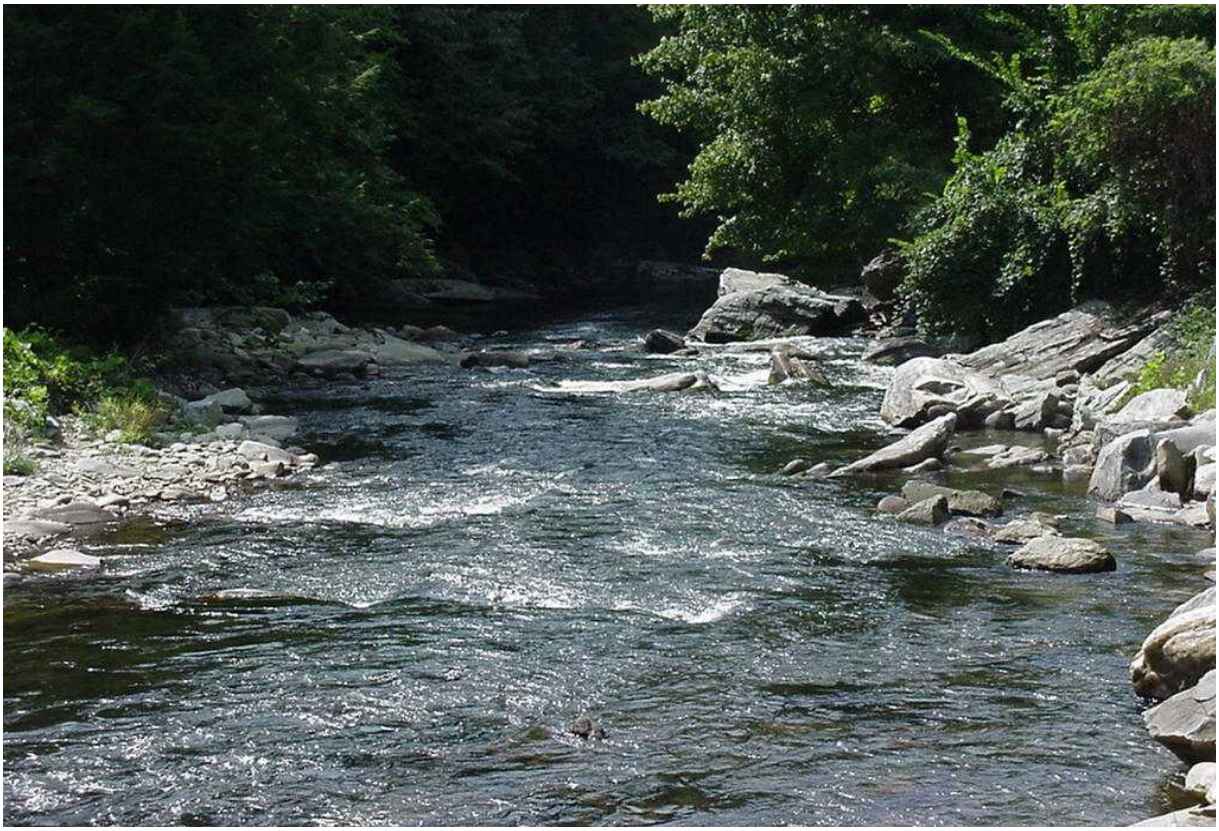
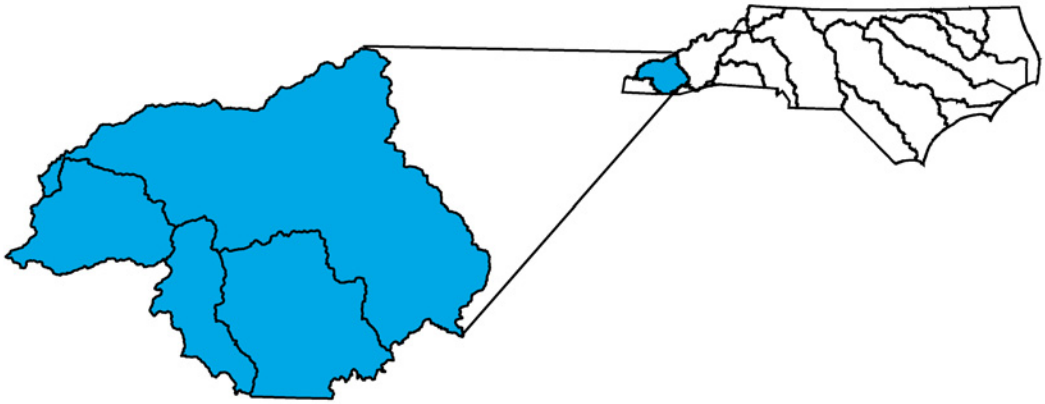


Little Tennessee River Basinwide Water Quality Plan

March 2007



North Carolina Department of
Environment and Natural Resources

Division of Water Quality
Basinwide Planning Unit

LITTLE TENNESSEE RIVER BASIN WATER QUALITY PLAN

March 2007

NC Department of Environment & Natural Resources
Division of Water Quality
Water Quality Section
1617 Mail Service Center
Raleigh, NC 27699-1617

(919) 733-5083 ext. 577

This document was approved and endorsed by the NC Environmental Management Commission on March 8, 2007 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 Little Tennessee River basin. This plan is the third five-year update to the Little Tennessee River Basinwide Water Quality Plan approved by the NC Environmental Management Commission in May 1997.

TABLE OF CONTENTS

Executive Summary i

Introduction 1

What is Basinwide Water Quality Planning? 1

Goals of Basinwide Water Quality Planning 1

Benefits of Basinwide Water Quality Planning 2

How You Can Get Involved 2

Division of Water Quality Functions and Locations 2

Some Other Reference Materials 4

How to Read the Basinwide Plan 4

Chapter 1 Little Tennessee River Subbasin 04-04-01 7

1.1 Subbasin Overview 7

1.2 Use Support Assessment Summary 17

1.3 Status and Recommendations of Previously and Newly Impaired Waters 17

1.3.1 Little Tennessee River [AU# 2-(1)a] 17

1.3.2 Upper Cullasaja River Watershed Including Cullasaja River (Ravenel Lake) [AU# 2-21-(0.5)] and Mill Creek [AU# 2-21-3] 18

1.4 Status and Recommendations for Waters with Noted Impacts 22

1.4.1 Burningtown Creek [AU# 2-38] 22

1.4.2 Cartoogechaye Creek Watershed Including Cartoogechaye Creek [AU# 2-19-(1) and 2-19-(10.5)], Allison Creek [AU# 2-19-3], Blaine Branch [AU# 2-19-13], Jones Creek [AU# 2-19-2], Mill Creek [AU# 2-19-9], Wayah Creek [AU# 2-19-8-(8)] 23

1.4.3 Cowee Creek [AU# 2-29] 24

1.4.4 Iotla Creek [AU# 2-27] 24

1.4.5 Little Tennessee River and Lake Emory [AU# 2-(1)b and 2-(1)c] 25

1.4.6 Rabbit Creek [AU# 2-23] 26

1.4.7 Walnut Creek [AU# 2-21-17] 27

1.5 Additional Water Quality Issues within Subbasin 04-04-01 27

1.5.1 The Land Trust for the Little Tennessee River Corridor Protection Project: Protecting Water Quality Through Land Conservation 28

1.5.2 Management Strategies for Water Quality Protection 29

1.5.3 Septic System Concerns 31

1.5.4 Floodplain Protection 32

1.5.5 Special Management Strategies for Threatened and Endangered Species 32

Chapter 2 Little Tennessee River Subbasin 04-04-02 35

2.1 Subbasin Overview 35

2.2 Use Support Assessment Summary 45

2.3 Status and Recommendations of Previously and Newly Impaired Waters.....45
2.3.1 Beech Flats Prong [AU# 2-79-55-2a].....45
2.3.2 Savannah Creek [AU# 2-79-36].....46
2.3.3 Scotts Creek [AU# 2-79-39].....48
2.3.4 Tuckasegee River [AU# 2-79-(35.5)a, 2-79-(38), and 2-(78)a].....50

2.4 Status and Recommendations for Waters with Noted Impacts.....53
2.4.1 Alarka Creek [AU# 2-69-(2.5)].....53
2.4.2 Camp Creek [AU# 2-79-49].....54
2.4.3 Cullowhee Creek [AU# 2-79-31a & b].....54
2.4.4 Panther Creek [AU# 2-115].....55
2.4.5 Stecoah Creek [AU# 2-130].....55

2.5 Additional Water Quality Issues within Subbasin 04-04-02.....56
2.5.1 Fontana Lake Waste Recovery.....56
2.5.2 Management Strategies for Water Quality Protection.....57
2.5.3 North Shore Fontana Lake Stream Reclassification.....58
2.5.4 Federal Energy Regulatory Commission Hydropower Relicensing.....59
2.5.5 Kirkland Creek [AU# 2-79-61-(2)] and Other Tuckasegee River Tributaries59
2.5.6 General Support for Volunteer Watershed Associations.....60
2.5.7 Septic System Concerns.....62
2.5.8 Floodplain Protection.....63
2.5.9 Special Management Strategies for Threatened and Endangered Species ...64

Chapter 3 Little Tennessee River Subbasin 04-04-03.....65

3.1 Subbasin Overview.....65

3.2 Use Support Assessment Summary.....69

3.3 Status and Recommendations of Previously and Newly Impaired Waters.....69
3.3.1 White Oak Creek [AU# 2-57-45a].....70

3.4 Status and Recommendations for Waters with Noted Impacts.....70
3.4.1 Dicks Creek [AU# 2-57-42].....70

3.5 Additional Water Quality Issues within Subbasin 04-04-03.....71
3.5.1 Management Strategies for Water Quality Protection.....71
3.5.2 Septic System Concerns.....73

Chapter 4 Little Tennessee River Subbasin 04-04-04.....75

4.1 Subbasin Overview.....75

4.2 Use Support Assessment Summary.....79

4.3 Status and Recommendations of Previously and Newly Impaired Waters.....80
4.3.1 Cheoah River [AU# 2-190-(22)a].....80
4.3.2 West Buffalo Creek Arm of Santeetlah Lake [AU# 2-190-12b].....81

4.4 Status and Recommendations for Waters with Noted Impacts.....82
4.4.1 Sweetwater Creek.....82
4.4.2 Tulula Creek [AU# 2-190-2-(0.5)].....82

4.5 Additional Water Quality Issues within Subbasin 04-04-04.....83
4.5.1 Management Strategies for Water Quality Protection.....83

4.5.2 Special Management Strategies for Threatened and Endangered Species ...85
4.5.3 Septic System Concerns ...85

Chapter 5 North Carolina Water Quality Classifications and Standards ...87

5.1 Description of Surface Water Classifications and Standards ...87
5.1.1 Statewide Classifications ...87
5.1.2 Statewide Water Quality Standards ...87
5.1.3 Special Management Strategies ...91
5.1.4 Reclassification of Surface Waters ...91

Chapter 6 Water Quality Stressors ...93

6.1 Stressor and Source Identification ...93
6.1.1 Introduction – Stressors ...93
6.1.2 Overview of Stressors Identified in the Little Tennessee River Basin ...93
6.1.3 Introduction – Sources of Stressors ...94
6.1.4 Overview of Stressor Sources Identified in the Little Tennessee River Basin95

6.2 Aquatic Life Stressors – Habitat Degradation ...96
6.2.1 Introduction and Overview ...96
6.2.2 Sedimentation ...97
6.2.3 Loss of Riparian Vegetation ...98
6.2.4 Loss of Instream Organic Microhabitats ...99
6.2.5 Channelization ...99
6.2.6 Recommendations for Reducing Habitat Degradation ...100
6.2.7 Small Dams, Impoundments, and Water Features ...101

6.3 Aquatic Life Stressors – Water Quality Standards ...103
6.3.1 Introduction and Overview ...103
6.3.2 pH ...103
6.3.3 Toxic Impacts ...103
6.3.4 Fish Consumption Advisories and Advice Related to Mercury ...103

6.4 Recreation Stressor – Fecal Coliform Bacteria ...105

Chapter 7 Population Growth, Land Cover Changes, and Water Quality in Western North Carolina ...107

7.1 Impacts of Population Growth and Land Cover Changes ...107
7.1.1 Rapid Urbanization ...107
7.1.2 Population Growth and Urbanization Impacts on Aquatic Resources ...108

7.2 Key Elements of a Comprehensive Watershed Protection Strategy ...109

7.3 Focus Areas for Managing the Impacts of Population Growth ...110
7.3.1 Control Stormwater Runoff and Pollution ...110
7.3.2 Protect Headwater Streams ...112
7.3.3 Reduce Impacts from Steep Slope Disturbance ...113
7.3.4 Implement Effective Education Programs ...115

7.4 The Role of Local Governments ...116
7.4.1 Reducing Impacts from Existing Urbanization ...116
7.4.2 Reducing Impacts of Future Urbanization ...118

7.5 The Role of Homeowners and Landowners....119
7.5.1 Ten Simple Steps to Reduce Runoff and Pollution from Individual Homes119

Chapter 8 Stormwater and Wastewater Programs....121

8.1 NPDES Wastewater Discharge Permit Summary....121

8.2 DWQ Stormwater Programs....122
8.2.1 NPDES Phase I....122
8.2.2 NPDES Phase II....123
8.2.3 State Stormwater Program....125

8.3 Water Supply Watershed Stormwater Rules....126
8.3.1 Septic Systems and Straight Piping....127

Chapter 9 Agriculture and Water Quality....129

9.1 Animal Operations....129

9.2 Impacted Streams in Agricultural Areas....130

9.3 Working Land Conservation Benefits....130

9.4 Agricultural Best Management Practices and Funding Opportunities....132
9.4.1 USDA – NRCS Environmental Quality Improvement Program (EQIP)....132
9.4.2 USDA - NRCS Wildlife Habitat Incentives Program....133
9.4.3 NC Agriculture Cost Share Program....134

Chapter 10 Forestry in the Little Tennessee River Basin....137

10.1 Forestland Ownership and Resources....137
10.1.1 Forest Management....137
10.1.2 Forest Legacy Program....137
10.1.3 Christmas Tree Production....137

10.2 Forestry Water Quality Regulations in North Carolina....138
10.2.1 Forest Practice Guidelines (FPG) for Water Quality....138
10.2.2 Other Forestry Related Water Quality Regulations....138
10.2.3 Water Quality Foresters....138
10.2.4 Forestry Best Management Practices (BMPs)....138
10.2.5 Watersheds and BMP Research....139
10.2.6 Bridgemats....139
10.2.7 Forest Products Industry....139
10.2.8 Protection from Wildfires....140
10.2.9 Forestry Accomplishments....140

Chapter 11 Water Resources....141

11.1 River Basin Hydrologic Units....141

11.2 Minimum Streamflow....141

11.3 Interbasin Transfers (IBT)....143
11.3.1 Local Water Supply Planning....144
11.3.2 Registered Water Withdrawals....145

11.4 Water Quality Issues Related to Drought 145

11.5 Source Water Assessment of Public Water Supplies.....146
11.5.1 Introduction.....146
11.5.2 Delineation of Source Water Assessment Areas 146
11.5.3 Susceptibility Determination – North Carolina's Overall Approach.....147
11.5.4 Source Water Protection 148
11.5.5 Public Water Supply Susceptibility Determinations in the Little Tennessee River Basin.....148

Chapter 12 Natural Resources.....151

12.1 Ecological Significance of the Little Tennessee Basin.....151

12.2 Rare Aquatic and Wetland-Dwelling Animal Species.....151

12.3 Significant Natural Heritage Areas in the Little Tennessee River Basin.....153

12.4 Public Lands.....154

Chapter 13 Water Quality Initiatives 157

13.1 The Importance of Local Initiatives.....157

13.2 Federal Initiatives.....159
13.2.1 Clean Water Act – Section 319 Program.....159

13.3 State Initiatives.....160
13.3.1 North Carolina Ecosystem Enhancement Program (NCEEP) 160
13.3.2 Clean Water Management Trust Fund.....161
13.3.3 Clean Water Bonds – NC Rural Center 164
13.3.4 U.S. Fish and Wildlife Service – Private Stewardship Grants Program.....166

References.....167

APPENDICES

I Population and Growth Trends in the Little Tennessee River Basin

II Local Governments and Planning Jurisdictions in the Little Tennessee River Basin

III Land Cover in the Little Tennessee River Basin

IV DWQ Water Quality Monitoring Programs in the Little Tennessee River Basin

V NPDES Discharges and Individual Stormwater Permits

VI 303(d) Listing and Reporting Methodology

VII Little Tennessee River Basin Nonpoint Source Program Description and Contacts

VIII Use Support Methodology and Use Support Ratings

IX Glossary of Terms and Acronyms

LIST OF FIGURES

Figure *i* Stressors Identified for Streams in the Little Tennessee River Basin xi
Figure *ii* Sources of Stressors Identified in the Little Tennessee River Basin xii
Figure *iii* General Map of the Entire Little Tennessee River Basin xvii
Figure *iv* General Map of the Little Tennessee River Basin in North Carolina..... xviii
Figure 1 Basinwide Planning Schedule (2005 to 2009).....1
Figure 2 Division of Water Quality Regional Offices 5
Figure 3 Little Tennessee River Subbasin 04-04-01 8
Figure 4 Upper Cullasaja River Watershed.....19
Figure 5 Little Tennessee Subbasin 04-04-02.....36
Figure 6 Recreation Impairment in the Tuckasegee River-Watershed 50
Figure 7 Monthly Fecal Coliform Concentrations Measured by DWQ at the Tuckasegee River - Bryson City station. The 200 and 400 unit standards appear as straight dashed and dotted lines, respectively.....52
Figure 8 Little Tennessee Subbasin 04-04-03.....66
Figure 9 Little Tennessee River Subbasin 04-04-04.....76
Figure 10 ORWs, HWQs and WSWS in the Little Tennessee River Basin 89
Figure 11 Stressors Identified for Streams in the Little Tennessee River Basin.....94
Figure 12 Sources of Stressors Identified in the Little Tennessee River Basin 95
Figure 13 Impervious Cover and Surface Runoff (EPA, 2003).....108
Figure 14 Impervious Cover and Stream Degradation.....109
Figure 15 Diagram of Headwater Streams within a Watershed Boundary 112
Figure 16 Significant Natural Resources in the Little Tennessee River Basin 155

LIST OF TABLES

Table *i* Summary of Use Support Ratings by Category and Subbasin in the Little Tennessee River Basin vi
Table *ii* Summary of Impaired Waters in the Little Tennessee River Basin vii
Table *iii* Summary of NCACSP projects in the Little Tennessee River Basin xv
Table 1 Basinwide Planning Schedule (2004 to 2011) 3
Table 2 Five-Year Planning Process for Development of an Individual Basinwide Plan 3
Table 3 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 04-04-01 9
Table 4 Summary of Use Support Ratings by Category in Subbasin 04-04-01 17
Table 5 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 04-04-02 37
Table 6 Summary of Use Support Ratings by Category in Subbasin 04-04-02 45
Table 7 Summary of turbidity along Greens Creek and in its tributaries collected daily during April 2006 – Source: Watershed Association of the Tuckasegee River 47
Table 8 Mean TSS Concentrations 49
Table 9 WATR Monitoring: Bacteria Concentrations in Tuckasegee River Tributaries 60
Table 10 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 04-04-03 67
Table 11 Summary of Use Support Ratings by Category in Subbasin 04-04-03 69
Table 12 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 04-04-04 77
Table 13 Summary of Use Support Ratings by Category in Subbasin 04-04-04 79
Table 14 Primary and Supplemental Surface Water Classifications 88
Table 15 Summary of NPDES Dischargers and Permitted Flows for the Little Tennessee River Basin 122
Table 16 Major Post-Construction Stormwater Controls in SL 2006-246 125
Table 17 Communities in the Little Tennessee River Basin Subject to Stormwater Requirements 127
Table 18 Summary of NCACSP projects in the Little Tennessee River Basin 135
Table 19 Hydrologic Subdivisions in the Little Tennessee River Basin 141
Table 20 Minimum Streamflow Projects in the Little Tennessee Basin 143
Table 21 Local Water Supply Planning in the Little Tennessee River Basin 144
Table 22 Registered Water Withdraws in the Little Tennessee River Basin 145
Table 23 SWAP Results for Surface Water Sources in the Little Tennessee River Basin 149
Table 24 List of Rare Animals Associated with Aquatic and Wetland Habitats in the Little Tennessee River Basin (August 2006) 152
Table 25 Little Tennessee River Basin Aquatic Significant Natural Heritage Areas 153
Table 26 Local Water Quality Initiatives 158
Table 27 Projects in the Little Tennessee River Basin Funded by the Clean Water Management Trust Fund 162
Table 28 Clean Water Bonds Awarded in the Little Tennessee River Basin 166