Chapter 2
White Oak River Subbasin 03-05-02
Including: New River, Northeast Creek and ICWW

2.1 Subbasin Overview

Subbasin 03-05-02 at a Glance

Land and Water Area

Total area:	462 mi^2
Land area:	419 mi^2
Water area:	43 mi^2

Land Cover (percent)

Forest/Wetland:	67%
Surface Water:	9%
Urban:	4%
Cultivated Crop:	13%
Pasture/ Managed Herbaceous:	7%

Counties
Onslow

Municipalities
Jacksonville, Richlands and Town of Sneads Ferry –
also Camp Lejeune Marine Corps Base

Monitored Waterbody Statistics

Aquatic Life

Total:	55.8 mi/15,226.6 ac
Total Supported:	42.6 mi/14,468.3 ac
Total Impaired:	13.2 mi/758.3 mi

Recreation

Total:	49.9 mi/15,764.7 ac
Total Supported:	41.6 mi/15,764.7 ac
Total Not Rated:	8.3 mi

Shellfish Harvesting

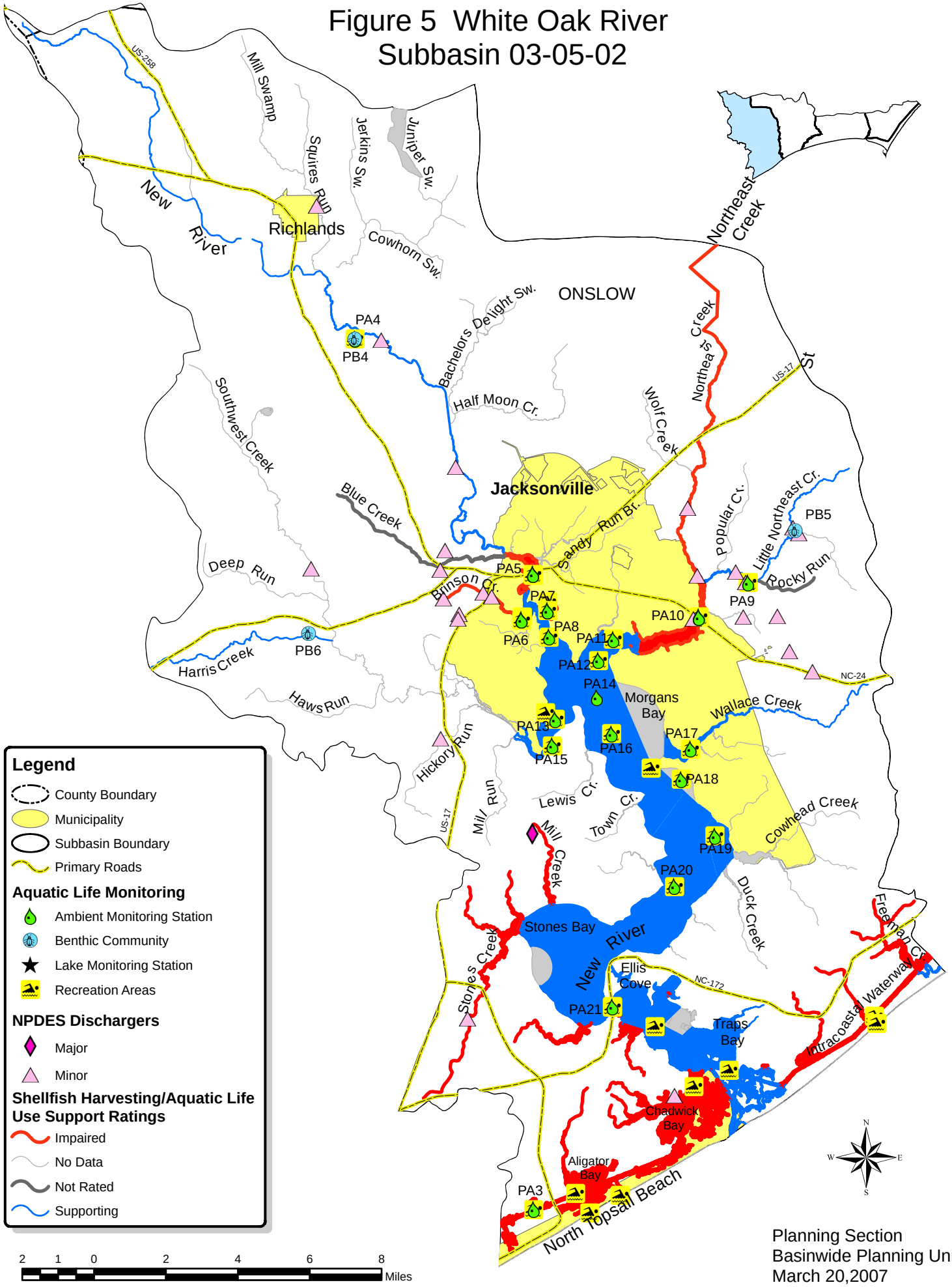
Total:	0.4 mi/11,466.3 ac
Total Supported:	0.4 mi/8,686.6 ac
Total Impaired:	2,779.7 ac

This subbasin is on the western end of the White Oak River basin and lies entirely within Onslow County (Figure 5). It contains the New River (50 mi) and its tributaries plus several small coastal streams. Nearly one-half of this subbasin is estuarine, with estuarine waters in the New River reaching upstream to Jacksonville and tidal freshwaters reaching almost to Richlands. There are 720 acres of Outstanding Resource Waters (ORW) in this subbasin; the remaining waters are classified as Nutrient Sensitive Waters (NSW) and/or High Quality Waters (HQW). Of the NSW there are 630 acres and 137 miles of freshwaters. A map of this subbasin including water quality sampling and NPDES locations are presented in Figure 5. Use support ratings for monitored waters are presented in Table 9.

This is the most densely populated area in the river basin. Most of the development in this subbasin is on the New River: the Town of Richlands near the headwaters, the City of Jacksonville and Camp Lejeune Marine Corps Base in the middle reaches, and Sneads Ferry near the mouth. Population at the Base is approximately 47,000 Marines and the City of Jacksonville has approximately 72,873 people with a total population in Onslow County of approximately 150,355 people according to the latest census data. Between 1990 and 2000, population in Richlands decreased by 7.3 percent, while the City of Jacksonville experienced accelerated growth of 58.3 percent. Outside the urban areas, rural residential properties and pasturelands are scattered throughout the watershed. Refer to Chapter 9 for more information about population growth and trends.

There are 27 individual National Pollutant Discharge Elimination System (NPDES) wastewater discharge permits in this subbasin with a total permitted flow of 17.45 MGD (Appendix II). The largest of these is held by the US Marine Corps - Camp Lejeune Advanced Wastewater Treatment Plant (WWTP) facility with a total permitted discharge of 15 MGD. In 2005, 21 facilities were out of compliance with permit limits for a total of 437 violations resulting in issuing 73 Notices of Violation and the remaining proceeded to enforcement. The facilities at Camp Lejeune and Weston Inc.-ABC One Hour Cleaners are required to conduct whole effluent toxicity (WET) testing. Significant toxicity

Figure 5 White Oak River Subbasin 03-05-02



Legend

- County Boundary
- Municipality
- Subbasin Boundary
- Primary Roads

Aquatic Life Monitoring

- Ambient Monitoring Station
- Benthic Community
- Lake Monitoring Station
- Recreation Areas

NPDES Dischargers

- Major
- Minor

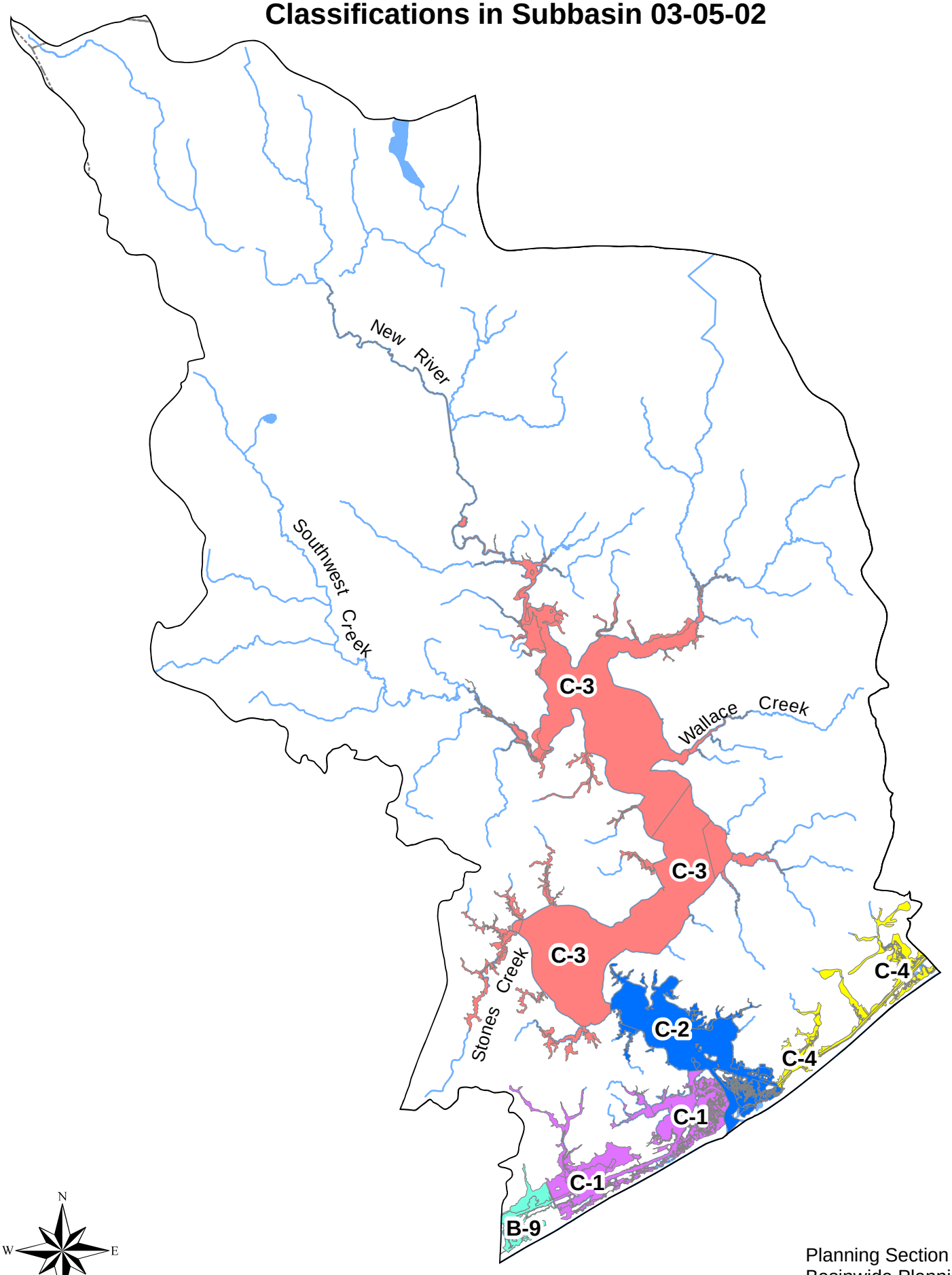
Shellfish Harvesting/Aquatic Life Use Support Ratings

- Impaired
- No Data
- Not Rated
- Supporting

2 1 0 2 4 6 8 Miles

Planning Section
Basinwide Planning Unit
March 20,2007

Figure 6 DEH Shellfish Growing Area Classifications in Subbasin 03-05-02



Planning Section
Basinwide Planning Unit
October 9, 2006

Table 9

WHITE OAK Subbasin 03-05-02

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
Alligator Bay															
19-39-3a	SA ORW	260.2	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
Bay south of ICWW													C-1		
19-39-3b1	SA ORW	22.1	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
Remainder of bay north of ICWW													C-1		
19-39-3b2	SA ORW	8.4	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	WWTP NPDES
DEH closure area at mouth of Mill Creek.													C-1		
19-39-3c	SA ORW	305.5	S Acres	ND					**S**	S56	NCE	I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
Bay north of ICWW except DEH closure area at mouth of Mill Creek.													C-1		
Bachelors Delight Swamp															
19-5	C NSW	4.5	FW Miles	ND					ND						
From source to New River															
Bear Prong															
19-4-2	C NSW	0.8	FW Miles	ND					ND						
From source to Cowhorn Swamp															
Bearhead Creek															
19-20-1	SB NSW	2.8	S Miles	ND					ND						
From source to Wallace Creek															
Beaverdam Creek															
19-20-2	SB NSW	1.4	S Miles	ND					ND						
From source to Wallace Creek															
Biglins Creek															
19-39-4-1-1	SA HQW	6.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Fullard Creek													C-1		
Blue Creek															
19-8	SC NSW	5.7	S Miles	**NR**					ND					Low Dissolved Oxygen	WWTP NPDES
From source to New River															

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WHITE OAK Subbasin 03-05-02

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				AL Rating	Station	Result	Parameter	% Exc / Year	REC Rating	Station	Result	SH Rating	GA		
Brinson Creek															
19-12	SC NSW	2.9	S Miles	I	PA6	CE	High pH	10.7	S	PA6	NCE			Low Dissolved Oxygen	WWTP NPDES
					PA6	CE	Chlor a	29.7						Turbidity	
					PA6	NCE	Turbidity	8.3						High pH	
From source to New River														Chlorophyll a	
Browns Swamp															
19-41-5-1	SA HQW	1.0	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Freeman Creek													C-4		
Bumps Creek															
19-39-4-1-3	SA HQW	15.7	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Fullard Creek													C-1		
Burnt House Branch															
19-10-2	SC NSW	0.8	S Miles	ND					ND						
From source to Chainey Creek															
Catherine Lake															
19-17-1-1	B NSW	35.7	S Acres	ND					ND						
Entire Lake															
Catherine Lake Creek															
19-17-1	C NSW	1.3	FW Miles	ND					ND						
From Catherine Lake to Southeast Creek															
Chadwick Bay															
19-39-4a	SA HQW	861.1	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
Entire Bay													C-1		
19-39-4b	SA HQW	3.9	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
DEH prohibited areas at Bayshore Marina and Bayshore Canal													C-1		
Chainey Creek															
19-10	SC NSW	0.9	S Miles	ND					ND						
From source to New River															

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Description				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
Charles Creek															
19-39-4-1-2	SA HQW	41.4	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Fullard Creek													C-1		
Clay Bank Branch															
19-41-5-2	SA HQW	1.0	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Freeman Creek													C-4		
Cogdels Creek (Coglin Creek)															
19-23	SC NSW	2.3	S Miles	ND					ND						
From source to New River															
Courthouse Bay															
19-36a	SA HQW	188.5	S Acres	ND					ND			S	APP		
Entire Bay except for DEH closure area in south arm of bay.													C-2		
19-36b	SA HQW	2.8	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
DEH closure area in south arm of bay.													C-2		
Cowford Branch															
19-2	C NSW	2.0	FW Miles	ND					ND						
From source to New River															
Cowhead Creek															
19-24-2	SC NSW	3.5	S Miles	ND					ND						
From source to Frenchs Creek															
Cowhorn Swamp															
19-4	C NSW	6.4	FW Miles	ND					ND						
From source to New River															
Deep Gully Creek (Elizabeth Lake)															
19-9-1	SC NSW	1.2	S Miles	ND					ND						
From source to Mill Creek															
Deep Run															
19-17-2	C NSW	4.9	FW Miles	ND					ND						
From source to Southwest Creek															

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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
Duck Creek															
19-25	SC NSW	2.7	S Miles	ND					ND						
From source to New River															
Edwards Creek															
19-13	SC HQW NSW	1.7	S Miles	ND					ND						
From source to New River															
Ellis Cove															
19-33	SA HQW	111.4	S Acres	ND					ND			S	APP		
Entire Cove													C-2		
Everett Creek															
19-32	SA HQW	83.8	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to New River													C-3		
Fannie Creek															
19-34	SA HQW	10.9	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to New River													C-2		
Farnell Bay															
19-22	SC NSW	227.9	S Acres	ND					ND						
Entire Bay															
Freeman Creek															
19-41-5	SA HQW	65.4	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Failing Septic Syst
From source to Intracoastal Waterway													C-4		
Frenchs Creek															
19-24	SC NSW	162.3	S Acres	ND					ND						
From source to New River															

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				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
Fullard Creek (Salt Branch)															
19-39-4-1a	SA HQW	74.8	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to DEH closure line at west side of mouth of Charles Creek.													C-1		
19-39-4-1b1	SA HQW	81.6	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH closure line at west side of mouth of Charles Creek to Chadwick Bay.													C-1		
19-39-4-1b2	SA HQW	2.5	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
Small embayments at northeast mouth of Fullard Creek at Bayshore Marina and Raquet Club													C-1		
19-39-4-1c	SA HQW	4.6	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
Small embayments at northeast mouth of Fullard Creek.													C-1		
Gillets Creek															
19-41-4	SA HQW	6.7	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Intracoastal Waterway													C-4		
Goose Bay															
19-39-2	SA ORW	38.6	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
Entire Bay													B-9		
Goose Creek															
19-28	SC HQW	1.0	S Miles	ND					ND						
From source to New River															
Half Moon Creek															
19-6	C NSW	6.1	FW Miles	ND					ND						
From source to New River															
Harris Creek															
19-17-3	C NSW	5.9	FW Miles	**S**					ND						
From source to Southwest Creek					PB6	M									
Haws Run															
19-17-4	C NSW	4.8	FW Miles	ND					ND						
From source to Southwest Creek															

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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
Hell Gate Creek															
19-39-5	SA HQW	14.1	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Intracoastal Waterway													C-2		
Hewitts Branch															
19-5-2	C NSW	1.2	FW Miles	ND					ND						
From source to Bachelors Delight Swamp															
Hicks Run (Hickory Run)															
19-17-6	C NSW	5.5	FW Miles	ND					ND						
From source to Southwest Creek															
Holover Creek															
19-41-3-1	SA HQW	6.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Salliers Bay													C-4		
Horse Swamp															
19-16-2-1	C NSW	4.6	FW Miles	ND					ND						
From source to Little Northeast Creek															
Howard Bay															
19-41-1	SA HQW	56.4	S Acres	ND					ND			S	APP		
Entire Bay													C-2		
Huffmans Branch															
19-5-1	C NSW	1.1	FW Miles	ND					ND						
From source to Bachelors Delight Swamp															

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				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA		
Intracoastal Waterway															
19-39-(0.5)	SA ORW	84.6 S Acres	From northeastern boundary of Cape Fear River Basin to Daybeacon #17 including all unnamed bays guts and channels	I	PA3	CE	Low DO	12.9	S	PA3	NCE	I	CAO C-1	Fecal Coliform Bacteria Low Dissolved Oxygen	Stormwater Runoff
19-39-(3.5)a1	SA HQW	81.3 S Acres	From Daybeacon #17 to DEH conditionally approved open line at north mouth of Chadwick Bay including all unnamed bays guts and channels	ND					ND			I	CAO C-1	Fecal Coliform Bacteria	Stormwater Runoff
19-39-(3.5)a2	SA HQW	11.9 S Acres	Prohibited area south of ICWW at Marina Way and Tradewinds Drive	ND					ND			I	PRO C-1	Fecal Coliform Bacteria	Stormwater Runoff
19-39-(3.5)b1	SA HQW	9.8 S Acres	From DEH conditionally approved open line at north mouth of Chadiwick Bay to New River	ND					ND			S	APP C-2		
19-39-(3.5)b2	SA HQW	28.6 S Acres	From DEH conditionally approved open line at north mouth of Chadiwick Bay to New River	ND					ND			I	CAO C-1	Fecal Coliform Bacteria	Stormwater Runoff
19-39-(3.5)b3	SA HQW	1.6 S Acres	From DEH conditionally approved open line at north mouth of Chadiwick Bay to New River. Prohibited area at New River Marina Swan Point Marina	ND					S	S57	NCE	I	PRO C-1	Fecal Coliform Bacteria	Marina
19-41-(0.5)a1	SA HQW	85.8 S Acres	From New River to DEH closure line at southwest mouth of Salliers bay	ND					S	S58	NCE	S	APP C-2		
19-41-(0.5)a2	SA HQW	19.3 S Acres	From New River to DEH closure line at southwest mouth of Salliers bay	ND					ND			I	CAO C-4	Fecal Coliform Bacteria	Stormwater Runoff
19-41-(0.5)b	SA HQW	20.1 S Acres	From DEH closure line at southwest mouth of Salliers Bay to DEH Conditionally Approved Open area line northeast of mouth of Salliers Bay	ND					ND			I	PRO C-4	Fecal Coliform Bacteria	Stormwater Runoff
19-41-(0.5)c1	SA HQW	145.2 S Acres	From DEH Conditionally Approved Open area line northeast of mouth of Salliers Bay to subbasin boundary	ND					S	C21	NCE	I	CAO C-4	Fecal Coliform Bacteria	Stormwater Runoff

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting	GA	Stressors	Sources
19-41-(0.5)c2	SA HQW	16.3	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From DEH Conditionally Approved Open area line northeast of mouth of Salliers Bay to subbasin boundary													C-4		
Jenkins Swamp															
19-4-4	C NSW	3.2	FW Miles	ND					ND						
From source to Cowhorn Swamp															
Jumping Run															
19-24-1	SC NSW	2.4	S Miles	ND					ND						
From source to Frenchs Creek															
Juniper Swamp															
19-4-1	C NSW	3.3	FW Miles	ND					ND						
From source to Cowhorn Swamp															
Lewis Creek															
19-19	SC HQW NSW	2.8	S Miles	ND					ND						
From source to New River															
Little Creek															
19-8.5	SC NSW	1.5	S Miles	ND					ND						
From source to New River															
Little Northeast Creek															
19-16-2	C NSW	8.3	FW Miles	**S**	PA9	NCE	Low DO	20	**NR***	PA9	NCE			Fecal Coliform Bacteria	Stormwater Runoff
From source to Northeast Creek					PB5	M								Low Dissolved Oxygen	
Margaret Branch															
19-4-3	C NSW	1.5	FW Miles	ND					ND						
From source to Cowhorn Swamp															
Mile Hammock Bay															
19-41-2a	SA HQW	7.4	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
Entire Bay except for DEH closed rectangular area on north side of bay.													C-2		
19-41-2b	SA HQW	66.6	S Acres	ND					ND			S	APP		
Closed DEH rectangular area on north side of bay													C-2		

Table 9

WHITE OAK Subbasin 03-05-02

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
Mill Creek															
19-9	SC NSW	1.9	S Miles	ND					ND						
From source to New River															
Mill Creek (Alligator Bay)															
19-39-3-1	SA HQW	22.1	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Alligator Bay													C-1		
Mill Creek (Stones Bay)															
19-30-1	SA HQW	39.0	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Stones Bay													C-3		
Mill Run															
19-17-7	SC NSW	4.4	S Miles	ND					ND						
From source to Southwest Creek															
Mill Swamp															
19-3-1	C NSW	5.0	FW Miles	ND					ND						
From source to Squires Run															
Millstone Creek															
19-30-3-1	SA HQW	8.5	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Stones Creek													C-3		
Mirey Branch															
19-41-5-3	SA HQW	1.0	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Freeman Creek													C-4		
Morgan Bay															
19-18	SC NSW	987.1	S Acres	ND					ND						
Entire Bay															
Mott Creek															
19-16-3	C NSW	2.1	FW Miles	ND					**NR**					Fecal Coliform Bacteria	WWTP NPDES
From source to Northeast Creek															
Muddy Creek															
19-30-2	SA HQW	18.7	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to Stones Bay													C-3		

Table 9

WHITE OAK Subbasin 03-05-02

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment: AL Rating	Station	Result	Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Shellfish Harvesting: SH Rating	GA	Stressors	Sources
New River															
19-(1)	C NSW	28.4	FW Miles	**S**	PA4	NCE			**S**	PA4	NCE			Fecal Coliform Bacteria	WWTP NPDES
From source to Blue Creek					PB4	GF									
19-(10.5)	SB HQW NSW	48.8	S Acres	**I**	PA5	CE	Low DO	12.3	**S**	PA5	NCE			Chlorophyll a	
					PA5	CE	Chlor a	15.4		S63	NCE			Low Dissolved Oxygen	
From U. S.Hwy. 17 bridge to Atlantic Coast Line Railroad															
19-(11)	SC HQW NSW	574.3	S Acres	**S**	PA8	NCE	Chlor a	7.1	**S**	PA8	NCE			Chlorophyll a	
										S66A	NCE				
From Atlantic Coast Line Railroad Trestle to Mumford Point															
19-(15.5)	SC NSW	6,580.6	S Acres	**S**	PA14	NCE			**S**	PA16	NCE				
					PA16	NCE				PA18	NCE				
					PA18	NCE				PA19	NCE				
					PA19	NCE				PA20	NCE				
					PA20	NCE				S61A	NCE				
From Mumford Point to a line extending across the river from Grey Point to point of land approximately 2200 yards downstream from mouth of Duck Creek															
19-(27)a1	SA HQW	5,738.8	S Acres	**S**	PA21	NCE			**S**	PA21	NCE	S	APP		
										S58A	NCE				
										S59	NCE				
From a line extending across New River from Grey Point to a point of land approximately 2200 yards downstream from mouth of Duck Creek to Atlantic Ocean; including all unnamed bay													C-3		
19-(27)a2	SA HQW	49.1	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
From a line extending across New River from Grey Point to a point of land approximately 2200 yards downstream from mouth of Duck Creek to Atlantic Ocean; including all unnamed bay													C-1		
19-(27)a3	SA HQW	4.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From a line extending across New River from Grey Point to a point of land approximately 2200 yards downstream from mouth of Duck Creek to Atlantic Ocean; including all unnamed bay Prohibited area at Old Ferry Marina													C-2		

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Description				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA	Stressors	Sources
19-(27)a4	SA HQW	5.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Marina
From a line extending across New River from Grey Point to a point of land approximately 2200 yards downstream from mouth of Duck Creek to Atlantic Ocean; including all unnamed bay. Prohibited area at Swan Point Marina													C-1		
19-(27)b	SA HQW	2.8	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From Everett Bay to DEH closure line.													C-3		
19-(27)c	SA HQW	50.3	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From Fannie Creek and Wheeler Creek to DEH closure line.													C-2		
19-(7)	SB NSW	116.0	S Acres	I	PA5	CE	Low DO	12.3	S	PA5	NCE			Chlorophyll a	
					PA5	CE	Chlor a	15.4						Low Dissolved Oxygen	
From Blue Creek to U. S. Hwy. 17 bridge															
New River Restricted Area # 1															
19-31	SC	296.5	S Acres	ND					ND						
All waters within 1000 yards of earthen dock at the United States Marine Corps Rifle Range															
New River Restricted Area # 2															
19-37	SC	242.1	S Acres	ND					ND						
All waters within a line beginning at the Government Dock in from of U.S. Coast Guard Detachment Barracks at Marines and running a southwest course 1000 yards to Channel Marker #															

Table 9

WHITE OAK Subbasin 03-05-02

AU Number / Description	Classification	Length/Area		Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting		Stressors	Sources
				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	SH Rating	GA		
Northeast Creek															
19-16-(0.5)	SC NSW	10.3	S Miles	I	PA10	CE	Low pH	10.5	S	PA10	NCE			Fecal Coliform Bacteria	WWTP NPDES
					PA10	CE	Chlor a	18.4						Chlorophyll a	
From source to N. C. Hwy. 24														Low pH	
19-16-(3.5)a	SC HQW NSW	400.3	S Acres	I	PA10	CE	Low pH	10.5	S	PA10	NCE			Chlorophyll a	Unknown
					PA10	CE	Chlor a	18.4						Low pH	Unknown
From N. C. Hwy.24 to a line crossing Northeast Creek															
19-16-(3.5)b	SC HQW NSW	280.0	S Acres	S	PA11	NCE			S	PA11	NCE				
From a line crossing Northeast Creek 1.8 miles downstream of NC 24 to downstream side of mouth of Scales Creek															
19-16-(4.5)	SC NSW	451.5	S Acres	S	PA12	NCE			S	PA12	NCE				
From the downstream side of mouth of Scales Creek to New River															
Popular Creek															
19-16-2-3	C NSW	3.6	FW Miles	ND					ND						
From source to Little Northeast Creek															
Rocky Run															
19-16-2-2	C NSW	1.8	FW Miles	NR					ND					Low Dissolved Oxygen	WWTP NPDES
From source to Little Northeast Creek															
Rogers Bay															
19-39-1a	SA HQW	4.0	S Acres	ND					ND			I	CAO	Fecal Coliform Bacteria	Stormwater Runoff
At mouth													B-9		
19-39-1b	SA HQW	41.8	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
Entire Bay													B-9		
Salliers Bay															
19-41-3	SA HQW	60.2	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
Entire Bay													C-4		
Sandy Run Branch															
19-10-1	SC NSW	3.4	S Miles	ND					ND						
From source to Chainey Creek															

Table 9

WHITE OAK Subbasin 03-05-02

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
Scales Creek															
19-16-4	SC HQW NSW	3.5	S Miles	ND					ND						
From source to Northeast Creek															
Sneads Creek															
19-33-1	SA HQW	43.6	S Acres	ND					ND			S	APP		
From source to Ellis Cove Bay													C-2		
Socoe Creek															
19-9-2	SC NSW	1.1	S Miles	ND					ND						
From source to Mill Creek															
Southwest Creek															
19-17-(0.5)	C NSW	19.3	FW Miles	ND					ND						
From source to Mill Run															
19-17-(6.5)	C HQW NSW	594.7	S Acres	**S**	PA13	NCE			**S**	PA13	NCE				
					PA15	NCE				PA15	NCE				
										S61B	NCE				
From Mill Run to New River															
Squires Run															
19-3	C NSW	6.1	FW Miles	ND					ND						
From source to New River															
Stick Creek															
19-15	SC HQW NSW	1.1	S Miles	ND					ND						
From source to New River															
Stones Bay															
19-30a1	SA HQW	1,776.9	S Acres	ND					ND			S	APP		
Entire Bay except for the area enclosed by the DEH closure at the mouth of Stones Creek.													C-3		
19-30a2	SA HQW	13.9	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
Entire Bay except for the area enclosed by the DEH closure at the mouth of Stones Creek.													C-3		
19-30b	SA HQW	32.6	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From Stones Creek to DEH closure line.													C-3		

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
Stones Creek															
19-30-3	SA HQW	76.9	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	WWTP NPDES
From source to Stones Bay													C-3		
Strawhorn Creek															
19-13-1	SC HQW NSW	1.2	S Miles	ND					ND						
From source to Edwards Creek															
Tank Creek															
19-17-5	C NSW	2.4	FW Miles	ND					ND						
From source to Southwest Creek															
Toms Creek															
19-38-2	SA HQW	0.4	S Miles	ND					ND			S	APP		
From source to Traps Bay													C-2		
Town Creek															
19-21	SC HQW NSW	2.1	S Miles	ND					ND						
From source to New River															
Traps Bay															
19-38	SA HQW	500.0	S Acres	ND					ND			S	APP		
Entire Bay													C-2		
Traps Creek															
19-38-1	SA HQW	11.1	S Acres	ND					ND			S	APP		
From source to Traps Bay													C-2		
Two Pole Branch															
19-29	SC HQW	0.7	S Miles	ND					ND						
From source to New River															
Unnamed Tributary to New River (Rufus Creek)															
19-37-1	SC HQW	18.8	S Acres	ND					ND						
From source to New River Restricted Area # 2															
Wallace Creek															
19-20	SB NSW	248.4	S Acres	**S**	PA17	NCE			**S**	PA17	NCE				
From source to New River															

Table 9

WHITE OAK Subbasin 03-05-02

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
Wards Channel															
19-40	SA HQW	97.5	S Acres	ND					ND			S	APP		
From Intracoastal Waterway to New River													C-2		
Wheeler Creek															
19-35	SA HQW	12.9	S Acres	ND					ND			I	PRO	Fecal Coliform Bacteria	Stormwater Runoff
From source to New River													C-2		
Whitehurst Creek															
19-26	SC HQW NSW	2.6	S Miles	ND					ND						
From source to New River															
Wilson Bay															
19-14	SC HQW NSW	108.6	S Acres	**I**	PA7	NCE	High pH	7	**S**	PA7	NCE			High pH	
					PA7	CE	Chlor a	22.9		S66	NCE			Chlorophyll a	
Entire Bay															
Wolf Creek															
19-16-1	C NSW	3.4	FW Miles	ND					ND						
From source to Northeast Creek															

Table 9

WHITE OAK Subbasin 03-05-02

AU Number	Classification	Length/Area	Aquatic Life Assessment					Recreation Assessment			Shellfish Harvesting			
Description			AL Rating	Station	Result	Parameter	Year/ % 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

I	m	13.2	S Miles
S	m	14,468.3	S Acres
I	m	758.3	S Acres
S	m	42.6	FW Miles
NR	e	5.7	S Miles
NR	e	1.8	FW Miles
ND		47.5	S Miles
ND		7,613.2	S Acres
ND		93.0	FW Miles

Recreation Rating Summary

S	m	13.2	S Miles
S	m	15,764.7	S Acres
S	m	28.4	FW Miles
NR*	m	8.3	FW Miles
NR	e	2.1	FW Miles
ND		53.2	S Miles
ND		7,075.0	S Acres
ND		98.7	FW Miles

Fish Consumption Rating Summary

I	e	66.3	S Miles
I	e	22,839.8	S Acres
I	e	137.4	FW Miles

Shellfish Harvesting Rating Summary

S	m	0.4	S Miles
S	m	8,686.6	S Acres
I	m	2,779.7	S Acres

issues have not occurred since 1999. As of 2004 there were 12 general stormwater permits. Refer to Appendix II for the listing of NPDES permit holders.

2.2 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 03-05-02, 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 three benthic macroinvertebrate samplings and 19 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 as 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 6 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 10 contains a summary of use support ratings by category in subbasin 03-05-02, detailed use support information about specific AU#s and shellfish growing areas follows.

Table 10 Summary of Use Support Ratings by Category in Subbasin 03-05-02

Use Support Rating	Aquatic Life		Recreation		Shellfish Harvesting	
	Freshwater	Saltwater	Freshwater	Saltwater	Freshwater	Saltwater
MONITORED WATERS						
Supporting	42.6 mi	14,468.3 ac	28.4 mi	13.2 mi 15,764.7 ac	0	0.4 mi 8,686.6 ac
Impaired*	0	13.2 mi (100%) 758.3 ac (5%)	0	0	0	2,779.7 ac (24%)
Not Rated	0	0	8.3 mi	0	0	0
Total	**42.6 mi**	**13.2 mi 15,226.6 ac**	**36.7 mi**	**13.2 mi 15,764.7 ac**	**0**	**0.4 mi 11,466 ac**
UNMONITORED WATERS						
Not Rated	1.8 mi	5.7 mi	2.1 mi	0	0	0
No Data	93 mi	47.5 mi 7,613.2 ac	98.7 mi	53.2 mi 7,075 ac	0	0
Total	**94.8 mi**	**53.2 mi 7,613.2 ac**	**100.8 mi**	**53.2 mi 7,075 ac**	**0**	**0**
TOTALS						
All Waters*	**137.4 mi**	**66.4 mi 22,839.8 ac**	**137.5 mi**	**66.4 mi 22,839.7 ac**	**0**	**0.4 mi 11,466 ac**

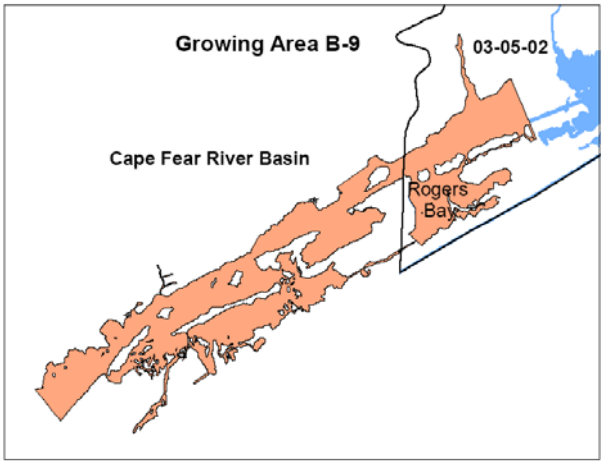
* The noted percent Impaired is the percent of monitored miles/acres only.

2.3 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 5 for a map of subbasin 03-05-02 and Figure 6 to identify growing area locations within 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.

2.3.1 Division of Environmental Health Growing Area B-9



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area B-9 as shown here and in Figure 6 & Table 11.

Goose Bay, Rogers Bay
These water bodies are Impaired for shellfish harvesting. Each is classified by DEH SS in the Table below for growing area B-9 due to potential fecal coliform bacteria levels, and will remain on the state's 303(d) list of Impaired waters.

According to the ***Sanitary Survey of Stump Sound Area, Area B-9,*** *(DEH, Shellfish Sanitation and Recreational Water Quality Section, June 2006)* the watershed for this area is only 40 square miles and contains 3,000 acres of estuarine waters. Oyster and clam production is considered to be fair in the area. Most of this growing area is within the Cape Fear River basin, but a discussion is provided here because of the mixing of waters in the ICWW.

During the sanitary survey, there were no noted malfunctioning septic systems. However, the sewer line that crosses the ICWW on the NC210 highway high-rise bridge had two leaks in 2004. These leaks caused temporary shellfish harvesting closures until the leaks were repaired.

This growing area contains the towns of Surf City (Cape Fear River basin) and North Topsail Beach, as well as the Stump Sound mainland. While year-round population is low in this area (estimated at 4,000), the tourist seasonal population can be as high as 20,000. The town of Surf City is a source of stormwater from streets and ditches into the ICWW and Stump Sound. North Topsail Beach is a also a source of stormwater runoff to Stump Sound.

There were two shellfish harvesting closures in Area B-9 as a result of the 2002 triennial Sanitary Survey near NC50 and the Highway 210 Swing Bridge and one on the east side of the ICWW in a channel. These closures were added because of increases in fecal coliform bacteria counts due to increased runoff from new homes, private boat slips, a restaurant and marinas.

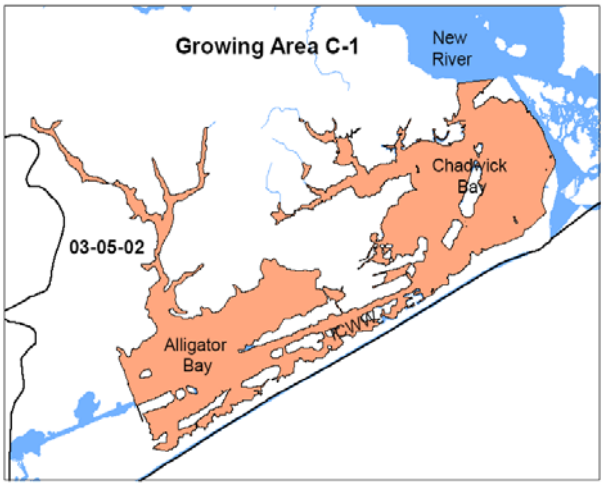
Of the 30 sampling stations in Area B-9, six stations currently exceed criteria for waters approved for shellfish harvesting. These waters are closed to shellfish harvesting and considered to be Impaired by DWQ. However, DEH analysis of the last five years of data gathered from sampling stations in the area indicated little overall change in bacteria levels since the last review in 2002.

Table 11 Summary of DEH Growing Area B-9 Classifications in Subbasin 03-05-02

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Goose Bay	19-39-2	CAO	B-9
Rogers Bay	19-39-1b 19-39-1a	PRO CAO	B-9

PRO=Prohibited, CAO=Conditionally Approved Open

2.3.2 Division of Environmental Health Growing Area C-1



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area C-1 as shown here and in Figure 6 & Table 12.

According to the ***Sanitary Survey of Chadwick Bay Area, Area C-1****, (DEH, Shellfish Sanitation & Recreational Water Quality Section, March 2002 and May 2006)* water quality has improved in some areas and continued to decline in others. Shellfish production is fair to good for both oysters and clams. This growing area has approximately 13 square miles drainage and 1,700 acres of water area. The communities of Carrel Chapel, Peru, Swan Point, Chadwick Acres and North Topsail Beach and portions of Sneads Ferry, all border these waters. Permanent population (~6,500) continues to grow, with substantial seasonal tourist influxes.

DEH has recommended an increase in shellfish closures in accordance with DEH rules, because of additional privately owned slips near the Galleon Bay Canal Marina and New River Marina, to extend 200 feet beyond the last docking space due to the number of privately owned slips in a closed flow system (canal) within close proximity. The overall slip count increased as a result of the 2006 C-1 Sanitary Survey at Swan Point Marina and resulted in an additional 325 feet of closure from the last slip. DEH has recommended reopening shellfish areas around the junction of Fullard and Charles Creek because of water quality improvements since 2002.

Since 2001, a steady decline in water quality in Mill Creek has occurred and corresponds with the expansion of North Topsail WWTP upstream, a situation that warrants further investigation. Additional monitoring stations will allow for accurately extending shellfish closure lines to reflect the high fecal coliform counts. Wastewater for the area is provided by North Topsail Utilities, which is expanding with an additional lagoon and sprayfield acreage. None of the lagoons or sprayfields for the Utilities had any notable problems. However, two spills occurred along their sewer lines running adjacent to estuarine waters. The leakage in a bridge sewer line crossing the ICWW resulted in closure of the waters adjacent to the bridge until repairs were completed. A pump station spill occurred on North Topsail Beach, but sewage did not enter estuarine waters and no additional closures were necessary. DEH surveys report no malfunctioning septic systems or illegal discharges. Stormwater runoff from North Topsail Beach's ditches and culverts are considered to be one of the main sources of bacterial contamination for the estuarine waters of C-1.

Table 12 Summary of DEH Growing Area C-1 Classifications in Subbasin 03-05-02

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Alligator Bay	19-39-3b2 19-39-3a 19-39-3b1 19-39-3c	PRO CAO CAO CAO	C-1
Biglins Creek	19-39-4-1-1	PRO	C-1
Bumps Creek	19-39-4-1-3	PRO	C-1
Chadwick Bay	19-39-4b 19-39-4a	PRO CAO	C-1
Charles Creek	19-39-4-1-2	PRO	C-1
Fullard Creek (Salt Branch)	19-39-4-1a 19-39-4-1b2 19-39-4-1b1 19-39-4-1c	PRO PRO CAO CAO	C-1
Mill Creek (Alligator Bay)	19-39-3-1	PRO	C-1
ICWW	19-39-(3.5)b1 19-41-(0.5)a1 19-39-(3.5)a2 19-39-(3.5)b3 19-41-(0.5)b 19-41-(0.5)c2 19-39-(0.5) 19-39-(3.5)a1 19-39-(3.5)b2 19-41-(0.5)a2 19-41-(0.5)c1	APP APP PRO PRO PRO PRO CAO CAO CAO CAO CAO	C-1, C-2, C-4
New River	19-(27)a1 19-(27)a3 19-(27)a4 19-(27)b 19-(27)c 19-(27)a2	APP PRO PRO PRO PRO CAO	C-1, C-2, C-3

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

Alligator Bay, Biglins Creek, Bumps Creek, Chadwick Bay, Charles Creek, Fullard Creek (Salt Branch) and Mill Creek (Alligator Bay)

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

Intracoastal Waterway ICWW [AU# 19-39-(0.5), 19-39-(3.5)a1, a2, b2, b3, 19-41-(0.5)a2, b, c1 and c2]

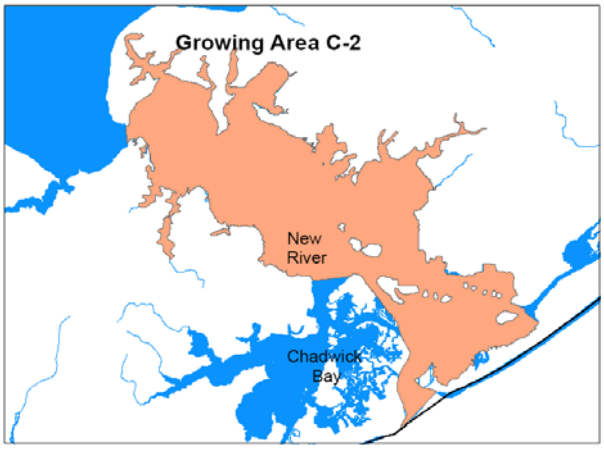
The above segments of the ICWW (408.9 acres), are Impaired for shellfish harvesting or aquatic life. These segments of the ICWW are classified by DEH SS as conditionally approved open and prohibited in growing areas C-1 and C-4 due to potential fecal coliform bacteria levels. Segment AU# 19-39-(0.5) is also Impaired in the aquatic life category due to low DO in 13 percent of samples at site PA3. An additional 95.6 acres (AU# 19-39-(3.5)b1 and 19-41-(0.5)a1) of the ICWW in these growing areas are classified as approved and are considered Supporting shellfish harvesting.

Much of the ICWW will remain on the state's 303(d) list of Impaired waters. Due to more accurate segmenting of the ICWW, acreages associated with assessment units are slightly different from the 2004 303(d) list. A total of an additional 80.2 acres will be added to the 2008 303(d) list. Assessment units19-39-(3.5)b1 (9.8 acres) and 19-41-(0.5)a1 (85.8 acres) will not be added to the 303(d) list in the shellfish harvesting category.

Lower New River [AU# 19-(27)a2, a3, a4, b and c]

Several segments of the lower New River (112.4 acres), are Impaired for shellfish harvesting. The lower New River is classified by DEH SS as prohibited and conditionally approved open in growing areas C-1, C-2 and C-3 due to potential fecal coliform bacteria levels. Assessment units 19-(27)b and c will remain on the 303(d) list and AUs 19-(27)a2, a3 and a4 will be added to the 2008 303(d) list. An additional 5,738.8 acres (AU# 19-(27)a1) are classified as approved and considered Supporting shellfish harvesting. Additional segments of the upper New River are discussed in Part 2.3.6 below.

2.3.3 Division of Environmental Health Growing Area C-2



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area C-2 as shown here and in Figure 6 & Table 13.

According to the *Sanitary Survey of Sneads Ferry Area, Area C-2, (DEH, Shellfish Sanitation & Recreational Water Quality Section, October 2002 and July 2006)* water quality is excellent throughout most of the area. This growing area encompasses over 3,100 acres and drains approximately 10 square miles of watershed. There is no municipal or privately owned WWTP available to the community of Sneads Ferry, therefore the homes and businesses draining to Area C-2 use ground absorbing septic systems for waste disposal. There are five seafood houses and three restaurants located along the waterfront. Each of the seafood houses has general dockage area to accommodate commercial fishing boasts, and all of the docks have fish cleaning basins, which allow the drainage to flow into the water. Two of the restaurants use a pump and haul method of waste treatment. Pelican Cove is the only established subdivision with a total of 40 potential lots. A horse and goat farm with 37 goats and six horses is located adjacent to the Swan Point Marina. The new Camp Lejeune Marine Corps Base WWTP at Frenchs Creek discharges into the New River in Area C-3.

Of the 25 sampling stations located throughout the area, one station exceeded shellfish sanitation criteria and no DEH reclassifications were made for the 2002 report. The 2006 Sanitary Survey resulted in an additional closure of 7 acres of shellfish waters closed because of the number of slips in close proximity to each other at Paradise Landing.

Table 13 Summary of DEH Growing Area C-2 Classifications in Subbasin 03-05-02

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Courthouse Bay	19-36a 19-36b	APP PRO	C-2
Fannie Creek	19-34	PRO	C-2
Hell Gate Creek	19-39-5	CAO	C-2
Mile Hammock Bay	19-41-2b 19-41-2a	APP PRO	C-2
Wheeler Creek	19-35	PRO	C-2
ICWW	19-39-(3.5)b1 19-41-(0.5)a1 19-39-(3.5)a2 19-39-(3.5)b3 19-41-(0.5)b 19-39-(0.5) 19-39-(3.5)a1 19-39-(3.5)b2 19-41-(0.5)a2 19-41-(0.5)c1	APP APP PRO PRO PRO CAO CAO CAO CAO CAO	C-1, C-2, C-4
New River	19-(27)a1 19-(27)a3 19-(27)a4 19-(27)b 19-(27)c 19-(27)a2	APP PRO PRO PRO PRO CAO	C-1, C-2, C-3

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

Courthouse Bay [AU# 19-36b]

Courthouse Bay from the DEH closure area in the south arm of the bay (2.8 acres), is Impaired for shellfish harvesting. This portion of Courthouse Bay is classified by DEH SS as prohibited in growing area C-2 due to potential fecal coliform bacteria levels. This portion of Courthouse Bay will remain on the state's 303(d) list of Impaired waters. An additional 188.5 acres (AU# 36a) is classified as approved and considered supporting shellfish harvesting.

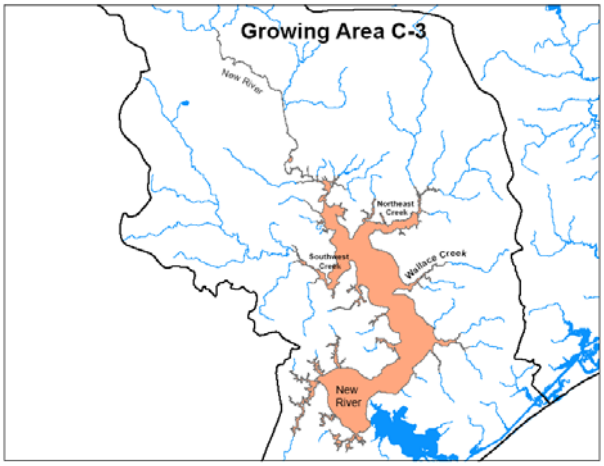
Fannie Creek, Hell Gate Creek and Wheeler Creek

These water bodies are Impaired for shellfish harvesting. Each is classified by DEH SS in the table above for growing area C-2 due to potential fecal coliform bacteria levels, and will remain on the state's 303(d) list of Impaired waters. Hell Gate Creek (14.1 ac.) will be added to the state's 2008 303(d) list of Impaired waters.

Mile Hammock Bay [AU# 19-41-2a and b]

Mile Hammock Bay (AU# 19-41-2a, 7.4 ac.), is Impaired for shellfish harvesting. This Impairment of Mile Hammock Bay is classified by DEH SS as prohibited in growing area C-2 due to potential fecal coliform bacteria levels. This portion of Mile Hammock Bay will be added to the 2008 303(d) list of Impaired waters. Segment 19-41-2b (66.6 ac.) is classified as approved and is considered to be Supporting shellfish harvesting. This segment will be recommended for removal from the 303(d) list.

2.3.4 Division of Environmental Health Growing Area C-3



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area C-3 as shown here and in Figure 6 & Table 14.

According to the ***Sanitary Survey of Stones Bay Area, Area C-3,*** *(DEH, Shellfish Sanitation & Recreational Water Quality Section, February 2006)* there has been little change in water quality throughout the area since the last sanitary survey. The watershed for the area is approximately 240 square miles with the Camp Lejeune Marine Corps Base encompassing the majority of the area watershed, along with the City of Jacksonville and other communities to the headwaters of the New River at Richlands. The 2004 survey inspected two WWTPs, two marinas and 87 septic systems.

The French Creek WWTP located on Camp Lejeune is a new state of the art facility that began operation in 1998 and consolidated seven discharges. Solids are treated on site and then land applied on the marine base; with effluent discharge into the New River. Although the WWTP is generally in good condition and well maintained there have been four major spills since July 2001. The most recent spill was from a pump station in July 2004, spilling 22,000 gallons of waste into the New River and resulted in a temporary shellfish closure. Two other spills associated with a cracked pipe resulted in temporary closures in French Creek. The fourth spill was well upstream of the closure line and did not result in any shellfish closures. Camp Lejeune recently made an agreement that will provide additional wastewater capacity to Onslow County Water and Sewer Authority.

The City of Jacksonville began operation of a new WWTP in January 1998. The new WWTP is about 20 miles inland and replaced a discharge into the New River. The WWTP consists of two large lagoons and 6,278 acres of spray fields, making it the second largest spray irrigation WWTP in the nation. The removal of this discharge from the New River is having a positive effect on water quality.

Two large subdivisions were also inspected, as well as a small mobile home park; no malfunctioning systems were detected.

Most stations have shown a slight improvement in water quality since the 2002 survey was conducted and no changes to classifications were recommended by DEH surveyors.

Table 14 Summary of DEH Growing Area C-3 Classifications in Subbasin 03-05-02

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Everett Creek	19-32	PRO	C-3
Mill Creek (Stones Bay)	19-30-1	PRO	C-3
Millstone Creek	19-30-3-1	PRO	C-3
Muddy Creek	19-30-2	PRO	C-3
Stones Bay	19-30a1	APP	C-3

	19-30a2 19-30b	PRO PRO	
Stones Creek	19-30-3	PRO	C-3
New River	19-(27)a1 19-(27)a3 19-(27)a4 19-(27)b 19-(27)c 19-(27)a2	APP PRO PRO PRO PRO CAO	C-1, C-2, C-3

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

Everett Creek, Mill Creek (Stones Bay), Millstone Creek, Muddy Creek and Stones Creek

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

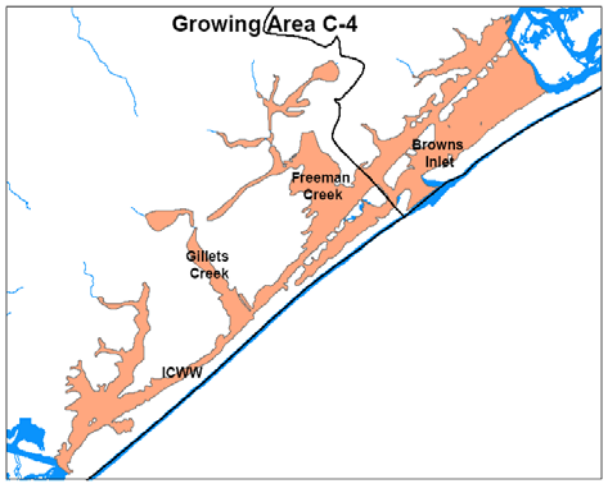
Stones Bay [AU# 19-30a2 and 19-30b]

Current Status

Stones Bay, the entire Bay except for the area enclosed by the DEH closure at the mouth of Stones Creek to the DEH closure line (46.5 acres), is Impaired for shellfish harvesting. This portion of Stones Bay is classified by DEH SS as prohibited in growing area C-3 due to potential fecal coliform bacteria levels. Stones Bay will remain on the state's 303(d) list of Impaired waters. Assessment unit 19-30a2 will be added to the 2008 state 303(d) Impaired waters list. An additional 1,776.9 acres are classified as approved and are considered to be Supporting shellfish harvesting.

Stones Bay, Stones Creek and adjacent property of Camp Lejeune is anticipated to undergo substantial development.

2.3.5 Division of Environmental Health Growing Area C-4



The following DWQ Class SA waters and the Impaired assessment units associated with these waters are located within Growing Area C-4 as shown here and in Figure 6 & Table 15.

According to the ***Sanitary Survey of Hurst Beach Area, Area C-4,*** *(DEH, Shellfish Sanitation & Recreational Water Quality Section, February 2003)* the watershed for this area is only 16 square miles and is located entirely within the Marine Corps Base at Camp Lejeune. Potential sources of pollution include runoff from forest clearing and wildlife, as well as humans.

Table 15 Summary of DEH Growing Area C-4 Classifications in Subbasin 03-05-02

Class SA Water	Assessment Unit #	Growing Area Classification	DEH Growing Area
Browns Swamp	19-41-5-1	PRO	C-4
Clay Bank Branch	19-41-5-2	PRO	C-4
Freeman Creek	19-41-5	PRO	C-4
Gillets Creek	19-41-4	PRO	C-4
Holover Creek	19-41-3-1	PRO	C-4
Mirey Branch	19-41-5-3	PRO	C-4
Salliers Bay	19-41-3	PRO	C-4
ICWW	19-39-(3.5)b1 19-41-(0.5)a1 19-39-(3.5)a2 19-39-(3.5)b3 19-41-(0.5)b 19-39-(0.5) 19-39-(3.5)a1 19-39-(3.5)b2 19-41-(0.5)a2 19-41-(0.5)c1	APP APP PRO PRO PRO CAO CAO CAO CAO CAO	C-1, C-2, C-4

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

Browns Swamp, Clay Bank Branch, Gillets Creek, Holover Creek, Mirey Branch and Salliers Bay

These water bodies are Impaired for shellfish harvesting. Each is classified by DEH SS in the table above for growing area C-4 due to potential fecal coliform bacteria levels, and will remain on the state's 303(d) list of Impaired waters.

Freeman Creek [AU# 19-41-5]

Freeman Creek from source to Intracoastal Waterway (65.4 acres), is Impaired for shellfish harvesting. Freeman Creek is classified by DEH SS as prohibited in growing area C-4 due to measured fecal coliform bacteria levels. A March 2000 report for the US Army Corps of Engineers indicated human waste was a contributing factor to fecal loading in Freemans Creek and the source was exposed "cat hole" trenches. The DEH SS survey was not able to confirm the human waste sources. However, DEH SS data indicate further water quality degradation in Freeman Creek. Freeman Creek will remain on the state's 303(d) list of Impaired waters.

2.3.6 Previously or Currently 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 16). 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 16 Summary of Currently Impaired Freshwater and Non-Shellfish Harvesting Waters in Subbasin 03-05-02

Class SB/SC Water	Assessment Unit #	Aquatic Life	Recreation	Fish Consumption
Brinson Creek	19-12	I	S	I
Little Northeast Creek	19-16-2	S	NR	I
New River	19-(1)	S	S	I
	19-(7)	I	S	I
	19-(10.5)	I	S	I
	19-(11)	S	S	I
	19-(15.5)	S	S	I
Northeast Creek	19-16-(0.5)	I	S	I
	19-16-(3.5)a	I	S	I
	19-16-(3.5)b	S	S	I
	19-16-(4.5)	S	S	I
Southwest Creek	19-17-(6.5)	S	S	I
Wilson Bay	19-14	I	S	I

I= Impaired, S=Supporting, NR= Not Rated

Brinson Creek [AU# 19-12]

Brinson Creek (2.9 miles), from source to New River is currently on the 303(d) list due to impairment under the fish consumption category (DENR, 2001). Currently, all waters of the state are considered Impaired on an evaluated basis in the fish consumption category due to elevated mercury (Refer to Chapter 7 for more information).

Brinson Creek, from source to New River (2.9 miles), is Impaired for aquatic life because criteria exceeded chlorophyll *a* in 30 percent of samples and high pH in 11 percent of samples at site PA6. In addition, turbidity was elevated in eight percent of samples. Springdale Acres WWTP (NC0057053) had significant violations of biological oxygen demand (BOD) and fecal coliform 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. Brinson Creek will remain on the state's 303(d) list of Impaired waters.

Little Northeast Creek [AU# 19-16-2]

2001 Recommendations

DWQ recommended that the four minor discharges to Little Northeast Creek should continue to pursue alternatives to discharge, and DWQ would continue to develop criteria for reclassifying this stream to swamp waters (DENR, 2001).

Current Status

Little Northeast Creek, from source to Northeast Creek (8.3 miles), is Supporting due to a Moderate bioclassification at site PB5. It should be noted that Little Northeast Creek is not rated for recreation due to elevated fecal coliform bacteria annual screening data at site PA9 and there was low DO in 20 percent of the samples. The low DO is likely from swamp streams that drain into Little Northeast Creek in this subbasin. DWQ will determine if a supplemental classification of Sw is warranted for this segment. Little Northeast Creek will remain on the state's 303(d) list of Impaired waters.

New River [AU# 19-(1), 19-(7), 19-(10.5), 19-(11) and 19-(15.5)]

2001 Recommendations

In 1997, the upper estuary was considered Impaired due to low dissolved oxygen and high chlorophyll *a* associated with algal blooms. At this time, high nutrient levels were being discharged by the City of Jacksonville as well as three discharges from Camp Lejeune. DWQ recommended these discharges pursue alternatives to discharge. In the 2001 basin plan noted the dischargers had been removed or consolidated into an advanced treatment facility and algal blooms had decreased in frequency, extent and severity. As a result, the upper New River (AU# 19-(1)) was only on the 303(d) list for fish consumption. Two segments of the lower New River are on the 303(d) list for shellfish harvesting impairment. The lower New River is discussed in Part 2.3.2 above.

DWQ recommended that Jacksonville develop a stormwater program as part of Phase II requirements. DWQ would continue to monitor nutrients in the New River to assess the risk of algal blooms to aquatic life. North Carolina Water Resources Program with the City of Jacksonville would restore five acres at Sturgeon City to a brackish marsh to treat stormwater runoff (DENR, 2001).

Current Status

New River, from source to Blue Creek (28.4 miles) is Supporting in the aquatic life category due to a Good-Fair bioclassification at site PB4 and no criteria exceeded at site PA4 (AU#19-(1)). The benthos site for New River is downstream of Richlands, located not quite midway down the length of the New River. Water quality in this reach significantly declined to a Good-Fair rating in 1990, and has yet to improve to previous conditions. The Onslow Water Quality Program also collects water quality samples in the New River watershed. Their data indicates high levels of nitrogen and phosphorus around Richlands and the need to identify the sources of these excess nutrients.

The New River (AU# 19-(7)) from Blue Creek to U.S. Hwy 17 bridge (116.0 acres), is Impaired because criteria exceeded chlorophyll *a* in 15 percent of samples and low DO in 12 percent of samples at station PA5. This portion of the New River will remain on the state's 2008 303(d) list of Impaired waters.

The New River (AU# 19-(10.5) from U.S. Hwy 17 bridge to Atlantic Coast Line Railroad (48.8 acres), is Impaired because criteria exceeded chlorophyll *a* in 15 percent of samples and low DO in 12 percent of samples at station PA5. This portion of the New River will remain on the state's 2008 303(d) list of Impaired waters.

New River waters from the Atlantic Coast Line Railroad trestle to Munford Point (AU# 19-(11)) and from Mumford Point to downstream of the mouth of Duck Creek (AU# 19-(15.5)) are now Supporting in the aquatic life category (7,154.9 acres). However, chlorophyll *a* was exceeded in 7 percent of samples in the AU# 19-(11). These segments of the New River will be recommended for removal from the state's 2008 303(d) list of Impaired waters.

The area around Richlands is still being developed, and even though road-widening impacts were thought to be the original cause of the decline, ongoing stress from urban runoff has not allowed any recovery. Grey Lauradale WWTP (NC0036226) had significant violations of fecal coliform

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.

Jacksonville Collection System and WWTP are under Special Order by Consent (SOC) agreement since September 2005. An SOC requires actions designed to reduce, eliminate, or prevent water quality degradation. Limits set for particular parameters under an NPDES permit may be relaxed in an SOC, but only for a time determined to be reasonable for making necessary improvements to the facility.

Nutrient enrichment has been a significant problem in the estuarine portions of the New River, and periodic elevated fecal coliform bacteria levels also appear to be a recurring problem in this subbasin. Jacksonville removed its discharge from the upper New River estuary in 1998, and Camp Lejeune consolidated its seven discharges into one tertiary treatment facility also in 1998. These discharges were considered a major source of nutrients into the upper estuarine portions of the New River. Since the removal of these nutrient effluent sources documented reduction of nitrogen and phosphorous, 57 percent and 71 percent decrease respectively, has occurred (Mallin et al., 2005).

A DWQ special study of phytoplankton communities in the New River, between 1998-2001, noted an overall decrease in algal concentrations and an increase in algal species diversity. A reduction in algal blooms resulted and subsequent water quality improvements of increased DO levels, increased light penetration, and decreased turbidity providing improvements in benthic habitat for aquatic life. Post sewage treatment upgrades, ammonium concentrations decreased approximately 41percent, nitrates decreased 26 percent, orthophosphates decreased 21 percent and chlorophyll *a* decreased 69 percent (Mallin et al., 2005). However, these nutrient decreases were of significance in relation to hydrologic conditions and location in the estuary (Mallin et al., 2005). Rainfall and river discharge records show positive correlation between nitrate pulses indicating upstream sources of nutrient input (Mallin et al., 2005). This research indicates the eutrophication reversal process of removing effluent from major point sources from the New River Estuary, but also indicates nonpoint sources (i.e., stormwater runoff) as current source driving algal blooms (Mallin et al., 2005).

Northeast Creek [AU# 19-16-(0.5) and (3.5)a, b and (4.5)]

Current Status

Northeast Creek (AU# 19-16-(0.5)) (10.3 miles), from source to N C. Hwy 24 is currently on the 303(d) list due to impairment under the fish consumption advise for mercury. Currently, all waters of the state are considered Impaired on an evaluated basis in the fish consumption category due to elevated mercury (Refer to Chapter 7 for more information). This segment of Northeast Creek, is also Impaired in the aquatic life category because criteria exceeded chlorophyll *a* in 18 percent of samples and low pH in 11 percent of samples at site PA10. This segment will remain on the 303(d) list of Impaired waters.

Much of Northeast Creek will remain on the list of impaired waters. The 2004 303(d) list has 1,131.8 acres of impairment in AU 19-16-(3.5) and (4.5) and 10.3 miles in AU# 19-16-(0.5). The current assessment will place 400.3 acres and 10.3 miles on the 2008 303(d) list due to exceedances at site PA10. Assessment units 19-16-(3.5)b and (4.5) will be recommended for removal from the 303(d) list (731.5 acres) because no criteria were exceeded at sites PA11 or PA12 .

White Oak Estates WWTP (NC0031577) had significant violations of fecal coliform 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.

Southwest Creek [AU# 19-17-(6.5)]

2001 Recommendations
High nutrient levels associated with discharges from the city of Jacksonville and Camp Lejeune resulted in low dissolved oxygen levels and algal blooms in 1997. As part of the Nutrient Sensitive Waters management strategy, DWQ recommended that these dischargers pursue discharge alternatives. The City of Jacksonville is now land applying waste and Camp Lejeune consolidated their seven discharges into one advanced treatment facility. Although a decline in algal blooms was noted in 2001 as a result of these changes, DWQ further recommended in 2002 that no new or expanding dischargers should be permitted due to the nutrient sensitive nature of the creek.

Current Status
Southwest Creek from Mill Run to New River (2.6 miles and 594.7 acres), was Impaired at the last assessment and is currently on the 2004 303(d) list. Current data at sites PA13 and PA15 shows no criteria were exceeded during this assessment period. Therefore, Southwest Creek will be recommended for removal from the 303(d) list.

Wilson Bay [AU# 19-14]

Wilson Bay (108.6 acres) is Impaired in the aquatic life category because criteria exceeded chlorophyll *a* in 23 percent of samples at site PA7. Wilson Bay also had high pH values in seven percent of the samples. Wilson Bay will remain on the state's 303(d) list of impaired waters. See section 2.6 for efforts supporting the restoration of water quality in Wilson Bay.

2.4 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.

2.4.1 Mott Creek [AU# 19-16-3]

Mott Creek is Not Rated on an evaluated basis in the recreation category. Sherwood Mobile Home Park WWTP (NC0022462) had significant violations of fecal coliform 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.

2.4.2 Rocky Run [AU# 19-16-2-2]

Rocky Run is Not Rated on an evaluated basis in the aquatic life category. Collins Estates Mobile Home Park WWTP (NC0036676) had significant violations of biological oxygen demand (BOD) 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.

2.4.3 Webb Creek [AU# 20-19]

Webb Creek is Not Rated on an evaluated basis in the recreation and aquatic life categories. Webb Creek WWTP (NC0062642) had significant violations of biological oxygen demand (BOD) and fecal coliform 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.

2.5 Additional Water Quality Issues within Subbasin 03-05-02

The previous sections discussed water quality concerns for specific stream segments. The following section focuses on water quality issues in the subbasin. The issues discussed may be related to waters near certain land use activities or within proximity to different pollution sources, as well highlighting projects that are proposed or underway to improve water quality.

New River Special Study (Center for Marine Science, UNC Wilmington & DWQ Workgroup) New River waters continue to have excess nutrients despite the reduction in sewage effluent from point sources. An in-depth study of harmful algal blooms in Wilson Bay identified urea as a stimulant in phytoplankton growth. When considering nutrient management strategies for the New River and Wilson Bay areas, urea should be considered in the role of algal bloom formation, along with targeting the abatement of phosphorous.

Marine Corp Base (MCB) Camp Lejeune, North Carolina
Located within Onslow County, along the coastal plain of North Carolina, the Base covers more than 153,000 acres that consist of approximately 26,000 acres of water and 127,000 acres of terrestrial features. Elevation at the Base ranges from sea level to 70 feet above mean sea level, with much of the site topography traversed by swales, wetlands, streams, and creeks that drain into the New River. The Base encompasses a 92-mile perimeter, including approximately 14 miles along the Atlantic Ocean, more than 450 miles of roads, 50 miles of railroads, one waste water treatment plant, five water treatment plans and one municipal solid waste landfill. Camp Lejeune is home to active duty, dependent, retiree, and civilian population of approximately 150,000. Approximately 47,000 military personnel are stationed at MCB Camp Lejeune. There are now 29 Installation Restoration (IR) Sites and 23 Military Munition Response Program (MMRP) Sites in need of additional remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA requires a review of IR and MMRP Sites every 5 years when hazardous substances remain above permitted levels in areas of unrestricted use and unlimited exposure. These reviews allow for an evaluation of implementation and remediation activities and whether these activities protect human health. The Base is also in the process of assessing and remediating 26 solid waste management units and 32 underground storage tank sites regulated under the Resource Conservation and Recovery

Act. All of these Sites are potential areas of concern on Base for human health and the environmental, although none pose as an immediate threat. Monitoring activities at these sites indicate possible soil, ground and surface water contamination, of particular interest are impacts on water quality conditions in or around Brinson Creek and Edwards Creek.

The Department of Defense Strategic Environmental Research and Development Program (SERDP) released a special SERDP Solicitation relevant to defining research needs for the newly formed Defense Coastal/Estuarine Research Program (DCERP). SERDP sought research proposals that evaluate the effects of military activities on, and support the sustainable management of, estuarine and coastal ecosystems. DCERP-funded projects will be based at MCB Camp Lejeune and in the New River estuary in North Carolina. As a result, a new research project will be started along the New River.

2.6 Local Initiatives for Subbasin 03-05-02 (for more information see Chapter 15)

Onslow Bight Conservation Forum targets this subbasin for conservation. The North Carolina Coastal Federation is planning a 4-acre oyster reef habitat restoration project for Chadwick Bay in the lower New River for 2007.

Wilson Bay Initiative & Restoration Project
Wilson Bay is a 165-acre embayment of the New River and is surrounded by the City of Jacksonville to the north and MCB Camp Lejeune to the east, west, and south. The Wilson Bay Water Quality Initiative was initiated by the City of Jacksonville to improve and sustain water quality in Wilson Bay. The initiative represents a partnership between the City, state (Clean Water Management Trust Fund) and federal agencies and universities working together to restore the Wilson Bay ecosystem and enhance opportunities for recreational use of the Bay by the citizens of Onslow County, NC**.** The Wilson Bay Water Quality Initiative complements the City's recent creation of a state of the art $48.5 million land waste application system and the recent decommissioning of the City's Waste Water Treatment Plant. It supports the City's overall goal of further enhancing the quality of life in Jacksonville reflected in the creation of BOLD (Bettering Our Local Downtown), and Sturgeon City (conversion of the Waste Treatment plant into an educational recreational park). These initiatives embrace the philosophy that environmental remediation and conservation are compatible with local economic development. (Source: http://cvm.ncsu.edu/wb/).

The **Wilson Bay Initiative** includes monitoring of water quality parameters including nutrient levels and presence or absence of aquatic communities (finfish, phytoplankton, growth and mortality of bivalves). The Wilson Bay Initiative is innovative in using oysters and shellfish as a natural method of cleaning the water column; they have currently planted four million oyster spat. Aeration of the water column is done by using a paddlewheel device "InStreem" to transport oxygenated water to the bottom of the bay, which has resulted in increase use of the aerated areas by fish larvae. An on-going wetlands restoration project helps teach local youth about aquatic ecology and when fully developed, the wetlands will treat a combined total of 325 thousand gallons of stormwater, river water and Bay water each year.

The City of Jacksonville's successes in water quality improvements in Wilson Bay provided momentum for the US Army Corps of Engineers to fund the **Wilson Bay Ecosystem Restoration Project**. This project will use a similar multi-step and phase approach to improving water quality. With community education and involvement, neighborhoods surrounding Wilson

Bay were identified to develop ideas to stop street sediments and yard nutrients from entering into the Bay. Twenty-seven sites are proposed for stormwater runoff controls. Activities include the wetland and creek restoration by installing stormwater BMPs (e.g., rain gardens and bioswales) to reduce and filter stormwater runoff. Oyster bed substrate will be established in Wilson Bay through this project as well, and submerged aquatic vegetation will be planted in order to provide additional filtration and habitat. Additional aerators will be used to reestablish circulation between the bay waters with the flow of New River waters, while improving dissolved oxygen levels, bottom substrate and benthic conditions. Restoration activities are also supported from the progress of the City of Jacksonville converting an abandoned WWTP into a recreation and education center, SAV nursery and aquaculture facilities. Since the Wilson Bay Initiative project began in the late 1990's improvements are apparent in the growth of oysters, an increase in polycyclic aromatic hydrocarbons (PAHs) concentration in oysters, and a reduction in fecal coliform, ammonia, phosphates, and nitrates found within the water column. As measurable water quality improvements occur from these restoration activities in Wilson Bay, continued effort is needed to address up stream conditions and sources of sedimentation and nutrient inputs for the New River watershed.