



Land Use Planning

Importance of Planning

- THE BOTTOM LINE: Better planning can *prevent* habitat loss and environmental quality problems while BMPs *manage the symptoms* of problems once they have been created.



Natural Resource Based Planning

Process of developing a vision of what land uses are appropriate for what areas in the context of natural resources

- What should be preserved?
 - Current condition
 - Restored
- What should be developed?
 - What kind of development

Components of Natural Resource Based Planning

Wildlife habitat
Wetlands
Steep slopes / topography
Water supply areas
Aquifer recharge areas
Productive farmland
Productive forest land
Recreation areas
Viewsheds
Floodplains
Historic sites
Archaeological sites
Existing infrastructure
Many more!!



Diagram courtesy of Bill Bumback, UGA

Components of Natural Resource Based Planning



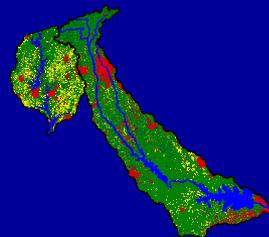
- Community Resource Inventory
 - Must know what you have before you can manage it



Recommended Categories of a Community Resource Inventory

Basic Map Sets:

1. Base Map
2. Land Cover
3. Soils
4. Water Resources
5. Unique and Fragile Lands
6. Committed Open Space



1. Base Map

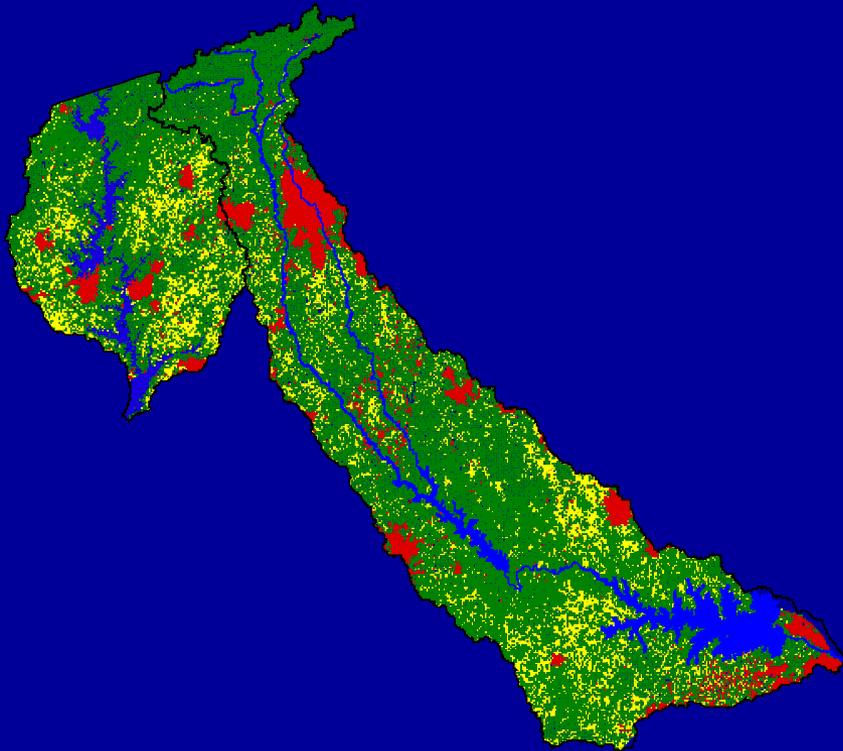
Base Maps delineate the boundaries of your study area. They also orient your study area to other geographical features.



- Several options for defining boundary of study area
- Stakeholder determination by geography and political boundaries

2. Land Cover

Land Cover is derived from images obtained from satellites that are interpreted using computers and professional judgment...

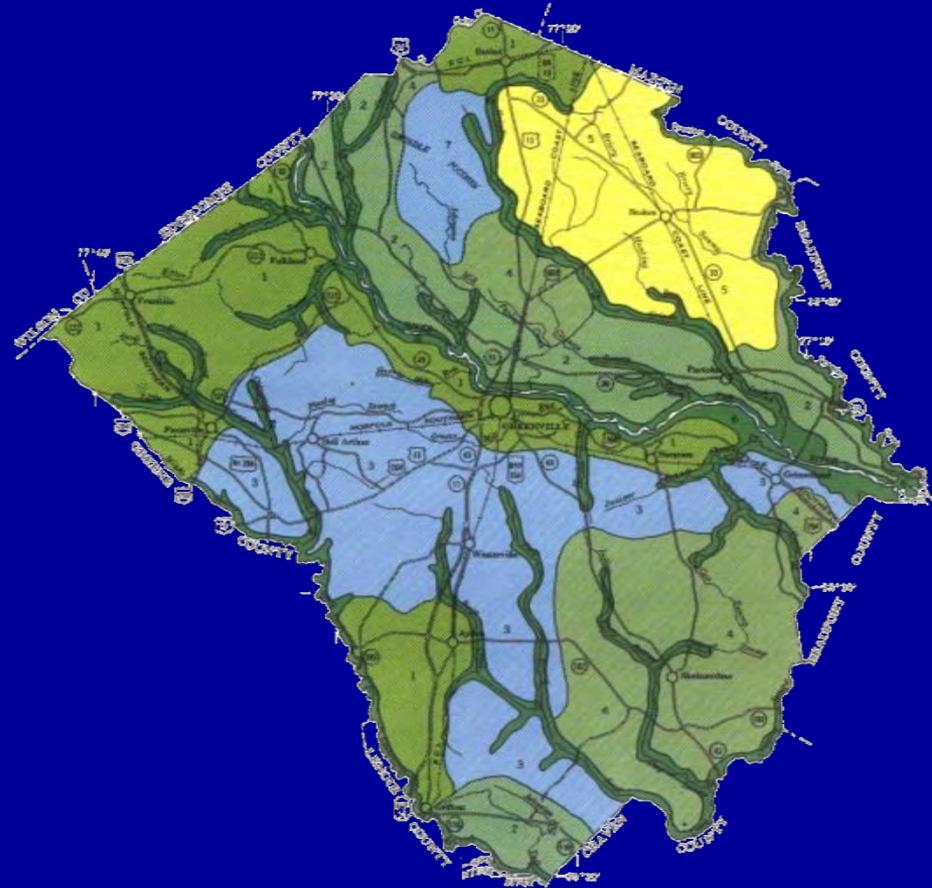


- Helps define:
 - Natural resources
 - Development patterns in community
 - Areas of focus for land use planning efforts
- Suitable for town or watershed-level analysis (30 m or greater resolution)

3. Soils

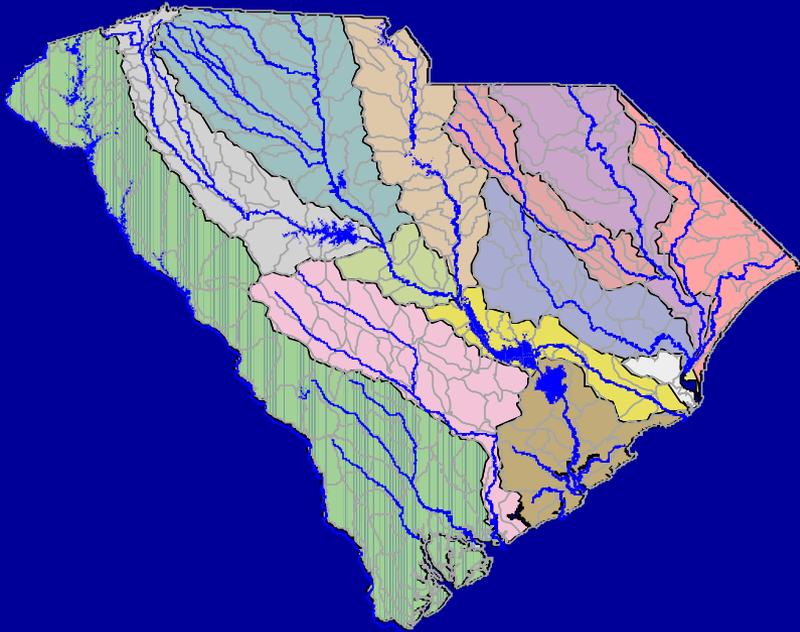
Soils information can help to determine the development potential of land...

- What can it tell us?
 - Regulated Wetlands
 - Agricultural Soils
 - Slope
 - Infiltration vs runoff
- How can we use it?
 - Determine patterns of wetland corridors and valuable farmland and forested areas
 - Suitability



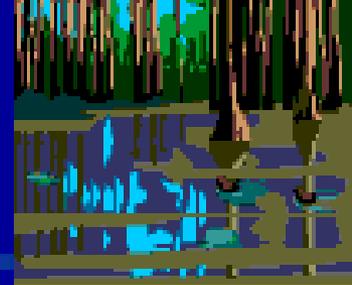
4. Water Resources

Water Resources are vital to biodiversity and the long term environmental health of your community.



- What are they?
 - Watershed boundaries
 - Regional & Local
 - Surface waters
- **Additional Data...**
 - Water Lines
 - Sewer Discharge Points
 - Water Quality

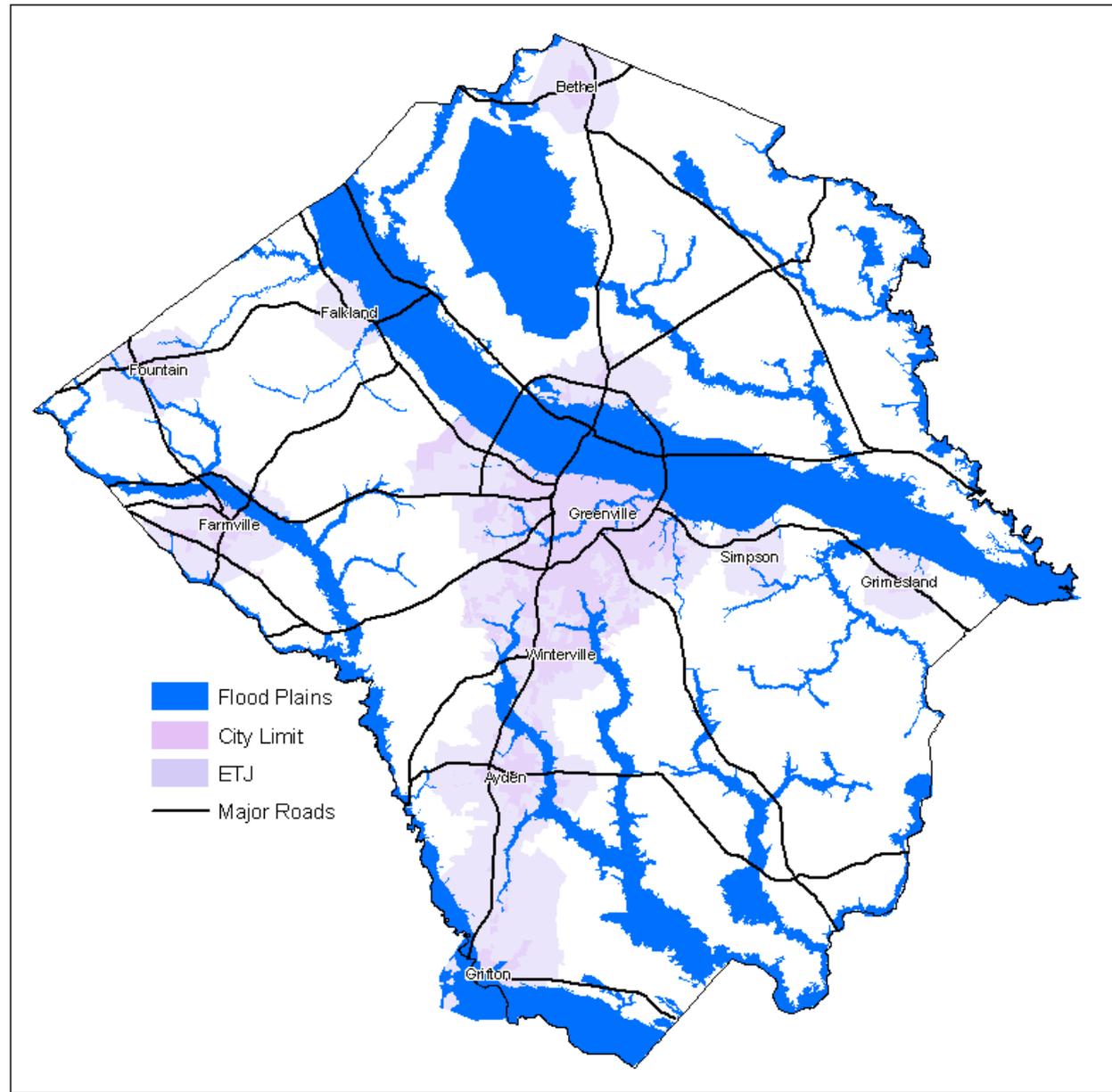
Priority Water Resources



- Refer to basic map set that includes surface waters, wetlands, sub-basin boundaries, and aquifers.
- Identify concerns:
 - Water quantity
 - Existing and future potential for water quality degradation
 - Vulnerability
 - Sensitivity

-US Army Corps
of Engineers &
DWQ

-Federal
Emergency
Management
Agency (FEMA)
-National Flood
Insurance
Program (NFIP)



-Note: Each acre of coastal wetlands contributes from \$800 to \$1,000 to the local economy through flood protection, recreation such as bird watching, fishing, and boating (Kirby, 1993)

5. Unique and Fragile Lands

Unique and Fragile Lands delineate areas in your community that provide habitat for unique flora and fauna.

- **What are they?**

- Endangered and threatened species, and species of special concern
- Significant natural and/or cultural resources

- **Data**

- Endangered and Threatened Species Inventory
- Heritage Trust Program

- **How to use?**

- Prioritize sensitive habitats



**Dungannon Plantation Heritage Preserve
Charleston County**

6. Committed Open Space

Committed Open Space is land that is protected from development by public and private ownership or easements.

- **May Include:**
 - State, Municipal, Federal, and Private Lands.
- **How can we use it?**
 - Create Connections
 - Prevent Fragmentation
 - Open Space Acquisition
 - Direct Development



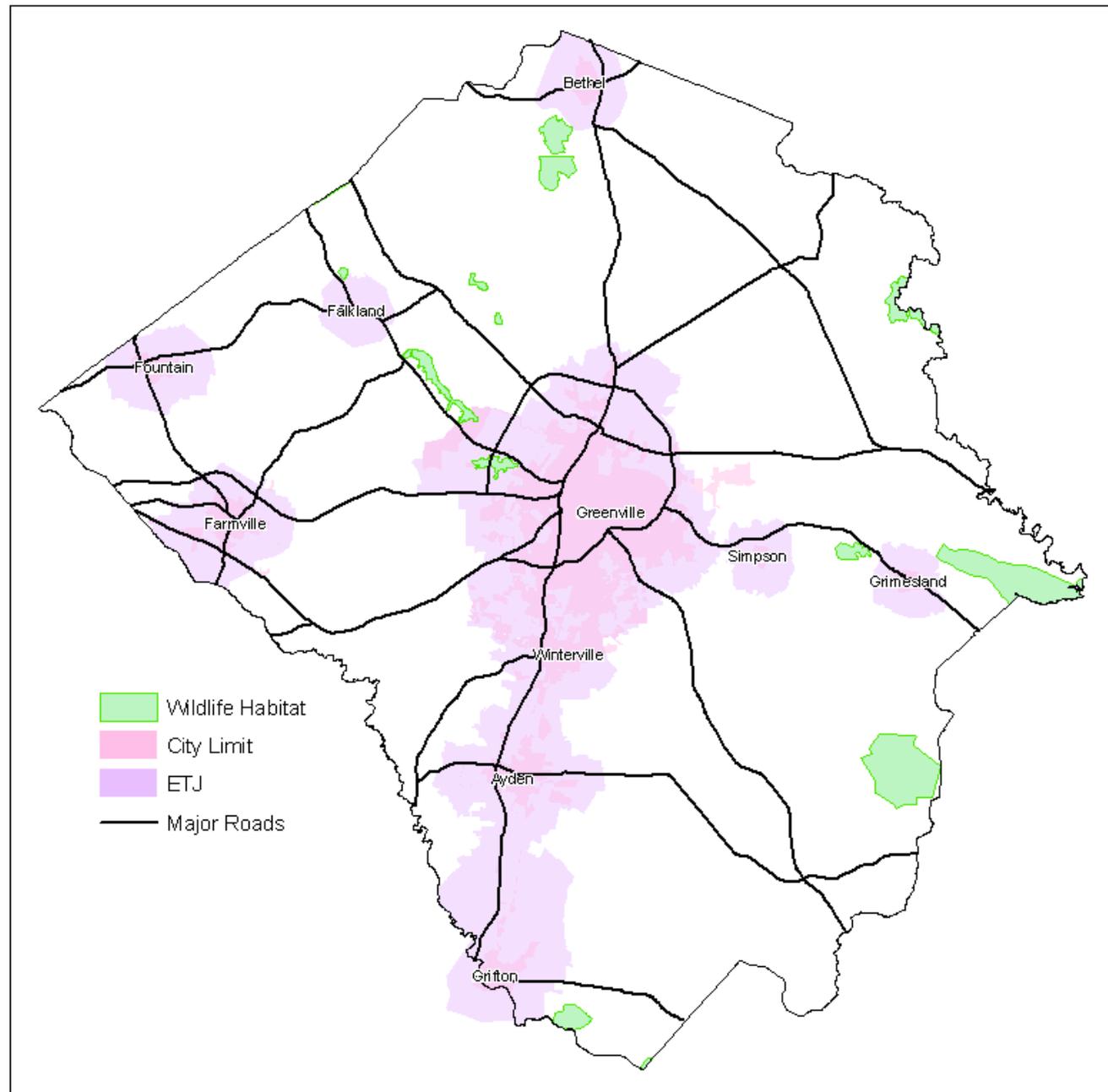
Priority Land Resources



- **Need to refer to basic map set illustrating land cover and/or land use.**
- **Identify concerns**
 - Ecological/habitat concerns
 - Deforestation
 - Removal of buffers
- **Analysis**
 - Determine lands most suitable for preservation or conservation efforts.
 - Unfragmented forest blocks
 - Biodiversity

Vegetated Areas

- Wildlife Resources Commission
- Non-profits



Note: Research shows residents actively engaged in these settings (Adams, 1994)

FARMING ON THE EDGE

Sprawling Development Threatens America's Best Farmland

North Carolina



Legend:

-  High-Quality Farmland & High Development
-  High-Quality Farmland & Low Development
-  Federal & Indian Lands
-  Urban Areas
-  Other Lands


American Farmland Trust
www.farmland.org

 0 20 Miles

What is Open Space?

Agriculture

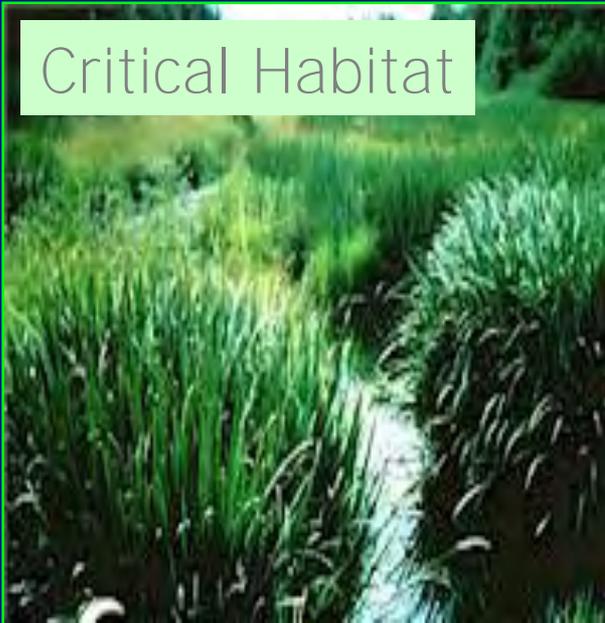


Recreation

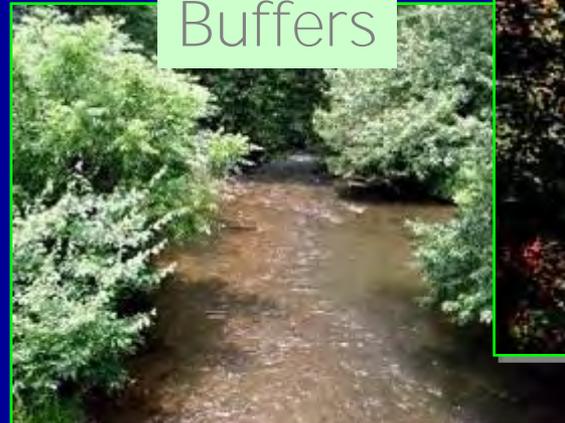


MANY TYPES OF OPEN SPACE

Critical Habitat



Buffers

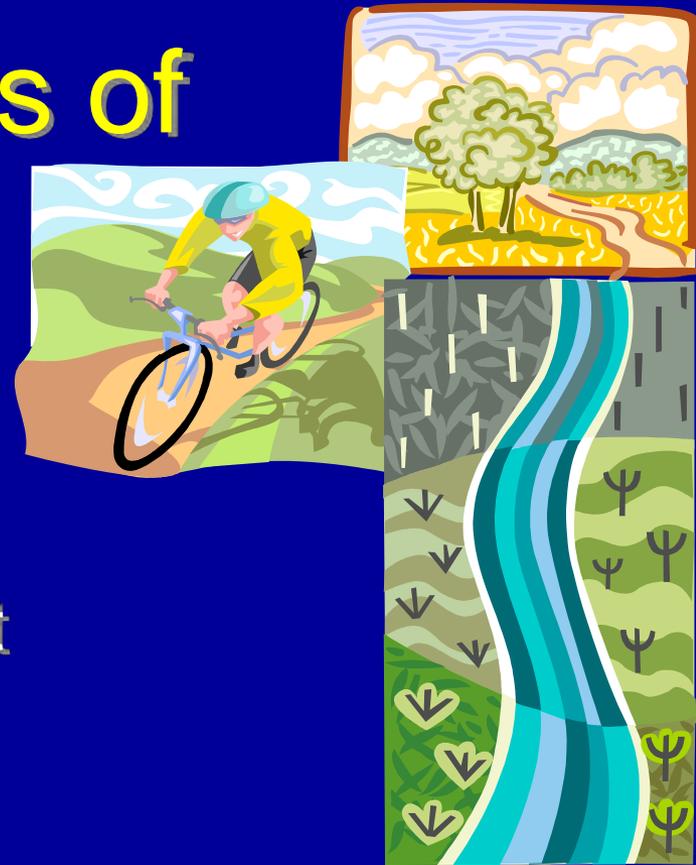


Forest



Functional Categories of Open Space

1. Natural Resource Protection
2. Natural Resource Management
3. Outdoor Recreation
4. Protection of Public Health & Safety
5. Define Community Character/Sense of Place



Open Space Planning



■ Conservation Easements

- Landowner retains ownership, but land use is restricted
- Tax benefits

■ Land Acquisition

- Acquisition and management of land
- Acquisition and lease/sell of land with restrictions
- Becoming more of a reality due to dedicated funding sources from many states

■ Donation

- Permanent protection
- Beneficial to owner as it is considered a charitable donation

■ Land Use Regulations and Plans

- Conservation sub-divisions
- Open Space Networks

Conservation Easements

- What is it?
 - Partial interest in property transferred to NPO or government
- Advantages to Landowner
 - Retain land and some control of land uses
 - Limit or control access
 - Property can still be rented or sold
 - Tax benefits



Conservation Easements

- Public Policy Issues
 - Easements should relate to comprehensive open space plan
 - Know the special characteristics of the land and ensure they are preserved
 - Know who will monitor and enforce easement
 - Have detailed management plans
- More information can be obtained from regional land trusts



NC Population Estimates

North Carolina Counties
2006 Certified Population Estimates



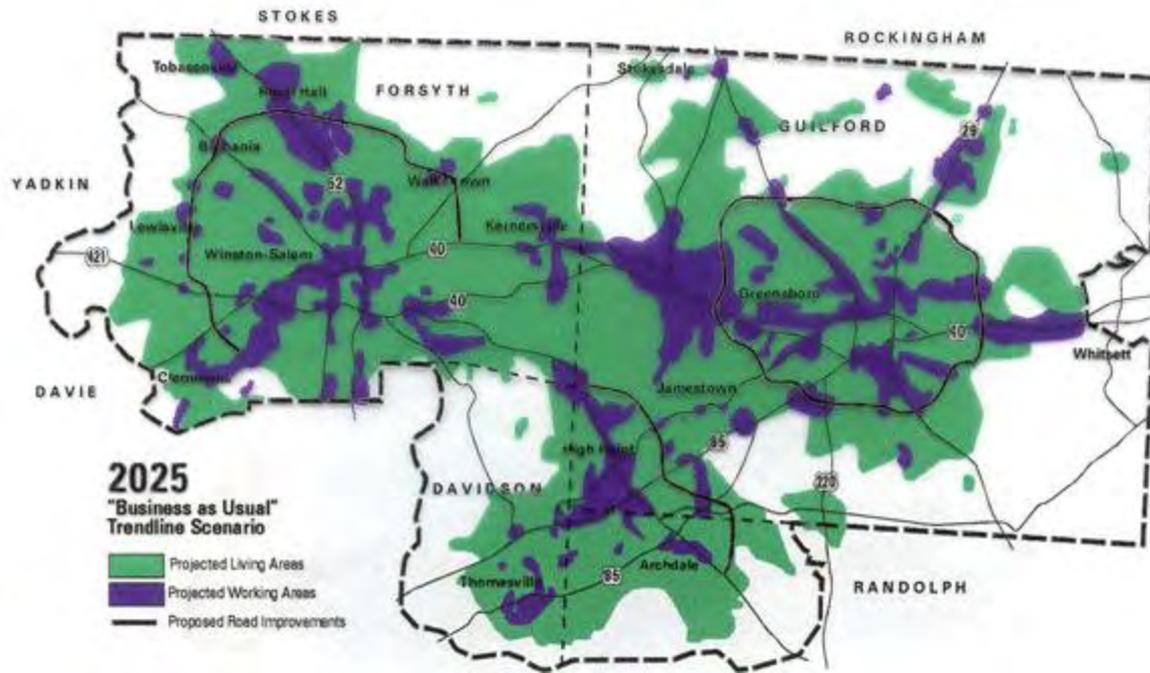
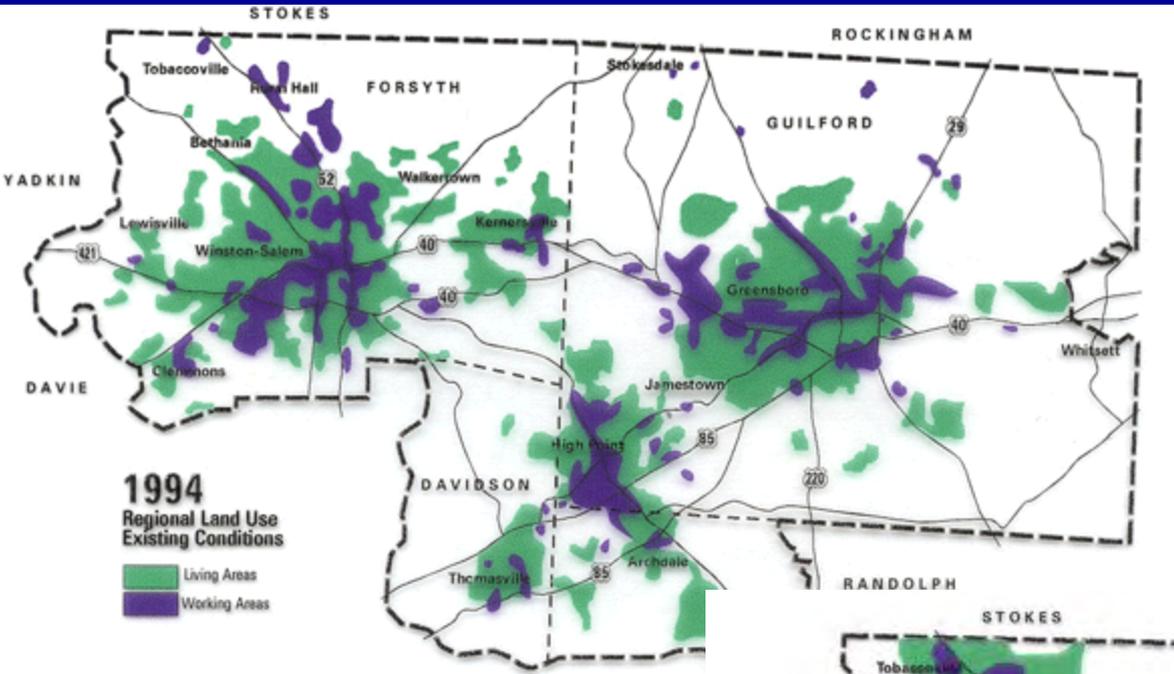
2006 Population Estimate

- 4,240 - 50,000
- 50,001 - 100,000
- 100,001 - 250,000
- 250,001 - 450,000
- 450,001 - 826,893

0 50 100 200 Miles



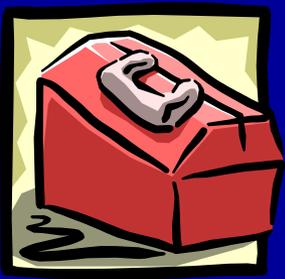
Population Projections



Cultural/ Historical Resources

- Protecting historic and cultural resources within the watershed and the landscape

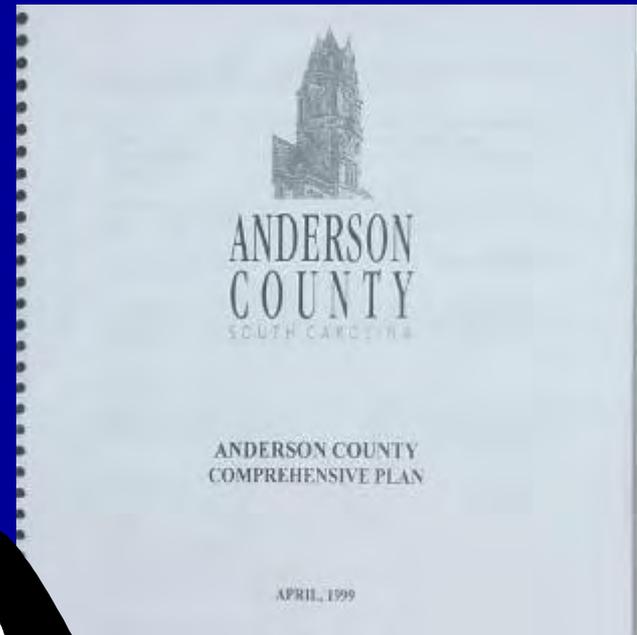




Tools for Consideration...

Planning Options

- Alternative Developments
- Watershed Management Plans
- Stormwater Management Plans



**Comprehensive Plans
And
Ordinances**



Alternative Developments

- **Conservation Sub-Divisions**
 - Incorporate open spaces
 - Smaller lot sizes
 - Use of buffers
- **Mixed Use Developments**
 - Incorporate mix of residential and commercial uses
 - Promote infill development, and redevelopment
- **Urban Growth Boundaries**
 - Delineates land to be developed and land to be protected for rural uses
 - Boundaries delineate areas where public services are available



Conservation Compact

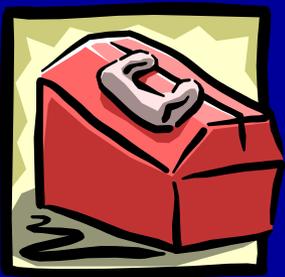
...”The towns of _____, _____, and _____ enter into this voluntary Conservation Compact that acknowledges our commitment to balance conservation and growth by:

1. Protecting and enhancing the water resources of the watershed.
2. Connecting and maintaining habitats and rural landscapes throughout the watershed...”



Stormwater Management Plans

- No direct channeling to watercourses or wetlands
- Minimum site clearance and grading
- Protect natural streams and riparian zones
- Maximize on-site treatment
- Minimize impervious surfaces
- Consider total watershed drainage patterns, not just those specific to the project site
- Coordinate construction activities with low flow seasons



Tools for Consideration...

Zoning Options

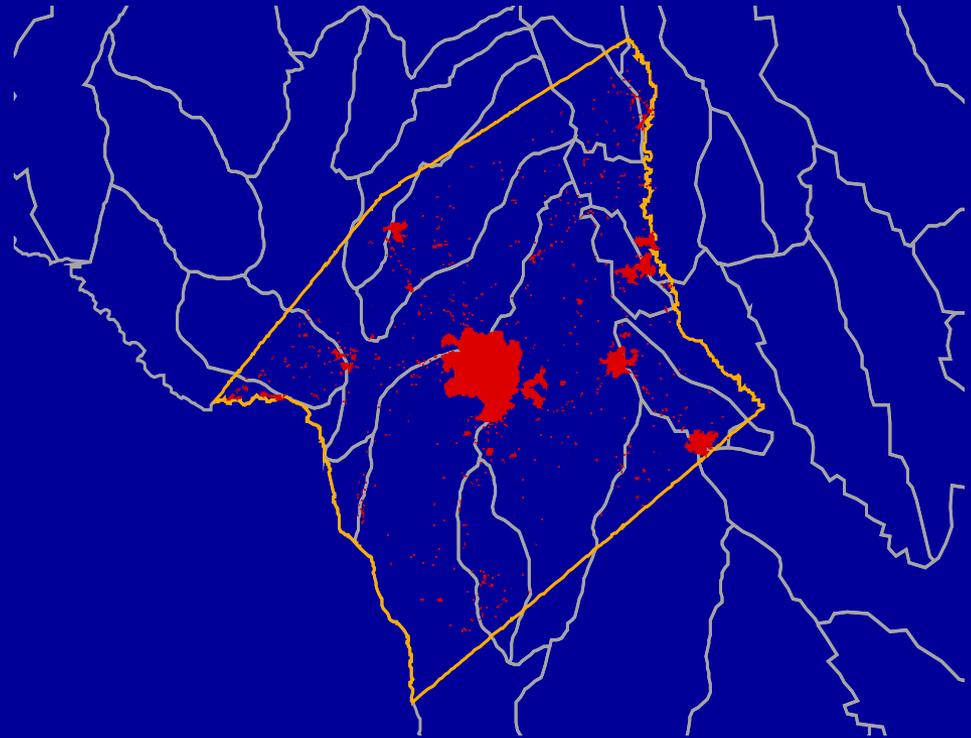
- Watershed Based Zoning
- Overlay Protection Zoning
- Riparian Buffer Zoning
- Other Options

Watershed Based Zoning

Watershed based zoning uses sub-watershed boundaries as the basis for future land use decisions. Its goal is to direct the location and density of future development to the sub-watersheds on which it would have the least adverse effect.

■ Recommended Steps:

- Stream Inventory
- Analyze Relationships
- Classify subwatersheds by stream quality
- Modify plans
- Adopt specific watershed protection strategies
- Long term monitoring



➔ **Involves a great deal of intergovernmental coordination as watershed boundaries do not parallel jurisdictional boundaries.**

Overlay Protection Zones



Overlay Protection Zones are zoning districts that impose an additional set of requirements or relax a set of requirements of the underlying zoning district to address issues within a particular area...

- Mapped boundary of overlay zone does not have to coincide with underlying zoning district
- Can be used as an incentive to encourage certain development
- May be an effective tool for protecting many valued resources.

Vegetated Buffer Zones

Strips of vegetation separating a waterway from adjacent land uses.



- Also referred to as vegetated filter strips and grassed buffers
- Effects:
 - Filtering pollutants
 - Regulating water temperature and runoff
 - Groundwater recharge
 - Storing floodwater
 - Protect riparian habitat
- Buffer Widths??



This looks like a vegetable garden

Getting

Ahhhh, much better!!!

Revise Existing Land Use Plans and Regulations



For Example

Suggested Language for Local Ordinances



The Town of _____ wishes to protect the health of its water resources, and seeks to reduce the impact of development on those resources.

In particular, the commission requires that all new or re-development projects :

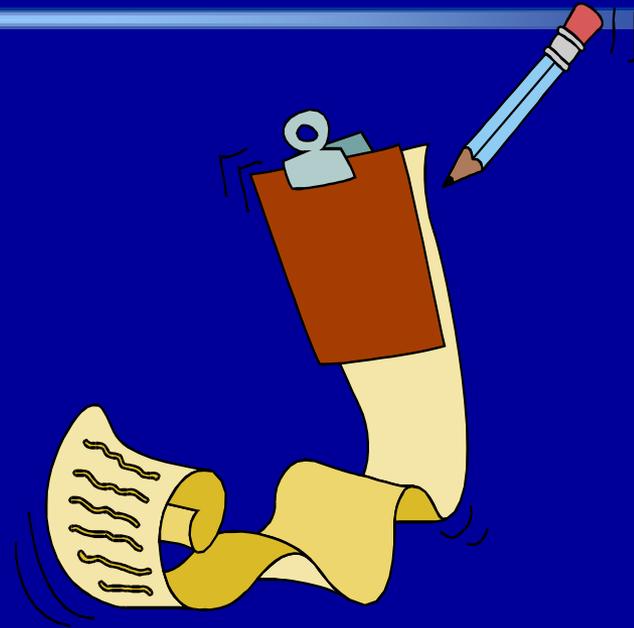
1. Consider it's location within the watershed
2. Minimize disturbance of natural grades and vegetation
3. Protect natural wetlands and stream buffers.
4. Maximize infiltration of stormwater
5. Minimize impervious surfaces.



Develop A Plan Of Action!!

Key Elements of an Action Plan

- Why it must be done
- Who will do it
- What must be done
- When it will be done
- What resources are needed to get it done
- How will progress or completion be monitored & evaluated



Community Protection of Natural Resources

1. Inventory natural resources
2. Prioritize areas for protection
3. Target development to most appropriate areas
4. Incorporate open space planning
5. Develop a plan of action
6. **Revise zoning and land development regulations to support plans**



Lastly...

- Foster public education that encourages citizen participation



What do we want for our future?

- Walkable neighborhoods, towns, and cities
- Access to beautiful natural areas
- Fishable and swimmable waterbodies
- Clean air and water
- Attractive character
- Air and water pollution with costly cleanup and utility bills
- Loss of city character
- Degraded waterbodies and natural areas
- Species loss



This transformation from concrete ditch to urban creek results in a thriving compact shopping area that could be in almost any neighborhood.



Left-bank banks of creeks and baysou in developed areas can handle more water during storm events and still be valuable human amenities.

Related web documents..

- SCDHEC's Critical Line Buffer Ordinance: Guidance for Coastal Communities:
http://www.scdhec.net/environment/ocrm/pubs/docs/Buffer_Ord.pdf

- NC Sea Grant's Soundfront Series:
http://www.ncseagrant.org/index.cfm?fuseaction=page&file name=outreach_coastal_communities_activites.html

Guidance Available for Ordinance Development

- Critical Line Buffer Ordinance manual with SCDHEC-OCRM, the City of Charleston, the College of Charleston, and S.C. Sea Grant Extension
- Buffer and plant selection guidance, with Clemson University's Master Gardener program



Credits...

- Cal Sawyer, Clemson University
- Dwane Jones, North Carolina State University
- NEMO