Chapter 4 -
Pasquotank River Subbasin 03-01-53
Includes Scuppernong River and tributaries and Phelps Lake

4.1 Water Quality Overview

Subbasin 03-01-53 at a Glance

Land and Water

Total area:	475 mi^2
Land area:	336 mi^2
Water area:	139 mi^2

Population Statistics

1990 Est. pop.:	8,836 people
Pop. density:	26 persons / mi^2

Land Cover (%)

Forest / Wetland:	41
Surface Water:	28
Urban:	<1
Cultivated Crop:	30
Pasture / Managed Herbaceous:	<1

The Scuppernong River, which drains to Albemarle Sound, is the largest river system in this subbasin. The largest town is Roper. A map including water quality sampling locations is presented as Figure B-5.

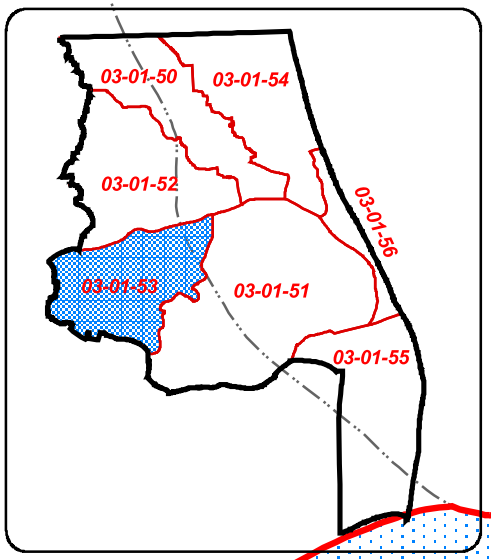
DWQ collects both ambient and benthic macroinvertebrate samples from this subbasin. Biological ratings for these sample locations are presented in Table B-7. Table B-8 summarizes use support ratings for subbasin 03-01-53. Refer to Appendix III for a complete listing of monitored waters and use support ratings.

This subbasin contains a diversity of public lands and Significant Natural Heritage Areas, including Lake Phelps State Park, Bull Neck Swamp, East Dismal and the Scuppernong River Swamp Forest.

There are seven permitted dischargers in the subbasin; all of which are minor NPDES permits. Columbia, Roper and Creswell hold wastewater treatment plant permits in the subbasin. Eight general stormwater permits are also held in the basin. No facilities are required under permit to perform whole effluent toxicity testing in the subbasin.

Benthic macroinvertebrates have been collected at four sites within this subbasin; however, these data are not rated; and therefore, they currently offer little indication of the water quality status of the Pasquotank River basin.

Figure B-5 Pasquotank River Subbasin 03-01-53



PASQUOTANK
PERQUIMANS
CHOWAN
Sound
Albemarle
BERTIE
Deep
Creek
B-2
Columbia
US-64
NC-308
Kendrick
River
US-64
NC-94
TYRRELL
US-64
Roper
Creswell
B-3
Scuppernong
B-1
Creek
Phelps Lake
WASHINGTON
HYDE

N
W
E
S

Legend

- Subbasin Boundary
- Ambient Monitoring Station
- Benthic Station
- Benthic Station
- County Boundary
- Primary Roads
- Hydrography
- Gamelands
- Municipality

5 0 5 10 Miles

NCDENR

Planning Branch
Basinwide Planning Program Unit
July 19, 2002

Table B-7 DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (2000) for Pasquotank River Subbasin 03-01-53

Site	Stream	County	Location	Bioclassification
Benthic Macroinvertebrates				
Freshwater				
SB	Kendrick Creek	Washington	US 64	Not Rated
B-1	Mail Canal	Washington	SR 1180	Not Rated
B-2	Deep Creek	Washington	SR 1302	Not Rated
B-3	Scuppernong River	Washington	SR 1155	Not Rated
Ambient Monitoring				***Problem Parameter***
M6920000	Kendrick Creek	Washington	at SR1300 at Mackeys	DO
M698000C	Scuppernong River	Tyrrell	at SR 1105 near Columbia	DO
M610000C	Albemarle Sound	Tyrrell	between Harvey Point and Mill Point mid channel	None observed
M610000N	Albemarle Sound	Tyrrell	between Harvey Point and Mill Point south shore	None observed

* Refer to Section A, Part 3.3 for more information on fish community and benthic macroinvertebrate bioclassifications.

Table B-8 Use Support Ratings Summary (2000) for Monitored and Evaluated[2] Streams in Pasquotank River Subbasin 03-01-53

Use Support Category	FS	PS	NS	NR	Total[1]
Aquatic Life/ Secondary Recreation[2]	63,433.2 estuarine ac	0	0	113.2 mi 15,938.3 fresh ac 3,653.3 estuarine ac	113.2 mi 15,938.3 fresh ac 67,086.5 estuarine ac
Primary Recreation	63,433.2 estuarine ac	0	0	1,839.4 estuarine ac 15,938.3 fresh ac	65,272.6 estuarine ac 15,938.3 fresh ac

[1] Total stream miles/acres assigned to each use support category in this subbasin. Column is not additive because some stream miles are assigned to more than one category.

[2] These waters are impaired because of a regional fish consumption advisory. Refer to Section A, Part 4.3 for further information.

For more detailed information on sampling and assessment of streams in this subbasin, refer to the *Basinwide Assessment Report-Pasquotank River Basin* (NCDENR-DWQ, December 2001), available from DWQ Environmental Sciences Branch at http://www.esb.enr.state.ncu.us/bar.html or by calling (919) 733-9960.

4.2 Status and Recommendations for Previously Impaired Waters

The 1997 Pasquotank River Basinwide Plan identified three segments of subbasin 03-01-53 as impaired in this subbasin. This section reviews use support and recommendations detailed in the 1997 basinwide plan, reports status of progress, gives recommendations for the next five-year cycle, and outlines current projects aimed at improving water quality for these stream segments.

4.2.1 **Scuppernong River** (15.2 miles from source to mouth of Riders Creek)

1997 Recommendations
The upper Scuppernong River was rated partially supporting, likely due to agriculture and animal operations and possibly Creswell WWTP. The 1997 basin plan recommended that the NPS team consider targeting their efforts to this area.

Status of Progress
The Scuppernong River is currently not rated. The Nonpoint Source Team chose against focusing on the Scuppernong River as its main water quality segment of concern. Instead, the Nonpoint Source Team focused on broader issues that could impact the entire basin.

Tyrrell County's Water Treatment Plant near Columbia discharges into Rider's Creek. The Washington Regional Office indicated that the facility had previously not been permitted. As of 2002, the facility had been issued a NPDES permit.

2002 Recommendations
DWQ determined that it is likely that the pH and dissolved oxygen values are due to natural conditions. DWQ will determine whether the ambient conditions are due to natural conditions. Though the river was not considered impaired during the 1995-2000 basinwide cycle, the Scuppernong River remains an issue of concern, and DWQ should encourage more funding, research and emphasis on the watershed.

DWQ will continue to monitor Tyrrell County Water Treatment Plant and work towards relocating the facility's discharge.

4.2.2 **Kendrick Creek and Main Canal** (13.2 miles from source to Hwy. 64 at Roper)

1997 Recommendations
Kendrick Creek and Main Canal were rated partially supporting, likely due to agriculture and animal operations. The 1997 basin plan recommended that the NPS team consider targeting their efforts to this area.

Status of Progress
Kendrick Creek is currently not rated. The Nonpoint Source Team chose against focusing on Kendrick Creek as its main water quality segment of concern. Instead, the Nonpoint Source Team focused on broader issues that could impact the entire basin.

DWQ conducted a special study in Washington County specifically in response to planning efforts to build a water treatment facility in the Town of Roper. The facility would include a brine effluent that could be discharged into Kendrick Creek at US 64 in Roper. The DWQ Regional Office requested a survey to determine if there is a freshwater benthic community in that part of the stream that would be negatively impacted by an input of salt. All of the 36 macroinvertebrate taxa collected were freshwater taxa, and the stream appeared to be very stressed. Staff also noted that even though SC waters in Kendrick Creek are classified as such to the US 64 bridge, analysis of monitoring data suggest that saline influence is much closer to the Albemarle Sound.

Weyerhaeuser Company has participated in a cooperative watershed study in the Kendrick Creek (Lebo et al., 2000) drainage basin with NC State University since 1996. Weyerhaeuser scientists conducted a water quality and biological assessment of the condition of the creek from its headwaters at the Parker Tract to Albemarle Sound. The study characterized water quality and the biological conditions of the creek in addition to identifying, where possible, the factors contributing to the observed water quality. Information on the report can be obtained by contacting Weyerhaeuser at (252) 633-7511.

2002 Recommendations
Though the 1995-2000 basinwide cycle does not rate Kendrick's Creek as impaired, DWQ still considers Kendrick Creek an issue of concern. DWQ should encourage more funding, research and emphasis on the watershed. DWQ determined that it is likely that the pH and dissolved oxygen values are due to natural conditions, because the river segment is located in a swampy area. DWQ will determine whether the ambient conditions are due to natural conditions.

4.3 Status and Recommendations for Newly Impaired Waters

The four benthic monitoring sites in this subbasin are currently not rated because criteria for assigning bioclassifications to swamp streams are still in draft form (page 67). No additional stream segments were rated as impaired in this subbasin based on recent DWQ monitoring (1995-2000).

4.4 Other Issues and Recommendations

The surface waters discussed in this section are fully supporting designated uses or are not rated based on recent DWQ monitoring; however, these data revealed some impacts to water quality. Although no action is required for these streams, voluntary implementation of BMPs is encouraged and continued monitoring is recommended. DWQ will notify local agencies of water quality concerns regarding these waters and work with them to conduct further monitoring and to locate sources of water quality protection funding.

4.4.1 Phelps Lake

Current Status
Phelps Lake is currently not rated. Lake Phelps, North Carolina's second largest natural lake, is located within a vast peninsula between the Albemarle Sound to the north and the Pamlico River

to the south. This peninsula contains numerous low-lying swampy areas underlain by thick organic muck and relatively well-drained areas with fertile mineral and organic soils. Much of this area has been cleared of vegetation, drained and put into large scale agricultural use.

The lake is owned by the State of North Carolina as part of Pettigrew State Park. This lake is principally recharged by natural precipitation with a small fraction of the water coming from underground aquifers. Because of its shallow depth, the lake is wind mixed and rarely stratifies. The waters are acidic, which is typical of coastal plain lakes, but unlike other coastal plain lakes, the water is not colored.

Lake Phelps is used primarily for boating and fishing. It has also been used as a source of water for fighting peat fires. The lake also provides habitat for the endemic Waccamaw killifish and for the leafless watermilfoil (*Myriophyllum tenellum*), an aquatic macrophyte not previously found south of New Jersey.

In August 2000, Lake Phelps was reclassified from C Swamp Water (Sw) to B Sw ORW (Outstanding Resource Water). The lake was not rated during the 1995-2000 basinwide planning cycle.

2002 Recommendations
DWQ will continue to monitor Phelps Lake.