

CHAPTER 2: NEED FOR STRATEGIC CONSERVATION PLANNING

North Carolina is rich in natural resources. Of its total land cover of 31 million acres, approximately 19 million acres remain in a relatively natural state, primarily composed of forests and wetlands (GAP, 2003). The natural resources provided by these undeveloped lands support many aspects of our economic development, cultural heritage and quality of life. These natural assets directly provide a living for people in some industries such as fisheries, forestry and outdoor recreation. For city dwellers, filtration through forests and wetlands provide clean drinking water. For those living or farming near shorelines, streams or steep hillsides, natural vegetation protects their land from erosion. Nature lovers enjoy recreational time hiking, camping, observing and photographing the diversity of plants and wildlife.

In order to protect those essential resources in a sustainable way, scientists suggest that a minimum of 20 percent of natural lands should be retained (ELI, 2003). To maintain these long-term benefits, our state must determine which 20 percent to conserve. *North Carolina needs a conservation planning tool that can be used to determine which natural lands are most critical for protection of ecological functions and natural resources.*

Threats to our Natural Landscape

North Carolina is the sixth-fastest growing state in the nation, with some counties growing as much as 50 percent between 1990 and 2000. By 2030, the number of residents is expected to rise to more than 12 million. This rapid growth has brought many good things to North Carolina – jobs, cultural diversity and new ideas - but while our population is growing, our supply of land is not.

You can travel almost anywhere in North Carolina and witness the changes to the landscape created by our increasing population. More than one million acres of natural and rural land have been developed during the last decade. Malls and subdivisions are sprouting from former farm fields. Our current patterns of development use a great deal more land per person than we did in the past, approximately two acres per person. (NCPIRG, 2003)

Other changes are less obvious to the casual observer, but critically important to our quality of life. An adequate supply of clean drinking water has become a major concern. Stormwater runoff floods downstream communities and forces closure of shell fishing areas. Air quality is being compromised as more cars jammed on crowded roads spew more pollutants. Massive forest fires threaten neighborhoods adjacent to historically abundant woodlands. Eighteen percent of North Carolina's native species are in danger of extinction.

In a sense, we are in a race against time. Once an area is developed, it will remain so indefinitely. Development is proceeding at a rapid rate, all across the state. A statewide strategy for conservation of our natural resources can ensure that generations to come will have the same opportunities to enjoy North Carolina's outstanding natural resources and high quality of life that we have today.

Due to public and scientific concerns about the loss of our natural resources, there is widespread support for development of a statewide strategic conservation plan to help determine the future of open space in our state. When Land for Tomorrow conducted a statewide poll in 2004, more than 70 percent of respondents had concerns about pollution of waterways, loss of wildlife habitat, air pollution and loss of farmland. In addition to these specific issues, there was concern for a lack of adequate land use planning (Land for Tomorrow, 2005).

Strategic Conservation Planning Benefits

Strategically planning for growth in North Carolina in an environmentally sensitive way will benefit all of our state's citizens. The Conservation Planning Tool can help to identify essential areas in the landscape for conservation, while at the same time helping guide development to those areas where it might have the least amount of impact. This collaborative approach to conservation planning and development planning can help communities prioritize conservation needs and determine where to direct new growth and development. The Conservation Planning Tool can provide a framework for future growth while also ensuring that significant natural functions and resources will be preserved for future generations.

To ensure that our native species of plants and wildlife flourish in North Carolina, the significant natural areas that support them are being identified and preserved. The state's strategic conservation planning effort focuses on the identification of existing significant habitats, based on the needs of both wildlife and humans, as well as focusing on lands that can be identified as serving multiple benefits for compatible land uses. This natural network, once identified, should serve to inform future growth patterns for win-win scenarios.

Focusing on a strategy for permanent protection of a functional system of essential natural resources will:

- Provide a balance to protecting land that provides resources consumed by humans (e.g., crops, seafood), resources that directly benefit humans (e.g., recreation, wetlands, water sources, floodplains) with protection of ecological services;
- Ensure the continuation of ecosystem services in each region that help clean the air and water;

- Support North Carolina's economy, especially the agricultural and forest products industry, seafood industry, nature tourism and outdoor recreation;
- Reduce the need for expensive storm water management, flood control and restoration projects by protecting water resources including streams, wetlands and riparian corridors; and
- Address commitments in the Million Acre Initiative supported by law G.S. 113A-241.
- Save money in the long run, as it is easier and cheaper to protect what is working now than to try and fix it later.

Strategic conservation planning will benefit existing conservation programs by:

- Conserving and connecting large contiguous areas of natural land, containing important natural resources;
- Providing a focal point to coordinate existing conservation programs and increase their overall effectiveness and efficiency; and
- Guiding and coordinating land conservation and preservation efforts across the state.

Developers, private landowners and others benefit from having a clear understanding of where the most ecologically valuable lands are located, and where targeted conservation activities will be directed. Citizens interested in increased stewardship activities will know where their efforts are most needed. Land planners and developers can use the Conservation Planning Tool maps as a reference in the development of site plans and management objectives.

Local governments can use the Conservation Planning Tool maps and data to enhance their efforts to provide open space, recreation lands and natural areas that retain the unique character of their communities and rural landscapes. This can complement their efforts to direct growth to specified areas.

Land trusts can also benefit. Conservation groups, and their members, will find that focusing on green infrastructure will give them a greater overall impact. It not only identifies large blocks of habitat and linkages; it gives a sense of how each given place fits into the larger landscape.

Valuing Ecological Benefits

This state's natural resources provide a wide variety of ecological benefits that support human needs, playing essential roles in maintaining both our health and society's economic well-being. The ecosystem services lost when wetlands and forests are taken for development are hidden costs to society. These services, such as cleansing the air and filtering water, meet fundamental needs for humans and other species. In the past, the resources providing these services have been so plentiful and resilient that they have been largely taken for granted.

With our tremendous population increase and rapid consumption of natural lands, these natural services must be afforded greater consideration. (Moore, 2002)

When local decision makers consider which areas to preserve and which to develop, the debate arises about direct economic benefits. By recognizing the value of the services provided by nature as they plan their communities, they can ensure that valuable natural services will continue for future generations, providing cheaper natural systems rather than the higher cost of developing and maintaining engineered systems to maintain our environment.

From an economic perspective, ecological benefits provided by our natural resources fall into two major categories: market and non-market. The market category includes those items that people can buy or sell directly, such as food and water sources, commercial fish and livestock, and timber. Within the non-market category are three sub-categories: direct-use, indirect-use and non-use:

- Direct-use includes recreational activities directly enjoyed by people, by which the resource is either consumed (fishing, hunting) or not consumed (boating, bird watching, hiking).
- Indirect-use resources are functions that provide secondary benefits to people through biochemical processes, like pollination of crops, groundwater recharge, water purification and maintenance of biodiversity. These indirect-use benefits are often taken for granted, but we value the life support provided by them.
- The final sub-category, non-use, is harder to justify on a purely economic basis; setting aside wilderness areas for future generations and preserving endangered species because of their inherent value are a critically important part of environmental stewardship.

Assessing Ecological Benefits

The value of each of these types of ecological benefits was deliberated as we developed our strategy for statewide conservation planning for our significant natural resources. The selected approach does not value one kind of benefit over another, but separates them into six “Essential Ecosystem Resources” classifications. Among these groupings, many kinds of market and non-market benefits are given consideration.

Within these classifications, separate assessments were developed to evaluate the relative value of particular resources. Some assessments focus primarily on marketable commodities, such as lands that produce agricultural and forest products. One assessment, Biodiversity and Wildlife Habitat, targets the indirect-use and non-use benefits. The Open Space and Conservation Lands assessment documents areas that have been set aside for conservation

purposes and/or recreational activities. Two other assessments, Water Services and Marine/Estuarine Resources, address our abundant but threatened aquatic resources, which provide both direct and indirect-use benefits.

Essential Ecosystem Resources

A. Biodiversity and Wildlife Habitat

North Carolina's undeveloped lands provide the bulk of the state's natural ecosystem support system. They serve as vital habitat for wild species and maintain a vast genetic library. One of the most crucial aspects of ecosystem functions is the maintenance of biodiversity, which includes the varied and complex collection of all living things, including humans. Biodiversity is evaluated at a number of levels, from the most familiar - species - to genetic variation within species, and to the variety of natural communities and landscapes.

Biodiversity is important to maintain healthy ecosystems that perform essential functions, but also because diversity allows for resilience and future adaptation. Recent discoveries of how quickly and drastically climate has changed in the past and is likely to change in the near future highlight the importance of biodiversity. Currently abundant and influential species were rare in the past, and species that are rare now may become much more important to future ecosystems. Protection of at least some good examples of all the different kinds of habitat and species is therefore an important component of the plan. Broad protection must be accomplished where different kinds of species and habitat occur. Rare species and those that are particularly sensitive to landscape-scale processes need special attention.

Processes that occur at broad landscape scales are also important aspects to consider in conservation planning. These key landscape functions include the dispersal of individual animals, gene flow, the ability of species to colonize and re-colonize natural areas, and support of species that require very large home ranges. Some wide-ranging carnivores, such as bear and bobcat, are keystone species that have a very important effect on whole ecosystems as they regulate herbivore populations. Even non-keystone species may depend on large landscapes for their survival. All natural lands become less viable if they are isolated from the larger natural landscape. Therefore, the protection of remaining large expanses of natural lands and of connections between natural lands is an important component of this plan.

B. Water Services

As North Carolina grows, so will its demand for safe drinking water. The expense of water treatment increases as the water quality at the source decreases. Protecting and preserving drinking water sources is the first line of

defense in ensuring safe and affordable drinking water, which in turn, enhances public health and economic welfare.

Aquatic systems are widely recognized as essential aspects of ecosystem function, because of water's direct benefit to humans, and the potential harm if not clean and in adequate supply. Protection of biodiversity and natural conditions are as important for the state's streams, rivers, lakes, estuaries, and ocean as they are for the land. However, protection efforts must focus not just on water bodies of interest, but on water sources and ocean bioregions. Of particular importance are riparian buffers, the lands immediately adjacent to the water runoff. Water flowing over the land can be filtered by riparian vegetation, which slows water velocity and regulates water temperature. Effective aquatic protection must often take a watershed approach, with consideration for all of the streams in a watershed. Protection of the water in the upstream tributaries is crucial to protecting the stream. Along with riparian buffers, there is special functional importance to floodplains and wetlands. These areas store water and help to regulate hydrology, as well as filtering water, cycling nutrients and providing crucial habitat for many species.

C. Agricultural and Forestry Lands

The \$68 billion agribusiness industry is the leading industry in North Carolina (Waldon, 2007). Seventeen percent of the N.C. labor force is employed in agriculture or agribusinesses. The forest product sector is now North Carolina's largest manufacturing industry. It is critical to maintain our working forests and farms to meet the economic needs of the state. North Carolina lost more prime farmland between 1987 and 1997 than any other state except Ohio and Texas. And for the first time since the 1930s, falling forest acreage contributed to a decline in the volume of the state's timber-growing stock.

Working farms provide benefits to local government tax base. An American Farmland Trust survey found that for every dollar in taxes received from farm and forest lands, the national average cost of services provided by the government is only 34 cents. In comparison, the cost of services provided to residential development average \$1.15 per dollar of taxes received. Therefore, farms generate a net gain of revenue for the tax base that generates economic benefit for counties and local governments. Surveys in North Carolina have shown similar ratios (Renkow, 2001).

The ecological, recreational and economic impacts of our forests are significant, since North Carolina's forest lands cover 18.3 million acres – 59 percent of the state's land area (National Land Cover Database). Our state's forests play a major role in ecosystem services, as woodlands influence the wind, soil, stream flow, water quality, air quality, fish and wildlife populations and climate of our

state. The citizens of North Carolina depend on forests for production of food and medicine, as well as wood for paper, construction and energy products. Additionally, for both residents and the numerous tourists, our forests are a joy to see and explore.

Agricultural lands also provide a variety of environmental services. For example, they provide wildlife habitat and are critical for their ability to recharge groundwater in our communities. By providing a local source of food, they also reduce the consumption of fossil fuel associated with the long-distance transportation of goods. Agricultural lands also sequester significant amounts of carbon, helping to mitigate global warming.

D. Marine and Estuarine Resources

Coastal fisheries of North Carolina are among the most productive in the nation. Since 1997, the recreational fishery has on average ranked second in terms of pounds landed, compared to other Atlantic coast states, and the commercial fishery has ranked fifth (Street, 2005). Both commercial and recreational fisheries fuel the economy of coastal communities, providing jobs for fishermen, dealers, seafood processors, charter boats, tackle and equipment suppliers, boat manufacturers and seafood restaurants, as well as enhancing tourism. Approximately 7,500 licensed commercial fishermen and 800 dealers work in North Carolina. More than 27,000 jobs are generated by the commercial fishing industry, yielding an annual payroll exceeding \$116 million. Recreational fishing in the state includes 1.6 million anglers annually. In Carteret County alone, sport fishing is estimated to contribute about \$75 million to the local economy annually and provide more than 1,800 jobs. (Diaby, 1999) Coastal communities in North Carolina have a strong heritage of commercial and recreational fishing, and that culture should be sustained for the future.

Several factors are thought to contribute to the exceptional productivity of North Carolina's coastal fishing industry. North Carolina's estuarine system, framed by a chain of barrier islands, is very extensive (2.3 million acres). Since more than 90 percent of commercially important species and more than 60 percent of recreationally important species in this state are estuarine dependent, the large amount of estuarine waters increases the habitat available to organisms, increasing the system's productivity. N.C.'s coastal waters support a wide diversity of habitat types, including submerged aquatic vegetation, shell bottom, freshwater and estuarine wetlands, ocean hard bottom, and soft bottom. This diversity of habitats supports species with different life history requirements. In addition, North Carolina is located at a transition point between the mid-Atlantic and South Atlantic zoogeographic zones. Because of this, species at both their northern and southern ranges occur in North Carolina, increasing the overall diversity of organisms.

E. Open Space and Conservation Lands

The state of North Carolina has significant natural areas owned by federal and state government agencies that are set aside in perpetuity. These lands form parts of the “green infrastructure network” that are permanently managed as open space. The existing open space and conservation lands that are in “permanent conservation” and are actively managed by a public entity must be identified first, before prioritizing new areas for conservation.

Understanding what lands are already under some sort of protection provides a valuable opportunity to:

- Expand those areas,
- Make connections between them, and
- Fill in gaps with additional lands containing valued natural resources.

In assessing the future open space needs in the state’s natural network, the Open Space and Conservation Lands data layer will provide a baseline. Conservation opportunities can then be evaluated on the basis of what is prioritized in the other five focused assessments that comprise the Conservation Planning Tool.

Realistically, evaluation of priority areas for conservation is limited to what current research shows to be significant. Further focused field study and research is needed to determine specific amounts of land and natural resources required to complete a sustainable network of functioning ecosystems. For example, there is little scientific data available at this point to determine “how many trees do we need?” A comprehensive understanding of the overall future needs of the whole network, as scientifically-based projections, will be addressed as more information is gathered from the appropriate agencies.