# Chowan River Basin
# Restoration Priorities
## May 2009

Ecosystem Enhancement PROGRAM

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## Introduction

This document, prepared by the North Carolina Ecosystem Enhancement Program (EEP), presents a description of Targeted Local Watersheds (TLWs) within the North Carolina portion of the Chowan River Basin. This is an update of the original document developed in 2002 by the Wetlands Restoration Program (NCWRP, a precursor to EEP), *Watershed Restoration Plan for the Chowan River Basin*.

The restoration priorities for the North Carolina portion of the Chowan River Basin are captured in this report. It includes information on the watersheds in USGS 8-digit Catalog Units 03010203 and 03010204. EEP prioritizes improvement and protection by hydrologic units at the 14-digit watershed scale. The North Carolina portion of the Chowan River Basin contains 48 14-digit watersheds. EEP is prioritizing 12 of these watersheds for improvement and protection.

The original plan selected seven watersheds to be targeted for stream, wetland and riparian buffer restoration and protection and watershed planning efforts. This plan retains five of these original watersheds, plus presents an additional seven TLWs for the basin. Two TLWs from the 2002 document were not included in the current targets due to re-evaluation of water quality information.

These watersheds receive priority for EEP planning and restoration project funds. The designation can also benefit stakeholders writing watershed improvement grants (e.g., Section 319 or Clean Water Management Trust Fund) by giving added weight to their proposals. For watershed projects that meet the goals of this River Basin Restoration Priorities (RBRP) report, EEP can provide letters-of-support to stakeholders for externally funded proposals.

The Chowan River Basin enters North Carolina along the Virginia border in the coastal plain. The two major catalog units flow into the Albemarle Sound.

## Purpose and Background of the NC EEP

In July 2003, North Carolina committed its resources to an innovative program to restore, enhance and protect its wetlands and waterways. The N.C. Ecosystem Enhancement Program (EEP) combines existing wetlands restoration initiatives (formerly the Wetlands Restoration Program or NCWRP) of the N.C. Department of Environment and Natural Resources with ongoing efforts by the N.C. Department of Transportation (NCDOT) to offset unavoidable environmental impacts from transportation-infrastructure improvements. The U.S. Army Corps of Engineers (USACE) joined as a sponsor in the historic agreement. A Memorandum of Agreement between

NCDENR, NCDOT and USACE stipulates that EEP mitigation projects will be:

- Provided in advance of the permitted NCDOT impacts,
- Designed to address functional replacement of stream, buffer and wetlands impacts and
- Identified and implemented within the context of a watershed approach based on multiple scales of planning.

## River Basin Restoration Priorities

*North Carolina General Statute 143-214.10* charges EEP to pursue wetland and riparian restoration activities in the context of Basin Restoration Plans, one for each of the 17 major river basins in the State, with the goal of protecting and enhancing water quality, fisheries, wildlife habitat, recreational opportunities and preventing floods.

EEP develops River Basin Restoration Priorities to guide its mitigation activities within each of the major river basins. The River Basin Restoration Priorities delineate specific watersheds that exhibit both the need and opportunity for wetland, stream and riparian buffer restoration. These priority watersheds, or Targeted Local Watershed, are 14-digit hydrologic units which receive priority for EEP planning and restoration project funds. The designation can also benefit stakeholders writing watershed improvement grants (e.g., Section 319 or Clean Water Management Trust Fund) by giving added weight to their proposals.

## Criteria for Selecting a Targeted Local Watershed

EEP evaluates a variety of GIS data and other resource and planning documents on water quality and habitat conditions in each river basin to select Targeted Local Watersheds. Public comment and the professional judgment of local resource agency staff also play a critical role in targeting local watersheds. Below is a summary of information used to select Targeted Local Watersheds?

**Water Quality Problems:** EEP targets watersheds with existing and potential water quality problems resulting from nonpoint source pollution. To make this determination, EEP evaluates DWQ use support ratings, the 303(d) List and DWQ Basinwide Assessment reports. EEP also uses land cover data to evaluate riparian buffer condition.

**Resource Values:** EEP recognizes that resource values beyond water quality should be considered in evaluating the restoration need and opportunity of a watershed. The resource values that EEP considers in targeting local watersheds include public water supply, shellfish areas, outstanding or high quality resource waters, aquatic natural heritage elements and significant natural heritage areas.

**Watershed Approach:** EEP watershed approach advocates concentrating multiple water quality projects in one relatively small watershed to yield a greater cumulative benefit to water quality. EEP wants to tie wetland and stream restoration projects with other efforts such as agricultural best management practices (BMPs), stormwater controls, and riparian buffer preservation to restore or improve entire watershed functions, not just streams and wetlands. For this reason, EEP targets areas with existing watershed planning or protection initiatives are already underway.

**Partnership Opportunities:** To assess the potential for partnership opportunities at the local watershed scale, EEP reviews existing or planned Clean Water Management Trust Fund and Section 319 projects and identifies watersheds that conservation groups are targeting. EEP also identifies areas where municipalities have surface water intakes or are a Phase II community. This information provides an indicator for potential partnerships in the watershed.

**Land Cover:** Water quality studies suggest that heavily forested watersheds regulate stormwater runoff, thereby reducing the likelihood for severe streambank erosion, nutrient runoff and sediment pollution. For this reason, EEP assesses the percentage of developed land in a watershed as an indicator of restoration need and opportunity.

**Local Resource Professional (RP) Comments/Recommendations:** The comments and recommendations of local resource agency professionals including staff with Soil & Water Conservation districts, the Natural Resources Conservation Service (NRCS), municipal planning and stormwater departments, NCDENR regional.

## Chowan River Basin Overview

The Chowan River Basin straddles the border of Virginia and North Carolina. Agricultural land uses continue to predominate throughout most of the basin with small municipalities situated at strategic crossroads. Since the previous report, population in most of the counties of the basin is stable or minimally declining.

The basin contains 48 14-digit watersheds. Seven of these were targeted in past planning efforts. In this document, an additional seven watersheds are identified as new priority targets. Each of the seven is discussed later in this document. Two originally targeted watersheds were removed from the target list for reasons discussed below.

## Chowan Restoration Priorities

Based on an assessment of existing watershed characteristics and resource information, EEP has developed restoration goals for the Chowan River Basin.

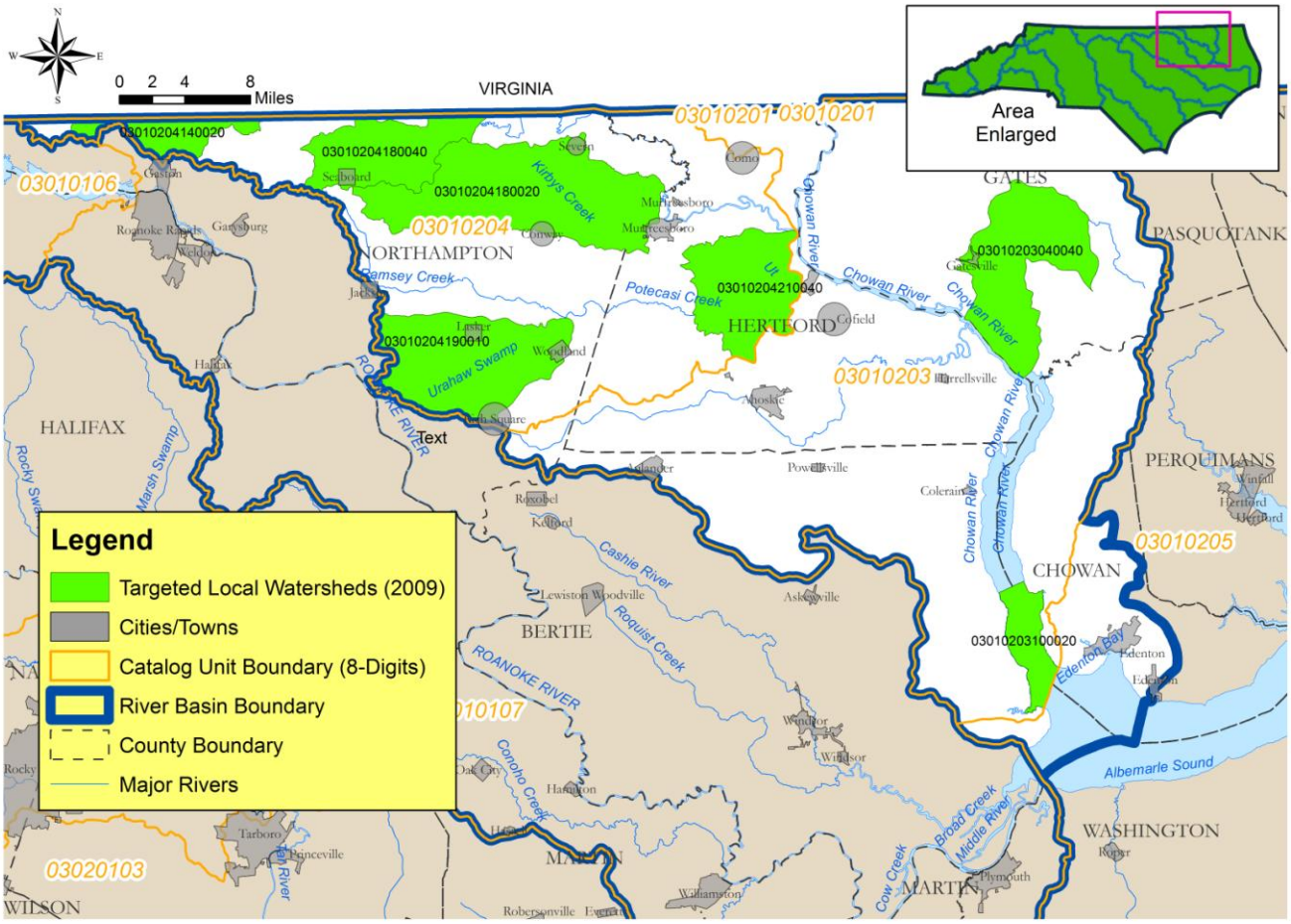
The goals reflect EEP's focus on restoring wetland and stream functions such as maintaining and enhancing water quality, restoring hydrology, and improving fish and wildlife habitat. The restoration goals for the Chowan River Basin are listed below.

- Implement wetland, stream and shoreline restoration projects that reduce sources of sedimentation, nutrient pollution and surface runoff by restoring hydrology and vegetation, stabilizing banks and restoring natural geomorphology where appropriate.
- Work with landowners, local governments, local conservancies and other nongovernmental groups to protect and restore watersheds through restoration and preservation.
- Restore streams and riparian buffers to provide shade and temperature control and increase in stream woody debris for habitat.
- Restore and protect sensitive aquatic resources to improve habitat and species diversity through the restoration of wetlands, streams and riparian buffers.
- Develop Local Watershed Plans in the basin to identify and address water quality impacts through a consensus based local stakeholder process. These plans will work to identify specific wetland, stream and riparian buffer restoration projects as well as preservation, enhancement and best management practice strategies.
- Cooperate and partner with local resource agencies to help leverage federal and state grant funding for watershed restoration efforts.

# Targeted Local Watershed Summary Table

| Stream Name | USGS Hydrologic Unit Code | Watershed Size (sq. mi.) | Predominant Ecoregion | Stream Miles | % 303(d) Streams | % Significant Natural Heritage Area | % Conservation Land Area | % Forest Wetland Area | % Developed Area | % Agricultural Area | Number of Permitted Animal Operations | Shellfish Closure Area (sq. mi.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bennetts Creek | 03010203040040 | 53 | Mid-Atlantic Flatwoods | 83 | 2.8 | 30.0 | 21.8 | 72.2 | 1.6 | 22.4 | 7 | 1.9 |
| Chowan River | 03010203100020 | 14 | Mid-Atlantic Flatwoods | 6 | 92.2 | 95.0 | 0.3 | 1.4 | 0.3 | 0.2 | 0 | 14.2 |
| Beaverpond Creek | 03010204140020 | 17 | Rolling Coastal Plain | 38 | 0.0 | 0.0 | 0.0 | 53.9 | 2.2 | 42.6 | 14 | 0.0 |
| Kirbys Creek | 03010204180020 | 82 | Rolling Coastal Plain | 139 | 0.0 | 0.5 | 0.5 | 48.5 | 2.0 | 47.2 | 13 | 0.0 |
| Cypress Creek | 03010204180040 | 34 | Rolling Coastal Plain | 52 | 0.0 | 1.9 | 0.1 | 57.4 | 1.5 | 40.1 | 10 | 0.0 |
| Urahaw Swamp | 03010204190010 | 60 | Mid-Atlantic Flatwoods | 65 | 0.0 | 0.3 | 1.3 | 62.6 | 2.0 | 34.1 | 19 | 0.0 |
| Potecasi Creek | 03010204210040 | 40 | Mid-Atlantic Flatwoods | 77 | 38.4 | 0.1 | 5.4 | 63.5 | 1.4 | 32.6 | 8 | 0.3 |

# Targeted Local Watershed Map

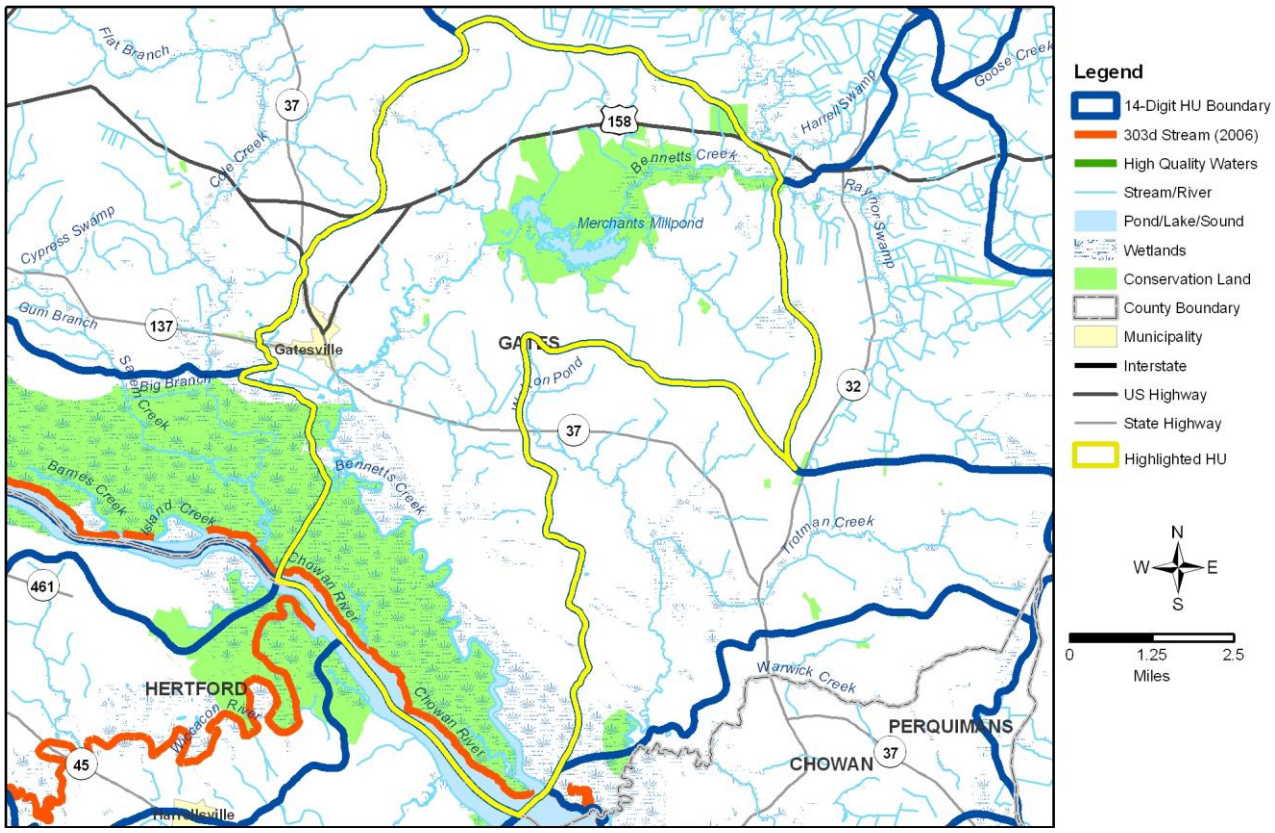


## Discussion of Targeted Local Watersheds in the Chowan River Basin

The following section provides maps of the current Targeted Local Watershed selections and a discussion of the assets and problems that have lead to the designation.

**Bennetts Creek** (03010203040040)

The Bennetts Creek watershed lies in Gates County and encompasses Merchants Millpond State Park. The creek flows out of the millpond, downstream past the Town of Gatesville and into Chowan River. Thirty percent (16 sq. mi.) of the watershed's land area is designated a Significant Natural Heritage Area and 24 element occurrences have been documented for the HU. The watershed includes 44% unfragmented forest area despite having approximately 18% of its streams unbuffered. Nearly two square miles of open water along the Chowan River are closed to shellfish harvest.



**Chowan River** (03010203100020)

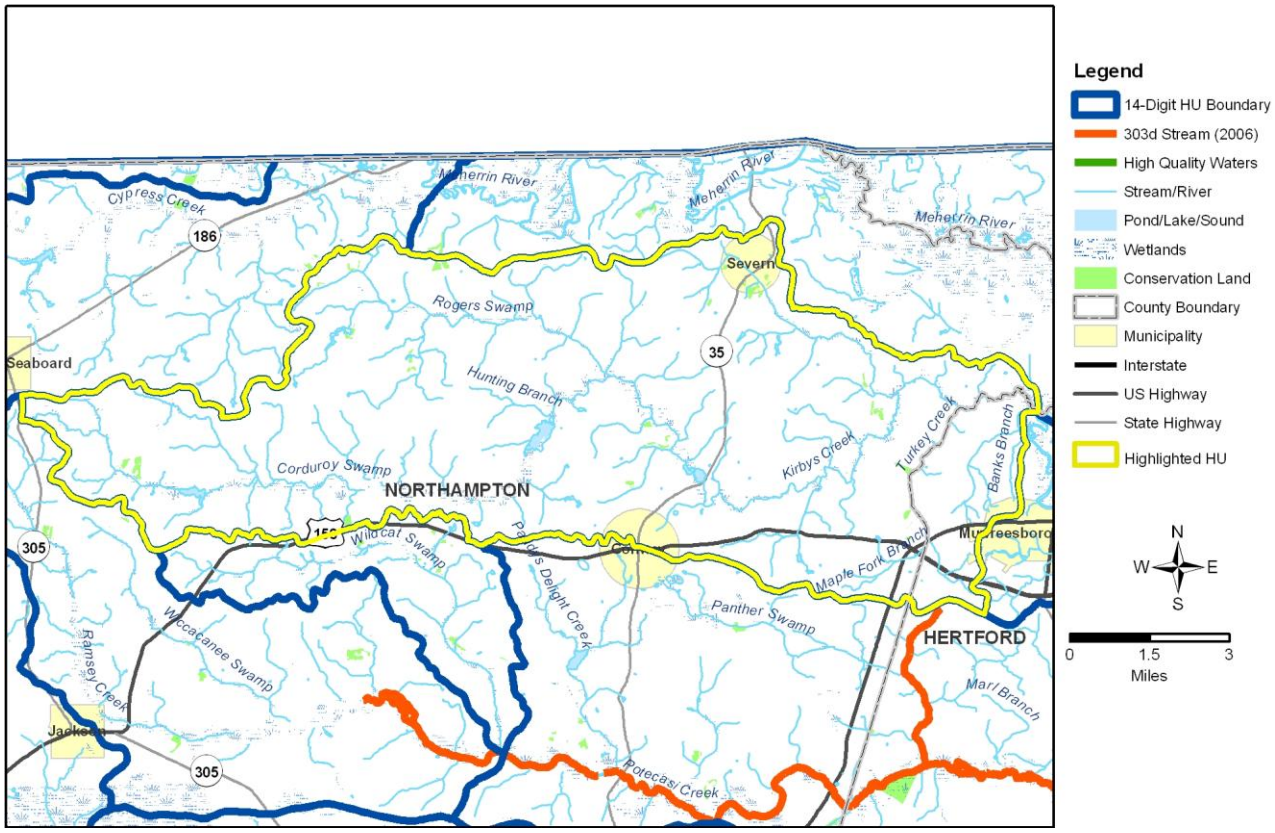
This hydrologic unit exists as 98% open water, with significant submerged aquatic vegetation beds and designated shellfish areas. Over 14 square miles of these shellfish areas have been closed to harvest. An additional 14 square miles are designated Significant Natural Heritage Areas. This part of the Chowan River offers ample opportunities to restore aquatic resources that are also designated priorities of the Coastal Habitat Protection Plan (DMF, 2005).

**Beaverpond Creek** (03010204140020)

The Beaverpond Creek watershed straddles the Virginia border. The creek enters and exits North Carolina twice before flowing into the Chowan River in Virginia. Twelve percent of the streams in the watershed are unbuffered. The watershed also has a high number of animal operations per land area. Ten of the 14 permitted livestock operations are swine farms. Forty-three percent of the watershed's land area is occupied by other agricultural land uses.

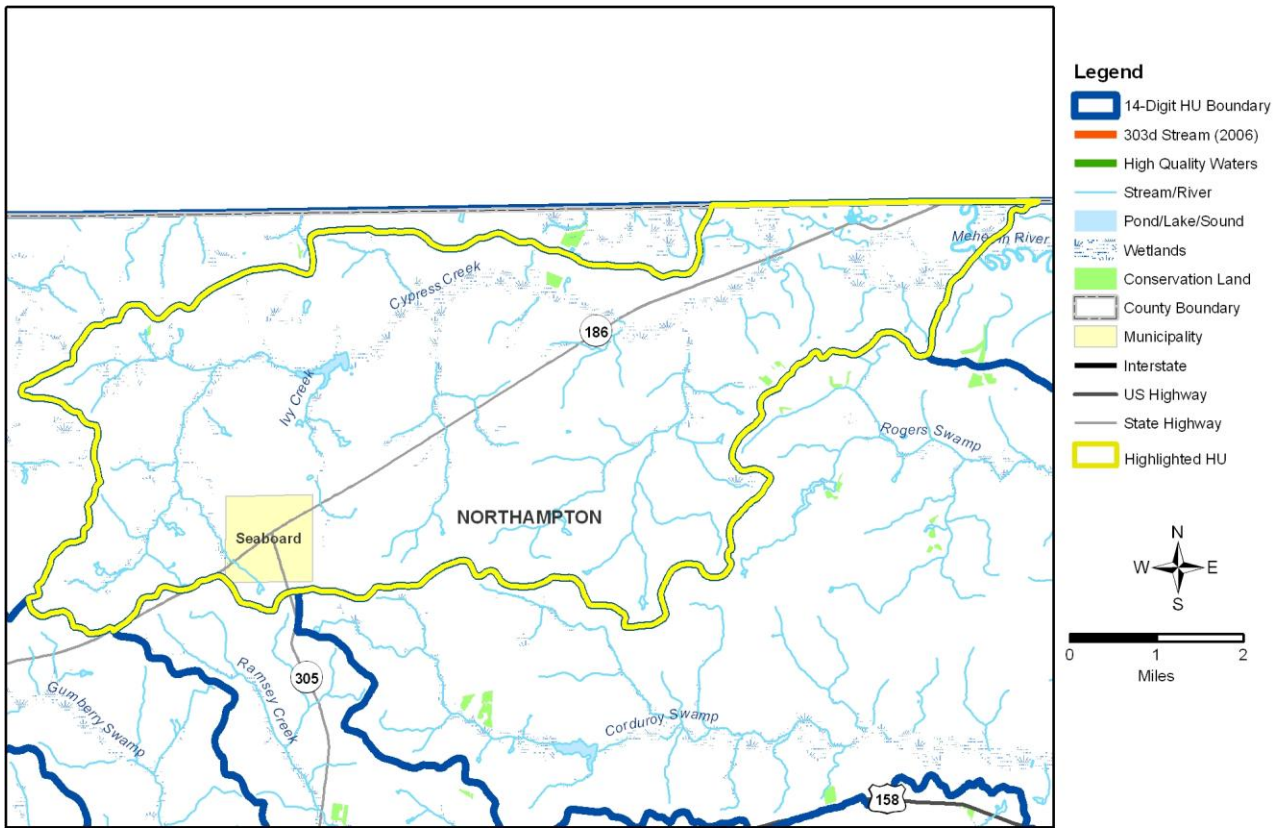
**Kirbys Creek** (03010204180020)

Corduroy and Rogers swamps flow together in the middle of Northampton County to form Kirbys Creek. A small portion of the hydrologic unit lies within western Hertford County. Forty-nine percent of the watershed exists as wetland or forest land, with about 18% of the forest habitat unfragmented. Twelve percent of streams are unbuffered. Approximately 47% of the land use is agricultural and 11 agricultural BMPs have been constructed in the watershed. The watershed also supports 13 permitted animal operations including five each of cattle and swine farms.



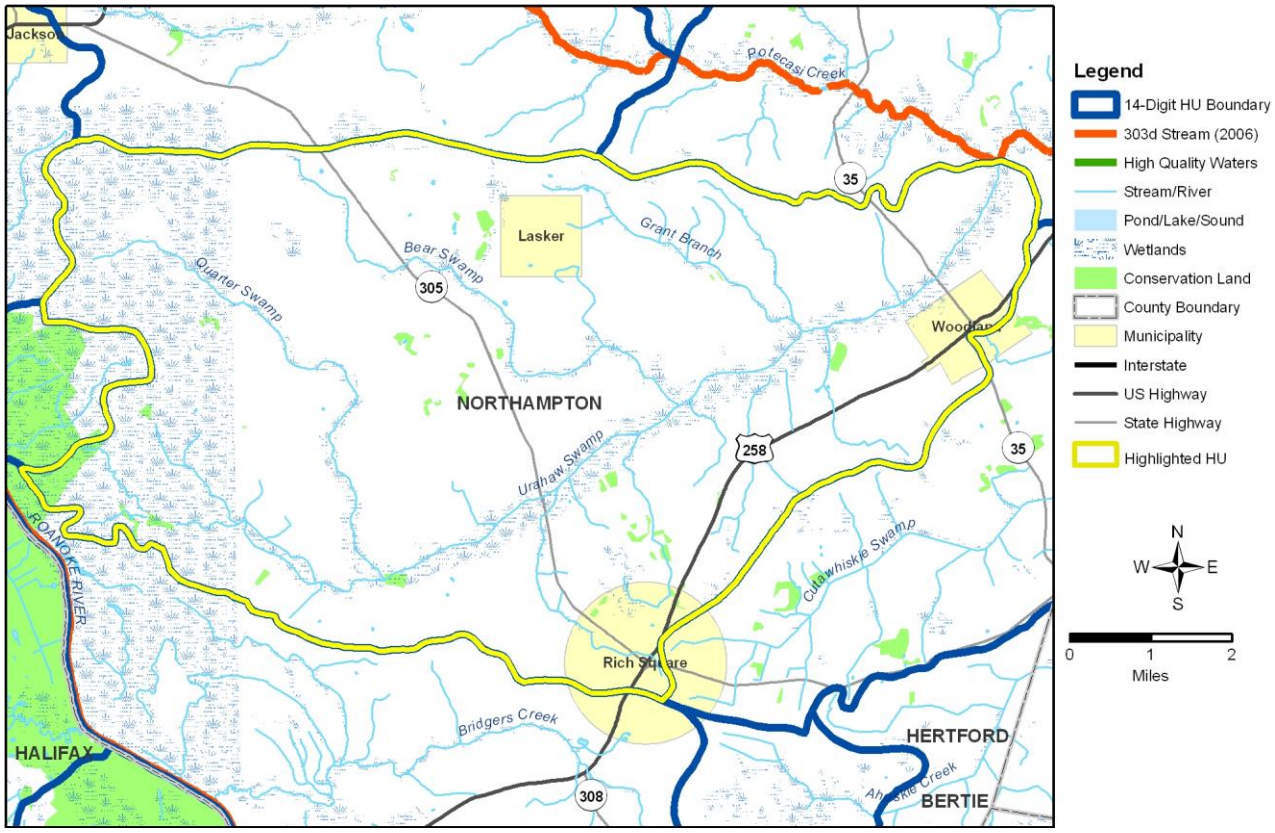
**Cypress Creek** (03010204180040)

Cypress Creek flows from its headwaters near the Town of Seaboard, NC into southern Virginia before flowing into the Chowan. Twenty-six percent of the forested area in the watershed is unfragmented despite having a total of 42 percent of disturbed land area. About 16% of streams are unbuffered. There are ten permitted animal operations, including seven swine farms.



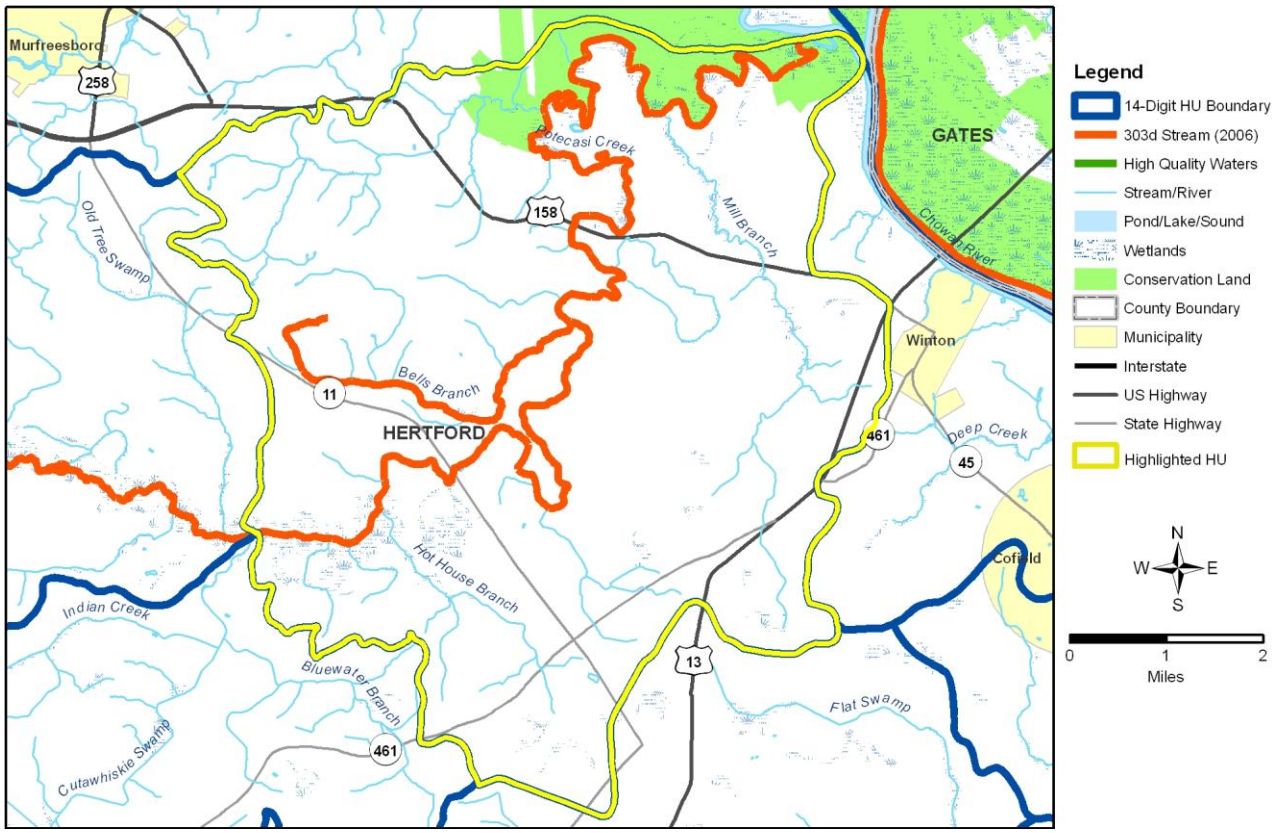
**Urahaw Swamp** (03010204190010)

Three small municipalities lie predominantly within the watershed including the towns of Lasker, Woodland and Rich Square. Quarter Swamp, Bear Swamp and Grant Branch flow into Urahaw Swamp as it flows through the watershed from the west to the east. About one-third of the forested area is unfragmented. Thirty-six percent of the watershed is disturbed land (primarily agriculture usage) and about 19% of streams are unbuffered. Eight agricultural BMPs have been constructed in the watershed. Nineteen animal operations can be found here, including 11 swine and six poultry farms.



**Potecasi Creek** (03010204210040)

This watershed contains the downstream reach of Potecasi Creek in Hertford County. The watershed terminates as the creek's confluence with the Chowan. The entire mainstem of the creek as well as the Bells Branch tributary are designated 303(d) listed streams due to impaired benthic macroinvertebrate community. Approximately 14% of streams in the watershed are unbuffered. Seven of the eight permitted animal operations in the watershed are poultry farms. Preservation opportunities exist throughout the watershed. Five percent of the land area near the confluence is designated conservation land. About 27% of the forested area in the watershed is unfragmented.




## 2002 Targeted Local Watersheds Not Targeted in 2009

**Lower Ahoskie Creek (03010203050030), Cutawhiskie Swamp (03010204200010)**
According to the current analysis, these watersheds have intermediate to low stressor effects compared to the newly designated TLWs above. The assets they offer are similar to most of the selected targets. A small portion of the Lower Ahoskie Creek watershed, the Wiccacon River segment, remains on the 303(d) list.

## References

Bertie County CAMA Land Use Plan. 2007. Bertie County Planning Department.

Chowan River Basinwide Water Quality Plan. 2007. North Carolina Division of Water Quality, Basinwide Planning Unit.

Edenton-Chowan County CAMA Core Land Use Plan. 2007. CAMA Land Use Plan Committee.

Gates County CAMA Core Land Use Plan. Update. 2003-2004. Gates County Planning Department.

An Inventory of the Significant Natural Areas of Hertford County, North Carolina. 1990. North Carolina Natural Heritage Program.

North Carolina Coastal Habitat Protection Plan. 2005. Division of Marine Fisheries.

Watershed Needs Assessment Team. 2003. Report from the Watershed Needs Assessment Team to the Mitigation Coordination Group. Online at http://www.nceep.net/news/reports/WNAT%20Mit%20Group%20Final.pdf

Watershed Restoration Plan for the Chowan River Basin. 2002. Watershed Restoration Program. http://www.nceep.net/services/restplans/chowan_2002.pdf

## For More Information

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## Local Resources Professionals

Input was requested from representatives from the following agencies:

- Soil and Water Conservation Districts, Bertie, Chowan, Gates, Hertford and Northampton counties
- USDA Natural Resource Conservation Service, Bertie, Chowan, Gates, Hertford and Northampton counties
- NC Cooperative Extension Service, Bertie, Chowan, Gates, Hertford and Northampton counties
- Division of Soil and Water Conservation
- NCDA Regional Agronomists
- Division of Forest Resources
- Division of Land Resources
- Erosion and Sediment Control, Washington Regional Office
- Division of Water Quality, Washington Regional Office
- DWQ Water Quality Section
- Wildlife Resources Commission
- DWQ Groundwater Section
- US Army Corps of Engineers
- Division of Waste Management
- Division of Environmental Health
- Conservation Reserve Enhancement Program
- NC Division of Marine Fisheries
- Albemarle-Pamlico National Estuarine Program
- Division of Shellfish Sanitation

# Definitions

**303(d) List** – This refers to Section 303(d) of the federal Clean Water Act, under which the U.S. EPA requires states to submit biennially a list of all impaired water bodies. Impaired water bodies are streams and lakes not meeting state water quality standards linked to their designated uses (e.g., water supply, recreation/fishing, propagation of aquatic life). Best professional judgment (in interpreting water quality monitoring data and observations) along with numeric and narrative standards/criteria are considered when evaluating the ability of a water body to serve its uses.

**8-digit Catalog Unit (CU)** – The USGS developed a hydrologic coding system to delineate the country into uniquely identified watersheds that can be commonly referenced and mapped. North Carolina has 54 of these watersheds uniquely defined by an 8-digit number. EEP typically addresses watershed – based planning and restoration in the context of the 17 river basins (each has a unique 6-digit number), 54 catalog units and 1,601 14-digit hydrologic units.

**14–digit Hydrologic Unit (HU)** – In order to address watershed management issues at a smaller scale, the U.S. Natural Resources Conservation Service (NRCS) developed methodology to delineate and uniquely identify watersheds at a scale smaller than the 8-digit catalog unit. A hydrologic unit is a drainage area delineated to nest in a multilevel, hierarchical drainage system. Its boundaries are defined by hydrographic and topographic criteria that delineate an area of land upstream from a specific point on a river, stream or similar surface waters. North Carolina has 1,601 14-digit hydrologic units.

**Animal Operations –** Inventory of animal farms (bovine; swine; poultry) provided by NC Department of Agriculture (NCDA) in December 2007.

**Aquatic Habitat** – the wetlands, streams, lakes, ponds, estuaries, and streamside (riparian) environments where aquatic organisms (e.g., fish, benthic macroinvertebrates) live and reproduce; includes the water, soils, vegetation, and other physical substrate (rocks, sediment) upon and within which the organisms occur.

**Benthic Macroinvertebrates** – organisms living in or on the bottom substrate of aquatic habitats; include insect larvae, worms, snails, crayfish and mussels; can be used as indicators of stream water quality and stream habitat condition.

**BMPs (best management practices)** – any land or stormwater management practice or structure used to mitigate flooding, reduce erosion & sedimentation, or otherwise control water pollution from runoff; includes urban stormwater management BMPs and agriculture/forestry BMPs.

**EEP** – The North Carolina Ecosystem Enhancement combines existing wetlands restoration initiatives (formerly the Wetlands Restoration Program or NCWRP) of the N.C. Department of Environment and Natural Resources with ongoing efforts by the N.C. Department of Transportation (NCDOT) to offset unavoidable environmental impacts from transportation-infrastructure improvements.

**GIS -** A geographic information system integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

**NC DWQ** – North Carolina Division of Water Quality.

**NC WRP** – The North Carolina Wetlands Restoration Program was a wetland restoration program under NC DENR and a predecessor of the NCEEP.

**Natural Heritage Element Occurrences (NHEOs) –** NC Natural Heritage Program (NHP) documented locations of rare and endangered species (plant and animal) populations and occurrences of unique or exemplary natural ecosystems and special wildlife habitats (terrestrial and palustrine community types).

**Preservation** – the long-term protection of an area with high habitat and/or water quality protection value (e.g., wetland, riparian buffer), generally effected through the purchase or donation of a conservation easement by/to a government agency or non-profit group (e.g., land trust); such areas are generally left in their natural state, with minimal human disturbance or land-management activities.

**RBRP** - The River Basin Restoration Priorities are documents that delineate specific watersheds (Targeted Local Watersheds) within a River Basin that exhibit both the need and opportunity for wetland, stream and riparian buffer restoration.

**Resource Professionals** – staff of state, federal, regional or local (city, county) natural resource agencies –including planners, water resources and storm water engineers, parks & recreation departments, water quality programs, regional councils of government, local/regional land trusts or other non-profit groups with knowledge/expertise and/or interest in local watershed issues and initiatives

**Restoration –** the re-establishment of wetlands or stream hydrology and wetlands vegetation into an area where wetland conditions (or stable streambank and stream channel conditions) have been lost; examples include: stream restoration using natural channel design methods coupled with re-vegetation of the riparian buffer; riparian wetlands restoration through the plugging of ditches, re-connection of adjacent stream channel to the floodplain, and planting of native wetland species; this type of compensatory mitigation project receives the greatest mitigation credit under the 401/404 regulatory framework.

**Riparian –**relating to the strip of land adjacent to streams and rivers, including streambanks and adjoining floodplain area; important streamside zones of natural vegetation that, when disturbed or removed, can have serious negative consequences for water quality and habitat in streams and rivers.

**Significant Natural Heritage Areas (SNHA) –** NC Natural Heritage Program identified areas containing ecologically significant natural communities or rare species. May be on private or public lands, and may or may not be in conserved status.

**TLW** - Targeted Local Watershed, are 14-digit hydrologic units which receive priority for EEP planning and restoration project funds.

**Use Support** –refers to the DWQ system for classifying surface waters based on their designated best use(s); at present, the DWQ primary stream classifications include the following: class C [fishing/boating & aquatic life propagation]; class B [primary recreation/direct contact]; SA [shellfish harvesting]; and WSW [water supply]. Supplemental classifications include High Quality Waters (HQW), Outstanding Resource Waters (ORW), Nutrient Sensitive Waters (NSW), Trout Waters (Tr), and Swamp Waters (Sw). All waters must at least meet the standards for class C waters.

**USGS** – United States Geological Survey.

**Watershed –**all the land area which contributes runoff to a particular point along a stream or river; also known as a "drainage basin", although the term *Basin* usually implies a very large drainage system, as of an entire river and its tributary streams.

**Watershed Restoration Plan** – Older versions of RBRP documents were called Watershed Restoration Plans. In essence, they are the same thing.