

A CASE STUDY:

NATURAL RESOURCE PLANNING TOOLS FOR SMALL TOWNS



Courthouse in Pittsboro, NC

Many rural communities in the Piedmont Atlantic Megaregion of the southeastern United States face development pressures that threaten their natural resources. Rural communities often have a limited number of staff to devote time to develop strategies to proactively conserve these resources and the social, environmental, and economic services they provide. It can be challenging to protect green infrastructure while providing the built infrastructure needs of a growing community.

The purpose of this case study is to illustrate the types of tools or strategies that can be used by a community to prioritize and protect their important natural areas. This case study outlines the planning tools

applied in Pittsboro, NC, a small community facing intense development pressure and significant changes to the character of their community and the surrounding area. The outcomes of the tools specifically address Pittsboro's situation but the process outlined in this case study provides a framework for assessing and reassessing any community's goals and identifying natural resource protection needs. In addition, the reports and summary reports resulting from Pittsboro provide background information that can inform discussion for any community, as well as justify the importance of the tools in the planning process. It is hoped that the work done in Pittsboro can serve as a template for other communities wishing to proactively conserve their natural resources.



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The natural resource planning tools project for Pittsboro was a collaborative effort between the Chatham Conservation Partnership, Town of Pittsboro, Urban & Community Forestry Program of the North Carolina Forest Service, Green Growth Toolbox Program of the North Carolina Wildlife Resources Commission, North Carolina Natural Heritage Program, Duke University Nicholas Institute for Environmental Policy Solutions, Robeson Creek Watershed Council, Global Ecosystem Center, New England Environmental Finance Center, Biocenosis LLC, and Piedmont Conservation Council.



According to a recent report by Smart Growth America (Ewing et. al 2014), cities of all size classes in the Piedmont of North Carolina rank in the top 10 for sprawl. In the Raleigh area, 3 times more land is developed per person now than in the 1970s (RENCI 2009, RENCI 2012).

The Raleigh, Durham, Chapel Hill area, collectively referred to as the Triangle, is home to the Research Triangle Park (RTP), one of the largest research parks in the world. It drives local economic development and spurs growth in the surrounding communities and rural areas.



Harperella
Source: www.fs.fed.us

I. BACKGROUND

Between now and 2050, more than half of the population growth and as much as two-thirds of the economic growth in the United States is projected to occur in interconnected areas known as megaregions. The Piedmont Atlantic Megaregion, one of the fastest-growing megaregions in the United States, extends north from Atlanta, Georgia to Raleigh and Durham in North Carolina. The megregion is projected to increase its 2000 census population by almost 70% by 2050.¹



The Town of Pittsboro, NC, is representative of the unprecedented growth facing rural communities throughout the megaregion. Pittsboro is the county seat of Chatham located in central North Carolina. The landscape of Chatham County is still largely dominated by small farms and extensive forests and the county lies entirely within the Cape Fear River Basin, drained by three major rivers and their tributaries: the Haw, the Deep, and the Rocky Rivers that come together to form the Cape Fear River, the largest river basin in NC. These rivers are home to the federally endangered [Cape Fear shiner](#) and a federally endangered plant, [Harperella](#).

The rural character of the county is changing due to population growth in the Triangle. One of the most prominent, and desirable, features of Chatham County is Jordan Lake, on the east side of the county. The area around Jordan Lake is one of the richest natural areas in the entire Triangle region and the largest water supply for the Triangle region. In 2014, 7,120 undeveloped acres in Pittsboro’s extraterritorial jurisdiction were rezoned as a Planned Development District (PDD) to accommodate mixed-use development. Over the projected 30-year build-out of this one development, the population of Pittsboro is expected to grow from just under 4,000 to more than 60,000 people.

The planning tools were created in the face of this significant change . Several of the tools developed for Pittsboro were based on tools introduced in the NC Wildlife Resource Commission’s (NCWRC) *Green Growth Toolbox* (GGT). The tools used in Pittsboro are introduced in Section II of this case study and are summarized as standalone reports in the Appendices. The complete list of planning tools is:

Appendix A. Summary of the Biodiversity and Wildlife Habitat Assessment for Pittsboro, NC: The Biodiversity and Wildlife Habitat Assessment (BWAHA) is a tool that helps highlight areas of significant natural resources. The result of the assessment is a map that represents the highest priority areas for conservation of wildlife habitat and biodiversity.

Appendix B. Summary of Land Cover Change Analysis and Urban Tree Canopy Assessment for Pittsboro, NC: The analyses used to create land cover data and to complete a tree canopy assessment for Pittsboro is documented. These data sets are used to calculate the economic value of the following ecosystem services: stormwater storage, air pollution removal and carbon storage provided by the forest and other green infrastructure.

¹ Center for Quality Growth and Regional Development (CQGRD) at the Georgia Institute of Technology

Green infrastructure refers to the use of soil, vegetation and other natural landscape features to manage and provide environmental services.

Appendix C. Strategies to Incorporate Green Infrastructure for North Carolina:

This brief guide presents approaches for incorporating **green infrastructure** through Carolina communities.

Appendix D. Summary of Developing Tree Protection Ordinances in North Carolina:

This is a guide that provides multiple references and examples of ordinances language that can be adopted to ensure tree protection for sites undergoing development. Primarily, protection of tree canopy is addressed, but additional protection through tree save areas and specimen trees is discussed.

Appendix E. Summary of the Natural Resource Conservation Ordinance Recommended for Pittsboro, NC:

The process used to draft a proposed natural resource overlay district that complements development is documented.

Appendix F. Summary of an Analysis of Future Property Tax Revenues and Co-benefits of Conservation for Pittsboro, NC:

This is a summary of the study on property tax revenues for a future buildout scenario using available data in the Pittsboro extraterritorial jurisdiction (ETJ), and how the property tax revenues change as conserved open space is increased. Also, the positive co-benefits associated with conservation are examined in this report

Appendix G. Possible Funding Sources: This provides a list of grant opportunities that could potentially be used to fund conservation planning and policy development.



The NC Wildlife Resource Commission **Green Growth Toolbox Handbook: Section 4. Green Planning: Enabling Wildlife and Habitat Conservation** outlines a comprehensive strategy for developing and implementing a conservation plan.

II. NATURAL RESOURCE PLANNING PROCESS

The planning process used in the project outlined in this case study generally follows the six green infrastructure-planning steps laid out in [Evaluating and Conserving Green Infrastructure Across the Landscape: A Practitioner's Guide](#) developed by the [Green Infrastructure Center](#). Each step is introduced below, followed by a discussion on the approach used in the Pittsboro case study.

Step 1. Set Your Green Infrastructure Goals

Step 2. Review Data

Step 3. Make Asset Maps

Step 4. Assess Risks

Step 5. Determine Opportunities

Step 6. Implement Opportunities



Step 1. Set Your Green Infrastructure Goals – What does your community value?

Goal-setting is an important first step, not only to ascertain what the community values, but also to build consensus for future implementation. Before a community can set goals about natural resource protection they may need to be informed about their natural resources. To determine what a community values requires a public forum for sharing information for discussion between local land use advisors, decision makers and stakeholders. Maps of community natural assets that can be viewed and commented upon by the public can facilitate discussion and goal setting. Community goals can range from overarching goals, such as protecting water quality, to specific goals, such as protecting a known wetland habitat.

Often, in a local government planning process, the goals of the community are set by the planning board or upon recommendations from a local government advisory board or committee. It is possible, however, for other stakeholders to assist with the process, especially where staff time is limited, and where there is a working relationship established and an understanding of the concerns and constraints of both parties. Organizations such as the N.C. Wildlife Resource Commission can also serve as an excellent source of wildlife and natural resource information.

**The North Carolina
Conservation
Planning Tool
provides Internet
links to regional
conservation
partnerships**

To engage the entire community, it is essential to be inclusive in goal-setting and building project support. Meetings, with all stakeholders, not just the conservation community, should be held. There are many avenues for local decision makers and stakeholders to be informed and discuss green infrastructure options such as:

1. Watershed groups or the Soil and Water Conservation District,
2. Neighborhood groups,
3. Meetings of town and county government bodies,
4. Project advisory committees, and
5. Online discussions.



Chatham Conservation Partnership meeting

At the request of the Town of Pittsboro, a partnership with the Chatham Conservation Partnership (CCP) was initiated. This was a natural choice for managing a public forum, as quarterly CCP meetings are open to anyone who has an interest in Chatham County's natural resources. Towns, counties, regional governing institutions and local community members, including local development and business leaders, may participate in such conservation partnerships.

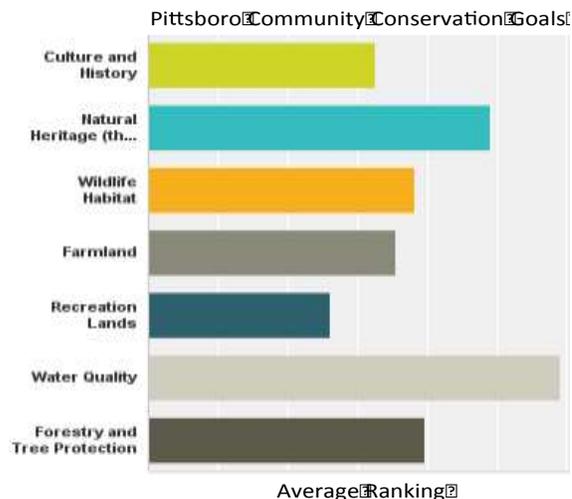


The CCP facilitated a stakeholder group, the Conservation Ordinance Review Committee (CORC), to develop recommendations on approaches to planning and development that would address the conservation goals of the Pittsboro community. The committee:

- Included representatives from the Board of Commissioners, the Planning Board, Chatham County Extension, NC Forest Service, Chatham Park developers, the Pittsboro Business Association, Grand Trees of Chatham, and town staff;
- Met bimonthly for two to three hours for six months;
- Presented committee recommendations in three-hour long work session with to Pittsboro Board of Commissioners and town staff; and
- Documented all meetings, presentations and recommendations online, on the [Chatham Conservation Partnership Wiki](#).

In Pittsboro, project partners took advantage of town and county board meetings and public forums planned by the local watershed group, the Robeson Creek Watershed Council, to gather information from the local community on conservation priorities. In addition, an online survey was conducted to create a framework to rank potential conservation areas within the town of Pittsboro and its ETJ. While not every resident

responded to the survey, the feedback indicated that that water quality, with the protection of headwater streams, was the highest priority for the majority of respondents. Respondents also indicated that they prioritized protection of large intact forests to provide wildlife habitat and forestry ecosystems.



Step 2. Review Data – What data is relevant to your community goals?

Every community has environmental, cultural and social aspects that give the community its character and quality of life. Particularly for rural communities, the forests, water, fields, local history, and people are woven together in a texture that forms its own ecosystem, balanced by use and nature. With rapid change, that balance is affected and the natural assets that support the community character can be lost or drastically changed. It is important for communities to understand where the most significant or sensitive natural ecosystems are in order to maintain their function and to avoid causing unnecessary degradation or loss, so that the community character is also supported.

Accurate maps are the best source of information when identifying significant areas such as wildlife habitat and natural resources for land use and transportation planning. In NC, many biologists have contributed to geographic information systems (GIS) databases to share their knowledge about the plants, animals and habitats that exist in North Carolina, and these databases are available for communities to use.

For Pittsboro, project partners compiled data from several sources and used the datasets compiled for the [Comprehensive Conservation Plan for Chatham](#) as a guide. See [Appendix A: Summary of the Biodiversity and Wildlife Habitat Assessment for Pittsboro, NC](#) for a description of the data sets that were used for Pittsboro. Most of these data sources are available to communities through two websites, NC Wildlife Resource Commissions [Green Growth Toolbox](#) or the [NC Natural Heritage Data Explorer](#). Datasets such as transportation, water resources, and soil data that are not available on these two website can be found on [NC One Map](#).

Resources for Data

NC Wildlife Resources Commission Green Growth Toolbox

The NCWRC's [Green Growth Toolbox](#) (GGT) is a resource for communities to enhance wildlife and natural resource conservation through their land use-related plans and policies. The GGT provides statewide and regional conservation data available from various agencies on its website. Section 2 of the GGT Handbook provides recommendations on how to interpret this data and how to use it for land use plans and ordinances. It is highly recommended that any community, using this data for the first time, contact the biologists with the NCWRC for assistance. In addition to conservation data, the GGT also provides case studies and methods for enhancing conservation through plans, incentives, ordinances and development design. Training and assistance are also available.



Flood plain wetland along Robeson Creek

NC Natural Heritage Program Data Explorer

The [Natural Heritage Data Explorer](#) website was created by the NC Natural Heritage Program (NCNHP) and [NatureServe](#) to improve public access to data about high quality natural areas as well as rare, endangered, threatened, and special concern species. The data is accessible via a GIS download and an online mapping program that has map-making and report-writing capabilities. Access to the online mapper is available to anyone. Those who complete the free NHDE training with NCNHP staff are eligible for a subscription and account with enhanced data access.



Haw River below the Bynum Bridge

Community Inventory

There are local experts in almost every community who are very knowledgeable about important natural areas in the vicinity. These people are an important source of information, especially for communities where the state data resources may be limited. Community mapping exercises bring together all levels of local knowledge, where local residents draw and rank the priority of important natural areas on a map, using aerial photos and their own personal and historical knowledge. The maps can then be digitized in GIS. Consultants can also be hired to conduct field inventories. For more guidance on conducting inventories see pages 35 and 36 of the GGT Handbook.

Online Mapping Databases

The use of online and mobile citizen science applications is growing. Websites like [eBird](#) and [iNaturalist](#) are places where professionals and amateurs can store and share information about observations of species. This is an additional way to identify experts in your area, and to build a local species and habitats inventory. (The Planning Tools for Pittsboro project did not make use of this resource because sufficient data and experts were already known).

Step 3. Make Asset Maps – Map and rank your community’s natural resources.

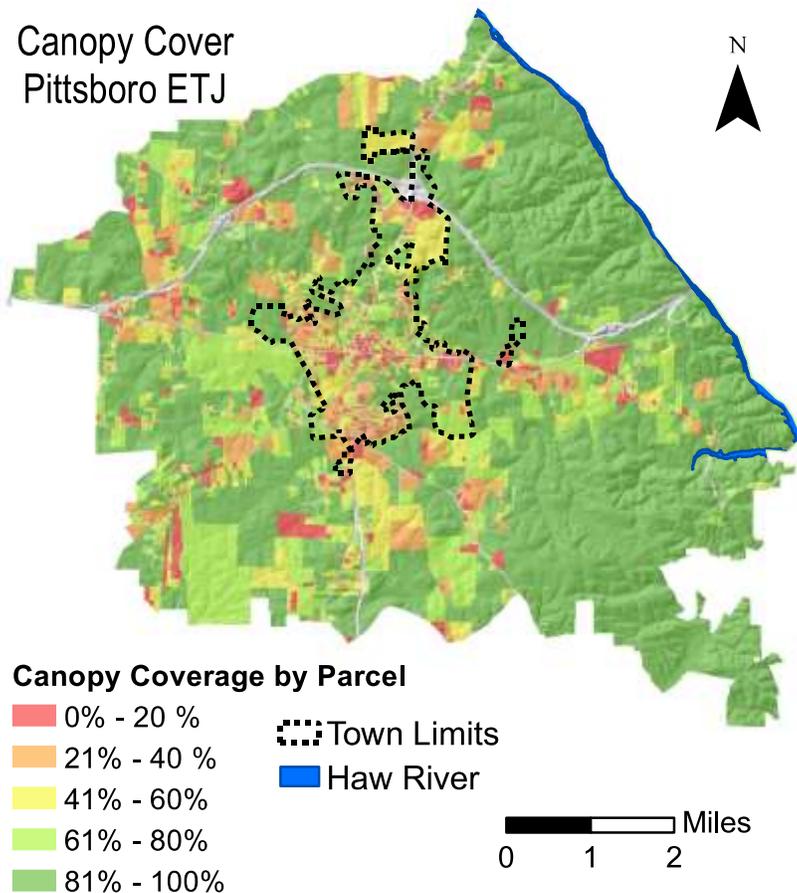
Once the best available and most up-to-date conservation data is compiled, the data needs to be mapped and prioritized based on the community goals. GIS mapping is an invaluable tool for visualizing data. Many counties and towns have GIS capabilities, and local Council of Governments (COGs) can often help provide this resource, as well as interpret the results. Interpreting a GIS map can be overwhelming, when mapping layers overlap and details can get lost in the wealth of information. The [NC Conservation Planning Tool](#) (CPT) is a good way to simplify the information into a single layer that will highlight areas with the most significant natural resource that matches your community’s priorities.

The CPT, available from the NC Heritage Program, provides four assessment maps that integrate information from multiple sources, these include:

1. Biodiversity and Wildlife Habitat
2. Open Space and Conservation Lands
3. Agricultural Lands
4. Forestry Lands



Canopy Cover Pittsboro ETJ



For Pittsboro, the Biodiversity and Wildlife Habitat Assessment (BWhA) was tailored from the locally available data and locally developed priorities. The BWhA provides a map that represents the highest priority areas for conservation of wildlife habitat and biodiversity in an area. Typically, the highest priority areas identified coincide with the areas that provide the natural assets valued by the community and, in some cases, are already part of management efforts by county, state, or other stakeholder groups. For a detailed description of the methodology used in Pittsboro see [Appendix A: Summary of the Biodiversity and Wildlife Habitat Assessment for Pittsboro, NC](#).

As part of the Planning Tools, a detailed land cover data set and a tree canopy assessment for Pittsboro and its ETJ were developed by the Global Ecosystem Center in Maryland. These assessments of the landscape provide a baseline of the town's existing ecological condition and are documented in the full report: [Land Cover Change Analysis and Urban Tree Canopy Assessment for Pittsboro, NC](#). See [Appendix B](#) for a **summary** of the report. Such assessments can also be used to track historical changes to land use (using past aerial imagery) and to establish a baseline for tracking future change.

The Canopy Assessment identified the economic value of the ecosystem services provided by the natural landscape. Ecosystem services are those essential benefits that trees and green space, water and soil provide to communities. They include clean air and water, recreational opportunities, beautiful vistas, decomposition, pollination, stormwater remediation, as well as healthy foods and places to rest the soul and recuperate. The economic contributions of green infrastructure for air and water quality, stormwater management and carbon sequestration can be calculated. Section 1 of the [GGT Handbook](#) provides a literature review of studies evaluating ecosystem services.

Step 4. Assess Risks – What natural resources are most at risk?

If the community goals developed in Step 1 reflect community concerns for specific natural assets, evaluating the assessments maps completed in Step 2 can identify what is at risk from development, roads, landfills or other factors. [A Quick Guide to Community Planning for Green Infrastructure Planning](#) provides an excellent list of questions when assessing risk such as, "Which areas are zoned for major development and do they overlap key natural assets?"

Another important assessment of risk to natural resources is to review existing local ordinances. Evaluation of non-environmental resource codes relevant to green infrastructure such as subdivision codes, street and parking standards, landscape standards and zoning codes should be evaluated for their impact on natural resources and for opportunities to better accommodate green infrastructure practices.



Wild Turkey
Source NCWRC

Pittsboro has a land use plan with a vision statement that addresses conservation, “new development will be consistent with Pittsboro’s rural heritage ensuring protection of environment while enhancing the quality of life for all citizens” and the land use plan advocates providing open space along the Haw River with a 2,000-foot wide buffer. But the Pittsboro Land Use plan does not provide the regulatory tools to proactively protect the natural resources within its jurisdiction. *Strategies to Incorporate Green Infrastructure for North Carolina* provided in **Appendix C** provides information on auditing tools for evaluating green infrastructure opportunities in current ordinances.

Like many small communities in North Carolina, Pittsboro, has minimal language in their ordinances to protect natural resources. They require developers to protect:

- Wetlands, floodplains,
- Steep slopes,
- Open space (5%),
- Perennial and intermittent streams with a 50-foot buffer, and
- Haw River and streams flowing to the river with 100-foot no-build area to protect property from flooding.

Cluster developments, where homes are clustered and the remaining area is left in an unaltered natural state, are allowed, but unfortunately, Pittsboro’s ordinances lack incentives, such as density bonuses, to encourage cluster development or to go above and beyond in protecting natural resources. By lacking support for strong environmental protection in its ordinances, Pittsboro inadvertently supports and encourages the **low density**, spread-out development patterns that are common in the United States. These development codes, coupled with looming growth, put water resources, wildlife habitat and large intact forests at risk for degradation and loss.

A review of Pittsboro’s ordinances reveals a need to implement greater protections for high priority natural areas, and trees particularly, in the face of the expected increase in development. Green infrastructure policy can be used effectively to direct new development towards areas that will have less impact on natural resources. The CORC committee spent much of their time developing ordinance language to recommend that Pittsboro adopt ordinances that would protect their most sensitive wildlife habitats and would help the community maintain a viable tree canopy.

Additional measures that will enhance conservation in incentives and ordinances:

- A density bonus in exchange for conservation of more than 35% natural open space that also incentivizes conservation of at least 50% natural open space.
- Natural open space area must be as square shaped as possible to minimize habitat fragmentation.
- Encouraging the conservation of upland habitat
- Forest protection within 50 feet of intermittent streams and 100 feet of perennial streams. (Double this amount if streams are in subwatersheds with federally listed aquatic species).



Four-toed Salamander
Source NCWRC

Low density development patterns can cause habitat degradation and fragmentation, has been shown to be one of the most significant causes of species imperilment in the United States and may rival climate change in biodiversity loss.
(Terando et al. 2014)

Step 5. Determine Opportunities – What protection can be obtained?

Green infrastructure provides a cost effective alternative to grey infrastructure (traditional hardscape that provides services like stormwater management). The

To know more about the Model NRCO contact the NC Wildlife Resources Commission at greengrowth@ncwildlife.org

functions of the natural landscape can assist local governments in providing services and protecting a variety of environmental resources, while increasing public health and the quality of life for residents. In order to protect natural resources in a rapidly developing landscape, communities must have a long-term vision that incorporates goals about natural resource protection into their policies and ordinances to require or incentivize natural resource protection in priority areas. See **Appendix C: *Strategies to Incorporate Green Infrastructure for North Carolina*** for a summary of policy options for local governments.

With the identification of zoning and ordinance limitations, the CORC utilized [Model Natural Resource Conservation Ordinance](#) (NRCO) as a guide. Developed by the NC Wildlife Resources Commission in collaboration with the Nicholas Institute for Environmental Policy Solutions at Duke University, this model ordinance aims to identify and protect the most sensitive wildlife habitat and associated natural resources, while encouraging development to less sensitive areas by:

- Establishing a natural resource conservation overlay district,
- Requiring a site survey prior to development within the overlay district,
- Instituting a conservation set aside, and
- Defining local significant natural resources.

For a summary of this model ordinance, see **Appendix E: *Summary of the Natural Resource Conservation Ordinance Recommended for Pittsboro, NC***.

This provided the basis for the CORC recommendations to Pittsboro with language for the NRCO and the supporting map overlay that could guide planning decisions for development while maintaining viable ecosystem services, habitat, and working lands.

As part of this project, the NC Forest Service Urban Forestry Program also worked with the Nicholas Institute for Environmental Policy Solutions to create [Developing Tree Protection Ordinances in North Carolina: A Guide to Local Ordinance Creation](#). This guide provides developing communities with:

- Model ordinance language for tree protection that is tied primarily to retention of the tree canopy,
- Multiple references and numerous examples from municipalities,
- Background on silviculture terminology, and
- A framework to follow in deciding how to protect trees within a community.

For a summary of this guide, see **Appendix D: *Summary of Developing Tree Protection Ordinances in North Carolina***.

Step 6. Implement Opportunities – Build support, tailor ordinances, and continue to encourage community involvement.

The final step, after identifying priorities, mapping and identifying risks and making recommendations is implementation. Any additional information or support that can help recommendations, and maps progress to actual municipal implementation, is essential. Community involvement at this stage is just as important as it was at the beginning and, indeed, at all stages along the way, particularly if the strategy involves adoption or revision of regulations. Forming a specific stakeholder group, if one does not exist, can be helpful to encourage implementation.



A neighborhood street in Pittsboro, NC



Little Creek, Pittsboro NC

For Pittsboro a stakeholder group, CORC, was formed at the request of the town, comprised of Board of Commissioners, the Planning Board, Chatham County Extension, a certified forester, the Pittsboro Business Association, PDD developers, the Grand Trees of Chatham, and town staff committed to the process to make recommendations. In one final tool developed for Pittsboro.

To address typical concerns about the economic impact of conservation measures on development and the tax base, the New England Environmental Finance Center was contracted evaluate the economic impact that would result for a community which increased the conservation of natural areas. The center completed the analysis by looking at the change in future tax revenue compared to the amount of conserved open space. It was shown that, similar to other studies that have looked into this comparison, that the impact of increased land conservation of sensitive and connecting natural areas would not have a tangible negative impact on municipal revenues due to the reduced cost of grey infrastructure required and due to an increase in property values and tax revenue for properties near natural open space. A summary of this analysis is included in **Appendix F: Summary of An Analysis of Future Property Tax Revenues and Co-benefits of Conservation for Pittsboro, NC**. This economic study also completed a literature review that provides the extensive research that confirms that individual property values typically increase within the vicinity of conservation areas.

As tasked by the Town of Pittsboro, the CORC developed recommendations on how to tailor the model ordinances for Natural Resource Conservation and for Tree Protection to fit the conservation goals of the Pittsboro community. As of 2016, the town of Pittsboro plans to include the recommendations from the CORC for implementing a Natural Resource Conservation Ordinance and a Tree Protection Ordinance into their Unified Development Ordinance, which is currently under development.

III. CONCLUSION

The planning needed to preserve our natural environment is not a one-time act, decision or ordinance as our environment is constantly changed, our own knowledge of natural resources grows, and our communities change. Identifying local priorities and enacting policies and procedures that support those priorities must be in place before a community is faced with significant development activities. Waiting to take action until presented with large-scale land-use changes means that all submissions received fall under existing ordinances and zoning. Even in a small community, the process of community engagement leading to changes in zoning and policy can take a year and more to be completed and approved.

While a shorter timeframe may be possible, in Pittsboro's case it was only the multiple partnerships and external funding that made it possible to support the Planning Tools process and develop recommendations over 8 months. Most communities will not have access to those resources.

Through the duration of the Planning Tools for Pittsboro project, the town has received information on important natural resources and the services they provide. The CORC also provided recommendations on how to protect these natural resources. Elected officials of the town have used this information to call for increased protection of their water resources and forests through an update of their ordinances.

Conducting the Pittsboro case study provided many insights into the planning process itself. First and foremost is that there are many planning resources such as the NC Wildlife Resource Commission [Green Growth Toolbox](#) and the [Green Infrastructure Center](#) that are available and can be utilized by towns and other community stakeholders to advance the protection of our natural resources.

Some of the other lessons learned in this study:

- 1. Start the review process early:** upfront project planning ensures the timely completion of studies needed for building community support and for tailoring the model ordinance language, before they are needed and in-time for developers to know what the community requirements are.
- 2. Identify expertise:** take advantage of in-state expertise in government and local organizations that are familiar with local examples and in-state regulations to help conduct any analysis needed.
- 3. Look for funding in advance:** be ready to take advantage of grant support for conservation planning and policy projects that can provide the carrot needed to motivate communities to

implement projects, see **Appendix G** for information on grants that may support such work for a small community.

- 4. Identify partners:** find a local champion, an individual or organization, to engage the community, to provide local knowledge of natural landscape and of the community, and to provide the momentum needed to initiate and move the project towards completion.
- 5. Don't wait:** start planning for green infrastructure and your local priorities before your community experiences development pressure that will change the face of your community forever.

IV. RESOURCE INTERNET SITES

- Chatham Conservation Partnership Planning Tools: chathamconservation.wikispaces.com
- NC Forestry Service Urban & Community Forest: ncforestservice.gov/Urban/Urban_Forestry.htm
- NC Wildlife Resource Commission Green Growth Toolbox: ncwildlife.org/greengrowth
- Developing Tree Protection Ordinances in NC: ncforestservice.gov/Urban/pdf/treeProtection.pdf
- Model Natural Resource Conservation Ordinance: ncwildlife.org/greengrowth
- NC Natural Heritage Program: portal.ncdenr.org/web/nhp
- NC Conservation Planning Tool: portal.ncdenr.org/web/cpt/cpt-home
- NC Natural Heritage Data Explorer: ncnhde.natureserve.org
- Green Infrastructure Center: gicinc.org
- NC OneMap: nconemap.com
- NatureServe: natureserve.org
- eBird: ebird.org
- iNaturalist: inaturalist.org



Cape Fear Shiner
Source: www.ncwildlife.org