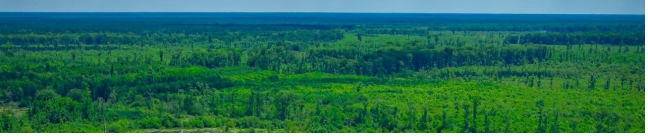



Growing Green

Pender County's Preferred Development Guide









Partners for Green Growth

2025

Table of Contents

Introduction

Situated in the southeastern coastal plain of North Carolina, Pender County contains some of the most significant habitat along the eastern United States (LeBlond & Grant, 2000). Several waterbodies support wildlife, such as the Atlantic Ocean, Intracoastal Waterway, Northeast Cape Fear River, and the Black River. Inland areas, such as the Holly Shelter and Angola Bay Game Lands, provide critical habitat to terrestrial animals. While the county still remains largely rural with a strong agriculture industry, notable increases in development pressure and changing climate conditions are threatening critical habitat and local environments.

Pender County is the fifth largest county in the state by total land area, and the population has steadily increased over the past couple of decades. Since 2000, the County has seen a compounded annual growth rate of 1.93%, and the population is projected to grow another 21.8% by 2029. With this population growth comes necessary development in the form of residences, retail, dining, health services, schools, and recreation. In recent years, residential units have been the main form of new development, but as more residents move into Pender County, commercial spaces are opening to support the growing population. Growth has been concentrated in the Hampstead area and is beginning to spread towards Rocky Point and Scotts Hill. This places a strain on the ecologically significant areas near the Black River, the Northeast Cape Fear River, and Game Lands, such as Holly Shelter and Angola Bay.

By the end of the century, North Carolina is expected to experience larger changes in climate than at any other point in state history (Kunkel et al., 2020). These changes will affect many different aspects of the environment through temperature abnormalities, increased precipitation rates, and a higher frequency and intensity of storms. Floods, droughts, and wildfire will also increase by the end of the century. These changing conditions are additional threats to ecosystems and wildlife in Pender County.

Pender County residents greatly support smart development practices and the protection of the County's environmental resources. Throughout the Imagine Pender 2050 comprehensive land use planning process, residents were asked about the biggest challenges they would like to see addressed in the plan, and the results identified the following three challenges:

- ☐ Drainage and flooding issues
- ☐ Wildlife habitat loss and environmental destruction
- ☐ Need for more restrictive land use regulations

Residents would like to see local officials regulate the character and location of new development in order to protect nearby property values, environmental resources, and broad community interests. Eighty percent of respondents of the survey expressed that more development regulations should be adopted by the County to prevent or restrict further building in flood zones, wetlands, and environmentally sensitive areas. It is clear through these engagement processes that the Pender County community finds the protection of natural resources a priority, and implementation of this guide will support their voices.

The Green Growth Toolbox, developed by the North Carolina Wildlife Resources Commission, outlines strategies the County can put into action to tackle these challenges.

The Green Growth Toolbox is a guiding document for addressing wildlife and habitat concerns in local planning efforts, and was used to inform the approaches included in the Pender County Preferred Development Guide.

The intention of the Preferred Development Guide is to balance development with protection of the remarkable natural assets in the county. It is meant to be used as a source of ideas and guidance for future tactics that can achieve green growth. The approaches and strategies in this document will not be put into place immediately, but rather considered and pursued at a later date. This guide is not only for planning staff and local officials; developers and landowners can use this guide as a resource when starting new development projects to create environmentally-responsible designs. Planning staff can assist developers with producing projects that achieve better environmental outcomes for the county.

This Preferred Development Guide can support the County's endeavors to preserve critical habitat that provides benefits to the plant and wildlife species and contributes to the economic vitality and resilience of the county. These efforts are important to current and future generations of Pender County residents, visitors, and wildlife.

What is Green Growth?

Green Growth is a method of development that prevents the loss of wildlife, habitat, and significant natural assets. It aims to bridge the gap between planning and natural resource protection by providing recommended methods to balance necessary growth with the conservation of wildlife habitat. Ensuring development patterns do not disrupt the environmental assets in communities is vital to the health and economic success of our county and state.

Green Growth practices benefit residents, visitors, and wildlife, and is advantageous for communities for the reasons below:

- ☐ Improves community health
- ☐ Maintains ecosystem services, which provide significant economic returns
- ☐ Mitigates damages from natural disasters, such as flooding, drought, and climate change
- ☐ Avoiding environmental conflicts may help streamline permitting processes
- ☐ Attracts new businesses by preserving high-quality and attractive green spaces
- ☐ Increases property values, produces more profitable developments, and increases the economic competitiveness of a community
- ☐ Supports the preservation of working lands in forestry and agriculture
- ☐ Generates tourism
- ☐ Reduces costs to taxpayers and local government by reducing the cost of community services
- ☐ Answers public demand for sustainable development patterns and conservation
- ☐ Provides an opportunity for innovative leadership

Green Growth Guiding Principles

The top threat to wildlife in North Carolina is habitat degradation, fragmentation, and loss caused by sprawling development patterns. With over 1,000 wildlife species found in North Carolina, including 46 federally endangered or threatened species and 256 state endangered or threatened species, establishing connected habitat corridors is critical to their survival (North Carolina Wildlife Resources Commission, 2023). The guiding principles of the Green Growth Toolbox planning concepts are to **protect, connect, and buffer.**

Protecting blocks of habitat supports species and provides numerous benefits to the community, such as clean water, wildlife habitat, recreation, stormwater absorption, and heat index reduction.

Connecting habitat core areas allows species access to enough resources like food, water, and mating partners, all of which are critical for their prosperity.

Buffering habitat core areas minimizes impacts such as noise, light, and pollution on the main habitat area.

Importance of Green Growth Development Practices

Prioritizing growth patterns that respect natural systems will deliver long-term benefits for residents, businesses, and wildlife. These benefits influence numerous aspects of community vitality, from economics to flood protection and even public health. Sprawling development patterns that have dominated landscapes over the past few decades have led to, and exasperated, many of the challenges faced in urban and rural areas today. By designing communities in Pender County with the environment in mind, we can foster vibrant, healthy spaces that are resilient for generations to come.

Fiscal Sustainability

Investing in green growth strategies can lower infrastructure and maintenance costs over time. Preserving natural landscapes can reduce the need for costly stormwater infrastructure, and compact, walkable developments can lower public and private expenses for roads, utilities, and emergency services. An analysis by Curruthers and Ulfarsson (2003) found that the per capita cost of most community services declined by increasing density over a smaller footprint, whereas the per capita cost of most community services increased with sprawl away from metropolitan areas. Research also suggests that lots in conservation subdivisions cost on average $7,400 less to develop than conventional subdivision lots (Mohamed, 2006). Research conducted in South Carolina found that conservation subdivision lots can cost $10,000 less to develop per lot than those in conventional subdivisions (Conservation Research Institute, 2005). Building on less land reduces the need for extensive infrastructure

systems, subsequently cutting construction and maintenance costs that get passed onto homebuyers, renters, and taxpayers.

Property Values

Properties near well-maintained green spaces often have higher market values. Natural amenities are highly desirable, attracting residents and businesses alike, and green growth strategies ensure that development capitalizes on these features. Results from a study in Rhode Island concluded that lots in conservation subdivisions sold for $122,000 to $125,000 per acre, whereas lots in conventional subdivisions sold for $107,000 to $109,000 per acre; this equates to an approximately $15,000 difference per acre between the two development types (Mohamed, 2006). In Apex, North Carolina, homes in a community adjacent to the American Tobacco Trail sold for $5,000 more than others in the neighborhood farther from the trail (Hopey, 1999). Higher property values due to proximity to green space is not specific to urban areas, as research has shown that it benefits property values everywhere, even in rural areas (Economic Research Associates, 2005). In turn, higher property values can generate stronger tax bases, supporting community services and investment back into the community.

Stormwater and Resilience

As more frequent and intense storms affect the coast of North Carolina, resilient design is essential to protect people and property. Green growth strategies encourage nature-based solutions for managing stormwater, such as rain gardens, bioswales, permeable pavements, wetland preservation, and the conservation of large tracts of vegetated land. These systems help absorb and filter rainwater, reduce flooding risks, and protect water quality. Preserving floodplains and coastal buffers maintains the hydrography of the land and lets water move in its natural path.

Natural stormwater management systems can save communities significant amounts of money by reducing damage costs following storm events, in addition to avoiding the costs it would require to construct and maintain traditional stormwater management systems. Research suggests that flood damage costs go beyond individual property owners and onto local governments and mortgage lenders, due to property abandonment, outmigration causing decreased tax revenue, and health impacts that overwhelm healthcare service systems (Thomson et al., 2023).

For example, wetlands in coastal communities can provide a 20% reduction in annual storm damage, resulting in cost savings during recovery efforts following major events. (Narayan, Beck, Wilson et al., 2017). The most recent calculations of total acreage of coastal and non-coastal in Pender County is 310,452 acres. If each one of those acres is able to hold an average of 330,000 gallons of water, the wetlands in the county could hold roughly 102.5 billion gallons of water. Utilizing the natural systems already in place and identifying opportunities for nature-based solutions can support communities resilience efforts and economic strength.

In Charlotte and Mecklenburg County, the nature preserves, stream buffers, and trees are valued at over $4.4 billion in avoided stormwater construction costs and $64 million in air purification (American Forests, 2010).

Did you know?

A one acre wetland, one foot deep, can hold approximately 330,000 gallons of water. One inch of rainfall on one acre is approximately 27,154 gallons of rainwater.

That means **one acre of wetland can hold roughly 12 inches of rainwater!**

Wildlife Habitat

Wildlife play a critical role in indicating the well-being of our natural resources and warn us of threats to our economic and physical health. Abundant wildlife and rich species diversity informs us that our natural resources are in good health. Connectivity is vital for animals to access the resources they need, which often changes throughout the course of their life. The places where animals find food and clean water is often different from the places they mate, which can be different from the places where they raise their young. Without connected landscapes, these natural processes are interrupted and the species suffer, often through reduce genetic diversity that leads to local extinction. Natural areas serve as essential habitat for wildlife and plants, and maintaining the connection of these landscapes supports biodiversity by allowing species to move, feed, and reproduce. Incorporating habitat considerations into land use planning, such as preserving connected open spaces and thoughtfully placing infrastructure, ensures that growth does not come at the expense of the region's ecological processes.

Animals and plants are not the only ones that benefit from thriving wildlife habitat. Known as ecosystem services, habitats greatly support our daily lives. We rely on wildlife as food supplies, pest control, pollinators, medicine, genetic resources, and tourism drivers. Their habitats provide us with clean water, protection from flooding and drought, and reduced heat. Reduced habitat can also lead to increased rates of human-wildlife conflict as animals seek out necessary resources. Our physical health and economies are dependent on the vitality of our wildlife, and only through connected spaces can these plants and animals thrive.

Sense of Place

Well-designed green spaces, such as parks, trails, and natural areas, are powerful social spaces that foster a sense of shared belonging and strengthen community bonds. They create places for people to gather, connect, and engage in shared activities. Communities with accessible and natural public spaces are often more cohesive and inclusive, which can lead to better health and social outcomes.

Implementing green growth development practices can deliver co-benefits to communities and maximize the efforts of planning departments and developers. For example, greenway trails and parks serve as recreational spaces for residents, while simultaneously providing

economic benefit and habitat for wildlife. One greenway can generate $2.7 million in economic activity, which can be placed back into the community and improve quality of life (Flink, 2011). Recognizing that the protection of natural resources does not come at the expense of community amenities is paramount to the successful implementation on this guide.

Quality of Life and Public Health

Access to nature is directly linked to improved physical and mental health. Walking and biking trails encourage active lifestyles, and green spaces reduce heat stress during summer months. Exposure to green space has been shown to lower stress levels, improve mood, enhance cognitive function, and lower rates of obesity (Krasny, Pace, Tidball, and Helphand, 2012; Jilcott, Edwards, Moore, Shores, Dubose, and McGranahan, 2012).

Community health is a priority for many individuals when settling on a place to live. Cleaner air and water, a result of green development practices, support long-term community health. When we degrade the natural systems that support our mental and physical health, we run the risk of placing adverse health outcomes onto future generations; this can drive residents away and increase costs for those still within the community. Protecting natural spaces in Pender County will most positively impact public health.

Green growth is not just an environmental ideal, it is an economically, socially, and environmentally positive strategy for community development. Integrating considerations for habitat, resilience, public health, fiscal responsibility, and property values into community development can create lasting prosperity that benefits the public and the environment. This approach positions the county to thrive in a changing world, ensuring that development today does not compromise the well-being of future generations.

Pender County's Environmental Resources

Pender County has some of the most exceptional natural areas along the East Coast. Pender County is part of the Cape Fear Arch, an ecologically significant area that has more plant and animal species diversity than any area north of Florida. In North Carolina, Pender County falls within the top 5% of all 100 counties for the total number of rare plant and animal species.

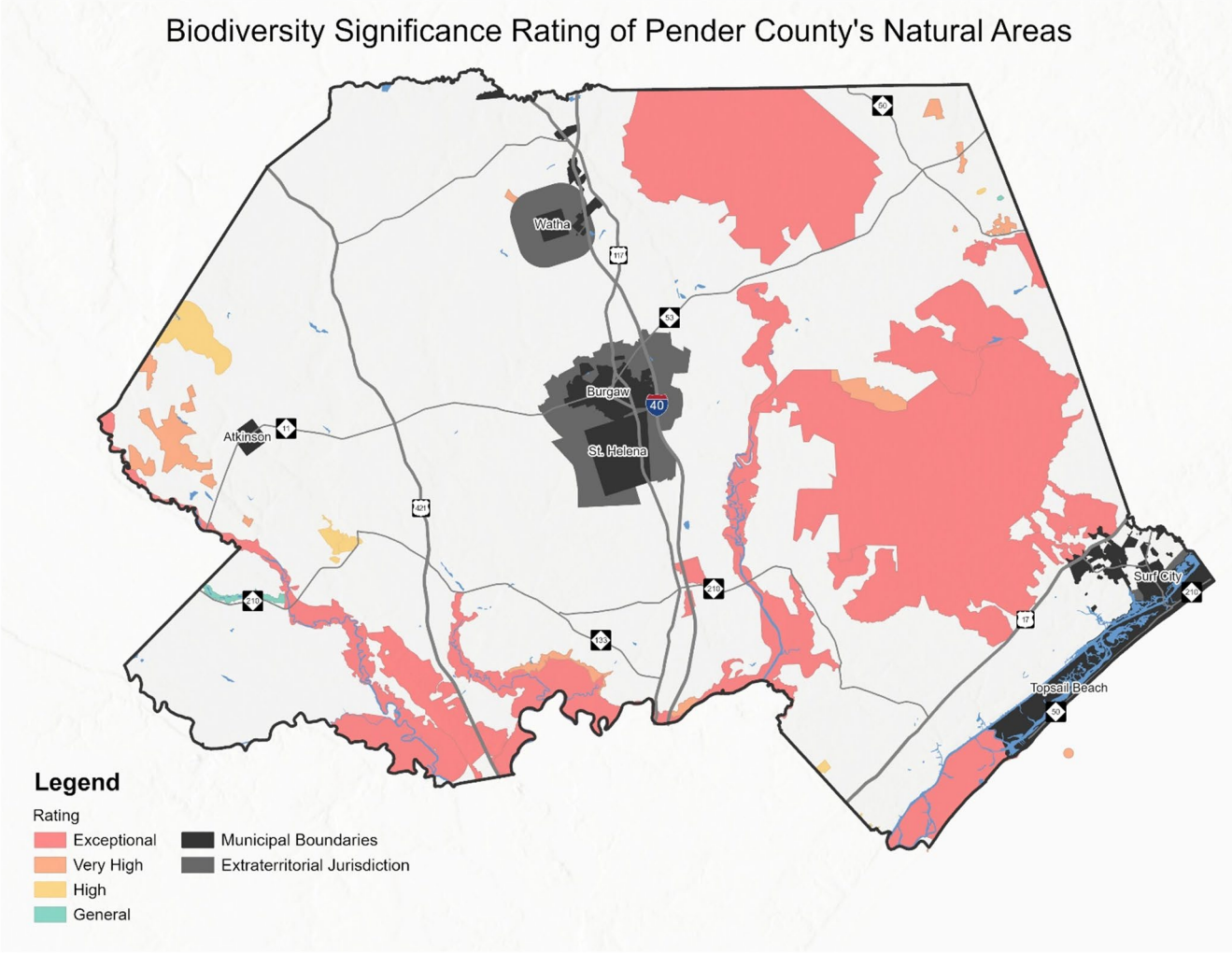
The North Carolina Natural Heritage Program works with counties across the state to complete county-specific natural area inventories. Pender County conducted a Natural Area Inventory between 1997 and 1999 to identify the county's most significant natural habitats, rare species, and ecological communities. These areas are recognized for their ecological, recreational, and cultural value, and are essential for biodiversity, water quality protection, and public health.

The inventory defines three categories of significant natural heritage areas. Standard sites are areas containing one or more exemplary natural communities, ranging from small tracts to thousands of acres. Macrosites are clusters of standard sites with strong ecological

relationships, and megasites are the final category of large landscape units encompassing multiple macrosites. Pender County contains 34 standard sites, three macrosites, and two megasites. Key sites include the Maple Hill Savannas Macrosite, the Black River Floodplain Macrosite, and the Holly Shelter Macrosite. These areas consist of diverse habitats such as pine savannas, pocosins, tidal swamps, and maritime forests. The County also supports a high concentration of globally rare ecosystems, including the only known example of the Wet Marl Forest and unique variants of pine savanna.

In addition to the standard, macro, and megasites, the North Carolina Natural Heritage Program identifies terrestrial and aquatic sites across the state that are of special biodiversity

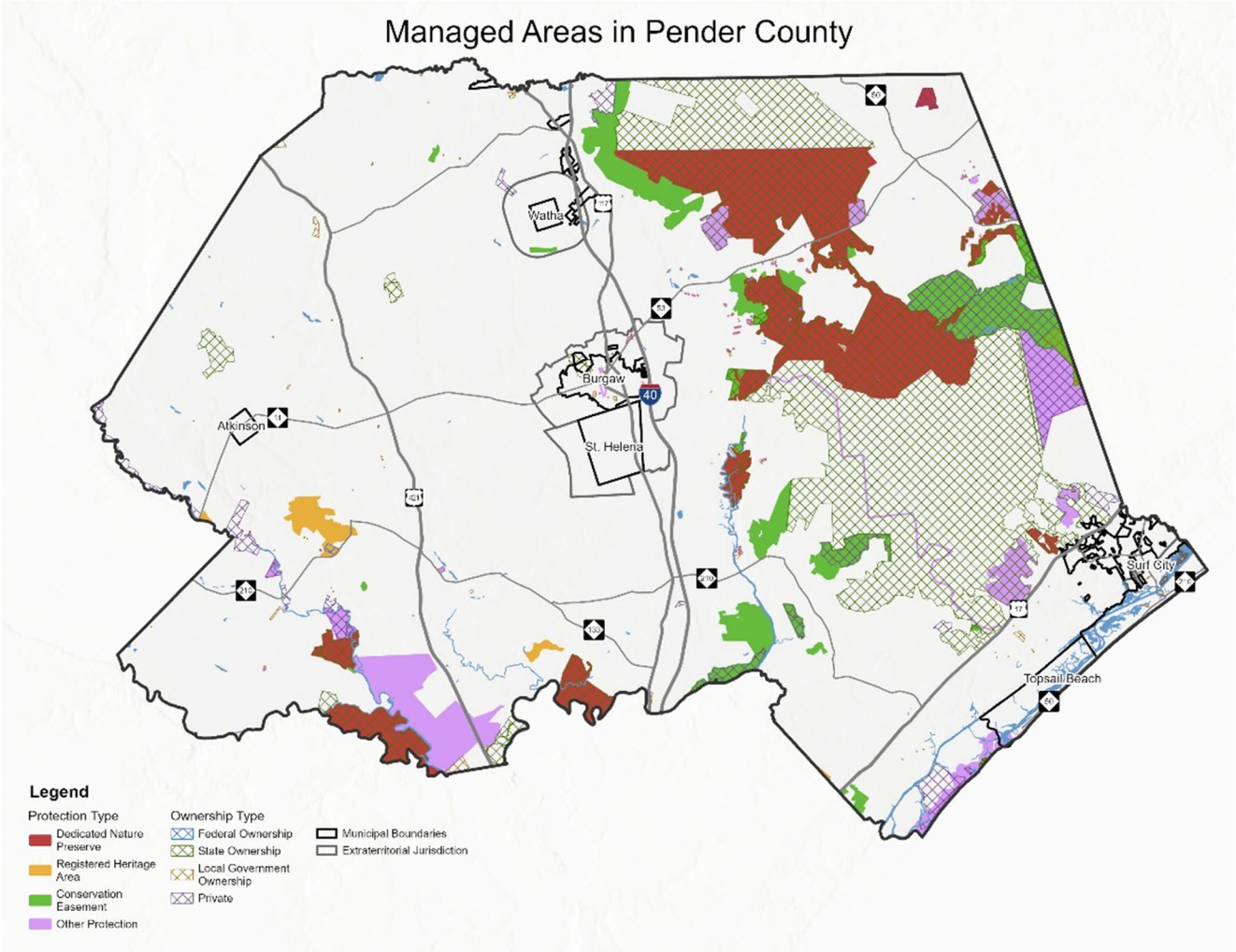
Figure 1.1



significance, known as Natural Areas. A Natural Area may be recognized due to the presence of rare species, high-quality natural communities, important animal assemblages, or other ecological features. Figure 1.1 illustrates the Natural Areas in Pender County and their rating of biodiversity significance as of 2024. Species richness is especially high in longleaf pine ecosystems and swamp habitats along the major rivers.

The North Carolina Natural Heritage Program has current data of properties and easements where natural resource conservation is one of the primary management goals, or the land is of conservation interest. These lands are known as Managed Areas. Many of these sites are publicly owned or held in conservation easements, but a significant portion remain in private ownership. Maintaining ecological wellbeing will require continued cooperation between landowners, developers, conservation groups, and government agencies. Figure 1.2 shows the Managed Areas identified in Pender County, along with their Protection and Ownership Type.

Figure 1.2



Threatened and Endangered Species

At the time of completion of the Natural Area Inventory in 2000, 83 rare plant species and 65 rare animal species were recognized at state or federal levels. Based on recent data from the North Carolina Natural Heritage Program, the following plant and animal species are

identified as federally endangered or threatened. There are additional endangered and threatened species at the state level.

Federally Endangered
Plants
Rough-leafed Loosestrife, *Lysimachia asperulifolia*
Cooley's Meadowrue, *Thalictrum cooleyi*
Golden Sedge, *Carex lutea*
Chaffseed, *Schwalbea americana*
Animals
Northern Long-eared Bat, *Myotis septentrionalis*
Tricolored Bat (proposed), *Perimyotis subflavus*
Kemp's Ridley Sea Turtle, *Lepidochelys kempii*
Shortnosed Sturgeon, *Acipenser brevirostrum*
Atlantic Sturgeon, *Acipenser oxyrinchus oxyrinchus*

Federally Threatened
Plants
Seabeach Amaranth, *Amaranthus pumilus*
Animals
Piping Plover, *Charadrius melodus melodus*
Rufa Red Knot, *Calidris canutus rufa*
Red-cockaded Woodpecker, *Dryobates borealis*
Green Sea Turtle, *Chelonia mydas*
Loggerhead Sea Turtle, *Caretta caretta*
Atlantic Pigtoe, *Fusconaia masoni*
Southern Hognose Snake, *Heterodon simus*
West Indian Manatee, *Trichechus manatus*

What is the difference between an endangered and threatened species?

Endangered species are at risk of becoming extinct throughout all or a significant portion of its range.

Threatened species are likely to become endangered within the foreseeable future.

Risk factors for endangered and threatened species include habitat loss, poaching, invasive species, and climate change.

Habitat types in Pender County range from coastal dunes and maritime forests to tidal marshes, cypress-gum swamps, pocosins, longleaf pine savannas, and river floodplains. Different habitat types support different species. The coastal habitats are critical for nesting shorebirds and sea turtles. The river floodplains support rare aquatic species, and longleaf pine ecosystems provide essential habitat for species such as the red-cockaded woodpecker, gopher frog, and Venus Flytrap. Many of these rare species are codependent on each other and the habitat they occupy, such as the Venus Flytrap Cutworm. Both the Venus Flytrap and the Venus Flytrap Cutworm are globally restricted to the North Carolina Coastal Plain.

This guide aims to prioritize a few key habitat areas for green growth development. These areas are 1) lands within and adjacent to NHNAs, 2) riparian areas, particularly along the Northeast Cape Fear River and the Black River and, 3) the following priority habitats as defined by the North Carolina Wildlife Resources Commission.

Priority Habitats

- ☐ Beaches and estuarine islands
- ☐ Tidal wetlands
- ☐ Maritime forests
- ☐ Estuaries and Coastal Marsh
- ☐ Longleaf pine forests and pocosins
- ☐ Small wetland communities
- ☐ Early successional habitats
- ☐ Floodplain forests
- ☐ Streams and key aquatic habitats
- ☐ Large, unfragmented, undeveloped parcels
- ☐ Undeveloped tracts in close proximity to existing Managed Areas
- ☐ Important wildlife travel corridor

Prioritizing these areas for green growth and conservation efforts is critical due to their high level of ecosystem services. Pender County's natural areas represent an irreplaceable group of biodiversity and play a vital role in sustaining rare species and healthy ecosystems in southeastern North Carolina. Through protecting these areas, county residents, visitors, and wildlife can achieve resilience toward changing environmental conditions.

Existing Policies and Regulations

Pender County has several planning documents that guide its growth and development. In order to understand how the County is currently addressing natural resource and wildlife protection, a few of the main documents were analyzed. The documents and each of their analysis are included in this section.

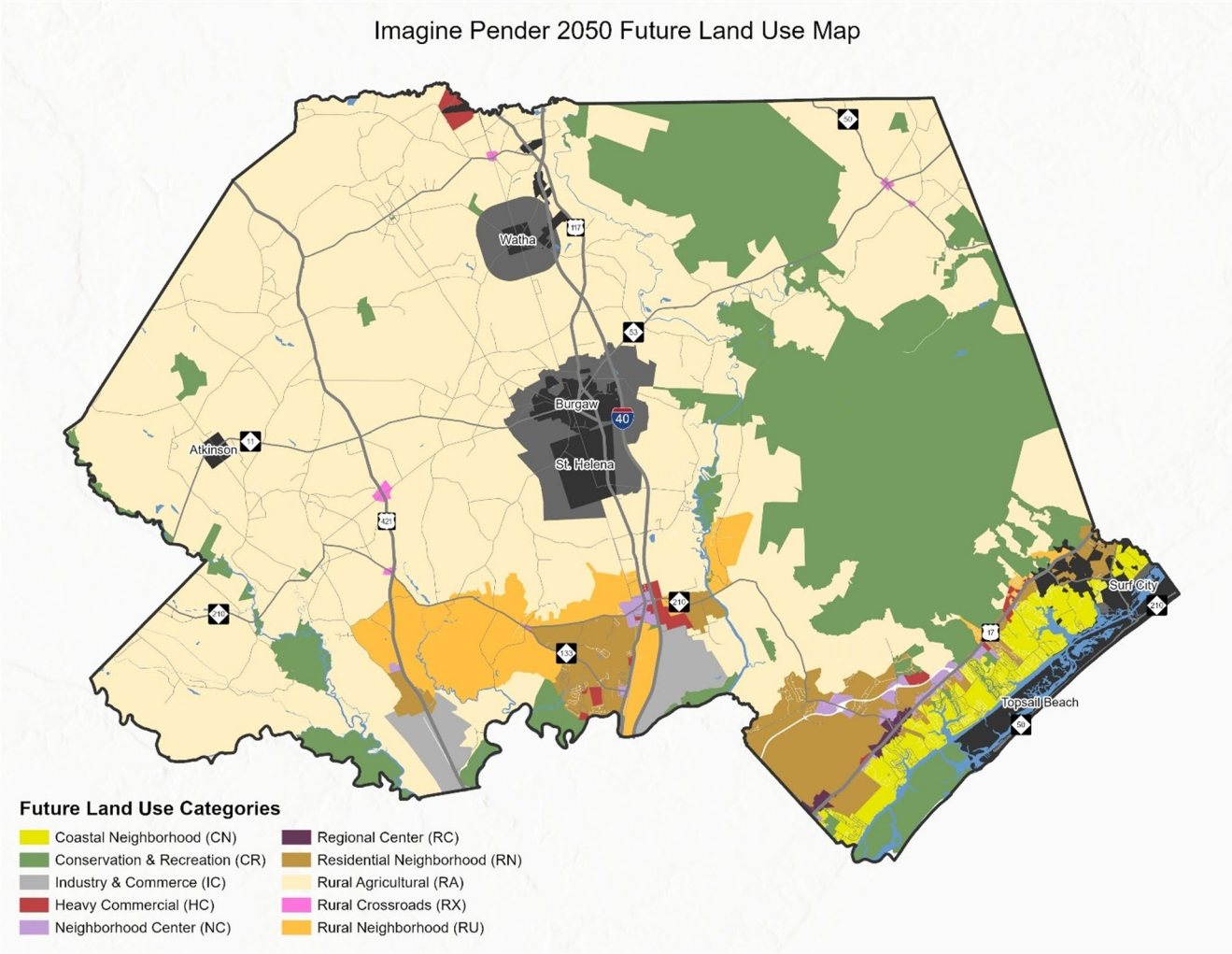
Imagine Pender 2050 Comprehensive Land Use Plan

In November of 2025, the County adopted a new comprehensive land use plan, Imagine Pender 2050. The Plan includes vision themes, goals, policies, and actions that provide aspirational and guiding direction for the county's growth and development over the next 25 years. The three community vision themes – Coordinate Growth, Preservation, Conservation,

and Infrastructure, Support Pender County's Fiscal Health, and Maintain a High Quality of Life – all speak to the overarching mission of the Green Growth Toolbox and Preferred Development Guide. Coordinating the County's development patterns in ways that support economic prosperity and environmental protection leads to a higher quality of life for residents and supports wildlife.

Through the Imagine Pender 2050 planning process, the County drafted nine goals, several of which relate to natural resource protection and resilience. Sustainable and Managed Growth, Environmental Conservation and Resilience, and Enhanced Quality of Life and Community Health are all goals that can be realized through the implementation of the Preferred Development Guide. Each of these goals has policies to support their implementation, and the ideas in this development guide have been included into the County's new comprehensive plan to support future development decisions. Under the Environmental Conservation and Resilience goal, Policy 7.1.D Green Growth Toolbox states, "coordinate future development with the concepts of the Green Growth Toolbox. Amend development regulations and processes to incentivize conservation subdivisions, especially in environmentally sensitive areas (such as riverine, wetland, and coastal areas)."

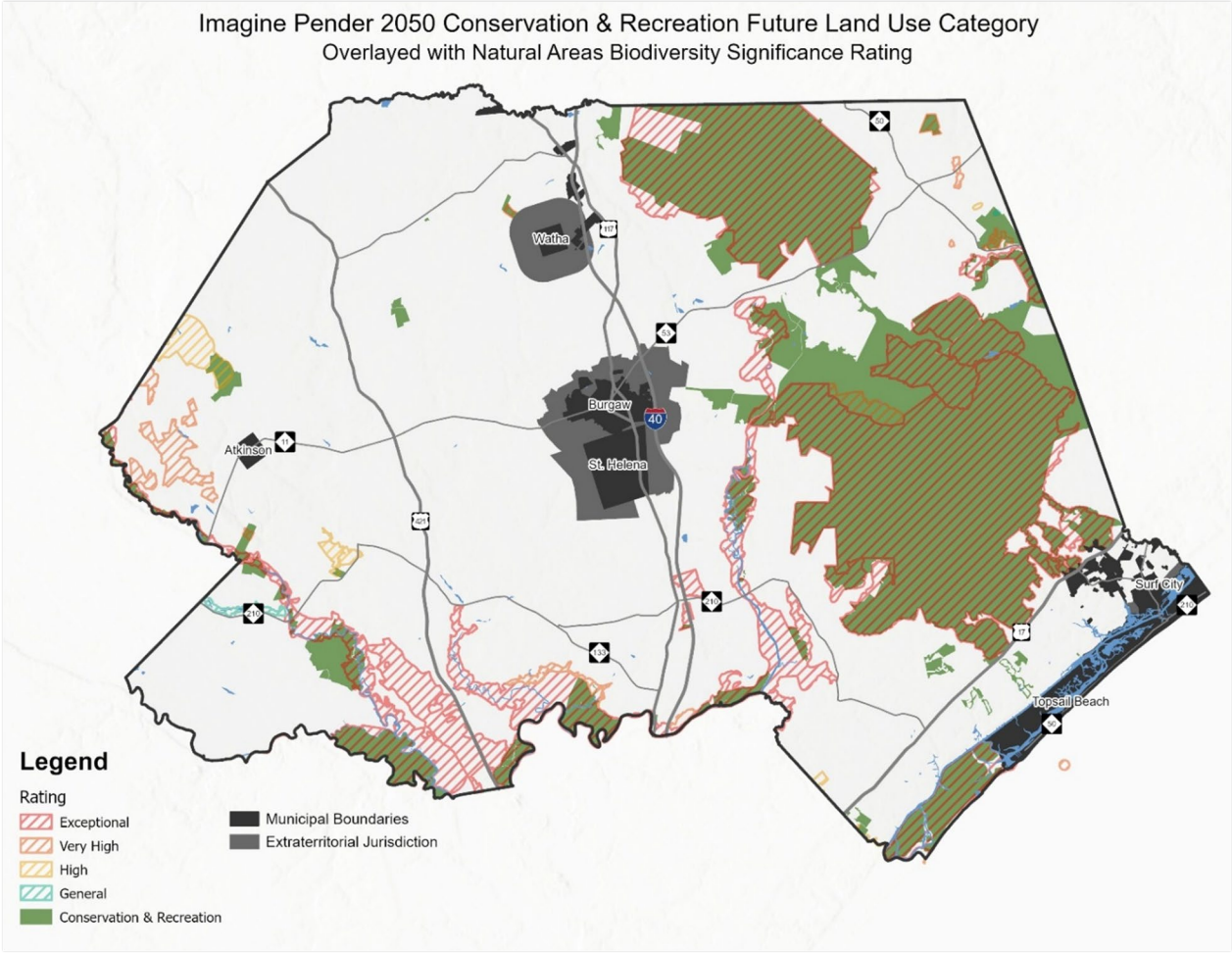
Figure 1.3



An integral part of a comprehensive plan is the future land use map (FLUM), which is a visual tool used to envision and guide long-term growth and development of a community. This map contains future land use categories that outline desired development types, characteristics, and features. For the Imagine Pender 2050 Comprehensive Land Use Plan, a new future land use map was developed and is shown in Figure 1.3. A larger version of the map and description of each category can be found in the Imagine Pender 2050 Comprehensive Land Use Plan on the Pender County Planning and Community Development Department's website.

The Imagine Pender 2050 future land use map includes a Conservation & Recreation (CR) category to denote areas that are identified to support the conservation of natural resources, promote recreational opportunities, and foster environmental access and education. Figure 1.4 illustrates the Conservation & Recreation future land use category along with the areas of high biodiversity significance in the county. Pender County currently has a large portion of its most ecologically rich areas in conservation or used as recreational space. Green growth development strategies should be considered in all of the future land use categories, with particular consideration for the areas that fall outside of the Conservation & Recreation category but within the identified Natural Areas.

Figure 1.4



This Preferred Development Guide can be used to further the goals of the Imagine Pender 2050 comprehensive land use plan, and many of the policies within the Plan can be used to support the implementation of this guide. Implementation of the Imagine Pender 2050 comprehensive plan is a priority, and utilizing the Preferred Development Guide can support progress toward achieving the Plan's goals.

Pender 2.0 Comprehensive Land Use Plan

Pender 2.0, the County's current comprehensive land use plan, was adopted in 2018 and served as the main policy document for land use decisions until late 2025. The Plan is not legally binding but rather guides the growth and development of the County by offering guidance for decision makers when making land use decisions. Numerous aspects of community development are encompassed in the Plan's goals, policies, and actions, including housing, infrastructure, transportation, economic development, and natural resource protection.

The Pender 2.0 Comprehensive Land Use Plan includes several policies on the County's environment and natural resources. The County contains coastal wetlands, estuarine waters, and coastal shorelines which are primarily regulated by North Carolina's Coastal Area Management Act (CAMA) under the Division of Coastal Management. Areas outside the control of CAMA are regulated by the County, providing more discretion to develop focused policies for protection.

Chapter 3, Natural Systems Analysis, of Pender 2.0 contains the goals, policies, and actions related to natural resources within the County. The chapter begins by stating "a coordinated balance between development, preservation of agricultural working lands, and environmentally sensitive areas must be a goal for the County." This goal emphasizes preserving the quality of life of residents through smart growth practices.

There are numerous other Policies and Recommended Actions throughout the comprehensive plan that can be grouped into general themes. These themes cover topics such as habitat preservation, environmental planning, open space, tree preservation and forestry, wetlands, hazard mitigation, and flood resilience. Each of the specific Policies and Recommendations within these groups can be found in the Preliminary Report of Findings located in Appendix C of this guide.

Pender County Unified Development Ordinance

The County's Unified Development Ordinance (UDO) was adopted in 2010, and since then the community has experienced many changes in needs and priorities. There are currently two sections of the County's UDO that relate to habitat preservation and green growth practices. Article 7, Open Space, specifies the two different types of open space – active and passive – that must be included with each development proposal. The required open space allocation for each project is also specified in this article. Article 8, Landscape and Buffering, states the intent of the landscape and buffering requirements, and mainly describes benefits to homeowners and property values without mentioning the benefits to wildlife. Buffer requirements within the Pender County UDO have been established to provide a "desired

level of buffering between various land use activities" and not necessarily to protect any type of natural resource or associated function. The UDO does not include regulations regarding riparian buffers, though the Pender 2.0 Comprehensive Land Use Plan does recommend that they be established as a development requirement (Policy 3.1.C). Additional details about both of these articles can be found in the Preliminary Report of Findings located in Appendix C of this guide.

Site Design Elements

Environmentally responsible design begins with a clear understanding of the natural environment and a commitment to protecting the ecological systems that are unique to Pender County. Development should be planned so that it minimizes ecological disturbances, preserves mature trees and native vegetation, and maintains the natural functions of land water systems. These practices not only safeguard valuable habitat, but also support community resilience and quality of life.

Environmental features on a site should be identified prior to any design decisions. Conducting early inventories of natural assets on a site allows engineers and planners to design around these features rather than altering the landscape to conform to the development design. A thorough tree and natural resource inventory should document the location, size, and health of mature trees and forest stands, identify wetlands, floodplains, and riparian buffers, and note unique habitat areas that are unique to coastal North Carolina. These environmental features should guide the layout of the development so that the project works with the site's existing ecological patterns.

Site design should work with, rather than against, the landscape. Cluster or conservation subdivision design provides a particularly effective model for achieving this balance. These types of subdivisions maintain overall development density by concentrating buildings and infrastructure on a portion of the site. This type of layout can preserve large contiguous blocks of open space or farmland. For example, a 50-acre tract might cluster homes on 20 acres, leaving 30 acres as preserved forest, marsh buffer, or agricultural land. A visual comparison of conventional versus conservation subdivisions can be found in Figure 1.5 and Figure 1.6 on the following pages.

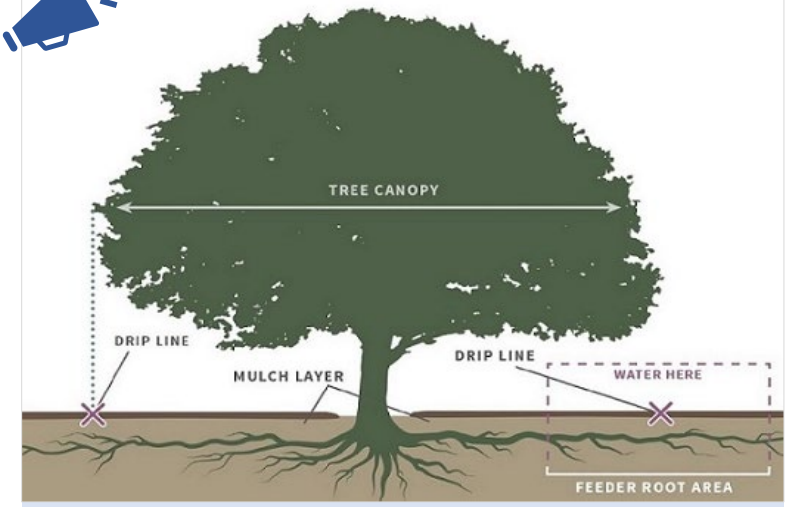
Ideally, these preserved open spaces would connect to open space on adjacent lots to create large, contiguous tracts of habitat corridors for wildlife. New development projects should make every effort to connect open space to neighboring parcels to prevent the fragmentation of wildlife corridors. It should be noted on site plans how the required open space is connected to adjoining parcels.

Incorporating nature-based infrastructure alongside traditional gray stormwater infrastructure (e.g., storm drains, retention basins, gutters) enhances ecological function and habitat for wildlife. Rather than relying solely on conventional stormwater systems, developments can use bioswales, rain gardens, and wetland preservation to slow, filter, and infiltrate runoff. Permeable pavements on driveways, parking areas, and low-traffic roads allow stormwater to soak into the ground rather than running off into nearby creeks or estuaries. Rain gardens can

be installed along streets and near buildings to collect roof and surface runoff, supporting pollinator-friendly landscaping while reducing flooding. These features are particularly important in coastal areas where high water tables and heavy rain make traditional stormwater systems less effective. Apart from the environmental benefits, incorporating nature-based infrastructure can reduce construction costs and long-term maintenance costs of traditional stormwater infrastructure.

Native plants and grasses should be planted for yards as their deep, fibrous root systems stabilize soil and absorb water. Since they are suited for the natural environment found in our area, native plants and grasses also require less water, fertilizer, and pesticides that can impact local water quality. Native plants and grasses can be difficult to find in local nurseries and more expensive than non-native varieties. Programs can be implemented to assist developers and homeowners with purchasing native plants and grasses, and as demand increases it is likely that accessibility and affordability will improve.

Tree preservation and soil protection during construction are equally critical. Establishing Tree Protection Zones (TPZs) around the drip line and beyond for significant trees creates a buffer that protects roots and soils from compaction and pollution. During construction, geotextile mats with woodchip layers can create temporary access or storage areas without damaging soil structure. These techniques protect existing trees and support natural infiltration and groundwater recharge.



A tree drip line is the area on the ground beneath the outermost edge of a tree's canopy where water drips from the leaves after rain or watering. This zone is important because it marks where the tree's roots are most concentrated and actively absorb water and nutrients.

Sustainable building design is another strategy for environmentally responsible development. Incorporating Leadership in Energy and Environmental Design (LEED) standards can improve energy efficiency, reduce water consumption, and minimize construction waste. In Pender County, sustainable building design ideas might include positioning buildings so they maximize natural ventilation and daylight, installing high-efficiency HVAC and water systems, and including native landscaping around buildings to reduce water demand and support local biodiversity.

After construction, long-term stewardship ensures that preserved features continue to thrive. Developers and property owners should establish clear guidelines on tree care, stormwater infrastructure maintenance, and invasive species control. Homeowners are also encouraged

to adopt rainwater harvesting systems, native gardens, and backyard habitat certifications to extend ecological benefits beyond common areas.

Environmentally responsible site design is an investment in the County's future. Developments that integrate green infrastructure and sustainable building practices often have lower long-term infrastructure costs, increased property values, and a stronger community identity. Mature trees, robust wildlife habitat, and functional natural systems cannot be replicated once lost.

Examples of Conventional versus Conservation Subdivision Design

Figure 1.5

Source: Southeastern Wisconsin Regional Planning Commission

Figure 1.6

Source: Southeastern Wisconsin Regional Planning Commission

Incentive-based Approaches

As our community continues to grow, it is important to guide development in a way that balances our natural resources with economic opportunities. By encouraging Green Growth practices that prioritize conservation of wildlife habitat, we can enhance the quality of life for residents, strengthen community resilience, and promote long-term financial sustainability. To support this vision, a set of incentive tools can be offered to developers and property owners to incorporate habitat protection and responsible design into their projects.

A list of potential incentives has been created for Pender County to consider offering to achieve the desired development patterns. These incentives should be considered based on their appeal and feasibility for implementation. Additional research and discussions will need to be conducted to develop appropriate processes for offering incentives.

Density Bonuses Density bonuses would allow developers to build additional housing units or increase floor area beyond what the zoning regulations permit in exchange for incorporating Green Growth practices into the project's site plan. Density bonuses are typically between 10 and 20% in communities across North Carolina. Height bonuses may also be considered in addition or alternatively to density bonuses.

Priority Plan Review Priority plan review would allow projects that incorporate Green Growth principles to move more quickly through the review queue than conventional proposals. By offering an expedited review schedule, developers can save valuable time and money throughout the life of their project.

Expedited Permitting Similar to priority plan review, expedited permitting offers a reduction in the time required to obtain permits and demonstrates the community's commitment to removing barriers for exceptional projects. Coordination with the County's Permitting Department will be paramount for this incentive to be effective. An example of a successful expedited permitting system is Chicago's Green Permit Program which reviews permits faster, in some instances in as few as 30 days, for projects that meet certain LEED criteria.

Transfer of Development Rights A voluntary Transfer of Development Rights (TDR) program allows property owners to sell or transfer the right to develop their land in designated "sending areas," such as ecologically sensitive habitats, to "receiving areas" where development is more appropriate. This market-based approach enables the preservation of high-value conservation lands while accommodating growth in areas better suited for development. The land in the sending area would be permanently protected through conservation easements. In North Carolina, local governments can establish severable development rights receiving districts and adopt ordinance regulations consistent with General Statue §136-66.11.

Stormwater Fee Discount A stormwater fee schedule could be created based on impervious surface area to encourage the reduction of impervious surfaces on a project site.

By reducing the impervious surface area and the volume of runoff discharged from the property, the municipality could reduce the fee.

Grants The County can consider the formation of a grant fund to encourage site-specific and neighborhood or municipal scale green infrastructure projects. Assisting property owners and developers with the design and construction of green infrastructure projects can reduce cost burdens and place more projects on the ground.

Rebates and Installation Financing Similar to a grant fund, the County could consider offering rebates and installation financing to provide incentives for property owners to install green infrastructure practices on their property. A local example of such an initiative is the City of Wilmington's Heal Our Waterways program, which offers homeowners up to $10,000 in rebates for green infrastructure on commercial and other large-scale developments within certain watersheds. Wilmington's model provides different rebate amounts based on the green infrastructure method implemented, ranging from $2 to $10 per square foot.

Awards and Recognition Programs Awards and recognition programs highlight successful examples of green growth practices in the community, such as the utilization of nature-based solutions, conserving large tracts of land on site, or achieving LEED certified building status. Granting awards and recognition can help drive the field forward and increase public awareness about local projects.

Property Tax Credits There are several avenues for property owners to receive tax credits for conserving land or using it for wildlife habitat, farming, and/or forestry. The Wildlife Conservation Lands Program (WCLP) allows landowners to receive a reduced property tax rate for conserving and managing wildlife habitat. In 2025, the North Carolina General Assembly reinstated the Conservation Tax Credit program which provides landowners with a credit of up to 25% of the fair market value of the land when they donate land with eligible public benefit. From 1983 to 2013, the Conservation Tax Credit helped to protect over 262,000 acres of land (*Conservation Tax Credit*, n.d.). The program provided great value to state conservation efforts and taxpayers; for every dollar that was given in tax credit, at least 6 dollars worth of land was conserved.

Regulatory-based Approaches

Pursuing regulatory-based approaches would reduce habitat fragmentation and unnecessary environmental impacts. Regulatory approaches mandate environmentally responsible development practices to achieve more consistent outcomes, and could require ordinance updates, zoning map amendments, or development review procedure changes. Efforts would be made to balance efficient development processes with protecting our environment to ensure the health of residents and the fiscal sustainability of the County.

The Preliminary Report of Findings identified key areas where updates to the County's regulations could achieve Green Growth development practices. These areas pertain to updating the County's open space requirements, including a conservation subdivision

ordinance, and establishing a conservation overlay district. Opportunities to update the development review process have also been included in the regulatory-based approaches.

Ordinance Updates

An ordinance update that could be pursued is a conservation subdivision ordinance. A conservation subdivision is a design strategy that attempts to preserve contiguous, buildable tracts of land as open space for residents (Arendt et al., 1996). Preferably, 40 to 70 percent of the buildable land is set aside as natural open space and homes are grouped together on the rest of the land. An example Conservation Subdivision Ordinance, adapted from Chatham County's ordinance, can be found in Appendix A.

Open space is a piece of land this is undeveloped and accessible to the public. Open space is valuable for social interactions and allows space for people to gather outside and interact with other community members. It attracts prospective homebuyers and businesses, leading to economic benefits for communities. Open space also acts as habitat for wildlife, and when thoughtfully planned can adjoin neighboring open space to form wildlife corridors. Land development codes often regulate open space, but the language can vary depending on the community's context and goals. Pender County should pursue updating the open space ordinance to better align with Green Growth goals.

Conservation Overlay Zoning District

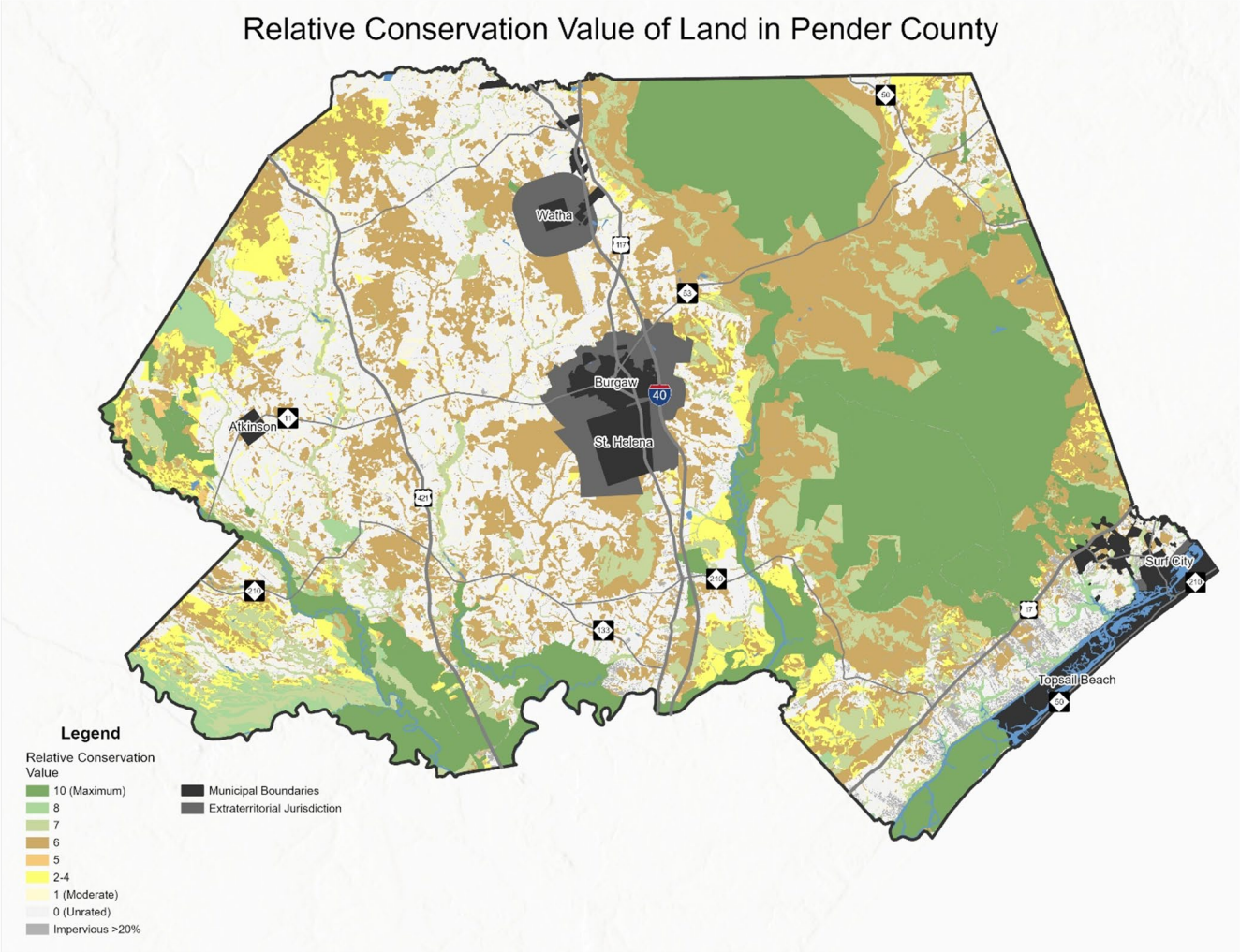
A Conservation Overlay Zoning District is intended to encourage conservation of the most sensitive wildlife habitats, particularly in rural areas and priority wildlife corridors. By implementing a conservation overlay zoning district, the healthy functioning of significant natural resources can be maintained while accommodating desired growth, development, and property rights. There are several steps that would need to be taken to successfully establish the overlay district, including mapping the natural resources in the county, determining whether the program should be mandatory or voluntary, selecting a conservation threshold, determining applicability and thresholds, and finally drafting the ordinance language. Model ordinance language from the Model Coastal Conservation Ordinance and Incentives Guide developed by the Cape Fear Council of Governments can be found in Appendix B.

It is recommended that the conservation threshold be determined based upon the Biodiversity and Wildlife Habitat Assessment data created by the North Carolina Natural Heritage Program. This dataset was created to identify, evaluate, and prioritize areas that are important for maintaining healthy and sustainable ecosystems statewide. The Biodiversity and Wildlife Habitat Assessment ranks lands with conservation value on a scale from 1 (moderate value) to 10 (highest value) to assist with identifying the high value natural resources in a community.

The Relative Conservation Value data can be used to determine the boundaries of the conservation overlay zoning district. The overlay zone boundary is established to coincide to all areas within the Relative Conservation Value greater than or equal to the selected Relative Conservation Value. Any proposed development projects which intersect the overlay zone are either subject to the conservation provisions of the district in a mandatory program, or

eligible for the conservation incentives of the district in a voluntary program. When selecting a Relative Conservation Value, it is important to target the lowest target value that is reasonable for the community. Determining the distribution of Relative Conservation Values across the community can ensure that an adequate portion of the landscape falls within the overlay zoning district. Ultimately, the value of the overlay district is in protecting resources from future development and maintaining rural character.

Figure 1.7



Development Review

There are several aspects of the development review process that could be amended to accommodate Green Growth principles. Potential improvements to the development review processes are:

- ☐ Appoint a Natural Resources Board or Environmental Review Advisory Committee, consisting of community members with natural resources backgrounds to review

ordinances and development proposals, and provide guidance to the Planning Board and County Commissioners.

- ☐ Require applicants to demonstrate that they have received state or federal environmental permits ahead of construction. This ensures that building permits are not issued to developments that will destroy federally endangered species habitats.

- ☐ Require the following in a Sketch or Concept Plan:
  - Conservation data from Green Growth databases, including aerial photos of site. Coordination with the NC Wildlife Resources Commission to review proposals should also be considered as part of the development review process. For example, staff from the NCWRC can be included on the Technical Review Committee when applicable.
  - For large-scale developments, such as major subdivisions and mixed-use developments, obtain on-site survey information about the location of priority habitats during the stream or wetlands survey or from a qualified biologist.
  - Description of the planned methods to minimize impacts and connect contiguous unfragmented habitats on or adjacent to the site.

- ☐ Require one conventional subdivision and one conservation subdivision plan to be submitted with project proposals. This helps developers think about alternative layouts for site plans and begin conversations about how projects can be more environmentally responsible.

Regulatory-based approaches to achieve green growth development patterns can take on several forms, and these strategies have been identified as potential options to pursue in Pender County. Further research would be necessary to ensure compliance with state laws, and to ensure that processes remain efficient and effective for the public, developers, and County staff.

Conclusion and Final Recommendations

Green Growth principles provide a framework for ensuring each new development enhances the quality of life for residents, protects wildlife habitat, and strengthens community resilience. The following recommendations are additional steps that can be taken to help integrate these principles into planning and decision-making.

The first recommendation is to update the Natural Area Inventory to have a current understanding of existing natural resources. Considering the development that has occurred in Pender County over the past 30 years, having an updated Natural Area Inventory will better capture today's wildlife and habitat conditions, providing local officials with the best available data on habitats, sensitive lands, and wildlife conditions to make informed decisions.

The second recommendation is to develop maps that help with evaluating opportunities and challenges regarding natural resource protection. The County should consider creating maps that show vacant and undeveloped properties, non-agricultural land, and passive and active open spaces to allow planners, developers, and community members to visualize future land use opportunities.

The last recommendation is to develop robust education and outreach programs to raise awareness about the benefits of environmentally responsible development. Actively promoting Green Growth principles for both new development and redevelopment will help incorporate sustainability into the community's growth model. Providing training and resources for commissioners, staff, developers, and community members will build a shared understanding of the importance of these efforts.

In addition to education about Green Growth principles, education and outreach programs should focus on educating landowners on the financial and environmental benefits of land conservation. Since long-term habitat protection requires collaboration, the County should consider partnering with land trusts and other conservation organizations to provide an avenue for educating and working with willing landowners to permanently protect a connected network of wildlife corridors. These partnerships also ensure that local conservation goals align with regional and statewide efforts. An informed community is well equipped to make decisions that balance development with ecological stewardship.

Embracing these recommendations supports the community's ability to move forward with a development strategy that preserves its natural assets, strengthens resilience, and secures a vibrant future for both people and wildlife. These actions reinforce the idea that economic growth and environmental sustainability are not competing goals but complementary ones. As the implementation of the Preferred Development Guide moves forward, the County should undertake robust discussion amongst officials, staff, and residents, and regularly assess the conditions within the community. Steps must be taken so that development occurs in a way that benefits everyone, both today and into the future.

Citations

American Forests. 2010. Urban Ecosystem Analysis, Mecklenburg County and the City of Charlotte, North Carolina. Washington D.C. Available from: http://charmeck.org/city/charlotte/epm/Services/LandDevelopment/Documents/Charlotte%20Mecklenburg%20UEA_lowres%20final2.pdf.

Arendt, R. et al. (1996). Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks. Washington, DC: Island Press.

Carruthers, J., & Ulfarsson, G. (2003). Urban Sprawl and Cost of Public Services. Environment and Planning B: Planning and Design, 30: 503-522. https://doi.org/10.1068/b12847.

Conservation Research Institute (CRI), 2005. Changing cost perceptions: an analysis of conservation development. Report for Illinois Conservation Foundation and Chicago Wilderness. Available from: www.chicagowilderness.org/what-we-do/protecting-green-infrastructure/epdd-resources/conservation-design/changing-cost-perceptions/.

Conservation Tax Credit. Natural Heritage Program. (n.d.). https://www.ncnhp.org/conservation/conservation-tax-credit

Economic Research Associates. 2005. Real Estate Impact Review of Parks and Recreation Report to Illinois Association of Park Districts.

Flink, Chuck. 2011. Economic Benefits of Greenspace. Presentation to the City of Raleigh, N.C.

Hopey, D. 1999. Prime Location on the Trail. Rails to Trails (magazine), Fall-Winter 1999.

Jilcott, P. S., Edwards, M., Moore, J. B., Shores, K. A., Dubose, K. D., and McGranahan, D. 2012. Obesity is Inversely Associated with Natural Amenities and Recreation Facilities Per Capita. Journal of physical activity and health. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23136370.

Krasny, M. E., Pace, K. H., Tidball, K. G., and Helphand, K. 2012. Nature engagement to foster resilience in military communities. In: Greening in the red zone: disaster, resilience, and community greening. Springer, New York, New York, USA. Pre-publication of book chapter [Internet]. Available from: http://civicecology.org/doc/Krasny2-2011.pdf.

Kunkel, K.E., D.R. Easterling, A. Ballinger, S. Bililign, S.M. Champion, D.R. Corbett, K.D. Dello, J. Dissen, G.M. Lackmann, R.A. Luettich, Jr., L.B. Perry, W.A. Robinson, L.E. Stevens, B.C. Stewart, and A.J. Terando, 2020: North Carolina Climate Science Report. North Carolina Institute for Climate Studies, 233 pp. https://ncics.org/nccsr

LeBlond, R. J., & Grant, G. S. (2000). *Natural Area inventory of Pender County, North Carolina*. Raleigh, NC: North Carolina Natural Heritage Program.

Mohamed, R. (2006). The economics of conservation subdivisions. Urban Affairs Review, 41(3): 376-399.

Narayan, S., Beck, M.W., Wilson, P. et al. The Value of Coastal Wetlands for Flood Damage Reduction in the Northeastern USA. SciRep 7, 9463 (2017). https://doi.org/10.1038/s41598-017-09269-z

North Carolina Wildlife Resources Commission. (2023). *Green Growth Toolbox*. Third Edition. Raleigh, North Carolina: North Carolina Wildlife Resources Commission.

Thomson, H., Zeff, H. B., Kleiman, R., Sebastian, A., & Characklis, G. W. (2023). Systemic Financial Risk Arising from Residential Flood Losses. *Earth's future*, *11*(4), e2022EF003206. https://doi.org/10.1029/2022ef003206

U.S. Environmental Protection Agency. (2009). *Managing wet weather with Green Infrastructure Municipal Handbook: Incentive Mechanisms.* Washington, D.C.

Appendix A: Model Conservation Subdivision Ordinance

1. Purpose
   As an alternative to conventional subdivision layouts, Pender County encourages the preservation of large, contiguous blocks of land as open space. The purposes of conservation subdivision design are to preserve existing tree canopy, natural land, and rural community character that might be lost through conventional development approaches. Specific objectives are:
   a. To encourage the maintenance and enhancement of habitat for various forms of wildlife and to create new woodlands through natural succession and reforestation where appropriate;
   b. To minimize site disturbance and erosion through retention of existing vegetation and avoiding development on steep slopes; [*voluntary*] Encourage development activity which minimizes impacts to significant natural resources and habitat connectivity.
   c. To preserve land for conservation, including those areas containing unique and sensitive features such as natural areas and wildlife habitats, steep slopes, streams, wetlands, and floodplains;
   d. To preserve scenic views and elements of the county's rural character and to minimize perceived density by minimizing views of new development from existing roads;
   e. To provide for the recreational needs of county residents;
   f. To provide greater efficiency in the siting of services and infrastructure by reducing road length, utility runs, and the amount of paving for development; and
   g. To create compact neighborhoods accessible to open space amenities and with a strong identity.

2. Applicability
   The standards contained in this Subsection apply to all proposed conservation subdivisions.

3. Open Space
   a. *Required Open Space.* At least 45% of the project area must be retained as open space.
   b. *Composition of Open Space.*
      i. At least 80% of the required open space must be Tree Save Area, as defined in XXX: Tree Save Area.
      ii. A maximum of 20% of the required open space may be other types of open space.
   c. *Connectivity of Open Space.*
      i. At least 50% of the proposed open space shall consist of a contiguous area.
      ii. The open space should adjoin any neighboring areas of open space on other parcels whenever practicable.

d. *Development of Tree Save Area*.
    i. A person may not perform grading and land clearing operations in the areas reserved for the Tree Save Area.
    ii. Violation of this provision will result in the denial of approval for a conservation subdivision and will require subdivision using the other subdivision types available in this UDO.

4. Density Bonuses. In zoning districts other than XXX, conservation subdivision may increase the number of dwelling units that would be allowed on the overall property by 10%.
    a. Calculation of the density bonus is based on the applicable underlying land use regulations dictating allowable development density.
    b. The base density for a conservation subdivision is determined by the underlying zoning district density standard as provided in Article 4: Zoning Districts, establishing otherwise allowable unit density (minus any riparian buffers, regulated floodplain, and wetlands) in which the development parcel is located.
    c. Regardless of the allowed density based on the density bonus, permitted housing densities shall not exceed the maximum allowances of any applicable water supply watershed requirements.

5. Lot Size, Structure Placement, and Transitional Buffer.
    a. Lot Size. There is no minimum size for lots in a conservation subdivision; however, the lot size shall be adequate to provide for minimum setbacks and any required infrastructure or services.
    b. Structure Placement.
        i. Structures within a conservation subdivision should be placed as close to internal roads as practical. The minimum front yard setback is five feet.
        ii. Structures within conservation subdivisions may be located in the side yard setback required by the zoning district regulations. Structures may be placed as closely together as permitted by the North Carolina State Building Code.
    c. Lot Proximity to Open Space.
        i. Open space shall be accessible to the largest possible number of lots within the development. To achieve this goal, the majority of lots should abut open space to provide residents with direct views and access.
        ii. Safe and convenient pedestrian access to the open space from all adjoining lots shall be provided, except in the case of farmland or other resources areas vulnerable to human disturbance.
    d. Transitional Buffer.
        i. A Type D buffer is required along the entire project boundary. [See 8.2.6: Buffer Descriptions and Options]

ii. The buffer area can count towards the density bonus calculation, except in areas where the perimeter buffer overlaps an area that is excluded from the density bonus calculation.

6. Identification of Open Space. Before submittal of a Sketch Plan, the applicant must follow the steps outlined in the County's Guidelines for Conservation Space Selection to identify and preserve qualifying open space, prepare the On-Site Inventory and Fragmentation Maps, and have those maps approved by the Administrator.

7. Management of Open Space. Required open space must be managed in accordance with Section XXX: *Long-Term Preservation and Maintenance*.

Appendix B: Model Conservation Overlay District Ordinance

Natural Resources Conservation Overlay (NR) District

1. Purpose

   The purpose of the Natural Resources Conservation Overlay district is to:

   a. Protect remaining large contiguous significant natural resource areas from activities that would alter their ecological integrity, balance, or character;
   b. Connect significant natural resource areas with corridors of land in a natural state to maximize the migration of wildlife and plant species among habitat areas; and
   c. [*voluntary*] Encourage development activity which minimizes impacts to significant natural resources and habitat connectivity.

      OR

      [*mandatory*] Ensure that land uses and development activities are planned and designed to be harmonious with significant natural resources areas and to reduce conflicts with working lands, wildlife conservation, and habitat management activities.

2. Applicability

   FOR VOLUNTARY PROGRAMS

   The provisions of this section shall apply to all development activity on a development site where any portion of one of more of the development tracts is within the NR district and for which the developer or property owner of such tract(s) seeks to be subject to the development standards herein.

   OR

   FOR MANDATORY PROGRAMS

   The provisions of this section shall apply to any development activity where land disturbing activity is proposed within the NR district, except:

   a. Land development activity that cumulatively disturbs less than one-half acre and is not part of a larger common plan of development.
   b. A single-family or duplex residential unit on individual lot.
   c. Land development activity by a governmental agency for a public purpose.
   d. Agriculture, silviculture, forestry, and any activity beyond the regulatory authority of Pender County.
   e. Minor subdivisions

3. Submittal Requirements

   Development applications for applicable sites shall provide the following information on the face of, or in addition to, any required site-specific development plans, such as Site Plan, Special Use Permit, or Subdivision Plat:

   a. A habitat survey, prepared by a qualified biologist with demonstrated experience in wildlife habitat identification (preferably a NC Wildlife Resources

Commission biologist or other agency wildlife expert), showing the location with reasonable specificity of all Significant Natural Resources, along with photographs of those resources.

b. The location of existing disturbed areas, existing buildings, structures, utility lines, sewers, water and storm drains, all constructed stormwater management systems, and existing impervious surfaces.
c. A habitat management plan, prepared by a qualified biologist (preferably a NC Wildlife Resources Commission staff biologist), identifying the habitat management activities employed to maintain significant natural resource areas, including specific habitat management implementation activities, schedules, and assignment of responsibility.

4. Natural Resource Protection Standards
   Applicable development activity shall conform to the following standards:
   a. Significant natural resources shall not be cleared of vegetation and shall not be developed in any manner that would negatively impact the habitat, except under the following conditions:
      i. Improvements that protect or enhance the enjoyment of the habitat, including but not limited to uncovered walkways, self-guided trails, and protective fences.
      ii. If the significant natural resources cover greater than 50% of the development tract, then up to 50% of the development tract may be developed. Significant natural resources should be permanently protected in order of priority listed in the definition section such that any higher item on the list is a higher priority. The undeveloped habitat areas shall be contiguous within the tract and with habitat areas on adjacent tracts to the maximum extent possible. The undeveloped habitat should have the maximum habitat interior to edge ratio possible (circular shape) to prevent habitat fragmentation. To the maximum extent possible the development design shall protect and connect as many priority significant natural resources as possible and such that wetlands, as defined under definition 22.c, are not filled and the buffer is maintained around the wetland that is connected to other wetlands or streams or floodplain forest. Connectivity means that habitat areas are linked with areas of contiguous, natural vegetation that is at least 300 feet wide.
      iii. To provide for access to otherwise inaccessible parts of the parcel/development. If part of the parcel could be developed, but would be inaccessible due to the existence of significant natural resources, a road and/or utilities may be constructed through the significant natural resources. The road and/or utilities, however, shall cross at the narrowest practical point and shall be designed and constructed to the maximum extent possible to minimize impact to and fragmentation of the highest priority significant natural resources. Where significant natural resources must be negatively

impacted, an equal area must be restored and protected on site, up to 50% of the tract.

b. Significant natural resource areas shall be permanently protected by conservation easements, protective covenants, or similar restrictions or by any procedure authorized for the dedication of park, recreation, and open space areas. Conservation easements on significant natural resource areas may, at the discretion of the body with final approval authority, be required as a condition of approval of any site-specific or phased development plan.
c. Stormwater runoff from impervious surfaces shall not be discharged directly to the significant natural resources without vegetated filtration and energy dissipation.
d. Sewer lines, water lines, and other utility infrastructure shall not be constructed within 100 feet of perennial and intermittent streams to the maximum extent possible. All utility crossings shall be minimized. The directional bore stream crossing method (installation of utilities beneath the riverbed avoiding impacts to the stream and buffer) shall be used for utility crossings wherever practical, and the open stream crossing method shall only be used when water level is low and stream flow is minimal.
e. Pesticides (including insecticides and herbicides) shall not be used for maintenance of rights-of-way within one hundred (100) feet of perennial and fifty (50) feet of intermittent streams, or within the 100 year floodplain, unless the pesticide is labeled for use in aquatic systems or is part of the approved Habitat Management Plan.
f. Curbing shall have a 1:4 slope to allow passage of small animals.
g. Bridges shall [OR should] be used for all permanent roadway crossings of streams and associated wetlands. If a culvert must be used, it shall be designed to allow passage of aquatic organisms by burying the culvert in the stream bottom or bank to a minimum depth of one (1) foot. Stream relocation or widening shall be avoided; however where required state-of-the-art natural channel design and construction techniques shall be used.
h. The land surrounding built structures should be maintained in natural vegetation to the maximum extent possible.
i. Non-native invasive species shall not be planted for any purpose.
j. The post-development condition should maintain connectivity of all significant natural resources, both within the tract and between adjacent tracts. Connectivity means that habitat areas are linked with areas of contiguous, natural vegetation that is at least 300 feet wide.
k. Site gas stations, car washes, and other potential "spill" land uses shall be located no less than two hundred (200) feet from perennial and intermittent streams.

5. Additional Development Standards

Applicable development activity in compliance with the Natural Resource Protection Standards above shall be entitled to the following development standards, which are intended to supersede the requirements of other sections or articles.

a. Residential density. Any land containing significant natural resources permanently protected pursuant to the provisions of subsection 4 of this Section, and pursuant to all open space protection requirements elsewhere in this Ordinance, may be counted in calculating the permitted residential density of the subject site.

b. Minimum lot dimensions. The minimum lot dimensional standards for the underlying zoning district(s) shall not apply to major subdivisions applicable under this Section, provided that the residential density permitted in subsection a above is not exceeded. *[NOTE: Project boundary buffers are recommended where minimum lot sizes are reduced below those allowed by the underlying zoning district. If your jurisdiction does not require vegetated project boundary buffers, it is recommended to include one here.]*

Appendix C: Preliminary Report of Findings

Preliminary Report of Findings for Pender County

Partners for Green Growth Program - 2024-2025[1]

INTRODUCTION

The intent of this Preliminary Report of Findings is to review the current Pender County policies within the Unified Development Ordinance (UDO) and Comprehensive Land Use Plan to determine what support exists for natural resource and wildlife habitat protection and how open space requirements are implemented. This review also establishes where improvements can be made in existing rules, regulations, and implementation, and what should be included in the Preferred Development Guide, the culminating product of this project.

The County has created a set of land use and development-related policies to act as guidelines during any official decision-making process. The two main documents that house these policies are the Pender 2.0: Comprehensive Land Use Plan and the Unified Development Ordinance. Within these documents, Chapter 3 of the Comprehensive Plan – Natural Systems Analysis – and Articles 7 and 8 of the Unified Development Ordinance address natural resource protection and open space requirements.

REVIEW OF POLICIES AND REGULATIONS

COMPREHENSIVE LAND USE PLAN

Pender 2.0, the County's current comprehensive land use plan, was adopted in 2018 and serves as the main policy document for land use decisions. The Plan is not legally binding but rather guides the growth and development of the County for the coming decades by offering guidance for decision makers when making land use decisions. Numerous aspects of community development are encompassed in the Plan's goals, policies, and actions, including housing, infrastructure, transportation, economic development, and natural resource protection.

The Pender 2.0 Comprehensive Land Use Plan includes several policies on the County's environment and natural resources. The County contains coastal wetlands, estuarine waters, and coastal shorelines which are primarily regulated by North Carolina's Coastal Area Management Act (CAMA) under the Division of Coastal Management. However, areas outside the control of CAMA are regulated by the County, providing more discretion to develop focused policies to protect these areas. Chapter 3, Natural Systems Analysis, of the Pender 2.0 Plan contains the goals, policies, and actions related to natural resources within the County. The chapter begins by stating "a coordinated balance between development, preservation of agricultural working lands, and environmentally sensitive areas must be a goal for the County." This goal emphasizes

[1] Pender County Planning & Community Development staff, Lee Duncan (Resilience Planner), Marcy Waters (Long Range Planner I), and Adam Moran (Senior Planner), with the help of Alisa Davis (Conservation Planner, NCWRC), completed this report in 2025 in partial fulfillment of the requirements of the 2024 Partners for Green Growth grant awarded to Pender County.

preserving the quality of life of residents through smart growth practices. The following section outlines the policies and recommended actions for achieving this goal.

Habitat Preservation Policies

The following policies and their recommended actions are related to habitat preservation.

Policy 3.1.C: Riparian Buffers	The County supports the preservation and/or installation of vegetated buffers adjacent to all streams, rivers, marshes, and estuarine waters in the County, with the intent of reducing the flow of nutrients and other contaminants into area surface waters.
Recommended Action 3.1.C.1	Consider identifying incentives for new subdivisions whereby riparian buffers are increased in size from the standard 30-foot buffer and identify strategies to limit land disturbance and tree removal within these areas.
Current Status: The County has not established any riparian buffer requirements when development occurs adjacent to or near any water bodies.	

Policy 3.1.H: Low Impact Development (LID)	The County supports Low Impact Development practices. Such LID practices may include retaining/infiltrating most of the runoff on-site, maximizing the use of permeable pavements, reducing the amount of impervious coverage, and clustering housing to allow a profitable development density while maximizing open space and minimizing wildlife habitat fragmentation.
Recommended Action 3.1.H.1	Explore options for implementing incentives for developers that utilize low-impact development (LID) techniques to manage the potential impacts of stormwater runoff
Recommended Action 3.1.H.2	Consider requiring LID techniques for development located within the CAMA 575-foot Outstanding Resource Waters Area of Environmental Concern (AEC).
Current Status: The County's UDO allows for a reduction in dimensional standards if a project has been designed with LID principles (UDO 7.14.B). The County has not implemented Recommended Action 3.1.H.2.	

Policy 3.1.I: Prime Wildlife Habitats	The County shall continue to protect its prime wildlife habitats, where possible, by enforcing the CAMA permitting program, open space requirements, and the Flood Damage Prevention Ordinance.
Recommended Action 3.1.I.1	The County shall consider requiring all rezoning/ conditional zoning petitions to be reviewed in relation to the Biodiversity/ Wildlife Habitat Assessment and the NC Wildlife Resources Commission Habitat Conservation Recommendations.
Current Status: Although the County does enforce all CAMA permitting requirements, open space requirements, and the Flood Damage Prevention Ordinance requirements, it has not required any zoning/ rezoning petitions to be reviewed in relation to the	

Biodiversity/ Wildlife Habitat Assessment and the NC Wildlife Resources Commission Habitat Conservation Recommendations.

Environmental Planning Policy

The following policy and its recommended actions from the comprehensive plan are related to the assessment of environmental features when considering new development projects. Assessing environmental features when reviewing projects increases awareness and can help ensure that prime habitat loss is avoided or mitigated during the development review process.

Policy 3.1.J: Environmental Planning	The County shall continue to require the inclusion of environmental features in the development review.
Recommended Action 3.1.J.1	Consider expanding the definition of "environmental features" to include Areas of Environmental Concern (AECs), Significant Natural Heritage Areas (SNHAs), Natural Heritage Element Occurrences (NHEOs), Smoke Awareness Areas, and Prime Farmland soils.
Recommended Action 3.1.J.2	Consider providing the information referenced in Recommended Action 3.1.J.1 on the County's GIS website.
Recommended Action 3.1.J.3	Consider developing a green infrastructure plan that identifies a network of natural lands and open spaces and provides ecosystem conservation as well as alternative transportation modes through trails and greenways. Such a plan should guide the preservation of open space for new development where identified.
Recommended Action 3.1.J.4	Consider establishing a green infrastructure committee composed of local government staff and natural resource professionals whose main purpose is to implement the green infrastructure plan and coordinate natural resources conservation among all local plans, ordinances, and departments.
Current Status: The first two recommendations have not been implemented. The third recommendation will be implemented through the Green Growth Preferred Development Guide, and the fourth could be implemented after the Preferred Development Guide has been created.	

Open Space Policy

Open space is land that is not developed for residential, commercial, industrial, or institutional use. The County currently requires the designation of open space for development projects, and numerous policies and recommended actions support continuing to require open space and encourage adjustments to the open space requirements to better support wildlife connectivity. These policies and recommended actions are included below.

Policy 3.1.K: Open Space	The County shall continue to require the designation of Open Space in accordance with the subdivision of land.
Recommended Action 3.1.K.1	Consider revising the density calculations to remove preserved open space from the calculation.
Recommended Action 3.1.K.2	Consider including a minimum passive open space requirement where environmental features are present and remove the 50% maximum designation.
Recommended Action 3.1.K.3	Consider providing specific standards for the provision of open space to include such things as habitat connectivity and tree preservation. Habitat connectivity should encourage the dedication of large contiguous tracts of land, typically 10 acres at a minimum, with a minimum average width of 500 feet and separation from building activity of at least 350 feet and conservation of natural open space that is at least 300 feet wide between environmental features will be encouraged to better ensure that wildlife can travel between core wildlife habitats. Where such cannot be reasonably provided, a payment in-lieu fee should be provided to the County for the future dedication of park land that will protect wildlife habitat, while also providing an amenity for the general public and residents of the subject development.
Recommended Action 3.1.K.4	Consider establishing a 'Resource Conservation Incentive District' located to the south of US 17, in and adjacent to floodplain forests along streams and rivers and adjacent to and between Game Lands. South of US 17, maritime forest blocks of five to ten acres should be set aside from development and connected to wetlands and forest in the floodplain where practicable.
Recommended Action 3.1.K.5	In concert with NC Wildlife Resources Commission, consider evaluating a program to rezone rural areas to a base density of no greater than one unit per three or more acres. A density of one unit per three acres has been shown to raise property values in rural areas. Within these areas consider allowing for a density bonus to conserve at least 50 percent of the site.
Recommended Action 3.1.K.6	Compile a GIS database of all designated open space and consider providing such on the County's GIS website or available through the Planning and Community Development Department.
Current Status: Recommended Actions 3.1.K.1-2 are being considered as part of the Imagine Pender 2050 update. 3.1.K.3 and 3.1.K.6 will be incorporated into the Preferred Development Guide. Action 3.1.K.4 and 3.1.K.5 have not been implemented.	

Tree Preservation and Forestry Policies

The following policy and its recommended actions are related to tree preservation and forestry practices.

Policy 3.1.L: Tree Preservation	The County shall continue to require tree preservation for significant trees.
Recommended Action 3.1.L.1	Consider expanding the applicable development types – rather than zoning districts – that require tree preservation.
Recommended Action 3.1.L.2	Consider removing the exemption for tree surveys/preservation in Special Flood Hazard Area (SFHAs), Areas of Environmental Concern (AECs), wetland buffers, and stream buffers.
Recommended Action 3.1.L.3	Consider a provision that allows for an applicant to display a tree protection area without the individual designation of each tree species and size.
Recommended Action 3.1.L.4	Consider enhancing mitigation for the removal of significant trees, as defined in the UDO, such that the caliper of trees removed is equivalent to that replaced.
Current Status: The County only requires tree preservation for a handful of tree species and requires mitigation for removing trees. Tree mitigation only allows for replacing single trees but does not consider the overall habitat loss due to removal of understory species and removal of tree canopy.	

Policy 3.1.M: Forestry	The County shall continue to support forestry as a means to maintain prime wildlife habitat areas, provided significant adverse impacts on natural resource systems are fully mitigated.
Recommended Action 3.1.M.1	Encourage the use of the NC Division of Forestry, *Forestry Best Management Practices Manual to Protect Water Quality. (https://www.ncagr.gov/divisions/nc-forest-service/water-quality/best-management-practices-manual)*
Current Status: The County does not specifically encourage the use of the NC Division of Forestry, *Forestry Best Management Practices Manual to Protect Water Quality*.	

Wetlands, Hazard Mitigation, and Flood Resilience Policies

Conserving and maintaining natural flood barriers for public health and safety is a goal of Pender County. The following policies and their recommended actions are related to hazard mitigation and flood resilience.

Policy 3.1.N: Protection of Wetlands	The County shall continue to protect freshwater wetlands, marshes, and 404 wetlands within its planning jurisdiction in accordance with applicable laws and regulations.
Current Status: Pender County requires all development to ensure compliance with any applicable laws and regulations related to wetland and marsh protection.	

Policy 3.2.A: Hazard Mitigation Planning	The County supports proactive hazard mitigation planning. The Comprehensive Land Use Plan and the Hazard Mitigation Plan should be consistent with one another. The *Southeastern NC Regional Hazard Mitigation Plan* policies are formally included as reference herein as part of the policy of the County's Comprehensive Land Use Plan.
Current Status: The County actively supports hazard mitigation planning. There is a full-time Resilience Planner on staff. This position seeks out projects and funding to increase the County's resilience to flooding and other natural disasters.	

Policy 3.2.B: Discouragement of Hazardous Development	The County shall use a variety of methods, including CAMA setback requirements, the Flood Damage Prevention Ordinance, and the Flood Hazard Overlay to discourage the development of property that can be reasonably foreseen as potentially hazardous.
Current Status: The County enforces CAMA setback requirements by requiring CAMA permit approval before any building permit is issued. The Flood Damage Prevention Ordinance is enforced through the Floodplain Development Permit process. The Floodplain Development Permit is an additional permit process for any development within the regulated flood zones. The requirements for floodplain development reduce the potential damage from flooding but do not necessarily "discourage" that development. Any "discouragement" is only associated with increased building costs and typically only effect small low-cost development projects like residential homes.	

Policy 3.2.C: Flood Prone Areas	The County shall permit development in the 100-year flood zones, provided that all new construction and substantial improvements comply strictly to the County's Flood Damage Prevention Ordinance, which has been adopted in conjunction with County's participation in the National Flood Insurance Program.
Current Status: The County enforces all provisions of the Flood Damage Prevention Ordinance through the Floodplain Development Permit process.	

Policy 3.2.E: Land Acquisition	The County supports the acquisition of property that is unsuitable for development due to flooding hazards when such acquisition serves a useful public purpose such as for land preservation, access to public trust areas, or as a community resource.
Recommended Action 3.2.E.1	Consider establishing a formalized procedure for evaluating potential land acquisition projects, which also considers wildlife habitat conservation, prior to such.
Current Status: The County**,** in conjunction with the State and the National Flood Insurance Program (NFIP), actively seeks out residential land acquisition projects for parcels repeatedly damaged by flooding. Once acquired any structures are removed and the land is allowed to return to a more "natural" state. These properties are not allowed to ever be developed again. Currently, the County does not have any formal process for evaluating potential land acquisition projects.	

UNIFIED DEVELOPMENT ORDINANCE

Open Space

Article 7 of the Pender County Unified Development Ordinance specifies two different types of open space, active and passive. The definitions of each type of open space are as follows:

> **Active Open Space** is defined as "areas such as park land chosen without regard to natural features for the explicit purposes of enhancing design, such as village commons, or providing space for outdoor recreation activities which may include, but not be limited to; cluster boxes, tennis courts, ball fields, swimming pools, and tot lots with play equipment."
>
> **Passive Open Space** is defined as areas that must consist of undisturbed, unique and sensitive natural features when available, that may include streams, floodplains, wetlands (excluding tidal marsh) conservation resources, and natural heritage areas if identified. These natural spaces will be characterized by undisturbed soils and natural vegetative cover for wildlife habitat. Passive amenities such as walking paths, piers, picnic areas and other passive recreational uses are allowed with minimal disturbance of the vegetation.

The UDO states that all new residential subdivisions shall provide open space in the amount of 0.03 acres per dwelling unit within the subdivision. No more than 50% of the required open space shall be designated as passive open space. Fifty percent or more of the required open space shall be designated as active open space.

Landscape and Buffering

Section 8.1.1 of the UDO states the intent of the landscaping and buffering requirements. It lists numerous examples which benefit the homeowner and increases property value but does not mention any benefits to wildlife. Buffer requirements within the Pender County UDO have been established to provide a "desired level of buffering between various land use activities" and not necessarily to protect any type of natural resource or associated function.

Section 8.1.3 describes the significant tree survey requirements. A significant tree is defined as follows:

- An American holly with a trunk caliper measurement of 6" or greater measured at 4.5 feet above ground
- A flowering dogwood with a trunk caliper measurement of 4" or greater measured at 4.5 feet above ground
- A water oak with a trunk caliper measurement of 8" or greater measured at 4.5 feet above ground
- A live oak with a trunk caliper measurement of 8" or greater measured at 4.5 feet above ground
- Any tree species included in the planting table, except a "loblolly pine" (see Appendix C) with a trunk caliper measurement of 12" or greater measured at 4.5 feet above ground

Section 8.1.5 describes how credit for existing vegetation is calculated. The section states "in order to encourage the preservation of established vegetation, credit shall be given for preservation within the proposed buffer or other required landscaping areas on a one-for-one basis." It further states "the preservation of the maximum amount of existing vegetation and selective removal of existing trees throughout the site is strongly encouraged during project design and construction to save time and money. In order to encourage such preservation, the Administrator may count established vegetation preserved during development towards the landscaping requirement."

Section 8.2 defines required buffers. As described in the UDO a buffer is a "specified land area, located parallel to and within the outer perimeter of a lot or parcel and extending to the lot or parcel boundary line, together with the planting and landscaping required on the land." A buffer may be used for recreation and picnic facilities; and it may contain pedestrian, bicycle, or equestrian trails. Depending on land use and buffer type, buffer width requirements are between 15 feet and 30 feet. Buffer areas can consist of planted vegetation, native undisturbed vegetation or a combination of the two.

The UDO does not include regulations regarding riparian buffers, though the Pender 2.0 Comprehensive Land Use Plan does recommend that they be established as a development requirement (Policy 3.1.C) (see page 2 of this report).

FINDINGS

Pender County has a solid framework of policies supporting natural resource protection and open space, particularly in its comprehensive plan however, many of the policies are aspirational or are only partially implemented. Some of the key gaps are as follows:

- Lack of formal riparian buffer requirements
- No required use of Low Impact Development techniques
- No mandatory habitat assessments for rezoning
- Open space requirements favor active recreational space over passive natural habitat

- Limited tree preservation and habitat mitigation requirements
- Buffers serve mainly as visual or land-use separators, not ecological corridors
- Tree preservation focuses on a narrow list of significant tree species but does encourage preservation of habitat
- No explicit wildlife or habitat connectivity goals are tied to buffer or landscaping requirements

One of the biggest challenges for encouraging and incentivizing habitat preservation is the current requirement to provide a minimum of 50% active open space with no minimum requirement for passive open space. Active open space provides amenities for use by homeowners, such as tennis courts and playgrounds, but provides little to no habitat value to wildlife. Although these amenities provide incentives for purchasing a home, these areas are often underutilized at the expense of wildlife habitat. Ultimately, requiring 50% or more of active open space may act as an incentive for developers to eliminate habitat and charge additional costs for any associated amenities. Furthermore, the presence of wildlife and natural habitat likely provides more of an aesthetic value to residents than a clubhouse or tennis court. Active open space can improve mental and physical health outcomes for residents, but the health benefits of natural resources should be taken into consideration when thinking about open space requirements.

RECOMMENDATIONS

To better align development practices with the County's natural resource protection goals, Pender County should prioritize the revision of regulatory language to eliminate the requirement of 50% or more active open space. Giving more flexibility in how open space is used (active vs passive) will allow the County to better incentivize green growth development. Allowing more passive open space would provide developers opportunities to prioritize large, contiguous, and connected tracts of land for habitat corridors while at the same time providing natural areas for residents to enjoy.

To better safeguard wildlife habitat, the County should strengthen its tree preservation standards. Expanding the definition of "significant trees" and incorporating understory species would provide a more ecologically meaningful approach. Another approach could be to replace the significant tree survey with a significant habitat survey. This would likely require input from other agencies in order to determine the habitat types and importance.

The County should transition from aspirational to enforceable policies regarding Low Impact Development (LID). Pender County should revise the UDO to require infiltration stormwater basins, reduction of impervious surfaces, and the clustering of development to reduce habitat fragmentation. Incorporating LID as a requirement rather than a recommendation – especially in high-value conservation areas – will help mitigate stormwater impacts and promote ecological resilience.

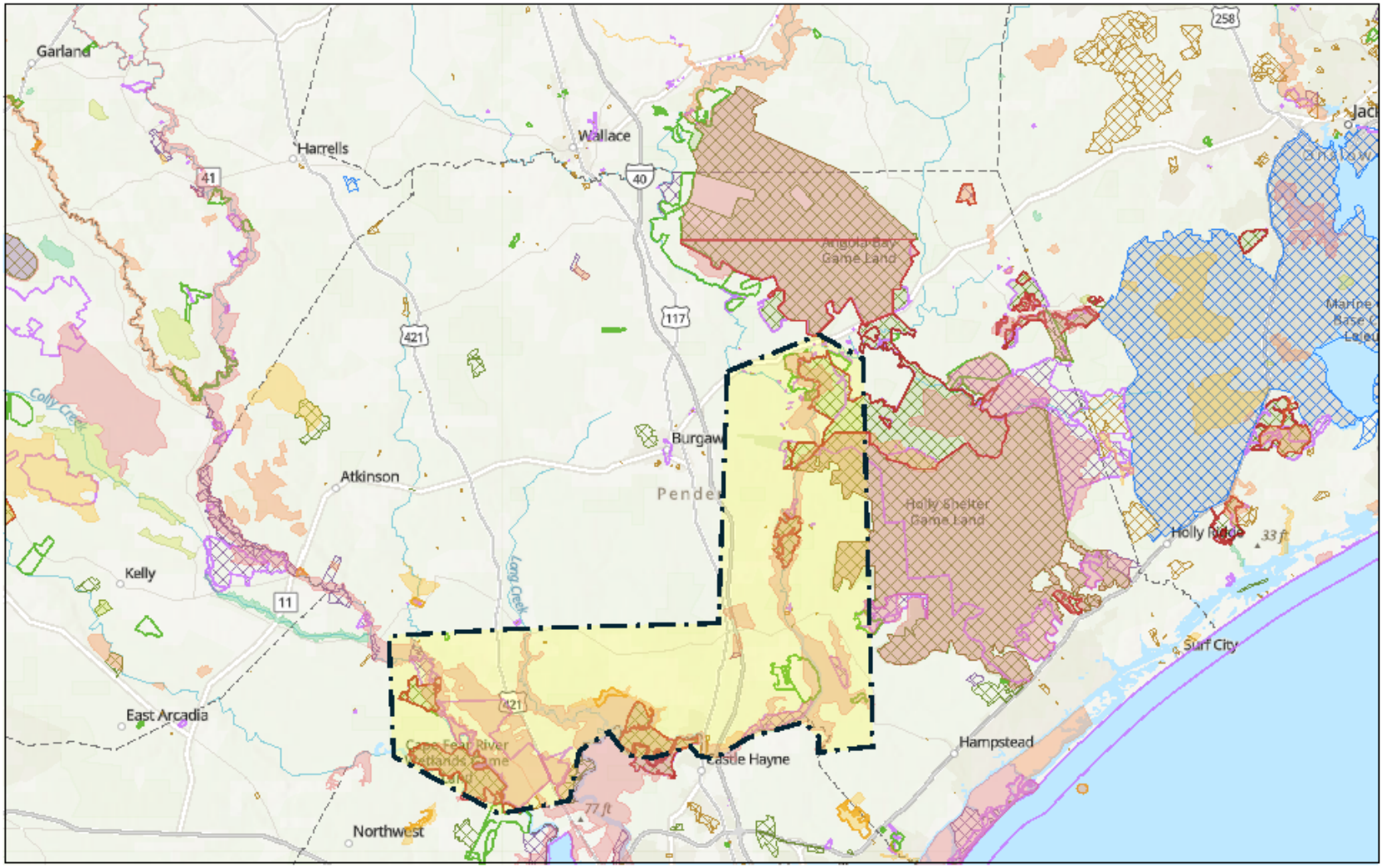
APPENDIX

PRIORITY HABITAT AREAS, MANAGED LANDS, AND WILDLIFE CORRIDORS

According to the North Carolina Natural Heritage Data Explorer[2], the majority of the critical habitat in Pender County is considered "Exceptional" in quality. The eastern side of the county is dominated by two large State-owned game land conservation areas, Angola Bay and Holly Shelter Game Lands. A wildlife habitat corridor exists along the Northeast Cape Fear River which connects these areas to the Black River watershed in the western side of the County where there is a mix of State and private protected areas. This corridor is shown in transparent yellow on the map on the next page. This map also shows the extant natural and managed areas of the County, which helps highlight the most sensitive and critical habitat. The Pender County Green Growth Preferred Development Guide will seek to protect, and potentially expand, this existing wildlife habitat corridor by promoting green growth development patterns and conservation subdivisions. Please see the map on the next page for more information.

[2] Through the North Carolina Department of Natural and Cultural Resources, the Natural Heritage Data Explorer is featured on this website: https://ncnhde.natureserve.org/.

Priority Habitat, Managed Lands, and Habitat Corridor



Appendix D: Imagine Pender 2050 Policies and Objectives that Support Green Growth

Objectives

Objective 4.3: New residential developments within growth areas should support sustainable and low-impact neighborhood design principles that leverage site conditions and provide desired neighborhood amenities.

Objective 7.3: Pender County supports efforts to enhance stormwater protection for existing and planned developments. The intent of this policy is to reduce drainage issues for citizens while also supporting surface water quality throughout the County.

Objective 7.4: Support efforts to expand and protect tree canopy throughout the County. Encourage continued protection of wildlife habitats within designated conservation areas and support options for wildlife protection. The intent of this policy is to promote preservation of tree canopy and sensitive wildlife habitat.

Objective 7.5: The County shall continue to protect wetlands as guided by state and federal regulations. The intent of this policy is to support natural drainage storage and surface water quality.

Objective 7.6: The County supports efforts to reduce storm damage and flooding for existing and planned development by enhancing stormwater protecting and flood mitigation measures. The intent of this policy is to reduce future losses from flooding and storm damage.

Policies

1.1.C. Regulations for New Development: The County shall require all development to adhere to the land use regulations set forth in the County's Unified Development Ordinance. Accordingly, the County shall utilize any and all zoning and subdivision procedures, allowed per North Carolina General Statutes, to preserve the unique characteristics of Pender County. This may include – but shall not be limited to – overlay districts, cluster development requirements, density incentives, open space allocation, tree preservation, school site reservation, reservation of sites for public and recreational facilities, conditional zoning, and other tools as may be necessary.

1.1.E. Development Review: The County supports an efficient, transparent, and predictable development review and approval process that includes consideration of hazards and infrastructure impacts.

2.6.A. Green Infrastructure Plan: Consider developing and integrating a green infrastructure plan and coordinating the plan with open space requirements and capital improvement planning.

4.1.B. Clustered Housing: Conservation and the preservation of rural character in exchange for smaller lot sizes is appropriate within the rural areas of the County. Clustered housing options that support the permanent protection of natural lands and open space for habitat are encouraged. This option is preferred particularly for sites with environmentally sensitive areas along rivers, creeks, and in floodplains. Private community systems are appropriate for delivering water and wastewater services to these developments if public utilities are not available.

4.3.A. Sustainable Growth: The County encourages development of sustainable neighborhoods in targeted growth areas that provide sidewalks, neighborhood parks, connectivity to nearby commercial areas through walking paths or trails, green infrastructure stormwater management facilities, and buildings that utilize water conservation systems.

4.3.B. Low-Impact Development for Sustainable Housing: The County encourages low-impact development principles that reduce the impact on the natural environment, adopt impervious coverage thresholds that reduce stormwater runoff, provide access to public trust lands along coastal areas, and preserve and enhance the tree canopy in residential development.

7.1.A. Low Impact Development for Conservation: The County supports low-impact development (LID) practices. Such LID practices may include retaining or infiltrating most of the runoff on-site, maximizing the use of permeable surfaces, reducing the amount of impervious coverage, and clustering housing to allow a profitable development density while maximizing open space and minimizing wildlife habitat fragmentation.

7.1.B. Open Space: The County shall continue to require the designation of open space in accordance with the subdivision of land. In coordination with the Sustainable and Managed Growth and Planned Public Facilities and Services Goals, the County will encourage more open space in development.

7.1.C. Environmental Planning: The County shall include an analysis of environmental conditions during the development review process.

7.1.D. Green Growth Toolbox: Coordinate future development with the concepts of the Green Growth Toolbox. Amend development regulations and processes to incentive conservation subdivisions, especially in environmentally sensitive areas (such as riverine, wetland, and coastal areas).

7.1.E. Conservation Easements: Achieve preservation of important natural resources and environmental lands by encouraging conservation easements where practicable. Consider

the establishment of a formal program to support conservation easements to be facilitated by Pender County.

7.2.A. Protect Surface Water Quality: The County shall continue to protect and enhance the water quality of the estuarine and riverine systems.

7.2.B. Point and Nonpoint Source Pollution: The County will evaluate ways to manage nonpoint source runoff associated with new development. Examples could include encouraging and incentivizing low impact development techniques, erosion control measures during development, implementing a tree preservation ordinance, or additional setbacks from sensitive habitat areas. The County will also address water quality problems associated with point source discharges.

7.3.A. Stormwater Runoff: The County shall continue to enforce the stormwater management requirements contained in the UDO. The County will evaluate ways to improve the stormwater management regulations to meet or exceed state guidelines.

7.4.A. Prime Wildlife Habitats: The County shall continue to protect its prime wildlife habitats, where possible, by enforcing the CAMA permitting programs, enhancing open space requirements, and encouraging land conservation and cluster subdivisions.

7.4.B. Tree Preservation: The County shall continue to require tree mitigation for significant trees. As part of this effort, the County will provide clear guidance in ordinance provisions on protecting, maintaining, and replacing trees. Best practice for tree protection, such as NC Cooperative Extension's "Protecting and Retaining Trees: A guide for Municipalities and Counties in North Carolina," should be considered.

7.5.D. Wetland Preservation Incentives: Encourage the preservation of wetland areas by incentivizing conservation easements and conservation subdivisions.