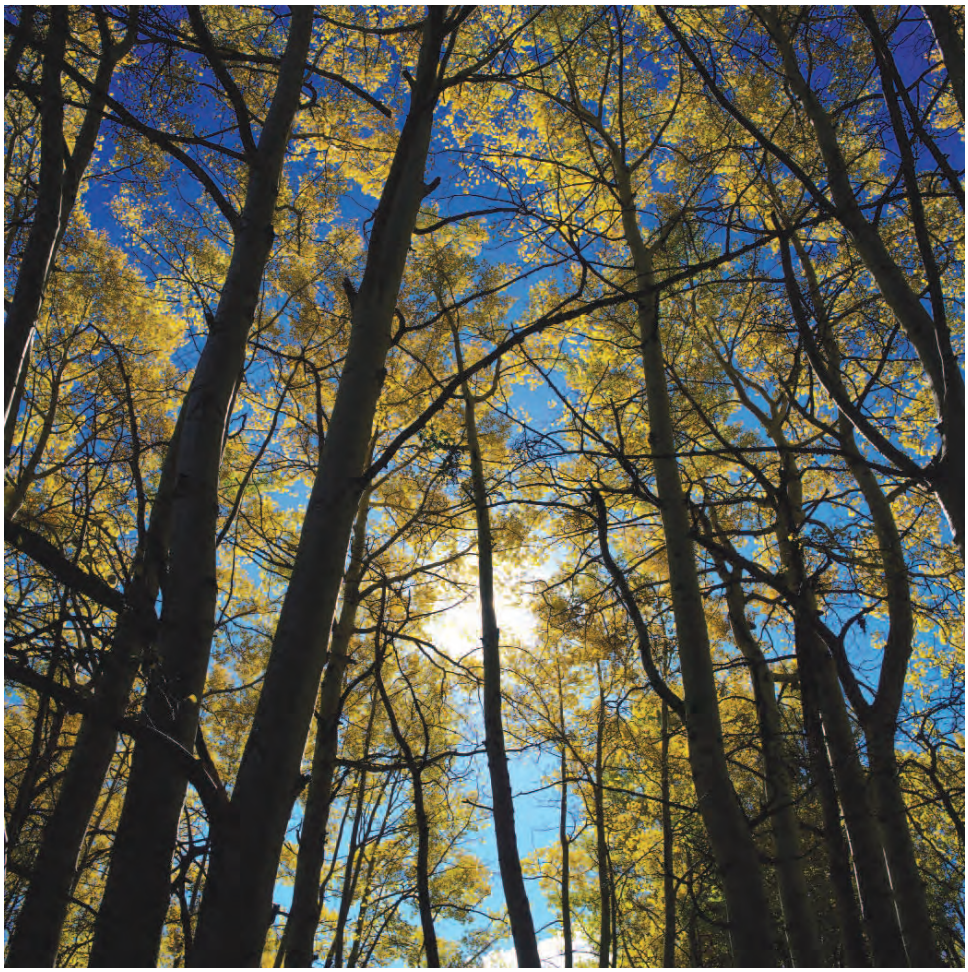
Standing Tall



A NEW PATH FOR NORTH CAROLINA'S PRIVATE FORESTS

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environmental defense

finding the ways that work

Standing Tall

A NEW PATH FOR NORTH CAROLINA'S PRIVATE FORESTS

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ENVIRONMENTAL DEFENSE
finding the ways that work

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Executive summary

The crisis intensifies. North Carolina is losing its private forests to development at the alarming rate of nearly 100,000 acres a year—an annual loss equal to the combined area of the Research Triangle's Durham, Orange and Wake counties. As forests give way to hundreds of thousands of acres of subdivisions, strip malls and highways, their functions disappear with them, leaving fewer and fewer trees to filter pollutants from water; to release oxygen and absorb carbon dioxide; to hold back runoff that muddies streams and rivers; and to serve as habitat for wildlife ranging from white-tailed deer to wild turkey to warblers.

Private forests are vital to North Carolina's economy, environment and overall quality of life, and every year 600,000 family landowners make decisions that help shape not only the future of the state's forests, but also the state itself. How an individual landowner manages a single parcel of land has far-reaching effects. Short-sighted development and incompatible management limit neighboring landowners' forest management options. These trends, combined with counterproductive state policies, inadequate public funding and continuing disincentives, make it increasingly difficult for landowners who want to maintain their forests.

Individual landowners cannot go it alone. Private citizens and government agencies must work together to create a unified vision for North Carolina's private forests. Without concerted action, the quality and quantity of the state's woodlands will continue to decline. Implementing the following 15 recommendations will help staunch the loss of forests and benefit North Carolina's landowners, environment, economy and overall way of life:

Recommendations for the Governor:

- Using existing data and expertise, the Governor should clearly identify the top priorities for North Carolina's private forests. At a minimum, these statewide priorities should include restoration of rare and declining forest types; maintenance of existing biodiversity and wildlife habitats; provision for clean water; improved air quality; sufficient landowner incentives; and enhanced rural economies.
- The Governor should direct the North Carolina Department of Environment and Natural Resources and the Department of Revenue, among other state agencies, to undertake a public review of all programs and activities that affect forests to ensure that they deliver multiple public benefits and advance statewide priorities.
- Under the Governor's direction, North Carolina should develop a comprehensive state plan to reduce sprawl and its negative impacts on rural lands.
- The Governor should direct the Department of Environment and Natural Resources to convene a stakeholder panel to provide recommendations on the possible implications of the many potential new markets that could emerge in the near future.
- The Governor and the Environmental Review Commission (ERC) should conduct a review of existing laws, rules and policies aimed at reducing adverse environmental impacts from forestry activities (e.g., sediment pollution, loss of wetlands). At a minimum, the Governor and ERC should develop recommendations to strengthen existing laws, rules and policies to reduce adverse environmental impacts.

Recommendations for the North Carolina General Assembly

- The North Carolina General Assembly should reform the Present-Use Value Tax (PUVT) program to remove the disincentive imposed on landowners who manage forests for wildlife habitat and other conservation benefits. The legislature should broaden the program to provide tax relief for these landowners. This change can be made in a manner that does not result in a reduction in county tax revenues.
- The North Carolina General Assembly should expand the Forest Development Program to provide incentives to landowners to manage forests for wildlife and other conservation benefits. Currently only forest practices aimed at commercial production receive incentives through this program.
- The North Carolina General Assembly should support Land for Tomorrow, an effort to help North Carolina meet its goal of saving one million acres of private land by authorizing $200 million a year for five years to purchase or protect conservation lands.
- The North Carolina General Assembly should authorize a state-funded version of the federal Forest Legacy Program, an easement acquisition program. A state Forest Legacy Program would assist in matching federal and private dollars as the state strives to meet the goals of the One North Carolina Naturally program.
- The North Carolina General Assembly should continue to support the state's Conservation Tax Program, which provides landowners a credit against their state income taxes for donating land for conservation purposes.
- The North Carolina General Assembly should amend the Sediment Pollution Control Act to require use of Forestry Best Management Practices (BMPs) and require notification prior to timber harvests or other land disturbing activities on forest land to better protect water quality and other forest values.
- The North Carolina General Assembly should reward local governments that implement policies to contain sprawl and direct new development and roads away from high-priority conservation areas.

Recommendations for local governments

- Local governments should increase the use of existing planning authority, impact fees and other tools to reduce forest loss.
- Local governments should support reform of the PUVT program to promote conservation of forests.

Recommendation for the United States Congress

- The United States Congress should reauthorize the federal Farm Bill in a way to expand the mix of tools available to private landowners to maintain and restore critical forests. Among other improvements, Congress should authorize enrollment of 500,000 acres under the existing Healthy Forest Reserve Program.

CHAPTER 1

Introduction

"I want to leave the land better than I found it, but it's getting harder for me to do that. Some say 'sprawl and fragmentation' are the culprits. I call it 'houses and highways.' There's a crisis brewing in our woods, and we better start paying attention."

Jim McEwen, Richmond County landowner

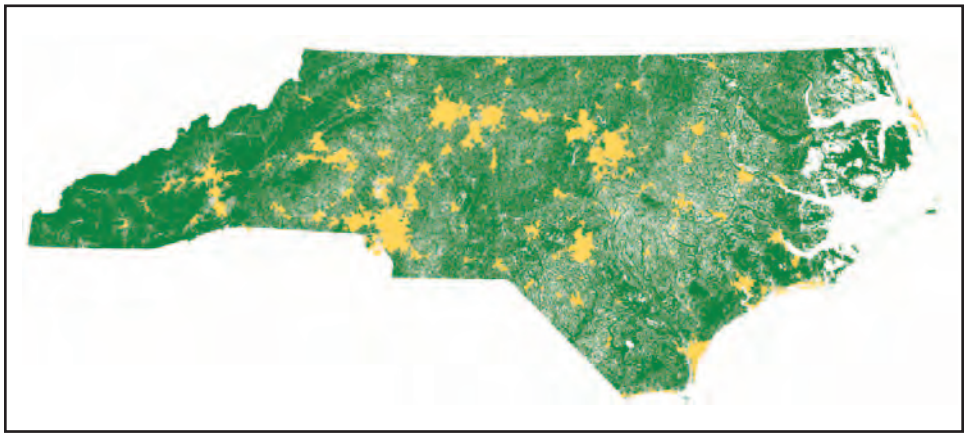
Forests play crucial roles in North Carolina's economy, ecology and way of life, providing clean water, clean air, wildlife habitats, scenic beauty and recreation opportunities, among other benefits. They dominate our landscape—of the state's 31 million acres, about 18 million are covered with trees—and they are deeply woven into our economic heritage and cultural fabric.[1]

Mention forests and many North Carolinians reflexively think of our magnificent national forests, Great Smoky Mountains National Park or publicly owned state forests. These public lands are indeed treasures, but they represent only a small portion of the state's total forest area. The vast majority of the state's forests—84%—are owned by farmers, families, investors, land trusts, forest products companies and other private parties.[2] Some 600,000 family forest owners manage the bulk of the state's private forests, which range from one-acre woodlots to 10,000-acre tracts.[3]

Typical of smaller tracts is the 33-acre Sandhills forest owned by Jim and Diane McEwen of Richmond County. (See "The approaching threat," page 2.) Since purchasing their land in the 1970s, the McEwens have watched development approach their longleaf pines, and they wonder how long they will be able to manage their working forest. The McEwens are like most forest landowners. No matter how large their tract or how long they have owned it, they want to do the right thing for their family, their forest, their community and for North Carolina. Though their pines may not be immediately threatened, their forest and those of thousands of other North Carolina landowners face an uncertain future.

FIGURE 1-1

North Carolina is a green state



Sixty percent of the state is covered by trees (green areas on map), 84% of which are privately owned. But current trends, including urban development (yellow) threaten the future of the state's private forests. Source: MRLC Consortium, 2001 National Land Cover Database (data), Environmental Defense (map)

The crisis intensifies

Private forests are disappearing at alarming and increasing rates. As urban development has spiraled outward from cities like Asheville, Charlotte and Raleigh, along with towns like Asheboro, Boone and Rocky Mount, it has gobbled up more than one million acres of trees from 1990 through 2002.[4] Subdivisions, shopping centers, office parks and highways now stand where pines and hardwoods once stood. As North Carolina's population grows—it is expected to approach 12 million people by the year 2030[5]—experts project accelerating forest loss as residents demand new housing, highways and shopping centers.[6] In addition to the loss of forest acreage to sprawl, the quality of remaining private forests is suffering from land fragmentation, mismanagement and shifting economic markets. Counterproductive state policies, inadequate public funding and continuing disincentives create additional pressures on landowners who want to maintain their forests.

When woodlands succumb to development, North Carolina loses more than just sawtimber and shade. As forests disappear, so do their functions, leaving fewer trees to filter out pollutants from the water, to provide oxygen and absorb carbon dioxide, to contain runoff that muddies streams and rivers, and to provide habitat for wildlife ranging from white-tailed deer to wild turkey to warblers.

Family forest landowners make numerous decisions every year that determine how the state's private forests are used, with a range of benefits that includes economic opportunities such as timber production; recreational activities from hunting to horseback riding; and public benefits such as watershed protection, stream buffering and wildlife habitat preservation.

The future of North Carolina's forests is in the hands of private landowners like the McEwens. They do their best to be good stewards of the land and to ensure that future generations will enjoy and profit from their forest as much as they do. However, the

The approaching threat

Name: Jim and Diane McEwen
Location: Richmond County
Forest size: 33 acres

When the McEwens bought a Sandhills forest in 1971, hardwoods had enveloped stands of scattered longleaf pines. The presence of post, blackjack and turkey oaks and a ten-inch thick layer of decomposed pine straw strongly indicated that the fire-dependent ecosystem near Hamlet had not seen a fire in decades. "We figure it's been 100 years since it was burned," Jim said.


JACK HORAN
Jim McEwen

McEwen set out to restore the native longleaf community 11 years ago with controlled burns every year or two. He removed some of the oaks for firewood and planted wiregrass. The burns have killed roughly one-half of the oaks, creating an open, park-like appearance.

In the restored longleaf forest, fox squirrels bound from limb to limb in the towering pines. Pileated, downy and yellow-bellied woodpeckers pry bark for insects. McEwen and his stepson, Chris Mercer, rake two acres of pine straw for the garden trade, selling up to 150 bales each summer.

Under his management plan, McEwen will selectively harvest some of the pines. But he wonders whether he'll be able to continue the burns, essential for the health and vitality of the pines, as neighboring forestland gives way to homes that now border his property. "When I moved here in 1971, I couldn't see anything but woods," he said glancing toward nearby homes.

fate of the McEwen's forest depends not only on their own choices, but also in large part on how neighbors manage their lands and especially on whether those neighbors maintain their forests or convert their land to other uses.

How an individual landowner manages one parcel of land affects the water quality, wildlife habitat and timber productivity of adjoining properties. Private landowners often find that their choices have been limited by sprawl and inappropriate management on neighboring properties. In the final analysis, individual landowners cannot go it alone. North Carolina must work with landowners to develop a unified vision for the future of our private forests.

Two visions of the future

North Carolina's forests are at a crossroads. The combined actions of private landowners, economic forces and public policy over the next few years will determine which of two divergent visions unfold. Presented below is a vision of our forests' likely future if the current status quo is maintained, contrasted with a brighter vision of the future our forests will enjoy if we take action.

Vision #1: Should North Carolina continue on its present path and maintain today's policies, the state will continue to lose its private forests at an increasing rate. In this future, cities and their suburbs expand into the countryside, leaving behind mere islands of forest amid the sprawl. Economic returns and management options diminish for landowners who want to maintain healthy, vibrant forests. As a result, forests provide fewer and fewer public benefits.

Without the cleansing capacity of trees, air quality continues to worsen, forcing children, the elderly and others sensitive to airborne pollutants to spend less time outside. As nutrient- and sediment-trapping forests disappear from the banks of North Carolina's streams and rivers, unfiltered pollution degrades the quality of drinking water, fouls fishing and swimming holes, and ruins

JACK HORAN

Subdivisions spiraling outward from Charlotte into Cabarrus, Stanly and Union counties typify the loss of private forests to urbanization across much of North Carolina.

popular canoeing and kayaking sites. Flooding increases as the flow of water across the landscape is hastened by new expanses of pavement, drainage ditches and the loss of forested wetlands.

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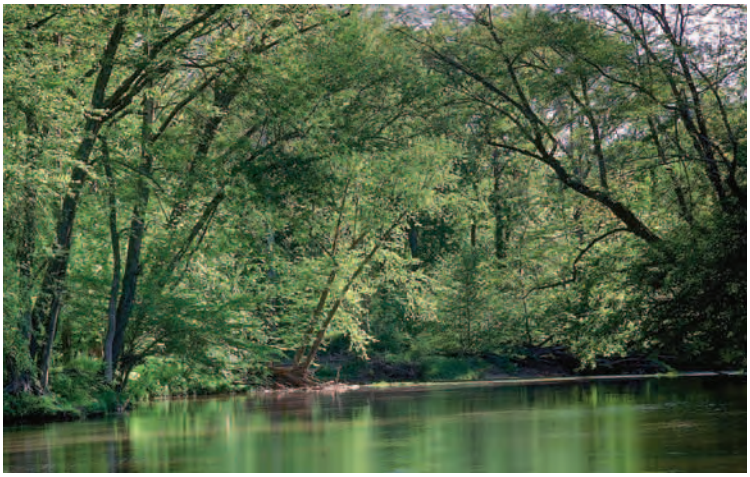

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NC WILDLIFE RESOURCES COMMISSION

A new vision balances economic growth, forest health and increased public benefits from private lands.

Wildlife populations decline, with fewer deer and turkey for hunters and fewer songbirds at our feeders. Decreased diversity of native forest types reduces North Carolina's ability to resist insects, disease, invasive species, hurricanes, ice storms and the effects of global warming.

Forest-based economies also suffer, as forest quality and quantity diminish. Without a unified vision for the future, new forest industries fail to emerge and replace the loss of traditional pulp and paper industries. As a result, owners of remaining forestlands find fewer opportunities for profit, creating a feedback loop in which the degradation and disappearance of forests make their restoration increasingly unlikely.

Vision #2: But it doesn't have to be that way. North Carolina can reverse current trends and strike a better balance between the public benefits that flow from forests and the economic needs of private landowners. A portrait of change is emerging in North Carolina's forests. Over the next generation, North Carolina's forests can both provide economic opportunities, such as well-paying jobs, a healthy forest industry and a strong tax base, and maintain ecological amenities like clean water, abundant wildlife and increased biodiversity. To get there, we need a new vision.

Imagine leaving Charlotte or Raleigh on a Sunday afternoon, driving through city neighborhoods adjoining urban forests and emerging onto rural highways with unbroken stretches of woodland. Private landowners are rewarded for many of the ecosystem services their forests provide, and the management of their land is coordinated with that of neighboring landowners. A mosaic of diverse forest types provides wildlife habitat, improved air quality, cleaner water and beautiful scenery across

the state. Fewer insects and disease outbreaks occur, and invasive species lose their advantage as forest management improves.

In this vision, new residents who move to North Carolina for work or retirement cite the quality of the environment and the "canopy of green" as a major reason for relocating to the state. As new residents and visitors pour in, a concerted state and local effort maintains our forests at current levels and new forest industries complement the remaining furniture and paper companies.

Achieving this vision will require significant public and private involvement to assist private landowners, ensure economic opportunities and maintain critical ecosystem services. To achieve this vision we must act now to save our remaining forests, both for present and future generations.

CHAPTER 2

Private forests: incalculable value, incredible opportunity

"My forests are a source of income and reward my family every day. My trees provide financial returns to pay taxes and management expenses, but the greatest value from our forests is the air I breathe and the water I drink. Most folks don't realize how important forests are to everyone, not just the people who own them."

Peter Hairston IV, Davie County landowner

The long-standing, deeply emotional ties that Peter Hairston IV (see "Natural capital," page 7) and his family have to the land are felt by many other forest landowners in North Carolina. For most, timber provides income and the means to a better life—perhaps cash for college or a retirement fund. A forest may represent a family's economic heritage, a touchstone that ties generations to the land. Many landowners also maintain their forests for non-economic benefits, whether for hunting and recreation or for aesthetic value and quality of life. For many North Carolinians, our forests provide daily reminders of carefree childhood romps through the woods or the pleasure of taking family walks or horseback rides.

But North Carolina's private forests provide value to more than just their owners. The citizens of the state depend on these forests. Over the past four centuries, North Carolina's forests have provided well-paying rural jobs, sustained family and cultural relationships, and nurtured native wildlife and biological diversity. The value of private forests ripples through North Carolina, affecting the economy and the environment.

Existing forest industries and new income opportunities

North Carolina ranks fourth nationally in area of privately owned forests, behind Alaska, Georgia and Alabama.[7] These forests have provided people with livelihoods from the times of the Native Americans, and the first European

JIM SITTS

Forests provide jobs in manufacturing, furniture, pulp and paper and associated industries.

Natural capital

Name: Peter W. Hairston
Location: Davie County
Forest size: 1,900 acres

For nearly 200 years, Cooleemee Plantation has produced crops from cotton to corn. The plantation was founded on 2,500 acres in 1817 by Peter Hairston, reaching 4,200 acres in the twentieth century.

Today, Hairston's great-great-great-grandson, Peter Hairston IV, manages the plantation fronting the Yadkin River near Advance in Davie County. Cooleemee's fields are leased for corn, soybeans and wheat, forming a mosaic of open fields, small streams and woodlands that nurture an abundance of wildlife. Here, white-tailed deer, wild turkey and, more recently, coyotes, thrive.


JACK HORAN

Peter Hairston IV

Most of Cooleemee Plantation is forested. Hairston tends mixed hardwoods on both sides of U.S. 64. Some of the trees will be converted into veneers for furniture or wooden pallets, depending on the quality of the wood. Loblolly pines cover two other forest areas.

Hairston doesn't regard all of his trees as potential tables, pallets or computer paper. Snags are left to stand for wildlife. Some trees will never be cut. He has set aside buffers along the stretch of the Yadkin. The buffers run 300 feet deep from river to upland, wide enough to function as a leafy viewshed, a wildlife corridor and a natural filter that retards nutrients, soil and other potential contaminants from washing into the river.

Hairston regards the trees in the buffer as worthwhile as those that go to the sawmill. "If I were to clear cut the buffer, what's going to happen to water quality?" he asks rhetorically. "The least value in the forest is the timber," Hairston says. "I think we have a great responsibility to the land and to take care of it."

settlers found profit by felling trees for English sailing ships. For centuries, North Carolinians depended on multiple forest products, including turpentine, pitch and the tar that created the Tar Heel nickname. Forests support many profitable industries, from sawmills to pulp and paper facilities to furniture manufacturing companies. They provide lumber for homes, barns and fences as well as pulp for paper and cardboard. Even today, forests remain a part of our twenty-first century fabric, touching every part of our daily lives, from furniture and computer paper to chewing gum and toothpaste.

Traditional forest products support more than 100,000 manufacturing jobs for North Carolina, with an annual payroll of $3.8 billion.[8] They provide jobs for furniture makers, pulp and paper workers, forestry consultants and

A changing forest industry

North Carolina's forest industry is undergoing rapid changes. The number of processing facilities has declined by 24% over the past ten years, with most of that decline in small sawmills. At the same time, the loss of high-paying mill jobs has accelerated, with nearly 22,000 jobs lost since 1992. And the total payroll from forest industry jobs has declined even more dramatically, a whopping 50% since the mid-1990s.[9]

The sell-off of forest industry land is accelerating. The largest forest products company in North Carolina, International Paper, has joined other companies by announcing it will sell all its forest land over the next two years, including 600,000 acres in the state. When completed, this transaction will equal the total acres sold by forest industry over the previous 25 years.[10] Many experts expect similar announcements from other major forest products companies, raising the possibility that the forest industry we've known won't exist in 20 years.

Luckily for forest landowners and the state, new opportunities are emerging. But will they mature quickly enough to stave off development? Will new opportunities meet landowner objectives?

loggers as well as ancillary industries. And they provide income for landowners. Forest products companies (International Paper, Weyerhaeuser and Jordan Lumber among others) own more than 1.5 million acres of forests and operate a variety of processing facilities throughout the state.[11]

For the past century, North Carolina's forest industry has been dominated by pulp and paper manufacturing on the coastal plain and furniture manufacturing in the upper Piedmont and Blue Ridge regions. North Carolina annually hosts the world's largest furniture show in High Point.

In the past two decades, forest owners have become part of a global market. Wood chips by the ton leave the ports of Morehead City and Wilmington for foreign markets while South American timber flows into mills across North Carolina. Global forces and industrial restructuring are making permanent changes in the primary forest products markets. As these traditional markets shift, concerns emerge about future economic rewards for private ownership and management of forests. (See "A changing forest industry," above.)

While most people still consider timber and pulpwood as the foundations of the forest products industry, non-timber forest uses continue to increase. Cottage industries have grown up around pine straw for use in home gardens, forest plants for medicinal uses and biodiversity banking. Other forest products include mushrooms, mosses, ginseng, ramps, cones, firewood and

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More than 49 million tourists visit NC each year, many of them camping, hunting and fishing in the state's forests.

nuts, all of which contribute to local and regional economies. Pine straw sold by nurseries for landscaping, a family industry in the Sandhills, yields $150 an acre annually to the landowner.[12] Ginseng harvests from both public and private lands in southern Appalachian forests exceeded $18.5 million in 2001.[13]

Wildlife is critical to our state's economy and cultural heritage. Some 2.3 million North Carolinians (40% of the state's residents) participated in some form of wildlife-related recreation in 2002.[14] Hunters lease millions of acres of private game land each year in North Carolina, paying landowners from $5 to $20 per acre annually.[15]

Other potential sources of income remain undeveloped. Hundreds of thousands of forested acres protect watersheds for municipal drinking water and draw people for recreation. Yet private landowners rarely see any economic benefits from the clean water, improved wildlife habitat or aesthetic beauty their forests provide. North Carolina tourism supports 180,000 jobs and draws 49 million visitors yearly, creates $13.3 billion in expenditures and contributes $2.1 billion in tax revenue. Many of those tourists visit the state's forests to camp, hunt and fish.[16]

Landowners have begun to recognize that traditional forest products will not always provide an income. If the public wants to continue to receive the many benefits of forests, we must find ways to reward landowners who provide those public benefits, including incentives to jump-start new markets and the removal of disincentives to allow fledgling opportunities to flourish. (See Chapter 5 for specific recommendations.)

Prioritizing ecological benefits

All forests across the state provide the public with ecological benefits. But not all forests provide the same quality or quantity of benefits—that depends on their structure, composition and function.

Over the past 400 years, the collective actions of countless generations of landowners and forest managers have left our forests in their current state. Today's forests vary from the complex, such as a mature hardwood forest with many species of vegetation, to simplified plantations of a single species of tree, most commonly the loblolly pine.

Restoring lost ecological functions will require prioritizing limited resources. Existing government programs have significant waiting lists of willing landowners who want to improve management and restore ecological functions to their forests. Given limited funding for forest incentives programs, public expenditures must be prioritized to maximize public benefits from private lands. Such prioritization will not only improve effectiveness of existing programs but could also allow for expanded future funding of forest conservation programs.

Priorities should focus on maintaining and restoring the highest value benefits from forests, including water quality, wildlife habitat, forest health and other critical ecosystem functions.

Ecological services: vital forest functions

Forests provide unparalleled ecological benefits. (See "Prioritizing ecological benefits," this page.) They cleanse the air, filter rainwater, nourish wildlife, absorb pollutants and protect biodiversity, among other things. Such benefits would be worth billions of dollars if they were part of a market economy, but currently they flow to the public without charge.

Forests cleanse the air. Forests act as the lungs of the state. Using the sun's energy, trees convert carbon dioxide and water into sugar molecules and oxygen. They release the oxygen, replenishing the air we breathe. Trees absorb pollutants that raise serious public health concerns, such as ozone, particulates and sulfur oxides. At the same time, trees absorb carbon dioxide, the primary pollutant contributing to global warming. When trees absorb carbon dioxide, they provide long-term storage of carbon in a process called carbon sequestration. A mature tree consists of approximately

25% carbon. The average acre of forest in North Carolina stores 32 tons of carbon above ground, and an even greater amount in the soil.[17]

Forests absorb polluting runoff and purify rainwater. Forests are the starting point for 60% of the water North Carolinians use.[18] Trees anchor the soil, preventing sediment runoff to creeks and streams. Forests trap and filter pollutants from lawns, farm fields and highways before they can enter rivers and lakes. More than five million residents drink from surface impoundments which are supplied by water flowing from forests.[19] The mountain cities of Asheville and Waynesville, for example, rely on 22,000 and 8,030-acre forested watersheds, respectively, to protect their drinking water.

Forests moderate floodwaters and stream temperatures. Forests help store rainwater, moderating peak flows and reducing floods. Across the state, forested wetlands and bottomland swamps help to control floods by soaking up heavy rains and slowing surface water movement across the landscape. In the mountains, overhanging tree canopies shade streams, keeping water temperatures cool enough for trout and other coldwater aquatic species.

Forests nourish wildlife. Game hunters and wildlife enthusiasts appreciate the importance of private forests. Some wildlife that thrive on edge habitat (where forest meets farm field) and can adapt to forest fragmentation have rebounded over the past few decades. Most of the state's deer population, which peaks annually at about one million animals, roams private forests.[20] So do wild turkeys, which have recovered from about 5,000 in 1970 to number more than 150,000 today.[21] Black bears use private forests as travel corridors and for foraging.

Forests protect biodiversity. Nationally, privately owned lands provide 80% of the habitat for more than half of the country's endangered species.[22] North Carolina is home to more than 4,000 animal species,

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Forests trap and filter pollutants before they enter rivers and lakes, protecting drinking water.

NATIONAL WILD TURKEY FEDERATION

For generations, private lands have offered opportunities for hunting and wildlife viewing across the state.

many of which do not thrive in fragmented, low-quality landscapes.[23] Ten percent of the state's fauna are at risk of extinction.[24] The state is among the top three Southern states in species richness, with more than 600 terrestrial vertebrate species.[25] North Carolina leads the Southeast in mammal diversity,[26] and with its array of salamanders, leads the nation in amphibian diversity.[27] Properly managed private forests are critical to sustain endangered species and prevent others from becoming threatened or endangered.

Without vital forest functions, taken for granted by many of us, the quality of air, water and soil and the relative abundance of wildlife would rapidly decline. Furthermore, as critical ecological and economic benefits disappear, public services would require more economic resources to compensate for the loss.

North Carolina landowner attitudes and perceptions

Over the past half century, forest management has been a good long-term investment for many landowners. However, numerous risks and challenges face owners of private forests. As they wait several decades for their trees to mature, they must pay property taxes, incur management expenses and manage risks such as fire, insects and diseases.

Given the risks, why do landowners retain forestlands? The top four reasons they give are aesthetics, privacy, hunting, and preservation of a family legacy. Ownership of forests doesn't rest entirely on economic viability, but with owners' continuing link to the land. However, the two reasons following the top four—land investment and timber production—are a reminder that landowners often require economic returns on their investment.[28]

Many landowners see trees not only as board-feet of lumber but also for their conservation benefits. Peter Hairston IV of Cooleemee Plantation says that, even without the existing economic benefits he receives, he would plant forests for their intrinsic value as a home for wildlife and silent processor of water and clean air. "Forests are way too valuable even without the state and federal government paying me to have them," he muses. "We should be paid (for) carbon absorbed and oxygen produced. The public has to understand it's a bargain for them."

The total benefit derived from North Carolina's forests is incalculable. Private forestlands provide tremendous ecological benefits, economic opportunities and value to both landowners and the state's citizens. These benefits are well documented, though generally not well understood by most citizens and policymakers. Maintaining these benefits will require significant public education and action in the face of growing threats to private forests.

CHAPTER 3

The quiet crisis: trends and consequences

"Many people today talk about sprawl as something that's just going to happen no matter where you live, even way out here in the country. That's the wrong attitude to take. The consequences of not taking action to protect our forests are unimaginable."

Boon Chesson, Montgomery County landowner

Largely hidden from the public's eyes, forest loss occurs quietly and cumulatively across the state. It doesn't evoke outcries of protest as would a proposed dam on a river or construction of a highway through a park. But it causes significant and permanent damage to the state's long-term environmental health.

While North Carolina loses nearly 100,000 acres of forests annually,[29] the quality of our remaining forests declines, threatening the state's future forests. Across North Carolina, younger trees are replacing older trees. Mature forests are being high-graded (a process where the highest quality trees are harvested, leaving only trees with little ecological or economic value). Roads and urban sprawl fragment forests as large, contiguous forest tracts shrink into smaller, isolated tracts. Structurally and functionally complex forests give way to simpler, less diverse forests.

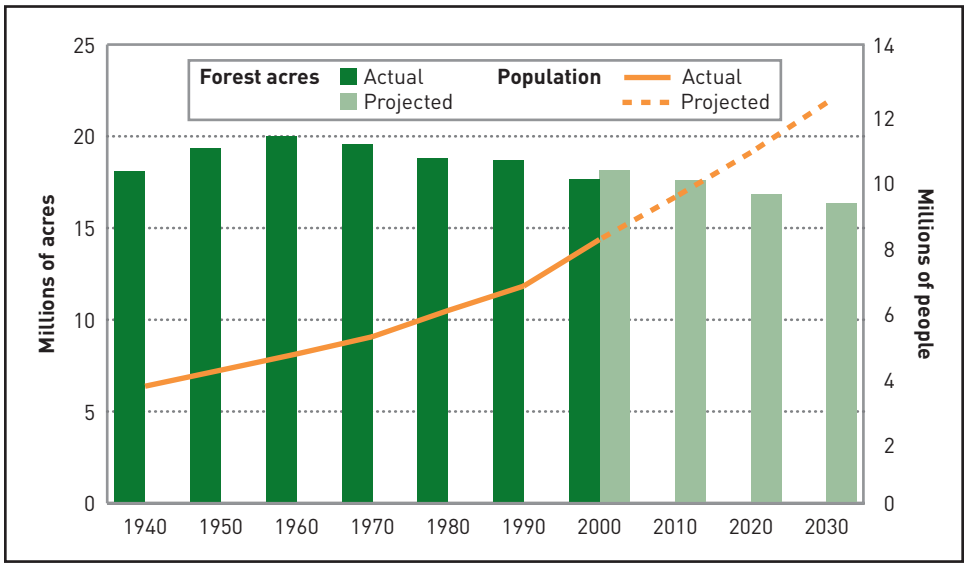
The first half of this chapter outlines the trends and threats causing a decline in the quality and quantity of the state's forests. These include sprawl, fragmentation and harvest patterns. The second half outlines the consequences of failing to act and describes the likely future of North Carolina's forests if current trends continue.

Threat # 1: Development and sprawl

Forest experts largely agree that sprawl and development are the greatest threats

FIGURE 3-1

As North Carolina's population increases, forests decline



Forest loss has increased as population growth accelerates. The projections of forest loss may be even greater because the ongoing loss rate was higher than actual survey data showed in 2000.
Source: U.S. Census Bureau (data); U.S. Forest Service, Forest Inventory Analysis and Southern Forest Resource Assessment (data); Environmental Defense (chart)

Return of the longleaf prairie

Name: Boon Chesson
Location: Montgomery County
Forest size: 107 acres

When Boon Chesson began burning his longleaf pine forest, he got an unexpected surprise: long-dormant grasses sprouted after the flames raced through the underbrush, grasses that once were part of Piedmont prairies. "All kinds of native grasses: little bluestem, Indian grass, big gamma grass. The residual stock is still there," Chesson said. Piedmont prairies flourished when settlers reached the region in the mid-1750s.

Chesson uses fire to suppress hardwoods and allow slower-growing longleafs to mature. The fires reduce fuel hazards that could feed wildfires and produce habitat for bobwhite quail and wild turkey. Chesson burns every two to three years.

NC WILDLIFE RESOURCES COMMISSION

Prescribed fires are a critical tool for restoring private forests

The longleafs form the centerpiece of the forest that Chesson purchased in 1974. The land, near Troy, was a subsistence farm pieced together beginning in the early 1900s. The tract once held a lake that Chesson drained to make way for pines. Chesson started his forests by planting 30 acres of loblolly pines based on recommendations from the North Carolina Forest Service. "That's what everybody was doing then," he said of the loblollies. At the time, a few remnant longleafs dotted the fields. Chesson began planting longleaf stands in the mid-1980s.

Chesson plans to cut the 27-year old loblolly stand in about eight years. He thinned 12–14 acres of loblollies in 2004, selling the trees for pulpwood. The longleafs are managed for aesthetics and economics. Chesson admires the stately presence of the trees amid the grasses in the park-like setting. His harvesting horizon extends 40 years or so, when the longleafs will be big enough to cut for sawtimber.

In the meantime, Chesson leases his land to deer hunters, who provide a source of income as the loblollies and longleafs grow to maturity.

to the future of private forests in North Carolina. From 1990 to 2002, more than one million acres of forest disappeared, largely due to construction of subdivisions, office parks and shopping centers.[30] The one-million-acre loss is larger than the combined land areas of the Research Triangle counties of Durham, Orange and Wake.

Urban development contributed to forest acreage shrinking to 18.3 million acres, a low point matched only in the 1930s when agricultural conversion displaced forests.[31] As agricultural conversion subsided during the mid-1900s, forests gradually rebounded, reaching a modern zenith in the 1960s. Since the 1960s, cumulative forest loss

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Lack of planning allows new housing developments to sprawl across once forested landscapes.

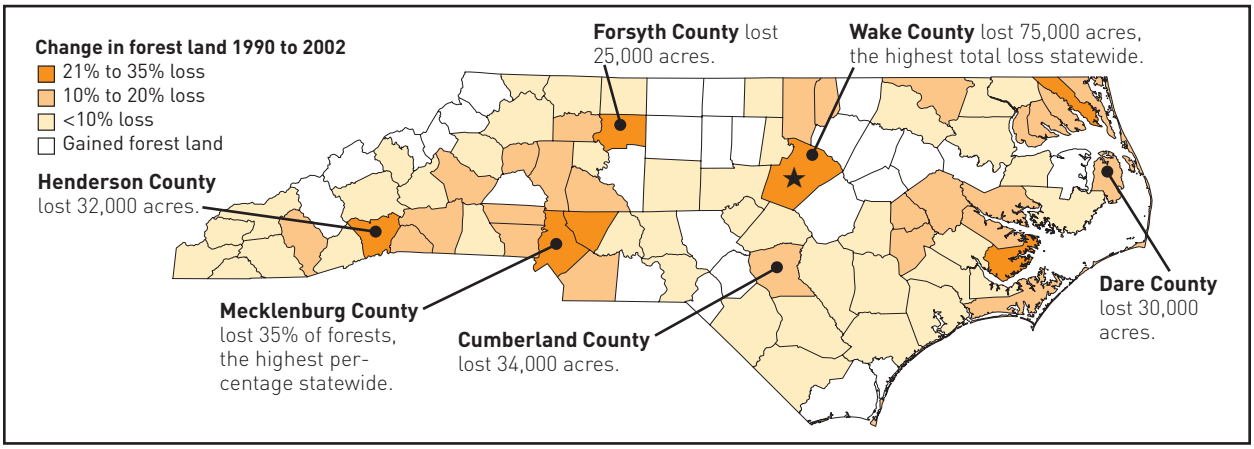
in North Carolina has swelled to 2.1 million acres, a loss greater than any other state in the nation.[32]

Fueling the forest conversion phenomenon is the state's rapid population growth. (See Figure 3-1, page 12.) North Carolina grew by 21% during the 1990s, from 6.6 million to 8 million people, making it the eighth-fastest growing state.[33] An additional 50% increase in population is predicted by 2030, further pressuring landowners to sell in once-rural areas such as Cabarrus County, Stanly County and Union County, all within the expanding Charlotte urban orbit.[34]

Forest loss touches every part of the state, as new residents fuel the construction of houses, stores and roads. Wake County alone lost 75,000 acres (33%) of its forests from 1990 to 2002. Mecklenburg County lost 47,000 acres (35%) of

FIGURE 3-2

Forest loss is a statewide problem, affecting large and small counties alike



Statewide forest statistics don't capture the local impacts. Twenty-five percent of North Carolina's counties lost at least 20,000 acres of forests from 1990 to 2002.

Source: U.S. Forest Service, Forest Inventory Analysis (data); Environmental Defense (map)

its forests during that time. Cumberland County, the home of Fayetteville and Fort Bragg, saw 34,000 acres vanish. In all, eleven counties across North Carolina each lost more than 30,000 acres of forests. More than one-quarter of all counties statewide lost more than 20,000 acres in a decade.[35] (See Figure 3-2, page 14.)

Sprawl seriously threatens the remaining forests and both the public benefits and private economic opportunities they provide (see Chapter 2). The conversion to concrete, asphalt and lawn grass is largely irreversible; the land is not likely to return to forest, or even farmland.

The conversion of forest land is expected to continue and even accelerate. The Southern Forest Resource Assessment, compiled in 2002 by the U.S. Forest Service, projects an additional four million acre decline in North Carolina forests over the next four decades—a 30% decline statewide.[36]

Forests are shrinking nationally, but the most overwhelming impacts are projected in the Southeast, considered the "wood basket" of the United States and an area of high biodiversity. "Causes of expansion of developed areas in the South include above-average consumption of land per additional resident and income growth," says the USDA study, "Forests on the Edge."[37]

Threat #2: Forest fragmentation: driven by roads

A precursor to sprawl, roads portend future forest loss. Roads that penetrate forests create harmful effects, even in areas where sprawl is not likely to occur. Roads disrupt the movements of wildlife and lead to the demise of far-ranging animals such as black bears.[38] Roads facilitate the invasion of exotic and non-native plants, such as kudzu, and parasitic species like cowbirds that displace native songbirds.[39] They also alter the forest structure and function, reduce water quality and aquatic diversity, limit management options and increase wildfire risks.[40] The fragmented landscape provides fewer recreational opportunities or scenic views. As land parcels shrink and

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Road building fragments forests, threatens water quality and portends future forest loss.

neighbors encroach, landowners encounter more resistance to controlled burns and other management options on their forests.

As urbanization invades rural areas, the phenomenon creates a cascade effect, further fragmenting remaining contiguous blocks of forest. A landowner sells a 10,000-acre tract, which is split into 1,000-acre tracts; the new landowners split the 1,000-acre tracts into 50-acre tracts and so on.

Over the past 25 years, forest parcels have gotten smaller with the most dramatic declines in the very largest parcels. In 1978, nearly 40% of forests across the American South existed in blocks greater than 1,000 acres. Today, only 15% of forests are that large and 42% of all forests exist in blocks of less than 100 acres, whereas twenty-five years ago, just 21% of forests fell into the smallest size classes.[41]

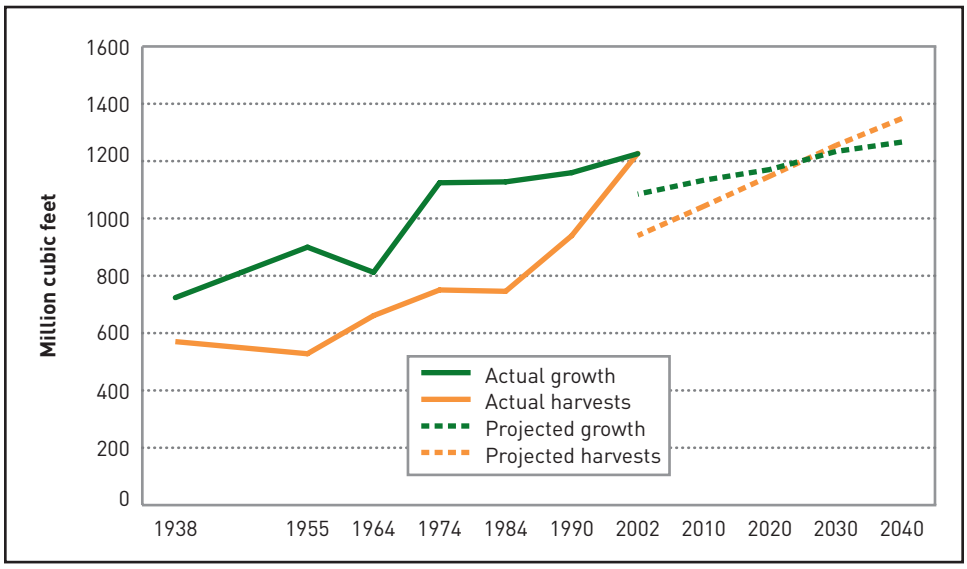
Similarly, a national study by the U.S. Forest Service determined "the dramatic decreases in interior and core forests over the range of landscape sizes tested indicate that fragmentation is pervasive and extensive where forests do occur."[42] The causes of fragmentation hot spots in North Carolina were identified as development, agriculture and roads.[43]

Threat #3: Harvests exceed growth

As the total area of forestland declines, timber extraction rates are increasing in remaining forests. Harvests have risen by 30% since 1990, to 1.2 billion cubic feet annually.[44] That's enough wood to build a wall five feet thick, 100 feet tall and 543 miles long across the state. This recent increase is on top of a 26% jump in harvest rates during the late 1980s.[45]

For the first time in North Carolina's recorded history, landowners are cutting more timber than they grow.[46] (See Figure 3-3 below.) Even more troubling, the Southern Forest Resource Assessment projects that growth of forests will not

FIGURE 3-3
Harvest rates accelerating faster than forest growth



Harvest rates on North Carolina's private forests now exceed the growth rates of forests. When projected in 2002, harvest rates were not expected to exceed growth rates until 2025.
Source: U.S. Forest Service, Forest Inventory Analysis data and Southern Forest Resource Assessment (data); Environmental Defense (chart)

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Top: Overstocked stands provide less wildlife habitat, increase forest health risks and reduce growth potential. Bottom: Thinned, well-managed forests reverse these trends and offer both public and private benefits.

exceed harvests again until after 2040 (the last year of the assessment's projections).[47]

According to the 2002 Forest Statistics of North Carolina report, every year between 1990 and 2002, landowners harvested some 246,000 acres of forests, 76% of which were clearcut.[48] If not properly managed, such harvests increase sediment erosion rates into streams and rivers and raise water temperatures.

As harvest rates increase and landowners convert mature forests to subdivisions and rural estates, the remaining forests have become younger. In 1990, 4.7 million acres of North Carolina forests were fewer than 20 years old.[49] Today, the number of stands younger than 20 years old has risen to 5.8 million acres, one-third of all forests in the state.[50] The very youngest of these stands may provide a few years of early successional wildlife habitat. But for the most part, these younger forests don't offer the robust, complex economic, ecological or cultural benefits of mature forests.

Threat #4: Lack of necessary management

Millions of acres across North Carolina are undermanaged or not managed at all. The state now has 3.6 million acres of overstocked forests with too many trees growing in too small an area.[51] As a result, tree growth stagnates, sunlight fails to reach the forest floor and diversity declines. Densely stocked stands run the risk of rampant damage from insects or diseases, and they provide poor habitat for wildlife. In 1990, about 8%, or fewer than one in twelve stands, were considered densely stocked.[52] Today, it is almost one in every five acres (21%).[53] These forests have not been properly managed, often lacking necessary thinnings and prescribed burns. Many of these stands are residual, unmanaged pine plantations that need immediate attention.

Consequences of inaction

If we maintain the status quo, the ecosystem functions that currently provide abundant economic opportunities, ecological services and landowner values will disappear. The trends and threats outlined above are already significantly damaging North Carolina's forests.

Without the necessary action, the numerous benefits that forests quietly dispense—clean and abundant water, clean air, biodiversity and wildlife,

TABLE 3-1
Forest loss and degradation result in fewer public and private benefits

Causes of decreasing forest quality and quantity	Potential consequences of decreased forest quality and quantity							
	Drinking water requires increased purification	Flooding potential increases	Lower capacity to filter air pollutants	Wildlife populations decline	Recreation opportunities decline	Landowner income potential and management options decline	Invasive and exotic species expand	Critical forest types disappear
Development and sprawl	✔	✔	✔	✔	✔	✔		✔
Forest fragmentation	✔			✔	✔	✔	✔	✔
Harvest exceeds growth	✔	✔		✔	✔	✔	✔	✔
Lack of management			✔	✔	✔	✔	✔	✔

cultural opportunities and economic income—will be degraded, diminished or destroyed.

Following are the likely consequences if we do not act to reverse current trends.

Drinking water from forested watersheds will require increased filtration and purification. The cleanest water in the state flows from intact forests. Five million North Carolinians get their drinking water from surface water. Most of this surface water originates in and flows across forested watersheds. The quality of these waters is critical to public health and the state's economy. However, logging roads that pierce forests can generate muddy runoff that fouls adjacent streams and downstream rivers during rainstorms. Ninety percent of annual sediment in streams comes from roads, mostly during one or two of the largest rainstorms of the year.[54] A recent study conducted in the North Carolina mountains found logging roads increased sedimentation rates of streams

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Poor logging practices and stream crossings too often foster erosion and let mud slide into waterways.

Indicators of forest decline

Scientists have identified seven types of changes that negatively alter the dynamics of natural forest processes. All seven indicators of change are found in North Carolina's forests, raising concerns for the future of our forests. Specifically, North Carolina's forests are:

1. shifting to practices favoring younger stands;

2. shifting from complex to simple stands, that is, from many types of trees to an increasing area of monocultures (i.e., one tree species);

3. shifting from large contiguous forests to smaller, fragmented patches,

4. shifting from forest stands that lie close to one another to more isolated patches;

5. shifting from a pattern of frequent, cool and less damaging fires to fewer, hot but more damaging fires;

6. shifting from fewer to many roads; and

7. shifting from stable and abundant wildlife populations to an increasing number of endangered species.[58]

three-and-a-half fold.[55] Additional studies have found accelerated sedimentation rates to be more than 20 times higher on harvest sites than in undisturbed forests.[56] Most troubling, existing voluntary forestry best management practices (BMPs) are not eliminating the risk. A recent Division of Forest Resources report found that stream crossings built for logging trucks and other harvest equipment pose a risk to water quality at three out of ten surveyed harvest sites across the state.[57] (See "Water quality threatened by voluntary best management practices," page 27.)

Forested wetlands will provide less filtering of pollutants and control of flood waters. The ditching and draining of wetlands impair their ability to store water, provide flood control and filter pollutants. Wetlands that have been developed or converted for agriculture and intensive forestry operations lose their storage functions. Forest management directly affects stream flow and the amount of water available for municipalities. Clearcutting forests increases storm water flows by 30–65%.[59] As peak storm flows increase, the flow overwhelms water retention devices and flood controls.

The state's forests will filter fewer pollutants from the air. Healthy, intact forests help supply clean air. Forests absorb harmful pollutants and release oxygen in return. This is especially critical near urban centers where sulfur dioxide and nitrogen oxides from smokestacks and tailpipes react in the atmosphere to form ground-level ozone, a component of photochemical smog, and particulate matter or soot. Smog and soot pollution contribute to thousands of hospitalizations and premature deaths each year in North Carolina. Forests also absorb carbon dioxide, a significant global warming pollutant. Trees sequester carbon within their cells and in the soil.

Wildlife and biodiversity will decline. Due to habitat destruction and other forces, more than 10% of vertebrate species that exist in the South are considered to be "of conservation concern" and twenty-eight are deemed "critically imperiled."[60] Partly as a result of forest loss and fragmentation, neotropical migrant songbirds and other interior forest birds are predicted to decline further.[61] At-risk or declining bird species include bobwhite quail, cerulean warblers and red-cockaded

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Habitat destruction causes declines in neo-tropical migrant songbirds and game birds, including the red cockaded woodpecker (above), the cerulean warbler, and the bobwhite quail.

woodpeckers. Current trends will lead to increased numbers of rare and endangered species.

North Carolinians will have fewer places for outdoor sports and recreation. Throughout the American South, only 7% of private land held by individuals is open to the public.[62] Changes in private land ownership and owner objectives mean less and less private land will become accessible for hiking, bird watching, camping and other outdoor activities. As forests disappear, shrink or lose their proper functions, they become less friendly to wildlife and diminish hunting opportunities. It is already difficult for hunters to get access to private forests without leasing land.

Landowner income potential and management options will decline. As forests fragment, management options dwindle. Prescribed burning becomes more difficult and riskier with the incursion of new homes whose owners increasingly object to smoke. Smaller forest tracts and encroaching development can make timber management less profitable. Recent studies have indicated returns provided by forestry often cannot compete with offers from home builders.[63] This scenario is becoming increasingly common across the Piedmont and other rapidly developing areas. As these trends make forest ownership more and more difficult for landowners, fewer forests are maintained for recreation, aesthetics or as part of a family legacy.

Exotic and invasive species will continue to expand. The South faces a host of threats from exotic and invasive species. Species such as the suffocating kudzu along major highways can overtake entire forest stands. Other invasive species pervade the herbaceous layer, suppressing plant and animal diversity. Increasing fragmentation and the use of land-clearing equipment contribute to the spread of some exotic invasive pests. Other invasive species travel along river corridors and roadways. In a 2004 report, the North Carolina Division of Forest Resources found that "exotic, invasive and non-native plants and animals threaten the ecological integrity of North Carolina's forests. These nuisance organisms rapidly spread across the landscape, choking out native vegetation while offering little ecological value."[64]

Critical forest types disappearing

Current trends are threatening many critical forest types in the state. North Carolina contains eight of the twenty-one most endangered ecosystems in the country, including four threatened forest types: spruce-fir forests, longleaf pine savannas, old growth Eastern deciduous forests and Southern forested wetlands.[65] Many forest types are declining rapidly, including:

- **Longleaf pine,** which decreased by 78,000 acres (a 30% decline) since 1990.[66] Two hundred years ago, longleaf pine dominated the coastal plain and extended into the Piedmont. In the late 1800s, North Carolina was covered by some 12 million acres of longleaf pine.[67] Today, about 200,000 acres remain.[68] Much of this loss is due to fire suppression, urban development and conversion to faster growing species, primarily loblolly pine. Longleaf, although slower growing, provides high-quality timber and habitat for game, such as quail, and rare species, such as red-cockaded woodpeckers.

- **Shortleaf pine,** another biologically rich, fire-adapted species like longleaf pine, which declined 62% during the 1990s. Shortleaf now exists on less than 155,000 acres. All but 11,000 acres of North Carolina's shortleaf pine is on non-industrial private forest lands.[69] If private landowners are not motivated to maintain and protect this forest type, it could disappear from the landscape.

- **Pond pine,** found in the upland freshwater swamps called pocosins, which declined 50% (to 306,000 acres) since 1990.[70] Pocosins, thick and difficult to penetrate by humans, serve as refuges for numerous wildlife species, including black bears and migratory birds. Many have yielded to agricultural fields and pine plantations.

- **Atlantic white cedar** and other increasingly rare wetland types (bottomland hardwood forests, bog complexes and pocosins) are being lost at alarming rates. Over the past 100 years, Atlantic white cedar forests shrank from over 200,000 acres in North Carolina to less than 10,000 acres.[71] Half of North Carolina's wetlands have been lost to development or conversion.[72] Their future is dependent on the decisions landowners make today.

The spread of urbanization, increasingly fragmented forests and existing harvest patterns raise concerns for those who want to hold onto their forests. Landowner opportunities depend at least in part on the actions of their neighbors, especially as sprawl, fragmentation and management patterns all affect their forests. One forest landowner who recognizes this is Boon Chesson (see "Return of the longleaf prairie," page 13), who lives near Troy in Montgomery County on 107 acres that he purchased in 1974. Since that time he has been slowly converting his loblolly pine stands to longleaf pine on a tract with three sides adjoining the Uwharrie National Forest.

Even with the national forest as a neighbor, Chesson wonders how long he will be able to carry out his management plan, as development pressures increase, even in rural Montgomery County. "Yes, I think it's going to come," he said of encroaching development in his rural landscape. "I think urban sprawl is a serious threat. And when it comes, I will lose the ability to manage for many public benefits we all enjoy."

CHAPTER 4

Current policies: fragmenting forests, failing landowners

"Realtors call all the time wanting me to sell my forest and subdivide it into 'farmlettes.' I don't want to sell my forest, but I need some help to keep it. Current policies don't do enough to keep my forests as forests forever."

Anne Royster, Vance County landowner

North Carolina lacks a coordinated policy to address the threats to its forests. There is little protection of forestlands and the environmental benefits they provide. The state lacks incentives and positive market pressures that would economically reward landowners who retain forests or provide ecosystem services.

In too many cases, after harvesting trees, landowners sell to developers rather than replant, in large part because the state does not provide sufficient incentives and planning tools to deter sprawl from infringing on sustainable forestry operations. In this chapter, we discuss current policies; in the following chapter we offer solutions to address the threats facing our forests.

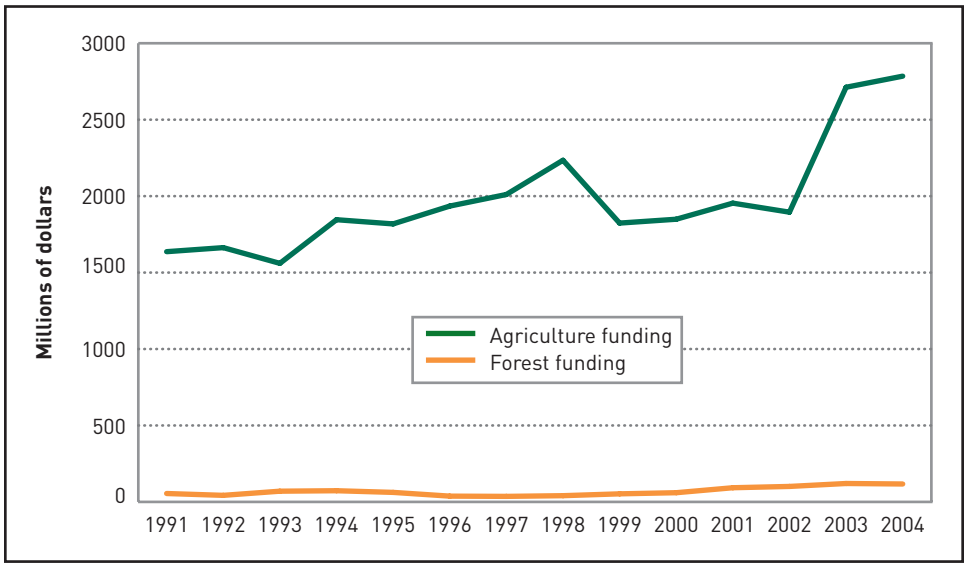
Inadequate government assistance

Unlike their agricultural producing neighbors, forest landowners are offered few government incentives to keep their lands forested. (See Figure 4-1, below.) Every year, the federal government provides some $3 billion in conservation funding for private landowners through the farm bill. Of the suite of conservation programs, forest-related programs comprise just over $100 million annually. Forest landowners are not asking for production related subsidies. But they deserve a fair share of federal conservation funding.

At the state level, limited assistance is available for forest landowners. And most of what is available goes toward

FIGURE 4-1

Federal landowner assistance funding fails forest owners



Federal farm bill conservation programs offer insufficient funding for forest owners (especially when compared to funding levels for agricultural producers). As a result, too many forest owners are unable to implement desired management activities.

Source: USDA NRCS; USDA Forest Service (data); Environmental Defense (chart)

A new beginning

Name: Anne Royster
Location: Vance County
Forest size: 305 acres

When John Royster of Raleigh died unexpectedly three years ago, his wife, Anne, along with her brother-in-law William Royster, inherited a 305-acre forest. Suddenly, the Raleigh woman found herself in charge of a pine forest about 50 miles away in Vance County. To put the forest on a sustainable, income-producing basis, she hired consulting forester David Halley of Holly Springs to come up with a management plan.

Following Halley's recommendations, Royster has thinned the pines, used a 75–25% cost-share program for controlled burns to improve habitat for wildlife and leased the property to a deer-hunting club for $1,300 a year.

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Anne Royster

The land has been in the Royster family since 1903 and Anne Royster wants to keep it that way. "When I go out there, it just makes me feel so good." The forest lies near Interstate 85 and developers approach her periodically with offers. Royster said while she's satisfied with the income from the forest, she'd like to see additional incentives or other sources of income that, in future years, would help the family keep the land and resist development.

Landowners like the Roysters can hold on to their legacies if provided incentives to keep forests intact. For now, they must do it on their own.

land acquisition to protect ecologically sensitive areas. Lesser amounts are available to assist with forest management. In cases where forest owners do apply for government assistance, many are rejected for lack of funds. The currently available funding in the state budget is insufficient to slow the loss of forests.

In recent years, the state Clean Water Management Trust Fund has received $60 to $100 million annually from the legislature, in part to acquire ecologically important lands such as stream buffers and flood plains. However, this fund has only met 40% of the need expressed by landowners and six in ten projects are not funded.[73] The Natural Heritage Trust Fund receives far less funding—approximately $12 million a year—to buy land within rare ecosystems and faces a similar backlog of funding requests.[74] Current funding levels for these programs are simply unable to shield forests from encroaching development.

The state's Conservation Tax Credit program offers another option for landowners who want to protect their land with conservation easements. The tax credit allows landowners to reduce their income taxes as compensation for the value of donated land or easements. Over the past 20 years, the Conservation Tax Credit has helped facilitate the protection of 138,600 acres across the state with a total value exceeding $505 million. Under the tax credit, the total cost to the state has been less than $85 million over two decades.[75]

The federal and state funding available to provide management and technical assistance to private landowners is insufficient to meet the needs. The state's forest cost-share program provides between $2 million and $3 million annually, but this and other incentive programs are oversubscribed.[76] In fact, every year, 75% of landowners who seek stewardship incentives through Farm Bill programs in North Carolina are turned down for lack of funding.[77] For example, North Carolina's annual funding through the federal Forest Land Enhancement Program (FLEP) was depleted in less than four months, leaving many landowners with no assistance. The following year, the funding for FLEP was redirected to pay for damage from western forest fires, leaving private landowners with few opportunities for management assistance funding. Landowners who want to better manage their forests deserve more from government programs.

Disincentives

Disincentives for conservation management and forest stewardship prevent many landowners from maximizing the potential found in their forests or achieving other objectives. These disincentives range from outdated tax laws created many decades ago to local decisions that reward sprawling development. Other disincentives arise when assistance programs focus solely on commercial production at the expense of other landowner objectives.

OUTDATED TAX LAWS

Under state law, local property tax relief is available to farmers and forest landowners who manage their lands for commercial crop and timber production.[78] By offering landowners a lower tax rate, this program—called the Present Use Value Tax program (see "Property tax relief for wildlife management," below)—makes it affordable to keep

Property tax relief for wildlife management

In the early 1970s, state legislators established the Present Use Value Tax (PUVT) program, aimed at providing tax relief for family-owned working farms and forests. Lawmakers were concerned at that time that revenues from farms and forests would not be sufficient to keep pace with rising property tax rates, especially in urbanizing areas. The program was a success, and remains important today for the private and public benefits it provides. In fact, many forest landowners today say that the PUVT program is the number one reason they can afford to keep lands undeveloped.

Unfortunately, the PUVT program is outdated and in many cases works against both landowners and forest conservation. As written, the law provides a tax break to forest landowners only if they clearcut their trees or otherwise manage their forests primarily for commercial timber production. A landowner who wants to maintain forested buffers to protect trout streams, or who chooses wildlife management as his number one objective, loses out. The price of conservation means higher taxes, even when the short-term income potential from the land has declined as a result of the management decision.

Unless amended, the PUVT program will continue to undermine other conservation-oriented public policies, like the One North Carolina Naturally initiative or the Forest Stewardship program. These programs encourage landowners to manage for conservation purposes. A broad coalition of landowners, conservation groups and land trusts is calling on lawmakers to update the PUVT law in order to reward those who generate public benefits, such as clean water and wildlife habitat. See Chapter 5 for more details on this recommendation.

the land forested, especially in urbanizing and other areas where property rates are high. Unfortunately, this 33-year-old law is out of date and should be revamped to provide tax relief to landowners who manage for wildlife and other conservation benefits.

One problem is that different counties interpret the law differently, creating confusion among landowners as to what kind of management practices are required to remain eligible for the tax break. For example, some counties require forest landowners to clearcut or otherwise intensively manage their timberlands in order to get the tax break. Other counties allow for somewhat less intensive timber production.

However, in all cases the law disallows tax breaks to landowners who want to manage for wildlife or other conservation objectives. This means that landowners who wish to improve the upland hardwood forest for wild turkeys or a longleaf pine savanna for bobwhite quail are not eligible for property tax relief. The same is true if landowners choose to commercially manage their forests for non-timber forest products, such as ginseng or pinestraw. Even landowners who put land under a conservation easement, and thereby reduce income-generating potential, can be subject to higher taxes under the current law.

In short, those landowners who are generating the greatest public benefits from their lands are penalized for doing so. (See Chapter 5 for recommendations to reverse this disincentive.)

SHORT-SIGHTED LOCAL DECISIONS

Land-use planning by counties has been inadequate to nonexistent in preventing sprawl from overrunning rural areas. The lack of county planning limits management options for landowners who wish to maintain their forests. In an ironic twist, forest owner property taxes often subsidize the development of sprawl, helping to pay for new sewer lines, roads and schools that, in turn, accelerate the development that threatens additional forest land. In addition, unlike developed lands, forests require few public services beyond the occasional response from a local fire department. In a study of Wake County, for example, for every dollar generated by property tax revenue on residential developments, officials spend $1.54 on residential services, compared with only $0.47 spent on infrastructure for forest and farm owners.[79]

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Existing forest incentive programs tilt toward intensive forest management practices at the expense of conservation objectives.

EMPHASIS ON COMMERCIAL PRODUCTION

Many existing programs tilt toward intensive forest management at the expense of other landowner objectives. These programs are often biased against conservation or management for ecological benefits. One such program is the state cost-share program, the Forest Development Program (FDP), which reimburses landowners for expenses

related to site preparation and tree plantings. The program has spent between $2 million and $3 million annually. In the past few years, 92–95% of FDP funds have been used to promote loblolly pine at a time when there is a surfeit of loblolly pulp in the market, and other forest types, such as longleaf and shortleaf pine, are declining rapidly.[80] As a final obstacle to landowners with conservation objectives, state law limits eligibility for FDP payments to timber production. Landowners with wildlife or water quality objectives are ineligible for assistance.

Inadequate landowner planning

The future of North Carolina's forests depends upon judgments made by landowners, both individually and in concert. The action taken by one landowner to protect and nurture wildlife habitat may be diminished if adjacent landowners convert their forestlands to other, incompatible uses. However, forest owners often lack sufficient information in making decisions about their forests, and few incorporate long-term economic or ecological practices into their planning. Compounding the problem, existing programs and markets rarely reward landowners who cooperate across multiple ownerships.

Several recent surveys reveal some unsettling data about the future of our forests. While landowners rely on their trees to produce an income, surveys show the majority of North Carolina landowners are not actively planning for the future of their forests. Just 3% of landowners have a written management plan, while some 18% of landowners have harvested timber for firewood, sawtimber or pulpwood over the past five years.[81] Even more troubling, landowners who control 14% of the South's forests plan to sell, subdivide or convert their forests in the next five years—a trend that, if it continues, could damage or destroy 2.7 million acres of forest in North Carolina.[82]

Over the coming decade, a generational transfer of forestland is expected.

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For sale signs are an all too common sign that more and more forests are being sold, subdivided and converted across the state.

The average forest landowner is now 60 years old.[83] However, fewer than 10% of surveyed forest owners indicated that they were making plans to transfer their land to heirs.[84] As the generational transfer occurs over the coming years, many of these forests will, in too many cases, be inherited by relatives unfamiliar with forest management and unprepared to own and manage forestland.

North Carolina lacks basic safeguards

In order for economic markets and government incentives to provide a higher level of public benefit from our forests, safeguards must be in place to maintain a reasonable standard of protection. Existing federal and state regulations, policies and programs do little to ensure that forestlands are well managed and that, for example, logging is carried out in a manner that protects water quality.

Forestry, like agriculture, is generally exempt from federal and state environmental regulations that apply to factories and cities, as well as from county zoning. Forestry receives special treatment under the federal Clean Water Act and the state Sedimentation Pollution Control Act.[85] The Clean Water Act allows forestry activities in wetlands, which has resulted in the ditching and draining of thousands of acres of wetlands in North Carolina and their conversion to loblolly pine plantations.

The North Carolina sedimentation law requires developers of more than one acre of land to receive approval before work begins.[86] They must submit an erosion and sediment control plan, must adhere to Best Management Practices (BMPs) and are subject to inspections. However, these rules exempt logging. The state Division of Forestry *recommends* loggers use BMPs but does not require their use. Poor logging practices (e.g., clearcutting along a streamside, poorly constructed stream crossings) foster erosion and let mud slide into waterways, causing another source of non-point source water pollution. (See Chapter 3 for more on water quality.)

Under current law, landowners and loggers must keep mud out of streams and adhere to Forest Practice Guidelines, but there is little or no state oversight or enforcement.[87] Unlike other land-disturbing activities, which require prior notification, forestry activities do not require prior notice. Without preharvest notification, state officials do not know in advance when logging will occur. When inspectors do find a logging site, the operations often have been closed out and any sedimentation has already occurred.

Water quality threatened by voluntary best management practices

North Carolinians have come to expect clean water from their forests. Forests are natural filters. But new survey data from the North Carolina Division of Forest Resources (DFR) show that timber harvests and related activities are often conducted in a manner that removes the natural filtering capacity of forests. These data raise doubts about the ability of existing rules to protect water quality during forestry operations.

Of particular concern are forestry operations that do not observe Best Management Practices (BMPs) for stream crossings and forested streamside buffers, known as streamside management zones (SMZs). A recent survey of BMPs implementation by DFR found 30% of all forestry stream crossings pose a risk to water quality. On sites where BMPs were not correctly implemented, 80% of stream crossings were found to pose a risk to water quality.

Similarly, DFR reports that "survey results show SMZs are not regularly being implemented adequately or correctly." In fact, at 13% of all surveyed sites, DFR staff observed forestry operations actually contributing visible sediment to the stream. Additionally, when BMPs were not properly implemented, 45% of sites were deemed a threat to water quality.

A new approach to forest BMPs is needed if forests are to continue providing the clean water North Carolina's citizens expect.

Survey results are available at http://www.dfr.state.nc.us/water_quality/wq_bmpreportfinal.htm.

CHAPTER 5

Conclusion: a new opportunity to renew forests

"How can we be the best stewards of the land? How can we maximize the best for the older generation and at the same time plan for me and my sister and our children? Meeting these needs will require a new approach to renew our forests."

Tucker Veach, Cherokee and Graham County landowner

North Carolina must do more to protect and restore its forests. Many landowners are helping to lead the effort to maintain existing forests and restore damaged forestland, but they cannot do it alone. Forest owners need up-to-date information, public incentives, private markets and economic opportunities to help ensure North Carolina's forests thrive. Current programs and policies either are not working or are not sufficient. Governments must eliminate disincentives and provide incentives while offering educational and technical assistance to encourage landowners to work together to improve management across the state. Otherwise, the crisis will intensify.

The Veach family's experience provides an example of the challenges facing the 600,000 owners of the state's private forests. (See "Out of the past, into the future," page 29.) They face many challenging decisions: how to manage their timber, which wildlife and conservation values to enhance, and whether to tap into existing federal and state forest programs, to name a few. Like many landowners, they face tough choices as the shadow of development creeps across their forests. Though many decide to sell—North Carolina has lost one million acres of private forest from 1990 to 2002—landowners like the Veaches choose instead to preserve and protect.

"There's a strong interest in conservation among landowners," said David Wear, manager of a research program in the economics of natural resource use for

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North Carolina needs coordinated programs and policies to maintain and restore private forests.

Out of the past, into the future

Name: Veach family
Location: Cherokee and Graham Counties
Forest size: 1,750 acres

The mountain forests of Western North Carolina have yielded income for the Veach family ever since John Bemis Veach came to run the Bemis Hardwood Lumber Co. sawmill in 1935. Veach was a cousin to the family that owned the company, whose forests in Cherokee and Graham counties produced softwood for a pulp and paper mill and hardwood for the furniture industry.

In 1970, Bemis Hardwood liquidated its sawmill and most of its lands at public auction. Today, a family partnership owns a portion of those holdings. Family owners are John Veach's daughter-in-law, Jean Veach; her son, Tucker, an Asheville lawyer; and daughter Meg Trowbridge, a real-estate broker in Chatham County.

The forests now consist of maturing hardwoods, hemlocks and white pines. Now the Veach family wants a plan for managing the forests for sustainability, profitability and environmental sensitivity. "How can we be the best stewards for the land?" asks Tucker Veach. "How can we maximize the best for the older generation and at the same time plan for me and my sister?"

NORTHERN LOGGER & TIMBER PROCESSOR[38]

The Bemis Hardwood Lumber Company allowed several generations to maintain forestland. Today, the sawmill is gone and the family is searching for new ways to retain the forests.

The family hired consultant Peter Bates of Western Carolina University to design a plan. Market forces and environmental concerns will guide them in how they manage the tracts, which adjoin the Nantahala National Forest and the Appalachian Trail. A four-lane highway will cut through Graham County in the next few years, creating further pressure for vacation home development.

The Veaches' management plan may comprise timber harvesting, selling some parcels and putting conservation easements on sensitive parcels. "The better it's done, the more valuable the land will be," Tucker said. "We feel very committed to doing it right...to the extent we can afford it. That's why it's so critical for us to be ahead of the game."

the U.S. Forest Service in Research Triangle Park and co-leader of the Southern Forest Resource Assessment. "I think they would respond to adaptive practices that would benefit the environment."

Expanding opportunities

A concerted, targeted and expanded effort from government agencies and private organizations is critical to stem the loss and degradation of North Carolina's forests. Public funding is required to enhance and expand the provision of public benefits from prioritized private forests. The provision of landowner assistance programs is accompanied by an expectation of landowner responsibility and a need for refocused economic markets.

Public incentives can reward the best and motivate the rest, but incentives alone cannot maintain necessary standards. As forests play an ever-increasing role in maintaining the environmental health of this state and its citizens, public support should be accompanied by appropriate safeguards.

Along with increased public funding and appropriate safeguards, regulatory and otherwise, we need to develop new income streams by restructuring existing markets and creating new ones. Current trends make it clear that existing market forces alone are insufficient to maintain our forests. Traditional markets, coupled with new economic opportunities, offer hope for rural economies and private landowners.

As pulp markets decline, new and expanding income sources emerge, including: the harvesting of non-timber forest products such as ginseng and ramps; cultural activities like hunting and bird-watching; and environmental mitigation, which includes wetland banking and carbon sequestration. Though markets currently do not reward landowners for producing public benefits, valuing "ecosystem services" could marry public benefits with government payments and private markets.

Principles for the provision of public benefits from private forests

Reversing current trends and ensuring healthy forests and landowner opportunities over coming decades will require both changes in policy and significant investments from public agencies, private landowners and concerned citizens. Though few landowners manage their forests exclusively for economic maximization, nearly all need some form of income from their land. To this end, landowners who provide public benefits should be rewarded with (1) increased public incentives; (2) removal of existing disincentives; and (3) access to new markets. As policymakers develop new strategies for forest conservation, they should adopt these principles and recommendations.

NC WILDLIFE RESOURCES COMMISSION

Forests provide numerous public and private benefits.

Principle #1: Statewide forest priorities should be clearly articulated based on current scientific assessments of forest resources and trends.

Recommendation: Using existing data and expertise, the Governor should clearly identify the top priorities for North Carolina's private forests. At a minimum, these statewide forest priorities should include restoration of rare and declining forest types; maintenance of existing biodiversity and wildlife habitats; provision for clean water; improved air quality; sufficient landowner incentives; and enhanced rural economies.

Principle #2: Government programs should promote and prioritize activities that provide multiple public benefits

and advance clearly articulated statewide forest priorities.

Recommendation: The North Carolina Department of Environment and Natural Resources and Department of Revenue, among others, should undertake a public review of all programs and activities that affect forests to ensure that they deliver multiple public benefits and advance statewide priorities.

Principle #3: Comprehensive planning at all levels of government should guide population growth with the goal of reducing the amount of forested acres lost to urbanization.

Recommendation: North Carolina should develop a comprehensive state plan to reduce sprawl and its impacts on rural lands.

Recommendation: Local governments should increase the use of existing planning authority, impact fees and other tools to reduce forest loss.

Recommendation: The North Carolina General Assembly should reward local governments that implement policies to contain sprawl and direct new development and roads away from high-priority conservation areas.

Principle #4: A strong public-private partnership should provide technical and financial assistance to landowners who manage for wildlife habitat, water quality and other conservation benefits.

Recommendation: The North Carolina General Assembly should reform the Present Use Value Tax (PUVT) program to remove the disincentive imposed on landowners who manage forests for wildlife habitat or other conservation values. The legislature should broaden the program to provide tax relief to these landowners. This change can be made in a manner that does not result in a reduction in county tax revenues.

Recommendation: The North Carolina General Assembly should expand the Forest Development Program to provide incentives to landowners who manage forests for wildlife and other conservation benefits. Currently only forest practices aimed at commercial production receive incentives through this program.

Recommendation: The United States Congress should reauthorize the Farm Bill in a way to expand the mix of tools available to private landowners. Among other improvements, Congress should fund 500,000 acres under the existing Healthy Forest Reserve Program. The program provides a mix of tools (cost-share, long-term easements) to conserve, restore and enhance degraded forest systems on private lands to promote the recovery of threatened and endangered species.

Principle #5: Funding for conservation easements and other tools, which allow landowners to retain their forests, should be available at sufficient amounts to adequately address the rate of forest conversion and other threats.

Recommendation: The North Carolina General Assembly should support Land for Tomorrow, an effort to help North Carolina meet its goal of saving one million acres by authorizing $200 million a year for five years to purchase or protect conservation lands.

Recommendation: The North Carolina General Assembly should authorize a state-funded version of the federal Forest Legacy Program, an easement acquisition program. A state Forest Legacy Program would assist in matching federal and private dollars as the state strives to meet the goals of the One North Carolina Naturally program.

Recommendation: The North Carolina General Assembly should continue to support the state's Conservation Tax

NC DIVISION OF TOURISM, FILM AND SPORTS DEVELOPMENT

Forests are the source of clean water, wildlife habitat, economic opportunity and family legacies. Immediate action is needed to ensure private forests continue to provide these desirable benefits.

Program, which provides landowners a credit against their state income taxes for donating land for conservation purposes.

Principle #6: Public support should be provided for emerging markets that 1) provide multiple public benefits; 2) contain necessary safeguards to keep forests functioning as forests; and 3) offer economic benefits to private forest landowners.

Recommendation: The Department of Environment and Natural Resources should convene a stakeholder panel to provide recommendations on the possible implications of the many potential new markets that could emerge in the near future.

Principle #7: Forest landowners and the general public deserve appropriate regulatory guidelines and baseline standards that ensure both economic opportunity and ecological stability.

Recommendation: The Governor and the Environmental Review Commission (ERC) should conduct a review of existing laws, rules and policies aimed at reducing adverse environmental impacts from forestry activities (e.g., sediment pollution, loss of wetlands). At a minimum, the Governor and ERC should develop recommendations to strengthen existing laws, rules and policies to reduce adverse environmental impacts.

Recommendation: The General Assembly should amend the Sediment Pollution Control Act to require use of Best Management Practices (BMPs) for water quality and require notification prior to timber harvests or other land disturbing activities on forest land to better protect water quality and other forest values.

Taken as a whole, these potential new markets and a simultaneous reorientation of state and federal programs could help to arrest—or at least slow down—the rapid loss of North Carolina's forests. That, in turn, would minimize fragmentation and empower more landowners to maintain their forests in the path of

encroaching development. With public support, forest landowners will continue to provide the many benefits that flow from private lands. Now is the time for a renewed effort to combine all available tools to address the many threats facing the state's privately owned forests.

In expanding programs and incentives for forest landowners, it is important to keep in mind the comment of David Wear, a Forest Service economist: "The real key is to be more explicit about the services needed and what you want to get out of the landscape."

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