

# Guide to the North Carolina Wetlands Restoration Program's Watershed Restoration Strategy



Version 1 / April 2001



## **EXECUTIVE SUMMARY**

This document is intended to complement the North Carolina Wetland Restoration Program (NCWRP) Watershed Restoration Plans that are developed for each of the state's 17 major river basins. It provides information on the NCWRP watershed restoration approach, the role the program plays in watershed restoration, and how NCWRP staff develop the restoration plans for the specific basins.

The NCWRP gathers a variety of data and information on watersheds within major river basins. The Division of Water Quality Basinwide Water Quality Plans are a critical source of this information. Based primarily on water quality, habitat, land cover and public comment, staff identify Priority Subbasins and Targeted Local Watersheds that are believed to be the best areas for the program to implement stream, wetland and buffer restoration projects. The goal is to locate multiple projects in areas that have the greatest need and opportunity for restoration. The NCWRP encourages other government entities and funding organizations to consider implementing water quality and habitat improvement projects in these areas as well. Multiple complementary projects focused in small watersheds will provide the greatest ecological benefit to North Carolina's streams, rivers, lakes, estuaries and wetlands.

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## **SECTION I - Introduction**

### **Background and Purpose of the North Carolina Wetlands Restoration Program**

Recognizing the value of wetlands and riparian areas for protecting water quality, storing floodwaters, providing fish and wildlife habitat, and performing other valuable functions, the North Carolina General Assembly established the North Carolina Wetlands Restoration Program in 1996 (N.C.G.S . 143-214.8). The purpose of the NCWRP is to restore, enhance, preserve and create wetlands, streams and streamside (riparian) areas throughout North Carolina's 17 major river basins. The goals of the program are:

1. To protect and improve water quality through the restoration of wetland, stream and riparian buffer functions and values lost through historic, current and future impacts.
2. To achieve a net increase in wetland acreage, functions, and values in all of North Carolina's major river basins.
3. To promote a comprehensive approach to the protection of natural resources.
4. To provide a consistent approach to address compensatory mitigation requirements associated with wetland, stream and riparian buffer regulations, and to increase the ecological effectiveness of compensatory mitigation projects.

In order to achieve these goals, the NCWRP has two major functions: planning and implementation. The planning function distinguishes North Carolina from other parts of the nation by ensuring that resources are spent in areas of the state that have the most need of restoration. The cornerstone of the planning function is production of Watershed Restoration Plans for each river basin. (These plans were formally known as Basinwide Wetlands and Riparian Restoration Plans).

### **Purpose of this Document**

The purpose of this document is to provide background information concerning the development of the revised Watershed Restoration Plans for the Tar-Pamlico, Catawba, New, Cape Fear and French Broad river basins. (A subsequent version of this document that reflects refinements in the planning process will be produced for subsequent river basin restoration plans.) In serving as a planning guide, this document has two primary components. First, it provides a description of the NCWRP's watershed planning approach to give the reader a context for the restoration plans, as well as to share the NCWRP's vision for watershed restoration in North Carolina. Second, this document provides information specific to the development of the Watershed Restoration Plans for each individual river basin. Because this information is applicable to several documents, it is more efficient for it to be presented here as opposed to duplicating it for each basin.

For further information on the NCWRP, please visit the NCWRP web site at <http://h2o.enr.state.nc.us/wrp/index.htm> or call (919) 733-5208.

## **SECTION II - The North Carolina Wetland Restoration Program's Watershed Planning Approach**

### **Introduction**

Watershed restoration planning is North Carolina's non-regulatory approach to identifying watersheds where wetland and stream restoration projects can help to address nonpoint source water quality problems. The NCWRP's watershed planning efforts have two primary areas of focus: the Watershed Restoration Plans and Local Watershed Planning. Each is described here briefly, but the Restoration Plans and their development are described in detail in the next section of this document.

### Watershed Restoration Plans

The NCWRP uses a watershed-based planning approach similar to that of the Division of Water Quality's Water Quality Section. This section is responsible for the development of the Basinwide Water Quality Plans. While the Water Quality Section uses watershed planning to coordinate wastewater discharge permitting and nonpoint source regulatory programs over the entire river basin, the NCWRP uses watershed based planning to target watersheds in each river basin that exhibit the greatest need and opportunity for stream, wetland and riparian buffer restoration. The program's Watershed Restoration Plans are intended to complement the Water Quality Section's Basinwide Water Quality Plans.

The NCWRP uses information presented in the Basinwide Water Quality Plans, such as use support ratings and monitoring data, to target degraded wetland and riparian areas which, if restored, could contribute to the goal of protecting and enhancing watershed functions. The NCWRP also targets a number of watersheds that are not currently rated as impaired but are in need of restoration due to habitat degradation, development or other factors.

### Local Watershed Planning

Local watershed planning is a comprehensive effort that the NCWRP recently initiated. Its goal is to focus significant investigation and restoration on particular local watersheds (14-digit hydrologic units) across North Carolina.

Local Watershed Plans identify factors contributing to water quality degradation within a watershed and provide strategies to address nonpoint sources of pollution. One component of a plan is the identification of sites for wetland, stream and streamside buffer restoration. However, this is just one piece of the water quality puzzle. In most watersheds, wetland, stream and streamside buffer restoration alone will not be sufficient to improve water quality. Other nonpoint sources of pollution, such as stormwater runoff and failing septic systems, must be located and addressed through other types of water quality improvement projects. Accordingly, the solutions identified in these plans include not only wetland, stream and streamside buffer restoration projects, but a comprehensive package of initiatives needed to successfully improve and protect water quality in the long term.

Local Watershed Plans include three key components:

- An inventory of the specific causes of water quality degradation identified through a detailed watershed assessment
- A plan which links water quality problems with specific restoration strategies that are supported by a local stakeholder group and/or community
- A strategy for implementing restoration projects and other water quality initiatives identified in the plan.

### **Watershed Restoration in General Terms**

Each river basin (ranging from 96,640 - 5,855,360 acres in size) is made up of multiple subbasins (46,401 – 784,000 acres) which are composed of smaller watersheds called local watersheds (5,000 – 50,000 acres). River basins, subbasins and local watersheds are each watersheds, or drainage areas, of varying sizes and they are hydrologically connected. Degraded water quality in a local watershed containing the headwater reaches of a river basin has an impact on the water quality within the entire river basin.

Restoration projects that are sited to address problems identified within local watersheds should ultimately benefit the entire river basin. The challenge of watershed restoration is determining the sources and causes of water quality degradation and deciding what management options should be applied to solve the problem.

Another challenge with watershed restoration is that each watershed is unique—both naturally (weather patterns, soils, vegetation) and in the ways that watershed has been altered (developed, cleared, drained). Water quality problems can result from pollution discharges to a stream from an industrial discharge (point source) or can result from pollutants carried in runoff during storm events such as sediment from agricultural fields or construction sites (nonpoint source). Some water quality problems come from changes to the natural drainage of a watershed such as increased areas of pavement which can significantly increase the streamflow in a river causing stream bank erosion. There is no prescribed way to restore a watershed, but there are many proven management options that can be used to address the unique characteristics and water quality problems in each watershed.

The NCWRP recognizes that wetland and riparian restoration alone may not meet all of the water quality, flood retention, fisheries and wildlife habitat needs in a river basin. However, through the planning process, the NCWRP hopes to identify opportunities to collaborate with resource agencies, local groups and the private sector to tie wetland and stream restoration projects with other efforts such as agricultural best management practices, storm water management control, and riparian buffer preservation. Combined efforts with local governments, other resource management agencies and programs, and the support of the local citizens is key to the success of the overall effort.

### **Goals of Watershed Restoration Planning**

Through its planning efforts, the NCWRP works to achieve multiple goals related to watershed management. Negative impacts to water quality and aquatic habitat in North

Carolina's rivers, streams, lakes, estuaries and wetlands have occurred over time from the cumulative effects of multiple pollution sources. The reversal of those impacts will rely on the implementation of a variety of solutions or projects coordinated among many groups and governments. Toward this effort, the NCWRP works toward the following specific goals:

- Identifying watersheds with nonpoint source water quality problems and ways to address those problems through wetland, stream and riparian buffer restoration and protection.
- Presenting an overview of current and ongoing restoration and conservation activities in the basin to promote a more comprehensive approach to restoration.
- Increasing the ecological effectiveness of restoration efforts by informing various agencies, mitigation banks and other individuals involved in compensatory mitigation where restoration projects will yield the greatest environmental benefits.
- Communicating NCWRP priorities to other funding programs such as the Clean Water Management Trust Fund and the U.S. Environmental Protection Agency and grant applicants.
- Promoting cooperative efforts with other groups interested in improving water quality, wildlife habitat, fisheries, flood storage and other wetland functions.
- Supporting the effective use of NCWRP resources by establishing a systematic way to assign resources to those projects that will yield the greatest environmental benefit.
- Supplying information to the public and other agencies and organizations for natural resource management, restoration and preservation planning.
- Assisting landowners in assessing the ecological value of their land for the purposes of wetlands and stream restoration and protection.

### **NCWRP's Role in Watershed Restoration**

The NCWRP has a distinct role to play in watershed restoration. It has monetary and technical resources to implement stream, wetland and riparian buffer restoration projects across the state. Funding comes from the General Assembly and voluntary payments made to the NCWRP by individuals or groups required to compensate for impacts they have caused to wetlands, streams or buffers. Following are examples of the types of activities that the NCWRP can do:

- Re-establish wetland or stream hydrology and vegetation in areas where they previously existed.
- Increase one or more of the functions of an existing wetland or stream by enhancing vegetation and/or hydrology.

- Construct a wetland in an area where wetlands did not exist previously.
- Protect wetlands, streams and riparian buffers through purchase, donation or conveyance of a conservation easement to an appropriate government or nonprofit agency for management.

By restoring the functions and values of wetlands and streams, the NCWRP can contribute to water quality improvement across the state. Streams and wetlands perform a number of important environmental functions, including:

- Wetlands and vegetated riparian areas act as filters that protect water quality in streams, lakes and estuaries by trapping sediments and removing pollutants from stormwater runoff.
- Wetlands store large quantities of water and reduce flood damage during periods of heavy rainfall.
- Wetland and riparian area plants stabilize shorelines and streambanks by holding soil in place, which reduces erosion and the amount of sediment, carried downstream.
- Wetlands and riparian areas provide important wildlife habitat, including habitat for a number of rare, threatened and endangered plant and animal species.
- Wetlands and riparian areas provide both spawning grounds and nursery areas for many commercially and recreationally valuable fish species.
- The diverse functions of wetland and riparian areas provide a variety of societal values including numerous recreational, research and educational opportunities.

There are many degraded streams and altered wetlands across the state that could benefit from restoration. Restoration projects can vary from simple bio-engineering projects that establish vegetation along cleared streambanks to complex projects involving construction of new stream channels to recreate historic meander patterns and riffle-pool sequences.

### **Examples of Stream and Wetlands Restoration Projects**

Most NCWRP projects are protected by permanent conservation easement or outright donation or purchase of property in fee simple and must improve or work to solve some water quality problem. In addition, to be cost effective, typically the most suitable sites for stream projects are greater than 1,000 linear feet in length and greater than three acres in size for wetland projects. However, the NCWRP does implement projects that are smaller in size. For stream projects, the conservation easement or property acquisition must be on both sides of the stream. The NCWRP prefers to implement projects on public property or property with a limited number of landowners. Since the NCWRP must protect the property in perpetuity, fewer property owners reduces the time required to acquire the property through fee simple purchase or conservation easement. The following are some examples of potential project areas where the NCWRP could be of assistance.

## Potential Stream, Wetland and Riparian Buffer Restoration Sites

### *Urban Setting*



This site is located in an urbanized watershed. Increased stormwater flows have severely scoured the banks of this stream. The lack of streambank vegetation combined with the straightening of the channel is causing the stream to seek its natural meander pattern which is causing overwidening in certain sections of the stream. A stream restoration project in this case would construct the natural meanders of the stream channel and plant vegetation on the streambanks to promote the natural stability of the stream ecosystem.

### *Rural Setting*



This stream typifies many streams in agricultural areas -- it has been straightened to maximize the land area for farming activities. Woody vegetation has been cleared from the stream banks. Because there is no forested riparian buffer, the aquatic and wildlife value of this system is severely degraded and there is little filtering of nutrients and sediment before these pollutants reach the stream.

*Potential Wetland Restoration Site – Rural Setting*



Wetlands have been effectively drained throughout North Carolina for a variety of reasons including agriculture, forestry and urban development. These are important areas where water quality protection and habitat can be restored through a number of techniques including re-establishing streams in their historical floodplains, plugging ditches and removing fill material.

## SECTION III – Watershed Restoration Plans

### Components of the Plans

The NCWRP produces Watershed Restoration Plans for each river basin in North Carolina. Specific information about each river basin is presented in the Watershed Restoration Plan for that basin. Each restoration plan will provide:

- A narrative overview of the river basin including general information on existing water quality problems.
- Restoration goals that describe how stream, wetland and riparian buffer restoration efforts could address the specific water quality problems in each basin.
- Maps showing the location of watersheds with greatest need and potential for wetland and stream restoration.
- Maps of individual watersheds that have been targeted for restoration efforts.
- Water quality maps showing use support ratings at the subbasin level.
- Data on permitted wetlands and stream impacts in the river basin.
- A description of priority watersheds and a discussion of the restoration need and opportunity in these watersheds.

### The Planning Process

Restoration plans are updated on a five-year schedule. This schedule is synchronized with the Water Quality Section's basinwide planning schedule. Appendix I provides a detailed schedule for North Carolina's 17 major river basins. Those interested in participating in the Watershed Restoration Planning Process should contact the NCWRP to receive meeting notices and other information about opportunities for public comment.

The Watershed Restoration Planning process is comprised of six major phases.

***Phase 1:*** The NCWRP begins collecting and compiling available water quality and resource information for the update of the Watershed Restoration Plan. The first attempt to recruit public input on water quality degradation issues and potential watersheds with restoration opportunities occurs at the Division of Water Quality's Basinwide Planning workshops (see Appendix I). At these workshops, staff give an overview of the program and its planning process. This usually occurs one year before the completion date of the restoration plan.

***Phase 2:*** The NCWRP gathers information about water quality – relying heavily on the Division of Water Quality's most recent Basinwide Assessment Report, Draft Basinwide Water Quality Plan, and 303(d) List of impaired water bodies. Information is also gathered about land use changes, Natural Heritage Program

priorities, habitat degradation and permitted wetland, stream and buffer impact data. This information is used to make draft local watershed selections that are shared in Phase 3.

**Phase 3:** The NCWRP initiates contact with local resource professionals to gather specific information about water quality degradation and restoration opportunities at the local watershed level. To gather this information, the NCWRP hosts one to three Resource Professional Meetings within each river basin and invites resource managers, local government representatives and other interested stakeholders to participate in a discussion designed to gather site specific information about restoration opportunities and needs as well as existing and ongoing project activities.

**Phase 4:** Staff may conduct site visits within local watersheds to validate the information gathered at meetings conducted in Phase 3 and to explore potential restoration opportunities identified through review of digital land cover information.

**Phase 5:** The program evaluates each local watershed in the river basin and ranks them by restoration need and opportunity using the data gathered in Phases 2-4. (The NCWRP prioritization process for ranking watersheds is discussed in the next part of this section.) Based on the rankings, the NCWRP selects those local watersheds with the greatest potential and need for restoration.

**Phase 6:** Public comment is solicited on those local watersheds selected as priority areas for restoration efforts.

**Phase 7:** The text and maps for the Watershed Restoration Plans are completed and the notice of the plan's availability is provided to interested parties. Plans are made available via the NCWRP web site and in hard copy form to those who request it.

### **Uses of the Restoration Plans**

The Watershed Restoration Plans complement the Basinwide Water Quality Plans by providing a framework for coordinating multiple public agency and private sector efforts to address nonpoint source pollution water quality problems and resource management issues that are identified in the plans. There are many ways that organizations can use the NCWRP's Watershed Restoration Plans. The following list includes a few examples.

**Local Governments:** Local governments can use the Watershed Restoration Plans to identify potential areas for water quality improvement and open space protection, to evaluate suitable sites for compensatory mitigation credits in advance of future development impacts, or as an offset to meet reduction targets under a nutrient management strategy. Local governments can also use the resource information presented in the plans to assist with land use planning and development decisions. Local governments can also play an important role in the long-term management of restoration sites acquired by the NCWRP.

**Land Conservancies:** Land conservancies can use the plans to identify watersheds where restoration combined with preservation will maximize water resource management and conservation benefits. They can then use this information to collaborate with the NCWRP on projects that can meet the goals and objectives of both entities. Land conservancies can also play an important role in the long-term management of restoration sites acquired by the NCWRP.

**Funding Programs:** There are many funding programs operating in North Carolina that provide resources to implement water quality improvement projects. Examples of these include: the Clean Water Management Trust Fund, the Environmental Protection Agency's grants administered by the Division of Water Quality's Nonpoint Source Planning Group, the N.C. Agricultural Cost Share Program and Conservation Reserve Enhancement Program coordinated through the Division of Soil and Water, the Natural Resource Conservation Service Wetland Reserve Program, as well as many other state, federal, local and nonprofit programs. Ideally, these programs will collaborate to maximize the resources available to fund watershed restoration projects. For example, combining agricultural best management practices with wetlands restoration can target both the source of the water quality impairment in a watershed as well as the sites where the impairment manifests itself.

The Watershed Restoration Plans describe and illustrate locations of priority watersheds in which the NCWRP will strive to implement restoration projects. Other resource agencies can use the plans to guide resource allocation and project selection to those areas NCWRP has identified as high quality restoration areas. To advance this cooperative spirit, the NCWRP will solicit comments and recommendations from these entities to ensure that the Watershed Restoration Plans support and promote the multiple objectives of these various funding programs.

**Mitigation Banks:** The NCWRP, working as a representative of the Division of Water Quality, in conjunction with the U.S. Army Corps of Engineers and other agencies, oversees the approval process for private wetland mitigation banks. This process ensures that mitigation banking projects account for wetland functions lost through the permitting process. Private mitigation banks offer a permit holder a voluntary venue to purchase "credits" in order to meet compensatory mitigation requirements. Bank sponsors can use the Watershed Restoration Plans to identify potential mitigation banking project sites. It is required by regulation that mitigation banks are located in Targeted Local Watersheds, or that it be documented how the bank is consistent with the Watershed Restoration Plan for the appropriate river basin.

## **Process of Identifying Priority Subbasins and Targeted Local Watersheds**

### **Achievement of Goals through Prioritization of Subbasins and Targeting of Local Watersheds**

To attain its goals, the Wetlands Restoration Program has developed a two-step prioritization process that focuses on two sizes of watersheds within each of the 17 major

river basins: the subbasin (Division of Water Quality management unit) and the local watershed (Natural Resources Conservation Service 14-digit hydrologic unit). Subbasins are component watersheds of the larger-scale river basins.

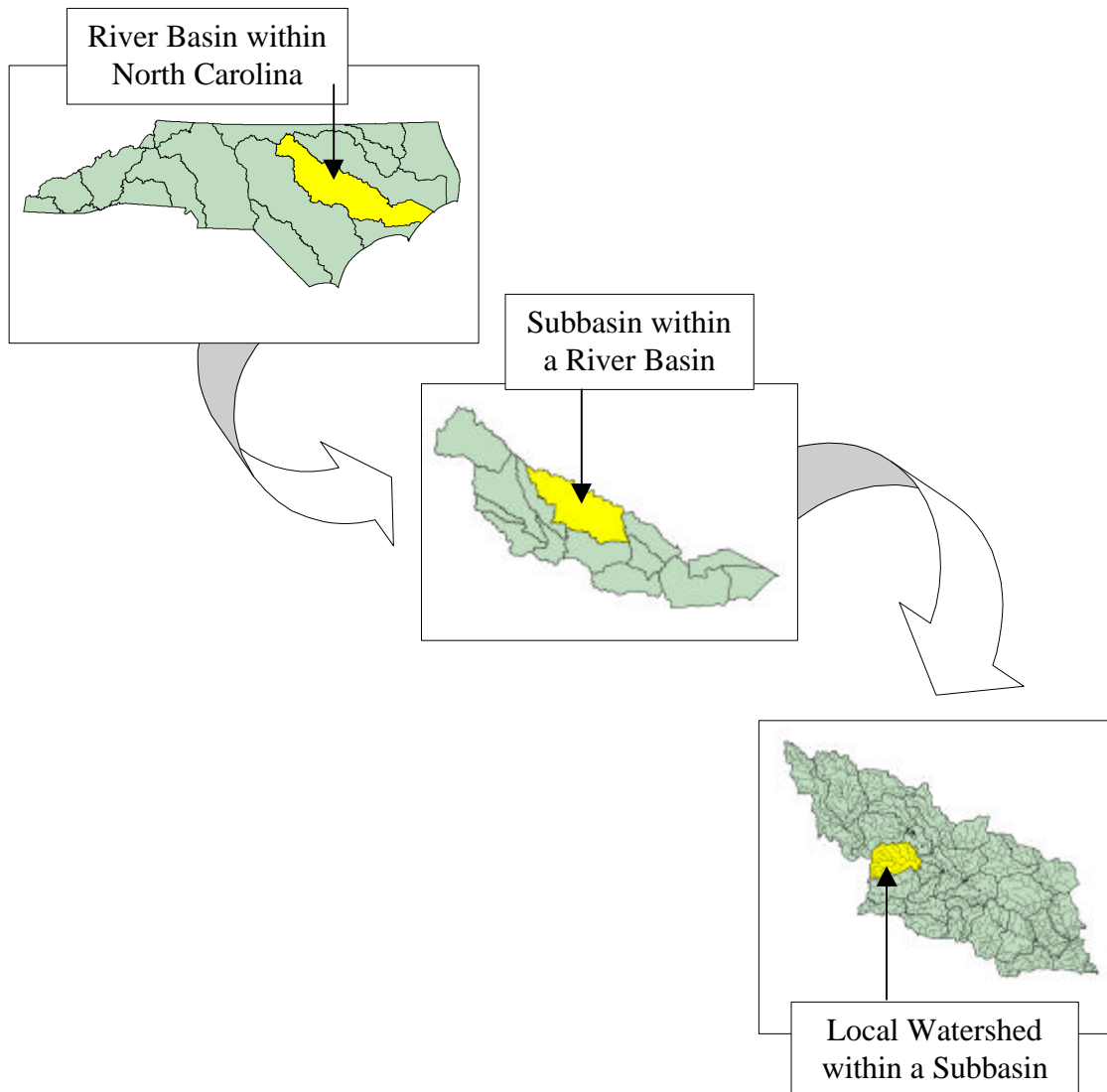


Figure 1: Diagram of the Relationship between River Basin, Subbasin and Local Watershed

The rationale for developing the prioritization methodology is based on two assumptions. First, it is assumed that although watersheds throughout the state could benefit from wetlands and riparian area restoration, restoration may be more effective, efficient and feasible in some watersheds than others. Second, some watersheds need restoration sooner than others in order to preserve their threatened natural resources or improve their degraded status before it becomes too late to make a difference. The prioritization process takes into account the time-critical needs of some watersheds over others. Prioritizing watersheds based on their individual characteristics and needs will help to

ensure that NCWRP resources are used in the most efficient manner to achieve program goals.

The method for identifying high priority watersheds is a process that begins with subbasin prioritization. As an initial screen for broad water quality needs, subbasin prioritization helps evaluate the potential for the watershed to contribute to the goals of its respective river basin through wetland and riparian area restoration. Next, the process becomes more geographically focused and resource-specific through targeting local watersheds within the subbasin units. At this level, the NCWRP can best and most efficiently focus its planning and project implementation efforts to achieve major program goals within smaller watersheds. Throughout the process staff seek input from resource professionals and citizens in the area. The following diagram (Figure 2) provides a more visual description of the detailed steps.

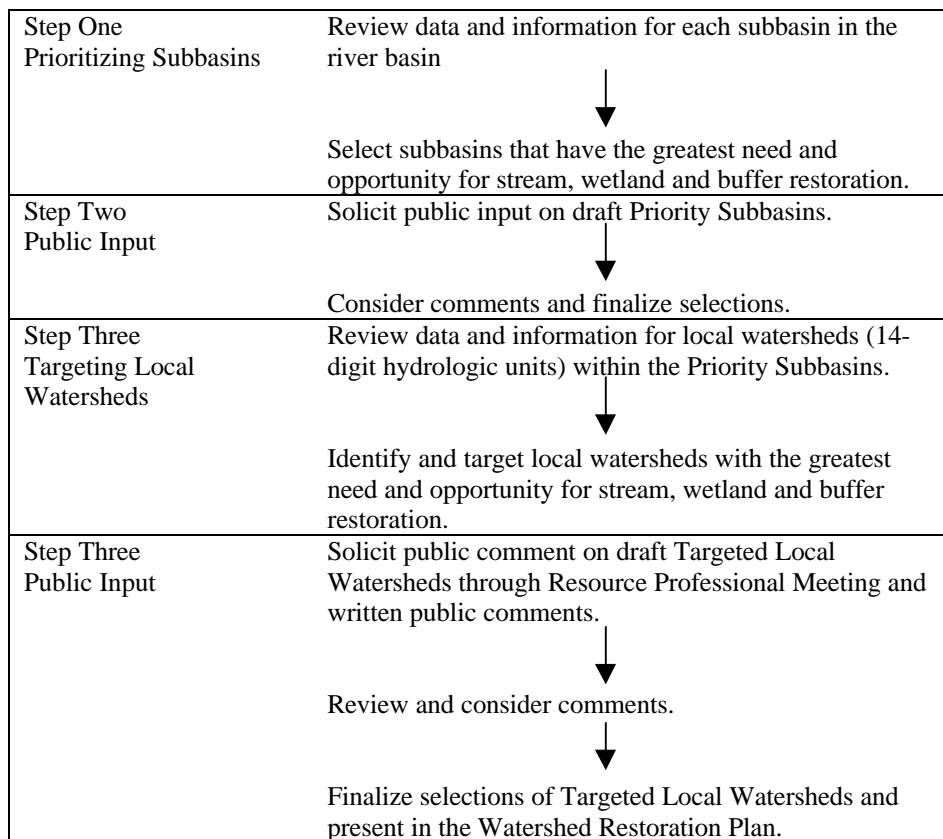


Figure 2: The NCWRP Process for Prioritizing Subbasins and Targeting Local Watersheds

Data Used in Identifying Priority Subbasins and Targeted Local Watersheds

The NCWRP considers a variety of data and information at the subbasin and local watershed level when making decisions about where to focus resources. Some data sources apply to both the subbasin and local watershed scales, and others are applicable to only one or the other. Table 1 provides a general list of the types of data and information considered.

Table 1 Types of Data and Information Used by the NCWRP to Prioritize Subbasins and Target Local Watersheds

<b>Data Used for Both</b>	<b>Subbasin Level Only</b>	<b>Local Watershed Level Only</b>
Presence of water quality impairment (Not Supporting, Partially Supporting or 303(d) list)	Priority Subbasin in last plan?	Targeted Local Watershed in last plan?
Existence of NCWRP, Clean Water Management Trust Fund, 319 or other projects	Permitted wetland, stream and buffer impacts	Information from Resource Professionals meeting(s)
Land cover	Hydrologic position in the watershed	Potential cooperative efforts
Existing and future NCWRP compensatory mitigation needs	Information from DWQ Basinwide Planning Workshops	
Sensitive resources		
Division of Coastal Management Geographic Information System data		
Public comment on draft selections		

The following bullets provide a more detailed description of some of the key data used in the decision-making process.

***Data and Information Used for Both Priority Subbasins and Targeted Local Watershed***

- *Whether or not the NCWRP has an existing or planned restoration project within the subbasin* -- The implementation of even one project within a subbasin is important to the NCWRP in building a watershed restoration approach to ensure maximum water quality benefits to the river basin.
- *The presence or absence of impaired water bodies (Not Supporting or Partially Supporting their state designated uses) or 303(d) listed water bodies* -- The NCWRP heavily considers the extent of water quality impairment that is related to nonpoint source pollution.
- *The amount of current and future compensatory mitigation needs* -- The NCWRP accepts payments into the Wetlands Trust Fund and implements projects based on these resources within Targeted Local Watersheds identified in the Watershed Restoration Plans. The NCWRP also considers the location of impacts for which it receives compensatory mitigation payments (15A NCAC 2R .0402) in prioritizing subbasins and targeting local watersheds.

***Data and Information Used at the Subbasin Level Only***

- *The presence and extent of permitted wetland, stream and riparian buffer impacts* -- The NCWRP considers 401 Water Quality Certification impact totals (for wetlands and streams) and totals for 1 acre of wetlands or less and 150 feet of stream or less (DWQ 401 Wetlands Group Database organized by subbasin). These permitted

impacts currently do not have compensatory mitigation requirements associated with them. These impacts may seem minor when considering them individually; however, over time as multiple impacts accumulate within watersheds, water quality impacts can become quite pronounced. Part of the NCWRP's enabling legislation charges the program to work toward addressing these historical and cumulative impacts which currently do not have compensatory mitigation requirements.

- *The hydrologic position of the subbasin within the river basin* -- This information is important to consider in that often times an upstream focus on water quality degradation can work to improve other downstream water bodies and watersheds within a river basin cost effectively.
- *Sensitive resource information* -- The NCWRP considers resource information identified in the original NCWRP Basinwide Wetlands and Riparian Restoration Plans and new information contained in the updated DWQ Water Quality Plans. The presence of the following designations help identify areas with sensitive and important resources: High Quality Waters, Outstanding Resource Waters, Trout Waters, Water Supply Watersheds, primary fish nursery areas, and Natural Heritage Program Priorities.
- *Information provided by participants in the DWQ Basinwide Planning Public Workshops* -- These Workshops are held at the beginning of each plan update cycle to recruit information concerning water quality degradation issues and potential solutions pertinent to a specific river basin. The NCWRP participates in these workshops and utilizes the information provided during breakout group sessions of the workshops to help select Priority Subbasins and Targeted Local Watersheds.

#### ***Data Used at the Local Watershed Level Only***

- *General land use information including percentages of developed, agricultural and forested land by local watershed* -- In some cases this information can be critical in considering the opportunity for restoration projects. Potential land acquisition costs and land use constraints can inhibit the ability of restoration to improve water quality in the most cost-effective manner. In some cases, up front local government cooperation and coordination can help resolve some of these potential concerns within local watersheds that are highly developed.

In the past, the NCWRP placed more significant weight on those local watersheds which had high percentages of agricultural lands. Today, the NCWRP does not rule out watersheds in highly urbanized or developed areas. In fact, since 1997 the NCWRP has implemented several restoration projects within these very developed areas with the cooperation and help of local governments and resource agencies and groups. Land use information in and of itself does not determine whether or not a local watershed is suitable for restoration activities – it's more of a complementary component of information used in making assumptions about potential causes of pollution, and possible project limitations which could occur with utilities, land costs, etc.

Within some river basins (and when available), additional information was also used in evaluating local watersheds including:

- *Division of Coastal Management data* – This includes information on altered wetlands and potential restoration sites within the 20 coastal counties and inner coastal plain area.

#### Targeted Local Watersheds Outside of Priority Subbasins

The NCWRP has targeted some local watersheds that lie outside Priority Subbasins.

These watersheds were added based on one or more of the following reasons:

- water quality degradation concerns identified in public comment; and/or
- potential opportunities identified through local field investigation done within a local watershed; and/or
- the NCWRP has initiated project implementation within a particular local watershed and the potential for other restoration opportunities still exists.

#### Resource Professional Meetings

To improve the current prioritization process, and to make this transition effective in updating the Watershed Restoration Plans for the Tar-Pamlico, Catawba, French Broad, New, and Cape Fear river basins, the NCWRP has been working to research and collect additional information to provide a broader level of justification for the selection of Targeted Local Watersheds. As part of this effort, after Priority Subbasins had been finalized for these five basins, NCWRP staff held meetings with resource professionals to solicit local and regional expertise concerning water quality degradation issues and restoration opportunities. The local information provided at these meetings was beneficial and complemented the resource data and information collected by the NCWRP to select Priority Subbasins and draft Targeted Local Watersheds.

In these meetings NCWRP staff also solicited information about planned, ongoing and existing water quality improvement efforts happening within specific local watersheds. This information was important in considering the potential for future partnership opportunities in line with the collaborative approach for watershed restoration. The NCWRP watershed approach follows the premise that by aggregating multiple project opportunities including restoration, various best management practices (BMPs), stormwater retrofits, education and outreach, etc. within a local watershed, that water quality restoration and improvement resources can be better optimized for the benefit of watershed and local resources.

Based on information provided by participants at the resource professional meetings, the NCWRP conducted follow-up, locally led field evaluations within some local watersheds. This on-the-ground experience allowed staff to get a face-to-face sense for the existing level of local water quality and riparian degradation, and the potential for restoration opportunities.

The inclusion of Resource Professionals Meetings and locally led field evaluations will continue to be a critical component of targeting local watersheds. These meetings

typically will be held after the DWQ Basin Workshops and before DWQ Public Meetings (Please refer to Appendix I for more information about DWQ's Basinwide Planning Schedule).

### Evaluating Information Collected to Determine Restoration Need and Restoration

#### Opportunity

In identifying areas to focus project implementation, the NCWRP looks at two primary characteristics of the subbasin and local watershed. These are restoration need and restoration opportunity. Restoration need refers to qualities of the watershed that indicate that it would benefit from projects to protect or improve water quality. Opportunity relates more to the feasibility of actually being able to implement projects in the watershed.

In determining *restoration need* using the above-mentioned information, the NCWRP places most emphasis on:

- use support ratings
- 303(d) listed water bodies
- where existing impacts and compensatory mitigation needs exist
- sensitive resource information; and
- public comment received concerning water quality degradation needs and issues.

In determining potential *restoration opportunity*, the following information is heavily considered:

- a watershed's hydrologic position in the river basin
- where projects have already been initiated by the NCWRP or others (to allow for building the watershed approach)
- land use and development trends with an eye toward availability of restorable land
- potential restoration costs associated with land use constraints, land acquisition, etc.
- local government cooperation; and
- public comments received concerning restoration opportunities.

### The Future of the Process

As the NCWRP continues to update Watershed Restoration Plans (formerly known as Basinwide Wetlands and Riparian Restoration Plans) for each river basin, targeting local watersheds will become the sole focus of the NCWRP prioritization process. Although information will be presented by subbasin, Priority Subbasins will not be identified. This focus on smaller watersheds will provide the NCWRP, as well as other resource agencies and groups, better information to identify the best on-the-ground restoration opportunities.

## **Using Targeted Local Watersheds to Identify Individual Restoration Sites**

Stream, wetland and buffer restoration site searches are conducted within Targeted Local Watersheds to find opportunities that can be successfully implemented to achieve the restoration goals for the river basin. The NCWRP staff then contacts the appropriate landowner(s) to determine interest in program participation. Interested landowners may fill out a Site Proposal Form. This form is located in Appendix II of this plan or may be downloaded from the NCWRP web page.

The search for restoration sites within Targeted Local Watersheds will be supplemented by recommendations of individual sites within these watersheds made by resource agency staff and others who have detailed local experience and contacts. A site assessment consists of the four following steps:

- (1) Map analysis to determine if site location has restoration need and opportunity;
- (2) Assessing the restoration potential of the site (field visit);
- (3) Estimating the costs associated with restoration and the feasibility of the project; and,
- (4) Comparing project costs with project benefits.
  - Low cost, high benefit – these indicate good potential restoration sites for NCWRP
  - High cost, high benefit
  - Low cost, low benefit
  - High cost, low benefit – these sites are least likely to be chosen

## GLOSSARY OF KEY TERMS

<b>basin [or river basin]</b>	The <i>watershed</i> (or drainage area) of a major river system. There are 17 major river basins in North Carolina.
<b>best management practices (BMPs)</b>	Techniques used to prevent or reduce pollutants from <i>point</i> and <i>nonpoint sources</i> in order to protect water quality. BMPs include, but are not limited to, structural controls, operation and maintenance procedures, specific farming and silviculture practices, maintenance of vegetated <i>buffer zones</i> along streams, the use of storm water detention basins, and other practices. BMPs are applied most effectively as a system of practices, not just one at a time.
<b>cataloging unit (CU)</b>	A watershed area as defined by a national uniform hydrologic unit system sponsored by the U.S. Geological Survey and the Water Resources Council. This system divides the country into 21 regions, 222 subregions, 352 accounting units and 2,149 cataloging units. A hierarchical code consisting of two digits for each of the above four levels combine to form an eight-digit cataloging unit. These units generally cover an average area of 1,000 square miles. There are 54 eight-digit CUs in North Carolina. These units have been further subdivided into 11- and 14-digit <i>hydrologic units</i> , or <i>HUs</i> , which represent local-scale watersheds.
<b>drainage area</b>	An alternate term for <i>watershed</i> . The land area draining into a given body of water such as a creek, stream, river, lake, bay or sound. The perimeter boundary of a drainage area, outside which incident precipitation drains into a different drainage area, is known as a <i>drainage divide</i> (usually located along topographically high areas such as ridges, hills, crests). A drainage area (or watershed) may vary in size from several acres for a small stream or pond, to thousands of square miles for a major river system. The drainage area of a major river system is referred to as a basin or <i>river basin</i> .

<b>FS</b>	Fully supporting. A rating given to a waterbody that fully supports its designated uses and generally has good to excellent water quality.
<b>GIS</b>	Geographic Information System. An organized collection of computer hardware, geographic data, and software designed to analyze, compile, view and present spatial and tabular data as maps, tables and charts. GIS software provides the tools to query and analyze spatially referenced data, and then present the results as high-quality maps.
<b>Impaired</b>	Term applied to a waterbody that has a use support rating of <i>partially supporting (PS)</i> or <i>not supporting (NS)</i> its designated uses.
<b>Nonpoint source (NPS)</b>	A source of water pollution generally associated with rainfall (storm water) runoff or snowmelt. The quality and rate of runoff of NPS pollution depends on the land cover and land use from which the runoff flows. For example, storm water runoff from forested lands will generally contain much less pollution and will runoff more slowly than storm water runoff from urban and suburban lands (which generally have a much higher percentage of impervious surfaces, such as pavement, roadways, rooftops, managed lawns). Many <i>best management practices (BMPs)</i> are designed to decrease the quantity (and increase the quality) of storm water runoff and associated NPS pollution.
<b>NR</b>	Not rated. A waterbody that is not rated for use support due to insufficient data.
<b>NS</b>	Not supporting. A rating given to a waterbody that does not support its designated uses and has poor water quality and severe water quality problems. The Division of Water Quality considers both PS and NS waters as <i>impaired</i> .
<b>PS</b>	Partially supporting. A rating given to a waterbody that only partially supports its designated uses (such as aquatic habitat, secondary contact recreation, human drinking water supply) and which has fair water quality and severe water quality problems. Both PS- and NS-rated waters are considered <i>impaired</i> .
<b>Riparian zone</b>	Vegetated corridor immediately adjacent to a stream or river. Sometimes referred to as a <i>buffer zone</i> or a

*streamside management zone (SMZ)*. Riparian zones and their associated vegetation serve important hydrological and ecological functions within watersheds. They filter sediments and other pollutants from storm water runoff, stabilize stream banks, provide wildlife habitat corridors, regulate stream water temperatures, provide shade and woody debris for aquatic organisms. In general, the wider the riparian zone on either side of a stream or river, the more effective are its water quality and biological functions.

**River basin**

The watershed of a major river system. North Carolina's landscape is comprised of 17 major river basins. These include -- moving from the mountains to the coast -- the Hiwassee, Little Tennessee, Savannah, French Broad, Broad, Watauga, New, Catawba, Yadkin-Pee Dee, Roanoke, Lumber, Cape Fear, Neuse, Tar-Pamlico, Chowan, Pasquotank, and White Oak. They range in total area from about 200 to 9,000 square miles.

**Subbasin**

A designated subunit or sub-watershed area of a major river basin. Subbasins typically encompass the watersheds of significant streams or lakes within a river basin. Each of North Carolina's 17 river basins is subdivided into subbasins, ranging from one subbasin in the Watauga River basin to 24 subbasins in the Cape Fear basin. There are 133 subbasins statewide. They range in size from approximately 100 to 1,200 square miles. The subbasins are not a part of the national uniform hydrologic unit system sponsored by the U.S. Geological Survey and Water Resources Council [see *cataloging unit*].

**Watershed**

See *drainage area*.

**Wetlands**

Generally defined, wetlands are transition areas between relatively dry upland sites and waterbodies or deepwater habitats such as lakes, ponds, rivers, streams, estuaries and sounds. They occupy landscape positions characterized by special hydrologic conditions (periodic or perennial inundation or saturation by ground water, surface water or rainfall) and which support a prevalence of vegetation adapted for life in saturated soil conditions.

*Wetlands definition (continued)*

The regulatory definition of wetlands developed by the U.S. Army Corps of Engineers hinges on three required site elements: wetlands hydrology, hydric soils and hydrophytic (water-adapted) vegetation. Hydrology -- that is, the percentage of time that site inundation or saturation of upper soil horizons occurs -- is the driving force behind wetlands creation and occurrence. It is important to note that there is "no single, correct, indisputable, ecologically sound definition for wetlands, primarily because of the diversity of wetlands and because the demarcation between dry and wet environments lies along a continuum" (Cowardin et al, 1979).

Fourteen major types of wetlands occurring in North Carolina have been described in "A Field Guide to North Carolina Wetlands" [DEHNR, 1996.]. The 14 wetland types, spanning a range of hydrologic regimes, are:

- wet flats
- pocosins
- ephemeral wetlands
- seeps
- mountain bogs
- bog forests
- headwater forests
- bottomland hardwood forests
- swamp forests
- freshwater marshes
- estuarine fringe forests
- brackish marshes
- salt shrub wetlands
- salt marshes.

**APPENDIX I - Schedule for the Development of the Division of Water Quality's Basinwide Water Quality Plans**

<b>Basin</b>	<b>DWQ Biological Data Collection</b>	<b>River Basin Public Workshops</b>	<b>Public Meetings and Draft Out for Review</b>	<b>Final Plan Receives EMC Approval</b>	<b>Begin NPDES Permit Issuance</b>
Neuse	Summer 95	3/1997	9/1998	12/1998	1/1999
Lumber	Summer 96	4/1998	2/1999	5/1999	11/1999
Tar-Pamlico	Summer 97	6/1998	4/1999	7/1999	1/2000
Catawba	Summer 97	2/1999	10/1999	12/1999	3/2000
French Broad	Summer 97	5/1999	2/2000	5/2000	8/2000
New	Summer 98	6/1999	4/2000	7/2000	11/2000
Cape Fear	Summer 98	7/1999	4/2000	7/2000	12/2000
Roanoke	Summer 99	4/2000	3/2001	7/2001	1/2002
White Oak	Summer 99	10/2000	7/2001	9/2001	6/2002
Savannah	Summer 99	10/2000	12/2001	3/2002	8/2002
Watauga	Summer 99	11/2000	12/2001	3/2002	9/2002
Little Tennessee	Summer 99	3/2001	12/2001	4/2002	10/2002
Hiwassee	Summer 99	10/2000	12/2001	3/2002	8/2002
Chowan	Summer 2000	3/2001	1/2002	5/2002	11/2002
Pasquotank	Summer 2000	3/2001	1/2002	5/2002	12/2002
Broad	Summer 2000	11/2001	9/2002	12/2002	7/2003
Yadkin Pee-Dee	Summer 2001	11/2001	11/2002	3/2003	9/2003

Note: A basinwide plan was completed for all 17 basins during the first cycle (1993 to 1998).

# APPENDIX II – Site Proposal Form

## North Carolina Wetland Restoration Program (NCWRP) Site Proposal Form

### Please complete this form and return it to:

The North Carolina Wetland Restoration Program  
1619 Mail Services Center  
Raleigh, NC 27600-1619

### Forms may also be faxed to:

Fax (919) 733-5321

**Questions? Call:** (919) 733-5208

### I. General Information

1. Date \_\_\_\_\_
2. Landowner name \_\_\_\_\_
3. Address \_\_\_\_\_
4. Telephone number \_\_\_\_\_
5. Contact Person Name (if other than landowner) \_\_\_\_\_
6. Contact Person Organization \_\_\_\_\_
7. Contact Person Telephone Number \_\_\_\_\_
8. How did you find out about NC Wetlands Restoration Program? \_\_\_\_\_

### II. Site Location

1. County property is located in: \_\_\_\_\_
2. Please list nearby towns and major roads and provide directions to the site:  
\_\_\_\_\_

### III. Site Characteristics

1. What is the size of the property (acreage)? \_\_\_\_\_
2. What is the current land use of the property and surrounding area? \_\_\_\_\_
3. What was the historic land use of the property and surrounding area? \_\_\_\_\_
4. Please attach a drawing of the site to this form showing property boundaries, roads, streams, ditches, fences, buildings, power lines, and other structures.

### IV. Vegetation Type

Please check all that apply: Pasture  Row Crop  Forested  Cleared  Other \_\_\_\_\_

**V. Wetland hydrology/Water Table** Please check one: Never flooded  Temporarily flooded (floods after heavy rain)   
Seasonally flooded (flooded during Winter)  Permanently flooded   
Please describe all hydrological alterations (such as ditches, fill, bridges, culverts, etc.):  
\_\_\_\_\_

### VI. Stream Conditions (if applicable)

1. Approximate length of stream \_\_\_\_\_ (counted as linear feet down center-line of channel)
2. Do you own both sides of the stream? Yes  No  combination \_\_\_\_\_
3. Please indicate the condition of the stream's vegetated buffer and channel (please check all that apply): Streambanks have trees/shrubs  Streambanks have grass/hay  Streambanks have bare soil  Steep banks (exposed soil) to streambed  Extremely sharp bends in stream  Stream is channelized

### VII. Type of transactions of interest to landowner

Please check all transactions the landowner may be interested in:  
Sale of Property (Fee simple)  Donation of Property for Tax Credits   
Sale of a Conservation Easement (retain ownership, NCWRP or other agency holds easement)   
Donation of Conservation Easement for Tax Credits  Other \_\_\_\_\_

The NCWRP will evaluate the information provided on this form and determine if the property meets NCWRP site criteria. Properties that meet NCWRP criteria are potential project sites that will require a field assessment before a funding determination can be made. By completing, signing, and returning this form, I give NCWRP permission to perform a site feasibility assessment of the property, location described above, at a date and time to be agreed upon by NCWRP and the landowner.

\_\_\_\_\_  
(Signature of landowner)

## **APPENDIX III – Documents and Web Sites to Obtain Further Information**

### **Documents:**

*A Citizen's Guide to Water Quality Management in North Carolina* – Produced in August 2000 by the DWQ Planning Branch (available for download at the Basinwide Planning web site)

*Basinwide Water Quality Plans* -- Produced for each river basin on a regular 5-year schedule (see Appendix I) by the DWQ Planning Branch (available for download at the Basinwide Planning web site)

*Basinwide Assessment Reports* – Produced for each river basin on a regular 5-year schedule by the DWQ Environmental Sciences Branch prior to basin plan development (available for download at the Environmental Sciences Branch web site)

*The North Carolina Wetland Restoration Program Annual Report* – Produced annually by the NCWRP (available for download at the NCWRP web site)

### **Web Sites:**

N.C. Wetlands Restoration Program -- <http://h2o.enr.state.nc.us/wrp/index.htm>

N.C. Basinwide Planning Program -- <http://h2o.enr.state.nc.us/basinwide/index.html>

N.C. Division of Water Quality Environmental Sciences Branch --  
<http://www.esb.enr.state.nc.us/>

N.C. Division of Water Quality Non-Point Source Management Program --  
<http://h2o.enr.state.nc.us/nps/bigpic.htm>

N.C. Division of Water Quality -- <http://h2o.enr.state.nc.us/>

N.C. Clean Water Management Trust Fund -- <http://www.cwmtf.net/>

Center for Watershed Protection -- <http://www.cwp.org/>