

Chapter 5

Pasquotank River Subbasin 03-01-54

Including: Currituck Sound, Coinjock Bay, Dowdys Bay, Sanders Bay and the North River

5.1 Subbasin Overview

Subbasin 03-01-54 at a Glance

Land and Water Area

Total area:	503 mi ²
Land area:	304 mi ²
Water area:	199 mi ²

Land Cover (percent)

Forest/Wetland:	39%
Surface Water:	39%
Cultivated Crop:	20%
Urban:	<1%
Pasture/ Managed Herbaceous:	<1%

Counties

Currituck and Camden

Municipalities

None

Monitored Waterbody Statistics

Aquatic Life:

Total:	1.6 mi
Supporting:	1.6 mi

Recreation:

Total:	75,988.1 ac
Supporting:	75,987.7 ac
Impaired:	0.4 ac

This subbasin contains portions of the Currituck Sound and several tributaries, many of which are channelized. Except for the barrier islands, most streams are of low relief and often swampy. Substrate is composed of silt and sand, and channelized ditches are common. Ecologically, the subbasin contains characteristics of the Chesapeake-Pamlico lowlands and tidal marshes, as well as nonriverine swamps and peatlands, the Virginian Barrier Islands and coastal marshes. Land cover generally consists of evergreen forests, mixed forests, forested wetlands, marshes and cultivated cropland. Land cover in the barrier islands includes marshes, forested wetlands and evergreen forests. This subbasin contains multiple public lands and Significant Natural Heritage Areas including several National Wildlife Refuges, the Currituck Banks National Estuarine Research Reserve, Northwest River Marsh Game Land, North River Game Land and portions of the Great Marsh.

A portion of this subbasin is located on the Outer Banks where there is the potential for high population growth and development. Most of Currituck County and the eastern portion of Camden County can be found in this subbasin. Both counties have a projected population growth of over 45 percent by 2020. Additional information regarding population and land use changes throughout the entire basin can be found in Chapter 11.

There are two minor National Pollutant Discharge Elimination System (NPDES) permitted facilities in this subbasin with a total permitted flow of 0.6 MGD. Both facilities are water treatment plants (WTP), one of which is required to monitor whole effluent toxicity (WET). Southern Outer Banks Water System WTP is a reverse osmosis (RO) facility that discharges filtered backwash or reject water into saline waters. No acute effluent toxicity violations were reported during the last two years of the assessment period. There are six non-discharge permits and two stormwater discharge permits for this subbasin. For the listing of NPDES permit holders, refer to Appendix III.

A map including the locations of the NPDES facilities and water quality monitoring stations is presented in Figure 7. Table 13 contains a summary of assessment unit numbers (AU#) and lengths, streams monitored, monitoring data types, locations and results, along with use support ratings for waters in the subbasin. Appendix V provides definitions of the terms used throughout this basin plan.

Figure 7 Pasquotank River Subbasin 03-01-54

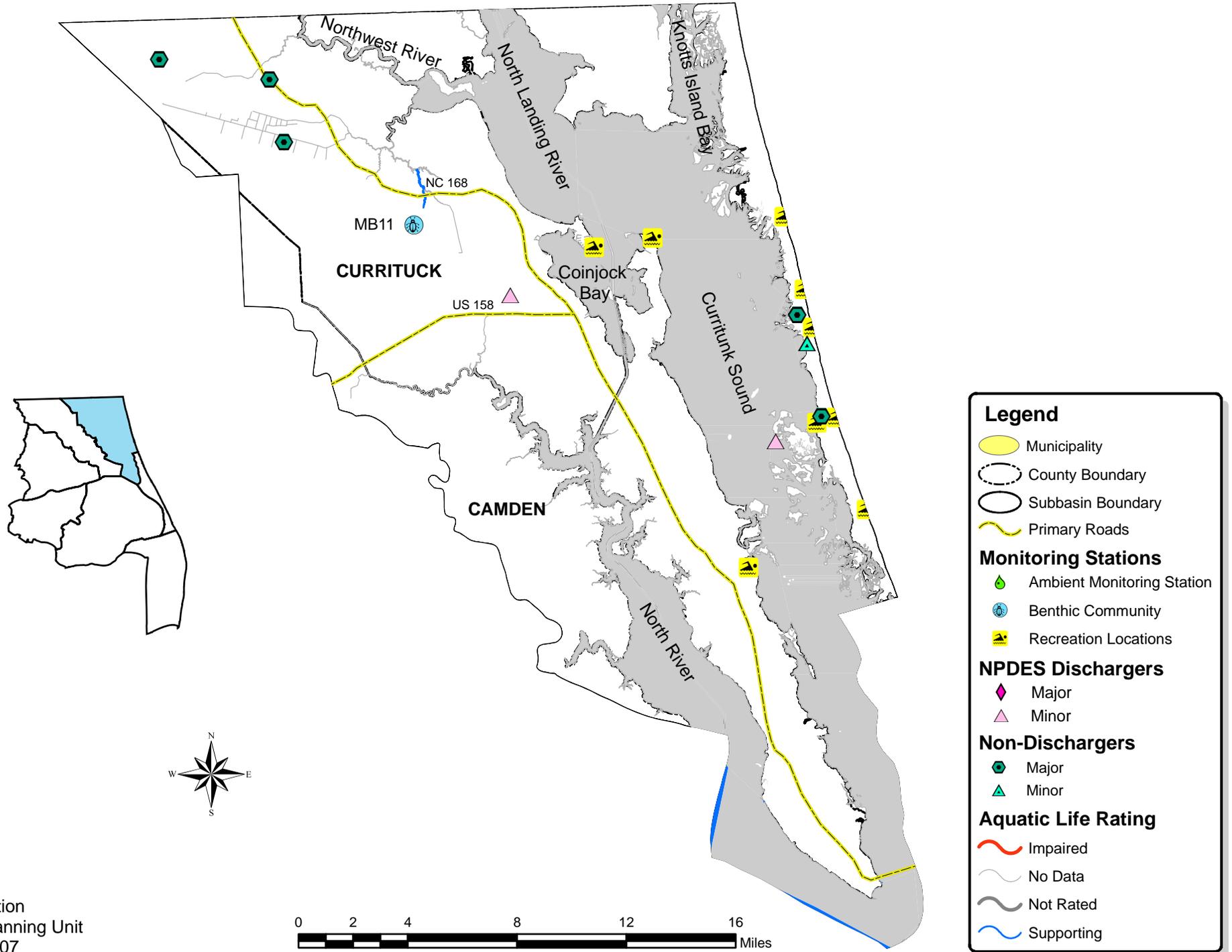


Table 15 Pasquotank Subbasin 03-01-54

AU Number	Classification	Length/Area		Aquatic Life Assessment			Recreation Assessment			Shellfish Harvesting		Stressors	Sources
				AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	SH Rating		
Description													
Coinjock Bay													
30-1-6	SC	4,670.6	S Acres	ND				S	N47	NCE			
Entire Bay													
Cowells Creek													
30-1-2-2-5-1-1	C;Sw	1.6	FW Miles	S				ND					
From source to Tull Creek													
					MB11	M	2005						
Currituck Sound													
30-1a	SC	69,301.2	S Acres	ND				S	N46	NCE			
From source to Wright Memorial Bridge at Albemarle Sound													
									N5B	NCE			
									N5C	NCE			
									N6A	NCE			
									N82A	NCE			
									N6	NCE			
									N82	NCE			
30-1b	SC	0.3	S Acres	ND				I	N5	CE	Enterrococcus	Unknown	
Currituck Sound off Ocean Bay Blvd.													
30-1c	SC	0.1	S Acres	ND				I	N89	CE	Enterrococcus	Unknown	
Southern Shores Private Soundside Access													
Dowdys Bay (Poplar Branch Bay)													
30-1-15	SC	1,532.3	S Acres	ND				S	N44A	NCE			
Entire Bay													
Sanders Bay													
30-1-11	SC	483.5	S Acres	ND				S	N84A	NCE			
Entire Bay													

Table 15 Pasquotank Subbasin 03-01-54

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment			Shellfish Harvesting		Stressors	Sources
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	SH Rating	GA		
Use Categories:		Monitoring data type:		Results:			Use Support Ratings 2006:						
AL - Aquatic Life	MF - Fish Community Survey			E - Excellent			S - Supporting	I - Impaired					
REC - Recreation	MB - Benthic Community Survey			G - Good			NR - Not Rated						
SH - Shellfish Harvesting	MA - Ambient Monitoring Site			GF - Good-Fair			NR*- Not Rated for Recreation (screening criteria exceeded)						
	ML- Lake Monitoring			F - Fair			ND-No Data Collected to make assessment						
	N- DEH RECMON			P - Poor			NR+-Not rated because draft criteria used for rating						
				NI - Not Impaired			Results						
GA - DEH SS Classification and Growing Area				S- Severe Stress			CE-Criteria Exceeded > 10% and more than 10 samples						
APP- Approved				M-Moderate Stress			NCE-No Criteria Exceeded						
CAO- Conditionally Approved-Open				N- Natural			Miles/Acres						
CAC- Conditionally Approved-Closed							FW- Fresh Water						
PRO- Prohibited							S- Salt Water						

Aquatic Life Rating Summary

Recreation Rating Summary

Fish Consumption Rating Summary

S m 1.6 FW Miles
 ND 123,984.8 S Acres
 ND 1,026.4 FW Miles

S m 75,987.7 S Acres
 I m 0.4 S Acres
 ND 47,996.7 S Acres
 ND 1,028.1 FW Miles

I e 123,984.8 S Acres
 I e 1,028.1 FW Miles

One site was sampled for the first time for benthic macroinvertebrates in 2005. Two other creeks were investigated as potential sampling sites; however, both were too deep for freshwater sampling methodologies. There are several recreational monitoring stations (RECMON) located throughout the subbasin, but there are no ambient monitoring stations within this subbasin. The NC Division of Environmental Health (DEH) evaluates these stations. Refer to the *2006 Pasquotank River Basinwide Assessment Report* <http://h2o.enr.state.nc.us/esb/Basinwide/PASQUOTANK2006Final.pdf> and Appendix I for more information on monitoring.

Waters in the following sections and in Table 13 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.

5.2 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. Table 14 provides a summary of use support for waters in subbasin 03-01-54.

In subbasin 03-01-54, 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. All 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).

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://h2o.enr.state.nc.us/basinwide/SupplementalGuide.htm>.

Table 14 Summary of Use Support Ratings by Category in Subbasin 03-01-54

Use Support Rating	Aquatic Life		Recreation	
	Freshwater	Saltwater	Freshwater	Saltwater
Monitored				
Supporting	1.6 mi	0	0	75,987.7 ac
Impaired*	0	0	0	0.4 ac
Total	1.6 mi	0	0	75,988.1 ac
Unmonitored				
No Data	1,026.4 mi	123,984.8 ac	1,028.1 mi	47,996.7 ac
Total	1,026.4 mi	123,984.8 ac	1,028.1 mi	47,996.7 ac
Totals				
All Waters	1,028.0 mi	123,984.8 ac	1,028.1 mi	123,984.8 ac

* The noted percent Impaired is the percent of monitored miles/acres only.

5.3 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. Information regarding 303(d) listing and reporting methodology is presented in Chapter 15.

5.3.1 Currituck Sound [AU# 30-1b and 30-1c]

Currituck Sound (Ocean Bay Blvd.) (0.3 acres) at site N5 is Impaired in the recreation category because recreational monitoring (RECMON) bacteriological standards for safe bodily contact were exceeded. However, this sampling site has been relocated to more accurately reflect where primary recreation occurs and is now 750 yards off of Ocean Bay Blvd. The site is currently (July 2007) open for recreation.

Southern Shores Private Soundside Access Site N89 (AU# 30-1c) (0.1 acres) is Impaired in the recreation category based on recreational monitoring (RECMON) exceedances. This site is near the mouth of Jean Guite Creek. The site is known to have stagnant freshwater because of poor flushing and little tidal influences. Abundant wildlife populations are also found in this area and may be contributing to water quality conditions.

5.4 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.

5.4.1 Unnamed Tributary to Cowells Creek [AU# 30-1-2-2-5-1-1]

Because Cowells Creek was not suitable for basinwide sampling, an unnamed tributary was sampled for benthic macroinvertebrates. The unnamed tributary is Supporting in the aquatic life category due to a Moderate swamp benthic bioclassification at site MB11. The tributary was sampled for the first time in 2005 and will be added to the list of basinwide sites for the Pasquotank River basin. To date, it is the only accessible freshwater site found in the subbasin.

The substrate consisted of sand with a layer of detritus. Sticks, snags and logs were present along with root mats. Leaf packs were present, but rare. There was little evidence of stream modification; however, streambanks were undercut even though the riparian areas on both sides

of the stream were wide and intact. Two of the abundant taxa collected are indicators of organic enrichment and/or low DO. No permitted NPDES facilities are located above site MB11.

2007 Recommendations

Cowells and Tulls Creek receive drainage from 12,000 acres of cropland. Erosion and sedimentation control continue to be a priority need in this drainage. Agricultural BMPs, such as grassed swales, conservation tillage and cover crops are encouraged. DWQ will work with local resource agencies to promote installation of BMPs in the watershed.

5.5 Additional Water Quality Issues within Subbasin 03-01-54

The previous sections discussed water quality concerns for specific stream segments. The following section discusses issues that may threaten water quality in the subbasin that are not specific to particular streams, lakes, or reservoirs. The issues discussed may be related to waters near certain land use activities or within proximity to different pollution sources.

Subbasin 03-01-54 is experiencing rapid growth, where approximately 500 acres of farmland is being converted to residential development per year. This change in land use also changes the source of water quality stressors from primarily agriculture to increased impervious surface runoff and associated pollutants, ineffective sewage systems, and lawn runoff. Local government and agencies are encouraged to proactively plan, provide public education programs and implement conservation strategies to prevent water quality degradation.

According to the *Sanitary Survey of Albemarle and Currituck Sounds, Areas I-1, I-3 through I-16* (DEH Shellfish Sanitation & Recreational Water Quality Section, December 2005), there has been little change in water quality since the last survey. The only shellfish found in this area are *Rangia* clams and no commercial shellfish harvesting occurs. Runoff is the most significant factor affecting water quality in this region, and can be associated with agricultural runoff or natural runoff from swamp waters following heavy rains. Heavy development has occurred in the outer banks portion of growing area I-16 within Currituck Sound, while a significant amount of agriculture (e. g., turf grass farms, fruit orchards, horse farms, row crops and logging) occurs on the mainland portion.

Area I-1 consists of the North River shoreline, as well as a small portion of the Albemarle Sound. This area is predominantly rural, with scattered residential housing. Land use was historically agriculture and is being replaced with commercial and residential development. Remaining agriculture includes one hog farm near the head of the North River, turf grass farms, fruit orchards, row crops, and small horse farms. Four golf courses are located in area I-1. There are also four sewage application sites, all treated with lime.

