Hiwassee River Basinwide Water Quality Plan

North Carolina Department of Environment and Natural Resources
Division of Water Quality
Water Quality Section March, 2002
HIWASSEE RIVER BASINWIDE WATER QUALITY PLAN

FINAL DRAFT

for the
Environmental Management Commission

March 2002

Prepared by:

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

Callie Dobson
callie.dobson@ncmail.net
(919) 733-5083 ext. 583
# TABLE OF CONTENTS

Executive Summary .............................................................................................................. ix

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 Benefits of Basinwide Water Quality Planning ................................................ 4
  1.5 How to Get Involved ...................................................................................... 5
  1.6 Other References ............................................................................................ 5
  1.7 Division of Water Quality Functions and Locations ........................................ 6

Chapter 2 – Basin Overview ............................................................................................... 8
  2.1 General Overview .......................................................................................... 8
  2.2 Local Governments and Planning Jurisdictions in the Basin ......................... 11
  2.3 Surface Water Hydrology ............................................................................. 11
  2.4 Land Cover ................................................................................................... 12
  2.5 Population and Growth Trends .................................................................... 16
  2.6 Natural Resources ....................................................................................... 17
    2.6.1 Rare Aquatic and Wetland-Dwelling Species ..................................... 18
    2.6.2 Significant Natural Heritage Areas in the Hiwassee River Basin .... 20
    2.6.3 Public Lands in the Hiwassee River Basin .................................... 22
  2.7 Permitted Wastewater and Stormwater Discharge Facilities ....................... 22
    2.7.1 Wastewater Discharges in the Hiwassee River Basin .................... 23
    2.7.2 Stormwater Discharges in the Hiwassee River Basin ................. 24
  2.8 Animal Operations ....................................................................................... 26
  2.9 Water Use and Minimum Streamflow ......................................................... 27
    2.9.1 Local Water Supply Planning ......................................................... 27
    2.9.2 Water Withdrawals ........................................................................ 28
    2.9.3 Interbasin Transfers ....................................................................... 29
    2.9.2 Minimum Streamflow .................................................................... 29

Chapter 3 – Summary of Water Quality Information for the Hiwassee River Basin .......... 31
  3.1 General Sources of Pollution ....................................................................... 31
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>Description of Surface Water Classifications and Standards</td>
<td>32</td>
</tr>
<tr>
<td>3.3</td>
<td>DWQ Water Quality Monitoring Programs in the Hiwassee River Basin</td>
<td>36</td>
</tr>
<tr>
<td>3.3.1</td>
<td>Benthic Macroinvertebrates</td>
<td>36</td>
</tr>
<tr>
<td>3.3.2</td>
<td>Fish Assessments</td>
<td>38</td>
</tr>
<tr>
<td>3.3.3</td>
<td>Aquatic Toxicity Monitoring</td>
<td>39</td>
</tr>
<tr>
<td>3.3.4</td>
<td>Lake Assessment</td>
<td>39</td>
</tr>
<tr>
<td>3.3.5</td>
<td>Ambient Monitoring System Program</td>
<td>40</td>
</tr>
<tr>
<td>3.4</td>
<td>Other Water Quality Research</td>
<td>41</td>
</tr>
<tr>
<td>3.5</td>
<td>Use Support Summary</td>
<td>43</td>
</tr>
<tr>
<td>3.5.1</td>
<td>Introduction to Use Support</td>
<td>43</td>
</tr>
<tr>
<td>3.5.2</td>
<td>Comparison of Use Support Ratings to Streams on the Section 303(d) List</td>
<td>44</td>
</tr>
<tr>
<td>3.5.3</td>
<td>Use Support Ratings for the Hiwassee River Basin</td>
<td>44</td>
</tr>
<tr>
<td>4.1</td>
<td>Overview</td>
<td>49</td>
</tr>
<tr>
<td>4.2</td>
<td>Habitat Degradation</td>
<td>49</td>
</tr>
<tr>
<td>4.2.1</td>
<td>Sedimentation</td>
<td>49</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Loss of Riparian Vegetation</td>
<td>52</td>
</tr>
<tr>
<td>4.2.3</td>
<td>Channelization</td>
<td>53</td>
</tr>
<tr>
<td>4.2.4</td>
<td>Recommendations for Reducing Habitat Degradation</td>
<td>54</td>
</tr>
<tr>
<td>4.3</td>
<td>Urban Runoff</td>
<td>54</td>
</tr>
<tr>
<td>4.3.1</td>
<td>Rural Development</td>
<td>55</td>
</tr>
<tr>
<td>4.3.2</td>
<td>Urbanization</td>
<td>55</td>
</tr>
<tr>
<td>4.3.3</td>
<td>Stormwater Regulations</td>
<td>56</td>
</tr>
<tr>
<td>4.3.4</td>
<td>Recommendations</td>
<td>56</td>
</tr>
<tr>
<td>4.4</td>
<td>Mining Activities in Streams</td>
<td>56</td>
</tr>
<tr>
<td>4.5</td>
<td>Straight Pipes and Failing Septic Systems</td>
<td>57</td>
</tr>
<tr>
<td>4.6</td>
<td>Protecting Headwaters</td>
<td>59</td>
</tr>
<tr>
<td>4.6</td>
<td>Priority Issues for the Next Five Years</td>
<td>60</td>
</tr>
<tr>
<td>4.6.1</td>
<td>Addressing Waters on the State’s Section 303(d) List</td>
<td>60</td>
</tr>
<tr>
<td>4.6.2</td>
<td>Strategies for Addressing Notable Water Quality Concerns in Unimpaired Waters</td>
<td>61</td>
</tr>
<tr>
<td>1.1</td>
<td>Water Quality Overview</td>
<td>63</td>
</tr>
</tbody>
</table>

---

Section B – Water Quality Data and Information by Subbasin

Chapter 1 – Hiwassee River Subbasin 04-05-01
Includes Chatuge Lake, Shooting Creek and Brasstown Creek

1.1 Water Quality Overview
1.2 Status and Recommendations for Previously Impaired Waters .............. 66
  1.2.1 Brasstown Creek ............................................................................. 66

1.3 Status and Recommendations for Newly Impaired Waters .................. 67

1.4 303(d) Listed Waters ......................................................................... 67

1.5 Other Water Quality Concerns and Recommendations ....................... 67
  1.5.1 Shooting Creek .............................................................................. 68
  1.5.2 Town Creek ................................................................................... 68
  1.5.3 Hiwassee River (below Chatuge Dam) .......................................... 69
  1.5.4 Hyatt Mill Creek
     Blair Creek ..................................................................................... 69

Chapter 2 – Hiwassee River Subbasin 04-05-02
Includes Hiwassee and Apalachia Lakes and Valley River ......................... 70

2.1 Water Quality Overview ..................................................................... 70

2.2 Status and Recommendations for Previously Impaired Waters .......... 73
  2.2.1 Valley River ................................................................................... 73
  2.2.2 Webb Creek .................................................................................. 74

2.3 Status and Recommendations for Newly Impaired Waters .................. 75

2.4 303(d) Listed Waters ......................................................................... 75

2.5 Other Water Quality Impacts and Recommendations ......................... 75
  2.5.1 Nottely River ............................................................................... 75

2.6 Additional Issues of Concern within this Subbasin ............................... 76
  2.6.1 NPDES Discharges ....................................................................... 76

Section C – Current and Future Water Quality Initiatives........................ 77

Chapter 1 – Current Water Quality Initiatives ........................................ 78

1.1 Workshop Summaries ........................................................................ 78

1.2 Federal Initiatives............................................................................... 79
  1.2.1 Clean Water Act – Section 319 Program ........................................ 79
  1.2.2 USDA – NRCS Environmental Quality Incentives Program
       (EQIP) ......................................................................................... 80
  1.2.3 Tennessee Valley Authority.......................................................... 80

1.3 State Initiatives.................................................................................... 82
  1.3.1 Clean Water Management Trust Fund .......................................... 82
  1.3.2 NC Wetlands Restoration Program .............................................. 82
  1.3.3 Wildlife Resources Commission – Habitat Conservation
       Program ..................................................................................... 83
  1.3.4 NC Agricultural Cost Share Program ........................................... 84
<table>
<thead>
<tr>
<th>1.4</th>
<th>Regional Initiatives ................................................................. 85</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4.1</td>
<td>Hiwassee Interagency Team ..................................................... 85</td>
</tr>
<tr>
<td>1.4.2</td>
<td>The Nature Conservancy .......................................................... 85</td>
</tr>
<tr>
<td>1.5</td>
<td>Local Initiatives ........................................................................ 86</td>
</tr>
<tr>
<td>1.5.1</td>
<td>Hiwassee River Watershed Coalition ........................................... 86</td>
</tr>
</tbody>
</table>

Chapter 2 – Future Water Quality Initiatives ................................................................................ 87

2.1 Overall DWQ Goals for the Future ......................................................................................... 87
2.2 DWQ Compliance and Enforcement Policy Revisions ......................................................... 90
APPENDICES

I. NPDES Dischargers in the Hiwassee River Basin

II. Biological Water Quality Data Collected by DWQ
   • Benthic Macrinvertebrate Collections
   • Lakes Assessment

III. Use Support Methodology and Use Support Ratings

IV. 303(d) Listing and Reporting Methodology

V. Hiwassee River Basin Summary of Public Comment

VI. Hiwassee River Basin Nonpoint Source Program Description and Contacts

VII. 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 Tennessee River Valley Including the Hiwassee River Basin ............................................................................................................. 9
Figure A-5 General Map of the North Carolina Portion of the Hiwassee River Basin .................. 10
Figure A-6 Land Cover Changes from 1982 to 1997 for the Hiwassee River Basin ...................... 14
Figure A-7 Percentages within Major CGIA Land Cover Categories in the Hiwassee River Basin ...................................................................................................................... 15
Figure A-8 Natural Heritage Areas and Public Lands in the Hiwassee River Basin ...................... 20
Figure A-9 Location of NPDES Permitted Dischargers in the Hiwassee River Basin .................... 25
Figure A-10 Estimated Self-Supplied Water Use in the Hiwassee River Basin .............................. 28
Figure A-11 Water Supply Watersheds, Trout Waters, High Quality Waters and Outstanding Resource Waters in the Hiwassee River Basin ..................................................... 35
Figure A-12 Bioclassifications for 15 Hiwassee River Basin Benthic Macroinvertebrate Sites Sampled by DWQ in 1999 ........................................................................... 38
Figure A-13 Summary of Compliance with Aquatic Toxicity Tests in the Hiwassee River Basin (1999) .................................................................................................................. 39
Figure A-14 North Carolina Trophic State Index Scores for Lakes in the Hiwassee River Basin ....................................................................................................................... 40
Figure A-15 Use Support Ratings for Monitored Waters in the Hiwassee River Basin .................. 48
Figure B-1 Sampling Locations within Subbasin 04-05-01 ............................................................. 64
Figure B-2 Sampling Locations within Subbasin 04-05-02 ............................................................. 71
Figure C-1 Percent of Total Attendance by Various Interests at DWQ Water Quality Workshops in the Hiwassee River Basin (2000) ................................................................. 78
Figure C-2 Agriculture Cost Share Program Dollars Expended (1995-1999) in Counties in the Hiwassee River Basin ............................................................................................ 85
**LIST OF TABLES**

Table 1 Aquatic Life/Secondary Recreation Use Support Summary Information for Waters in the Hiwassee River Basin (1999) ........................................................... xi

Table 2 Primary Recreation Use Support Summary Information for Waters in the Hiwassee River Basin (1999) ................................................................................ xii

Table 3 Water Supply Use Support Summary Information for Waters in the Hiwassee River Basin (1999) ................................................................................................ xii

Table A-1 Schedule for Second Cycle of Basinwide Planning (1998 to 2003) ....................... 3

Table A-2 Five-Year Process for Development of an Individual Basinwide Water Quality Plan .......................................................................................................................... 3

Table A-3 Local Governments and Planning Units within the Hiwassee River Basin .......... 11

Table A-4 Hydrologic Subdivisions in the Hiwassee River Basin ...................................... 11

Table A-5 Statistics for Major Lakes (Entire Size Calculations) in the Hiwassee River Basin ............................................................................................................................... 12

Table A-6 Land Cover in the Hiwassee River Basin by Major Watersheds – 1982 vs. 1997 ......................................................................................................................................... 13

Table A-7 Description of Land Cover Types ........................................................................ 14

Table A-8 Description of Major CGIA Land Cover Categories ......................................... 15

Table A-9 Hiwassee River Subbasin Population, Densities (1970, 1980 and 1990) and Land Area Summaries ........................................................................................... 16

Table A-10 Population and Percent Change for Municipalities Located Wholly or Partly in the Basin............................................................................................................ 17

Table A-11 Past and Projected Population (1990, 2000, 2020) and Population Change by County ................................................................................................................... 17

Table A-12 Rare Aquatic and Wetland-Dwelling Species (as of November 2000) ............... 18

Table A-13 Summary of NPDES Dischargers and Permitted Flows for the Hiwassee River Basin (as of February 2001) .................................................................................. 24

Table A-14 Estimated Populations of Swine, Dairy and Poultry in the Hiwassee River Basin (1998 and 1994) ........................................................................................................ 27

Table A-15 Registered Water Withdrawals in the Hiwassee River Basin .......................... 28

Table A-16 Minimum Streamflow Projects in the Hiwassee River Basin ............................. 29

Table A-17 Primary and Supplemental Surface Water Classifications .................................. 32

Table A-18 Summary of Benthic Macroinvertebrate Ratings for All Freshwater Benthos Sites (using the most recent rating for each site) in the Hiwassee River Basin .... 37

Table A-19 Ambient Monitoring System Stations within the Hiwassee River Basin ............ 40

Table A-20 Summary of Fecal Coliform Bacteria Collections from the Hiwassee River Basin Ambient Monitoring Stations (1973-1999) .............................................. 41

Table A-21 Biological and Habitat Data Collected by the Tennessee Valley Authority from the Hiwassee River Basin, March 1999 ........................................................................ 42

Table A-22 Aquatic Life/Secondary Recreation Use Support Ratings for Monitored and Evaluated Waters Listed by Subbasin (1995-1999) ......................................................... 45
Table A-23  Aquatic Life/Secondary Recreation Use Support Summary Information for
Waters in the Hiwassee River Basin (1999) .......................................................... 45
Table A-24  Primary Recreation Use Support Ratings for Monitored and Evaluated Waters
Listed by Subbasin (1995-1999) ........................................................................... 46
Table A-25  Primary Recreation Use Support Summary Information for Waters in the
Hiwassee River Basin (1999) ................................................................................ 46
Table A-26  Water Supply Use Support Summary Information for Waters in the Hiwassee
River Basin (1999) .............................................................................................. 47
Table B-1   DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications
(1999) for Hiwassee River Subbasin 04-05-01 ..................................................... 65
Table B-2   Use Support Ratings Summary (2000) for Monitored Lakes (acres) in Hiwassee
River Subbasin 04-05-01 ....................................................................................... 65
Table B-3   Use Support Ratings Summary (2000) for Monitored and Evaluated Freshwater
Streams (miles) in Hiwassee River Subbasin 04-05-01 ........................................ 66
Table B-4   DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications
(1999) for the Hiwassee River Subbasin 04-05-02 ............................................. 72
Table B-5   Use Support Ratings Summary (2000) for Monitored Lakes (acres) in Hiwassee
River Subbasin 04-05-02 ....................................................................................... 73
Table B-6   Use Support Ratings Summary (2000) for Monitored and Evaluated Freshwater
Streams (miles) in Hiwassee River Subbasin 04-05-02 ........................................ 73
Table C-1   Wetlands Restoration Program Targeted Local Watersheds (2001) ............... 83