Chapter 3
White Oak River Subbasin 03-05-03
Including: Bogue Sound and the Newport River

3.1 Subbasin Overview

Subbasin 03-05-03 at a Glance

Land and Water Area

Total area:	228 mi^2
Land area:	168 mi^2
Water area:	60 mi^2

Land Cover (1997)

Forest/Wetland:	59%
Surface Water:	26%
Urban:	4%
Cultivated Crop:	6.5%
Pasture/ Managed Herbaceous:	4%

County
Carteret

Municipalities
Atlantic Beach, Beaufort, Bogue, Emerald Isle, Indian Beach, Morehead City, Newport, Pine Knoll Shores

Monitored Waterbody Statistics

Aquatic Life

Total:	15.1 mi/5,788.1 ac
Total Supported:	5,847.9 mi
Total Impaired:	140.2 ac
Total Not Rated:	15.1 mi

Recreation

Total:	11.2 mi/17,912.9 ac
Total Supported:	11.2 mi/17,764.7 ac
Total Impaired:	148.2 ac

Shellfish Harvesting

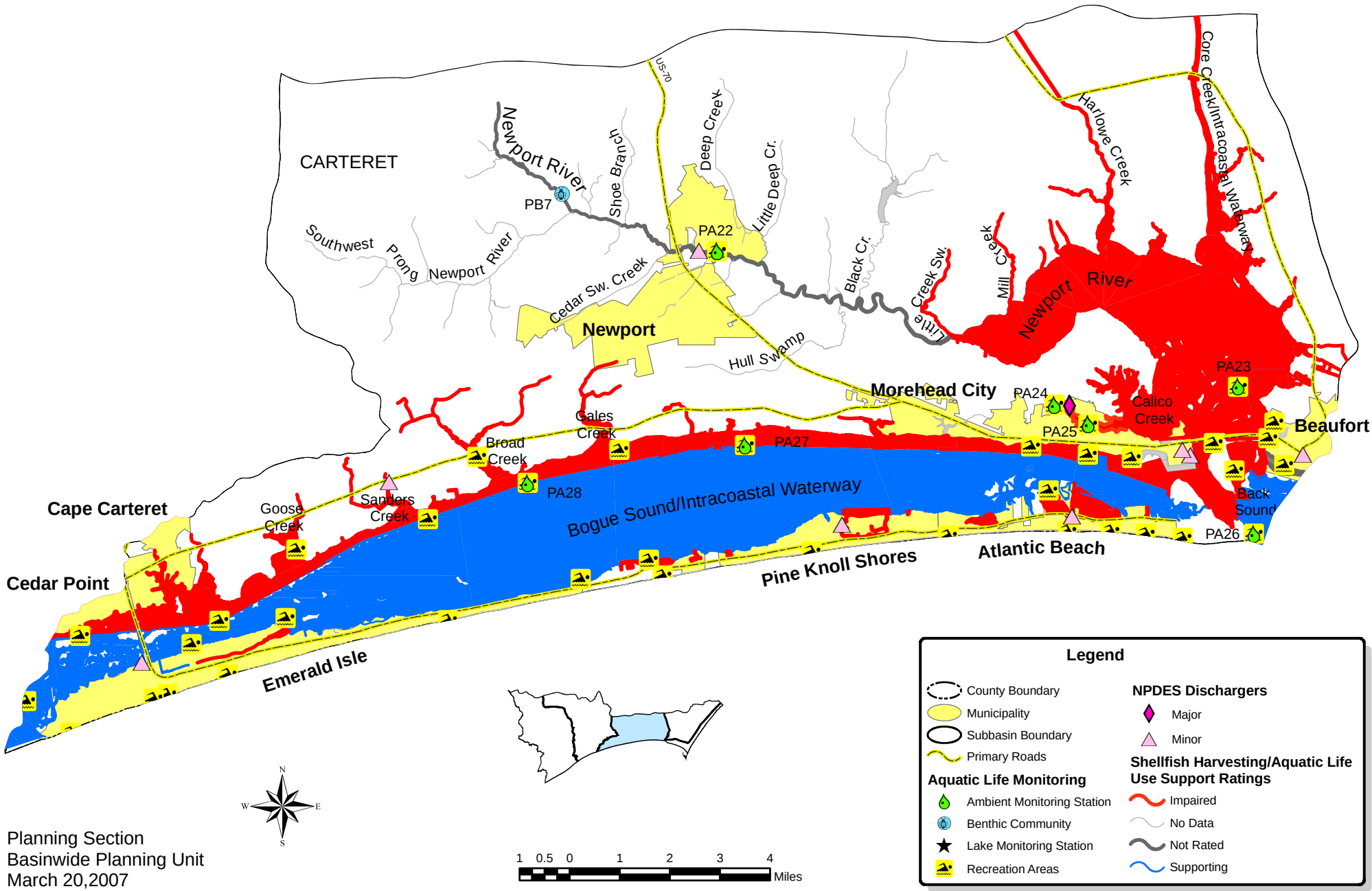
Total:	5.2 mi/33,867.4 ac
Total Supported:	19,357.1 ac
Total Impaired:	5.2 mi/14,510.3 ac

This subbasin contains the center of Carteret County, extending from the Croatan National Forest to Beaufort and Beaufort Inlet. Most of this subbasin is estuarine with the Newport River as the only major source of freshwater. There are two areas of Outstanding Resource Waters (ORW) in this subbasin: the western half of Bogue Sound and the swamp and saltwaters of the Theodore Roosevelt State Natural Area, totaling 11,236 acres. The Division of Marine Fisheries has classified waters in this subbasin to have Fair to Good commercial fisheries value. Oyster production was considered Fair, while clam production was considered Good. Newport River was found to be the most productive area for both clams and oysters. A map of this including water quality sampling and NPDES locations are presented in Figure 7. Use support ratings for monitored waters are presented in Table 17.

Land cover in this subbasin is mostly forested. With the exception of Newport, most of the development in this subbasin is along the coast: Morehead City, Beaufort, Atlantic Beach and Bogue Banks. Bogue, Morehead City and Newport have experienced population increases of 40.5, 21.4 and 24.9 percent, respectively, while Atlantic Beach and Beaufort population decreased between 1990 and 2000. Refer to Chapter 9 for information about population growth and trends.

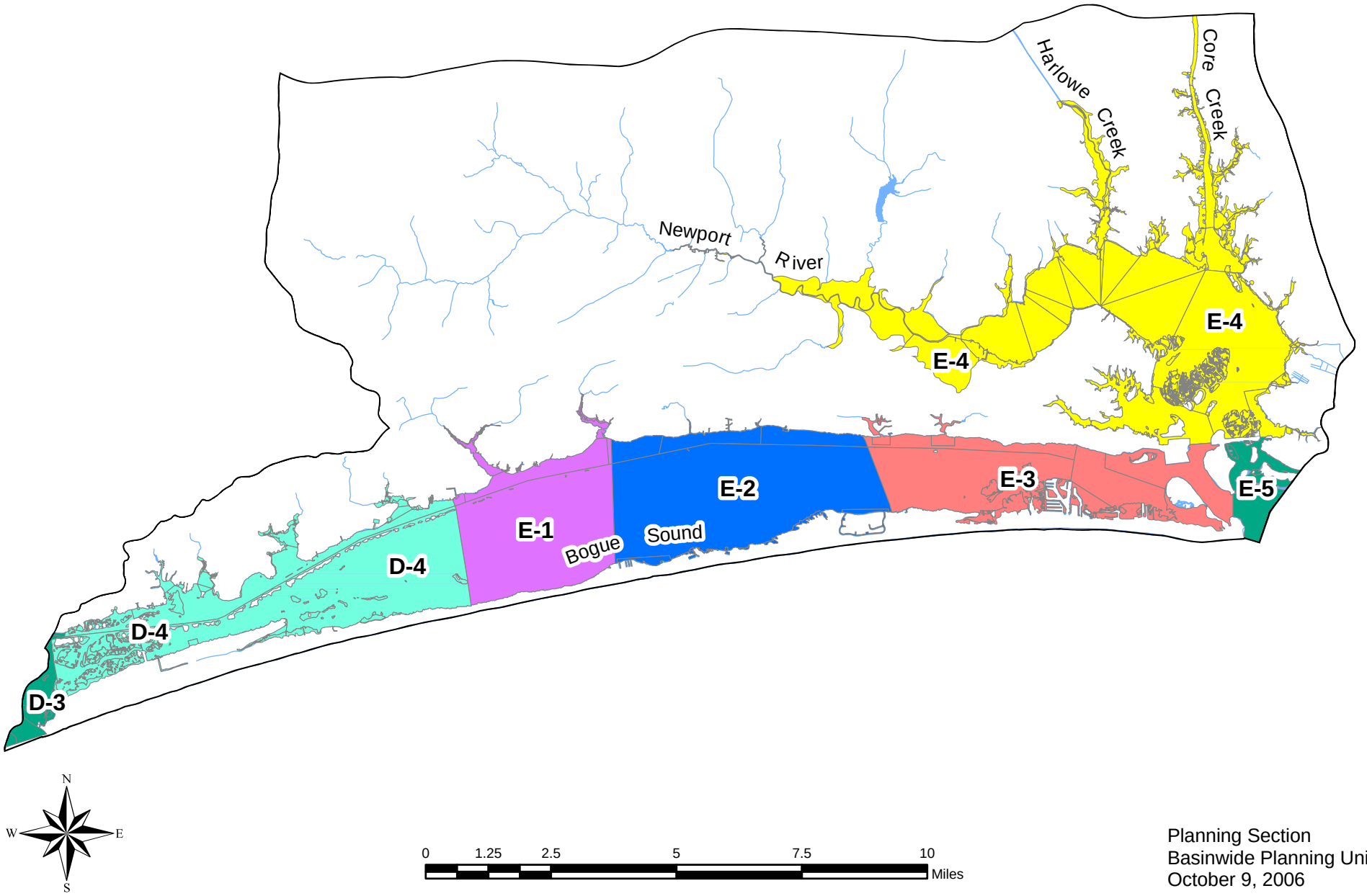
There are nine individual NPDES wastewater discharge permits in this subbasin with a total permitted flow of 3.95 MGD. The Town of Morehead City Wastewater Treatment Plant (WWTP), with a total permitted flow of 1.7 MGD holds the largest of these permits and discharges to Calico Creek. In 2005, five facilities were out of compliance with permit limits for a total of 101 violations resulting in issuing 18 Notices of Violation (NOV) and the remaining proceeded to enforcement. Previously, Beaufort and Morehead City WWTPs received NOVs and were then required to perform whole effluent toxicity (WET) testing. Significant toxicity issues have not occurred since 1999. As of 2004, there were 13 general stormwater permits and one individual stormwater permit. Refer to Appendix II for the listing of NPDES permit holders.

Figure 7 White Oak River Subbasin 03-05-03



Planning Section
Basinwide Planning Unit
March 20,2007

Figure 8 DEH Shellfish Growing Area Classifications in Subbasin 03-05-03



Planning Section
Basinwide Planning Unit
October 9, 2006

Table 17

WHITE OAK Subbasin 03-05-03

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting			
				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
Allen Slough															
20-36-13-2	SA HQW	5.8	S Acres	ND					ND			S	APP		
From source to Money Island Bay													E-3		
Alligator Creek															
21-22-2	SA HQW	2.1	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Harlowe Creek													E-4		
Archer Creek (Piney Cr.)															
20-36-5	SA HQW	19.4	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													D-4		
Back Sound															
21-35-(0.5)a	SA HQW	303.6	S Acres	**S**		PA35	NCE		**S**		PA35	NCE	S	APP	
Portion of the following in subbasin 030503 From Newport River to a point on Shackleford Banks at lat. 34 40'57" and long 76 37'30" north to the western most point of Middle Marsh														E-5	
21-35-(0.5)d	SA HQW	50.9	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area at west mouth of Taylor Creek around Pivers Island													E-5		
Bell Creek															
21-24-2a	SA HQW	19.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to DEH closed line													E-4		
21-24-2b	SA HQW	46.2	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH closed line to Core Creek													E-4		
Big Creek															
21-20	SA	0.3	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
Big Ramhorn Branch															
21-4	C	1.2	FW Miles	ND					ND						
From source to Newport River															
Billys Branch															
21-16-3	C	0.9	FW Miles	ND					ND						
From source to Mill Pond Black Creek															

Table 17

WHITE OAK Subbasin 03-05-03

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting: SH Rating	GA	Stressors	Sources
Black Creek (Mill Pond)															
21-16	C	2.4	FW Miles	ND					ND						
From source to Newport River															
Blakes Branch															
21-9-1	C	0.9	FW Miles	ND					ND						
From source to Smiths Swamp															
Bogue Sound															
20-36-(0.5)b1	SA ORW	44.2	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area at mouth of Hunting Island Creek													D-4		
20-36-(0.5)b2	SA ORW	11.9	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area at mouth of Hunting Island Creek													D-4		
20-36-(0.5)c	SA ORW	33.6	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area at mouth of Sanders Creek													D-4		
20-36-(0.5)d1	SA ORW	3.8	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area 870 meters west of mouth of Broad Creek													E-1		
20-36-(0.5)d2	SA ORW	0.7	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area 870 meters west of mouth of Broad Creek													E-1		

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Bogue Sound (Including Intracoastal Waterway to Beaufort Inl														
20-36-(8.5)b1	SA HQW	48.7 S Acres	ND					ND			S	APP		
Approved area immediately adjacent to Salter Path prohibited area												E-2		
20-36-(8.5)b2	SA HQW	62.1 S Acres	ND					**S**	C41B	NCE	I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH prohibited area adjacent to Salter Path on sound side of outer banks												E-2		
20-36-(8.5)c1	SA HQW	373.1 S Acres	**S**	PA27	NCE			**S**	PA27	NCE	I	CAC	Fecal Coliform Bacteria	Stormwater Runoff
DEH Conditionally Approved Closed area near Jumping Run Creek												E-2		
20-36-(8.5)c2	SA HQW	5.0 S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH Conditionally Approved Closed area near Jumping Run Creek												E-2		
20-36-(8.5)d	SA HQW	8.0 S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
DEH closed area in unnamed bay approximately 2500 meters east of line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point												E-2		
20-36-(8.5)e	SA HQW	4.9 S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
DEH closed area in unnamed bay approximately 3500 meters east of line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point												E-2		
20-36-(8.5)g	SA HQW	47.9 S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area at mouth of Spooner Creek												E-3		
20-36-(8.5)h	SA HQW	93.2 S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area at mouth of Peltier Creek												E-3		
20-36-(8.5)i	SA HQW	41.3 S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area near Hoophole Creek west of Atlantic Beach												E-3		
20-36-(8.5)j	SA HQW	47.4 S Acres	ND					ND	C47A	NCE	I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed areas west at Atlantic Beach Bridge and Cedar Hammock												E-3		
20-36-(8.5)k	SA HQW	355.4 S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Unknown
DEH closed area from Newport River Restricted area to Fort Macon Creek												E-3	Fecal Coliform Bacteria	Stormwater Runoff
													Fecal Coliform Bacteria	Impervious Surface

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting: SH Rating	GA	Stressors	Sources
Bogue Sound (Including Intracoastal Waterway)															
20-36-(0.5)a1	SA ORW	9,281.0	S Acres	ND					**S**	C10B	NCE	S	APP		
										C34	NCE				
										C39A	NCE				
										C7B	NCE				
From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek. Main body of Bougue Sound South of ICWW.													E-2		
20-36-(0.5)a2	SA ORW	1,750.1	S Acres	**S**	PA28	NCE			**S**	PA28	NCE	I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
										C31	NCE				
										C35	NCE				
From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek. Area between ICWW and North Shore of Bogue Sound													E-1		
20-36-(0.5)a3	SA ORW	3.4	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek. Cedar Point Villas Marina													D-4		
20-36-(0.5)a4	SA ORW	1.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek. Dolphin Street Park Dockage													D-4		
20-36-(0.5)a5	SA ORW	2.0	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek. Bayshore Park Dockage													D-4		
20-36-(0.5)a6	SA ORW	4.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek. Old Ferry Dock at Cape Carteret													D-4		

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting: SH Rating	GA	Stressors	Sources
20-36-(0.5)a7	SA ORW	11.5	S Acres	ND					**S**	C33	NCE	I	PRO	Fecal Coliform Bacteria	Marina
From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek. Island Harbor Marina													D-4		
20-36-(0.5)a8	SA ORW	4.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek. Salty Shores Marina													E-1		
20-36-(0.5)a9	SA ORW	1.5	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek. Bogue Sound Yacht Club													D-4		
20-36-(8.5)a1	SA HQW	9,108.2	S Acres	ND					ND			S	APP		
From a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point to Beaufort Inlet excluding the DEH Conditionally Approved Closed area near Jumping Ru													E-2		
20-36-(8.5)a12	SA HQW	12.1	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point to Beaufort Inlet excluding the DEH Conditionally Approved Closed area near Jumping Ru. Salter Path													E-2		
20-36-(8.5)a2	SA HQW	1,180.5	S Acres	ND					**S**	C40 C48A C51	NCE NCE NCE	I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point to Beaufort Inlet excluding the DEH Conditionally Approved Closed area near Jumping Ru.													E-2		
20-36-(8.5)a4	SA HQW	134.1	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point to Beaufort Inlet excluding the DEH Conditionally Approved Closed area near Jumping Ru. Morehead City Port													E-3	Fecal Coliform Bacteria	Unknown
														Fecal Coliform Bacteria	Stormwater Runoff
														Fecal Coliform Bacteria	Impervious Surface

AU Number	Classification	Length/Area		Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting			
Description				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
20-36-(8.5)a5	SA HQW	46.2	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point to Beaufort Inlet excluding the DEH Conditionally Approved Closed area near Jumping Ru. Bogue Sound Atlantic Beach Area													E-3		
20-36-(8.5)a7	SA HQW	3.0	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point to Beaufort Inlet excluding the DEH Conditionally Approved Closed area near Jumping Ru. Triple S Marina													E-3		
20-36-(8.5)a8	SA HQW	1.3	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point to Beaufort Inlet excluding the DEH Conditionally Approved Closed area near Jumping Ru. Pine Knoll Shores Area													E-2		
20-36-(8.5)a9	SA HQW	0.4	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point to Beaufort Inlet excluding the DEH Conditionally Approved Closed area near Jumping Ru. Bogue Pines Boat Basin													E-3		
20-36-(8.5)f	SA HQW	81.0	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area in unnamed bay area near Hoophole Woods approximately 7400 meters east of line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point													E-2		
Bogue Sound (Including Intracoastal Waterway). Brandywine Bay Inc.															
20-36-(8.5)a3	SA HQW	3.3	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
Prohibited area in sound extending from Brandywine Bay Inc.													E-2		
Broad Creek															
20-36-7a	SA HQW	73.8	S Acres	ND					**S**	C39	NCE	I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													E-1		
20-36-7b	SA HQW	16.0	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													E-1		

Table 17

WHITE OAK Subbasin 03-05-03

AU Number	Classification	Length/Area	Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting			
Description			AL Rating	Station	Result	Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
Calico Creek														
21-32	SC HQW	140.2 S Acres	I	PA24	CE	Turbidity	39.1	I	PA24	CE			Low Dissolved Oxygen	
				PA24	ID	Chlor a	75		PA25	CE			Fecal Coliform Bacteria	Stormwater Runoff
				PA25	CE	Low DO	17.4						Chlorophyll a	
				PA25	ID	Chlor a	57.1						Turbidity	WWTP NPDES
				PA25	CE	Turbidity	34.8							
	From source to Newport River (The mouth of Calico Creek is defined as beginning at a point of land on the north shore at Lat. 34 43' 46" Long. 76 43' 07" thence across the creek													
Cedar Swamp Creek														
21-7	C	2.8 FW Miles	ND					ND						
	From source to Newport River													
Core Creek (Intracoastal Waterway - Adams Creek Canal)														
21-24a	SA HQW	29.3 S Acres	ND					ND			I	CAC	Fecal Coliform Bacteria	Stormwater Runoff
	From Neuse River Basin boundary to DEH closed line											E-4		
21-24b1	SA HQW	212.0 S Acres	ND					ND			I	CAC	Fecal Coliform Bacteria	Stormwater Runoff
	From DEH closed line to DEH Conditionally Approved Closed line											E-4		
21-24b2	SA HQW	14.9 S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
	From DEH closed line to DEH Conditionally Approved Closed line											E-4		
21-24c	SA HQW	196.4 S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
	From DEH Conditionally Approved Closed line to Newport River											E-4		
Crab Point Bay														
21-30	SA HQW	157.3 S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
	Entire Bay											E-4		
Cypress Drain														
21-2-2	C	1.3 FW Miles	ND					ND						
	From source to Northwest Prong Newport River													
Deep Creek														
21-11	C	4.6 FW Miles	ND					ND						
	From source to Newport River													

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting: SH Rating	GA	Stressors	Sources
Deer Creek															
20-36-1	SA HQW	53.3	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													D-4		
East Prong Broad Creek															
20-36-7-2	SA HQW	10.1	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Broad Creek													E-1		
East Prong Gales Creek															
20-36-8-1	SA HQW	0.8	S Miles	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Gales Creek													E-1		
East Prong Jasons Branch															
21-3-5-1	C	0.6	FW Miles	ND					ND						
From source to Jasons Branch															
East Prong Sanders Creek															
20-36-6-1	SA HQW	2.8	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Sanders Creek													D-4		
Eastman Creek															
21-24-1	SA HQW	15.5	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Core Creek													E-4		
Fishing Creek															
20-36-15-1	SA HQW	11.3	S Acres	ND					ND			S	APP		
From source to Tar Landing Bay													E-3		
Fort Macon Creek															
20-36-16	SA HQW	25.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													E-3		
Gable Creek															
21-28a	SA HQW	35.4	S Acres	ND					ND			I	CAC	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
21-28b	SA HQW	10.9	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		

Table 17

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Gales Creek															
20-36-8	SA HQW	53.8	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													E-1		
Ghouls Fork															
21-16-1-1	C	1.3	FW Miles	ND					ND						
From source to Main Prong															
Goose Creek															
20-36-4a	SA HQW	73.3	S Acres	ND					**S**	C36	NCE	I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to DEH closure line Bogue Sound													D-4		
20-36-4b	SA HQW	128.8	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH closure line to Bogue Sound													D-4		
Hannah Branch															
20-36-7-1-1	SA HQW	0.8	S Miles	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to West Prong Broad Creek													E-1		
Harbor Channel															
20-36-14	SC	61.7	S Acres	ND					**S**	C51B	NCE				
Entire Channel															
Harlowe Canal															
21-22-1	SA HQW	10.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From Neuse River Basin Boundary (at Craven-Carteret County Line) to Harlowe Creek (at N.C. Hwy. # 101)													E-4		

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AU Number	Classification	Length/Area		Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting			
Description				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
Harlowe Creek															
21-22a	SA HQW	31.3	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area from source (at N.C. Hwy. # 101) to DEH closure line south of mouth of Alligator Creek													E-4		
21-22b1	SA HQW	1.4	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH closure line south of mouth of Alligator Creek to DEH Conditionally Approved Closed line near Newport River													E-4		
21-22b2	SA HQW	92.2	S Acres	ND					ND			I	CAC	Fecal Coliform Bacteria	Stormwater Runoff
From DEH closure line south of mouth of Alligator Creek to DEH Conditionally Approved Closed line near Newport River													E-4		
21-22b3	SA HQW	0.2	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH closure line south of mouth of Alligator Creek to DEH Conditionally Approved Closed line near Newport River													E-4		
21-22c	SA HQW	99.7	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH Conditionally Approved Closed line near Newport River to Newport River													E-4		
Hoop Pole Creek															
20-36-12	SA HQW	163.2	S Acres	ND					ND			S	APP		
From source to Bogue Sound													E-3		
Hull Swamp															
21-15	C	4.6	FW Miles	ND					ND						
From source to Newport River															
Hunting Island Creek															
20-36-2	SA HQW	2.7	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													D-4		
Jasons Branch															
21-3-5	C	1.3	FW Miles	ND					ND						
From source to Southwest Prong Newport River															
Jumping Run															
20-36-9	SA HQW	4.5	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													E-2		

AU Number	Classification	Length/Area	Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting			
Description			AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
Juniper Branch														
21-3-3	C	1.4 FW Miles	ND					ND						
From source to Southwest Prong Newport River														
Laurel Branch														
21-11-1	C	0.2 FW Miles	ND					ND						
From source to Deep Creek														
Little Creek														
21-21	SA HQW	0.5 S Miles	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River												E-4		
Little Creek Swamp														
21-18	SA HQW	0.4 S Miles	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River												E-4		
Little Deep Creek														
21-11-2	C	2.1 FW Miles	ND					ND						
From source to Deep Creek														
Little Ramhorn Branch														
21-4-1	C	0.8 FW Miles	ND					ND						
From source to Big Ramhorn Branch														
Little Run														
21-2-1	C	0.5 FW Miles	ND					ND						
From source to Northwest Prong Newport River														
Lodge Creek														
21-14	C	0.3 FW Miles	ND					ND						
From source to Newport River														
Main Prong														
21-16-1	C	2.7 FW Miles	ND					ND						
From source to Mill Pond Black Creek														
Mairey Branch														
21-3-1	C	0.7 FW Miles	ND					ND						
From source to Southwest Prong Newport River														

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting: SH Rating	GA	Stressors	Sources
Meadows Branch															
21-5	C	3.3	FW Miles	ND					ND						
From source to Newport River															
Mill Creek															
21-19	SA HQW	0.3	S Miles	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
Milldam Branch															
21-3-6	C	1.3	FW Miles	ND					ND						
From source to Southwest Prong Newport River															
Millis Swamp															
21-3-2	C	1.2	FW Miles	ND					ND						
From source to Southwest Prong Newport River															
Money Island Bay															
20-36-13a	SA HQW	106.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
Closed DEH area in western portion of Bay													E-3		
20-36-13b1	SA HQW	16.9	S Acres	ND					ND			S	APP		
DEH approved area near Allen Slough in eastern portion of Bay													E-3		
20-36-13b2	SA HQW	21.0	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH approved area near Allen Slough in eastern portion of Bay. Bogue Banks Atlantic Beach Area													E-3		
Money Island Slough															
20-36-13-1	SA HQW	10.9	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Money Island Bay													E-3		
Money Island Swamp															
21-16-2	C	1.4	FW Miles	ND					ND						
From source to Mill Pond Black Creek															

Table 17

WHITE OAK Subbasin 03-05-03

AU Number	Classification	Length/Area		Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting			
Description				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
Newport River															
21-(1)	C	11.2	FW Miles	**NR**	PA22	CE	Low DO	23.2	**S**	PA22	NCE				
					PA22	CE	Low pH	26.8							
From source to Little Creek Swamp															
21-(17)a	SA HQW	31.5	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	WWTP NPDES
From Little Creek Swamp to DEH closure line													E-4		
21-(17)b1	SA HQW	579.5	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	WWTP NPDES
From DEH closure line to DEH Conditionally Approved Closed line													E-4		
21-(17)b2	SA HQW	407.2	S Acres	ND					ND			I	CAC	Fecal Coliform Bacteria	Stormwater Runoff
From DEH closure line to DEH Conditionally Approved Closed line													E-4		
21-(17)c	SA HQW	2,701.4	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH Conditionally approved closed line to DEH Conditionally approved open line extending from Penn Point to west mouth of Core Creek													E-4		
21-(17)d1	SA HQW	3,200.7	S Acres	**S**	PA23	NCE			**S**	PA23	NCE	I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH conditionally approved open line extending from Penn Point to the west shore of Core Creek to the Atlantic Ocean excluding closed areas around Morehead City and Beaufort													E-4		
21-(17)d2	SA HQW	302.7	S Acres	ND					ND			S	APP		
From DEH conditionally approved open line extending from Penn Point to the west shore of Core Creek to the Atlantic Ocean excluding closed areas around Morehead City and Beaufort													E-5		
21-(17)d3	SA HQW	0.4	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From DEH conditionally approved open line extending from Penn Point to the west shore of Core Creek to the Atlantic Ocean excluding closed areas around Morehead City and Beaufort. Deerfield Shores Marina													E-4		
21-(17)e1	SA HQW	19.7	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area north of Morehead City Harbor restricted area including Crap Point Thorofare and Calico Creek Marsh to Hwy 70 Bridge.													E-4		

Table 17

WHITE OAK Subbasin 03-05-03

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting: SH Rating	GA	Stressors	Sources
21-(17)e2	SA HQW	671.1	S Acres	ND					**S**	C53A	NCE	I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH conditionally approved open line extending from Penn Point to the west shore of Core Creek to the Atlantic Ocean excluding closed areas around Morehead City and Beaufort													E-4		
21-(17)f	SA HQW	220.4	S Acres	**S**	PA26	NCE			**S**	PA26	NCE	I	PRO	Fecal Coliform Bacteria	Unknown
DEH closed area from Hwy 70 Bridge to a line extending form the south point of Radio Island to Fort Macon including Morehead City Channel													E-3	Fecal Coliform Bacteria	Stormwater Runoff
														Fecal Coliform Bacteria	Impervious Surface
21-(17)g1	SA HQW	30.8	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area around Gallant Point south to Hwy 70 Bridge including Beaufort Channel													E-4		
21-(17)g2	SA HQW	136.9	S Acres	ND					**S**	C55B	NCE	I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closed area around Gallant Point south to Hwy 70 Bridge including Beaufort Channel													E-4		
21-(17)h	SA HQW	198.7	S Acres	ND					**S**	C57	NCE	I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
Deh closed area south of Hwy 70 Bridge and west of Pivers Island including Bulkhead Channell													E-5		
Newport River Restricted Area (Morehead City Harbor)															
21-31	SC	126.0	S Acres	ND					ND						
All waters within a line beginning at a point of land near the south end of 11th street in Morehead City at Lat. 34 43' 08"Long. 76 43' 04"; thence in straight line to the west															
Northwest Prong Newport River															
21-2	C	3.9	FW Miles	**NR**					ND						
From source to Newport River					PB7	NR									
Oyster Creek															
21-23a	SA HQW	28.7	S Acres	ND					ND			I	CAC	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
21-23b	SA HQW	22.1	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
Peak Swamp															
21-3-4	C	0.9	FW Miles	ND					ND						
From source to Southwest Prong Newport River															

Table 17

WHITE OAK Subbasin 03-05-03

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting			
				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
Peltier Creek															
20-36-11	SB#	23.9	S Acres	ND					ND						
From source to Bogue Sound															
Russell Creek															
21-26a	SA HQW	16.8	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
21-26b	SA HQW	2.7	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
Sanders Creek															
20-36-6a	SA HQW	17.9	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													D-4		
20-36-6b	SA HQW	19.3	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													D-4		
Sanders Creek (Goose Creek)															
20-36-4-1	SA HQW	0.8	S Miles	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Goose Creek													D-4		
Sandy Branch															
20-36-7-1-1-1	SA HQW	0.7	S Miles	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Hannah Branch													E-1		
21-13	C	1.8	FW Miles	ND					ND						
From source to Newport River															
School House Branch															
21-8	C	0.4	FW Miles	ND					ND						
From source to Newport River															
Shoe Branch															
21-6	C	2.6	FW Miles	ND					ND						
From source to Newport River															
Sikes Branch															
20-36-6-1-1	SA HQW	1.2	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to East Prong Sanders Creek													D-4		

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting: SH Rating	GA	Stressors	Sources
Smiths Swamp															
21-9	C	1.8	FW Miles	ND					ND						
From source to Newport River															
Smiths Swamp Branch															
21-10	C	0.8	FW Miles	ND					ND						
From source to Newport River															
Snows Swamp Branch															
21-12	C	1.2	FW Miles	ND					ND						
From source to Newport River															
Southwest Prong Newport River															
21-3	C	6.5	FW Miles	ND					ND						
From source to Newport River															
Spooner Creek															
20-36-10	SA HQW	28.9	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Bogue Sound													E-3		
Tar Landing Bay															
20-36-15	SA HQW	115.8	S Acres	ND					ND			S	APP		
Entire Bay													E-3		
Taylor Bay															
20-36-3	SA ORW	81.9	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
Entire Bay													D-4		
Taylor Creek															
21-34	SC	166.3	S Acres	**NR**					**S**	C56	NCE			Fecal Coliform Bacteria	WWTP NPDES
										C56A	NCE			Total Suspended Solids	WWTP NPDES
From source to Newport River (The mouth of Taylor Creek is defined as beginning at a point of land on the north shore at Lat. 34 43' 07" Long. 76 40' 13" thence														Low Dissolved Oxygen	WWTP NPDES

Table 17

WHITE OAK Subbasin 03-05-03

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting: SH Rating	GA	Stressors	Sources
Town Creek															
21-33a	SC	8.0	S Acres	ND					I	C55A	CE			Enterrococcus	Unknown
Area on side of creek															
21-33b	SC	51.9	S Acres	ND					ND						
From source to Newport River (The mouth of Town Creek is defined as beginning at a point of land on the north shore at Lat. 34 43' 41" Long. 76 40' 04" thence across the creek															
Wading Creek															
21-27	SA HQW	19.5	S Acres	ND					ND			I	CAC	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
Ware Creek															
21-25	SA HQW	42.2	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
West Prong Broad Creek															
20-36-7-1	SA HQW	11.5	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Broad Creek													E-1		
Willis Creek															
21-29	SA HQW	17.1	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Newport River													E-4		
Wolf Branch															
20-36-7-1-2	SA HQW	1.0	S Miles	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to West Prong Broad Creek													E-1		

Table 17

WHITE OAK Subbasin 03-05-03

AU Number	Classification	Length/Area	Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting			
Description			AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources

Use Categories:
AL - Aquatic Life
REC - Recreation
SH - Shellfish Harvesting

Monitoring data type:
PF - Fish Community Survey
PB - Benthic Community Survey
PA - Ambient Monitoring Site
PL- Lake Monitoring
S, C- DEH RECMON

GA - DEH SS Classification and Growing Area
APP- Approved
CAO- Conditionally Approved-Open
CAC- Conditionally Approved-Closed
PRO- Prohibited

Results:
E - Excellent
G - Good
GF - Good-Fair
F - Fair
P - Poor
NI - Not Impaired
S- Severe Stress
M-Moderate Stress
N- Natural

Use Support Ratings 2006:
S - Supporting, I - Impaired
NR - Not Rated
NR*- Not Rated for Recreation (screening criteria exceeded)
ND-No Data Collected to make assessment

Results
CE-Criteria Exceeded > 10% and more than 10 samples
NCE-No Criteria Exceeded

Miles/Acres
FW- Fresh Water
S- Salt Water

Aquatic Life Rating Summary

S	m	5,847.9	S Acres
I	m	140.2	S Acres
NR	m	15.1	FW Miles
NR	e	166.3	S Acres
ND		5.2	S Miles
ND		28,291.0	S Acres
ND		54.1	FW Miles

Recreation Rating Summary

S	m	17,764.7	S Acres
I	m	148.2	S Acres
S	m	11.2	FW Miles
ND		5.2	S Miles
ND		16,532.5	S Acres
ND		58.0	FW Miles

Fish Consumption Rating Summary

I	e	5.2	S Miles
I	e	34,445.4	S Acres
I	e	69.2	FW Miles

Shellfish Harvesting Rating Summary

I	m	5.2	S Miles
S	m	19,357.1	S Acres
I	m	14,510.3	S Acres

3.2 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. In subbasin 03-05-03, use support was assigned for (1) fish consumption, (2) aquatic life, (3) recreation, and (4) shellfish harvesting, as noted below. For more information about use support methodology, refer to Appendix IV.

(1) All waters are Impaired on an evaluated basis in the fish consumption category because of a fish consumption advise that applies to the entire state. More information on fish consumption use support can be found in Chapter 7.

(2) Waters were assessed for supporting aquatic life using one benthic macroinvertebrate sampling and seven ambient monitoring stations. Refer to the ***2005 White Oak River Basinwide Assessment Report*** at http://www.esb.enr.state.nc.us/Basinwide/WOA2005.pdf and Appendix I for more information on monitoring.

(3) Waters were assessed for supporting recreation activities based on the DEH recreation monitoring program detailed in Chapter 7.

(4) Criteria for making use support determinations for the shellfish harvesting category were based on Division of Environmental Health Sanitary Survey (DEH SS) growing area classifications. The problem parameter for all shellfish waters is the potential for exceeding the fecal coliform standards. Differences in acreage estimates between basin cycles are not just related to changes in water quality. Changes in acreage are related to more refined methods of estimating acreages, changes in growing area classifications, extension of closure areas as a result of additional boat slips associated with marinas, and to changes in use support methodology. Refer to Figure 8 to identify growing area locations within this subbasin.

Waters in the following sections 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 is used 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. Table 18 contains a summary of use support ratings by category in subbasin 03-05-03; detailed use support information about specific AU#s and shellfish growing areas follows.

Table 18 Summary of Use Support Ratings by Category in Subbasin 03-05-03

Use Support Rating	Aquatic Life		Recreation		Shellfish Harvesting	
	Freshwater	**Saltwater**	**Freshwater**	**Saltwater**	**Freshwater**	**Saltwater**
Monitored Waters						
Supporting	0	5,847.9 ac	11.2 mi	17,764.7 ac	0	19,357.1 ac
Impaired*	0	140.2 ac (2%)	0	8 ac (.04%)	0	5.2 mi (100%) 14,510.3 ac (43%)
Not Rated	15.1 mi	0	0	140.2 ac	0	
Total	**15.1 mi**	**5,988.1 ac**	**11.2 mi**	**17,912.9 ac**	**0**	**5.2 mi** **33,867.4 ac**
Unmonitored Waters						
Not Rated	0	166.3 ac	0	0.8 mi	0	0
No Data	54.1 mi	5.2 mi 28,291 ac	58 mi	4.4 mi 16,532.5 ac	0	0
Total	**54.1 mi**	**5.2 mi** **28,457.3 ac**	**58 mi**	**5.2 mi** **16,532.5 ac**	**0**	**0**
Totals						
All Waters*	**69.2 mi**	**5.2 mi** **34,445.4 ac**	**69 mi**	**5.2 mi** **34,445.4**	**0**	**5.2 mi** **33,867.4 ac**

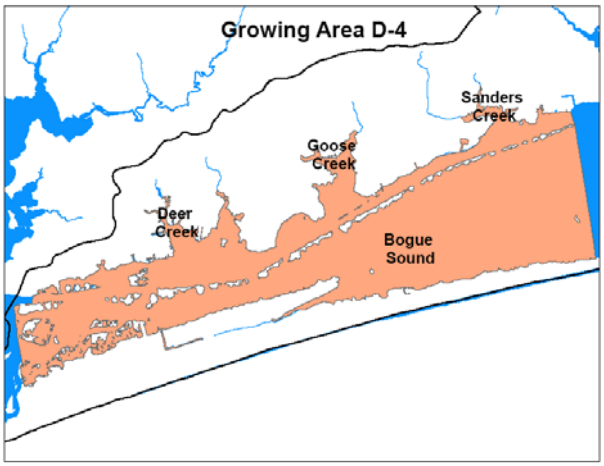
* The noted percent Impaired is the percent of monitored miles/acres only.

3.3 Status and Recommendations for Previously and Newly Impaired Waters

The following waters were either identified as Impaired in the previous basin plan (2001) 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 assessment unit number (AU#).

For the Impaired Class SA waters presented below, refer to Chapter 7 for more information and recommendations on shellfish harvesting use support and DEH SS growing area classifications. Refer to Figure 7 for a map of subbasin 03-05-03 and Figure 8 to identify growing area locations in this subbasin. If the entire Class SA water is located within more than one growing area it is noted in the corresponding growing area table.

3.3.1 Division of Environmental Health Growing Area D-4



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area D-4 as shown here and in Figure 8 & Table 19.

According to the ***Sanitary Survey of Deer Creek Area, Area D-4***, *(DEH, Shellfish Sanitation & Recreational Water Quality Section, September 2002 and August 2006)* there is little change in water quality throughout the area with the exception of the Deer Creek, Goose Creek and Archer Creek areas. Both of these areas have exhibited water quality improvements since 2000. Oyster production is fair and clam production is good. The mainland portion of the area is mainly woodland, farmland, residential and Bogue Field Marine Corps Air Base. The coastal area is rapidly developing, with seasonal populations (40,000 – 50,000) significantly higher than year-round populations (12,800). Since 1999, subdivisions have increased 14 percent and residential homes 30 percent. Bogue Watch, Cannonsgate, Morada Bay and Emerald View are all new large subdivisions being developed along the sound off of Hwy 24 in Newport.

Individual septic systems service most of the D-4 area. No problems on the mainland were noted during the surveys, however some developments are in low lying areas and may experience septic system problems when the soils are saturated. Two septic system failures were noted on Emerald Isle during the 2006 survey. WWTPs in the area are package plants, with no direct discharge and do not appear to pose a water quality threat.

As a result of the 2002 survey, two openings are recommended in the Hunting Island Bay and Sanders Creek areas (approximately 45 acres). Approximately 1,395 acres of approved shellfish waters will be reclassified to conditionally approved open as a result of this survey. Nonpoint pollution and runoff associated with increased development along the Hwy 24 portion of the area warrants this reclassification.

As a result of the 2006 survey, shellfish closures occurred as a result of a new marina for Cannonsgate Subdivision and closure lines were adjusted around the Old Ferry Dock Marina. Additional closure is recommended for the west end of Archer Creek that runs behind the Food Lion shopping center. Survey of the Emerald Isle portion of D-4 identified stormwater as a concern as several open shellfish growing areas were identified as receiving high stormwater flows from parking lots, subdivision drainage and town-owned stormwater outflows.

As part of a Clean Water Management Trust Fund grant, Emerald Isle Woods (43 acres) was purchased for stormwater treatment and disposal for the Coast Guard Road Stormwater Project (see Section 3.5 and Chapter 8, Section 8.4.4). To help reduce the impacts of stormwater runoff in Growing Area D-4 restoration of Archer Creek is recommended, mowing of buffers should be limited, illicit piping and illegal discharges should be identified and removed and runoff from Hwy 58 needs to be converted and/or slowed down to increase infiltration.

Table 19 Summary of DEH Growing Area D-4 Classifications in Subbasin 03-05-03

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Archer Creek (Piney Creek)	20-36-5	PRO	D-4
Deer Creek	20-36-1	PRO	D-4
East Prong Sanders Creek	20-36-6-1	PRO	D-4
Goose Creek	20-36-4a 20-36-4b	PRO CAO	D-4
Hunting Island Creek	20-36-2	PRO	D-4
Sanders Creek	20-36-6a 20-36-6b	PRO CAO	D-4
Sikes Branch	20-36-6-1-1	PRO	D-4
Taylor Bay	20-36-3	CAO	D-4
Bogue Sound	20-36-(0.5)b1 20-36-(0.5)d2 20-36-(0.5)b2 20-36-(0.5)c 20-36-(0.5)d1	PRO PRO CAO CAO CAO	D-4, E-1
Bogue Sound (Including ICWW to Beaufort Inlet)	20-36-(8.5)b1 20-36-(0.5)a1 20-36-(8.5)a1 20-36-(8.5)b2 20-36-(8.5)c2 20-36-(8.5)d 20-36-(8.5)e 20-36-(8.5)g 20-36-(8.5)h 20-36-(8.5)i 20-36-(8.5)j 20-36-(8.5)k 20-36-(0.5)a3 20-36-(0.5)a4 20-36-(0.5)a5 20-36-(0.5)a6 20-36-(0.5)a7 20-36-(0.5)a8 20-36-(0.5)a9 20-36-(8.5)a12 20-36-(8.5)a4 20-36-(8.5)a5 20-36-(8.5)a7 20-36-(8.5)a8 20-36-(8.5)a9 20-36-(8.5)f 20-36-(0.5)a2 20-36-(8.5)a2 20-36-(8.5)c1	APP APP APP PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO PRO CAO CAO CAC	D-4, E-1, E-2, E-3

APP=Approved, PRO=Prohibited, CAC=Conditionally Approved Closed, CAO=Conditionally Approved Open

Archer Creek (Piney Creek), Deer Creek, East Prong Sanders Creek, Goose Creek, Sanders Creek (Goose Creek), Sikes Branch and Taylor Bay

These water bodies are Impaired for shellfish harvesting. Each is classified by DEH SS in the table above for growing area D-4 due to potential fecal coliform bacteria levels, and will remain on the state's 303(d) list of Impaired waters. Deer Creek, AU# 20-36-4b (53.3ac) and Taylor Bay, AU# 20-36-3 (81.9ac) will be added to the state's 2008 303(d) list of Impaired waters.

Bogue Sound [AU# 20-36-(0.5)b1, b2, c]

Most of Bogue Sound is Impaired for shellfish harvesting. Refer to Section 3.3.3 below for further information.

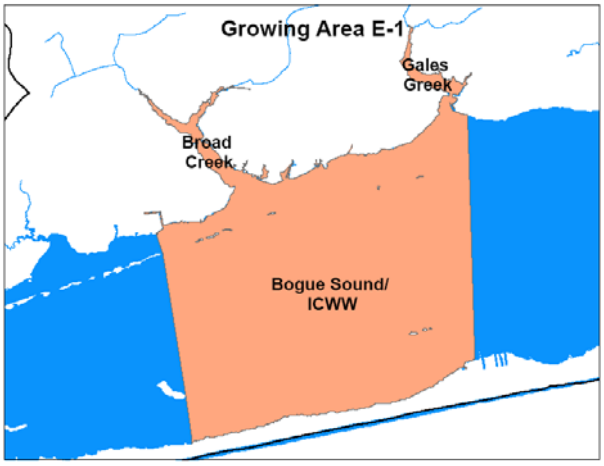
Hunting Island Creek [AU# 20-36-2]

Hunting Island Creek from source to Bogue Sound (2.7 acres) is Impaired for shellfish harvesting. Hunting Island Creek is classified by DEH SS as prohibited in growing area D-4 due to potential fecal coliform bacteria levels. Based on the 2002 DEH SS report 15 acres of Hunting Island Bay is recommended for reclassification to approved. Hunting Island Creek will remain on the state's 303(d) list of Impaired waters until the reclassification occurs; it will then be removed from the 303(d) list.

Sanders Creek [AU# 20-36-6a and b]

Sanders Creek from source to Bogue Sound (37.2 acres) is Impaired for shellfish harvesting. Sanders Creek is classified by DEH SS as conditionally approved open and prohibited in growing area D-4 due to potential fecal coliform bacteria levels. Based on the 2002 DEH SS report 30 acres of Sanders Creek is recommended for reclassification to approved. Sanders Creek will remain on the state's 303(d) list of Impaired waters until the reclassification occurs; it will then be removed from the 303(d) list.

3.3.2 Division of Environmental Health Growing Area E-1



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area E-1 as shown here and in Figure 8 & Table 20.

According to the ***Sanitary Survey of Broad Creek Area, Area E-1,*** *(DEH, Shellfish Sanitation & Recreational Water Quality Section, August 2002)* there is little change in water quality throughout the area. However, approximately 500 acres (from the ICWW to the mainland) of approved shellfish waters will be reclassified to conditionally approved as a result of the survey. Nonpoint source pollution and runoff associated with increased development along Highway 24 is the reason for the classification change. Area E-1 is small, approximately 4,700 acres and drains approximately 16 square miles of watershed. Oyster production is poor, but clam production in good. The most significant threat to the water quality of this developing area is associated with stormwater and runoff. Residential development, increase in impervious surface, and yard activities are the major sources of nonpoint pollution in the immediate watershed. Land disturbances by off-road vehicles create ruts and trails that indirectly affect upper Broad Creek in the Croatan National Forest. Additional indirect water pollution sources arise from agriculture and development along Highway 24. One residential septic system was found to be failing and corrections have been made.

Table 20 Summary of DEH Growing Area E-1 Classifications in Subbasin 03-05-03

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Bogue Sound	20-36-(0.5)b1	PRO	D-4, E-1
	20-36-(0.5)d2	PRO	
	20-36-(0.5)b2	CAO	
	20-36-(0.5)c	CAO	
	20-36-(0.5)d1	CAO	
Bogue Sound (Including ICWW to Beaufort Inlet)	20-36-(8.5)b1	APP	D-4, E-1, E-2, E-3
	20-36-(0.5)a1	APP	
	20-36-(8.5)a1	APP	
	20-36-(8.5)b2	PRO	
	20-36-(8.5)c2	PRO	
	20-36-(8.5)d	PRO	
	20-36-(8.5)e	PRO	
	20-36-(8.5)g	PRO	
	20-36-(8.5)h	PRO	
	20-36-(8.5)i	PRO	
	20-36-(8.5)j	PRO	
	20-36-(8.5)k	PRO	
	20-36-(0.5)a3	PRO	
	20-36-(0.5)a4	PRO	
	20-36-(0.5)a5	PRO	
	20-36-(0.5)a6	PRO	
	20-36-(0.5)a7	PRO	
	20-36-(0.5)a8	PRO	
	20-36-(0.5)a9	PRO	
	20-36-(8.5)a12	PRO	
	20-36-(8.5)a4	PRO	
	20-36-(8.5)a5	PRO	
	20-36-(8.5)a7	PRO	
	20-36-(8.5)a8	PRO	
	20-36-(8.5)a9	PRO	
	20-36-(8.5)f	PRO	
	20-36-(0.5)a2	CAO	
	20-36-(8.5)a2	CAO	
	20-36-(8.5)c1	CAC	
Broad Creek	20-36-7a	PRO	E-1
	20-36-7b	CAO	
East Prong Broad Creek	20-36-7-2	PRO	E-1
Gales Creek	20-36-8	PRO	E-1
Hannah Branch	20-36-7-1-1	PRO	E-1
Sandy Branch	20-36-7-1-1-1	PRO	E-1
West Prong Broad Creek	20-36-7-1	PRO	E-1
Wolf Branch	20-36-7-1-2	PRO	E-1

APP=Approved, PRO=Prohibited, CAC=Conditionally Approved Closed, CAO=Conditionally Approved Open

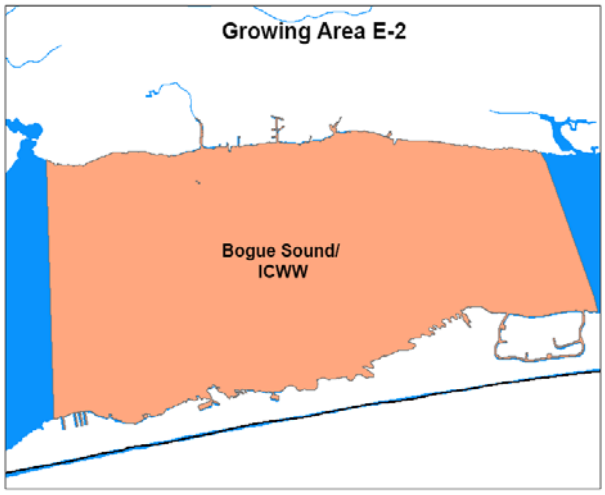
Bogue Sound [AU# 20-36-(0.5) d1 and d2]

Most of Bogue Sound is Impaired for shellfish harvesting. Refer to Section 3.3.3 below for further information.

Broad Creek, East Prong Broad Creek, East Prong Gales Creek, Gales Creek, Hannah Branch, Sandy Branch, Wolf Branch and West Prong Broad Creek

These water bodies are Impaired for shellfish harvesting. Each is classified by DEH SS in the table above for growing area E-1 due to potential fecal coliform bacteria levels, and will remain on the state's 303(d) list of Impaired waters.

3.3.3 Division of Environmental Health Growing Area E-2



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area E-2 as shown here and in Figure 8 & Table 21.

According to the ***Sanitary Survey of Bogue Sound Area, Area E-2,*** *(DEH, Shellfish Sanitation & Recreational Water Quality Section, September 2000)* there were water quality improvements at some stations and deterioration at other stations. Approximately 650 acres of approved shellfish harvesting areas were reclassified to conditionally approved as a result of this survey.

According to the ***Sanitary Survey of Bogue Sound Area, Area E-2****, (DEH, Shellfish Sanitation & Recreational Water Quality Section, September 2005)* the major source of bacteriological contamination is from stormwater runoff. Of particular concern are the numerous stormwater culverts that drain directly into Bogue Sound, draining parking lots of surrounding businesses, Hwy 58, and secondary roads. Jumping Run Creek receives drainage from the west side of Hwy 24, which has also developed significantly. Clam production remains good and oyster production is poor.

This area is small, approximately 16 square miles. Population within the area increased approximately 29 percent since the 2000 survey to an estimated 6,683 people. An estimated 159 residences have been built in subdivisions within the last 5 years. The addition of a Super Wal-Mart shopping complex was the largest commercial development since the last survey. Nonpoint source pollution and runoff associated with the increased development along Hwy 24, is one of the major sources of contamination in the area. Some of the 18 WWTPs serving the population are in poor structural condition due to corrosion from the salt environment. One failing septic system was noted during the survey and this system was repaired.

Table 21 Summary of DEH Growing Area E-2 Classifications in Subbasin 03-05-03

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Bogue Sound (Including ICWW to Beaufort Inlet)	20-36-(8.5)b1	APP	
	20-36-(0.5)a1	APP	
	20-36-(8.5)a1	APP	
	20-36-(8.5)b2	PRO	
	20-36-(8.5)c2	PRO	
	20-36-(8.5)d	PRO	
	20-36-(8.5)e	PRO	
	20-36-(8.5)g	PRO	
	20-36-(8.5)h	PRO	
	20-36-(8.5)i	PRO	
	20-36-(8.5)j	PRO	
	20-36-(8.5)k	PRO	
	20-36-(0.5)a3	PRO	
	20-36-(0.5)a4	PRO	
	20-36-(0.5)a5	PRO	D-4, E-1, E-2, E-3
	20-36-(0.5)a6	PRO	
	20-36-(0.5)a7	PRO	
	20-36-(0.5)a8	PRO	
	20-36-(0.5)a9	PRO	
	20-36-(8.5)a12	PRO	
	20-36-(8.5)a4	PRO	
	20-36-(8.5)a5	PRO	
	20-36-(8.5)a7	PRO	
	20-36-(8.5)a8	PRO	
	20-36-(8.5)a9	PRO	
	20-36-(8.5)f	PRO	
	20-36-(0.5)a2	CAO	
	20-36-(8.5)a2	CAO	
	20-36-(8.5)c1	CAC	
DEH closure line near Brandywine Bay	?	PRO	E-2
Jumping Run	20-36-9	PRO	E-2

APP=Approved, PRO=Prohibited, CAC=Conditionally Approved Closed, CAO=Conditionally Approved Open

Bogue Sound [AU# 20-36-(0.5)a2, a3, a4, a5, a6, a7, a8, a9, b1, b2, c, d1, d2, and 20-36-(8.5)a2, a4, a5, a7, a8, a9, a12, b2, c1, c2, d, e, f, g, h, i, j, k]

2001 Impaired Class SA Waters Status for Bogue Sound and Tributaries

Bogue Sound and tributaries were not supporting shellfish harvesting. These areas were classified as prohibited/restricted and permanently closed to shellfish harvesting. Population increases in Bogue Sound and surrounding areas were the potential sources of pollution due to runoff from urbanized areas and subdivisions (NCDENR, 1999).

Current Status

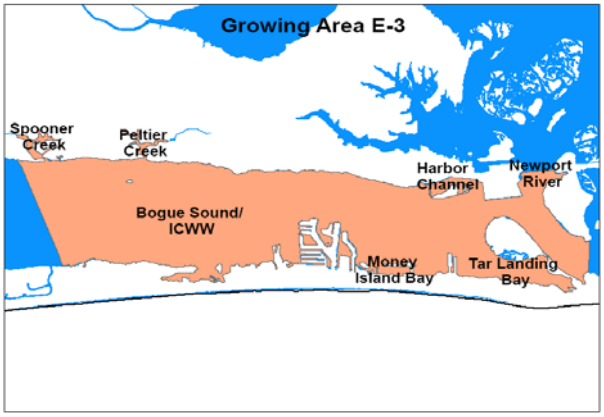
Much of Bogue Sound (4,370.4 acres) is Impaired for shellfish harvesting. These segments of Bogue Sound are classified by DEH SS as conditionally approved open, conditionally approved closed and prohibited in growing areas D-4, E-1, E-2 and E-3 due to potential fecal coliform bacteria levels. Bogue Sound (including Intracoastal Waterway to Beaufort Inlet) will remain on the state's 303(d) list of Impaired waters. Assessment units: 20-36-(0.5)a2, a3, a4, a5, a7, a8, a9, 20-36-(8.5), a12, a2, a4, a5, a7, a8 and a9, totaling 3,156.9 acres, will be added to the 2008 303(d) list of Impaired waters. An additional 18,437.9 acres are classified as approved and are considered Supporting shellfish harvesting.

Jumping Run [AU# 20-36-9]

Jumping Run from source to Bogue Sound (4.5 acres) is Impaired for shellfish harvesting. Jumping Run is classified by DEH SS as prohibited in growing area E-2 due to potential fecal coliform bacteria levels. Jumping Run will remain on the state's 303(d) list of Impaired waters.

Jumping Run Creek was selected for a shellfish growing area multi-agency restoration project (DEH. Shellfish Sanitation Unit, September 2005). The project objective is to evaluate land use changes impacting shellfish growing areas and implement restoration techniques. The creek drains into approximately 612 acres of conditionally approved closed waters in Bogue Sound, has a watershed size of approximately 800 acres, and is only moderately developed. Fecal counts post rainfall events are being used to calculate loading rates for the creek. Some BMPs have been installed, such as reconstructed wetlands, and more are planned. DNA source tracking is also part of the project to determine the source of fecal levels. Project partners are hopeful that water quality will improve, allowing the opening of shellfish areas in the future.

3.3.4 Division of Environmental Health Growing Area E-3



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area E-3 as shown here and in Figure 8 & Table 22.

According to the ***Sanitary Survey of Morehead City-Atlantic Beach Area, Area E-3,*** *(DEH, Shellfish Sanitation & Recreational Water Quality Section, August 2002)* there was some deterioration in water quality, particularly in the old Coopers Camp area. Approximately 400 acres of approved shellfish waters will be reclassified to conditionally approved open as a result of this survey. Nonpoint source pollution and runoff associated with increased development along Hwy 70 warrants this reclassification. This watershed is relatively small in size. Oyster production is fair and clam production is good.

The towns of Morehead City and Atlantic Beach are located within the area, making it one of the most heavily populated areas along the coast. Permanent population is approximately 7,185 people, but seasonal tourist population can range from 30,000 to 50,000.

Morehead City reports that approximately 30 percent of the developed lots in the City's jurisdiction are on septic tanks, with approximately 2,100 septic tanks in Morehead City's extraterritorial jurisdiction and 5,100 sewer customers in the city limits. Some of these systems are within the E-4 growing area. On-site septic systems are typical on the Atlantic beach side of Bogue Sound. Small package plants serve the condominiums along Bogue Banks; according to DWQ records, these plants have reported some failures. Some businesses in Atlantic Beach are permitted to do pump and haul of waste due to poor site conditions. In August 2005, a WWTP serving The Sheraton and Island Beach and Racquet Club spilled 55,000 gallons of untreated sewage. The spill inundated Croatan Mobile Home Park and closed a 3-mile stretch of water for

21 days. Carteret County is now the only county in the country that has preparedness planned for large scale WWTP system failure.

In the area of Atlantic Station, on either side of the shopping center, are two methods to treat stormwater on the island. On the east, discharge pipes drain water from several hundred mobile homes and dense housing. To the west is a lift station which pumps groundwater and stormwater through a ditched area draining to Hoop Pole Creek, in an effort to lower the water table and reduce street flooding during rainfall events. The new Lowes and Super Wal-Mart have constructed several stormwater retention ponds to handle runoff from the large amount of impervious surfaces created with these shopping centers. There are many stormwater drains from Hwy 70 and other developed areas that discharge directly into Bogue Sound.

This growing area contains 26 marinas and docking facilities, with a combined total of 1000 wet slips, and yet there is only one pump out station at Portside Marina. A new marina, Radio Island Yacht and Boating Club, has plans to install a pump out facility. Boat washing and sanding operations have been observed at several marinas and contribute to water quality degradation as well as fuel and oil residues.

Table 22 Summary of DEH Growing Area E-3 Classifications in Subbasin 03-05-03

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Bogue Sound (Including ICWW to Beaufort Inlet)	20-36-(8.5)b1	APP	D-4, E-1, E-2, E-3
	20-36-(0.5)a1	APP	
	20-36-(8.5)a1	APP	
	20-36-(8.5)b2	PRO	
	20-36-(8.5)c2	PRO	
	20-36-(8.5)d	PRO	
	20-36-(8.5)e	PRO	
	20-36-(8.5)g	PRO	
	20-36-(8.5)h	PRO	
	20-36-(8.5)i	PRO	
	20-36-(8.5)j	PRO	
	20-36-(8.5)k	PRO	
	20-36-(0.5)a3	PRO	
	20-36-(0.5)a4	PRO	
	20-36-(0.5)a5	PRO	
	20-36-(0.5)a6	PRO	
	20-36-(0.5)a7	PRO	
	20-36-(0.5)a8	PRO	
	20-36-(0.5)a9	PRO	
	20-36-(8.5)a12	PRO	
	20-36-(8.5)a4	PRO	
	20-36-(8.5)a5	PRO	
	20-36-(8.5)a7	PRO	
	20-36-(8.5)a8	PRO	
	20-36-(8.5)a9	PRO	
	20-36-(8.5)f	PRO	
	20-36-(0.5)a2	CAO	
	20-36-(8.5)a2	CAO	
	20-36-(8.5)c1	CAC	
Fort Macon Creek	20-36-16	PRO	E-3
Money Island Bay	20-36-13b1	APP	E-3
	20-36-13a	PRO	
	20-36-13b2	PRO	
Money Island Slough	20-36-13-1	PRO	E-3

Spooner Creek	20-36-10	PRO	E-3

APP=Approved, PRO=Prohibited, CAC=Conditionally Approved Closed, CAO=Conditionally Approved Open

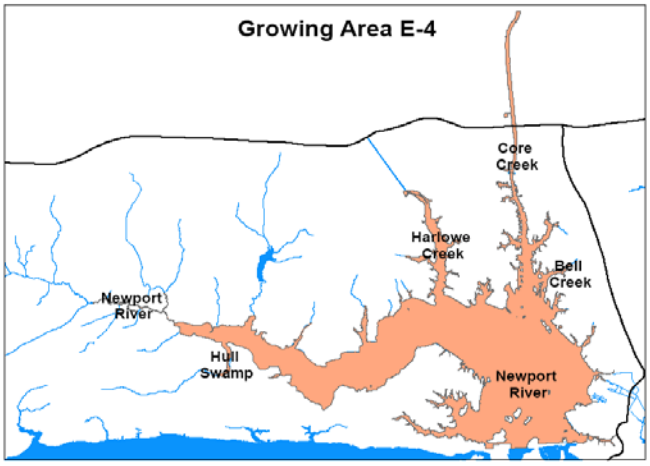
Fort Macon Creek, Money Island Slough and Spooner Creek

These water bodies are Impaired for shellfish harvesting. Each is classified by DEH SS in the table above for growing area E-3 due to potential fecal coliform bacteria levels, and will remain on the state's 303(d) list of Impaired waters.

Money Island Bay [AU# 20-36-13a, b2]

Money Island Bay from closed DEH area in western portion of Bay (106.6 acres) and from the DEH approved line near Allen Slough in the eastern portion of the Bay (21.0 acres), are Impaired for shellfish harvesting. These portions of Money Island Bay are classified by DEH SS as prohibited in growing area E-3 due to potential fecal coliform bacteria levels. Money Island Bay (AU# 20-36-13a) will remain on the state's 303(d) list of Impaired waters. AU# 20-36-13b2 (21.0 acres) will be added to the 2008 303(d) list. An additional 16.9 acres (AU#20-36-13b1) are classified as approved and are considered Supporting shellfish harvesting.

3.3.5 Division of Environmental Health Growing Area E-4



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area E-4 as shown here and in Figure 8 & Table 23.

According to the ***Sanitary Survey of Newport River Area, Area E-4,*** *(DEH, Shellfish Sanitation & Recreational Water Quality Section, May 2005)* the most significant threat to the water quality of this rapidly developing area is associated with stormwater runoff. Area E-4 has a watershed consisting of approximately 175 square miles and 8,600 of water acreage. It is comprised of approximately 45 percent forest, 38 percent wetlands, 9 percent residential, 5 percent bays/estuaries and 3 percent cropland. Land use practices including commercial and urban development, corporate forestry, agriculture and an international seaport contribute to water quality conditions in the growing area. Population centers around the waterfront areas of Morehead City and Beaufort estimated at approximately 20,500 people. Runoff from impervious surfaces, developed lots, subdivisions, farms and failing septic systems are most likely a major contributor to fecal coliform contamination in E-4. High bacterial counts followed moderate to heavy rainfall events were recorded. Significant stormwater conveyances were noted during DEH surveys. There are 25 subdivisions throughout the E-4 area and continued development contributing to sedimentation in adjacent creeks.

The Morehead City Municipal WWTP and the Newport Municipal WWTP are two point source dischargers to the Newport River estuary. The Morehead WWTP is a trickling filter plant that treats to a secondary level with an outfall pipe into Calico Creek. The WWTP exceeded its

permitted flow and fecal coliform levels in 2003, but has not had any failures in the past 3 years. Expansion of the WWTP includes an oxidation ditch treatment facility and will treat to the tertiary level; effluent discharge will continue to Calico Creek. The Newport WWTP treats to a secondary level and plans to expand its capacity to 0.75 MGD. Discharge is to the upper Newport River into an area prohibited for shellfish harvesting. Additional requests for increasing discharge to 2.0 MGD, 3.0 MGD and 4.0 MGD have been proposed to DWQ and are under investigation for further impacts to shellfish waters. There are two wastewater treatment package plants in E-4; both were operating properly during inspections. Septic systems service most homes outside of the municipalities. Six septic failures were noted during surveys and occurred in close proximity to water. The county health department issued violations and they have since been repaired.

There are eight marina facilities and two haul out and maintenance facilities. Seven marinas exist in waters already closed to shellfish harvesting and the Deerfield Shores marina created an additional shellfish closure area extending 325 feet from the docks. Of the five marinas that have pump-out facilities in the E-4 area, only two of those were working when they were evaluated.

There is one large hog operation adjacent to Little Deep Creek. Manure is managed through lagoon and spray application on bermuda grass, which have passed inspections by DWQ and Soil and Water Conservation District staff. Crop based agriculture (soybeans, corn and cotton) accounts for a land use on the upper and east side of the Newport River watershed. These land uses contribute runoff into Deep Creek and Little Deep Creek. Harlowe Creek, Core Creek and Upper Newport River affect water quality in Area E-4, draining wood and farmland, waters from the Neuse River down the Intracoastal Waterway (ICWW), swamps, woodlands and the community of Newport, respectively.

Water quality conditions have improved near Oyster Creek and have decreased in the upper portions of Newport River since the last sanitary survey. This has lead to the 235 acres being reclassified as to conditionally approved closed for shellfish harvesting and the need for additional monitoring sites to accurately relocate closure lines. Fifteen acres were reclassified as open for shellfish harvesting as a result of findings in the 2005 Sanitary Survey.

Table 23 Summary of DEH Growing Area E-4 Classifications in Subbasin 03-05-03

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Alligator Creek	21-22-2	PRO	E-4
Bell Creek	21-24-2a 21-24-2b	PRO PRO	E-4
Big Creek	21-20	CAO	E-4
Core Creek (ICWW-Adams Crk Canal)	21-24b2 21-24c 21-24a 21-24b1	CAO CAO CAC CAC	E-4
Crab Point Bay	21-30	PRO	E-4
Eastman Creek	21-24-1	PRO	E-4
Gable Creek	21-28b 21-28a	CAO CAC	E-4
Harlowe Canal	21-22-1	PRO	E-4
Harlowe Creek	21-22a 21-22b1 21-22b2 21-22b3	PRO PRO CAC CAO	E-4

	21-22c	CAO	
Little Creek	21-21	CAO	E-4
Little Creek Swamp	21-18	PRO	E-4
Mill Creek	21-19	PRO	E-4
Newport River	21-(17)d2 21-(17)a 21-(17)b1 21-(17)d3 21-(17)e2 21-(17)f 21-(17)g2 21-(17)h 21-(17)c 21-(17)d1 21-(17)e1 21-(17)g1 21-(17)b2	APP PRO PRO PRO PRO PRO PRO PRO CAO CAO CAO CAO CAC	E-4, E-5
Oyster Creek	21-23b 21-23a	CAO CAC	E-4
Russel Creek	21-26a 21-26b	PRO CAO	E-4
Wading Creek	21-27	CAC	E-4
Ware Creek	21-25	CAO	E-4
Willis Creek	21-29	PRO	E-4

APP=Approved, PRO=Prohibited, CAC=Conditionally Approved Closed, CAO=Conditionally Approved Open

Alligator Creek, Bell Creek, Big Creek, Crab Point Bay, Core Creek (Intracoastal Waterway – Adams Creek Canal), Eastman Creek, Gable Creek, Harlowe Canal, Harlowe Creek, Little Creek Swamp, Little Creek, Mill Creek, Oyster Creek, Russell Creek, Wading Creek, Ware Creek and Willis Creek

These water bodies are Impaired for shellfish harvesting. Each is classified by DEH SS in the table above for growing area E-4 due to potential fecal coliform bacteria levels, and will remain on the state's 303(d) list of Impaired waters. (AU# 21-24c and Ware Creek will be added to the 2008 Impaired waters list.)

Newport River [AU# 21-(17)a, b1, b2, c, d1, d3, e1, e2, f, g1, g2, and h]

2001 Recommendations for Newport River and Tributaries (Area E-4)

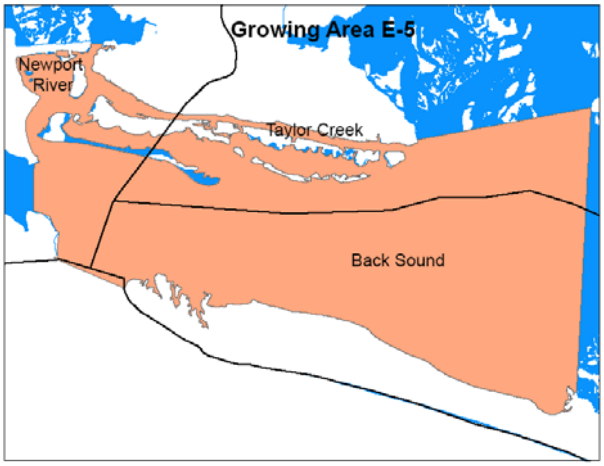
Newport River and adjacent bays and tributaries extending to the Atlantic Ocean were not supporting shellfish harvesting. These areas were classified as prohibited/restricted and permanently closed to shellfish harvesting. The population of the area had grown around Newport, Morehead City and Beaufort. Potential sources of pollution included runoff from urban areas and subdivisions as well as agricultural and forestry land uses (DENR 2001).

Current Status

Many segments of the Newport River (7,997.4 acres) are Impaired for shellfish harvesting. These portions of the Newport River are classified by DEH SS as conditionally approved open, conditionally approved closed and prohibited in growing areas E-3, E-4 and E-5 due to potential fecal coliform bacteria levels. Approximately 302.7 acres are classified by DEH SS as approved (AU# 21-(17)d2) and are considered to be Supporting shellfish harvesting.

Newport River will remain on the state's 303(d) list of Impaired waters. Assessment units 21-(17)d1 and d3 will be added to the 2008 Impaired waters list (3,201.1 acres).

3.3.6 Division of Environmental Health Growing Area E-5



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area E-5 as shown here and in Figure 8 & Table 24.

According to the ***Sanitary Survey of Taylor Creek Area, Area E-5,*** *(DEH, Shellfish Sanitation & Recreational Water Quality Section, October 2002)* water quality continues to be excellent. DEH did not recommend any classification changes at the time of the most recent survey. Oyster production is fair and clam production is generally good throughout the area. Most of the watershed has been developed; but growth continues along the eastern side of Radio Island and Lennoxville Road. The most significant threat to the water quality in Taylor Creek Area is nonpoint pollution associated with stormwater and runoff. The majority of the area is served by the Beaufort WWTP. The outfall of the WWTP discharges into Taylor Creek, a closed shellfish area. The plant is currently under an SOC from DWQ for chlorine; DWQ is working with the town while they install dechlorination. This area has older homes with septic systems on very small tracts of land and has traditionally experienced septic system problems that likely affect water quality. During this survey, no failures were noted. The area adjacent to the Beaufort Docks is heavily crowded with boats and docks, increasing the potential for illegal marine head pumping or faulty pump out stations. Beaufort Fisheries was inspected during this survey and has been cited with violations from DWQ (see 3.4.1 below).

Table 24 Summary of DEH Growing Area E-5 Classifications in Subbasin 03-05-03

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Newport River	21-(17)d2 21-(17)a 21-(17)b1 21-(17)d3 21-(17)e2 21-(17)f 21-(17)g2 21-(17)h 21-(17)c 21-(17)d1 21-(17)e1 21-(17)g1 21-(17)b2	APP PRO PRO PRO PRO PRO PRO PRO CAO CAO CAO CAO CAC	E-4, E-5
Back Sound	21-35-(0.5)a 21-35-(0.5)d	APP PRO	E-5

APP=Approved, PRO=Prohibited, CAC=Conditionally Approved Closed, CAO=Conditionally Approved Open

Back Sound [AU# 21-35-(0.5)d]

Back Sound from DEH closed area at mouth of Taylor Creek around Pivers Island (50.9 acres), is Impaired for shellfish harvesting. This portion of Back Sound is classified by DEH SS as prohibited in growing area E-5 due to potential fecal coliform bacteria levels. An additional 303.6 acres (AU# 21-35-(0.5)a) is classified as approved and considered Supporting shellfish harvesting. This same AU is also Supporting in the aquatic life category due to no criteria exceeded at site PA35. Additional areas of Back Sound are within subbasin 03-05-04 and are discussed in Chapter 4. Back Sound, AU# 21-35-(0.5)d, will remain on the state's 303(d) list of Impaired waters.

3.3.7 Impaired Freshwater and Non-Shellfish Harvesting Waters

The following waters were either identified as Impaired in the previous basin plan (2001) or are newly Impaired based on recent data (Table 25). 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 assessment unit number (AU#).

Table 25 Summary of Currently Impaired Freshwater and Non-Shellfish Harvesting Waters in Subbasin 03-05-03

Class SB/SC Water	Assessment Unit #	Aquatic Life	Recreation	Fish Consumption
Calico Creek	21-32	I	I	I

I= Impaired

Calico Creek [AU# 21-32]

2001 Status

Calico Creek was not rated during the previous basin cycle, although studies in 1999 indicated water quality impacts from urban nonpoint sources as well as the Morehead City WWTP. The creek has experienced water quality problems over the years, including elevated fecal coliform bacteria and nutrient levels, algae blooms and resulting dissolved oxygen level fluctuations (DEM 1977, 1981, 1988, and DWQ 2001). Dye studies have indicated that retention time in the creek is several tidal cycles and that effluent from the WWTP is continuously distributed throughout the majority of the reach of the creek (DEM 1977, 1981).

Current Status

Calico Creek, from source to Newport River (the mouth of Calico Creek is defined as beginning at a point of land on the north shore at latitude 34 43' 46" and longitude 76 43' 07" thence across the creek) (140.2 acres), is Impaired in the aquatic life category due to exceeding turbidity standards in 39 percent of samples and low DO in 17 percent of samples at site PA24, and turbidity exceedances in 35 percent of samples at site PA25. Both sites PA24 and PA25 also had high chlorophyll *a* levels (75 and 57 percent respectively), but samples did not meet the minimum criteria of 10 samples for use support assessment for this parameter. Calico Creek is also Impaired in the recreation category because fecal coliform bacteria standards were exceeded in 5 samples of 200 colonies/100 ml in a 30 day time period. Calico Creek will be added to the state's 2008 303(d) list of Impaired waters. Calico Creek is poorly flushed due to tidal

influences and any additional inputs of nutrients or BOD may increase the potential for adverse water quality impacts.

Calico Creek is the receiving water for the Morehead City WWTP discharge, which is currently permitted at 1.7 MGD. Historically the WWTP has operated very close to their permitted capacity and for nearly a decade DWQ has strongly encouraged the town to examine non-discharge alternatives for treated wastewater disposal. A DWQ modeling evaluation determined that the main impacts from the WWTP on dissolved oxygen levels in Calico Creek are from oxygen-consuming waste (CBOD, NH3 and SOD) and point source nutrient loading (DWQ 1990).

The Town was placed under statutory moratorium in April 1999, after analysis showed the plant to be operating at 93 percent of its design capacity. DWQ staff worked with the Town allowing it to extend its collection system with construction of new sewer lines while under the moratorium. However, the moratorium was reinstated in September 2002 because the Town was making little progress toward satisfying the moratorium requirements. The Town was awarded a $2,000,000 Clean Water Grant, as well as $1,000,000 loan in 2000, to rehabilitate outdated sewer lines. This rehabilitation project was recently completed and is expected to reduce extraneous flow to the collection system by 200,000 GPD. In 2003, the WWTP flow exceeded the monthly average limit nine out of twelve months despite these improvements to the collection system.

DWQ inspections of the WWTP have detected solids in the effluent and noted on-going problems with poor settling characteristics in the clarifiers. Inspection of the plant in early February 2005 indicated that corrective action by the WWTP has improved solids accumulation in the clarifiers.

DWQ conducted "*An Examination of Fecal Coliform, Nutrients and Their Response Variables in Calico Creek, Carteret County, North Carolina"* (March 2005) that documents impacts to Calico Creek. Retention time within the creek is several tidal cycles as evidenced by previous DWQ dye studies that detected dye in the upper reaches of the creek for over 36 hours. While WWTP data is referred to as 'upstream' and 'downstream' this tidal mixing results in continual distribution of flow and pollutants. Although the creek is not DWQ classified as Class SA water, the creek is classified as "Prohibited/Restricted" for shellfish harvesting by DEH and is considered permanently closed to shellfish harvesting (DEH 2000). Until recently, use support had not been assessed because Calico Creek did not meet sampling criteria to assess the State standard for fecal coliform (five samples over a 30-day period). However, instream fecal coliform monitoring required by the Morehead City NPDES permit and further sampling by DWQ has provided sufficient data with adequate monitoring frequency to list Calico Creek as Impaired due to exceeding fecal coliform bacteria standards.

Elevated fecal coliform levels are widespread throughout the Calico Creek watershed and are from a variety of sources including Morehead City WWTP effluent, wildlife, pets and failing septic tanks. The water quality standard for fecal coliform is 200 colonies/100 ml. Instream sampling conducted by the WWTP has revealed extremely high levels of fecal coliform bacteria, ranging from estimates of greater than 70,000 colonies/100 ml at the upstream site to greater than 47,000 colonies /100 ml at the downstream site. The WWTP laboratory reported values were estimated as "greater than" when sample dilutions were not sufficient to accurately count the bacterial colonies. This also results in possible underreporting of bacterial concentrations in that a value reported as "greater than 600" could actually have represented a count of substantially

higher concentrations. The DWQ laboratory section, as well as regional staff, have made recommendations for the WWTP to use more appropriate dilutions. This would provide greater accuracy in calculating the geometric mean as well as a more precise evaluation of whether or not the plant is meeting its permit requirements.

Chemical data indicate that the WWTP contributes to nutrient loading, particularly at low tide when instream waste concentration is highest (DWQ 2001). Average nutrient levels in the WWTP effluent between 2002 and 2005 were 2.1 mg/l for NH3, 12.2 mg/l for Total N, and 2.3 mg/l for Total P. Two ambient stations were established at the narrows (station P8750000) and near the mouth (station P8800000) by DWQ on Calico Creek in 2002. Chlorophyll *a* data, a measurement of nutrient loading, were not collected monthly at these stations until 2004. In addition, phytoplankton were collected and seven algal blooms were documented near the mouth and two near the narrows between February 2003 and September 2004 (DWQ 2004). Algal blooms may have been documented more frequently had chlorophyll *a* and phytoplankton been sampled monthly and not only in response to elevated DO.

2007 Recommendations

DWQ and the Town have been discussing expansion of the WWTP from 1.7 MGD to 2.5 MGD, with the construction of a new 2.5 MGD treatment facility at the existing WWTP site. The upgrade will include an oxidation ditch design, which incorporates a combination of anaerobic and aerobic zones within the treatment plant to accomplish total nitrogen removal. The plant will also have the capability to remove phosphorus. Fecal coliform and nutrient loadings are the primary threats to water quality in Calico Creek. The following recommendations are offered to ensure that the existing and designated uses of the water body are protected and restored:

- More frequent monitoring will be required and stricter effluent limits will be effective; old and new criteria are listed in Table 26. Construction should be completed in two years; while the plants permit renewal date is July 2007.

Table 26 Old and New Effluent Limits

Parameter	Effluent Limits			
	Monthly Average		Weekly Average	
	Old	New	Old	New
BOD (summer)	20 mg/l	5 mg/l	30 mg/l	7.5 mg/l
BOD (winter)	30 mg/l	10 mg/l	45 mg/l	15 mg/l
Total Suspended Solids	30 mg/l	10 mg/l	45 mg/l	15 mg/l
NH3 as N (summer)	none	1 mg/l	none	3 mg/l
NH3 as N (winter)	none	2 mg/l	none	6 mg/l
Dissolved Oxygen	Daily average not less than 5.0 mg/l (old)			
	Daily average not less than 6.0 mg/l (new)			
Fecal Coliform	86/100 ml	14/100 ml	172/100 ml	28/100 ml

- Any existing and future discharge permits should be modified to require limits that include a stringent daily maximum for fecal coliform. Proposed speculative limits for Morehead City WWTP for fecal coliform include a weekly geometric mean of 28/100ml that would still allow for potential discharge of excessive levels of fecal coliform bacteria. Without a daily maximum limit, the monitoring requirement frequency of three

times per week would allow the discharge of 20,000 colonies/100ml on one day, if the other two observations within that same week were 1 colony/100ml each.

- The proposed WWTP is capable of total nitrogen removal, as well as removal of phosphorus. The data strongly indicate that nutrient over-enrichment is a problem in the creek and appropriate limits should be set for both total nitrogen and total phosphorus, per 15A NCAC 02B.0224(1)(b) which states that "where nutrient over enrichment is projected to be a concern, appropriate effluent limitations shall be set for phosphorous or nitrogen, or both."
- Eventual removal of the Morehead City discharge in favor of a non-discharge system is strongly recommended. Operating under stricter discharge limits will facilitate future transition to non-discharge alternatives.
- The local government is encouraged to adopt and apply stringent policies to prevent and/or control nonpoint source pollution (i.e., stricter sedimentation and erosion control, create or enhance vegetated and forested buffers, site development that maximizes green spaces and conservation of natural areas, etc.).
- Local public education and participation initiatives on stormwater best management practices, proper application of fertilizers and pesticides, and management of pet waste are strongly encouraged.
- Morehead City should consider stronger ordinances to control stormwater runoff to Calico Creek, including the development of a Phase II stormwater program.

Morehead City recently received DWQ authorization and was awarded contracts to construct a $15M state of the art tertiary replacement WWTP that will have the capability of removing nitrogen and phosphorus using ultraviolet technology for bacteria removal. The plant will be capable of producing a Class A sludge product and reuse quality effluent, which is proposed to be used for irrigation purposes at two City parks (combined acreage of close to 25 acres) in close proximity to the WWTP. The City recently applied for a CWMTF to construct Phase 1 of its proposed reuse distribution system (i.e. elevated tank and lines), which will distribute the reuse effluent for irrigation use to private properties and public facilities, including a golf course and multiple school sites and parks, located along an approximately five mile area from the WWTP. The City has also had discussions with NCCF regarding extending this distribution system on a regional basis to a large tract of land that NCCF is attempting to acquire well outside the City's jurisdiction. This tract could handle much larger quantities of reuse quality effluent for irrigation, thus moving the City towards its goal of eventually eliminating the discharge of the WWTP effluent into Calico Creek.

3.4 Status and Recommendations for Waters with Noted Impacts

Based on DWQ's most recent use support methodologies, the surface waters discussed in this section are not Impaired, except for fish consumption. 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#. Refer to Section 1.1 for more information about AU#. Nonpoint source program agency contacts are listed in Appendix III.

3.4.1 Taylor Creek [AU#21-34]

Taylor Creek is Not Rated on an evaluated basis in the aquatic life category. Beaufort Fisheries, Inc (NC0000728) had significant violations of biological oxygen demand (BOD) and total suspended solids (TSS) permit limits, and the Town of Beaufort WWTP (NC0021831) had significant violations of fecal coliform, total suspended solids and DO permit limits during the last two years of the assessment period. The NPDES compliance process will be used to address the significant permit violations noted above.

During December 2001 investigators observed dead and dying fish in the Taylor's creek adjacent to the Beaufort waterfront. The majority of fish were reported as juvenile pinfish with a few juvenile flounder and mullet. Dead and dying spot, mullet, and flounder were also observed at the public boat ramp near Beaufort Fisheries. Investigators reported an oil sheen on the surface along with organic material. Beaufort Fisheries was subsequently investigated for an illegal discharge. Numerous leaks from the menhaden holding vats were discovered upon investigation of the plant. The leaking material, consisting of fish oil, fats, and blood emitted a large plume into Taylor's Creek. Water samples were taken from above and below the Beaufort Fisheries plant. After counts were made it was estimated that 161,783 fish were killed.

3.5 Local Initiatives for Subbasin 03-05-03

North Carolina Coastal Federation (NCCF) Land Acquisition
Land acquisition projects in this subbasin through NCCF total 118 acres and include Hoop Pole Creek in Atlantic Beach, Emerald Isle Woods in Emerald Isle, and Sugarloaf Island in Morehead City. NCCF is investigating the possibility of the acquisition of conservation easements on about 7,000 acres of land north of the Newport River to protect water quality in the Newport and preserve forested habitat. This is a high priority in the oyster action plan.

Other water quality improvement activities undertaken by NCCF include:

- NCCF has partnered on four stormwater projects in this basin, located at Emerald Isle Woods (2001), Morehead City Visitor's Center (2004), Carteret Community College (2006), and Hoop Pole Creek (2007).

- Living Shoreline Projects provide shoreline stabilization while also restoring wetland habitat area and providing a stormwater buffer. Living shorelines projects in this subbasin are located at the NC Maritime Museum in Beaufort (2001), Duke University Marine Lab in Beaufort (2002), NC Aquarium at Pine Knoll Shores (2002), and four private locations in Morehead City, Beaufort, Pine Knoll Shores, and Salter Path.

- Oyster habitat area has been restored through NCCF at Hoop Pole Creek in Atlantic Beach. Four distinct oyster reef areas have been restored through different projects from 1998-2006. These projects also included educational opportunities for local students and research opportunities for local universities.

- A shoreline stabilization and habitat restoration project was completed at Carteret Community College in 2006. This project included sections of living shoreline, offshore breakwaters, oyster reef habitat, and a stormwater BMP.

This subbasin is targeted for conservation by Onslow Bight Conservation Forum.

Morehead City Land Conservation

Morehead City initiated the partnership with NCCF to acquire Sugarloaf Island, an undeveloped island off the downtown waterfront slated for development. The Council matched the CWMTF grant with $125,000 of local funds and the City retains ownership of the island. The island is used to provide public recreational water access.

Town of Emerald Isle Land Conservation

The Town of Emerald Isle purchased the Emerald Isle Woods Tract (Coast Guard Road Storm Water Project), and completed construction of Phase I of a stormwater project; additional phases of the project will follow. The land was purchased in May 2002 for $3.3 million, of which $2.4 million was provided by a CWMTF grant and the remaining $900,000 was funded by the Town. In addition, the Town expended $600,000 on design and construction of the Phase I project, completed in June 2005. The Town is proceeding with design work for Phase II. Phase II construction, expected to cost over $1.0 million, is expected to occur in late 2007 or early 2008. Phase III is planned for an unspecified date, with a cost of $1 - $2 million. This project is designed to treat and infiltrate storm water pumped from various subdivisions along Coast Guard Road (the westernmost 1.6 square miles of Emerald Isle) to enable the Town to avoid pumping stormwater to the beach strand after severe rainfall events (i.e., hurricanes).

Blair Pointe, LLC Donation

The developers of Blair Pointe, located on Dill Creek, elected to preserve approximately 25 acres of marsh front land as a donation to the National Audubon Society.