b>	Cumberland, Harnett, Hoke, Robeson
<b>Rocky Mount-Greenville</b>	Edgecomb, Nash, Pitt
<b>The Triangle</b>	Chatham, Durham, Franklin, Johnston, Orange, Wake
<b>The Triad</b>	Alamance, Davidson, Davie, Forsyth, Guilford, Randolph, Stokes, Yadkin
<b>Piedmont Rural</b>	Surry, Iredell, Cleveland, Rockingham, Caswell, Person, Granville, Vance, Warren, Halifax, Northampton, Lee, Moore, Stanly, Montgomery, Anson, Richmond, Scotland, Sampson, Wayne, Greene, Wilson
<b>Coastal Region</b>	
<b>Wilmington-Jacksonville</b>	Brunswick, Columbus, New Hanover, Onslow, Pender
<b>Coastal Rural</b>	Hertford, Gates, Camden, Currituck, Chowan, Bertie, Martin, Perquimans, Pasquotank, Washington, Tyrrell, Dare, Hyde, Beaufort, Pamlico, Carteret, Craven, Jones, Lenoir, Duplin, Bladen
<b>Mountain Region</b>	
<b>Asheville</b>	Buncombe, Madison, Henderson
<b>Hickory-Morganton</b>	Alexander, Burke, Caldwell, Catawba
<b>Mountains Rural</b>	Cherokee, Graham, Clay, Macon, Swain, Jackson, Transylvania, Haywood, Polk, Rutherford, Yancey, Mitchell, McDowell, Avery, Watauga, Ashe, Alleghany, Wilkes

Figure 1. County Groupings

## Understanding the Numbers

The NRI survey estimates the acreage of various land use types down to the county level. Land use is divided into the following categories: forest, cropland, pasture, federal, water, conservation recovery, urban, rural transportation, and minor land cover.

For the purposes of this report, we have chosen to investigate trends in the three largest land use categories: forest, cropland, and developed land (which we define as urban land combined with rural transportation). Forest and cropland are the two largest open space categories surveyed by the NRI and the two most rapidly decreasing land use types. Developed land is the fastest growing land use type.

Our calculations for past changes in acreage of forest land and cropland are from the results of the NRI. To come up with our calculations of changes in developed land, we combined urban land and rural transportation land (roads).

**Figure 2. Land Use Changes, Urban vs. Rural, 1987-2007**

	Increase in Developed Acreage	Decrease in Cropland and Forest Land Acreage
Urban Counties	1,270,000	1,420,000
Rural Counties	590,000	950,000

The total increase in developed acreage does not equal the decrease in acreage of forest and cropland, meaning not all forest land and cropland lost has become developed, or not all developed land has taken the place of cropland or forest land.

For example, some cropland and forest land were converted into land use types other than urban developed land, and vice versa, according to the NRI survey. For example, cropland could have been transformed into pastureland or minor land uses (light rural development).

Some cropland and forestland may have been re-categorized without actually having changed land uses. For example, if the federal government purchased land formerly categorized by the NRI as forest land, and that land is now labeled as federal land, the land itself has probably not been actually converted to another land use.

Thus, our estimates of cropland and forest land lost include a margin of error. The error equals the amount of cropland or forest land that was re-categorized into other land use labels without having actually changed uses. The error is unavoidable given that the data itself does not describe whether the re-categorization was due to a change in actual land use or a change in description.

## The Projections

In order to calculate estimated acreage for 2007 and then project changes in acreage through 2027, we used census results, census estimates since 2000, and future census projections to calculate land use changes per new resident. While there are multiple ways to make projections of future land use, we felt it was important to link those projections to population. We felt any prediction of future growth must account for U.S. Census' projections of rapid population growth in the next two decades, which will be one of the most important factors in future development.

For each period between NRI surveys, 1982-1987, 1987-1992, and 1992-1997, we calculated a per-new-resident change in acreage for each of the three major land use categories—for developed land, cropland,

and forest land. The period of 1982-1987 was a boom period, with much higher rates of development per new resident and higher rates of cropland and forest land decrease per person than 1987-1992 or 1992-1997.

To calculate the change in acreage for 1997-2007 for each land use category, we multiplied the change in population between 1997 and 2002 and from 2002 to 2007 by the change in acreage per-new-resident from 1992-1997. Because development rates are based on five-year intervals, we projected land use changes from 2002 to 2007 based on estimated actual population data for 2002 and estimates for 2007.

To calculate the projected land use changes from 2007 through 2027 we multiplied population projections from the U.S. Census by the per-new-resident change in acreage from 1992-1997.<sup>3</sup> Because the per-new-resident change in acreage was relatively low for 1992-1997 (about 0.7 acres/new resident) compared to 1982-1987 and 1987-1992 (about 1.1 and 1.0 acres/new resident, respectively), our land use projections through 2027 are conservative. If the higher rates of development-per-new-resident and forest/cropland-loss-per-new-resident of the 1980s and early 1990s return, then North Carolina's natural areas could disappear even faster than projected in this report.



# Land Use Changes in North Carolina 1987-2007

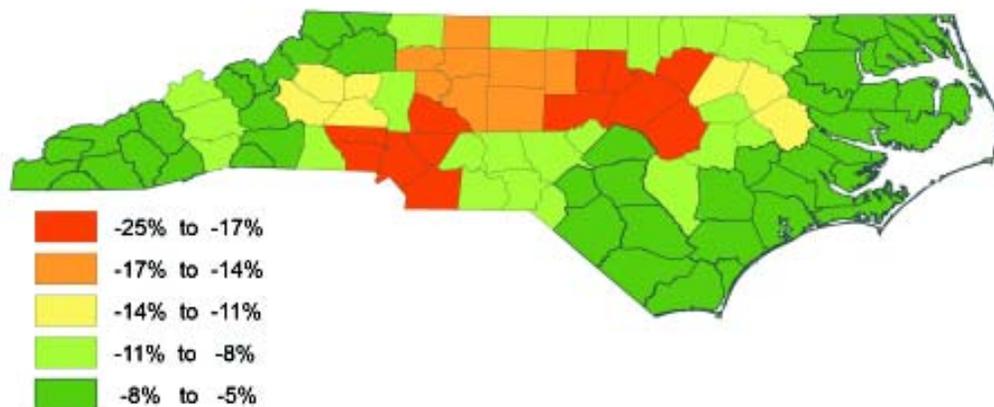
In the last two decades North Carolina has lost nearly 2.4 million acres of cropland and forest land. The state has seen nearly 20 percent of its cropland and 7 percent of its vast forest land disappear. While much of the loss of these open spaces has been concentrated near major urban centers, rural areas of the state, especially the western mountains, also lost vast tracts of open space to development.

Loss of cropland in the state was more evident in urban metro-area counties, which lost 720,000 acres compared to rural counties' loss of 550,000 acres. Urban counties also lost more forest land than

rural counties: 700,000 acres compared to 404,000, respectively.

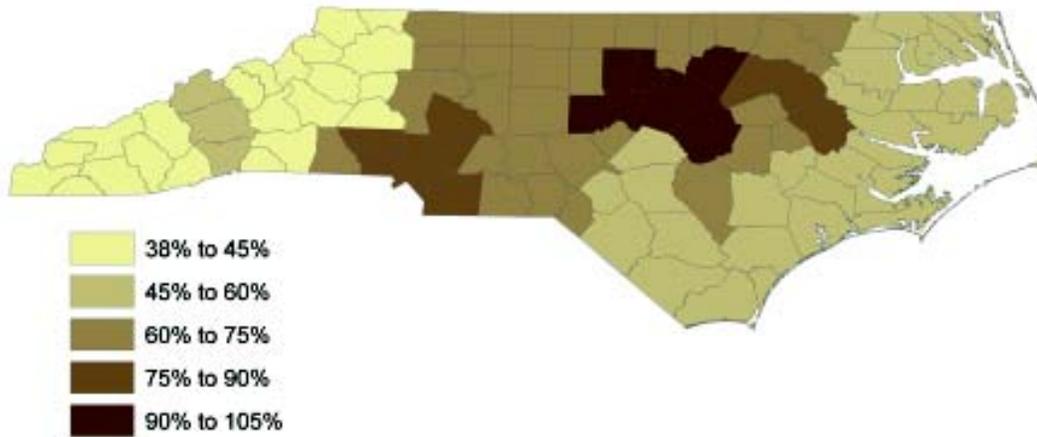
The disappearance of North Carolina's farm and forest land is for the most part the result of burgeoning development. All told, in the last twenty years, development land area has increased by 1.86 million acres, a 65 percent increase.

The majority of development occurred in counties that comprise the metropolitan areas of the state's largest cities. Between 1987 and 2007, these counties added 1.27 million acres of developed land, an increase of 72 percent. Rural counties saw developed land increase by 588,000 acres, a 54 percent increase.



**Map 1. Percent Loss of Total Crop and Forest Land, 1987-2007**

**Map 2. Percent Change in Developed Land Area, 1987-2007**



## The Piedmont

The Piedmont region of North Carolina is home to most of the state's population and large metropolitan areas. Charlotte, the Triangle (Raleigh-Durham-Chapel Hill), the Triad (Greensboro-Winston-Salem-High Point), Fayetteville, and Greenville-Rocky Mount make up the major urban metropolitan areas of the region.

As developed land sprawls out from the Piedmont's urban centers, open space is disappearing at an alarming rate. During the last twenty years, the Piedmont region has

lost 638,000 acres of forest land and 1 million acres of cropland, decreases of 8 percent and 25 percent, respectively.

The Piedmont's rapid rate of open space loss corresponds with its high rates of development. The majority of land development in the state over the previous twenty years occurred in the Piedmont region. Between 1987 and 2007, the Piedmont developed an additional 1.38 million acres of land, a 77 percent increase in developed land area.



**Map 3. Piedmont County Groupings**

## **Piedmont Urban Metro-Area Counties**

### **Charlotte**

The counties in the Charlotte metro area, Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Union, and Alexander comprise the largest metropolitan area in the state with a population estimated to be 1.58 million in 2007.

The Charlotte area saw 109,000 acres of farmland and 161,000 acres of forest land disappear between 1987 and 2007, decreases of 33 percent and 21 percent, respectively.

In the previous twenty years, the Charlotte metro area also experienced one of the largest increases in developed land of any area in the state. Developed land area increased 88 percent with 321,000 additional acres developed.

### **The Triangle**

Similar to the Charlotte area, the Triangle counties of Chatham, Durham, Franklin, Johnson, Orange, and Wake developed 327,000 acres of land between 1987 and 2007. Developed land in the Triangle more than doubled, the highest percentage increase of any area in the state over that time.

Record-setting development rates correspond with overwhelming losses of farmland and forest land in the Triangle. Farmland acreage decreased 58 percent, or 283,000 acres; forest land decreased by 10 percent since 1987, or 123,000 acres.

### **The Triad**

The Greensboro-Winston Salem-High Point metro area counties (Alamance, Davidson, Davie, Forsyth, Guilford, Randolph, Stokes, and Yadkin) make up the second most populated metro area in population. An estimated 1.36 million people call the area home in 2007.

With a population surge of nearly one-third since 1987, Greensboro has seen similar

development trends to those of Charlotte and the Triangle. Developed land increased by 60 percent since 1987, more than 219,000 acres. During the same period, the Greensboro-Winston Salem-High Point area lost a quarter of its cropland, and 10 percent of its forest land.

### **Fayetteville**

The Fayetteville metro-area comprises the counties of Cumberland, Harnett, Hoke, and Robeson. Fayetteville is one of the smaller metropolitan areas in the Piedmont with 588,000 people in 2007.

Between 1987 and 2007, the Fayetteville area lost 50,000 acres of farmland and 22,000 acres of forest land. At the same time, developed land increased 53 percent, an increase of 82,000 acres.

### **Greenville – Rocky Mount**

The Greenville-Rocky Mount metro area is the smallest of the major urban areas in the Piedmont with a population of 293,000 in 2007. The area consists of Edgecombe, Nash, and Pitt counties.

Greenville-Rocky Mount lost 81,000 acres, or 19 percent of cropland during the same period. The area lost 9 percent of its forest land, totaling 44,000 acres.

Greenville-Rocky Mount has seen its acreage of developed land increase by 80 percent in the last twenty years. Developed acreage grew from 94,000 in 1987 to 170,000 in 2007.

## **Piedmont Urban Area Totals**

Much of North Carolina's increase in developed land area has occurred in and around the metropolitan areas of the Piedmont region.

The counties that comprise the metro population areas of Charlotte, the Triangle (Raleigh-Durham-Chapel Hill), the Triad (Greensboro-Winston Salem-High Point), Fayetteville, Greenville, and Rocky Mount contain 59 percent of the state's population.

A full 70 percent of the state's new residents arriving between 1987 and 2007 are living in the counties surrounding the Piedmont's major cities.

Urban area counties in the Piedmont have seen enormous losses of open space in the last twenty years. Forest land has shrunk by 480,000 acres and cropland has dropped by 650,000 acres, decreases of 11 percent and 29 percent, respectively.

Much of this loss of open space can be attributed to rapid development. Along with the population growth of the 1980s and 1990s came intense new development around the Piedmont's urban areas. Counties that surround the Piedmont's urban areas saw an 80 percent increase in developed acreage between 1987 and 2007. All told, urban counties in the Piedmont developed 1 million acres from 1987 to 2007.



counties of the Piedmont saw development increase 66 percent over that period, a total increase of 322,000 acres.

Correspondingly, Piedmont rural counties lost enormous quantities of open space from 1987 to 2007. 336,000 acres of croplands disappeared over that time along with 147,000 acres of forest land.

### Piedmont Rural Counties

While most new development in the Piedmont region occurred near the major urban centers, rural counties also saw large percentage increases in developed land between 1987 and 2007. In total, rural



Map 4. Piedmont Rural

## The Coast

The North Carolina coast is famous for its beautiful beaches and natural areas, along with its historic towns and cities. From Roanoke Island, the site of the first English settlement in the Americas; Kitty Hawk, where the Wright brothers made their famous first flight; and Cape Hatteras, the first National Seashore; to the balmy southern region around Wilmington, the North Carolina coast is rich with historic and ecological heritage.

Unfortunately, like the urban areas of the Piedmont, North Carolina's coast is facing drastic changes.

Between 1987 and 2007 the coastal counties of North Carolina lost more than 164,000 acres of cropland and 262,000 acres of woodland. Concurrently, coastal counties experienced a 52 percent increase in developed land, or 248,000 acres of development.

### Coastal Urban Counties

The coastal counties around Wilmington and Jacksonville (Brunswick, Columbus, New Hanover, Onslow, Pender), the major cities of the coastal region, have experienced substantial growth in the past two decades.

Wilmington-Jacksonville metro area counties added 109,000 acres of developed land, a 59 percent increase since 1987. At the same time, the area lost 34,000 acres of farmland and 122,000 acres of forest land.

### Coastal Rural Counties

The rural counties of the North Carolina coast saw a similar transition in land use over the previous twenty years. Acres of developed land in these counties grew from 293,000 acres to 429,000 acres in that time period, an increase of 46 percent.

During the same time, rural coastal counties experienced a loss of 128,000 acres of cropland and 142,000 acres of forest land.

## The Mountains

North Carolina's mountain region is home to some of the most beautiful vistas and highest peaks east of the Rockies. Millions of tourists head to the mountains of North Carolina each year for rest and relaxation.

But the beauty of the mountains has attracted many new people and a great deal of development in recent years. From retirees building their dream homes in golf course communities to urbanites from the Piedmont region building vacation retreats, the western mountains of North Carolina have become a favorite spot for new homes.

Developed land has increased 44 percent in the mountains in the last two decades, from 591,000 acres to 852,000 acres. During the same time, forest land acreage decreased by 212,000 acres (6 percent) and were lost.



Map 5. The Coast

## Map 6. The Mountains



### Asheville

Asheville, the largest city in the western mountains, is nestled in a picturesque valley in the southern Appalachians. The mountain region's major population center is a favorite tourist destination for travelers.

Asheville's heritage and scenic location have made it a hot new spot for development. Asheville's developed acreage grew 56 percent between 1987 and 2007, an increase of 60,000 acres. Asheville metro area counties also lost 28 percent of their cropland in the last twenty years and 8 percent of their forested land, or 38,000 acres.

### Hickory-Morganton

Hickory-Morganton, the only other metro area in the western part of the state, experienced 38 percent growth in developed land. Hickory-Morganton saw 19 percent of its cropland disappear and 10 percent of its forest land, a total open space loss of nearly 77,000 acres.

### Rural Counties

Development in the mountains occurred at an almost equal rate in urban and rural counties, with development increasing 43 percent in rural areas and 45 percent in mountain urban counties near Asheville and Hickory-Morganton.

Rural mountain counties added 130,000 acres of developed land in the previous 20 years. Simultaneously, those counties lost nearly half of all cropland, 86,000 acres, and 115,000 acres of forest land.



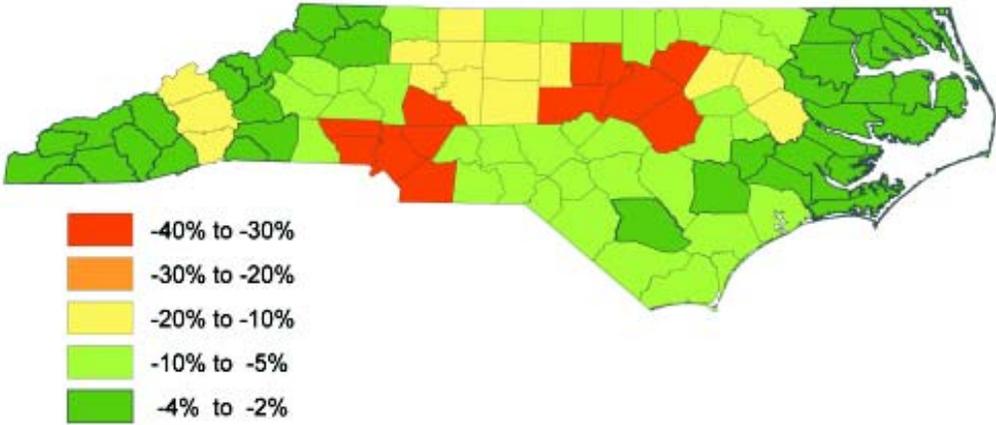
# Projected Land Use Changes 2007-2027

If today's patterns of land use transformation continue, North Carolina will lose an additional two million acres of forest land and cropland by 2027.

Land use transformation will be driven by development. Prodded by a booming population and low-density development projects, developed land area will increase by over 1.7 million acres, an increase of 38 percent from 2007. (See Understanding the Data section for methodology of projections.)

## Projected Open Space Loss

Rates of open space loss will continue at the highest rate in the Triangle and Charlotte areas, followed by the Triad and the Rocky-Mount/Greenville. The Triangle will lose another 37 percent of its crop and forest land; Charlotte will lose 30 percent. The Rocky Mount-Greenville and Triad areas will also lose crop and forest land at high rates, losing 15 and 14 percent respectively by 2027.



Map 7. Projected Percentage Decrease in Total Forest and Cropland, 2007-2027

**Figure 3. Open Space Projections by Geography, 2007-2027**

	Projected Forest Acres Lost 2007-2027	- % Change in Forest Area 2007-2027	Projected Acres of Cropland Lost 2007-2027	- % Change in Cropland Area 2007-2027	Projected Acres of Open Space Lost 2007-2027	- % Change in Open Space 2007-2027
<b>Piedmont Total</b>	<b>-624,500</b>	<b>-8%</b>	<b>-999,400</b>	<b>-34%</b>	<b>-1,623,900</b>	<b>-15%</b>
Piedmont All Urban	-465,200	-12%	-714,600	-45%	-1,179,800	22%
Charlotte	-142,700	-24%	-105,900	-48%	-248,600	-30%
Fayetteville	-40,200	-5%	-39,000	-9%	-79,200	-7%
Rocky Mount-Greenville	-39,900	-9%	-81,200	-23%	-121,100	-15%
The Triangle	-141,000	-13%	-327,800	-159%	-468,800	-37%
The Triad	-80,500	-7%	-126,300	-36%	-206,700	-14%
Piedmont Rural	-134,500	-4%	-237,100	-17%	-371,500	-7%
<b>Coastal Total</b>	<b>-131,500</b>	<b>-3%</b>	<b>-99,100</b>	<b>-5%</b>	<b>-230,600</b>	<b>4%</b>
Wilmington-Jacksonville	-101,400	-7%	-26,800	-9%	-128,200	-7%
Coastal Rural	-32,600	-1%	-66,300	-4%	-99,000	-2%
<b>Mountains Total</b>	<b>-148,700</b>	<b>-5%</b>	<b>-69,100</b>	<b>-31%</b>	<b>-217,700</b>	<b>-6%</b>
Mountains All Urban	-96,800	-10%	-16,200	-13%	-113,000	-11%
Asheville	-35,100	-8%	-16,400	-41%	-51,600	-10%
Hickory-Morganton	-55,500	-11%	-1,600	-2%	-57,200	-10%
Mountains Rural	-51,600	-2%	-45,500	-45%	-97,200	-4%
Rural	-218,700	-2%	-348,900	-11%	-567,600	-5%
Urban	-663,400	-10%	-757,600	-38%	-1,421,000	-17%
<b>Total</b>	<b>-882,100</b>	<b>-6%</b>	<b>-1,106,600</b>	<b>-23%</b>	<b>-1,988,700</b>	<b>-10%</b>

### Projected Increase in Developed Land

In the next twenty years, development will again increase most rapidly in the Piedmont's urban areas. The Triangle will be developed most rapidly, its developed land increasing by 58 percent, followed by

Charlotte at 48 percent and the remainder of the Piedmont's urban and rural counties.

The western mountains will experience a development rate of 22 percent from 2007 to 2027. The rural mountain counties will see the lowest increase in developed land (18 percent), but that still means that 76,000 acres will be developed.

Map 8. Projected Increase in Developed Land, 2005-2027

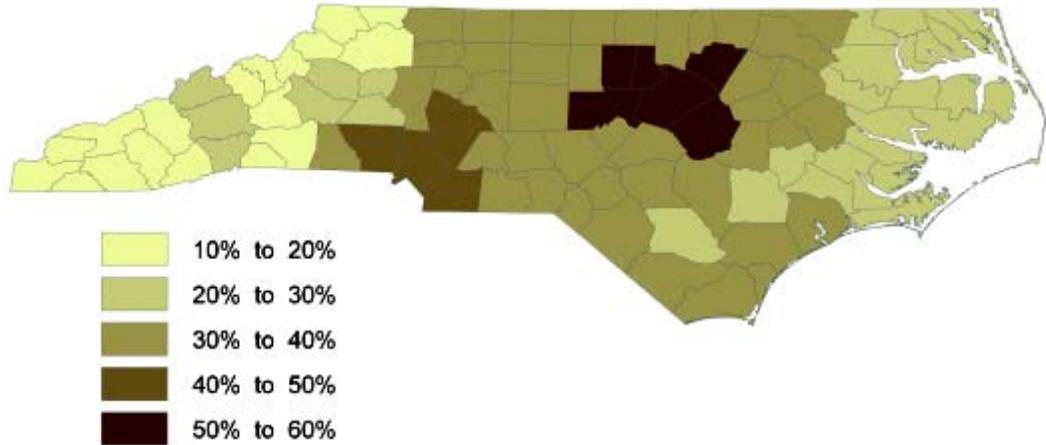


Figure 4. Development Projections by County Groupings, 2007-2027

Region	Projected Increase in Developed Acres 2007-2027	% Change in Developed Area 2007-2027
<b>Piedmont Total</b>	<b>1,400,700</b>	<b>44%</b>
Piedmont All Urban	1,070,100	46%
Charlotte	328,600	48%
Fayetteville	81,500	34%
Rocky Mount-Greenville	59,400	35%
The Triangle	376,500	58%
The Triad	195,200	33%
Piedmont Rural	282,100	35%
<b>Coastal Total</b>	<b>207,000</b>	<b>28%</b>
Wilmington-Jacksonville	97,500	33%
Coastal Rural	103,600	24%
<b>Mountains Total</b>	<b>184,800</b>	<b>22%</b>
Mountains All Urban	104,600	25%
Asheville	48,700	29%
Hickory-Morganton	52,300	21%
Mountains Rural	76,000	18%
Rural	461,600	28%
Urban	1,272,200	42%
<b>Total</b>	<b>1,733,900</b>	<b>38%</b>

## Population and Development Rates

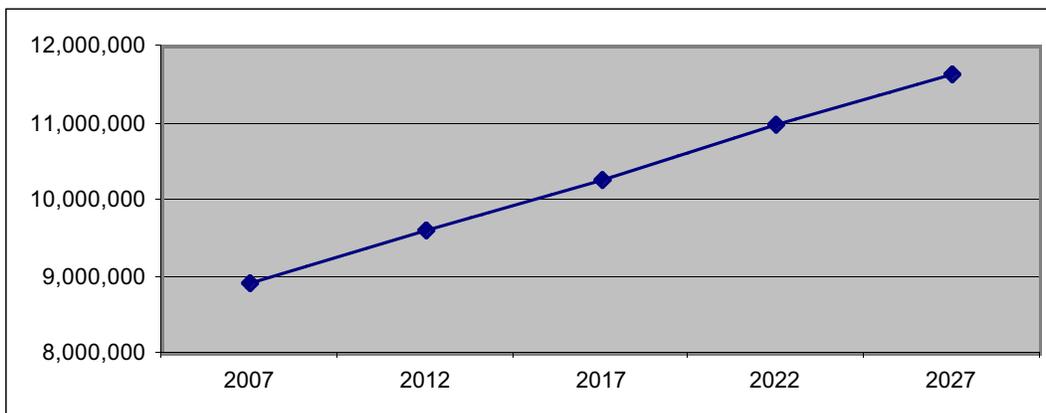
**R**apid population growth and associated development have driven the rapid degradation of the North Carolina landscape over the last twenty years. However, development is not just a natural byproduct of our rising population; while population increased 40 percent between 1987 and 2007, development increased 65 percent.

New sprawling patterns of development mean more open space will disappear in coming years. As sprawling development extends out from the suburbs of our urban areas, new developments are, on average, using up more of our natural areas. New sprawling development is using bigger roads, more parking lots, larger homes, and more shopping malls.

While development outpaced growth over the last twenty years, the rates of development per person in North Carolina appeared to retreat in the mid-1990's. In the mid-1980's, land was developed at a rate of 1.13 acres for each new person entering the state; five years later it was 1.0 acre per new resident; and by the mid-1990's that rate had fallen to 0.65 of an acre per new resident.

The bad news is that despite the apparent decrease in development rates per person in recent years, census projections for the twenty year period from 2007-2027 predict an increase of a full 30 percent, or 2.7 million people. Thus even with declining per-person rates of development, future population growth will virtually guarantee that large tracts of land are developed, coinciding with large losses of open space.

**Figure 5. North Carolina Population Growth Projections**



## Policy Findings

In 2006, the North Carolina General Assembly established the Land and Water Conservation Study Commission to examine ways to finance a significant increase in funding for the state's existing land conservation programs—the Clean Water Management Trust Fund, the Natural Heritage Trust Fund, the Parks and Recreation Trust Fund, and the Agricultural Development and Farmland Preservation Trust Fund—as well as to fund new initiatives to capitalize on economic opportunities associated with land conservation.



After numerous meetings and three public hearings, attended by more than 1000 citizens, the Commission recommended \$1 billion—roughly 1 percent of the state's budget—in additional funds over the next five years for land conservation programs.<sup>4</sup>

The Commission recommended a number of potential financing mechanisms for this additional funding, including general obligation bonds, broad-based taxes, and fees on new development.

This increase in funding, if approved by state leaders, can ensure the protection of additional 260,000 acres of forests, farmlands, trails, parks, gamelands, and other natural areas, and more than 6000 miles of river and stream buffers across the state.<sup>5</sup> The recommendations of the Land and Water Conservation Study Commission, if adopted, would go a long way towards protecting the state's natural areas in the face of rapid development.

# Appendix A

Figure 6: Data for Change in Developed Area by Study Area, 1987-2007

	1987 Developed Land Area	2007 Developed Land Area	Total Acres Developed 1987-2007	% Change in Developed Area
<b>Piedmont Total</b>	<b>1784800</b>	<b>3161900</b>	<b>1,377,100</b>	<b>77%</b>
Piedmont All Urban	1298700	2334500	1,035,800	80%
Charlotte	364900	685400	320,500	88%
Fayetteville	154400	236300	81,900	53%
Rocky Mount-Greenville	94200	169700	75,500	80%
The Triangle	320600	647100	326,500	102%
The Triad	364600	583800	219,200	60%
Piedmont Rural	486100	808500	322,400	66%
<b>Coastal Total</b>	<b>478700</b>	<b>726700</b>	<b>248,000</b>	<b>52%</b>
Wilmington-Jacksonville	185300	294600	109,300	59%
Coastal Rural	293400	428700	135,300	46%
<b>Mountains Total</b>	<b>591100</b>	<b>851500</b>	<b>260,400</b>	<b>44%</b>
Mountains All Urban	287600	416700	129,100	45%
Asheville	106900	166600	59,700	56%
Hickory-Morganton	180700	248600	67,900	38%
Mountains Rural	303500	433800	130,300	43%
Rural Total	1,083,000	1,671,000	588,000	54%
Urban Total	1,771,600	3,045,800	1,274,200	72%
<b>State Total</b>	<b>2,854,600</b>	<b>4,716,800</b>	<b>1,862,200</b>	<b>65%</b>

# Appendix B

Figure 7: Data for Projected Loss of Open Space by Study Area, 1987-2007

	1987 Cropland Area	2007 Cropland Area	Total Cropland Lost 1987-2007	Percent Change in Cropland Area	1987 Forest Land Area	2007 Forest Land Area	Total Forest Land Lost 1987-2007	Percent Change in Forest Area
<b>Piedmont Total</b>	3,957,400	2,951,700	-1,005,700	-25%	8,345,500	7,707,600	-637,900	-8%
Piedmont All Urban	2,222,900	1,572,100	-650,800	-29%	4,393,600	3,912,700	-480,900	-11%
Charlotte	332,400	222,600	-109,800	-33%	762,300	600,800	-161,500	-21%
Fayetteville	507,200	457,500	-49,700	-10%	761,400	738,900	-22,500	-3%
Rocky Mount-Greenville	432,500	351,100	-81,400	-19%	487,400	443,100	-44,300	-9%
The Triangle	489,300	206,600	-282,700	-58%	1,174,500	1,051,400	-123,100	-10%
The Triad	461,500	347,100	-114,400	-25%	1,208,000	1,086,900	-121,100	-10%
Piedmont Rural	1,734,500	1,398,300	-336,200	-19%	3,951,900	3,804,500	-147,400	-4%
<b>Coastal Total</b>	2,057,200	1,892,400	-164,800	-8%	4,896,700	4,633,800	-262,900	-5%
Wilmington-Jacksonville	320,100	286,500	-33,600	-10%	1,656,600	1,534,400	-122,200	-7%
Coastal Rural	1,737,100	1,609,300	-127,800	-7%	3,240,100	3,098,000	-142,100	-4%
<b>Mountains Total</b>	349,600	226,200	-123,400	-35%	3,377,200	3,165,600	-211,600	-6%
Mountains All Urban	162,900	127,500	-35,400	-22%	1,035,100	938,200	-96,900	-9%
Asheville	56,100	40,200	-15,900	-28%	490,100	452,500	-37,600	-8%
Hickory-Morganton	106,800	86,600	-20,200	-19%	545,000	488,200	-56,800	-10%
Mountains Rural	186,700	100,400	-86,300	-46%	2,342,100	2,227,400	-114,700	-5%
Rural	3,658,300	3,108,000	-550,300	-15%	9,534,100	9,129,800	-404,300	-4%
Urban	2705900	1,986,100	-719,800	-27%	7,085,300	6,385,400	-699,900	-10%
<b>Total</b>	6364200	5,094,100	-1,270,100	-20%	16,619,400	15,515,200	-1,104,200	-7%

# Appendix C

Figure 8a and 8b. Ranks of Study Areas by Projected Open Space Loss 2007-2027

Region	Acres Lost	% Change in Forest Land
Charlotte	-142,700	-24%
The Triangle	-141,000	-13%
Hickory-Morganton	-55,500	-11%
Rocky Mount-Greenville	-39,900	-9%
Asheville	-35,100	-8%
The Triad	-80,500	-7%
Wilmington-Jacksonville	-101,400	-7%
Fayetteville	-40,200	-5%
Piedmont Rural	-134,500	-4%
Mountains Rural	-51,600	-2%
Coastal Rural	-32,600	-1%

Region	Acres Lost	% Change in Crop Land Area
The Triangle	-327800	-159%
Charlotte	-105900	-48%
Mountains Rural	-45500	-45%
Asheville	-16400	-41%
The Triad	-126300	-36%
Rocky Mount-Greenville	-81200	-23%
Piedmont Rural	-237100	-17%
Wilmington-Jacksonville	-26800	-9%
Fayetteville	-39000	-9%
Coastal Rural	-66300	-4%
Hickory-Morganton	-1600	-2%

Figure 8c. Ranks of Study Areas by Increase in Development 2007-2027.

Region	Acres Developed	% Increase in Developed Areas
The Triangle	376,500	58%
Charlotte	328,600	48%
Rocky Mount-Greenville	59,400	35%
Piedmont Rural	282,100	35%
Fayetteville	81,500	34%
The Triad	195,200	33%
Wilmington-Jacksonville	97,500	33%
Asheville	48,700	29%
Coastal Rural	103,600	24%
Hickory-Morganton	52,300	21%
Mountains Rural	76,000	18%

# Endnotes

1. “The point is, it’ll be preserved,” *Wilmington Star-News*, November 20, 2006.
2. The Nature Conservancy, North Carolina Chapter, downloaded March 27, 2007 at <http://www.nature.org/wherework/northamerica/states/northcarolina/help/art5907.html>
3. This report was originally published in 2003 by NCPIRG Education Fund. The projected numbers for 2002 in that report were based on 2002 population estimates. Those estimates have subsequently been corrected using new projections released in June 2006. All figures and charts have been revised using the latest population estimates, revising the numbers slightly downward.
4. Joint Legislative Committee on Land and Water Conservation, Report to the 2007 General Assembly of North Carolina, available at <http://www.ncleg.net/LegLibrary/>
5. Land for Tomorrow, “*Saving the Goodliest Land: A Five-Year Plan for Investing in North Carolina’s Land, Water, History and Future*,” June 2005, available at [www.landfortomorrow.org](http://www.landfortomorrow.org).