

## **CHAPTER 12 – PROTECTING WATER QUALITY**

The future of our rivers, streams, wetlands and estuaries are closely linked to land use decisions made on both a public and private scale. Most areas within a watershed are privately owned and it is the private landowner who can best protect our waters through conservation and various land use management options. This chapter explores various options for protecting water quality and includes information related to local initiatives, planning and funding opportunities.

### **12.1 THE IMPORTANCE OF LOCAL INITIATIVES**

Local initiatives to protect water quality are essential to any community because local people make decisions that affect change in their own communities. There are a variety of limitations local initiatives can overcome including limited state government budgets and staff resources, minimal regulations for land use management, rulemaking processes and many others. Local organizations and agencies are able to combine professional expertise in a watershed, thus allowing groups to holistically understand the challenges and opportunities of different water quality efforts. Involving a wide array of people in water quality projects also brings together a wide range of knowledge and interests and encourages others to become involved and invested in these projects.

By working in coordination across jurisdictions and agency lines, more funding opportunities may be available. This will potentially allow local entities to do more work and be involved in more activities because their funding sources are diversified. The most important aspect of these local endeavors is that the more localized the project, the better the chances for success.

The collaboration of local efforts are key to water quality improvements. There are good examples of local agencies and groups using these cooperative strategies throughout the state and specific groups are discussed in each of the seventeen basinwide water quality plans. DWQ applauds the foresight and proactive response of local watershed groups and local governments to address any number of water quality problems.

### **12.2 GROWTH MANAGEMENT AND LAND USE PLANNING**

Growth management can be defined as the application of strategies and practices that help achieve sustainable urban development and redevelopment in harmony with the conservation of environmental qualities and features. In other words, growth management is the effective and equitable management of growth and change in human habitats. Growth management tools range from on-the-ground best management practices (BMPs) such as modifying parking areas to reduce impervious surfaces, to establishing regional wastewater and/or stormwater authorities.

#### **12.2.1 COMPREHENSIVE WATERSHED PROTECTION STRATEGIES**

In order for land use planning to effectively protect watersheds in the long-term, tools and strategies must be applied at several scales. Effective implementation will require commitment ranging from the individual citizen to the state government. A comprehensive watershed protection plan should act on the following elements.

### Basin Scale (Implemented by Town, County, and State Governments)

- ❑ Characterize the watersheds within a basin as developed or undeveloped, identifying the watersheds that are currently less than and more than 10 percent impervious.
- ❑ Focus new construction projects to the already developed watersheds first. Then assign any construction that cannot be accommodated in developed watersheds to a limited number of undeveloped watersheds. The watersheds to be developed should be determined by their ecological importance and by other regional growth considerations, such as the value of terrestrial ecosystems, the economic development potential as determined by proximity to roads and rail lines, and the disposition of landowners in the area toward land preservation and development.
- ❑ Adopt policies that maintain impervious surfaces in undeveloped watersheds at less than ten percent. These can include private conservation easements, purchase of development rights, infrastructure planning, urban service boundaries, rural zoning (20-200 acres per unit, depending on the area) and urban growth boundaries.
- ❑ Ensure that local governments develop land use plans to provide adequate land for future development within developed or developing watersheds.

### Neighborhood Scale (Implemented by Town and County Governments)

- ❑ Allow residential densities that support mass transit (i.e., buses, trains, etc.), reduce vehicle trips per household and minimize land consumption. The minimum density for new development should be seven to ten net units per acre.
- ❑ Require block densities that support walking and reduce the length of vehicle trips. Cities that support walking and transit often have more than 100 blocks per square mile.
- ❑ Connect the street network by requiring subdivision road systems to link to adjacent subdivisions.
- ❑ Integrate houses with stores, civic buildings, neighborhood recreational facilities and other daily or weekly destinations.
- ❑ Incorporate pedestrian and bike facilities (greenways) into new development and ensure these systems provide for inter-neighborhood travel.
- ❑ Encourage and require other design features and public facilities that accommodate and support walking by creating neighborhoods with a pleasing scale and appearance. (i.e., short front-yard setbacks, neighborhood parks, alleys and architectural and material quality)

Site Scale (Implemented by Individual Property Owners, Developers Town and County Governments)

- ❑ Require application of the most effective structural stormwater practices, especially focusing on hot spots such as high-volume streets, gas stations and parking lots.
- ❑ Establish buffers and setbacks that are appropriate for the area to be developed – more extensive in undeveloped watersheds than in developed watersheds. In developed watersheds, buffers and setbacks should be reconciled to other urban design needs (such as density) and a connected street network.
- ❑ Educate homeowners about their responsibility in watershed management, such as buffer and yard maintenance, proper disposal of oil and other toxic materials, and the impacts of excessive automobile use (Beach, 2002).

### 12.2.2 REDUCING IMPACTS FROM EXISTING URBANIZATION

Below is a summary of management actions recommended for local authorities, followed by discussions on large watershed management issues. These actions are necessary to address current sources of impairment and to prevent future degradation in all streams. The intent of these recommendations is to describe the types of actions necessary to improve stream conditions, not to specify particular administrative or institutional mechanisms for implementing remedial practices. Those types of decisions must be made at the local level.

Because of uncertainties regarding how individual remedial actions cumulatively impact stream conditions and how aquatic organisms will respond to improvements, the intensity of management effort necessary to bring about a particular degree of biological improvement cannot be established in advance. The types of actions needed to improve biological conditions can be identified, but the mix of activities that will be necessary – and the extent of improvement that will be attainable – will only become apparent over time as an adaptive management approach is implemented. Management actions are suggested below to address individual problems, but many of these actions are interrelated.

- ❑ **Feasible and cost-effective stormwater retrofit projects should be implemented throughout the watershed to mitigate the hydrologic effects of development** (i.e., increased stormwater volumes and increased frequency and duration of erosive and scouring flows). This should be viewed as a long-term process.
  - Over the short term, currently feasible retrofit projects should be identified and implemented.
  - In the long term, additional retrofit opportunities should be implemented in conjunction with infrastructure improvements and redevelopment of existing developed areas.
  - Grant funds for these retrofit projects may be available from EPA initiatives, such as EPA Section 319 funds, or the North Carolina Clean Water Management Trust Fund (CWMTF).

- **A watershed scale strategy to address toxic inputs should be developed and implemented, including a variety of source reduction and stormwater treatment methods.** As an initial framework for planning toxicity reduction efforts, the following general approach is proposed:
  - Implementation of available BMP opportunities for control of stormwater volume and velocities. As recommended above to improve aquatic habitat potential, these BMPs will also remove toxics from stormwater.
  - Development of a stormwater and dry weather sampling strategy in order to facilitate the targeting of pollutant removal and source reduction practices.
  - Implementation of stormwater treatment BMPs, aimed primarily at pollutant removal, at appropriate locations.
  - Development and implementation of a broad set of source reduction activities focused on: reducing non-storm inputs of toxics; reducing pollutants available for runoff during storms; and managing water to reduce storm runoff.
  
- **Stream channel restoration activities should be implemented in target areas, in conjunction with stormwater retrofit BMPs, in order to improve aquatic habitat.** Before beginning stream channel restoration, a geomorphologic survey should be conducted to determine the best areas for stream channel restoration. Additionally, it would be advantageous to implement retrofit BMPs before embarking on stream channel restoration, as restoration is best designed for flows driven by reduced stormwater runoff. Costs of approximately \$200 per foot of channel should be anticipated (Haupt, et al., 2002 and Weinkam, 2001). Grant funds for these retrofit projects may be available from federal sources, such as EPA Section 319 funds, or state sources including North Carolina Clean Water Management Trust Fund.
  
- Actions recommended above (i.e., stormwater quantity and quality retrofit BMPs) are likely to reduce nutrient/organic loading, and to some extent, its impacts. Activities recommended to address this loading include the identification and elimination of illicit discharges; education of homeowners, commercial applicators, and others regarding proper fertilizer use; street sweeping; catch basin clean-out practices; and the installation of additional BMPs targeting biological oxygen demand (BOD) and nutrient removal at appropriate sites.
  
- Prevention of further channel erosion and habitat degradation will require effective post-construction stormwater management for all new development in the study area.
  
- Effective enforcement of sediment and erosion control regulations will be essential to the prevention of additional sediment inputs from construction activities. Development of improved erosion and sediment control practices may also be beneficial.
  
- Watershed education programs should be implemented and continued by local governments with the goal of reducing current stream damage and preventing future degradation. At a minimum, the program should include elements to address the following issues:

- Redirecting downspouts to pervious areas rather than routing these flows to driveways or gutters;
- Protecting existing woody riparian areas on all streams;
- Replanting native riparian vegetation on stream channels where such vegetation is absent; and
- Reducing and properly managing pesticide and fertilizer use.

### 12.2.3 REDUCING IMPACTS FROM FUTURE URBANIZATION

Proactive planning efforts at the local level are needed to ensure that development is done in a manner that maintains water quality. These planning efforts can find a balance between water quality protection, natural resource management and economic growth. Growth management requires planning for the needs of future population increases, as well as developing and enforcing environmental protection measures. These actions are critical to water quality management and the quality of life for residents across the state.

Streams in areas adjacent to high growth areas are at a high risk of losing healthy aquatic communities. These biological communities are important to maintaining the ecological integrity of the state. Unimpacted streams are important sources of benthic macroinvertebrates and fish for reestablishment of biological communities in nearby streams that are recovering from past impacts or are being restored.

To prevent future water quality degradation, local governments should:

- ❑ Identify waters that are threatened by development.
- ❑ Protect existing riparian habitat along streams.
- ❑ Implement stormwater BMPs during and after development.
- ❑ Develop land use plans that minimize disturbance in sensitive areas of watersheds.
- ❑ Minimize impervious surfaces including roads and parking lots.
- ❑ Develop public outreach programs to educate citizens about stormwater runoff.

#### *Planning Recommendations for New Developments*

- ❑ Minimize number and width of residential streets.
- ❑ Minimize size of parking areas (angled parking & narrower slots).
- ❑ Place sidewalks on only one side of residential streets.
- ❑ Minimize culvert pipe and hardened stormwater conveyances.
- ❑ Vegetate road right-of-ways, parking lot islands and highway dividers to increase infiltration.
- ❑ Plant and protect natural buffer zones along streams and tributaries.

Action needs be taken at the local level to plan for new development in urban and rural areas and on inland, soundside and barrier islands. For more detailed information regarding recommendations for new development found in the text box (above), refer to the US Environmental Protection Agency's (EPA) Watershed Academy Web site [www.epa.gov/owow/watershed/wacademy/acad2000/protection](http://www.epa.gov/owow/watershed/wacademy/acad2000/protection), the Center for Watershed Protection Web site [www.cwp.org](http://www.cwp.org), and the Low Impact Development Center Web site [www.lowimpactdevelopment.org](http://www.lowimpactdevelopment.org). Additional information regarding environmental stewardship for coastal homeowners is available at [www.soil.ncsu.edu/assist/coastindex.html](http://www.soil.ncsu.edu/assist/coastindex.html). Further public education is also needed throughout the state in order for citizens to understand the value of

urban planning and stormwater management. For an example of local community planning effort to reduce stormwater runoff, visit [www.charmeck.org/Home.htm](http://www.charmeck.org/Home.htm).

#### **12.2.4 PREVENTING STREAMBANK EROSION**

Streambank erosion can be caused by a number of factors, some of which may be difficult to identify. For example, erosion may be caused by a lack of streambank vegetation that holds soil in place. Erosion may also result from complex changes in urban runoff patterns, poor logging or farming practices or other activities within the watershed.

Because the stabilization of a streambank can be an expensive and time-consuming process that may require several attempts, the specific cause and nature of a problem should be investigated and understood before any action is taken to restore a degraded stream channel or riparian area.

The following techniques can help control sediment loading and protect instream water quality:

- ❑ Avoid the disturbance of streams and riparian zones.
- ❑ Protect existing riparian forest buffers and restore vegetation that has been cleared from the riparian zone.
- ❑ Use BMPs for sediment control. A variety of agricultural BMPs effectively controls sediment including conservation tillage/residue management, filter strips, field borders and cover crops.
- ❑ Maintain natural channels, or if modification is unavoidable, design channels based on the stability and behavior of natural stream channels. Channel designs based on natural stability principles will be less susceptible to erosion, remain more stable and provide more habitat than traditional engineered channel designs.
- ❑ Maintain predevelopment peak flows, flow velocities and flow timing to the extent possible using stormwater management techniques and appropriate BMPs.
- ❑ Use BMPs such as riser basins, diversion ditches, rock dams, check dams and buffers for construction activities.

### 12.2.5 USING RIPARIAN BUFFERS TO PROTECT STREAM QUALITY AND INTEGRITY

A stream and its riparian area function as one. The condition of a riparian area plays a pivotal role in the integrity of a stream channel and instream water quality. While any type of streamside vegetation is desirable, forests provide the greatest amount of benefit and the highest potential for meeting both water quality and habitat restoration objectives. Riparian forest buffers are managed to protect water quality through the control of nonpoint source pollution and the maintenance of the stream environment.

Riparian forest buffer systems are typically comprised of an area of trees, usually accompanied by shrubs and other vegetation, adjacent to a waterbody and managed as three integrated streamside zones that are designed to intercept surface runoff and subsurface flow.

A sound scientific foundation exists to support the sediment reduction, nutrient reduction and ecological values and functions of riparian forest buffers. The use of riparian buffers as a management tool should be promoted.

### 12.2.6 IMPLEMENTING EFFECTIVE EDUCATION PROGRAMS

North Carolina's natural resources are under stress and could be lost in the absence of a widespread awareness of their existence, their significance and their value. Government officials, business leaders and private citizens must better understand the complexity of the natural ecosystems that support our quality of life and make this state an appealing place to live, work and visit.

These natural resources are not isolated from each other or from the people. Each element is part of the ecosystem, interrelated and interconnected. When one part of the system is affected, other parts feel the impact. Sound development decisions require an understanding of these interconnections, as well as of the life-support roles played by natural resources.

The cause and effect relationship between human behavior and the environment and the economics of that relationship must be well understood by decision makers - including individuals, business, industry, government and elected officials - to instill a conservation ethic and a sense of stewardship into the choices facing the state. Such stewardship of land, water, air and biological resources is required to continue to enjoy the existing quality of life and to ensure future improvements.

#### *Riparian/Forested Buffers Specifically Designed and Managed To:*

- ❑ Maintain the integrity of stream channels and shorelines by protecting them from erosion.
- ❑ Reduce the impact of upland sources of pollution by trapping, filtering and converting sediments, nutrient and other chemicals.
- ❑ Provide wildlife habitat for birds and other species dependant on the streams and woods for food, shelter and raising young.
- ❑ Provide shade, which stabilizes water temperatures, keeping water livable for fish and other aquatic species.
- ❑ Provide woody debris and organic matter to the bacteria, fungi and other species forming the basis of the aquatic food chain.

Environmental quality ultimately depends upon the understanding and support of individual and corporate citizens who come to embrace standards and practices that discourage pollution while they prize high quality air, water and soil. This relationship between knowledge of the environment and support for its protection form a basis of public policy development. While the need for education to improve our understanding of ecology and environment is accepted as important, the practice of environmental education may take many forms. DWQ encourages implementation of educational programs tailored to specific audiences that invoke the following principles:

❑ **Respect and care for the community of life.**

All things are connected. When something affects one part of the environment, other parts feel the impact. The more we understand and respect our own community, the better we will understand this interconnectedness and our responsibilities to the global community of life.

❑ **Improve the quality of human life.**

The aim of development is to improve the overall quality of human life. Development must enable all people to realize their potential and lead lives of dignity and fulfillment. This kind of development requires a healthy and robust supporting ecosystem.

❑ **Conserve North Carolina's vitality and diversity.**

*Renewable natural resources* are the base of all economies. Soil, water, air, timber, medicines, plants, fish, wildlife and domesticated species -- all come from natural systems and can be maintained through conservation.

*Life support systems* are the ecological processes that shape climate, cleanse air and water, regulate water flow, recycle essential elements, create and regenerate soil and keep our environment fit for life. We must prevent pollution and degradation of these ecosystems as well as the natural plant and wildlife habitats they provide.

*Biological diversity* includes the total array of species, genetic varieties, habitats and ecosystems on Earth. It contributes to our quality of life, including a healthy economy. It is a foundation of the Earth's biosphere, buffering us from the inevitable changes in the environment.

❑ **Change personal understanding and practice.**

Society must promote values that build and support its ability to continuously improve the quality of living for its citizens. This requires maintaining the quality and integrity of our natural environment. Knowledge, awareness and decision-making skills must be taught through formal and non-formal education to promote problem solving and constructive action to nurture the life-giving qualities of our ecosystem.

❑ **Enable communities to care for their own environment.**

Living within the limits set by the environment depends on the beliefs and commitment of individuals, but it is through communities that people share concerns and promote practices that can nourish rather than cripple their natural life-support systems.

❑ **Provide a state and local knowledge base for integrating development and conservation.**

Economic policy can be an effective instrument for sustaining ecosystems and natural resources. Every economy depends on the environment as a source of life support and raw materials. The knowledge base for each city, county and the state must be strengthened, and information on environmental matters made more accessible. The state's adult and student populations must understand certain ecological and civics concepts, and North Carolina's place within those concepts.

### **12.2.7 THE ROLE OF HOMEOWNERS AND LANDOWNERS**

The following are ten simple steps individuals can do today to protect water quality.

- ❑ To decrease polluted runoff from paved surfaces, households can develop alternatives to areas traditionally covered by impervious surfaces. Porous pavement materials are available for driveways and sidewalks, and native vegetation and mulch can replace high maintenance grass lawns.
- ❑ Homeowners can use fertilizers sparingly and sweep driveways, sidewalks, and roads instead of using a hose.
- ❑ Instead of disposing of yard waste, use the materials to start a compost pile.
- ❑ Learn to use Integrated Pest Management (IPM) in the garden and on the lawn to reduce dependence on harmful pesticides.
- ❑ Pick up waste pet waste and dispose of it properly.
- ❑ Use, store, and dispose of chemicals properly.
- ❑ Drivers should check their cars for leaks and recycle their motor oil and antifreeze when these fluids are changed.
- ❑ Drivers can also avoid impacts from car wash runoff (e.g., detergents, grime, etc.) by using car wash facilities that do not generate runoff.
- ❑ Households served by septic systems should have them professionally inspected and pumped every 3 to 5 years. They should also practice water conservation measures to extend the life of their septic systems.
- ❑ Support local government watershed planning efforts and ordinance development.

## 12.3 LOCAL WATER SUPPLY PLANNING

The North Carolina General Assembly mandated a local and state water supply planning process in 1989 to ensure that communities have an adequate supply of potable water for future needs. Under this statute, all units of local government that provide, or plan to provide, public water supply service are required to prepare a Local Water Supply Plan (LWSP) and to update that plan at least every five years. The information presented in a LWSP is an assessment of a water system's present and future water needs and its ability to meet those needs. By looking at current and future needs, local governments will be better able to manage water supplies and better prepared to plan for water supply system improvements. Local governments must have an adopted current LWSP on file with the NC Division of Water Resources (DWR) to qualify for certain grants and loans available for water supply systems in North Carolina. More information about local water supply planning can be found on the DWR Web site ([www.ncwater.org](http://www.ncwater.org)).

### *Benefits to Local Water Supply Planning*

- ❑ Provides comprehensive look at water supply needs, water usage, and water availability.
- ❑ Reduces the potential for water conflicts and water shortages. Early identification of these issues will allow more time for resolution.

## 12.4 SOURCE WATER ASSESSMENT OF PUBLIC WATER SUPPLIES

The Federal Safe Drinking Water Act (SDWA) Amendments of 1996 emphasize pollution prevention as an important strategy for the protection of ground and surface water resources. This new focus promotes the prevention of drinking water contamination as a cost-effective means to provide reliable, long-term and safe drinking water sources for public water supply (PWS) systems. In order to determine the susceptibility of public water supply sources to contamination, the amendments also required that all states establish a Source Water Assessment Program (SWAP). Specifically, Section 1453 of the SDWA Amendments require that states develop and implement a SWAP to:

- ❑ Delineate source water assessment areas;
- ❑ Inventory potential contaminants in these areas; and
- ❑ Determine the susceptibility of each public water supply to contamination.

In North Carolina, the agency responsible for SWAP is the Public Water Supply (PWS) Section of the NCDENR Division of Environmental Health (DEH). The PWS Section received approval from the EPA for their SWAP Plan in November 1999. The SWAP Plan, entitled *North Carolina's Source Water Assessment Program Plan*, fully describes the methods and procedures used to delineate and assess the susceptibility of more than 9,000 wells and approximately 207 surface water intakes, and it builds upon existing protection programs for ground and surface water resources. These include the state's Wellhead Protection Program and the Water Supply Watershed Protection Program.

*Wellhead Protection (WHP) Program:* North Carolinians withdraw more than 88 million gallons of groundwater per day from more than 9,000 water supply wells across the state. In 1986, Congress passed Amendments to the SDWA requiring states to develop wellhead protection

programs that reduce the threat to the quality of groundwater used for drinking water by identifying and managing recharge areas to specific wells or wellfields.

Defining a wellhead protection area (WHPA) is one of the most critical components of wellhead protection. A WHPA is defined as “the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield.” The SWAP uses the methods described in the state's approved WHP Program to delineate source water assessment areas for all public water supply wells (<http://www.deh.enr.state.nc.us/pws/swap>).

*Water Supply Watershed Protection (WSWP) Program:* DWQ is responsible for managing the standards and classifications of all water supply watersheds. In 1992, the WSWP Rules were adopted by the NC Environmental Management Commission (EMC) and require all local governments that have land use jurisdiction within water supply watersheds adopt and implement water supply watershed protection ordinances, maps and management plans. SWAP uses the established water supply watershed boundaries and methods established by the WSWP program as a basis to delineate source water assessment areas for all public water surface water intakes ([www.ncwaterquality.org/wswp/index.html](http://www.ncwaterquality.org/wswp/index.html)).

#### **12.4.1 SUSCEPTIBILITY DETERMINATION – NORTH CAROLINA’S OVERALL APPROACH**

The SWAP Plan contains a detailed description of the methods used to assess the susceptibility of each PWS intake in North Carolina. The following is a brief summary of the susceptibility determination approach.

*Overall Susceptibility Rating:* The overall susceptibility determination rates the potential for a drinking water source to become contaminated. The overall susceptibility rating for each PWS intake is based on two key components: a contaminant rating and an inherent vulnerability rating. For a PWS to be determined “susceptible”, a potential contaminant source must be present and the existing conditions of the PWS intake location must be such that a water supply could become contaminated. The determination of susceptibility for each PWS intake is based on combining the results of the inherent vulnerability rating and the contaminant rating for each intake. Once combined, a PWS is given a susceptibility rating of higher, moderate or lower (H, M or L).

*Inherent Vulnerability Rating:* Inherent vulnerability refers to the physical characteristics and existing conditions of the watershed or aquifer. The inherent vulnerability rating of groundwater intakes is determined based on an evaluation of aquifer characteristics, unsaturated zone characteristics and well integrity and construction characteristics. The inherent vulnerability rating of surface water intakes is determined based on an evaluation of the watershed classification (WSWP Rules), intake location, raw water quality data (i.e., turbidity and total coliform) and watershed characteristics (i.e., average annual precipitation, land slope, land use, land cover, groundwater contribution).

*Contaminant Rating:* The contaminant rating is based on an evaluation of the density of potential contaminant sources (PCSs), their relative risk potential to cause contamination, and their proximity to the water supply intake within the delineated assessment area.

*Inventory of Potential Contaminant Sources (PCSs):* In order to inventory PCSs, the SWAP conducted a review of relevant, available sources of existing data at federal, state and local levels. The SWAP selected sixteen statewide databases that were attainable and contained usable geographic information related to PCSs.

#### **12.4.2 SOURCE WATER PROTECTION**

The PWS Section believes that the information from the source water assessments will become the basis for future initiatives and priorities for public drinking water source water protection (SWP) activities. The PWS Section encourages all PWS system owners to implement efforts to manage identified sources of contamination and to reduce or eliminate the potential threat to drinking water supplies through locally implemented programs

To encourage and support local SWP, the state offers PWS system owners assistance with local SWP as well as materials such as:

- ❑ Fact sheets outlining sources of funding and other resources for local SWP efforts.
- ❑ Success stories describing local SWP efforts in North Carolina.
- ❑ Guidance about how to incorporate SWAP and SWP information in Consumer Confidence Reports (CCRs).

Information related to SWP can be found at <http://www.deh.enr.state.nc.us/pws/swap>.

#### **12.4.3 PUBLIC WATER SUPPLY SUSCEPTIBILITY DETERMINATIONS**

In April 2004, the PWS Section completed source water assessments for all drinking water sources and generated reports for the PWS systems using these sources. A second round of assessments were completed in April 2005. The results of the assessments can be viewed in two different ways, either through the interactive ArcIMS mapping tool or compiled in a written report for each PWS system. To access the ArcIMS mapping tool, simply click on the “NC SWAP Info” icon on the PWS Web site (<http://www.deh.enr.state.nc.us/pws/swap>). To view a report, select the PWS System of interest by clicking on the “SWAP Reports” icon.

### **12.5 RECLASSIFICATION OF SURFACE WATERS**

The classification of surface water may be changed after a request is submitted to the DWQ Classifications and Standards Unit. DWQ reviews each request for reclassification and conducts an assessment of the surface water to determine if the reclassification is appropriate. If it is determined that a reclassification is justified, the request must proceed through the state rule-making process. To initiate a reclassification, the *Application to Request Reclassification of NC Surface Waters* must be completed and submitted to DWQ’s Classifications and Standards Unit. For more information on requests for reclassification and contact information, visit

<http://h2o.enr.state.nc.us/csu/swcfaq.html#ClassChanges>. More information about DWQ's classifications and water quality standards can be found in Chapter 2.

## **12.6 FEDERAL AND STATE INITIATIVES**

### **12.6.1 FEDERAL CLEAN WATER ACT – SECTION 319 PROGRAM**

Section 319 of the Clean Water Act provides grant money for nonpoint source demonstration and restoration projects. Through annual base funding, there is approximately \$1 million available for demonstration and education projects across the state. An additional \$2 million is available annually through incremental funds for restoration projects. All projects must provide nonfederal matching funds of at least 40 percent of the project's total costs. Information on the North Carolina Section 319 Grant Program application process is available online [http://h2o.enr.state.nc.us/nps/application\\_process.htm](http://h2o.enr.state.nc.us/nps/application_process.htm). Descriptions of projects and general Section 319 Program information are available on the DWQ Web site [http://h2o.enr.state.nc.us/nps/Section\\_319\\_Grant\\_Program.htm](http://h2o.enr.state.nc.us/nps/Section_319_Grant_Program.htm). For more information on program initiatives refer to Chapter 6.

### **12.6.2 NORTH CAROLINA ECOSYSTEM ENHANCEMENT PROGRAM (NCEEP)**

The North Carolina Ecosystem Enhancement Program (NCEEP) is responsible for providing ecologically effective compensatory mitigation in advance of permitted impacts associated with road projects and other development activities. The fundamental mission of the program is to restore, enhance and protect key watershed functions in the seventeen river basins across the state. This is accomplished through the implementation of wetlands, stream and riparian buffer projects within selected local watersheds. The vital watershed functions that NCEEP seeks to restore and protect include water quality, floodwater conveyance and storage, fisheries and wildlife habitat.

The NCEEP is not a grant program but can implement its restoration projects cooperatively with other state or federal programs such as the Section 319 Program. Combining NCEEP-funded restoration or preservation projects with 319 or other local watershed initiatives (i.e., those funded through the Clean Water Management Trust Fund or local/regional Land Trusts) increases the potential to improve the water quality, hydrologic and habitat functions within selected watersheds.

The selection of optimal sites for NCEEP mitigation projects is founded on a basinwide and local watershed planning approach, which results, respectively, in the development of *River Basin Restoration Priorities* and *Local Watershed Plans*. In developing *River Basin Restoration Priorities* (RBRP), the NCEEP identifies local watersheds (14-digit hydrologic units) with the greatest need and opportunity for restoration, enhancement or preservation projects. These high-priority watersheds are called "targeted local watersheds" (TLWs). Targeted local watersheds are identified, in part, using information compiled by DWQ's programmatic activities (i.e., *Basinwide Assessment Reports* and *Basinwide Water Quality Plans*). Local factors considered in the selection of TLWs include: water quality impairment, habitat degradation, the presence of critical habitat or significant natural heritage areas, the presence of water supply watersheds or

other high-quality waters, the status of riparian buffers, estimates of impervious cover, existing or planned transportation projects, and the opportunity for local government partnerships. Recommendations from local resource agency professionals and the presence of existing or planned watershed projects are given significant weight in the selection of *TLWs*. In essence, targeted local watersheds represent those areas within a river basin where NCEEP resources can be focused for maximum benefit to local watershed functions.

The *Local Watershed Plans (LWPs)* are usually located within targeted local watersheds identified in the *RBRPs*. Through the local watershed planning process, NCEEP conducts watershed characterization and field assessment tasks to identify critical stressors in local watersheds. The NCEEP planners and their consultants coordinate with local resource professionals and local governments to identify optimal watershed projects and management strategies to address the major functional stressors identified in that watershed. The *LWPs* prioritize restoration/enhancement projects, preservation sites and BMP projects that will provide water quality improvement, habitat protection and other environmental benefits to the local watershed. More information about watershed planning through NCEEP can be found on the NCEEP Web site ([www.nceep.net](http://www.nceep.net)).

### **12.6.3 NORTH CAROLINA'S CLEAN WATER MANAGEMENT TRUST FUND (CWMTF)**

The CWMTF offers approximately \$40 million annually in grants for projects within the broadly focused areas of restoring and protecting state surface waters and establishing a network of riparian buffers and greenways. For more information on the CWMTF or these grants, call (252) 830-3222 or visit the website at [www.cwmtf.net](http://www.cwmtf.net).

### **12.6.4 COMMUNITY CONSERVATION ASSISTANCE PROGRAM (CCAP)**

The landscape of North Carolina is changing and Soil and Water Conservation Districts (SWCD) have voiced concern about a void in program areas to address the growing threat of nonpoint source pollution issues on non-agricultural lands. In the summer of 2005, a survey was distributed to all districts to inventory their level of interest and BMP needs on urban, suburban and rural lands. Many districts completed surveys about their needs for a community assistance program and requested over \$6.5 million for local projects. In July 2006, the legislature unanimously passed House Bill 2129, creating the Community Conservation Assistance Program (CCAP).

CCAP will focus its efforts on stormwater retrofits to existing land uses. It will not be used to assist in new development sites to meet state and federal stormwater mandates. Districts have the technical expertise to install stormwater BMPs and a successful history of promoting voluntary conservation practices. The program will give the districts the structure and financial assistance to carry out this mission. CCAP will encourage local governments, individual landowners and businesses to incorporate stormwater BMPs within their landscape. The economic incentive, 75 percent of average installation costs, will encourage voluntary conservation to be installed.

A workgroup is developing recommendations for the standards and specifications of CCAP BMPs. This group is also charged with defining the average cost of each practice. Practices that have been approved by the Technical Review Committee (TRC) and the Soil and Water

Conservation Commission (SWCC) include: impervious surface conversion, permeable pavement, grassed swale, critical area planting, bioretention areas, backyard rain gardens, stormwater wetlands, backyard wetlands, diversion, riparian buffer, stream restoration, stream stabilization, cisterns/rain barrels and pet waste receptacles.

The NCDENR Division of Soil and Water Conservation (DSWC) was awarded two grants that will fund CCAP implementation in eighteen counties across the state. The DSWC received a grant from the CWMTF in the sum of \$557,000 and an award from Section 319 program for \$277,425. Since this is a grant-funded program, only districts that participated in the surveys will receive an allocation. The maximum amount of assistance per practice is limited to \$50,000. It is the goal of the DSWC to seek additional funding sources, including recurring state appropriations, to offer this program statewide in the future.

### **12.6.5 CLEAN WATER BONDS – NC RURAL CENTER**

Outdated wastewater collection systems, some more than 70 years old, allow millions of gallons of untreated or partially treated wastewater to spill into the state's rivers and streams. The NC Rural Economic Development Center, Inc. (Rural Center) has taken the lead role in designing public policy initiatives to assist rural communities in developing and expanding local water and sewer infrastructure. The Rural Center is a private, nonprofit organization. The Rural Center's mission is to develop sound, economic strategies that improve the quality of life in North Carolina, while focusing on people with low to moderate incomes and communities with limited resources.

To support local economic growth and ensure a reliable supply of clean water, the Rural Center administers three Water and Sewer Grant Programs to help rural communities develop water and sewer systems. The *Supplemental Grants Program* enables local governments and qualified non-profit corporations to improve local water and sewer systems. Projects may address public health, environmental and/or economic development critical needs. The maximum grant amount for this program is \$400,000. Rural Center funds must be used to match other project funds. The *Capacity Building Grants Program* provides funding for local governments to undertake planning efforts that support strategic investments in water and sewer facilities. Funds typically are used to prepare preliminary engineering reports, master water/sewer plans, capital investment plans, water/sewer feasibility studies, rate studies and grant applications. The maximum amount for this program is generally \$40,000. The *Unsewered Communities Grants Program* provides funding for the planning and construction of new central, publicly-owned sewer systems. Qualified communities must be unserved by wastewater collection or treatment systems. Unsewered communities grants are designed to cover 90 percent of the total cost of a project but will not exceed \$3 million. For each grant program, priority is given to projects from economically distressed counties of the state as determined by the NC Department of Commerce ([www.nccommerce.com](http://www.nccommerce.com)).

The water and sewer grant programs are made possible through appropriations from the NC General Assembly and through proceeds from the Clean Water Bonds. In 1998, North Carolina voters approved an \$800 million clean water bond referendum that provided \$330 million to state grants to help local governments repair and improve water supply systems and wastewater

collection and treatment. The grants also address water conservation and water reuse projects. Another \$300 million was made available as clean water loans.

Since the program's beginning, the Rural Center has awarded nearly 500 communities and counties more than \$64 million to plan, install, expand, and improve their water and sewer systems. As a result, these communities have served new residential and business customers, created and preserved thousands of jobs, and leveraged millions of dollars in other water and sewer funds. For more information on the Water and Sewer Grants administered by the Rural Center visit [www.ncruralcenter.org/grants/water.htm](http://www.ncruralcenter.org/grants/water.htm).

#### **12.6.6 NC CONSTRUCTION GRANTS AND LOANS PROGRAMS**

The NC Construction Grants and Loans Section provides grants and loans to local government agencies for the construction, upgrades and expansion of wastewater collection and treatment systems. As a financial resource, the section administers five major programs that assist local governments. Of these, two are federally funded programs administered by the state, the Clean Water State Revolving Fund (SRF) Program and the State and Tribal Assistance Grants (STAG). The STAG is a direct congressional appropriations for a specific "special needs" project. The High Unit Cost Grant (SRG) Program, the State Emergency Loan (SEL) Program and the State Revolving Loan (SRL) Program are state funded programs, with the latter two being below market revolving loan money.

As a technical resource, the Construction Grants and Loan (CG&L) Section, in conjunction with EPA, has initiated the Municipal Compliance Initiative Program. It is a free technical assistance program to identify wastewater treatment facilities that are declining but not yet out of compliance. A team of engineers, operations experts and managers from the section work with local officials to analyze the facility's design and operation. For more information, visit the Web site [www.nccgl.net](http://www.nccgl.net). You may also call (919)-715-6212.

#### **12.6.7 STATE FUNDED OYSTER HATCHERIES**

North Carolina Aquariums, in conjunction with the Department of Marine Fisheries (DMF), are working together to establish additional oyster hatcheries in proximity to the three state aquariums to support oyster gardening efforts and public education programs. An additional commercial-sized hatchery would be constructed to support the goals of the DMF and will have a production capacity of a billion larvae and include a nursery area for setting. The General Assembly appropriated \$600,000 to the state aquariums to facilitate the hatchery program. The committee is also working to establish an education program that could potentially lead to a certification in constructing and maintaining oyster hatcheries in North Carolina.

### 12.6.8 CLEAN MARINA PROGRAM

The Clean Marina is a voluntary program that began in the summer of 2000. The program is designed to show that marina operators can help safeguard the environment by using management and operations techniques that go above and beyond regulatory requirements. This is a nationwide program developed by the National Marine Environmental Education Foundation, a nonprofit organization that works to clean up waterways for better recreational boating. The foundation encourages states to adapt Clean Marina principles to fit their own needs. North Carolina joins South Carolina, Florida and Maryland as states with Clean Marina programs in place.

Marina operators who choose to participate must complete an evaluation form about their use of specific best management practices. If a marina meets criteria developed by NC Marine Trades Services and the Division of Coastal Management (DCM), it will be designated as a Clean Marina. Such marinas will be eligible to fly the Clean Marina flag and use the logo in their advertising. The flags will signal to boaters that a marina cares about the cleanliness of area waterways. Marinas that do not meet the standards will be able to learn about improvements needed for Clean Marina designation. Marina owners can reapply after making the necessary changes.

For more information about the program, visit <http://dcm2.enr.state.nc.us/Marinas/clean.htm>, <http://www.nccoastalmanagement.net/Marinas/marinas.htm> or contact NC Coastal Reserve Education Office at 252-728-2170 or Coastal Management at 919-733-2293.

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