N.C. Ecosystem Enhancement Program

The Power of Partnerships
Albemarle-Pamlico NEP
November 17, 2004

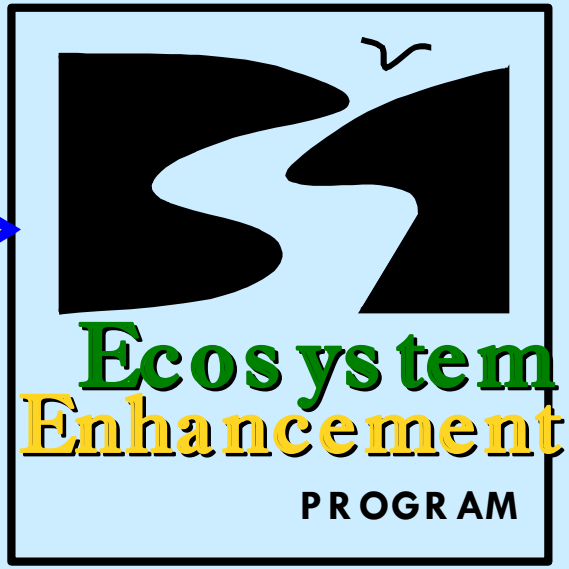
EEP : a Merging of Three Program Resources & Functions

NC DENR

NC DOT

USACE

US Army Corps of Engineers®



July 20

NCDENR

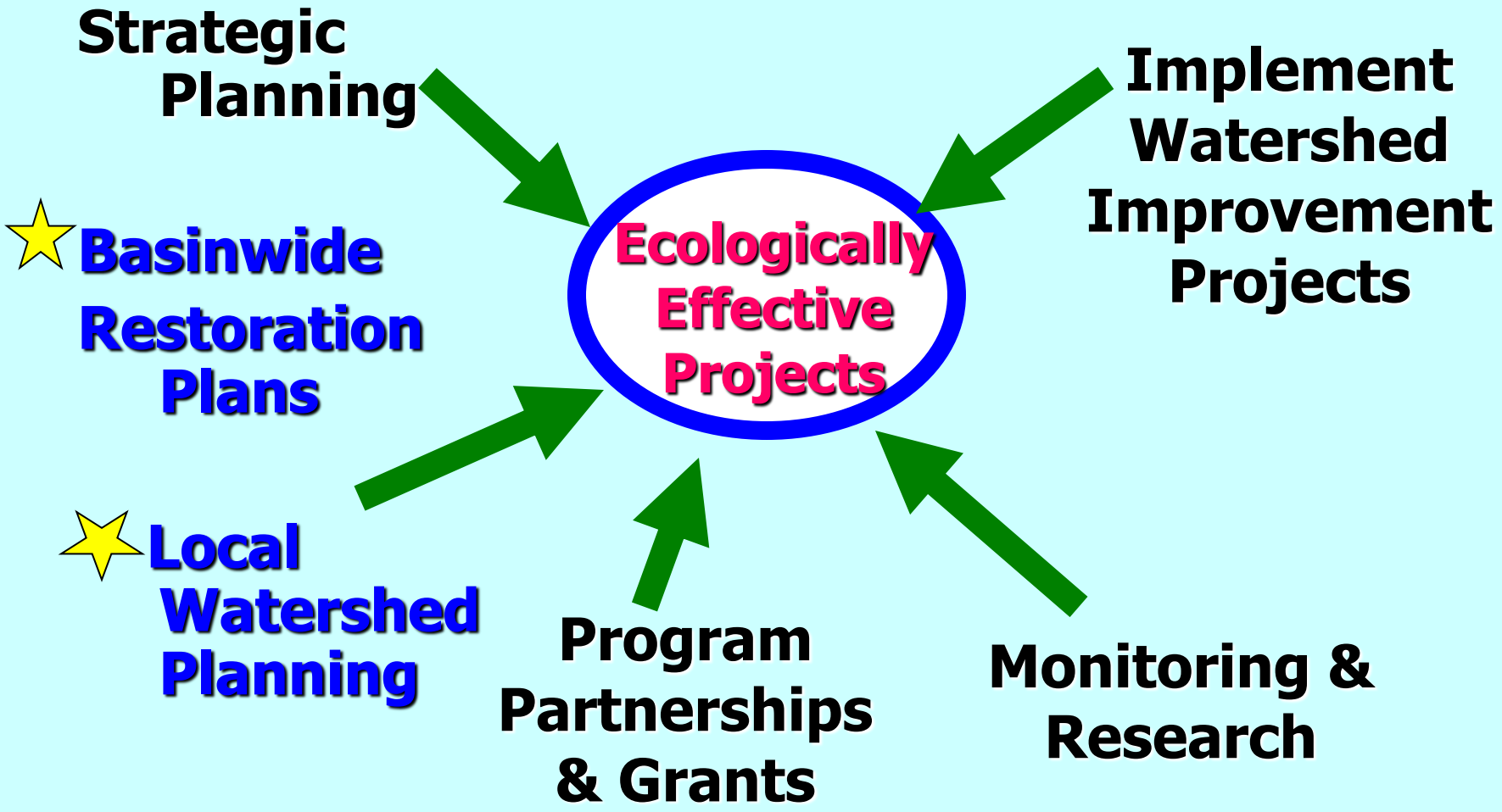
Ecosystem Enhancement Program (EEP)

- **Mission:**

  To restore, enhance, preserve, and protect the functions associated with wetlands, streams, and riparian areas including but not limited to those necessary for the restoration, maintenance, and protection of water quality and riparian habitats throughout North Carolina

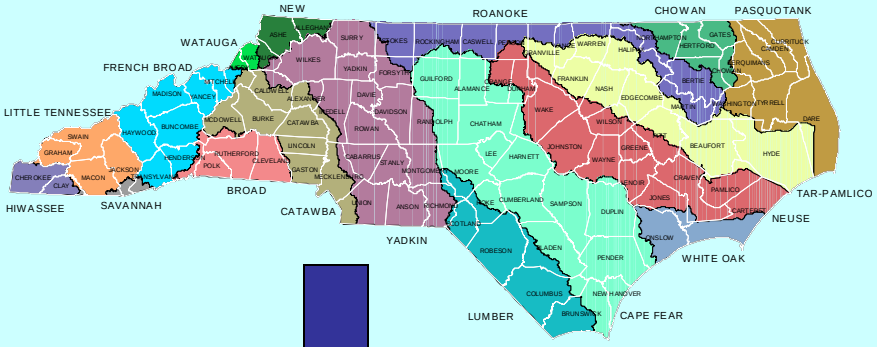
Ecosystem Enhancement Program

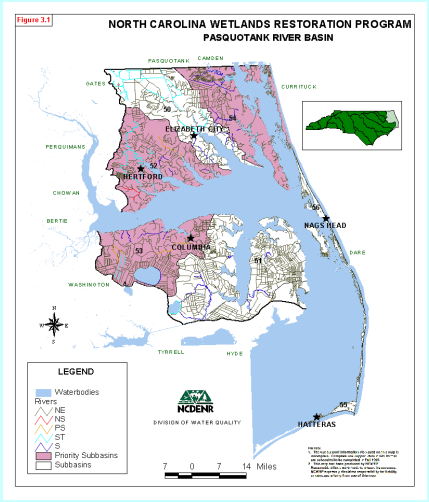
Components



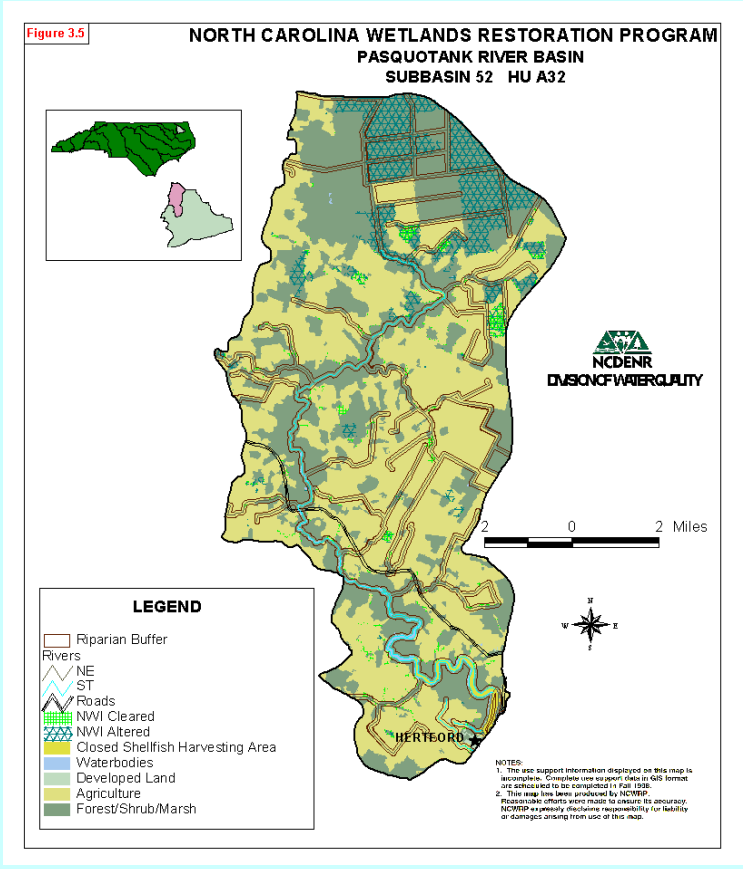

Planning Components
Basinwide Restoration Plans &
Local Watershed Plans
North Carolina Ecosystem
Enhancement Program

Planning for Restoration Activities: a Focused Watershed Approach





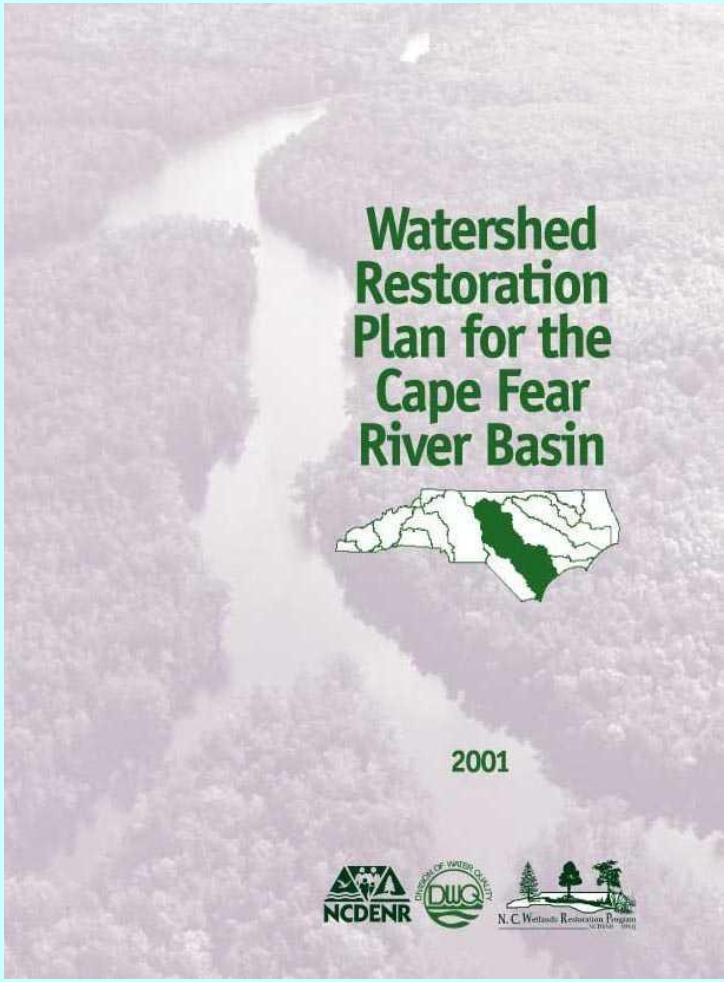
Watershed Restoration Plans



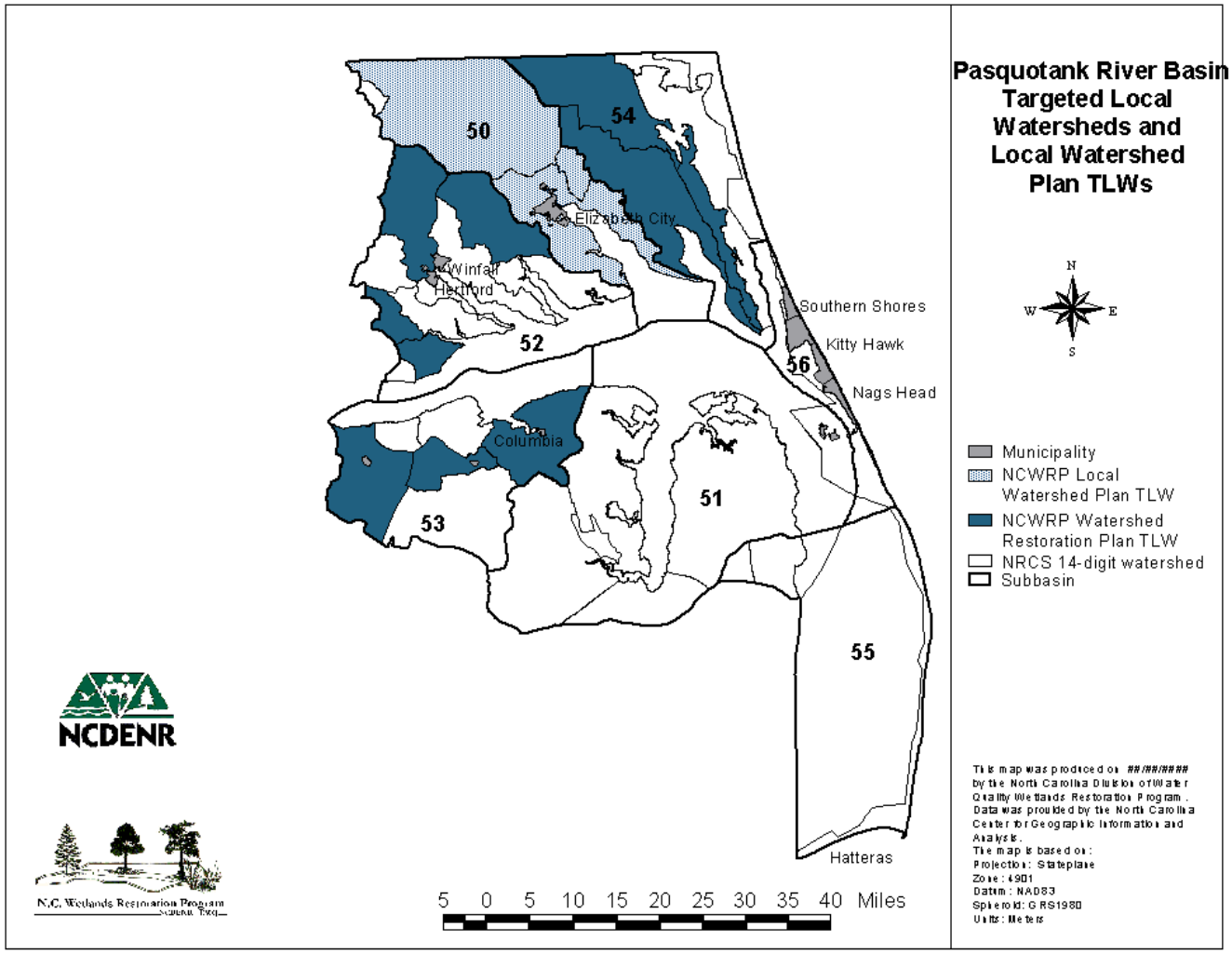
Targeted Local Watersheds & Local Watershed Plans

Basinwide Restoration Plans

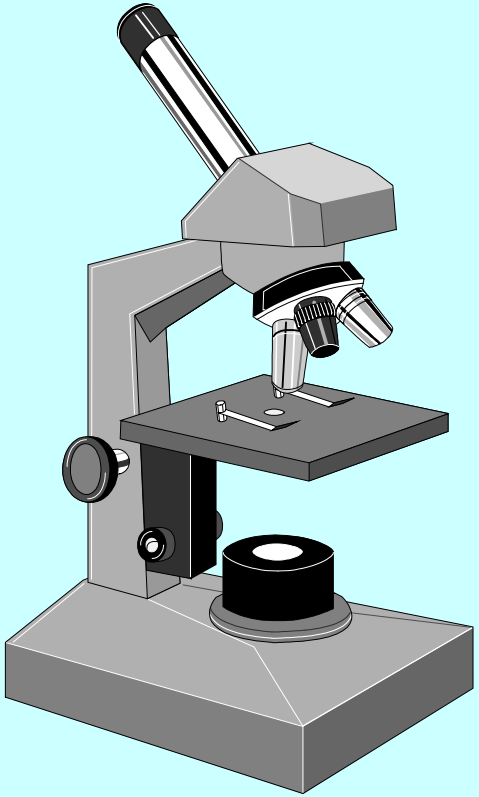
- Developed for ea. river basin & updated every 5 years
- Identifies Targeted Local Watersheds within ea. basin where watershed improvement needs & opps. exist
- Provides basis for EEP & resource ags. & groups to justify and concentrate watershed improvement project efforts where needed most.
- Available at: http://www.nceep.net/



Targeted Local Watersheds in the Pasquotank River Basin

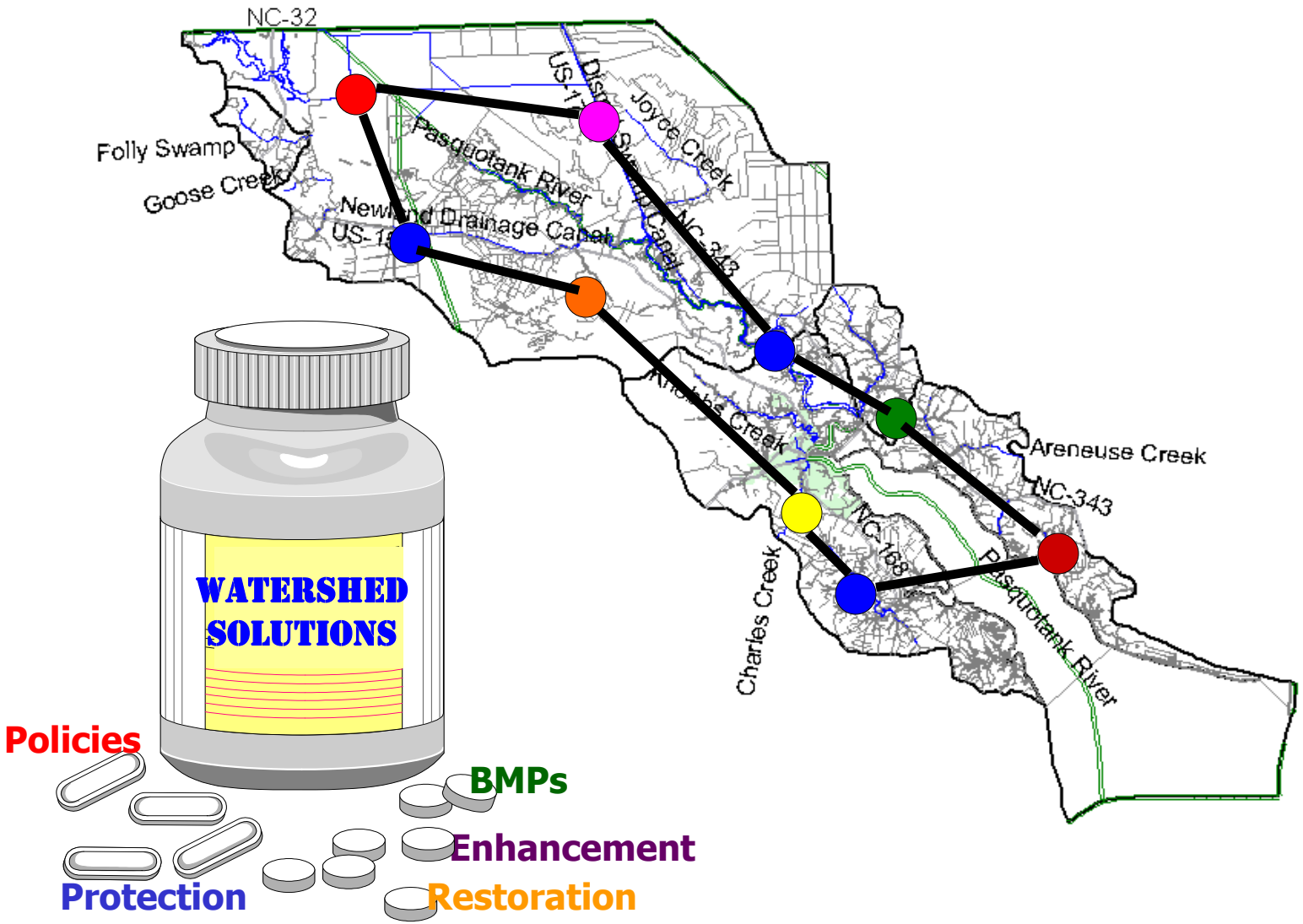


Local Watershed Plans: Focusing at a Finer Scale within Local Watersheds

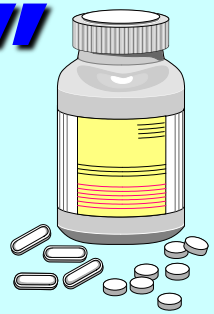


Local Watershed Planning:
a Better Understanding of the Watershed Symptoms

The "Right Medicine"
based on prescribed recommendations



The "Right Medicine"



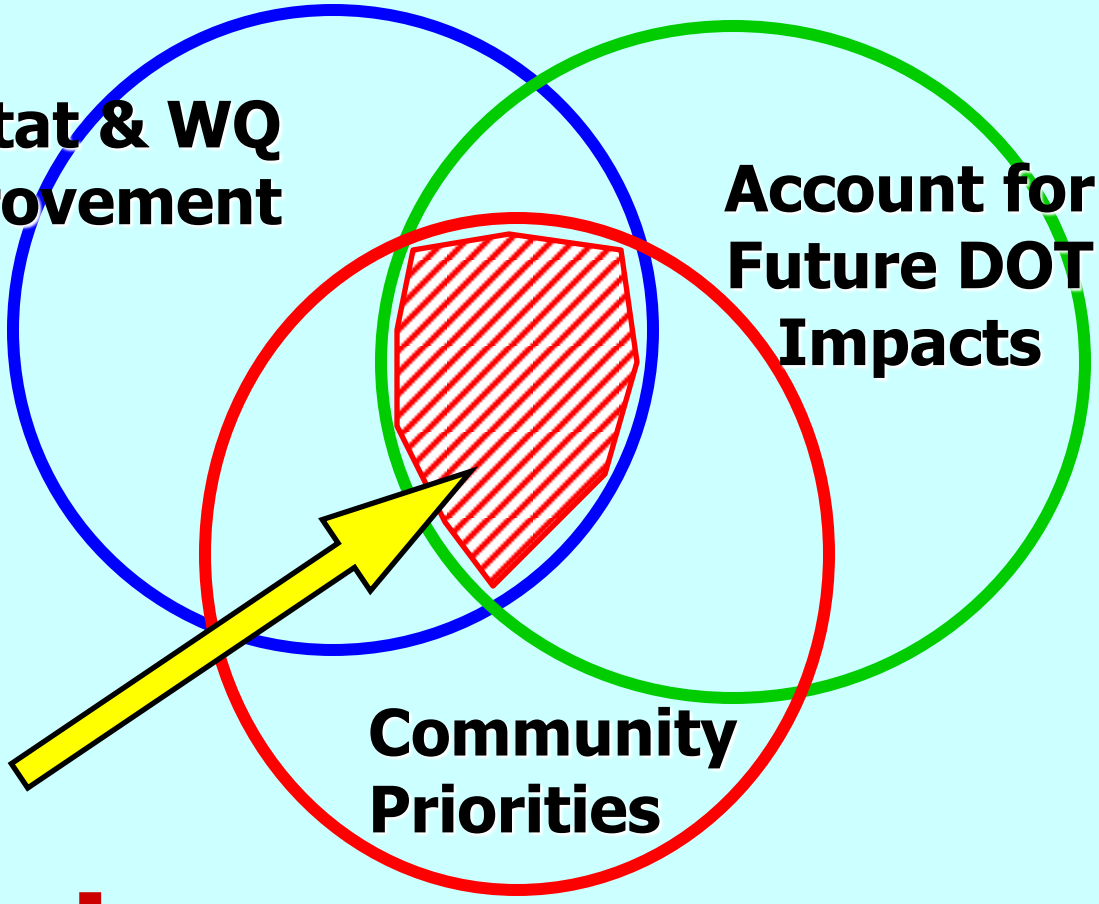
- Stream & Wetlands Restoration
- Riparian Buffer Implementation
- Best Management Practices
- Recommendations / Strategies for Improving & Protecting

✓ **Water Quality**,

✓ **Stormwater** and

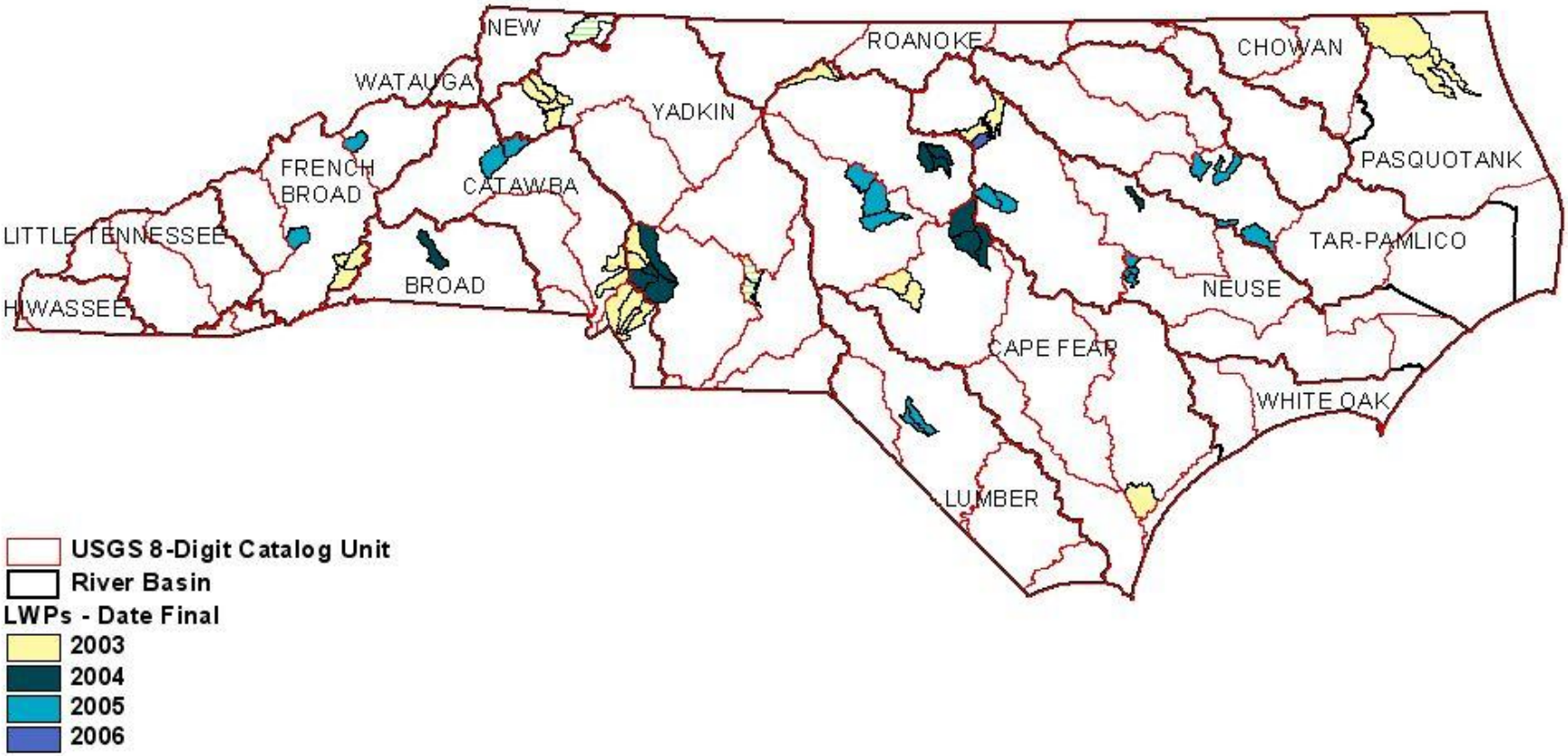
✓ **Habitat**

Focus of Local Watershed Planning: to Identify the Nexus



The best projects

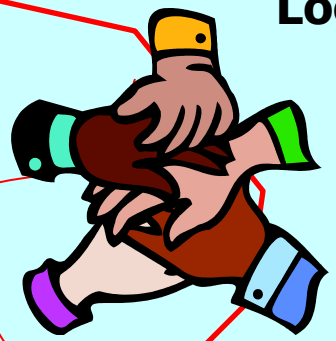
EEP Local Watershed Planning Areas
November 2004

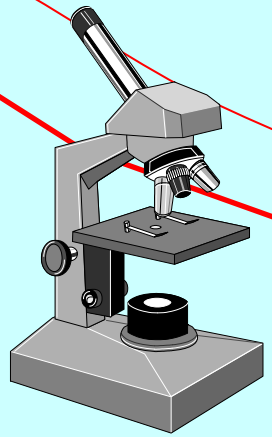


4 Key Ingredients
of a *successful* Local Watershed Plan

Technical Assessment: Consultant Services

Local Stakeholders & Resource Professionals





Watershed Water Quality Monitoring

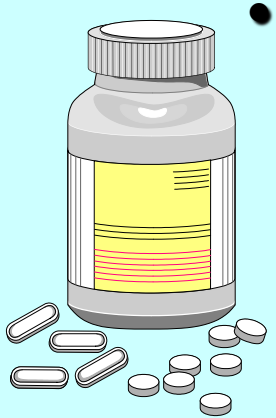
Local Partners to assist with local involvement & implementation

Potential Elements of a Local Watershed Plan (LWP)

- Watershed assessment
- Wetlands and stream restoration projects
- Local growth management initiatives
- Stormwater / Ag. BMP projects
- Water supply protection strategies
- Education and technical assistance program

Components of the Technical Assessment

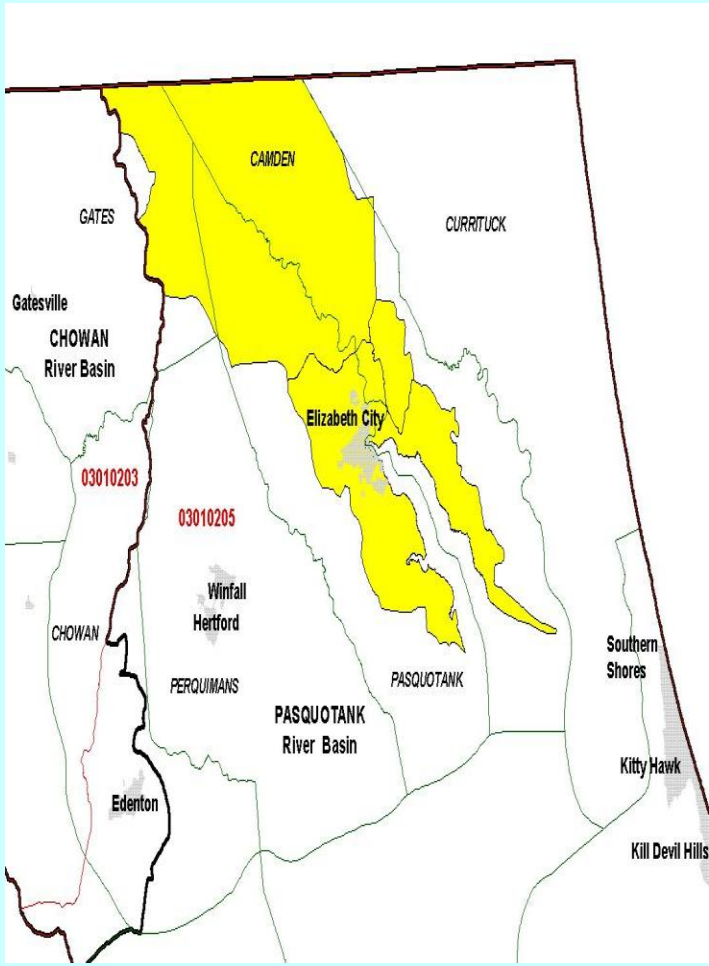
- Inventory available data & information, stakeholder identified issues
- Detailed Assessment: field assessment & modeling
- Recommendations/ Implementation



Pasquotank River LWP

Pasquotank, Camden and Gates Cos.

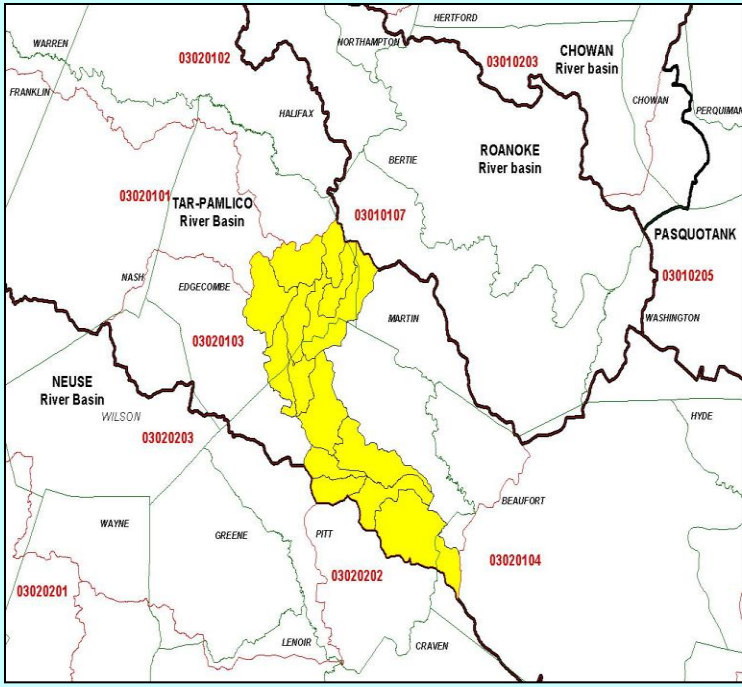
- **Stakeholder Process**
  - Local interests, local government & other interested parties; technical resource professional advisors
  - Watershed plan completed Dec. 2003
- **Key Issues**
  - Stormwater & growth & dev.
  - Historic channelization & poor buffers
  - Nutrient & sediment inputs
  - Habitat degradation / protection
- **Outcomes**
  - EEP Project Implementation, stormwater wetlands & other BMPs



Tar-Pamlico LWP

a subwatershed approach in Martin, Edgecombe and Pitt Cos.

- **Stakeholder Process**
  - Local interests, local government & other interested parties; technical resource professional advisors
  - Watershed plan initiated Sept. 2004
- **Key Issues**
  - 303(d) listed streams
  - NSW designations
  - Stormwater & growth & dev.
  - Historic channelization and poor buffers
  - Nutrient & sediment inputs
  - Habitat degradation / protection
- **Initial Outcomes & Cooperative Efforts**
  - EEP Project Implementation, stream rest.,
  - USACE Flood Hazard Mitigation Study

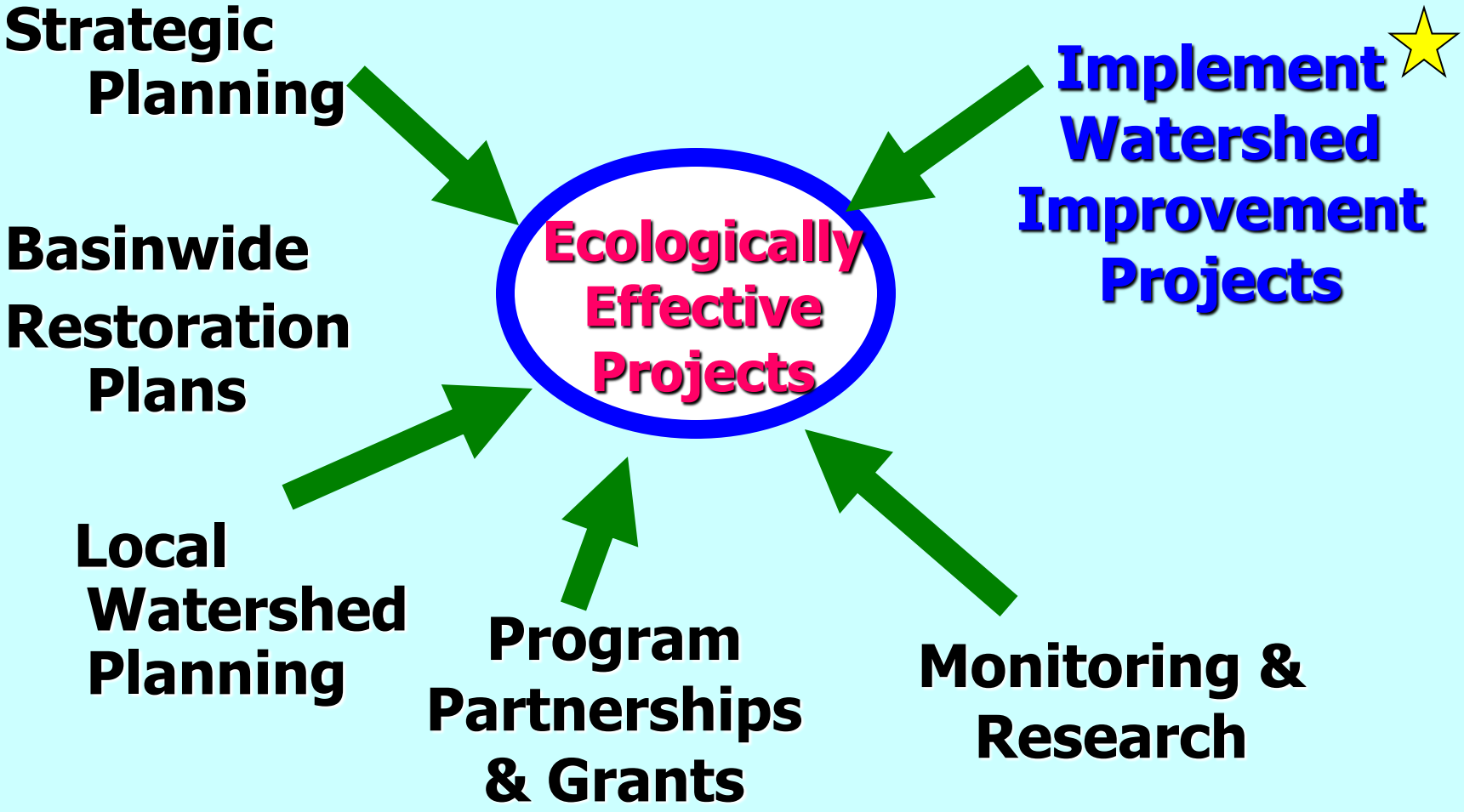


Implementation Components

North Carolina Ecosystem Enhancement Program

Ecosystem Enhancement Program

Components



How We Identify Sites

- **EEP Planning Section Resources**
  - Use Watershed-based plans and criteria that identify Targeted Local Watersheds; and
  - Local Watershed Planning efforts which focus on identifying projects which will provide the greatest benefit
- **Site recommendations are developed based on:**
  - Internal searches
  - Recommendations from other agencies
  - Landowner interest (Landowner Interest Forms)

How We Choose Sites

- **Basic Site Criteria**
  - Located within an EEP Targeted Local Watershed or based on planning criteria
  - Permanently protected by a conservation easement
  - Construction access
  - Different specific criteria for stream and wetland projects
- **Project Review Team**

What Types of Projects Does EEP Do?

- Restoration, enhancement and preservation of streams & wetlands
- Riparian buffer restoration
- Stormwater Best Management Practices (BMPs)

Restoration, Enhancement and Preservation

- **Restoration of wetlands**
  - Vegetation, hydrology and soils
- **Restoration of streams**
  - Pattern, profile and dimension
- **Enhancement**
  - One or two of the above components
- **Preservation**
  - Protect the area as is

Specific Stream Restoration Project Criteria

- minimum 50 ft buffer zone on both sides of channel,
- length of at least 2,000 lf
- perennial

What Makes a 'Good' Candidate for a Stream Restoration Project?

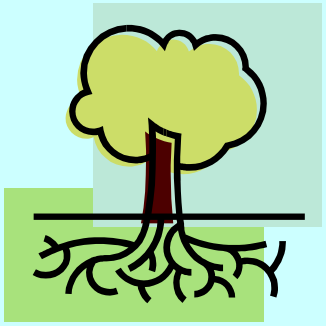
- **Stream pattern has been altered**
  - **Straightened, relocated, severe meandering**
- **Elevated sediment levels, deposition in channel**
- **Evidence of bank erosion**
  - **Undercut banks, exposed tree roots, downed trees**

What Makes a 'Good' Candidate for a Stream Restoration Project?

- **Stream channel looks incised (narrow and deep)**
- **Pool/Riffle sequence been impacted**
  - **Shallow pools, riffles in the meanders**
- **Stream has over widened**
  - **Proposed stream reach is wider than above and below segments, mid-stream bars are forming, heavy sediment deposits on benches**

How Do You Restore Streams?

- **Ultimate goal:**
  - **Pattern**
  - **Dimension**
  - **Profile**
  - **Fully functional riparian zone**



Methods:
Sloping Back Banks

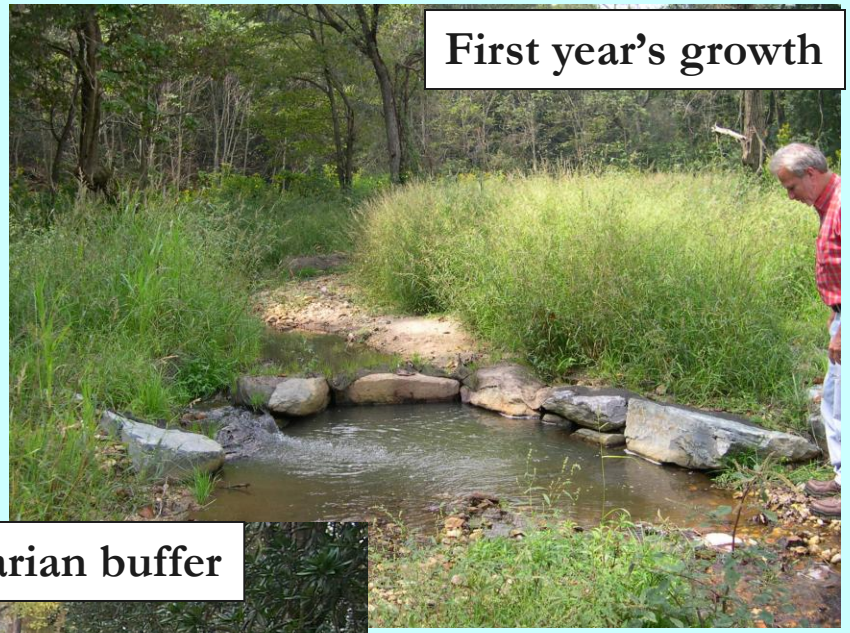
Tools For Restoring Streams:
Installing in-stream structures

Tools For Restoring Streams:
Rootwad revetments

Tools For Restoring Streams:
Establishing vegetative buffers

Live stakes prior to planting

First year's growth



Established riparian buffer

EEP Stream Restoration Successes

Payne Dairy 1999

Pre- Restoration

Payne Dairy 2001

Just after permanent planting

Hominy Swamp Creek – Wilson Co., Urban Coastal Plain Project

Brush Creek

Before

~Two months after

Specific Wetland Restoration Project Criteria

- Hydric soils present
- Hydrology modified
  - Ditches/canals present
  - Tile drainage
  - Dams
  - Prior converted (PC) land
- Vegetation removed or upland vegetation encroaching
- Greater than 5 acres preferred

Hammocks Beach- August 2000

Hammocks Beach- May 2001

Sturgeon City-Before

Sturgeon City-After

Sturgeon City - After

Riparian Buffers

- The vegetated area adjacent to a stream, river or ditch
- In the Neuse and Tar-Pamlico basins, 50 feet on either side is required
- Native vegetation protects water body by filtering and slowing runoff
- Stabilizes stream banks
- Provides shade

Riparian Buffers

Riparian Buffers

BMPs

- Treat stormwater and other runoff
- Are useful in situations where traditional restoration is not practical (e.g. urban sites)
- Can be wetlands, wet ponds, rain gardens, grassed swales

Stormwater BMPs – Grassed Swales

Stormwater BMPs – Rain Gardens/Bioretention Areas

Stormwater BMPs – Wetlands and Wet Ponds

Stormwater BMPs – Wetlands and Wet Ponds

Project Benefits

- **Enhanced water quality**
  - Reduced nutrient loading into the stream
  - Reduced bank erosion and in stream deposition of of sediment
- **Flood control**
- **Improved aquatic & terrestrial habitat**

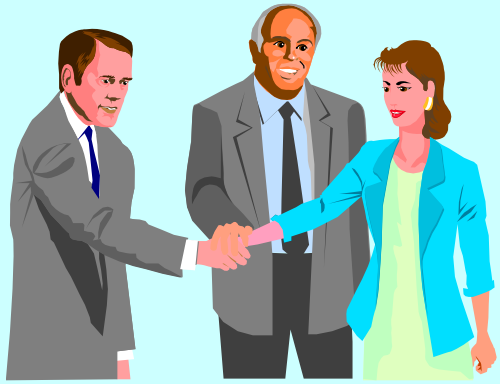
EEP provides long-term protection for projects by:

Purchasing

- -property in fee simple (fair mkt.)
- -permanent conservation easement

Accepting Donations (for tax credits)

- -property in fee simple
- -permanent conservation easement



EEP Will Provide…

- **Project design & Construction (includes necessary permits)**
- **Project management**
- **Monitoring of project (and maintenance, if necessary) for 5 years following construction**


Questions ?