Executive Summary

North Carolina's Basinwide Approach to Water Quality Management

Basinwide water quality planning is a nonregulatory watershed-based approach to restoring and protecting the quality of North Carolina's surface waters. Basinwide water quality plans are prepared by the NC Division of Water Quality for each of the seventeen major river basins in the state. Each basinwide plan is revised at five-year intervals. While these plans are prepared by the Division of Water Quality, their implementation and the protection of water quality entails the coordinated efforts of many agencies, local governments and stakeholders in the state. The first basinwide plan for the Cape Fear River basin was completed in 1996.

This document is the first five-year update of the *Cape Fear River Basinwide Water Quality Plan*. The format of this plan was revised in response to comments received during the first planning cycle. Much of the general information in the first plan was replaced by more detailed information specific to the Cape Fear River basin. A greater emphasis was placed on identifying causes and sources of pollution for individual streams in order to facilitate local restoration efforts.

Comments from three pubic workshops held in the basin were seriously considered during plan development. While all of the comments may not have been addressed to the satisfaction of the commentors, this input will help guide continuing DWQ activities in the basin.

Goals of the Basinwide Approach

The primary goals of DWQ's basinwide program are to:

- identify water quality problems and restore full use to impaired waters;
- identify and protect high value resource waters;
- protect unimpaired waters while allowing for reasonable economic growth;
- develop appropriate management strategies to protect and restore water quality;
- assure equitable distribution of waste assimilative capacity for dischargers; and
- improve public awareness and involvement in the management of the state's surface waters.

Cape Fear River Basin Overview

The Cape Fear River basin is the state's largest river basin. The river basin is located entirely within the state's boundaries and flows southeast from the north central piedmont region near Greensboro to the Atlantic Ocean near Wilmington.

The Cape Fear River is formed at the confluence of the Haw and Deep Rivers on the border of Chatham and Lee counties, just below the B. Everett Jordan Reservoir dam. From there, the river flows across the coastal plain past Fayetteville through three locks and dams to Wilmington before entering the ocean. The Black and Northeast Cape Fear Rivers are blackwater systems that meet the Cape Fear River in Brunswick County.

The basin includes four coastal Outstanding Resource Waters (Stump Sound, Middle and Topsail Sounds, and Masonboro Sound) and one inland ORW (a portion of the Black River basin).

Over one-half of the land in the river basin is forested. Statistics provided by the US Department of Agriculture, Natural Resources Conservation Service (NRCS), indicate that during the 10-year period from 1982 to 1992, there was a significant increase in the amount of developed land (43%). The basin contains 54% of the state's swine operations, and swine populations in the basin have increased 90% between 1994 and 1998.

There are many different aquatic ecosystems in the Cape Fear River basin with a wide variety commercial and recreational fisheries. Wetlands, estuaries, blackwater rivers and rocky streams support 30 endangered species in the basin.

The most populated regions of the basin are in and near the Triad area (Greensboro-Burlington-High Point), the Durham-Chapel Hill area and Fayetteville. The overall population density is 160 persons per square mile compared to a statewide average of 139 persons per square mile. The percent population growth over the 7-year period from 1990 to 1997 was 13.2% compared to a statewide increase of 12.0%. Estimated water usage in the basin is expected to increase nearly 95% (193 MGD in 1992 to 376 MGD by 2020).

Assessment of Water Quality in the Cape Fear River Basin

Waters are classified according to their best intended uses. Determining how well a waterbody supports its designated uses is an important method of interpreting water quality data and assessing water quality. This determination results in a use support rating. The use support ratings refer to whether the classified uses of the water (such as water supply, aquatic life protection and swimming) are fully supported, partially supported or not supported. For instance, waters classified for fishing and water contact recreation (Class C) are rated as fully supporting if data used to determine use support (such as chemical/physical data collected at ambient sites or benthic macroinvertebrate bioclassifications) did not exceed specific criteria. However, if these criteria were exceeded, then the waters are rated as partially supporting or not supporting, depending on the degree of exceedence. Streams rated as either partially supporting or not supporting are considered *impaired.*

Twenty percent of the monitored waters in the Cape Fear River basin are rated as impaired according recent data (Table 1). Most of the impaired stream miles are located near urbanized areas. Approximately 34% (2,037.1 miles) of the named freshwater streams in the basin are monitored.

Table 1 Use Support Summary Information for All Monitored and Evaluated Streams in the Cape Fear River Basin (1999)

	Monitored and Evaluated Streams			Monitored Streams Only	
	Miles	**%**		**Miles**	**%**
Fully Supporting	4295.6	71		1647.3	81
Impaired	403.2	7		389.8	19
Partially Supporting	*285.8*	*5*		*276.2*	*13*
Not Supporting	*117.4*	*2*		*113.6*	*6*
Not Rated	1349.3	22			
Total Miles	6048.1			2037.1	

Jordan Reservoir

Nutrient over enrichment is a continuing potential source of impairment to the waters in the B. Everett Jordan Reservoir watershed. The Clean Water Responsibility Act (House Bill 515) was enacted in 1997 to further address ongoing problems associated with waters classified as NSW. The Act sets limits for nitrogen (TN) and phosphorus (TP) discharges to NSW waters. The limits apply to facilities discharging more than 0.5 MGD and that were in operation or had authorization to construct prior to July 1, 1997 and all facilities issued authorization to construct after that date.

Senate Bill 1366 granted extensions to compliance dates in watersheds affected by House Bill 515. The extension includes conditions that the dischargers must meet, including development of a calibrated nutrient response model. The municipalities of Greensboro, Mebane, Reidsville, Graham, Pittsboro, Burlington, and the Orange Water and Sewer Authority requested compliance extensions from the nutrient limits, primarily because of nitrogen. Compliance extension requests were received by DWQ prior to the statutory deadline of January 1, 1999. South Durham, Durham RTP and Cone Mills did not apply for the extension. Triangle J and Piedmont Council of Governments are administering the project and have to hired a consultant to perform the modeling tasks. They will report to the EMC two times a year.

Randleman Reservoir

In November 1998, waters in the proposed Randleman Reservoir watershed were reclassified to WS-IV CA. Rules have been adopted (15A NCAC 2B .0248 through .0251) to help prevent potential water quality problems in the proposed reservoir. The rules address point source discharges by not allowing new or expanding discharges into the watershed except for High Point Eastside WWTP. This facility will have to meet phosphorus limits established to protect water quality standards. The rules also address nonpoint source pollution in the Randleman Reservoir watershed with management strategies that maintain and protect riparian areas and require urban stormwater programs to be developed by local governments having land use authority in the watershed.

Highpoint Eastside WWTP will have to relocate its discharge point 1.5 miles downstream and establish effluent limits for phosphorus at a monthly average of 0.5 mg/l at a maximum flow of 26 MGD. Also, the facility would have to involve the EMC in any future decisions that might increase phosphorus above mass loading at 26 MGD and 0.5 mg/l.

Local governments are required to develop ordinances or modify existing water supply ordinances to protect riparian areas and implement stormwater management plans by January 1, 2000. All of the affected local governments have submitted their revised ordinances to meet the specifications set forth in the Randleman Lake Water Supply Watershed Nutrient Management Strategy (15A NCAC 2B .0248 through .0251) for approval by the EMC's Water Quality Committee.

Recommended Management Strategies for Restoring Impaired Waters

The long-range mission of basinwide management is to provide a means of addressing the complex problem of planning for increased development and economic growth, while protecting and/or restoring the quality and intended uses of the Cape Fear River basin's surface waters. In striving towards its mission, DWQ's highest priority near-term goals are to:

- identify and restore impaired waters in the basin;
- identify and protect high value resource waters and biological communities of special importance; and
- protect unimpaired waters while allowing for reasonable economic growth.

Impaired waters in the Cape Fear River basin and recommended strategies are summarized briefly in Table 2. For information on each stream segment refer to Section B.

Water quality problems are primarily attributed to nonpoint source pollution (NPS) and include urban runoff and sedimentation (resulting primarily from land clearing activities, loss of riparian vegetation and stormwater surges). However, some streams are degraded by point source pollution. For these streams, the plan presents a management strategy to reduce that pollutant source.

The task of quantifying nonpoint sources of pollution and developing management strategies for these impaired waters is very resource intensive. It is overwhelming, given the current limited resources of DWQ, other agencies (e.g., Division of Land Resources, Division of Soil and Water Conservation, Cooperative Extension Service, etc.) and local governments. Therefore, only limited progress towards restoring waters that are impaired by nonpoint sources can be expected during this five-year cycle unless substantial resources are put toward solving NPS problems.

DWQ plans to further evaluate impaired waters in the Cape Fear River basin in conjunction with other agencies that deal with nonpoint source pollution issues and develop management strategies for a portion of these impaired waters for the next *Cape Fear River Basinwide Water Quality Plan*.

Table 2 Impaired Waters in the Cape Fear River Basin*

Subbasin	Name of Stream	Miles	Rating	Major Source*	Management Strategy
03-06-01	Haw River	7.7	PS	NP	DWQ will monitor to evaluate extent of nonpoint source impacts from agricultural land uses.
03-06-01	Haw River	20.1	PS	NP	
03-06-01	Troublesome Creek	15.6	PS	NP	
03-06-01	Little Troublesome Creek	3.3	PS	NP	DWQ will monitor implementation of Phase II stormwater program.
03-06-01	Little Troublesome Creek	5.0	NS	NP	Develop TMDL for fecal coliform bacteria and stormwater program.
03-06-02	Haw River	19.2	PS	NP	Develop TMDL for fecal coliform bacteria and monitor to determine extent of nonpoint source pollution.
03-06-02	Brush Creek	5.6	PS	NP	Continue to monitor streams to evaluate implementation of Greensboro stormwater program.
03-06-02	Horsepen Creek	6.1	PS	NP	
03-06-02	Horsepen Creek	1.6	PS	NP	
03-06-02	Reedy Fork	8.6	PS	NP, P	Monitor to evaluate implementation of TMDL and Greensboro stormwater program in Buffalo Creek watershed.
03-06-02	North Buffalo Creek	8.7	NS	NP, P	Develop TMDL for fecal coliform bacteria and Greensboro stormwater program.
03-06-02	North Buffalo Creek	8.1	NS	NP, P	Develop TMDL to address ammonia and Greensboro stormwater program.
03-06-02	South Buffalo Creek	14.8	PS	NP	Greensboro stormwater program.
03-06-02	South Buffalo Creek	3.3	NS	NP	
03-06-02	South Buffalo Creek	4.0	NS	NP	Develop TMDL to address ammonia and Greensboro stormwater program.
03-06-03	Little Alamance Creek (Alamance County)	12.3	NS	NP	DWQ will monitor implementation of Phase II stormwater program.
03-06-04	Marys Creek	9.7	PS	NP	DWQ will monitor to evaluate extent of nonpoint source impacts from agricultural land use.
03-06-04	Robeson Creek	5.6	PS	NP, P	Develop TMDL to address nutrients. Local initiatives needed to address nonpoint source pollution.
03-06-04	Robeson Creek	0.6	PS	NP,P	
03-06-05	New Hope Creek	0.5	PS	NP	Develop TMDL for fecal coliform bacteria and Durham stormwater program.
03-06-05	New Hope Creek	24.5	PS	NP, P	
03-06-05	Northeast Creek	2.6	PS	NP, P	Develop TMDL for fecal coliform bacteria and Durham stormwater program.
03-06-05	Northeast Creek	5.8	PS	NP, P	
03-06-06	Little Creek	5.4	NS	NP	DWQ will monitor implementation of Phase II stormwater program.
03-06-06	Bolin Creek	1.0	PS	NP	
03-06-06	Booker Creek (Eastwood Lake)	3.6	PS	NP	
03-06-06	Booker Creek	1.2	PS	NP	
03-06-06	Booker Creek	0.8	PS	NP	
03-06-06	Little Creek	0.7	PS	NP	
03-06-06	Morgan Creek	4.5	PS	NP, P	
03-06-06	Meeting of the Waters	1.4	NS	NP	
03-06-06	Morgan Creek (including the Morgan Creek Arm of New Hope River Arm of Jordan Reservoir)	0.6	PS	NP, P	
03-06-07	Kenneth Creek	3.7	NS	NP, P	Local initiatives needed to address nonpoint source pollution.
03-06-07	Kenneth Creek	3.6	NS	NP, P	

Table 2 Impaired Waters in the Cape Fear River Basin* (con't)

Subbasin	Name of Stream	Miles	Rating	Major Source*	Management Strategy
03-06-08	East Fork Deep River	6.5	PS	NP	Monitor to evaluate continued implementation Greensboro stormwater program and evaluate nonpoint source impacts.
03-06-08	East Fork Deep River	0.6	PS	NP	
03-06-08	DEEP RIVER	1.3	PS	NP	
03-06-08	DEEP RIVER	0.9	PS	NP	
03-06-08	DEEP RIVER	2.0	PS	NP	Develop TMDL for fecal coliform bacteria and management strategy to address turbidity.
03-06-08	DEEP RIVER	6.8	PS	NP	
03-06-08	Richland Creek	6.4	NS	NP	Develop TMDL for fecal coliform bacteria and High Point stormwater program.
03-06-08	Richland Creek	2.6	NS	NP,P	
03-06-09	Haskett Creek	5.9	NS	NP	DWQ will monitor implementation of Phase II stormwater program.
03-06-09	Haskett Creek	1.3	NS	NP	
03-06-10	Cotton Creek	2.2	NS	P	DWQ will work with Star WWTP to evaluate and eliminate toxicity and determine extent of nonpoint source pollution.
03-06-10	Cotton Creek	3.9	PS	P	
03-06-12	Rocky River	10.6	PS	NP	DWQ will monitor to evaluate extent of nonpoint source impacts from agricultural land use.
03-06-12	Loves Creek	2.8	PS	NP	Local initiatives needed to address urban nonpoint source pollution.
03-06-12	Loves Creek	0.5	NS	NP, P	
03-06-14	Crane Creek (Crains Creek)	28.3	PS	NP	DWQ will monitor to evaluate extent of nonpoint source impacts from agricultural land use.
03-06-15	Cross Creek (Big Cross Creek)	9.0	NS	NP	DWQ will monitor to evaluate continued implementation of the Fayetteville stormwater program.
03-06-15	Cross Creek (Big Cross Creek	0.5	NS	NP	
03-06-15	Cross Creek (Big Cross Creek)	3.5	NS	NP	
03-06-15	Little Cross Creek	7.0	PS	NP	
03-06-15	Little Cross Creek	0.5	PS	NP	
03-06-15	Little Cross Creek	0.3	PS	NP	
03-06-16	Browns Creek (Cross Pond)	8.5	NS	NP	Local initiatives to address nonpoint source pollution.
03-06-17	CAPE FEAR RIVER	3.8	PS	P, NP	DWQ will monitor to evaluate source of impairment.
03-06-19	Stewarts Creek	15.0	PS	NP	DWQ will monitor to evaluate recovery from hurricanes.
03-06-21	Northeast Cape Fear River	3.3	NS	P	DWQ will continue to monitor impacts of discharges.
03-06-22	Muddy Creek	14.0	PS	NP	DWQ will monitor to evaluate recovery from hurricanes.
03-06-22	Rock Fish Creek (New Kirk Pond)	5.3	PS	NP, P	DWQ will monitor to evaluate recovery from hurricanes and desnagging operations.
03-06-22	Rock Fish Creek (New Kirk Pond)	3.4	PS	NP, P	
03-06-23	Burgaw Creek	9.5	NS	NP, P	DWQ will monitor to evaluate nonpoint source pollution.
03-06-23	Burnt Mill Creek	4.8	NS	NP	DWQ will monitor to evaluate nonpoint source pollution.

Key: NS = Not Supporting PS = Partially Supporting
NP = Nonpoint sources P = Point Sources

+ = Only limited progress towards developing and implementing NPS strategies for these impaired waters can be expected without additional resources.

* = These waters are also on the 303(d) list, and a TMDL and/or management strategy will be developed to remove the water from the list.

Addressing Waters on the State's 303(d) List

For the next several years, addressing water quality impairment in waters that are on the state's 303(d) list will be a DWQ priority. Section 303(d) of the federal Clean Water Act requires states to develop a list of waters not meeting water quality standards or which have impaired uses. (The waters in the Cape Fear River basin that are on this list are discussed in the individual subbasin descriptions in Section B.) States are also required to develop Total Maximum Daily Loads (TMDLs) or management strategies for 303(d) listed waters to address impairment. EPA issued guidance in August 1997 that called for states to develop schedules for developing TMDLs for all waters on the 303(d) list within 8-13 years.

There are approximately 2,387 impaired stream miles on the 303(d) list in NC. The rigorous and demanding task of developing TMDLs for each listed water during a 13-year time frame will require the focus of many resources. It will be a priority for North Carolina's water quality programs over the next several years to develop TMDLs for 303(d) listed waters. This task will be accomplished through the basinwide planning process and schedule.

Challenges Related to Achieving Water Quality Improvements

To achieve the goal of restoring impaired waters throughout the basin, DWQ will need to work more closely with other state agencies and stakeholders to identify and control pollutants. The costs of restoration will be high, but several programs exist to provide funding for restoration efforts. These programs include the Clean Water Management Trust Fund, the NC Agricultural Cost Share Program, the Wetlands Restoration Program, and the federally funded Conservation Reserve Enhancement Program.

With increased development occurring, there will be significant challenges ahead in balancing economic growth with the protection of water quality. Point source impacts on surface waters can be measured and addressed through the basinwide planning process. Nonpoint sources of pollution can be identified through the basinwide plan, but actions to address these impacts must be taken at the local level. Such actions should include: development and enforcement of local erosion control ordinances; requirement of stormwater best management practices for existing and new development; development and enforcement of buffer ordinances; and land use planning that assesses impacts on natural resources. This basinwide plan presents many water quality initiatives and accomplishments that are underway within the basin. These actions provide a foundation on which future initiatives can be built.