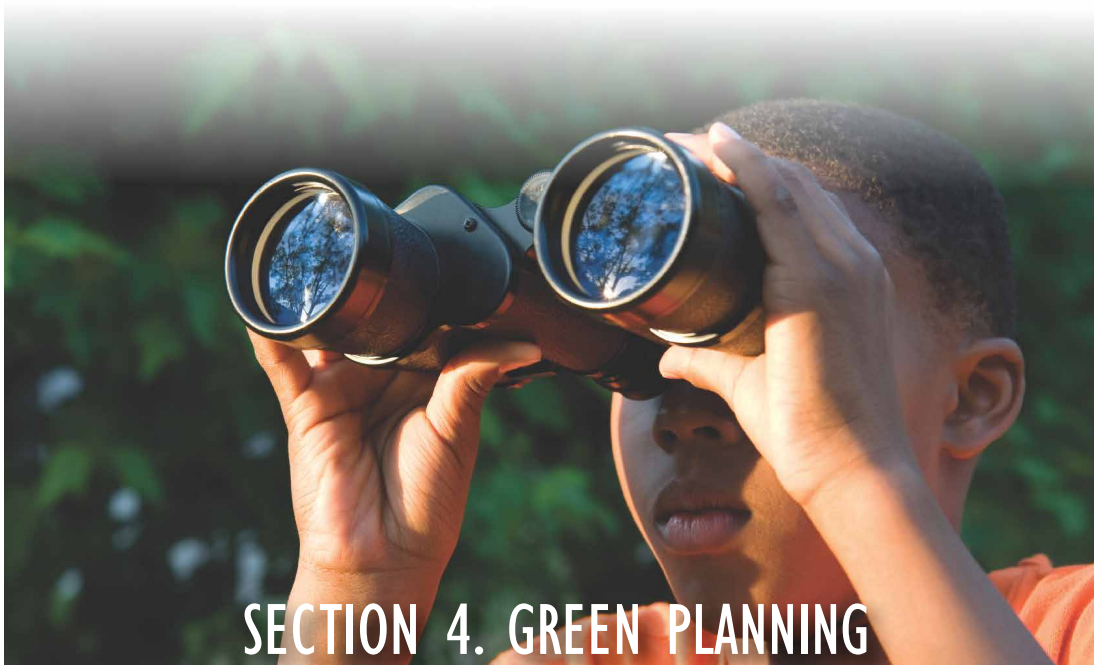


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SECTION 4. GREEN PLANNING

ENABLE WILDLIFE AND HABITAT CONSERVATION THROUGH VISIONING AND PLAN-MAKING

Green planning involves crafting the vision, goals, strategies and implementation sections in all planning documents that will enable conservation of important species and ecosystems and build resilience to increasingly severe weather events as your community grows. In this section we provide guidelines on ways to include this priority in the following:

- Community-wide visioning documents
- Conservation plans
- Land use and comprehensive plans
- Transportation plans
- Park, greenway, and open space plans
- Farmland protection plans
- Watershed management plans
- Risk assessment, climate resilience, and hazard mitigation plans
- Strategic and economic development plans
- Green building and energy efficiency plans

Six Step Conservation Planning Process

Many communities identify a need for wildlife and natural resources conservation in planning. The following six step planning process will help to incorporate wildlife and habitat conservation in green infrastructure or conservation plans, land use, transportation, hazard mitigation, and other plans.

Step 1. Identify and describe the status of priority species and habitats in your community.

Identify the species, habitats, and ecosystems that are of particular conservation interest or concern in your study area.

- a) *Consult the Conservation Data for Green Growth* – Download and create maps that display priority habitats and ecosystems in and adjacent to your community.



What are **wildlife and habitat conservation priorities?**

Conservation priorities are species, habitats, ecosystems or landscapes that conservation organizations are currently involved in protecting or that your community is particularly interested in. Scientifically-determined conservation priorities in North Carolina include priority wildlife species and habitats identified in the N.C. Wildlife Action Plan, rare species and natural communities identified by the N.C. Natural Heritage Program and landscapes identified by statewide assessments like the N.C. Conservation Planning Tool. Conservation priorities can also include other natural resources, such as areas that protect drinking water, important forest lands and agricultural lands. See page 17 for a list of priority habitats and Section 2 for maps of conservation priority areas in North Carolina.

b) Conduct any needed field inventories – Additional field inventory work may be needed to provide more complete information on important natural resources. If inventories cannot be completed in a timely manner, the plan should not be delayed but should allow for updates of new information.¹ See [page 39](#) for information about conducting inventories.

c) Identify and display maps of wildlife and habitat conservation priority areas - Use the Conservation Data in Section 2 and local knowledge to analyze, map and describe the status of species, habitats and ecosystems. Below are a few questions you can use as a guide to identify important natural resources in need of conservation.²

- What is the condition of the species, habitats, and ecosystems in your community?
- How well protected are your habitat and natural resource priorities?
- Where are the areas that could serve as wildlife travel corridors, to maintain as agricultural and conservation development districts between natural areas?
- What outside forces are likely to negatively impact these linkages in the future, such as future development and extreme weather events?
- Are there conservation priorities outside your community's planning jurisdiction that may affect your area? If so, are they linked to natural areas within your community? If not, is there a potential to create a linkage?

Step 2. Through a public process, establish a conservation vision and set conservation goals for your community.

The vision statement can outline the specific attributes of the natural environment that community members would like conserved.



- Prior to writing the vision statement, you may want to develop a list of conservation “issues” the public thinks are important. This list—and information collected about these issues—can inform the vision and goal statements.
- Once stakeholders in your community agree on a conservation vision statement, conservation goals can be drafted.
- Then, outline concrete, measurable objectives to be followed in order to achieve each goal.

Avoid vague language in setting goals. Plans that are too vague in defining their goals and objectives are often not effective in realizing those goals.

Goals that will lead to wildlife and natural resources conservation include:

- Conservation of a network of connected natural habitats and resources
- Greenways are designed to conserve priority wildlife habitats
- Development patterns are less spread out and more centralized in all districts
- Conservation planning is coordinated with neighboring counties and municipalities

Objectives that support wildlife and natural resources conservation include:

- Revising land use districts and development standards to use land more efficiently and to better conserve contiguous, large, priority habitat core areas
- Setting targets for acres of priority habitats that should be conserved
- Creating a conservation district for highly sensitive areas in your community where a percent of contiguous natural open space will be set aside in new developments

Step 3. Develop conservation strategies to achieve goals.

The conservation strategies you select should be designed to implement your vision, goals and objectives. A menu of conservation strategies is presented later in this section.

Step 4. Identify ways to implement the conservation strategies.

Each conservation goal and strategy outlined in your plan should be linked to objectives and information stating who is responsible for doing what and by when. Prioritize implementation activities and present a timeline for completing tasks.

Step 5. Write the conservation plan.

- In addition to creating a stand-alone plan, it is important to integrate the implementation schedule and the vision, goals, maps and strategies into all planning documents
- If possible, obtain grant funds to hire a consultant to write your conservation plan. You will want to make the consultant aware of this Toolbox and the resources it includes.

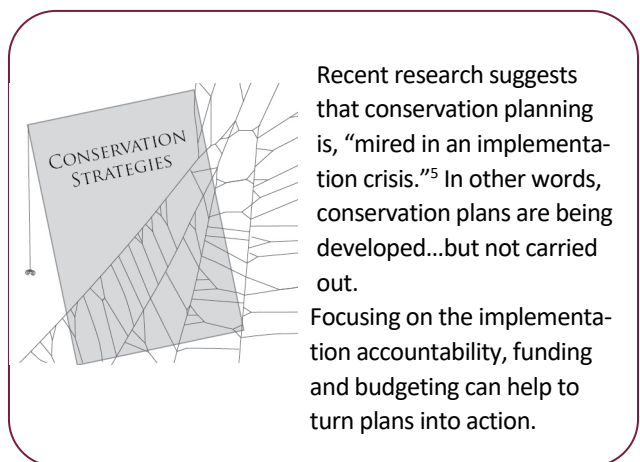
Step 6. Implement the plan and monitor progress.

The final step is to include implementation activities in budgets and work schedules, create a network for implementation support and monitor your progress using practical measures of success. Ideas for implementation are provided throughout this section.

Developing a County or City-Wide Conservation Plan

Creating even a simple, brief jurisdiction-wide conservation plan is the most effective way to help ensure the realization of your community's vision for conserving wildlife, habitat and other natural resources.

The Implementation Crisis



Recent research suggests that conservation planning is, “mired in an implementation crisis.”⁵ In other words, conservation plans are being developed...but not carried out.

Focusing on the implementation accountability, funding and budgeting can help to turn plans into action.

Examples of Conservation Plans in the North Carolina

- The [Comprehensive Conservation Plan for Chatham County, NC^a](#) was funded by external grants and was created by a partnership of scientific experts, community members, the planning department, and elected officials.
- [New Hope Corridor Open Space Master Plan, Durham City & County, Town of Chapel Hill, Orange County, NC^b](#) was a joint conservation planning effort to protect New Hope Creek which resulted in an inter-jurisdictional advisory board that provided input on development proposals within conservation priority areas

RANDY CASE, TALL TIMBERS RESEARCH STATION, FL



bobwhite quail

Greening Existing Plans

A good compromise for busy communities

Depending on your community's immediate priorities it may be easier to write a habitat conservation section for your land use, transportation or comprehensive plan. It is important to incorporate habitat conservation goals, objectives and strategies into other sections of all local plans to fully enable habitat conservation.

The process of writing a habitat conservation section for an existing plan is less in-depth but follows the same general process as the six step process outlined above.

Leverage all of your conservation resources.

Utilize complementary public investment grants and programs.

- Public investments are expenditures toward the future public good, such as roads, water and sanitation. Public investments also need to be made to support a community's natural assets through funding conservation education and planning, land acquisition, transaction costs for conservation easements and habitat stewardship on locally owned public lands. Funds can come from external grants but also from bonds and minimal fees.

Collaborate with local, state and federal natural resource agencies.

- Call on your local land trust, Soil and Water Conservation District and Extension agency to assist with conservation planning and projects. See Appendix B for a list of organizations that can provide technical assistance.

Use the best conservation data and strategic planning tools available.

- Integrate and regularly update conservation GIS data in the community's online GIS mapping application or local government computer network.
- Use land use planning software that evaluates the fiscal impact of decisions. [NatureServe Vista^c](#) is a free ArcMap 10 Extension based on CommunityViz that measures the benefits of conservation decisions for land use planning

a <https://www.chathamconservation.org/home/chatham-conservation-plan>

b <https://www.newhopecreek.org/history.html#planpdf>

c <https://www.natureserve.org/products/natureserve-vista>

Green Infrastructure Planning

In that last decade, green infrastructure planning has taken off as a preferred framework by local governments to plan for conservation of natural resources, including biodiversity. The central principle of green infrastructure is to plan the green before the gray. It is important to include the information in Section 3 to effectively



bald eagle

conserve wildlife habitat, which is not fully addressed in green infrastructure guidance. See the [Conservation Fund website^d](#) for more information (search term “green infrastructure”).

A MENU OF CONSERVATION STRATEGIES³

Listed below is a menu of planning strategies that can help your community achieve its conservation goals.

Involve local citizens, businesses, landowners and other representatives from every interest group in conservation visioning exercises.

- Ask stakeholders to rate how important wildlife and habitats are to them to demonstrate the level of demand for conservation in the community. If you do not have the resources for this, poll your Planning Board or Board of Commissioners.
- Arrange mapping workshops with representatives of every interest group and ask them to identify important conservation areas on maps. Consider using the Conservation Data for Green Growth and identifying target growth areas.

Include language in planning documents detailing the importance of conserving areas of high wildlife and biodiversity value.

- During the planning document updates include information about wildlife and habitats from existing statewide and local conservation plans (see [page 71](#)).
- During the plan creation or update process, propose that information be included on the benefits of Green Growth from Section 1.

Translate conservation goals and objectives into policies in the land use, transportation or comprehensive plan. Address conservation goals and strategies in all other community planning documents.

- Refer to Sections 3 through 6 of the Green Growth Toolbox for specific recommendations on the amount of habitat wildlife need and what land use planning techniques can be used to better conserve habitats and natural resources. This science-based information can help in creating policies that actually conserve priority wild life habitat.

Coordinate with neighboring counties and municipalities.

- Adopt a regional wildlife and habitat conservation resolution to coordinate planning actions, implementation strategies, land acquisition activities, stewardship activities and other conservation actions.

^d www.conservationfund.org

When planning for the creation of greenways and trails, consider the needs of wildlife that could also use these greenways as habitats and travel corridors.

- Refer to Section 3 for specific recommendations on designing greenways to conserve priority wildlife habitat.

Encourage setting aside contiguous large core areas of natural open space in developments in sensitive areas. Encourage clustered rural and urban development and agricultural districts to enable conservation of a network of priority habitats.

- Identify which ordinances, programs and other tools could be used to make development patterns less spread out and more centralized in rural developments and in urban areas.
- Schedule when the revisions and ordinances will be drafted and considered by local boards.
- Refer to Sections 3 to 6 for measures to conserve priority wildlife habitat at all levels of land use planning.

Implementation Support

Implementation is the most challenging aspect of planning. Listed below are a few key components that will help to ensure that your plans do not sit on a shelf.

To support implementation activities:

- Include implementation responsibilities in plans, work unit business plans and individual staff work plans.
- Create line items in work unit budgets to provide funds needed to implement conservation strategies.
- Make certain all appropriate staff and elected officials are educated about their roles to ensure successful implementation.
- Develop and publish a list of contacts for conservation partners that can assist in Green Growth planning and implementation (see [Appendix B](#)).

Create and Update an Action Plan

Create an implementation action plan that will outline specifically who, what, when, where and how conservation strategies will be implemented. For instance, Orange County, North Carolina, adopts [two-year action plans](#)^e to guide implementation of the strategies outlined in their Lands Legacy Program guiding document.



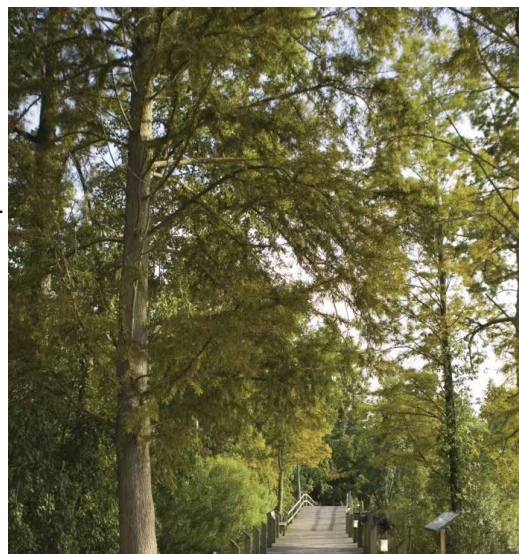
Conservation Advisory Boards

A number of North Carolina communities have conservation related boards. These boards can play an active role in helping your community achieve Green Growth. A conservation advisory board can:

- Inform or guide development of a local conservation plan.
- Work with elected officials, planning staff and the planning board to structure zoning and development ordinances to improve habitat conservation.
- Review development applications and assist developers in creating wildlife friendly development projects.
- Initiate and guide a county-wide natural resource inventory.
- Guide development of management plans for natural areas in the town.
- Work with local land trusts to purchase strategic parcels of land for conservation.
- Consider appointing a staff member with some biological expertise to assist the conservation advisory board in the roles described above.

Land Acquisition and Conservation Easements

- Public education on the benefits and need for land conservation generated public support for conservation funding in York County, S.C.
- Establish funding for transaction or total costs of conservation easements on important natural areas in your community. A conservation easement is a voluntary agreement that allows a land owner to permanently limit the type and amount of development on their property while retaining private ownership.
- Coordinate land acquisition strategies with other jurisdictions to conserve landscapes that may cross your own community's boundaries.
- Develop a partnership with your local land trust to cooperatively work toward conserving high-quality natural areas in your community.
- Encourage your Soil and Water Conservation District to accept and monitor conservation easements.
- Plan for your land acquisition program to obtain strategic parcels of land.



Scuppernong River boardwalk

Examples

Raleigh, North Carolina, has a [watershed protection fee^f](https://raleighnc.gov/services/water-and-sewer/watershed-protection-program) on water bills. The fee averages 60 cents per month per family and is used to protect lands important to drinking water quality.

[York County Forever^g](http://yorkcountysc.iqm2.com/Citizens/Board/1084-York-County-Forever-Commission) is a commission of York County, South Carolina, that funds transaction costs of conservation easements. It is funded by a small proportion of local taxes voted in by the public after a conservation education campaign.

^f <https://raleighnc.gov/services/water-and-sewer/watershed-protection-program>

^g <http://yorkcountysc.iqm2.com/Citizens/Board/1084-York-County-Forever-Commission>

Public Works and Utilities

- Integrate wildlife habitat conservation and restoration strategies into existing public works programs (i.e., solid waste programs, water resources programs).
- Incorporate wildlife conservation priorities into transportation facility planning, design, development and maintenance.
- Restore and develop wildlife habitat management plans for community-owned lands, including parks, green ways, natural areas, schoolyards and other open spaces.
- The [Wake Nature Preserves Partnership](#)^h (Wake County, North Carolina) is a good example of collaboration between the county, a university, and natural resource agencies to manage county parks for natural habitat.
- Use native landscaping on municipal and county building sites.
- Work with businesses, government agencies and other groups to reduce bright night lighting and its negative impact on wildlife. This can also save public energy costs.



Native grassland along a powerline

JEFF MARCUS

Incentive Programs

- Create a local recognition or rewards program for landowners or developers who maintain wildlife habitat on their properties.
- Promote wildlife habitat management cost-share programs and tax incentives.
- See Section 5 for more incentives information.
- See the Defenders of Wildlife report, [Incentives for Biodiversity Conservation](#).ⁱ

Education

Public education about the value of our wildlife and habitats is essential to natural resources conservation at the local level.

- Encourage your newspaper to run a regular wildlife conservation-related column.
- Utilize social media to educate the public about wildlife and conservation issues.
- Work with conservation partners to develop wildlife education programs and facilities to provide opportunities for citizens to learn about the species, habitats, and important ecosystems in your community.
- Provide information to residents and visitors about how to avoid wildlife conflict situations and respond appropriately when they arise (see Appendix C).

^h wakenature.wordpress.com

ⁱ www.defenders.org/publications/incentives_for_biodiversity_conservation.pdf

INTEGRATING STATE AND REGIONAL CONSERVATION PLANS

Although local governments focus on developing plans for individual jurisdictions, it is important to examine the larger, regional context within which these plans are being created. When putting together a local conservation plan—or a “habitat conservation” section for an existing plan—integrate the goals and strategies of state and regional conservation plans into your local plan.

State and regional plans are important because they can help your community to:

- Analyze the impacts of land use policies in a regional context.
- Leverage the expertise of prior planning efforts.
- Establish a fruitful partnership with state and regional conservation initiatives.

North Carolina Wildlife Action Plan^j

This plan was developed by the North Carolina Wildlife Commission in partnership with hundreds of stakeholders and wildlife experts across the state. The plan provides science-based information on the wildlife and habitat conservation priorities in our state.



- The plan identifies fish and wildlife species and describes associated habitats that are priorities for conservation.
- Use and reference the habitat descriptions and priority species lists from this plan in planning documents as appropriate.

N.C. Conservation Planning Tool^k

The North Carolina Department of Environment and Natural and Cultural Resources (NCDNCR) has developed a conservation planning tool.

- This tool consists primarily of six GIS assessments that identify the highest quality lands and waters for conservation across the state. For more information, see **Section 2**.

Regional Conservation Plans

In addition to these statewide initiatives, many conservation planning efforts have been undertaken at the regional level. Regional conservation plans specific to your area are available in your Green Growth Toolbox Regional Appendix. Some links to regional plans are:

- The N.C. Conservation Planning Tool [web page on other conservation planning efforts^l](#)
- The [Coastal Habitat Protection Plan^m](#), which provides information on the status of marine habitats and coastal fisheries and outlines management needs for threatened coastal resources.
- [Basin-wide Water Quality Plansⁿ](#) from NCDEQ which contain information about local natural resources conditions.
- Available through your Council of Government and include watershed, green infrastructure, and other conservation related plans.

^j www.ncwildlife.org/plan

^k <https://www.ncnhp.org/conservation/north-carolina-conservation-planning-tool>

^l www.ncnhp.org/conservation/conservation-planningtool/resources/other-efforts

^m <https://deq.nc.gov/about/divisions/marine-fisheries/habitat-information/coastal-habitat-protection-plan>

ⁿ <https://deq.nc.gov/about/divisions/water-resources/water-planning/basin-planning-branch>

KEY CONCEPTS FOR ENABLING HABITAT CONSERVATION IN PLANNING

It is essential to incorporate conservation goals, objectives and strategies in all types of community plans and to include an implementation action section in all plans. The following are key concepts to address in community plans that will enable wildlife and habitat conservation. Refer also to Handbook Sections 3, 5 and 6 for additional policy ideas.

Land Use Planning (See example plans on [page 75](#))

The action that is most important to enable wildlife and habitat conservation in land use planning is to encourage a connected network of priority habitats. Design land use districts and policies to avoid extensive spread out development in high priority habitat areas and to encourage agricultural districts around and between protected lands.

Transportation Planning (See example plans on [page 76](#))

Roads have a great impact on the health and stability of habitats and wildlife populations, especially for those animals that move on land such as amphibians and reptiles, but also for species that fly or glide, including bats and flying squirrels.

- Encourage development patterns and resulting road projects that encourage centralized growth and will avoid priority wildlife habitats.
- Take advantage of Federal Highway Administration (FHWA) grant programs for ecological conservation.
- Emphasize “Transit Oriented Development,” biking, walking, and public transit
- Avoid wetlands and minimize road stream crossings.
- Encourage roads and developments that are set out in a grid system versus cul-de-sacs and unconnected streets; this allows for compact development and walking.

Wildlife Crossing Structures



Wildlife crossing structures enable wildlife to cross under or over busy roads. These can be placed in areas where major roads bisect high priority wildlife habitats and travel corridors. Wildlife crossing structures are effective in preventing collisions and reducing injuries, deaths and vehicle repair costs. Costs are approximately 8 percent of the road project cost.⁴ The N.C. Department of Transportation (NCDOT) consider installing these at locations between permanently conserved lands.

Therefore, it is important to target land acquisition in key areas.

- Request that NCDOT or FHWA fund wildlife road underpasses in your community.
- Collaborate with federal, state and local partners to plan a system of wildlife underpasses using programs such as the FHWA [Environmental Review Toolkit](#)^o

For more information on wildlife crossing structures see:

- Federal Highway Administration’s [Critter Crossings website](#)^p and [Wildlife Crossing Structure Handbook Design and Evaluation in North America](#)^q

o https://www.environment.fhwa.dot.gov/env_initiatives/eco-logical.aspx

p www.fhwa.dot.gov/environment/critter_crossings/main.cfm

q https://www.fhwa.dot.gov/clas/ctip/wildlife_crossing_structures/

Park and Greenway Plans (See example plans on page 76)

- Refer to Section 3 and specifically discuss the width and area of habitat needed to conserve priority wildlife habitat and travel corridors with greenways.
- Create a category of public parks that conserve and manage natural habitats with a goal along the lines of connecting the public with nature.
- Set up a method to remain aware of conservation opportunities with willing land owners in priority habitat areas. Work with your land trust.
- When designing parks and greenways try to conserve and manage a connected network of large habitat hubs and wide natural corridors that connect the hubs.

Risk Assessments, Climate Resilience, and Hazard Mitigation Plans

(See example plans on page 76)

Healthy ecosystems, compact development patterns, and wildlife friendly development practices protect our communities from storms, floods, drought, and wildfire. Actions your community takes to conserve wildlife and habitat will reduce the risk of natural disasters.

- Address the importance of supporting prescribed fire on managed areas through land use planning. See pages 4, 30, and 94 for more information.
- Encourage Firewise design and keep intensely developed areas far from large natural areas and working lands.
- Discuss the hazard mitigation benefits of conserving floodplain forests, large and small wetland communities and large blocks of forest (**see Section 1** for benefits).
- Provide incentives to developers to use conservation design and other low impact development techniques to reduce the severity of flooding events.
- Zoning overlays can provide protection to natural areas needed to support community resilience.
- Identify ordinances that could protect natural resources and habitat, **see Section 5** and [NC Wildlife Commission's model natural resources conservation ordinance](#).^r

For detailed information on how to do Climate Resiliency planning, see:

- N.C. Office of Recovery and Resiliency supports communities in planning to reduce impacts of climate change and recover from hazardous events, www.rebuild.nc.gov/.
- Environmental Law Institute's [Wetlands, Wildlife Habitat and Flood Hazards](#), for guidance on integrating priority habitat conservation in local hazard planning.
- FEMA's [Building Community Resilience with Nature-based Solutions: A Guide for Local Communities](#) is a comprehensive guide on integrating conservation, restoration, and green infrastructure in community planning and public works.
- Hudson River Estuary Program's [Climate-Adaptive Communities resources](#)^s
- [Great Green Cities](#)^t summarizes resiliency projects being conducted in many cities.
- NOAA's [Naturally Resilient Communities](#)^u is a guide and training program featuring options, examples, success stories, and case studies.

For Climate Resiliency planning tools for the coast see the **Coastal Appendix**.

r <https://www.ncwildlife.org/Conserving/Programs/Green-Growth-Toolbox/Greening-Ordinances#32461101-nc-model-natural-resourcesbrconservation-ordinance>

s <https://www.dec.ny.gov/lands/39786.html>

t www.nature.org/content/dam/tnc/nature/en/documents/Green_City_FINAL_PDF.pdf

u <https://coast.noaa.gov/digitalcoast/training/nrc.html>

Watershed Management Plans (See example plans on page 76)

- Address the importance of conserving high-quality streams proactively
- Emphasize conservation of stream buffers - restoration is much more costly than preserving riparian forest buffers to maintain water quality and healthy streams
- Encourage the use of wildlife friendly low impact development and management practices to minimize nutrient, sediment, stormwater and other polluted runoff
- Identify wildlife and habitat conservation priority areas that overlap with watershed priorities

Farmland Protection Plans

- Address the importance of farm and forest land as buffers to Managed Areas and as wildlife travel corridors (see page 31)
- Evaluate where priority species that depend on cropland or forest connectivity occur
- Stress the importance of habitat management on working lands and easements
- Address the role of biodiversity in pollination
- Include information about the [Wildlife Conservation Lands Program](#)^v as a mechanism to conserve wildlife habitats on private land



Floodplain forests protect farms

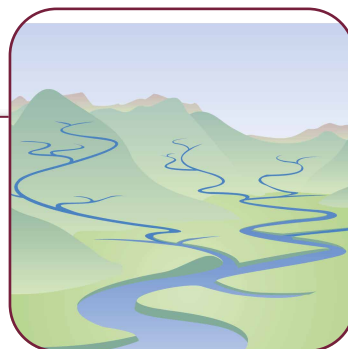
JEFF MARCUS

Strategic and Economic Development Plans

- Include information on the benefits of Green Growth from Section 1
- Address the importance of Green Growth practices in maintaining rural, scenic, and nature-related recreation, spending, and tourism.
- Enable wildlife related recreation, including hunting and fishing, through coordinated acquisitions, easements, and land use planning measures
- Recognize the importance of wildlife friendly greenways to economic development
- Address the importance of outdoor nature-related opportunities to attracting new business and skilled workers

What is a watershed?

All land is part of a watershed - where water flows from higher to lower elevations into streams, rivers and, eventually, the ocean. Riparian forest stream buffers are essential to filter and clean water, maintain top soil, trap sediment, and filter polluted runoff. Without riparian forest buffers rainwater runs off directly into streams without being filtered by trees and plants, which increases drought conditions and pollution.



ERIN HANCOCK, NCWRC

Green Building and Energy Efficiency Plans

- Encourage conservation of natural, contiguous open space in green building criteria in priority habitat areas
- Address the cost and energy savings that are gained from more centralized development patterns and mixed uses that encourage less driving
- Encourage wildlife friendly site selection for wind and solar facilities

Performance Measures

Performance measures for local government habitat conservation planning include:

- Acres of conserved priority habitat and average habitat patch core area
- Number of cluster developments in each land use district
- Feet of stream buffered by riparian forest and average buffer width
- Water and air quality metrics
- Number of parcels with connected natural open space
- Forest cover using the [National Land Cover Database^w](#)
- Acres of forests or agriculture in Present Use Value
- Acres of land enrolled in the N.C. Wildlife Conservation Lands Program
- The number of planning processes and ordinances that improve habitat and natural resource protection

Examples of Local Government Performance Measures

- Mecklenburg County, North Carolina, [State of the Environment Report^x](#)
- King County Washington [Environmental indicators and Performance Measures^y](#)

Example Plans

Land Use and Comprehensive Plans

- [Davidson, NC Rural Area Plan^z](#) -award-winning example of a plan that upholds conservation as the basis for planning in an area with high development pressure; integrates Green Growth Toolbox habitat recommendations.
- [Town of Navassa, NC, CAMA Land Use Plan^{aa}](#) - provides an example for a rural community near a major city.
- [Madison County, NC Comprehensive Plan^{ab}](#) - is an example of how a rural community chose to incorporate green growth principles.
- [Randolph County, NC, Growth Management Plan^{ac}](#) - emphasizes a vision and practical goals to conserve natural heritage through cluster development. It also lays out techniques to allow for higher density development, once public water and sewer are available on previously developed sites.
- [Raleigh, NC, 2030 Comprehensive Plan^{ad}](#) - integrates wildlife and habitat conservation and compact development strategies in all planning elements. Section 5, 'Environmental Protection,' provides detailed priority wildlife habitat

w <http://www.mrlc.gov>

x <https://www.mecknc.gov/LUESA/sustainability/Pages/GoalsandProgress.aspx>

y <https://kingcounty.gov/services/environment/data-and-trends/indicators-and-performance.aspx>

z <http://www.townofdavidson.org/DocumentCenter/View/7264/20160902-Davidson-Rural-Area-Plan-Low-Res?bidId=>

aa https://townofnavassa.org/images/planning_zoning/Future_Land_Use_Plan_201174376.pdf

ab https://www.madisoncountync.gov/uploads/5/9/7/0/59701963/madison_county_comprehensive_plan.pdf

ac <https://www.randolphcountync.gov/236/Growth-Management-Plan>

ad <https://raleighnc.gov/planning/2030-comprehensive-plan>

conservation information, justification, goals and strategies.

- [Orange County, NC, Comprehensive Plan](#),^{ae} Section 6.4.4 - contains a description of the county's wildlife and plant resources and establishes conservation strategies.
- [City of Tampa, FL, Comprehensive Plan](#),^{af} Chapter 5, 'Sustainable Environment,' includes a rationale, goals and policies to conserve significant wildlife habitats. The plan's policies are further implemented through the city's Upland Habitat Protection Ordinance and Urban Environmental Coordinator.

Transportation Plans

- [McHenry County, Illinois, Long Range Transportation Plan](#)^{ag} is based on a Green Infrastructure plan and maps that include important wildlife habitat areas.
- [Arizona Department of Transportation Wildlife Linkages Assessment](#)^{ah} was created in consultation with wildlife professionals to identify key areas for wildlife underpasses and to minimize road construction.

Watershed Management Plans

- Lincoln County, North Carolina used the Green Growth Toolbox and the N.C. Conservation Planning Tool in the [Indian Creek and Howards Creek Local Watershed Plan](#).^{ai}

Greenway Plans

- The Westmoreland County, Pennsylvania, [New Horizons: A County-wide Greenways and Blueways Network](#),^{aj} plan uses habitat conservation data to identify a network of large habitat hubs and corridors. Strategies, land use methods and funding mechanisms to conserve the network are discussed.

Climate Resiliency, Risk Assessment, and Hazard Mitigation Plans

- Blacksburg, Virginia's [Climate Action Plan](#)^{ak} emphasizes the need for forest protection in order to meet its climate goals.
- [Nature-Based Coastal Flood Mitigation Strategies](#) City of Virginia Beach, Virginia, prioritizes restoration of natural ecosystems to address flooding issues associated with sea-level rise.
- Albany, New York's Comprehensive Plan's [Climate Action Plan](#)^{al} identifies the protection of natural areas as a critical resiliency strategy.
- Oakland, California's [Equitable Climate Action Plan](#)^{am} provides a model for effective climate resiliency planning that prioritizes equity, inclusion, and justice as the centerpiece of its engagement and action. The Adaptation chapter focuses on nature-based solutions.

ae <http://www.orangecountync.gov/1238/Comprehensive-Land-Use>

af www.planhillsborough.org/tampa-comprehensive-plan/

ag <https://www.mchenrycountyil.gov/county-government/departments-j-z/transportation/transportation-plans/long-range-transportation-plan>

ah <https://azdot.gov/business/environmental-planning/programs/wildlife-linkages>

ai <http://www.lincolncounty.org/DocumentCenter/View/1997/080210Item7?bidId=>

aj www.dcnr.state.pa.us/cs/groups/public/documents/document/d_001213.pdf

ak <https://www.blacksburg.gov/home/showpublisheddocument?id=5773>

al <https://www.albanyny.gov/DocumentCenter/View/3524/2012---Albany-Climate-Action-Plan-Albany-2030-Plan-Appendix-D-PDF?bidId=>

am <https://cao-94612.s3.amazonaws.com/documents/Oakland-ECAP-07-24.pdf>

Wildlife and Biodiversity Conservation Plans

- Village of Schaumburg, Illinois, [Biodiversity Recovery Plan^{an}](#) is part of their Comprehensive Plan. It guides the community's efforts to preserve, restore, and maintain biodiversity within the community.
- Anchorage, Alaska's municipal [Comprehensive Wildlife Management Plan^{ao}](#) was developed in partnership with multiple state and federal agencies.

Local Government Green Infrastructure Programs

- The Piedmont Triad Regional Council created a [Green Infrastructure Plan^{ap}](#) for its whole region.
- The Conservation Fund is one organization that maintains a [website of local government green infrastructure case studies^{aq}](#).

Regional Comprehensive Assessments

- The [Western North Carolina Vitality Index^{ar}](#) provided information on the status of the economic, social, natural, and built environment indicators of 27 counties in western North Carolina. It incorporated the N.C. Conservation Planning Tool and summary information on the biodiversity resources of the region.
- [GroWNC^{as}](#) was created by the Land of Sky Regional Council and is based on planning that will increase economic competitiveness and job creation in the Council's region of the southwest North Carolina mountains. It incorporates a green infrastructure analysis and scenario mapping for development patterns and natural resource conservation.

Multiple Examples of Wildlife Conservation-Based Planning and Development

- See the Minnesota Department of Natural Resources [Guide to Using Natural Resource Information in Local Decision Making^{at}](#).

For More Information and Resources

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ap <https://www.ptcr.org/home/showpublisheddocument/7240/636621452741970000>

aq https://www.conservationfund.org/our-conservation-strategy/focus-areas/green-infrastructure/case-studies/index.php?option=com_content&view=article&id=539&Itemid=160

ar www.wncvitalityindex.org

as http://www.landofsky.org/pdf/LGS/GroWNC/GroWNC_Regional_Plan_Final_small.pdf

at www.dnr.state.mn.us/nrig/index.html

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- 1 Hedley, S. G., K. A. Wilson, A. Moilanen, T. Rebelo and H. P. Possingham. 2009. Delaying conservation actions for improved knowledge: how long should we wait? *Ecology Letters* 12:293 – 301.
- 2 Perlman, D.L. and Milder, J.C. 2005. *Practical Ecology for Planners, Developers, and Citizens*. Lincoln Institute of Land Policy.
- 3 These suggestions are drawn from several sources cited under 'For More Information' in this section: Chicago Wilderness Consortium (2007), Austin et al. (2004) and Maine Department of Inland Fisheries and Wildlife (2003).
- 4 Bank, F. G., C. L. Irwin, G. L. Evink, M. E. Gray, S. Hagood, J. R. Kinar, A. Levy, D. Paulson, B. Ruediger, R. M. Sauvajot, D. J. Scott, and P. White. 2002. Wildlife habitat connectivity across European highways. U. S. Department of Transportation Federal Highway Administration Report: 1-45.
- 5 Knight, Andrew T., Cowling, R.M., Campbell, B.M. 2006. An Operational Model for Implementing Conservation Action. *Conservation Biology*, 20(2), 408-419.