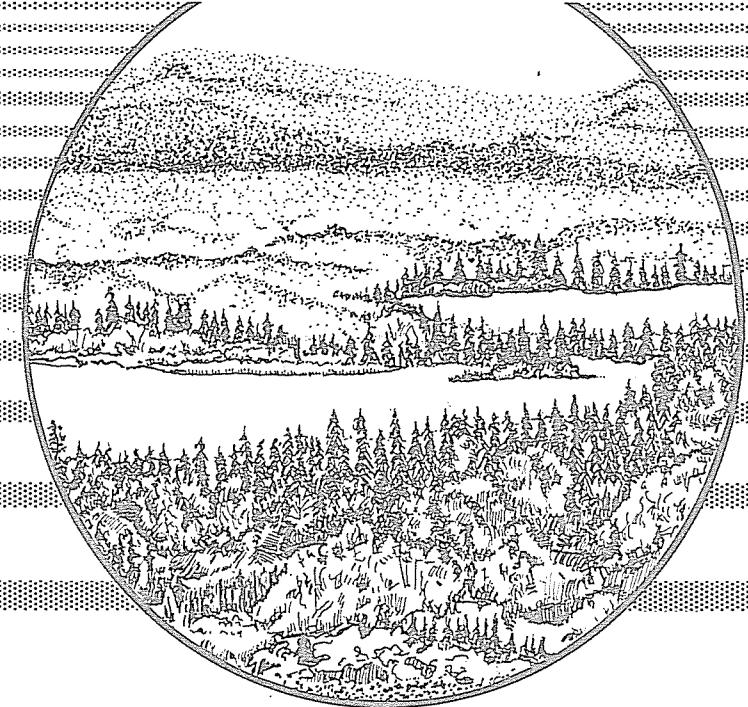


DISPLAY COPY

DO NOT REMOVE

# Catawba River



## Basinwide Water Quality Plan

North Carolina  
Department of Environment  
and Natural Resources



Division of Water Quality  
Water Quality Section - December 1999





Michael F. Easley, Governor  
William G. Ross Jr., Secretary  
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director  
Division of Water Quality

April 22, 2003

Thank you for your interest in North Carolina's water quality issues. Enclosed is the basinwide water quality plan that you recently requested from the Division of Water Quality (DWQ).

The basinwide planning program aims to identify and restore full use to impaired waters, identify and protect highly valued resource waters, and protect the quality and intended uses of North Carolina's surface waters while allowing for sound economic planning and reasonable growth. North Carolina relies on the input and experience of its public to ensure that the water quality plans are effective. DWQ coordinates plan development; however, plan implementation and effectiveness entails the coordinated efforts and endorsement of many agencies, groups, local governments, and the general public. Your participation is essential for us to achieve our goals.

Our website (<http://h2o.enr.state.nc.us/wqs/>) provides detailed information on our program, other basin plans, current events, publications, and rules and regulations. Please visit us at this site.

DWQ appreciates your interest in water quality issues, and we hope to continue working with you into the future. Please contact me if you have any further questions or ideas on specific basins at (919) 733-5083, ext. 354.

Sincerely,

Darlene Kucken  
Basinwide Planning Program Coordinator

Enclosure



**ADDENDUM: Use Support Changes for the Catawba River Basin**  
January 2000

The fully supporting but threatened (support-threatened, ST) category is no longer used as a use support rating. In the past, ST was used to identify a water that was fully supporting but had some notable water quality problems. ST could represent constant, degrading, or improving conditions. North Carolina's use of ST was very different from that of the US Environmental Protection Agency (EPA), which uses it to identify waters that are characterized by declining water quality. In addition, the US EPA requires the inclusion of ST waters on the 303(d) list in its proposed revision (August, 1999) to the 303(d) list rules (Appendix IV). Due to the difference between US EPA's and North Carolina's definitions of ST, North Carolina no longer uses this term. Because North Carolina has used fully supporting but threatened as a subset of fully supporting (FS) waters, those waters formerly called ST are now rated FS. This change is reflected in the 305(b) report for 2000. Based on this change, use support ratings for all basins have been altered. Revised use support ratings for the Catawba River basin are presented below.

**Streams and Rivers**

**Table A-22      Use Support Summary Information for All Monitored and Evaluated Streams in the Catawba River Basin (1999) (Found on p. 56 of this plan.)**

		Monitored and Evaluated Streams			Monitored Streams Only	
		Miles	%		Miles	%
Fully Supporting		2379.3	79			
Impaired		186.6	6			
	Partially Supporting	174.2	6		162.1	15
	Not Supporting	12.4	<1		7.4	1
Not Rated		439.5	15			

Table A-23      Use Support Determination for Monitored and Evaluated Freshwater Streams  
*(Found on p. 57 of this plan.)*

Catawba Use Support Ratings in Miles for 1993-1997					
Subbasin	Fully Supporting	Partially Supporting	Not Supporting	Not Rated	Total
030830	625.7	5.3	0	19.9	650.9
030831	558.3	35.3	0	75.6	669.2
030832	462.3	0	0	19.8	482.1
030833	147.5	9.8	0	10.1	167.4
030834	34.1	82.1	2.6	131.3	250.1
030835	391.9	19.0	0	81.2	492.1
030836	42.4	0.8	0	26.2	69.4
030837	14.5	21.9	9.8	26.8	73.0
030838	102.6	0	0	48.6	151.2
TOTAL	2375.3	174.2	12.4	443.5	3005.4
%	79	6	<1	15	100

### Lakes

Maiden Lake (p. 117) and the Catawba Creek and Crowders Creek Arms of Lake Wylie (p. 107) are now considered fully supporting.

# CATAWBA RIVER

## BASINWIDE WATER QUALITY PLAN

December, 1999

Prepared by:

North Carolina  
Division of Water Quality  
Water Quality Section  
1617 Mail Service Center  
Raleigh, NC 27699-1617

(919) 733-5083 ext. 354

*This document was approved and endorsed by the NC Environmental Management Commission on December 9, 1999 to be used as a guide by the NC Division of Water Quality in carrying out its Water Quality Program duties and responsibilities in the Catawba River basin. This plan is the first five-year update to the original Catawba River Basinwide Water Quality Management Plan approved by the NC Environmental Management Commission on February 9, 1995.*

**500 copies of this document were printed at a cost of \$4,713.25 or \$9.43 per copy.**



## TABLE OF CONTENTS

Executive Summary .....	x
Section A - General Basinwide Information .....	1
Chapter 1 - Introduction to Basinwide Water Quality Planning.....	2
1.1    What is Basinwide Water Quality Planning .....	2
1.2    Goals of Basinwide Water Quality Planning.....	2
1.3    Major Components of the Basinwide Plan .....	4
1.4    Features of Basinwide Water Quality Planning.....	4
1.5    Benefits of Basinwide Water Quality Planning.....	4
1.6    How to Get Involved.....	5
1.7    Other References.....	5
1.8    Division of Water Quality Functions and Locations .....	6
Chapter 2 - Catawba River Basin Overview.....	8
2.1    General Overview .....	8
2.2    Local Governments and Planning Jurisdictions in the Basin .....	11
2.3    Surface Water Hydrology .....	12
2.4    Land Cover.....	12
2.5    Population and Growth Trends .....	16
2.6    Natural Resources .....	21
2.6.1    Major Lakes .....	21
2.6.2    Ecological Significance of the Catawba River Basin.....	23
2.6.3    Public Lands in the Catawba River Basin .....	24
2.6.4    Significant Natural Heritage Areas.....	24
2.6.5    Rare Aquatic and Wetland-Dwelling Animal Species .....	27
2.7    Permitted Wastewater and Stormwater Discharge Facilities .....	28
2.7.1    Wastewater Discharges in the Catawba River Basin.....	28
2.7.2    Stormwater Discharges in the Catawba River Basin.....	30
2.8    Agriculture .....	31
2.9    Water Use and Minimum Streamflow .....	33
2.9.1    Local Water Supply Planning .....	33
2.9.2    Minimum Streamflow.....	34
2.9.3    Interbasin Transfers .....	34

Chapter 3 - Summary of Water Quality Information for the Catawba River Basin .....	38
3.1    General Sources of Pollution .....	38
3.2    Description of Surface Water Classifications and Standards .....	39
3.3    DWQ Water Quality Monitoring Programs in the Catawba River Basin .....	43
3.3.1    Benthic Macroinvertebrates.....	43
3.3.2    Fish Assessments .....	45
3.3.3    Aquatic Toxicity Monitoring.....	49
3.3.4    Lakes Assessment Program .....	50
3.3.5    Ambient Monitoring System Program .....	50
3.4    Other Water Quality Research.....	53
3.5    Use Support Summary .....	53
3.5.1    Introduction to Use Support.....	53
3.5.2    Revisions to Methodology Since 1992-1993 305(b) Report .....	54
3.5.3    Comparison of Use Support Ratings to Streams on the 303(d) List .....	54
3.5.4    Use Support Ratings for the Catawba River Basin.....	55
Chapter 4 - Water Quality Issues Related to Multiple Watersheds in the Catawba River Basin .....	59
4.1    Prior Basinwide Plan Recommendations and Achievements for Issues Related to Multiple Watersheds.....	59
4.1.1    Introduction.....	59
4.1.2    General Recommended Strategies for New and Expanding Dischargers to Lakes.....	59
4.1.3    Nutrient Management for Lake Wyylie.....	59
4.1.4    Color Reduction Strategy .....	65
4.1.5    South Fork Catawba River Watershed Toxics Review .....	67
4.2    Priority Issues and Recommendations for the Entire Basin During the Next Five Years .....	68
4.2.1    Introduction.....	68
4.2.2    Strategies for Restoring and Protecting Impaired Waters .....	69
4.2.3    Addressing Waters on the State's 303(d) List.....	69
4.2.4    Growth and Development and Stormwater Management .....	71
4.2.5    Water Supply Watershed Protection.....	73
4.2.6    Sedimentation Control .....	74
4.2.7    The Importance of Riparian Buffers.....	78
Section B - Water Quality Data and Information by Subbasin.....	80
Chapter 1 - Catawba River Subbasin 03-08-30 Includes Catawba River Headwaters .....	81
1.1    Water Quality Overview .....	81
1.2    Prior Basinwide Plan Recommendations (1995) and Achievements .....	85

1.2.1	Impaired Waters.....	85
1.3	Current Priority Issues and Recommendations .....	86
1.3.1	Monitored Impaired Waters.....	86
1.3.2	303(d) Listed Waters .....	87
1.3.3	Other Recommendations .....	87
<b>Chapter 2 - Catawba River Subbasin 03-08-31</b>		
Includes Warrior Fork, Johns River and Rhodhiss Lake .....	89	
2.1	Water Quality Overview .....	89
2.2	Prior Basinwide Plan Recommendations (1995) and Achievements .....	93
2.2.1	Impaired Waters.....	93
2.2.2	Other Recommendations .....	93
2.3	Current Priority Issues and Recommendations .....	94
2.3.1	Monitored Impaired Waters.....	94
2.3.2	303(d) Listed Waters .....	96
<b>Chapter 3 - Catawba River Subbasin 03-08-32</b>		
Includes the Little Rivers, Lake Hickory, Lookout Shoals Lake and Lake Norman .....	97	
3.1	Water Quality Overview .....	97
3.2	Prior Basinwide Plan Recommendations (1995) and Achievements .....	102
3.2.1	Impaired Waters.....	102
3.2.2	Other Recommendations .....	103
3.3	Current Priority Issues and Recommendations .....	104
3.3.1	Monitored Impaired Waters.....	104
3.3.2	303(d) Listed Waters .....	104
<b>Chapter 4 - Catawba River Subbasin 03-08-33</b>		
Includes Dutchmans Creek and Mountain Island Lake .....	105	
4.1	Water Quality Overview .....	105
4.2	Prior Basinwide Plan Recommendations (1995) and Achievements .....	108
4.2.1	Impaired Waters.....	108
4.2.2	Other Recommendations .....	109
4.3	Current Priority Issues and Recommendations .....	110
Monitored Impaired Waters.....	110	
4.3.2	303(d) Listed Waters .....	110
<b>Chapter 5 - Catawba River Subbasin 03-08-34</b>		
Includes Sugar Creek and its tributaries .....	111	
5.1	Water Quality Overview .....	111
5.2	Prior Basinwide Plan Recommendations (1995) and Achievements .....	114
5.3	Current Priority Issues and Recommendations .....	116

5.3.1	Monitored Impaired Waters.....	116
5.3.2	303(d) Listed Waters .....	118
<b>Chapter 6 - Catawba River Subbasin 03-08-35</b>		
Includes Henry Fork, Jacob Fork, Clark Creek, Indian Creek and South Fork Catawba River.....		120
6.1	Water Quality Overview.....	120
6.2	Prior Basinwide Plan Recommendations (1995) and Achievements .....	123
6.2.1	Impaired Waters.....	123
6.2.2	Other Recommendations .....	125
6.3	Current Priority Issues and Recommendations .....	125
6.3.1	Monitored Impaired Waters.....	125
6.3.2	303(d) Listed Waters .....	126
6.3.3	Other Issues and Recommendations.....	127
<b>Chapter 7 - Catawba River Subbasin 03-08-36</b>		
Includes Long Creek and lower South Fork Catawba River .....		128
7.1	Water Quality Overview.....	128
7.2	Prior Basinwide Plan Recommendations (1995) and Achievements .....	130
7.2.1	Impaired Waterbodies.....	130
7.2.2	Other Recommendations .....	131
7.3	Current Priority Issues and Recommendations .....	132
7.3.1	Monitored Impaired Waters.....	132
7.3.2	303(d) Listed Waters .....	132
<b>Chapter 8 - Catawba River Subbasin 03-08-37</b>		
Includes Crowders Creek and its tributaries .....		133
8.1	Water Quality Overview.....	133
8.2	Prior Basinwide Plan Recommendations (1995) and Achievements .....	135
8.2.1	Impaired Waterbodies.....	135
8.2.2	Other Recommendations .....	136
8.3	Current Priority Issues and Recommendations .....	136
8.3.1	Monitored Impaired Waters.....	136
8.3.2	303(d) Listed Waters .....	137
<b>Chapter 9 - Catawba River Subbasin 03-08-38</b>		
Includes Sixmile Creek, Waxhaw Creek and Twelvemile Creek.....		138
9.1	Water Quality Overview.....	138
9.2	Prior Basinwide Plan Recommendations (1995) and Achievements .....	140
9.2.1	Impaired Waterbodies.....	140
9.2.2	Other Issues.....	140
9.3	Current Priority Issues and Recommendations .....	141
9.3.1	Monitored Impaired Waters.....	141

---

9.3.2 303(d) Listed Waters .....	141
Section C - Current and Future Water Quality Initiatives ..... 142	
Chapter 1 - Current Water Quality Initiatives .....	143
1.1 Workshop Summaries.....	143
1.2 Recommendations from Other Sources .....	145
1.3 Federal Initiatives .....	150
1.3.1 Section 319 - National Monitoring Program.....	150
1.3.2 Section 319 – Base Program.....	150
1.4 State Initiatives .....	152
1.4.1 NC Wetlands Restoration Program .....	152
1.4.2 Clean Water Management Trust Fund.....	153
1.4.3 Nicholas School of the Environment at Duke University .....	153
1.5 Local Initiatives .....	154
1.5.1 Western Piedmont Council of Governments (WPCOG).....	154
1.5.2 Mecklenburg County Department of Environmental Protection.....	155
1.5.3 City of Charlotte Storm Water Services .....	156
1.5.4 Initiative for Mountain Island Lake.....	158
1.5.5 Muddy Creek Watershed Restoration Initiative .....	158
1.6 Corporate Initiatives .....	159
1.6.1 Duke Power.....	159
1.7 Citizen Efforts.....	159
1.7.1 Catawba River Foundation and the Riverkeeper Program .....	159
1.7.2 Gaston County Quality of Natural Resources Commission (QNRCC) .....	160
1.7.3 Catawba Lands Conservancy (CLC) .....	160
1.7.4 Lake Norman Marine Commission .....	161
1.7.5 Lake Wylie Marine Commission.....	161
1.7.6 Mountain Island Lake Marine Commission .....	162
1.7.7 Trust for Public Land Mountain Island Lake Technical Study .....	163
1.8 Regional Activities .....	163
1.8.1 Catawba River Bi-State Task Force .....	163
1.8.2 Catawba Water Quality Consortium (CWQC) .....	163
1.8.3 Voices and Choices.....	163
Chapter 2 - Future Water Quality Initiatives .....	165
2.1 Overall DWQ Goals for the Future.....	165
2.2 DWQ Compliance and Enforcement Policy Revisions .....	168



## APPENDICES

- I      NPDES Dischargers and Individual Stormwater Permits in the Catawba River Basin
- II     Water Quality Data Collected by DWQ
  - Benthic Macroinvertebrate Collections
  - Fish Community Assessments
- III    Use Support Methodology and Use Support Ratings
- IV    303(d) Listing and Reporting Methodology
- V    Other Recommendations
  - Catawba Riverkeeper Platform
  - Mountain Island Lake Marine Commission
  - Lake Wylie Marine Commission
  - Mecklenburg County Department of Environmental Protection
- VI    Glossary of Terms and Acronyms



## LIST OF FIGURES

Figure A-1	Basinwide Planning Schedule (1999 to 2003) .....	2
Figure A-2	Water Quality Section Organization Structure.....	6
Figure A-3	Division of Water Quality Regional Offices .....	7
Figure A-4	General Map of the Entire Catawba River Basin .....	9
Figure A-5	General Map of the Catawba River Basin in North Carolina.....	10
Figure A-6	Land Cover Changes from 1982 to 1992 for the Catawba River Basin.....	14
Figure A-7	Percentages within Major Land Cover Categories in the Catawba River Basin.....	16
Figure A-8	1990 Population Density by Census Block Group.....	18
Figure A-9	Population Growth by Subbasin (1970 to 1990).....	19
Figure A-10	Catawba River Chain Lakes .....	22
Figure A-11	Significant Natural Heritage Areas of the Catawba River Basin .....	25
Figure A-12	Location of NPDES Permitted Discharges in the Catawba River Basin .....	29
Figure A-13	Registered Animal Operations in the Catawba River Basin .....	32
Figure A-14	NC Division of Water Resources Interbasin Map of Major River Basins and Subbasins.....	36
Figure A-15	Water Supply Watersheds, Outstanding Resource Waters and High Quality Waters in the Catawba River Basin.....	42
Figure A-16	The North Carolina Index of Biotic Integrity for the Catawba River Basin (1997) .....	47
Figure A-17	The North Carolina Index of Biotic Integrity for the Catawba River Basin 1993 (shaded bars) vs. 1997 (solid bars) .....	48
Figure A-18	NCTSI Scores for Lakes in the Catawba River Basin (1997).....	50
Figure A-19	Use Support Ratings for the Upper Catawba River Basin .....	57
Figure A-20	Use Support Ratings for the Lower Catawba River Basin.....	58
Figure A-21	Overall Permitted Pollutant Reductions to the Lake Wylie Watershed Since the 1995 Catawba River Basinwide Plan .....	64
Figure B-1	Sampling Locations within Subbasin 03-08-30 .....	82
Figure B-2	Sampling Locations within Subbasin 03-08-31 .....	90
Figure B-3	Sampling Locations within Subbasin 03-08-32 .....	98
Figure B-4	Sampling Locations within Subbasin 03-08-33 .....	106
Figure B-5	Sampling Locations within Subbasin 03-08-34 .....	112
Figure B-6	Proposed TMDL Development for the Watershed of Lake Wateree, South Carolina .....	119
Figure B-7	Sampling Locations within Subbasin 03-08-35 .....	121
Figure B-8	Sampling Locations within Subbasin 03-08-36 .....	129
Figure B-9	Sampling Locations within Subbasin 03-08-37 .....	134
Figure B-10	Sampling Locations within Subbasin 03-08-38 .....	139



## LIST OF TABLES

Table 1	Use Support Summary for All Monitored and Evaluated Streams in the Catawba River Basin (1999) .....	xi
Table 2	Impaired Waters Within the Catawba River Basin (as of 1999).....	xiii
Table A-1	Schedule for Second Round of Basinwide Planning (1998 to 2003).....	3
Table A-2	Five-Year Process for Development of an Individual Basinwide Management Plan.....	3
Table A-3	Local Governments and Planning Units within the Catawba River Basin .....	11
Table A-4	Hydrologic Subdivisions in the Catawba River Basin.....	12
Table A-5	Estimated Land Use Acreage for the Catawba River Basin - 1982 vs. 1992.....	13
Table A-6	Description of Land Cover Types (1992 NRI-USDA SCS) .....	14
Table A-7	Description of Land Cover Categories.....	15
Table A-8	Catawba River Subbasin Population (1970, 1980 and 1990), Percent Population Change and Land Area Summaries .....	17
Table A-9	Population and Percent Change (1980, 1990, 1996) for Municipalities Greater Than 2,000 Located Wholly or Partly in the Catawba River Basin .....	20
Table A-10	Past and Projected Population and Percent Change (1990 to 2015) by County ...	21
Table A-11	Statistics on Major Lakes in the Catawba River Basin .....	23
Table A-12	Rare and Aquatic Animals in the Catawba River Basin .....	27
Table A-13	Summary of NPDES Dischargers and Permitted Flows for the Catawba River Basin.....	30
Table A-14	Registered Animal Operations in the Catawba River Basin (as of 4/98).....	33
Table A-15	Estimated Populations of Swine (1998, 1994 and 1990), Dairy (1998 and 1994) and Poultry (1998 and 1994) in the Catawba River Basin .....	33
Table A-16	Minimum Streamflow Projects in the Catawba River Basin .....	35
Table A-17	Interbasin Transfers in the Catawba River Basin .....	37
Table A-18	Primary and Supplemental Surface Water Classifications (Primary classifications beginning with an "S" are assigned to saltwaters).....	40
Table A-19	Biological Ratings for Recent Samplings in the Catawba River Basin .....	44
Table A-20	Long-Term Changes in Water Quality Using Benthic Macroinvertebrate Samples .....	45
Table A-21	Scores, Integrity Classes and Class Attributes for Evaluating a Wadeable Stream Using the North Carolina Index of Biotic Integrity .....	46
Table A-22	Summary of Compliance with Aquatic Toxicity Tests in the Catawba River Basin.....	49
Table A-23	Ambient Monitoring System Stations within the Catawba River Basin .....	52
Table A-24	Fecal Coliform Summary Data for the Catawba River Basin - 1993 to 1997.....	53
Table A-25	Use Support Summary Information for All Monitored and Evaluated Streams in the Catawba River Basin (1999) .....	55
Table A-26	Use Support Determination for Monitored and Evaluated Freshwater Streams ...	56
Table A-27	Impaired Waters within the Catawba River Basin (as of 1999).....	70
Table A-28	Recommended Actions to Prevent Construction-Related Sediment Problems....	77
Table B-1	Biological Assessment Sites in Catawba River Subbasin 03-08-30 (1997).....	83
Table B-2	Biological Assessment Sites in Catawba River Subbasin 03-08-31 (1997).....	91

Table B-3	Biological Assessment Sites in Catawba River Subbasin 03-08-32 (1997).....	99
Table B-4	Biological Assessment Sites in Catawba River Subbasin 03-08-33 (1997).....	107
Table B-5	Biological Assessment Sites in Catawba River Subbasin 03-08-34 (1997).....	113
Table B-6	Biological Assessment Sites in Catawba River Subbasin 03-08-35 (1997).....	122
Table B-7	Biological Assessment Sites in Catawba River Subbasin 03-08-36 (1997).....	130
Table B-8	Biological Assessment Sites in Catawba River Subbasin 03-08-37 (1997).....	135
Table B-9	Biological Assessment Sites in Catawba River Subbasin 03-08-38 (1997).....	138
Table C-1	Section 319 Projects in the Catawba River Basin .....	151
Table C-2	Projects in the Catawba River Basin Funded by the Clean Water Management Trust Fund (as of 7/99) .....	154