

CHAPTER 13: IMPLEMENTATION OF CONSERVATION PLANNING TOOL

The approach to protecting green infrastructure involves five steps:

1. Identify lands in your area that have been identified as the most important by reviewing the Conservation Planning Tool report and the series of focused assessments. These statewide layers can be overlaid on any existing land use map at the same scale, including parcel data;
2. Verify the presence and value of these lands on the ground;
3. Conserve those lands that are currently not protected through targeted acquisitions and easements;
4. Explore the possibility of connecting these lands via a system of connectors through conservation or restoration;
5. And lastly, implementation of actual land conservation, including management, is performed by various state programs, local governments, land trusts and other entities.

What is the Status of North Carolina's Green Infrastructure?

The acreage converted to development is increasing even more rapidly now, as suburbs expand outward and large-lot houses are built in formerly rural areas. The scattered pattern of modern development consumes an excessive amount of land and fragments the landscape. However, we understand that growth is a part of our state's economy and prosperity - growth is not the issue, it is the pattern of growth. Growth is not necessarily essential to economic health, but sustainability is!

As forests and natural lands are divided and isolated by roads, houses and shopping malls, wildlife habitat and migration corridors are lost, and normal ecosystem function such as absorption of nutrients, recharging of water supplies, and replenishment of soil are disturbed or destroyed. Water quality has been degraded in numerous streams and rivers. Many remaining wetlands have been drained, filled, polluted, or otherwise degraded. Habitat loss and fragmentation have contributed greatly to a continuing loss of biodiversity in North Carolina. At least 7 plant and 21 animal species have been extirpated from North Carolina. Another 907 plants and 565 animal species are rare, threatened or endangered.

Billions of dollars are spent each year to construct or maintain the state's built infrastructure of roads, bridges and utilities that we depend on for modern life. By contrast, the state's green infrastructure, which exists naturally, is under tremendous pressure from development, yet is virtually ignored in public policy. Left unprotected, the remaining green infrastructure is vulnerable and will be further reduced and fragmented. North Carolina is projected to grow in population by four million in the next 25 years. Under current rates, this translates to the loss of an additional 8 million acres in that same 25 year period.

Focusing conservation efforts on green infrastructure will help protect the ecological health found in each region of the state, including forests, streams and wetlands, preserving and enhancing this heritage for future generations. By acting now, North Carolina can ensure cleaner air and water for its citizens, safeguard habitat needed to spare native animals and plants from extinction, and preserve outdoor recreational opportunities that a large and increasing number of residents and visitors enjoy.

Creating partnerships at all levels of involvement, in all areas of land and water planning, conservation and stewardship of our state's most significant natural resources is essential to the success of the statewide effort and the future of North Carolina.

Importance of Field Verification at the Parcel Level

Determination of existing significant natural resources is in many cases made from on the ground data. However, because of our ever changing landscape, field verification of current data will need to be confirmed before any major investments toward conservation are made. In addition, some datasets were evaluated on land cover data, aerial photography, and modeled projection. These again are cases where field verification are required.

Future iterations of the Conservation Planning Tool will include more in depth evaluation of other factors that may influence the investment of conservation dollars. For instance, the identification of potential restoration needs to be based, in part, on the presence of gaps in the green infrastructure, as well as the estimation of the degree of threat of conversion the property faces if fee or easement acquisition is not pursued.

Identifying Data Gaps

Landscape/Habitat Indicator Guilds: The use of Landscape/Habitat Indicator Guilds in this plan has proven to be a comprehensive and accurate way of determining conservation targets for large scale essential habitats. This is currently the most accurate tool available for addressing landscape integrity and habitat fragmentation. To date this approach, due to limited funding, has been focused in the coastal region of our state and furthermore focused on the riparian landscape and species. Continuation of this process for the remainder of the state and upland habitats and species is crucial to understanding the ecosystem needs of the state as a whole.

County Natural Heritage Inventories: In some areas of the state, field inventories have not been completed. The Natural Heritage Program conducts detailed field inventories on a county by county basis, with a lead biologist focusing on each county for approximately two field seasons. Data collected during inventories

feeds directly into NHP's protection work. Since the 1980s, approximately 80 counties have been surveyed individually or as part of regional studies, with six counties currently in progress and 14 that have had little or no comprehensive survey to date. In addition to counties that have not yet been surveyed, data from the earliest inventories is becoming outdated. Two important areas in which to focus survey efforts are the northeast/middle coastal plain and in all mountain counties. In these areas ecosystem integrity likely remains high, yet development pressure is predicted to rise and could pose new threats. Increased use of predictive modeling in the future may also identify new areas which should be high priorities for inventory.

Developing an Adaptive Strategy for Climate Change

A complete vulnerability study will be completed as part of the conservation planning process. This assessment would not be complete if climate change was not addressed. North Carolina is vulnerable in many ways to climate change.

In the best case scenario, we can expect global temperatures to rise about 2.5 Fahrenheit degrees by 2100. Globally, we expect more precipitation, but mainly in wet seasons and wet places. Dry seasons and dry places are actually expected to be drier. Storms are expected to become stronger as the result of a warmer, wetter atmosphere. In North Carolina, we expect warmer, wetter winters and hotter, drier summers. We also expect more severe thunderstorms, hurricanes and nor'easters. In North Carolina, much of the state has already changed to a new, warmer USDA climate zone in just the last 15 years. Here in the Triangle, our climate has changed from Zone 7 to Zone 8. USDA climate zones are based on winter minimum temperatures.

The unique climate-soil combinations, on which many species depend, are expected to decrease. As much as 86 percent of the unique climate-soil combinations are projected to disappear from North America within 100 years. This in itself will be devastating, but when combined with the speed at which it is expected to occur – will nature be able to adapt in time? Species and ecosystems have never had to adapt this fast before. During the Ice Age, the transition from the coldest temperatures to the warmest took 10,000 years. That same temperature change is predicted to occur now in only 100 years.

In the Albemarle Region, we have a landscape that is defined by the many interactions of land and water. The Albemarle Region is critical for the conservation of North Carolina's global natural heritage. This region is one of the continental areas most severely threatened by rising seas.

Relative sea-level rise in the Albemarle Region is presently 2 inches in 10 years. The rate of inundation will increase between two and three times. A million acres

will be under water in fewer than 200 years – perhaps a lot fewer. About half a million of those acres are already in conservation ownership.

We believe that there are proactive steps we can take that will increase resilience of the natural systems of the Albemarle Region so they can progressively adapt to the rising sea.

THE FOUR MAIN THREATS WE NEED TO COUNTER:

- Salt intrusion into the interior via ditches
- Higher energy currents, waves and storm surges
- Rising water and moving habitats
- The false perceptions that nothing can be done, or worse, that something should be done Later

For more than 200 years, people have been digging ditches in the Albemarle Region to control mosquitoes, to drain land for agriculture and timber management, to provide fill for road construction and now to provide waterfront (canal front) real estate. But now, with rising seas, the ditches provide conduits for salt water to reach the interior.

When salt water comes in contact with peat soils, it causes them to rot very rapidly. This results in both local and global problems:

- Locally, as the peat soils rot, the land subsides, and the rate of inundation increases.
- Globally, the loss of these peat soils results in vast amounts of previously sequestered carbon being released into the atmosphere as carbon dioxide and methane.

The Nature Conservancy established monitoring nodes and contracted with Duke University to provide a sophisticated network model of the drainage system. Their primary strategy for reducing coastal energy is to build oyster reefs to buffer wave action and to slow currents. Oyster reefs will also sequester new carbon, help to ensure clean water and provide habitat for many species in addition to oysters.

As the sea rises, we will need to plant salt marsh species ahead of the moving front and seagrass beds on newly submerged lands. We need to plant cypress in the interior. We also need to prevent the hard armoring of the shore. We can best accomplish these strategies through the acquisition of conservation lands and agreements with other landowners. Implementation of the various restoration projects (oyster reef, tree and grass planting, etc.) represents an outstanding opportunity for community and volunteer engagement.

These strategies and others like them provide a slow transition from one kind of ecosystem to another, as well as sequester new carbon in salt marsh peat and cypress wood, and we take additional steps to prevent the erosion and decomposition of the peat already in the soil.

If no proactive strategies are developed to address climate change, in much less than 100 years it is projected that we will see a severely eroded shore, punctuated in places by failed bulkheads, while offshore, the bottom is finely textured mud, stirred by every storm and essentially devoid of life.

Unfortunately, we already have more than a few places where we can see this happening.