

4.1 Subbasin Overview

<i>Subbasin 03-01-04 at a Glance</i>	
Land and Water Area	
Total area:	177 mi ²
Land area:	152 mi ²
Water area:	45 mi ²
Land Cover (percent)	
Forest/Wetland:	41%
Cultivated Crop:	31%
Surface Water:	25%
Urban:	<1%
Pasture/ Managed Herbaceous:	2%
Counties	
Bertie and Chowan	
Municipalities	
Edenton	
Monitored Waterbody Statistics	
Aquatic Life	
Total:	16.9 mi/15,600.4 ac
Total Supporting:	9.1 mi/ 15,600.4 ac
Total Not Rated:	7.8 mi
Recreation:	
Total:	7.8 mi/15,600.4 ac
Total Supporting:	7.8 mi/ 15,600.4 ac

Subbasin 03-01-04 contains the lower Chowan River and small tributaries including Salmon Creek, Edenton Bay and Pembroke Creek. It also includes a small northwest portion of the Albemarle Sound. This subbasin contains portions of the Chowan Game Land, a track managed by the Wildlife Resources Commission. This property is one of four publicly owned conservation lands in the subbasin.

Edenton is the largest municipality in the subbasin with a population of 5,394. Between the years of 1990 and 2000, Edenton grew by approximately 2.4 percent. Additional information regarding population and land use changes throughout the entire basin can be found in Chapter 8.

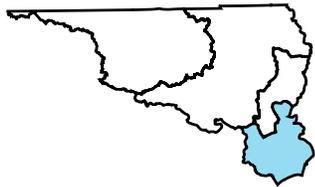
This region of the Chowan River basin is experiencing growth and development with proposed upscale housing communities, golf courses and marinas. With this growth along the inland waterways, many channels to the Chowan River are losing their riparian buffers and consequently water quality is in jeopardy.

There are three minor NPDES dischargers in this subbasin with a total permitted flow of 0.02 MGD. All three permits are associated with water treatment plants (WTP) and all are in compliance with their effluent limits. There are three non-discharge permits and five general stormwater permits in this subbasin (see Appendix III). Many of the permitted discharge violations result from facility mismanagement. Assuring managers have adequate training and understand the financial and environmental repercussions of facility

violations are essential to prevent future degradations to water quality.

A map including the locations of the NPDES facilities and water quality monitoring stations is presented in Figure 6. Table 10 contains a summary of monitored waterbodies with their associated identification assessment unit numbers (AU#) and lengths, monitoring data types, locations and results, along with use support ratings for waters in the subbasin.

Figure 6 Chowan River Subbasin 03-01-04



Legend

- Municipality
- County Boundary
- Subbasin Boundary
- Primary Roads

Monitoring Stations

- Ambient Monitoring Station
- Benthic Community
- Recreation Locations

NPDES Dischargers

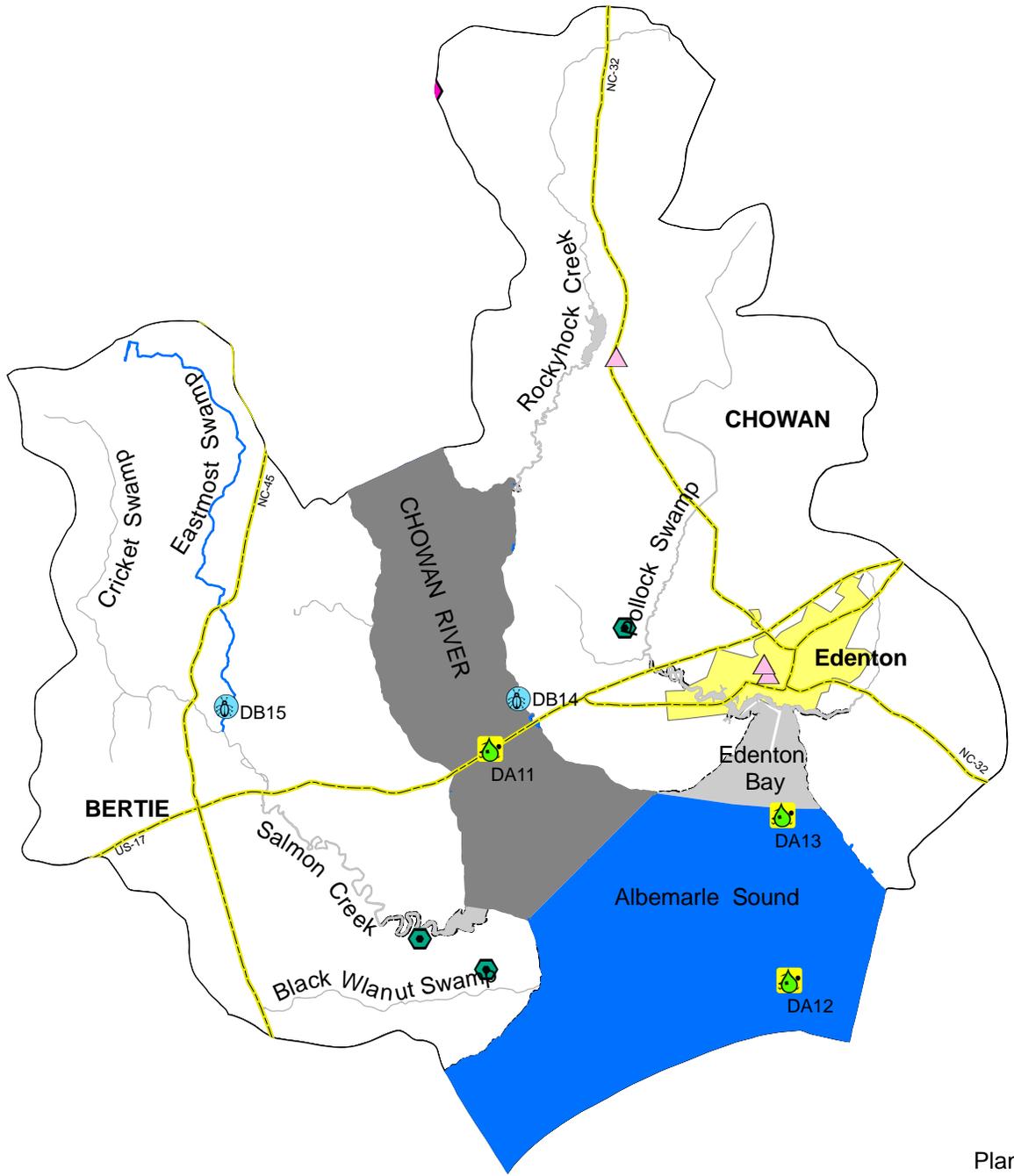
- Major
- Minor

Non-Dischargers

- Major
- Minor

Aquatic Life Rating

- Impaired
- No Data
- Not Rated
- Supporting



Planning Section
 Basinwide Planning Section
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Table 10 CHO

Subbasin 03-01-04

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment					
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors	Sources	
ALBEMARLE SOUND												
26	B;NSW	15,600.4 FW Acres	S	DA12	NCE			S	DA12	NCE	Dioxin	WWTP NPDES
				DA13	NCE				DA13	NCE		
<p>From mouth of Chowan River, defined by a line extending in a southerly direction from Reedy Point on the north shore of Albemarle Sound to a point of land on the south side of Black Walnut Swamp to a line running across Albemarle Sound in a southerly dire</p>												
CHOWAN RIVER												
25c	B;NSW	7.8 FW Miles	NR+	DA11	NCE			S	DA11	NCE	Dioxin	WWTP NPDES
				DB14	G	2005						
<p>From the Subbasin 03-01-03/03-01-04 Boundary to mouth defined by a line extending in a southerly direction from Reedy Point on the north shore of Albemarle Sound to a point of land on the south side of the mouth of Black Walnut Swamp</p>												
Eastmost Swamp												
25-24-1	C;NSW	9.1 FW Miles	S									
				DB15	M	2005						
<p>From source to Salmon Creek</p>												

Table 10 CHO

Subbasin 03-01-04

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment			
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors
Description										
Use Categories:		Monitoring data type:		Results:		Use Support Ratings 2005:				
AL - Aquatic Life		DF - Fish Community Survey		E - Excellent		S - Supporting, I - Impaired				
REC - Recreation		DB - Benthic Community Survey		G - Good		NR - Not Rated				
		DA - Ambient Monitoring Site		GF - Good-Fair		NR*- Not Rated for Recreation (screening criteria exceeded)				
		DL- Lake Monitoring		F - Fair		ND-No Data Collected to make assessment				
				P - Poor		NR+-Not Rated because draft criteria used for rating				
				NI - Not Impaired						
Miles/Acres		m- Monitored		N- Natural		Results				
FW- Fresh Water		e- Evaluated		M- Moderate		CE-Criteria Exceeded > 10% and more than 10 samples				
				S- Severe		NCE-No Criteria Exceeded				
						ID- Insufficeint Data Available				

Aquatic Life Rating Summary

S	m	9.1	FW Miles
NR	m	7.8	FW Miles
S	m	15,600.4	FW Acres
		58.9	FW Miles
		1,370.3	FW Acres

Recreation Rating Summary

S	m	7.8	FW Miles
S	m	15,600.4	FW Acres
		68.1	FW Miles
		1,370.3	FW Acres

Fish Consumption Rating Summary

I	m	7.8	FW Miles
I	m	15,600.4	FW Acres
I	e	68.1	FW Miles
I	e	1,370.3	FW Acres

There were two benthic macroinvertebrate samples collected in subbasin 03-01-04 during this assessment period, and overall, biological data suggest little change in water quality since the basin was last sampled in 2000. Benthic macroinvertebrates collected in 2005 were diverse and indicated no problems with dissolved oxygen (DO), nutrients or pH. Refer to the *2006 Chowan River Basinwide Assessment Report* (<http://www.ncwaterquality.org/esb/Basinwide/ChowanBASINWIDEFinal.pdf>) and Appendix I for more information on monitoring.

Four ambient monitoring stations were also sampled during this assessment period. Three are located in the Albemarle Sound (DA12, DA13 and MA13) and one is located in the Chowan River (DA11). DO and pH do not appear to be a problem, but salinity readings have been as high as 3.63 parts per trillion (ppt).

All waters in this subbasin have the supplemental classification of Nutrient Sensitive Waters (NSW) in addition to the primary classification of Class C or Class B. See Chapter 5 for more information on water classifications.

Waters in the following sections and in Table 10 are identified by an assessment unit number (AU#). This number is used to track defined segments in the water quality assessment database, list 303(d) Impaired waters, and to identify waters throughout the basin plan. The AU# is a subset of the DWQ index number (classification identification number). A letter attached to the end of the AU# indicates that the assessment is smaller than the DWQ index segment. No letter indicates that the AU# and the DWQ index segment are the same.

4.2 Use Support Assessment Summary

All surface waters in the state are assigned a classification appropriate to the best-intended use of that water. Waters are regularly assessed by DWQ to determine how well they are meeting their best-intended use. Refer to Table 11 for a summary of use support for waters in subbasin 03-01-04.

In subbasin 03-01-04, use support was assigned for aquatic life, recreation and fish consumption. Waters are Supporting, Impaired, Not Rated, and No Data in the aquatic life and recreation categories on a monitored or evaluated basis. Waters are Impaired in the fish consumption category on an evaluated basis based on fish consumption advice issued by the Department of Health and Human Services (DHHS).

Table 11 Summary of Use Support Ratings by Category in Subbasin 03-01-04

Use Support Rating	Aquatic Life	Recreation
Monitored Waters		
Supporting	9.1 mi 15,600.4 ac	7.8 mi 15,600.4 ac
Not Rated	7.8 mi	0
Total	16.9 mi 15,600.4 ac	7.8 mi 15,600.4 ac
Unmonitored Waters		
No Data	58.9 mi 1,370.3 ac	68.1 mi 1,370.3 ac
Total	58.9 mi 1,370.3 ac	68.1 mi 1,370.3 ac
All Waters**	75.8 mi 16,970.7 ac	75.9 mi 16,970.7 ac
* The noted percent Impaired is the percent of monitored mile/acres only.		
**Total Monitored + Total Unmonitored = Total All Waters.		

For more information about use support determinations, refer to Appendix II or the *Supplemental Guide to North Carolina's Basinwide Planning: Support Document for Basinwide Water Quality Plans* found at DWQ's website:

<http://www.newaterquality.org/basinwide/SupplementalGuide.htm>. Appendix V provides definitions of the terms used throughout this basin plan.

4.3 Status and Recommendations of Previously and Newly Impaired Waters

The following waters were either identified as Impaired in the previous basin plan (2002) or are newly Impaired based on recent data. If previously identified as Impaired, the water will either remain on the state's 303(d) list or will be delisted based on recent data showing water quality improvements. If the water is newly Impaired, it will likely be placed on the 2008 303(d) list. The current status and recommendations for addressing these waters are presented below, and each is identified by an AU#. Information regarding 303(d) listing and reporting methodology is presented in Chapter 11.

4.3.1 Albemarle Sound [AU# 26]

The Albemarle Sound is Supporting in both the aquatic life and recreation categories. However, the waters are Impaired for fish consumption based on the dioxin advisory issued by the Department of Health and Human Services in 2001. Dioxins are the byproducts of industrial processes and are formed during the chlorine bleaching process at pulp and paper mills. The advisory is for the consumption of catfish and carp in the Albemarle Sound from Bull Bay to Harvey Point; West to the mouth of the Roanoke River and to the mouth of the Chowan River to the U.S. Highway 17 Bridge (Perquimans, Chowan, Bertie, Washington, and Tyrrell Counties). Women of childbearing age and children should not eat any catfish or carp from this area until further notice. All other persons should eat no more than one meal per month of catfish and carp from this area. For more information on this advisory please visit the DHHS website <http://www.epi.state.nc.us/epi/fish/>.

4.3.2 Chowan River [AU# 25c]

2002 Status

The lower section of the Chowan River was listed on the 2002 and 2004 303(d) list of impaired waters based on 1998 historical listing for nutrients. No potential sources were identified.

Current Status

The lower Chowan River, from the subbasin boundary to the Albemarle Sound (7.8 miles), is Not Rated⁺ in the aquatic life category. A Good benthic bioclassification at site DB14 was given based on draft Coastal B criteria. Coastal B rivers are defined as waters in the coastal plain that are deep (nonwadeable), freshwater systems with little or no visible current under normal or low flow conditions. Other characteristics may include an open canopy, low pH and low DO. Boat sampling is required for these waters. Any bioclassifications derived from sampling data should be considered draft and not used for use support decisions; therefore the lower Chowan River is Not Rated (BAU, July 2006).

Since 1983, the lower Chowan River has been sampled nine times. Bioclassifications have ranged from Fair to Good. Since 1995, the river has been rated using draft criteria for Coastal B rivers. The 2005 Good bioclassification is an improvement from the Good-Fair it received during 2000. The improvement was noted in the number of species collected in 2005 compared to 2000.

No water quality standards were exceeded at the ambient monitoring station (DA11); however, salinity values over 3.0 parts per trillion (ppt) have been recorded 10 percent of the time. Because salinity can be above 3.0 ppt, the lower Chowan River has historically been classified as both freshwater and oligohaline. Oligohaline is an estuarine classification for waters with salinity between 0.5 and 5.0 ppt. Due to the low salinity during this assessment period, however, the bioclassification at site DB14 was based on draft criteria for Coastal B rivers. The lower Chowan River will continue to be sampled as a freshwater site with saltwater intrusions from 0.5 to 5.0 ppt (oligosaline).

This segment of the Chowan River (7.8 mi.) is Impaired in the fish consumption category because of a dioxin advisory issued by the Department of Health and Human Services in 2001. For more information on this advisory please visit DHHS website <http://www.epi.state.nc.us/epi/fish/> and Section 4.3.1 above.

2007 Recommendations

Water quality conditions appear to be improving in the Chowan River, but AU # 25c will remain on the 303(d) list of impaired waters because of the dioxin advisory and until Coastal B rating criteria have been finalized and approved.

4.4 Status and Recommendations for Waters with Noted Impacts

The surface waters discussed in this section are not Impaired. However, notable water quality problems and concerns were documented for these waters during this assessment. Attention and resources should be focused on these waters to prevent additional degradation and facilitate water quality improvements. DWQ will notify local agencies of these water quality concerns and work with them to conduct further assessments and to locate sources of water quality protection funding. Additionally, education on local water quality issues and voluntary actions are useful tools to prevent water quality problems and to promote restoration efforts. The current status and recommendations for addressing these waters are presented below, and each is identified by an AU#. Nonpoint source program agency contacts are listed in Appendix IV.

4.4.1 Eastmost Swamp [AU# 25-24-1]

Eastmost Swamp, from source to Salmon Creek (9.1 miles), is Supporting in the aquatic life category due to a Moderate swamp benthic bioclassification at site DB15. Little water quality or biological changes were noted between the 2000 and 2005 samples.

The drainage area of this site is 12 square miles. Due to a beaver dam (that was present during the 2000 sampling as well as the most recent sampling period), the stream channel has been altered and there are fewer pools downstream of the dam. Riparian and some in-stream habitat has been limited by recent desnagging operations upstream. Other in-stream habitat, such as undercut banks, detritus and aquatic weeds, and filamentous algae are common. The benthic substrate is mostly silt and clay with 30 percent sand.

4.4.2 Pollock Swamp [AU# 26-1-1-1] and Rockyhock Creek [AU# 25-22]

Pollock Swamp drains to Edenton Bay and Rockyhock Creek is a tributary to the Chowan River. These waters were not monitored and are therefore not given use support ratings. Water quality conditions are of concern here because Valhalla WTP (NC0032719) is discharging to an unnamed tributary to the Pollock Swamp when they are permitted to discharge to Rockyhock Creek. The facility is currently out of compliance with toxicity issues; the lagoon is leaking to old borrow pits on the south side and may be contaminating surface waters. The plant holds a temporary permit for the new discharge site, while the renewal permit is being processed for discharge into the unnamed tributary of Pollock Swamp. The new permit will require toxicity monitoring. DWQ recommends the lagoon be repaired and excess solids be cleaned out.

Pollock Swamp drains into Pembroke Creek (AU# 26-1-1) along the western edge of Edenton and Queen Ann's Creek (AU # 26-1-2) flows along the eastern side of Edenton. Resource agencies have identified these creeks as priority in need of riparian buffers, stormwater wetlands and critical area plantings to improve water quality.