# Chapter 7 -
# Pasquotank River Subbasin 03-01-56
## Includes Roanoke Sound and small portions of Albemarle and Currituck Sounds

## 7.1 Water Quality Overview

***Subbasin 03-01-56 at a Glance***

**Land and Water**

| | |
|---|---|
| Total area: | 109 $mi^2$ |
| Land area: | 37 $mi^2$ |
| Water area: | 72 $mi^2$ |

**Population Statistics**

| | |
|---|---|
| 1990 Est. pop.: | 11,282 people |
| Pop. density: | 305 persons / $mi^2$ |

**Land Cover (%)**

| | |
|---|---|
| Forest / Wetland: | 22 |
| Surface Water: | 70 |
| Urban: | 7 |
| Cultivated Crop: | <1 |
| Pasture / Managed Herbaceous: | 2 |

This subbasin consists of the lower portion of Currituck Sound, outer Albemarle Sound, Kitty Hawk Bay and eastern Roanoke Sound in Dare County. A map including water quality sampling locations is presented as Figure B-10.

DWQ did not collect benthic macroinvertebrate, fish community, fish tissue or ambient water quality data in this subbasin. Water quality use support determinations are based on fish consumption advisories, DEH sanitary surveys, water treatment plant operator reports, and recreational waters testing. Use support ratings are presented in Table B-11.

Several public lands and Significant Natural Heritage Areas occur in this subbasin, including Jockey's Ridge State Park, Nags Head Woods Preserve, Run Hill State Natural Area, Wright Brothers National Memorial, and Kitty Hawk Woods Coastal Reserve.

The cities with the highest populations in the basin include Kill Devil Hills and Nags Head. This subbasin contains the highest population density (305 persons/square mile) in the entire Pasquotank River basin with the second highest density falling far behind at 80 persons/square mile. This subbasin has also undergone the highest rate of population density growth over the 1980-1990 period, growing from 130 persons/square mile to 305 persons/square mile.

Only one facility holds a NPDES minor permit in the subbasin: Villas Association, Inc. The facility is nonmunicipal and discharges using an on-site land application method. No facilities are required under permit to perform whole effluent toxicity testing in the subbasin. There are no individual NPDES stormwater permits issued in the basin; however, there are two general stormwater permits issued.

For more detailed information on sampling and assessment of streams in this subbasin, refer to the *Basinwide Assessment Report-Pasquotank River Basin* (NCDENR-DWQ, January 2002), available from DWQ Environmental Sciences Branch at http://www.esb.enr.state.ncu.us/bar.html or by calling (919) 733-9960.

# Figure B-10 Pasquotank River Subbasin 03-01-56

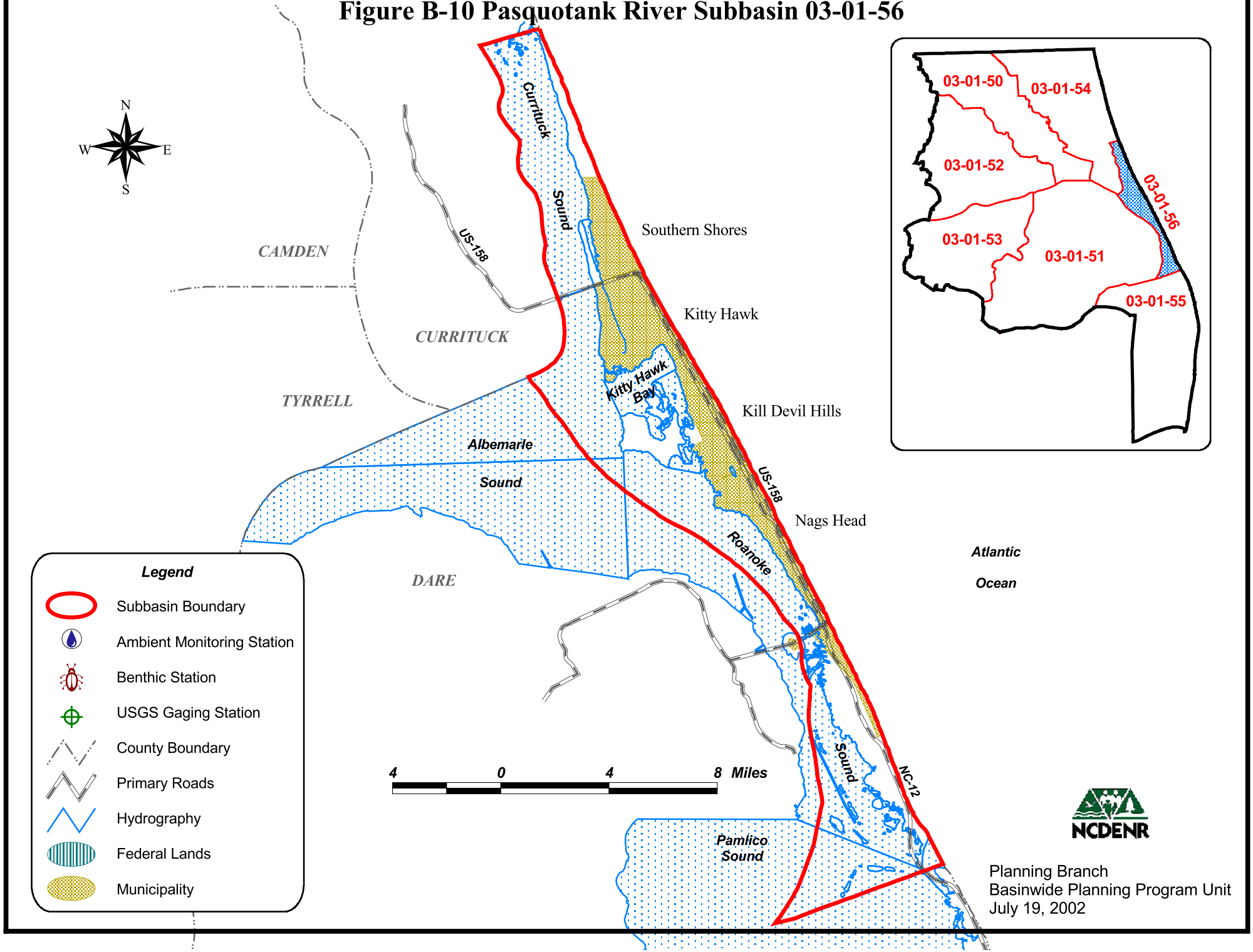

Table B-11 Use Support Ratings Summary (2000) for Monitored and Evaluated[2] Streams (Miles) in Pasquotank River Subbasin 03-01-56

| Use Support Category | FS | PS | NS | NR | Total[1] |
|---|---|---|---|---|---|
| **Aquatic Life/ Secondary Recreation**[2] | 12,463.2 estuarine ac | 0 | 0 | 15,830.2 estuarine ac 23.8 fresh ac 34.2 coastal mi | 28,293.5 estuarine mi 23.8 fresh ac 34.2 coastal mi |
| **Fish Consumption**[3] | 0 | 34.2 coastal mi | 0 | 0 | 34.2 coastal mi |
| **Primary Recreation** | 12,851.8 estuarine ac 34.2 coastal mi | 0 | 21.4 estuarine ac | 15,411.9 estuarine ac | 28,285.1 estuarine ac 34.2 coastal mi |
| **Shellfish Harvesting** | 18,775.0 estuarine ac | 0 | 1,712.9 estuarine ac | 0 | 20,487.9 estuarine 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] For the fish consumption use support category, only monitored stream miles are presented.

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

## 7.2 Status and Recommendations for Previously Impaired Waters

Previously impaired Class SA waters are discussed in Section 7.4 below. There were no other waters identified as impaired in the 1997 plan.

## 7.3 Status and Recommendations for Newly Impaired Waters

There are 34.2 Atlantic coastal miles which are partially supporting that were monitored for fish consumption. All waters in this subbasin are currently partially supporting (PS) on an evaluated basis for the fish consumption use support category because of a regional fish consumption advisory for shark, swordfish, king mackerel, tilefish, largemouth bass, bowfin (or blackfish), and chain pickerel (or jack). There are other newly impaired shellfish waters in this subbasin. Class SA waters are discussed below in Section 7.4.

### 7.3.1 **Roanoke Sound** (Waters surround Villas Association, Inc. Outfall)

*Current Status*

This portion of Roanoke Sound (21.4 estuarine acres) is currently not supporting primary recreation. DEH Recreational Water Quality issued a swimming advisory for a portion of Roanoke Sound centered around the Villas Association, Inc. direct discharge. The advisory closure due to rule had been posted since 1998. Villas Association, Inc. exceeded its ammonia limits by over 40 percent over the last quarter of 1998 and the first quarter of 1999. The association did not exceed ammonia limits in 2000. In 2002, the Villas Association received a non-discharge permit to eliminate the direct discharge to Roanoke Sound. The facility is utilizing a land application method on-site of the Villas property.

*2002 Recommendations*

DWQ will continue to work with DEH to monitor the Roanoke Sound's swimming uses.

## 7.4 Impaired Class SA Waters

There are 20,487.9 acres of Class SA waters in this subbasin that were assessed in the shellfish harvesting use support category. In this subbasin, 1,712.9 acres (8.4%) are considered impaired for the shellfish harvesting use support category. Refer to Figure B-11 to identify locations of DEH SS growing areas and growing area classifications. The larger water areas in this subbasin are described below with reference to DEH SS growing areas. The problem parameter for all waters listed below is fecal coliform bacteria contamination. Refer to page 61 for recommendations to address impairment in Class SA waters.

The differences in acreage estimates between basinwide cycles are not necessarily related to changes in water quality, but to different methods of estimating acreage and changes in use support methodology. For more information on changes in use support methodology, refer to Appendix III and page 59. For a complete listing of monitored Class SA waters, refer to Appendix III.

Subbasin 03-01-56 contains portions of three DEH Growing Areas: H1, H6 and I2 (Figure B-11).

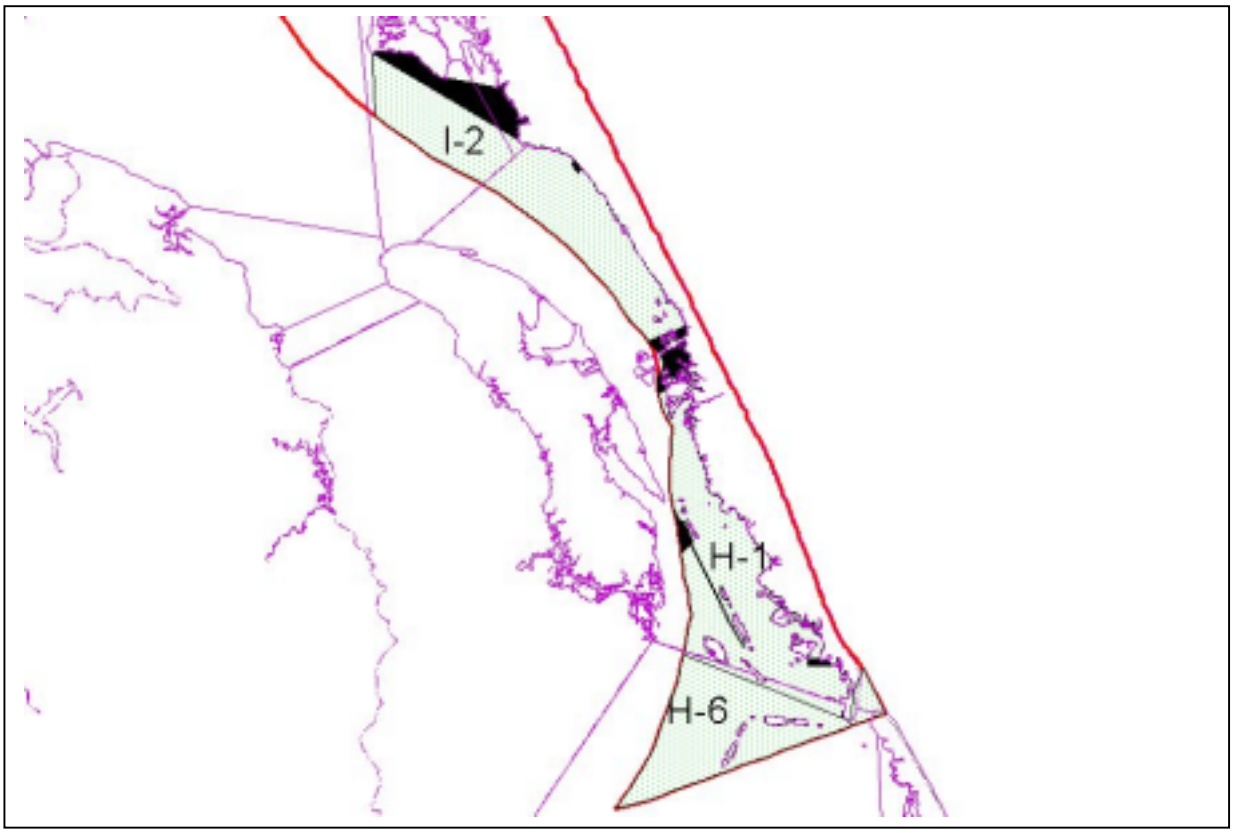


Figure B-11 DEH Shellfish Growing Area Classifications in SA Waters of Subbasin 03-01-56

**Eastern Shore of Roanoke Sound (Area H-1)**

DEH Growing Area H-1 contains the waters of the Roanoke Sound. The DEH growing area overlaps several subbasins, and DWQ has improved its reporting methodology to provide area closure information by subbasin. Waters currently prohibited for commercial shellfish harvesting include portions of Roanoke Sound, Pond Island and Rockhall Creek. Contamination sources included nonpoint source pollution from adjacent land uses. Analysis of the bacteriological data for the DEH Growing area indicated that little change in water quality occurred throughout the area during 1993-1999 (NCDENR-DEH, H1).

## 7.5 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.

This subbasin has undergone a great increase in population between 1980-1990. Growth management within the next five years will be imperative in order to maintain good water quality in this subbasin. Growth management can be defined as the application of strategies and practices that help achieve sustainable development in harmony with the conservation of environmental qualities and features of an area. On a local level, growth management often involves planning and development review requirements that are designed to maintain or improve water quality. Refer to Section 4.11 for more information about minimizing impacts to water quality from development.