

Appendix A

Use Support Ratings for All Monitored Waterbodies in Lake Tillery / Pee Dee River Subbasin HUC- 03040104

IR Category	Integrated Reporting Categories for individual Assessment Unit/Use Support Category/Parameter Assessments. A single AU can have multiple assessments depending on data available and classified uses.
1	Supporting the assessed use no criteria exceeded (NCE) for a parameter of interest (POI) in a Use Support Category (USC).
1t	Supporting the assessed use no criteria exceeded (NCE) for a parameter of interest (POI) in a Use Support Category and there is an approved TMDL for the POI.
2	Supporting or not Impaired for all monitored uses
3a	Instream/monitoring data are inconclusive (DI)
3c	No Data available for assessment
3t	No Data available for assessment –AU is in a watershed with an approved TMDL
4a	Impaired for the assessed USC/POI; There is a standards violation (SV) and an approved TMDL for the POI.
4b	Impaired for the assessed USC/POI; Other program expected to address POI
4c	Impaired for the assessed USC/POI loss of use (LOU) and POI is a non pollutant
4cr	Impaired for LOU Recreation use and there is no data for TMDL (swimming advisories posted)
4ct	Impaired for the assessed USC/POI and the AU is in a watershed that is part of TMDL study area for the POI.
4s	Impaired Biological integrity with an identified Aquatic Life Standards Violation listed in Category 5
5	Impaired for the assessed USC/POI in need of TMDL for POI
5s	Impaired Biological integrity and stressor study does not indicate aquatic life standard violations.

Yadkin-Peedee River Basin

Lake Tillery-Pee Dee River 8-Digit Subbasin 03040104

Assessment Unit Number	Name	Potential Stressors	Use Support Category	Use Support Rating	Reason for Rating	Parameter of Interest	Collection Year	Listing Year	IR Category
Description		Potential Sources							
Classification	DWO Subbasin	Miles/Acres							
13-25-24	Bridgers Creek		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2006		1
From source to Little River									
C;HQW	03-07-15	9.2 FW Miles							
13-20a	Brown Creek	Habitat Degradation	Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2006		1
From N.C.-S.C. State Line to mouth of Lick Creek									
C	03-07-10	16.5 FW Miles			General Agriculture/Pasture Natural Conditions				
13-20b	Brown Creek	Habitat Degradation	Aquatic Life	Impaired	Standard Violation	Low Dissolved Oxygen	2006	1998	5
From mouth of Lick Creek to Pee Dee River									
C	03-07-10	28.5 FW Miles	Aquatic Life	Impaired	Biological Criteria Exceeded	Ecological/biological Integrity Benthos	1996	1998	4s
			Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1
					Low Dissolved Oxygen Natural Conditions				
13-21	Cedar Creek	Habitat Degradation	Aquatic Life	Not Rated	Data Inconclusive	Ecological/biological Integrity FishCom	2006		3a
From source to Pee Dee River									
C	03-07-10	10.7 FW Miles			Natural Conditions Stormwater Runoff				
13-25-36a	Cheek Creek		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2006		1
From source to NC 731									
C	03-07-15	9.3 FW Miles							
13-25-36b	Cheek Creek		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2006		1
From NC 731 to Little River									
C	03-07-15	8.1 FW Miles							
13-16	Clarks Creek		Aquatic Life	Supporting	No Criteria Exceeded	Water Quality Standards Aquatic Life	2006		1
From source to Pee Dee River									
C	03-07-10	12.6 FW Miles	Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2004		1
			Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity Benthos	2006		1
			Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1
13-25-20-(9)	Densons Creek	Habitat Degradation	Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2004		1
From dam at Troy Reservoir to Little River									
C	03-07-15	2.8 FW Miles			Impoundment Natural Conditions				
13-25-20-8	Dumas Creek		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2001		1
From source to Densons Creek									
C;HQW	03-07-15	9.4 FW Miles							

Yadkin-Peedee River Basin

Lake Tillery-Pee Dee River 8-Digit Subbasin 03040104

Assessment Unit Number	Name	Potential Stressors	Use Support Category	Use Support Rating	Reason for Rating	Parameter of Interest	Collection Year	Listing Year	IR Category
Description	Potential Sources								
Classification	DWQ Subbasin	Miles/Acres							
13-9-(2)	Jacobs Creek	Low Dissolved Oxygen	Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2004		1
From a point 0.3 mile upstream of Stanly County SR 1740 to Lake Tillery, Pee Dee River		Nutrient Impacts	Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity Benthos	2004		1
WS-IV;CA	03-07-08	0.5 FW Miles							
13-25-38-1	Little Buffalo Creek		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity Benthos	2005		1
From source to Buffalo Creek									
WS-IV	03-07-15	2.7 FW Miles							
13-5-1-(1)	Little Mountain Creek		Aquatic Life	Supporting	No Criteria Exceeded	Water Quality Standards Aquatic Life	2006		1
From source to a point 0.5 mile upstream of Stanly County SR 1545			Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2004		1
C	03-07-08	1.4 FW Miles	Aquatic Life	Impaired	Biological Criteria Exceeded	Ecological/biological Integrity Benthos	2006	1998	5
			Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1
13-5-1-(2)	Little Mountain Creek	Low Dissolved Oxygen	Aquatic Life	Supporting	No Criteria Exceeded	Water Quality Standards Aquatic Life	2006		1
From a point 0.5 mile upstream of Stanly County SR 1545 to Mountain Cr.		Impoundment	Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2004		1
WS-IV	03-07-08	5.7 FW Miles	Aquatic Life	Impaired	Biological Criteria Exceeded	Ecological/biological Integrity Benthos	2006	1998	5
			Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1
			Water Supply	Supporting	No Criteria Exceeded	Water Quality Standards Water Supply	2006		1
13-25-(1)	Little River		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2006		1
From source to Suggs Creek									
C	03-07-15	23.9 FW Miles							
13-25-(11.5)	Little River		Aquatic Life	Supporting	No Criteria Exceeded	Water Quality Standards Aquatic Life	2006		1
From Suggs Creek to Densons Creek			Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity Benthos	2006		1
C;HQW	03-07-15	12.9 FW Miles	Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1
13-25-(19)	Little River		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity Benthos	2006		1
From Densons Creek to Hammer Creek									
C	03-07-15	18.5 FW Miles							

Yadkin-Peedee River Basin

Lake Tillery-Pee Dee River 8-Digit Subbasin 03040104

Assessment Unit Number	Name	Potential Stressors	Use Support Category	Use Support Rating	Reason for Rating	Parameter of Interest	Collection Year	Listing Year	IR Category
Description		Potential Sources							
Classification	DWO Subbasin	Miles/Acres							
13-25-(37.5)	Little River		Aquatic Life	Supporting	No Criteria Exceeded	Water Quality Standards Aquatic Life	2006		1
From Hamer Creek to Pee Dee River									
WS-IV	03-07-15	3.7 FW Miles	Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1
13-28-(0.5)	Mountain Creek		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2006		1
From source to a point 1.1 miles upstream of mouth									
WS-IV	03-07-10	4.6 FW Miles	Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity Benthos	2006		1
13-5-(0.7)	Mountain Creek		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2004		1
From Stanly County SR 1542 to a point 0.5 mile upstream of mouth									
WS-IV	03-07-08	7.3 FW Miles							
13-(15.5)a	PEE DEE RIVER		Aquatic Life	Supporting	No Criteria Exceeded	Water Quality Standards Aquatic Life	2006		1
From Norwood Dam to Rocky River									
WS-V,B	03-07-10	4.9 FW Miles	Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1
			Water Supply	Supporting	No Criteria Exceeded	Water Quality Standards Water Supply	2006		1
13-(15.5)b	PEE DEE RIVER		Aquatic Life	Impaired	Standard Violation	Turbidity	2006	2008	5
From Rocky River to mouth of Turkey Top Creek									
WS-V,B	03-07-10	10.4 FW Miles	Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1
			Water Supply	Supporting	No Criteria Exceeded	Water Quality Standards Water Supply	2006		1
13-(34)a	PEE DEE RIVER		Aquatic Life	Supporting	No Criteria Exceeded	Water Quality Standards Aquatic Life	2006		1
From Blewett Falls Dam to mouth of Hitchcock Creek									
C	03-07-16	6.3 FW Miles	Fish Consumption	Impaired	Standard Violation	Mercury	2004	2004	5
			Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1
13-25-30-(0.5)	Rocky Creek		Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity FishCom	2006		1
From N.C. Hwy. 27 to Little River									
C;HQW	03-07-15	6.4 FW Miles							
13-28-2-4	Toms Branch		Aquatic Life	Supporting	No Criteria Exceeded	Water Quality Standards Aquatic Life	2006		1
From source to Little Mountain Creek									
C	03-07-10	2.3 FW Miles	Recreation	Supporting	No Criteria Exceeded	Fecal Coliform (recreation)	2006		1

Yadkin-Peedee River Basin

Lake Tillery-Pee Dee River 8-Digit Subbasin 03040104

Assessment Unit Number	Name		Potential Stressors	Use Support Category	Use Support Rating	Reason for Rating	Parameter of Interest	Collection Year	Listing Year	IR Category
Description	Classification	DWQ Subbasin	Miles/Acres	Potential Sources						
13-25-15	West Fork Little River			Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity	2006		1
From source to Little River										
C		03-07-15	23.7 FW Miles	Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity	2006		1
							Benthos			
13-7-(2)	Wood Run			Aquatic Life	Supporting	No Criteria Exceeded	Ecological/biological Integrity	2006		1
From a point 0.2 mile upstream of Montgomery County SR 1150 to Lake Tillery, Pee Dee River										
WS-IV;CA		03-07-08	0.6 FW Miles				Benthos			

Appendix B

**Ambient Monitoring Stations
Summary Sheets**

Ambient Monitoring System Station Summaries
 NCDENR, Division of Water Quality
 Basinwide Assessment Report

Location: LITTLE MOUNTAIN CRK AT NC 1798 NR BADIN
Station #: Q6950000 **Hydrologic Unit Code:** 3040104
Latitude: 35.36928 **Longitude:** -80.11088 **Stream class:** WS-IV
Agency: YPDRBA **NC stream index:** 13-5-1-(2)

Time period: 01/17/2002 to 12/14/2006

	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	79	0	<4	0	0		5.5	5.7	6.4	7.2	10.1	10.7	11.3
	79	0	<5	0	0		5.5	5.7	6.4	7.2	10.1	10.7	11.3
pH (SU)	79	0	<6	0	0		6.6	6.9	7	7.1	7.3	8	8.1
	79	0	>9	0	0		6.6	6.9	7	7.1	7.3	8	8.1
Spec. conductance (umhos/cm at 25°C)	78	0	N/A				86	106	122	133	155	172	206
Water Temperature (°C)	79	0	>32	0	0		4.1	7	10.9	19.2	23.4	24.6	27
Other													
Turbidity (NTU)	55	2	>50	3	5.5		1.5	1.9	3	5.2	9.5	29.4	90
Nutrients (mg/L)													
NH3 as N	55	10	N/A				0.01	0.01	0.02	0.06	0.1	0.17	0.55
NO2 + NO3 as N	55	0	>10	0	0		0.01	0.19	0.4	0.68	0.99	1.78	2.89
TKN as N	55	4	N/A				0.1	0.21	0.33	0.49	0.63	0.91	1.69
Total Phosphorus	55	1	N/A				0.01	0.04	0.06	0.11	0.16	0.2	3.31
Fecal coliform (#/100mL)													
# results:	Geomean		# > 400:	% > 400:		%Conf:							
55	68		2	4									

Key:
 # result: number of observations
 # ND: number of observations reported to be below detection level (non-detect)
 EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
 Results not meeting EL: number and percentages of observations not meeting evaluation level
 %Conf: States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
 Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
 NCDENR, Division of Water Quality
 Basinwide Assessment Report

Location: PEE DEE RIV AT BOAT RAMP AT MORROW MOUNTAIN STATE PARK
Station #: Q6960000 **Hydrologic Unit Code:** 3040104
Latitude: 35.37970 **Longitude:** -80.06130 **Stream class:** WS-IV&B CA
Agency: YPDRBA **NC stream index:** 13-(1)

Time period: 01/17/2002 to 12/14/2006

	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	85	0	<4	0	0		5.2	5.7	6.1	6.9	9.8	10.6	10.8
	85	0	<5	0	0		5.2	5.7	6.1	6.9	9.8	10.6	10.8
pH (SU)	85	0	<6	0	0		6.5	6.9	7	7.2	7.5	8	8.3
	85	0	>9	0	0		6.5	6.9	7	7.2	7.5	8	8.3
Spec. conductance (umhos/cm at 25°C)	84	0	N/A				78	94	101	108	126	142	173
Water Temperature (°C)	85	0	>32	0	0		4.4	7.6	11.7	20.7	24.2	25.2	28.9
Other													
Chlorophyll a (ug/L)	25	0	>40	0	0		1	1	2	4	6	10	38
Turbidity (NTU)	60	1	>50	1	1.7		1.5	2.8	3.6	5.7	12	29.5	65
Nutrients (mg/L)													
NH3 as N	60	11	N/A				0.01	0.01	0.01	0.04	0.08	0.13	0.27
NO2 + NO3 as N	60	1	>10	0	0		0.01	0.15	0.28	0.48	0.68	0.97	1.41
TKN as N	60	3	N/A				0.1	0.2	0.36	0.47	0.63	0.86	1.81
Total Phosphorus	60	2	N/A				0.01	0.04	0.05	0.08	0.13	0.18	18.02

Fecal coliform (#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
60	44	3	5	

Key:

result: number of observations
 # ND: number of observations reported to be below detection level (non-detect)
 EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
 Results not meeting EL: number and percentages of observations not meeting evaluation level
 %Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
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Ambient Monitoring System Station Summaries
 NCDENR, Division of Water Quality
 Basinwide Assessment Report

Location: PEE DEE RIV AT NC 24 NC 27 AND NC 73 NR ALBEMARLE
Station #: Q7030000 **Hydrologic Unit Code:** 3040104
Latitude: 35.30825 **Longitude:** -80.07972 **Stream class:** WS-IV&B CA
Agency: YPDRBA **NC stream index:** 13-(1)

Time period: 01/17/2002 to 12/14/2006

	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	85	0	<4	0	0		5.2	5.3	6.1	6.9	9.5	10.6	11.5
	85	0	<5	0	0		5.2	5.3	6.1	6.9	9.5	10.6	11.5
pH (SU)	85	0	<6	0	0		6.5	6.9	6.9	7.1	7.3	8	8.3
	85	0	>9	0	0		6.5	6.9	6.9	7.1	7.3	8	8.3
Spec. conductance (umhos/cm at 25°C)	84	0	N/A				62	82	92	108	124	145	184
Water Temperature (°C)	85	0	>32	0	0		4.2	7.3	11.3	20.3	24.1	26	29.6
Other													
Chlorophyll a (ug/L)	24	1	>40	0	0		1	1	3	4	8	14	18
TSS (mg/L)	60	0	N/A				1.6	2.8	3.9	6.5	9	21.7	240
Turbidity (NTU)	60	0	>50	2	3.3		1.8	3.3	4.4	7.3	11	19	80
Nutrients (mg/L)													
NH3 as N	59	12	N/A				0.01	0.01	0.02	0.05	0.07	0.15	0.21
NO2 + NO3 as N	60	3	>10	0	0		0.01	0.01	0.08	0.26	0.42	0.53	2.05
TKN as N	60	0	N/A				0.18	0.3	0.38	0.5	0.7	0.91	1.86
Total Phosphorus	60	2	N/A				0.01	0.04	0.05	0.06	0.09	0.11	0.94
Metals (ug/L)													
Aluminum, total (Al)	18	1	N/A				50	113	158	388	644	2694	5007
Arsenic, total (As)	18	17	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	18	17	>2	0	0		1	1	1	1	1	1	1
Chromium, total (Cr)	18	17	>50	0	0		5	5	5	5	5	5	9
Copper, total (Cu)	18	12	>7	0	0		2	2	2	2	2	3	5
Iron, total (Fe)	18	0	>1000	3	16.7	90.2	117	159	234	564	803	3670	3974
Lead, total (Pb)	18	17	>25	0	0		5	5	5	5	5	5	5
Mercury, total (Hg)	18	18	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	18	17	>25	1	5.6		10	10	10	10	10	12	28
Zinc, total (Zn)	18	15	>50	0	0		10	10	10	10	10	13	23
Fecal coliform (#/100mL)													
# results:	Geomean	# > 400:	% > 400:	%Conf:									
60	35	3	5										

Key:
 # result: number of observations
 # ND: number of observations reported to be below detection level (non-detect)
 EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
 Results not meeting EL: number and percentages of observations not meeting evaluation level
 %Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
 Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
 NCDENR, Division of Water Quality
 Basinwide Assessment Report

Location: PEE DEE RIV AT NC 731 NR SHANKLE

Station #: Q7150000

Hydrologic Unit Code: 3040104

Latitude: 35.20052

Longitude: -80.06248

Stream class: WS-V&B

Agency: NCAMBNT

NC stream index: 13-(15.5)

Time period: 01/22/2002 to 12/19/2006

	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<4	4	6.9		3.1	4.4	6	8.2	11.1	12.5	14.5
	58	0	<5	8	13.8	87.9	3.1	4.4	6	8.2	11.1	12.5	14.5
pH (SU)	58	0	<6	3	5.2		5.8	6	6.3	6.8	7.2	7.7	8.1
	58	0	>9	0	0		5.8	6	6.3	6.8	7.2	7.7	8.1
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				64	71	79	88	102	115	131
Water Temperature (°C)	58	0	>32	0	0		5	8.1	10.8	18.8	24.1	27.2	28.7
Other													
TSS (mg/L)	20	5	N/A				2.5	2.5	2.6	4	5	6.9	20
Turbidity (NTU)	58	0	>50	1	1.7		1.7	2.5	3.4	5	7.9	14.2	75
Nutrients (mg/L)													
NH3 as N	41	16	N/A				0.02	0.02	0.02	0.02	0.05	0.08	0.2
NO2 + NO3 as N	41	0	>10	0	0		0.19	0.25	0.37	0.5	0.63	0.79	0.89
TKN as N	41	0	N/A				0.21	0.23	0.29	0.33	0.39	0.45	0.56
Total Phosphorus	41	0	N/A				0.02	0.03	0.03	0.04	0.06	0.07	4
Metals (ug/L)													
Aluminum, total (Al)	20	1	N/A				50	75	118	190	265	841	4000
Arsenic, total (As)	20	20	>10	0	0		5	5	5	10	10	10	10
Cadmium, total (Cd)	20	20	>2	0	0		2	2	2	2	2	2	2
Chromium, total (Cr)	20	20	>50	0	0		25	25	25	25	25	25	25
Copper, total (Cu)	20	10	>7	0	0		2	2	2	2	3	5	7
Iron, total (Fe)	20	0	>1000	2	10	67.7	82	102	198	265	478	1073	2900
Lead, total (Pb)	20	20	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	20	0	>200	2	10	67.7	19	21	25	50	104	205	410
Mercury, total (Hg)	20	20	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	20	20	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	20	19	>50	1	5		10	10	10	10	10	10	63
Fecal coliform (#/100mL)													
# results:	Geomean	# > 400:	% > 400:	%Conf:									
56	10	0	0										

Key:

result: number of observations

ND: number of observations reported to be below detection level (non-detect)

EL: Evaluation Level; applicable numeric or narrative water quality standard or action level

Results not meeting EL: number and percentages of observations not meeting evaluation level

%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)

Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries

NCDENR, Division of Water Quality

Basinwide Assessment Report

Location: CLARKS CRK AT SR 1187 NR MOUNT GILEAD

Station #: Q7210000

Hydrologic Unit Code: 3040104

Latitude: 35.20438

Longitude: -80.05752

Stream class: C

Agency: YPDRBA

NC stream index: 13-16

Time period: 01/17/2002 to 12/14/2006

Field	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
D.O. (mg/L)	85	0	<4	0	0		5.2	5.7	6.4	7.3	9.9	10.8	11.5
	85	0	<5	0	0		5.2	5.7	6.4	7.3	9.9	10.8	11.5
pH (SU)	85	0	<6	0	0		6.7	6.9	7	7.1	7.4	8.1	8.5
	85	0	>9	0	0		6.7	6.9	7	7.1	7.4	8.1	8.5
Spec. conductance (umhos/cm at 25°C)	84	0	N/A				72	90	110	139	154	168	211
Water Temperature (°C)	85	0	>32	0	0		3.6	6.5	10.7	19.8	23.5	24.5	26.7
Other													
Turbidity (NTU)	60	1	>50	3	5		1.5	2.8	5.1	8.1	13	37.8	160
Fecal coliform (#/100mL)													
# results:	Geomean	# > 400:	% > 400:	%Conf:									
60	64	4	7										

Key:

result: number of observations

ND: number of observations reported to be below detection level (non-detect)

EL: Evaluation Level; applicable numeric or narrative water quality standard or action level

Results not meeting EL: number and percentages of observations not meeting evaluation level

%Conf: States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)

Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
 NCDENR, Division of Water Quality
 Basinwide Assessment Report

Location: BROWN CRK AT SR 1627 NR PINKSTON

Station #: Q9155000

Hydrologic Unit Code: 3040104

Latitude: 35.06372

Longitude: -80.05283

Stream class: C

Agency: NCAMBNT

NC stream index: 13-20

Time period: 01/07/2002 to 12/27/2006

	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	49	0	<4	10	20.4	99.2	1.4	2.5	4.2	6.7	10	10.9	13
	49	0	<5	16	32.7	100	1.4	2.5	4.2	6.7	10	10.9	13
pH (SU)	48	0	<6	1	2.1		5.9	6.3	6.4	6.7	6.9	7	7.3
	48	0	>9	0	0		5.9	6.3	6.4	6.7	6.9	7	7.3
Spec. conductance (umhos/cm at 25°C)	49	0	N/A				46	74	93	112	126	160	194
Water Temperature (°C)	49	0	>32	0	0		2.1	6	9.8	16	22.2	25.2	27.6
Other													
TSS (mg/L)	16	1	N/A				3.5	3.7	4	5.1	10.8	50	64
Turbidity (NTU)	49	0	>50	3	6.1		3.2	5.7	8.2	17	24.5	50	140
Metals (ug/L)													
Aluminum, total (Al)	16	0	N/A				57	108	195	400	1125	2850	3200
Arsenic, total (As)	16	16	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	16	16	>2	0	0		2	2	2	2	2	2	2
Chromium, total (Cr)	16	16	>50	0	0		25	25	25	25	25	25	25
Copper, total (Cu)	16	6	>7	2	12.5	78.9	2	2	2	2	4	8	9
Iron, total (Fe)	16	0	>1000	14	87.5	100	570	577	1425	1900	2475	2750	3100
Lead, total (Pb)	16	16	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	16	16	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	16	14	>50	0	0		10	10	10	10	10	10	11
Fecal coliform (#/100mL)													
# results:	Geomean	# > 400:	% > 400:	%Conf:									
47	106	6	13										

Key:

result: number of observations

ND: number of observations reported to be below detection level (non-detect)

EL: Evaluation Level; applicable numeric or narrative water quality standard or action level

Results not meeting EL: number and percentages of observations not meeting evaluation level

%Conf: States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)

Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
 NCDENR, Division of Water Quality
 Basinwide Assessment Report

Location: PEE DEE RIV AT NC 109 NR MANGUM

Station #: Q9160000

Hydrologic Unit Code: 3040104

Latitude: 35.08591

Longitude: -79.99888

Stream class: WS-V&B

Agency: NCAMBNT

NC stream index: 13-(15.5)

Time period: 01/07/2002 to 12/27/2006

	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	49	0	<4	2	4.1		3.6	5.1	6.3	7.8	10	11.6	13.3
	49	0	<5	4	8.2		3.6	5.1	6.3	7.8	10	11.6	13.3
pH (SU)	48	0	<6	1	2.1		5.9	6.3	6.6	6.9	7.2	7.3	7.9
	48	0	>9	0	0		5.9	6.3	6.6	6.9	7.2	7.3	7.9
Spec. conductance (umhos/cm at 25°C)	49	0	N/A				65	82	90	102	126	146	302
Water Temperature (°C)	49	0	>32	0	0		5.5	7.3	9.6	17	24.6	28.2	30.2
Other													
TSS (mg/L)	16	0	N/A				3.2	4.5	6.6	8.5	46.5	75.3	90
Turbidity (NTU)	49	0	>50	7	14.3	88.8	3.7	6.1	8.4	12	30.5	65	110
Nutrients (mg/L)													
NH3 as N	32	9	N/A				0.02	0.02	0.02	0.03	0.04	0.07	0.17
NO2 + NO3 as N	32	0	>10	0	0		0.25	0.34	0.59	0.73	0.9	1.24	3.6
TKN as N	32	0	N/A				0.3	0.31	0.37	0.45	0.56	0.69	0.8
Total Phosphorus	32	0	N/A				0.04	0.05	0.06	0.1	0.19	0.25	0.34
Metals (ug/L)													
Aluminum, total (Al)	16	0	N/A				190	211	248	435	2328	3670	4300
Arsenic, total (As)	16	16	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	16	16	>2	0	0		2	2	2	2	2	2	2
Chromium, total (Cr)	16	16	>50	0	0		25	25	25	25	25	25	25
Copper, total (Cu)	16	5	>7	2	12.5	78.9	2	2	2	3	5	8	10
Iron, total (Fe)	16	0	>1000	5	31.2	99.7	300	314	340	725	2675	3420	3700
Lead, total (Pb)	16	16	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	16	0	>200	1	6.2		45	46	51	95	135	252	420
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	16	16	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	16	11	>50	0	0		10	10	10	10	11	16	16
Fecal coliform (#/100mL)													
# results:	Geomean	# > 400:	% > 400:	%Conf:									
47	149	8	17										

Key:

result: number of observations

ND: number of observations reported to be below detection level (non-detect)

EL: Evaluation Level; applicable numeric or narrative water quality standard or action level

Results not meeting EL: number and percentages of observations not meeting evaluation level

%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)

Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
 NCDENR, Division of Water Quality
 Basinwide Assessment Report

Location: LITTLE RIV AT SR 1340 NR STAR

Station #: Q9200000

Hydrologic Unit Code: 3040104

Latitude: 35.38722 **Longitude:** -79.83152

Stream class: C HQW

Agency: NCAMBNT

NC stream index: 13-25-(11.5)

Time period: 01/08/2002 to 12/05/2006

	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	47	0	<4	0	0		4.7	6.6	8.1	9.8	12.1	12.9	15.7
	47	0	<5	1	2.1		4.7	6.6	8.1	9.8	12.1	12.9	15.7
pH (SU)	48	0	<6	0	0		6	6.4	6.5	6.8	7.2	7.3	7.7
	48	0	>9	0	0		6	6.4	6.5	6.8	7.2	7.3	7.7
Spec. conductance (umhos/cm at 25°C)	48	0	N/A				40	54	59	64	66	72	90
Water Temperature (°C)	48	0	>32	0	0		1.3	5.8	8.3	15.4	21.9	24.3	28.1
Other													
TSS (mg/L)	16	9	N/A				2.5	2.5	2.5	2.6	4.8	10.1	15
Turbidity (NTU)	48	0	>50	0	0		1.1	2.9	3.6	7.6	11.8	23.5	40
Nutrients (mg/L)													
NH3 as N	31	27	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.08
NO2 + NO3 as N	31	7	N/A				0.02	0.02	0.03	0.14	0.24	0.26	0.61
TKN as N	31	3	N/A				0.2	0.2	0.26	0.32	0.41	0.53	0.62
Total Phosphorus	31	0	N/A				0.02	0.03	0.05	0.06	0.09	0.1	0.16
Metals (ug/L)													
Aluminum, total (Al)	16	0	N/A				88	92	162	195	352	1255	2200
Arsenic, total (As)	16	16	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	16	16	>2	0	0		2	2	2	2	2	2	2
Chromium, total (Cr)	16	16	>50	0	0		25	25	25	25	25	25	25
Copper, total (Cu)	16	12	>7	0	0		2	2	2	2	2	4	5
Iron, total (Fe)	16	0	>1000	4	25	98.3	460	600	700	815	1052	1480	1900
Lead, total (Pb)	16	16	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	16	16	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	16	15	>50	0	0		10	10	10	10	10	12	16
Fecal coliform (#/100mL)													
# results:	45												
Geomean	99												
# > 400:		5											
% > 400:		11											
%Conf:													

Key:

result: number of observations

ND: number of observations reported to be below detection level (non-detect)

EL: Evaluation Level; applicable numeric or narrative water quality standard or action level

Results not meeting EL: number and percentages of observations not meeting evaluation level

%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)

Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries

NCDENR, Division of Water Quality

Basinwide Assessment Report

Location: LITTLE RIV AT SR 1148 NR ELLERBE

Station #: Q9320000

Hydrologic Unit Code: 3040104

Latitude: 35.10633

Longitude: -79.89895

Stream class: WS-IV

Agency: YPDRBA

NC stream index: 13-25-(37.5)

Time period: 01/17/2002 to 12/14/2006

Field	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
D.O. (mg/L)	85	0	<4	0	0		4.2	5.6	6.2	7.1	9.4	10.6	11.4
	85	0	<5	1	1.2		4.2	5.6	6.2	7.1	9.4	10.6	11.4
pH (SU)	85	0	<6	0	0		6.4	6.9	7	7.1	7.4	8.1	8.4
	85	0	>9	0	0		6.4	6.9	7	7.1	7.4	8.1	8.4
Spec. conductance (umhos/cm at 25°C)	84	2	N/A				50	84	96	112	129	150	196
Water Temperature (°C)	85	0	>32	0	0		4.1	6.7	10.4	19.9	23.4	25.1	28.1
Other													
Turbidity (NTU)	60	0	>50	3	5		1.8	3.1	5.3	8.4	15.8	40	150
Fecal coliform (#/100mL)													
# results:	Geomean	# > 400:	% > 400:	%Conf:									
60	62	1	2										

Key:

result: number of observations

ND: number of observations reported to be below detection level (non-detect)

EL: Evaluation Level; applicable numeric or narrative water quality standard or action level

Results not meeting EL: number and percentages of observations not meeting evaluation level

%Conf: States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)

Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
 NCDENR, Division of Water Quality
 Basinwide Assessment Report

Location: TOMS BRANCH AT SR 1310 NR ELLERBE

Station #: Q9340000

Hydrologic Unit Code: 3040104

Latitude: 35.08783

Longitude: -79.78942

Stream class: C

Agency: YPDRBA

NC stream index: 13-28-2-4

Time period: 01/17/2002 to 12/14/2006

	# result	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	81	0	<4	0	0		5.1	5.7	6.3	7.3	9.7	10.6	11.1
	81	0	<5	0	0		5.1	5.7	6.3	7.3	9.7	10.6	11.1
pH (SU)	81	0	<6	0	0		6.8	6.9	6.9	7.1	7.3	8.1	8.5
	81	0	>9	0	0		6.8	6.9	6.9	7.1	7.3	8.1	8.5
Spec. conductance (umhos/cm at 25°C)	80	1	N/A				50	70	91	117	155	174	240
Water Temperature (°C)	81	0	>32	0	0		3.8	6.2	9.8	19.1	23.3	25.4	28.6
Other													
Turbidity (NTU)	58	0	>50	4	6.9		2.7	4.5	6.7	9.8	16	34.2	280
Fecal coliform (#/100mL)													
# results:	Geomean	# > 400:	% > 400:	%Conf:									
58	71	5	9										

Key:

result: number of observations

ND: number of observations reported to be below detection level (non-detect)

EL: Evaluation Level; applicable numeric or narrative water quality standard or action level

Results not meeting EL: number and percentages of observations not meeting evaluation level

%Conf: States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)

Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Appendix C

**Biological Data Sample Sites
Summary**

YADKIN RIVER HUC 03040104 – LAKE TILLERY/PEE DEE RIVER

Description

This HUC encompasses subbasins 10, 15, and a portion of 08. The portion of subbasin 08 included in begins at the confluence of the Uwharrie and Yadkin rivers, which forms the Pee Dee River (Figure 5).

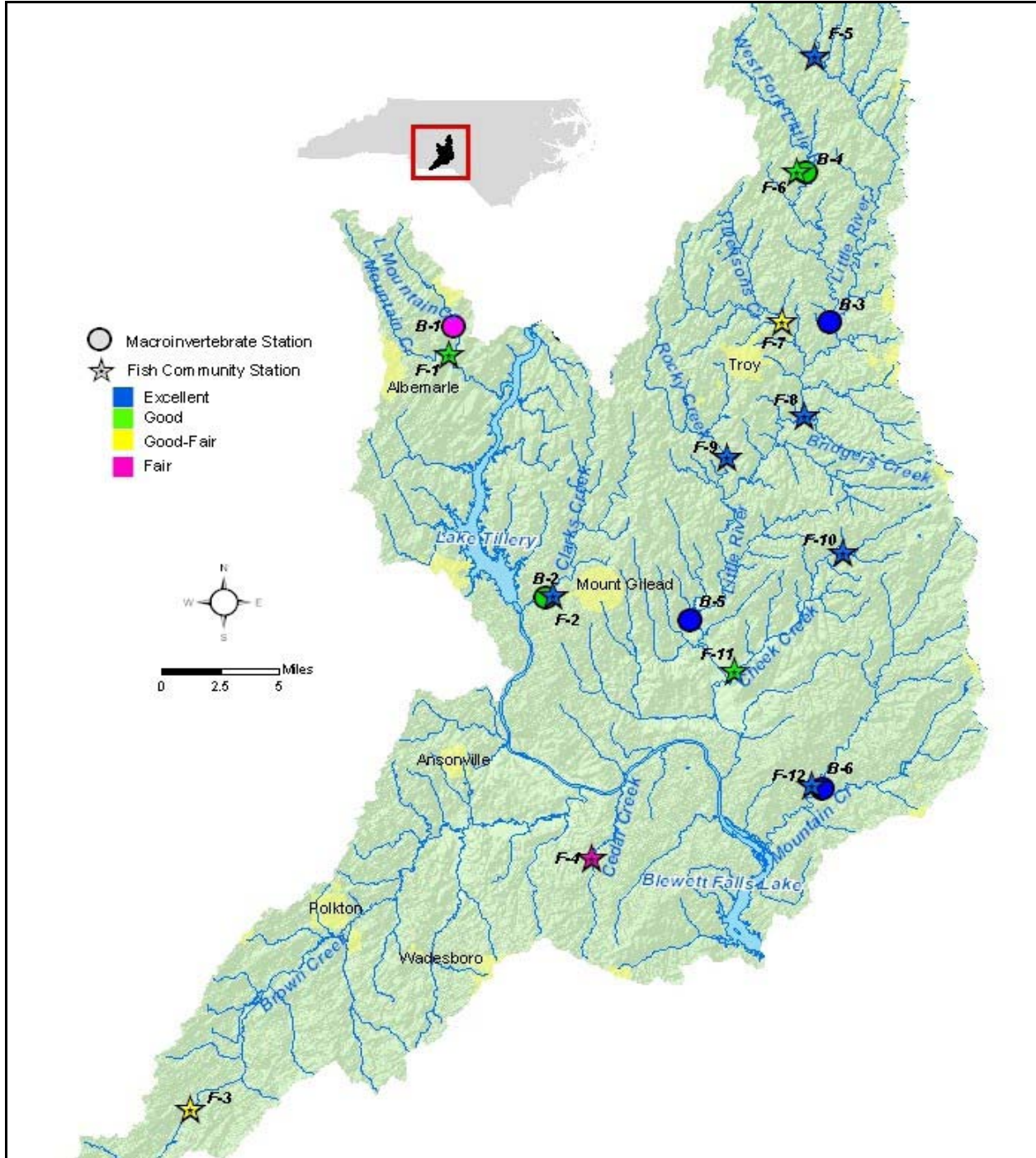


Figure 5. Sampling sites in HUC 03040104 in the Yadkin River basin. Monitoring sites are listed in Table 4.

The Uwharrie River watershed is not included in this HUC. Near this boundary and included in this HUC is the Mountain Creek watershed that flows south of Morrow Mountain and enters the Pee Dee River from the west. This area includes the municipalities of Albemarle (in part) and Norwood. The principle impoundment on the Pee Dee River in this part of the HUC, is Lake Tillery. East and north of this area (formerly subbasin 030715) is the Little River and its tributaries. The Little River itself is a tributary of the Pee Dee River. A large portion of this area of the HUC is located within the Uwharrie National Forest. The land is mostly forested, but with some areas utilized for agriculture and silviculture. The town of Troy is the largest urban area in this northeastern part of HUC 03040104. The Carolina Slate Belt subcoregion dominates the northern part of the HUC. This subcoregion has some of the lowest water yielding geology in the state resulting in the tendency of streams to dry up in summer.

Just south of this area is an approximately 50 mile long and 10 mile wide band of Triassic geology that runs southwest to northeast. Streams in the Triassic subcoregion have low base flows and also tend to stop flowing in summer months. This area consists of the portion of the Pee Dee River and its tributaries from the Rocky River confluence to the dam at Blewett Falls Lake. Land use here is primarily a combination of forest and agriculture with smaller towns like Polkton and Ansonville. The town of Wadesboro is partially contained within this area. Clarks Creek is contained within a narrow portion of Carolina Slate Belt geology that exists in the extreme southeastern part of this HUC.

The Pee Dee River has many permitted dischargers. However, contained within this HUC are less than 10 permitted facilities, none of which are listed as Major dischargers. Several of these are located within watersheds where biological samples were collected for this report. These include Greater Badin WWTP (NC 0074756), discharging up to 0.55 MGD to Little Mountain Creek; Mount Gilead Town WWTP (NC 0021105), 0.85 MGD to Clarks Creek; and Montgomery County WTP (0080322), 0.47 MGD to UT Clarks Creek. Three facilities are located within the Little River Watershed. These are Biscoe Town WWTP (NC 0021504) discharging up to 0.6 MGD to Hickory Branch; Carolina Trace Utilities Inc. (NC 0038831), 0.325 MGD to the Upper Little River; and Troy Town WWTP (NC 0028916), 0.84 MGD to Densons Creek.

One discharger, Ansonville Town WWTP (NC 008125), discharges up to 0.12 MGD directly to the Pee Dee River. Another facility, Stony Gap Fish House (NC 0040801) has ceased discharging up to 0.004 MGD to UT Jacobs Creek before January 2007.

Overview of Water Quality

A total of 18 biological monitoring sites were sampled within HUC 03040104 for basinwide assessment of water quality (Table 4). Of those sites, nine rated Excellent, five Good and two Good-Fair. Two sites were Fair. No sites rated Poor in either 2004 or 2006. The two Fair streams, Little Mountain Creek and Cedar Creek are both affected by naturally low flows typically seen in both Carolina Slate Belt and Triassic Basin ecoregions. Flows in Little Mountain Creek however appear unable to dilute effluent from the upstream Badin WWTP. No anthropogenic influences could be detected that contributed to the naturally low flows at Cedar Creek to cause it to be in an biologically degraded condition.

Water quality in HUC 03040104 appears to be stable between the 2001 to 2006 samplings (Table 4). Of the six benthic sites sampled in 2006, three improved in bioclassification (Little River at NC 731, Mountain Creek at SR 1150 and Clarks Creek at SR 1110); one site declined (West Fork Little River at SR 1311); and two sites remained the same (Little River at SR 1340 and Little Mountain Creek at SR 1720).

There were 12 fish sites sampled in 2006 (or in 2004 as special studies). Compared with the 2001 basinwide sampling effort: four improved in bioclassification (Little River at SR 1127, Bridges Creek at SR 1519, Mountain Creek at SR 1720 and Mountain Creek at SR 1150); three declined (Brown Creek at SR 1230, Cedar Creek at SR 1709 and Cheek Creek at SR 1541); and four remained the same (West Fork Little River at SR 1311, Rocky Creek at SR 1549, Clarks Creek at SR 1110 and Cheek Creek at SR 1563). One site, Densons Creek at SR 1323 was only sampled once (in 2004).

Table 4. Waterbodies monitored in the Yadkin River HUC 03040104 for basinwide assessment, 2001-2006.

Map # ¹	Waterbody	County	Location	2001	2006
B-1	Little Mountain Cr	Stanly	SR 1720	Fair	Fair
B-2	Clarks Cr	Montgomery	SR 1110	Good-Fair	Good
B-3	Little R	Montgomery	SR 1340	Excellent	Excellent
B-4	West Fk Little R	Montgomery	SR 1311	Excellent	Good
B-5	Little R	Montgomery	NC 731	Good	Excellent
B-6	Mountain Cr	Richmond	SR 1150	Good	Excellent
F-1	Mountain Cr	Stanly	SR 1720	Good-Fair	Good (2004)
F-2	Clarks Cr	Montgomery	SR 1188 (SR1110)	Excellent	Excellent (2004)
F-3	Brown Cr	Anson	SR 1230	Good	Good-Fair
F-4	Cedar Cr	Anson	SR 1709	Good-Fair	Fair
F-5	Little R	Randolph	SR 1127	Good	Excellent
F-6	W Fk Little R	Montgomery	SR 1311	Good	Good
F-7	Densons Cr	Montgomery	SR 1323	---	Good-Fair (2004) ²
F-8	Bridgers Cr	Montgomery	SR 1519	Good	Excellent
F-9	Rocky Cr	Montgomery	SR 1549	Excellent	Excellent
F-10	Cheek Cr	Montgomery	SR 1563	Excellent (1999)	Excellent
F-11	Cheek Cr	Montgomery	SR 1541	Excellent	Good
F-12	Mountain Cr	Richmond	SR 1150	Good	Excellent

¹B = benthic macroinvertebrate monitoring sites; F = fish community monitoring sites.

²special study site that has become a basinwide site.

River and Stream Assessment

Mountain Creek (at SR 1720) and Cheek Creek (at SR 1541), benthic sites that were sampled in 2001, were not sampled in 2006. Both streams lacked sufficient flows to enable sampling. In 2001, Mountain Creek rated Good-Fair and Cheek Creek rated Fair. Fish sites that were not sampled in 2006 (or 2004) that were sampled in 2001 included Dumas Creek (at SR 1310) and Hamer Creek (SR 1159). Hamer Creek is within an area of Triassic geology and was not flowing during spring 2006. This site has since been dropped as a basin sampling location. Time restrictions did not permit the sampling of Dumas Creek in 2006.

Specific site summaries of the 6 benthic macroinvertebrate and 12 fish community samples may be found at this link: [03040104](#).

SPECIAL STUDIES

Mountain Creek, Little Mountain Creek and Jacobs Creek, Ecosystem Enhancement Program Study

Three sites were sampled for benthic macroinvertebrates in January 2004 as part of the Memorandum of Agreement between the Division of Water Quality and the North Carolina Ecosystem Enhancement Program in the creation of a Local Watershed Plan for the Mountain Creek planning area.

Bioassessments ranged from Poor to Good-Fair. The benthic communities at all three sites indicate the low flow conditions naturally present in the Slate Belt ecoregion. See memorandum B-040831 for more information.

Lick Creek TMDL

Two benthic sites were sampled in 2003 because Lick Creek was considered impaired from its source to a point one mile upstream of Davidson County SR 2501, not far above the confluence with the Yadkin River. Both sites received a Good-Fair rating. See memorandum B-040212 for more information.

Small Streams Study

One benthic site, Wood Run at SR 1150, was sampled twice in 2005 as part of the Small Streams Study. It rated Not Impaired on both occasions. No memorandum is available for this site.

Fish Community Ecosystem Enhancement Program Study

The instream and riparian habitats, physical and chemical characteristics, and fish communities of Mountain, Little Mountain, and Jacobs Creeks in Stanly County were evaluated by DWQ in 2004 (Biological Assessment Unit Memorandum 20040501). These streams are downstream from the Towns of Badin and Albemarle and near Morrow Mountain State Park. Nonpoint nutrient runoff from pastures and livestock which have access to the streams contributed to slightly elevated conductivities, abundant periphyton, and an abundance of nutrient indicator species and tolerant fish.

Fish Community Urbanization Study

Clarks Creek at SR 1110 and Densons Creek at SR 1323 in Montgomery County were sampled by DWQ in 2004 as part of a North Carolina State University fish community urbanization study (unpublished data). The fish communities were rated Excellent and Good-Fair, respectively.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Mountain Cr	SR 1720	03/22/04	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Stanly	8	03040104	352148	800657	13-5-(0.7)	Carolina Slate Belt

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
WS-IV	14	--	9	0.3	No

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	40	0	40	20 (rural residential)

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	8.5
Dissolved Oxygen (mg/L)	12.0
Specific Conductance (µS/cm)	96
pH (s.u.)	6.8

Water Clarity	Clear
---------------	-------

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	13
Pool Variety (10)	8
Riffle Habitat (16)	15
Left Bank Stability (7)	6
Right Bank Stability (7)	4
Light Penetration (10)	7
Left Riparian Score (5)	3
Right Riparian Score (5)	2
Total Habitat Score (100)	81

Site Photograph



Substrate	Cobble, slate
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
03/22/04	2004-01	16	50	Good
04/17/01	2001-18	15	46	Good-Fair
04/18/96	96-23	13	50	Good

Most Abundant Species	Bluehead Chub	Exotic Species	Green Sunfish
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Species Change Since Last Cycle

Gains -- Highfin Shiner, Flat Bullhead, and Pumpkinseed. **Losses** -- Brassy Jumprock and Redear Sunfish.

Data Analysis

Watershed -- drains semi-rural, east-central Stanly County; tributary to Lake Tillery (Pee Dee River) at Morrow Mountain State Park. **Habitat** -- a typical Carolina Slate Belt type stream; high quality instream habitats; angled bedrock; open canopy at the bridge; open forested riparian zones; water easily silted with periphyton; slick rocks with thick periphyton; bluegreen algal mats on some rocks; livestock with access to the stream causing bank erosion, breaks in the riparian zones, and nutrient enrichment. **2004** -- only 1 species of darter collected; no intolerant species; and percentage of tolerant fish moderately elevated. **1996 - 2004** -- specific conductance has averaged ~ 90 µS/cm; 18 species are known from the site, but no intolerant species and only 1 species of darter present; lack of intolerant species and the low diversity of darters are the result of Lake Tillery serving as a recolonization barrier; dominant species is consistently the Bluehead Chub; 2004 data were summarized in Biological Assessment Unit Memorandum F-20040501.

Benthic Macroinvertebrate Sample

Waterbody	Location	Date	Bioclassification
L MOUNTAIN CR	SR 1720	08/10/06	Fair

County	Subbasin	8 digit HUC	Index Number	Latitude	Longitude
STANLY	8	03040104	13-5-1-(2)	352253	800647

Level IV Ecoregion	Stream Classification	Drainage Area (mi2)	Stream Width (m)	Stream Depth (m)
Carolina Slate Belt	WS-IV	8.5	5	0.1

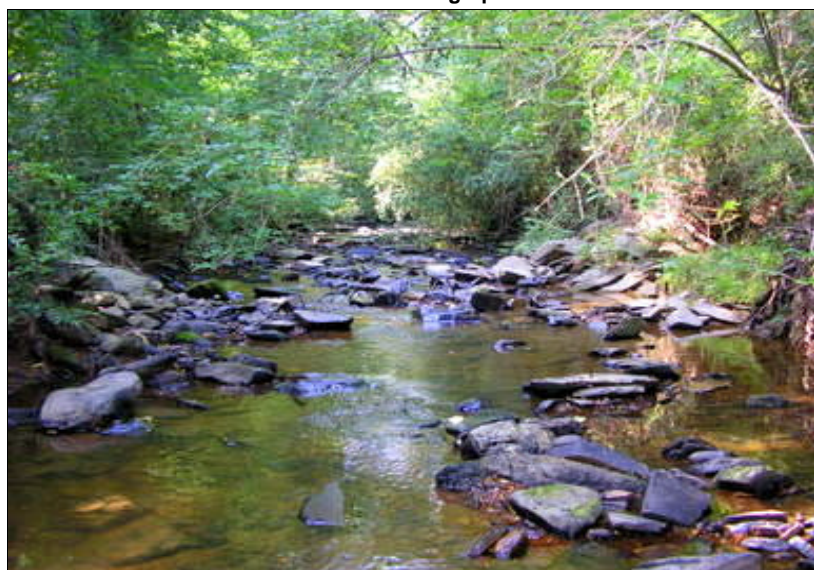
Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	40	60	0	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
none	---	---

Water Quality Parameters

Temperature (°C)	25.5
Dissolved Oxygen (mg/L)	5.3
Specific Conductance (µS/cm)	192
pH (s.u.)	6.6
Water Clarity	slightly turbid

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	14
Bottom Substrate (15)	14
Pool Variety (10)	4
Riffle Habitat (16)	14
Left Bank Stability (7)	5
Right Bank Stability (7)	5
Light Penetration (10)	8
Left Riparian Score (5)	4
Right Riparian Score (5)	3
Total Habitat Score (100)	76

Substrate	boulder, rubble gravel sand
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Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/10/06	10049	53	10	6.2	5.9	Fair
08/08/01	8547	54	12	5.9	5.8	Fair
08/07/96	7130	---	11	---	5.9	Fair

Taxonomic Analysis

The number of EPT taxa collected has remained stable since the first collection in 1996. Though the 2006 collection included two new taxa for this site (intolerant caddisflies *Polycentropus* and *Diplectrona modesta*), these taxa were rare in abundance. One intolerant stonefly (*Eccopectura xanthenes*) was also collected though it too was rare. Abundant taxa at the site (the caddisflies *Cheumatopsyche* and *Hydropsyche betteni*, the omnipresent mayfly *Maccaffertium modestum* and the snail *Elimia*) were highly tolerant with the exception of intolerant *Elimia*. A midge, *Dicrotendipes noemodestus*, a species indicative of organic enrichment, was present in abundance.

Data Analysis

Approximately 1.5 miles downstream of the Badin WWTP, Little Mountain Creek exhibits the intermittent flow characteristic of slate belt streams. Low flows during the summer months fail to dilute the the effluent from the WWTP resulting in elevated specific conductance. An increase in the EPT BI is most likely due to lower abundances of EPT collected in 2006 as compared to 2001 (43 and 70, respectively). It is probable that low flows and organic enrichment are prohibiting an improvement in water quality as habitat was not restrictive.

Benthic Macroinvertebrate Sample

Waterbody	Location	Date	Bioclassification
Clarks Creek	SR 1110	08/22/06	Good

County	Subbasin	8 digit HUC	Index Number	Latitude	Longitude
Montgomery	10	03040104	13-16	351236	800230

Level IV Ecoregion	Stream Classification	Drainage Area (mi2)	Stream Width (m)	Stream Depth (m)
Carolina Slate Belt	C	30.7	3	0.2

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	90	10	0	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
none	---	---

Water Quality Parameters

Temperature (°C)	25.6
Dissolved Oxygen (mg/L)	8.1
Specific Conductance (µS/cm)	86
pH (s.u.)	6.9
Water Clarity	slightly turbid

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	15
Bottom Substrate (15)	12
Pool Variety (10)	7
Riffle Habitat (16)	14
Left Bank Stability (7)	3
Right Bank Stability (7)	6
Light Penetration (10)	9
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	81

Substrate	Rubble, boulder, gravel, bedrock
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Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/22/06	10081	NA	21	NA	4.3	Good
08/08/01	8549	NA	18	NA	4.9	Good-Fair
08/07/96	7132	82	26	5.8	5.2	Good-Fair

Taxonomic Analysis

This site has been sample twice using EPT methodology (2001 and 2006). The 2006 collection resulted in two previously uncollected (at this location) intolerant mayfly taxa (*Habrophlebiodes sp.* and *Habrophlebia vibrans*) as well as one new intolerant caddisfly record (*Pycnopsyche sp.*).

Data Analysis

The first time addition of several intolerant mayfly and caddisfly taxa at this location resulted in an improved Good bioclassification for 2006. However, the minimum EPT needed for a Good bioclassification for a Piedmont stream is 21. As a result, the 2006 Good bioclassification was borderline. Indeed, the EPTN was identical (91) from 2001 to 2006. These data suggest stable conditions upstream of this stream segment. Currently, the most important influence on this slate belt system is likely related to low summer flows.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Clarks Cr	SR 1110	06/24/04	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Montgomery	10	03040104	351234	800230	13-16	Carolina Slate Belt

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	32.6	--	7	0.3	Yes

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	75	0	0	25 (rural residential)

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	24.3
Dissolved Oxygen (mg/L)	6.8
Specific Conductance (µS/cm)	62
pH (s.u.)	--
Water Clarity	Slightly tannin stained

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	12
Pool Variety (10)	8
Riffle Habitat (16)	16
Left Bank Stability (7)	5
Right Bank Stability (7)	5
Light Penetration (10)	7
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	86

Substrate	Cobble, bedrock
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
06/24/04	2004-107	25	54	Excellent
04/12/01	2001-14	19	54	Excellent

Most Abundant Species	Bluehead Chub	Exotic Species	Green Sunfish, Redear Sunfish, and Yellow Perch.
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Species Change Since Last Cycle
Gains -- Coastal Shiner, Yellow Bullhead, Flat Bullhead, Speckled Killifish, Pumpkinseed, Warmouth, Bluegill, Redear Sunfish, sunfish hybrid, and Largemouth Bass. **Losses** -- Creek Chub, Rosyside Dace, Satinfish Shiner, Notchlip Redhorse, and Brassy Jumprock.

Data Analysis

Watershed -- drains southwestern Montgomery County, including the western area of the Town of Mount Gilead; site is ~ 1.2 miles below site sampled in 2001 (difference in drainage area is 6.6 square miles); tributary to Pee Dee River immediately below Lake Tillery, site is ~ 1.5 miles from the creek's mouth. **Habitat** -- a typical Carolina Slate Belt type streams; riffles (good short and long shallow riffles), runs, pools, snags, and deadfalls. **2004** -- seven species of sunfish collected; moderately elevated percentage of omnivores+herbivores; sampled as part of a NCSU Urban Fish Study. **2001 and 204** -- 29 species known from the creek, including 3 species of darters, 4 species of suckers, and 7 species of sunfish; increase in the percentage of omnivores+herbivores in 2004 and decrease in the percentage of insectivores; site qualifies as High Quality Waters if so petitioned.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Brown Cr	SR 1230	04/12/06	Good-Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Anson	10	03040104	345252	801806	13-20	Triassic Basins

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	25.2	--	6	0.3	No

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	60	0	40	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	14.0
Dissolved Oxygen (mg/L)	7.8
Specific Conductance (µS/cm)	126
pH (s.u.)	6.1

Water Clarity	Slightly turbid, tannin stained
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Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	14
Bottom Substrate (15)	6
Pool Variety (10)	7
Riffle Habitat (16)	4
Left Bank Stability (7)	2
Right Bank Stability (7)	2
Light Penetration (10)	9
Left Riparian Score (5)	5
Right Riparian Score (5)	4
Total Habitat Score (100)	58

Substrate	Sand, cobble, clay, gravel
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
04/12/06	2006-14	18	44	Good-Fair
04/10/01	2001-09	20	52	Good
04/16/96	96-16	17	50	Good

Most Abundant Species	Bluegill	Exotic Species	Green Sunfish and Redear Sunfish
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Species Change Since Last Cycle
Losses -- Bowfin, Creek Chubsucker, Black Bullhead, Eastern Mosquitofish, Mud Sunfish, and Black Crappie. **Gains** -- Rosyside Dace, Bluehead Chub (first record for Brown Creek watershed), Yellow Bullhead, and Swamp Darter.

Data Analysis

Watershed -- originates in Chesterfield County, SC, flows through the southeastern corner of Union County into southwestern Anson County; site is in the upper part of the watershed and borders the Carolina Slate Belt and Sand Hills. Habitat -- snags; a couple of shallow riffles (a function of low flow); side pools; unstable banks. Specific conductance elevated (low flow effect?); has steadily increased from 92 to 102 to 126 µS/cm since 1996; no NPDES facilities in watershed. **2006** -- lowest percentage of species with multiple age classes of any fish site, 9 of 18 species with only 1 or 2 fish/species; number of fish declined substantially; no suckers, no intolerant species. **1996 - 2006** -- a species rich site (n = 25), including 9 species of sunfish, but no intolerant species; dominant species include Pirate Perch, Whitemouth Shiner, Bluegill, Redbreast Sunfish, and Carolina Darter. Carolina Darter, a species of Special Concern, consistently collected. Low flow affected stream.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Cedar Cr	SR 1709	04/10/06	Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Anson	10	3040104	350237	800020	13-21	Triassic Basins

Stream	Classification	Drainage Area (mi2)	Elevation (ft)	Stream (m)	Width	Average (m)	Depth	Reference Site
C		8.6	--	4		0.2		Yes

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	100	0	0	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	16.4
Dissolved Oxygen (mg/L)	9.3
Specific Conductance (µS/cm)	125
pH (s.u.)	6.0
Water Clarity	Clear

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	12
Bottom Substrate (15)	6
Pool Variety (10)	6
Riffle Habitat (16)	14
Left Bank Stability (7)	5
Right Bank Stability (7)	5
Light Penetration (10)	9
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	72

Substrate Sand, gravel, cobble, woody debris

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
04/10/06	2006-07	10	36	Fair
04/10/01	2001-07	12	46	Good-Fair
06/10/96	96-67	12	40	Fair

Most Abundant Species Creek Chub **Exotic Species** Green Sunfish

Species Change Since Last Cycle Losses -- Redlip Shiner and Yellow Bullhead. Gains -- none.

Data Analysis

Watershed -- small, rural drainage area in northeastern Anson County, northeast of the Town of Wadesboro; no municipalities; tributary to the Pee Dee River; stream may go intermittent during low flow periods; borders the Carolina Slate Belt. **Habitat** -- very shallow and sandy runs; gravel and cobble riffles; snags; loss of habitats due to low flow. **2006** -- specific conductance elevated (low flow effect?); decrease in the number of species and a substantial decline in the number of fish from 472 and 484 in 1996 and 2001 to 119 in 2006; increase in the percentage of tolerant fish; Redlip Shiner declined from 112 in 2001 to 0 in 2006. **1996 - 2006** -- specific conductance has steadily increased from 85 to 107 to 125 µS/cm since 1996, no NPDES facilities in watershed; habitat scores average ~ 70; total species at site = 12, but no intolerant species or piscivores; reproduction usually good. Low flow affected stream.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Little R	SR 1127	05/08/06	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Randolph	15	03040104	353322	795043	13-25-(1)	Carolina Slate Belt

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	24.7	--	12	0.4	No

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	100	0	0	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	14.3
Dissolved Oxygen (mg/L)	9.0
Specific Conductance (µS/cm)	71
pH (s.u.)	6.4

Water Clarity	Very slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	14
Pool Variety (10)	9
Riffle Habitat (16)	16
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	7
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	94

Site Photograph



Substrate	Cobble, boulder, slick rocks
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/08/06	2006-33	19	56	Excellent
04/14/99	99-12	14	52	Good

Most Abundant Species	Bluehead Chub and Redlip Shiner	Exotic Species	Redear Sunfish
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Species Change Since Last Cycle	Losses -- Sandbar Shiner. Gains -- Rosyside Dace, Creek Chub, Creek Chubsucker, Snail Bullhead, Warmouth, and Redear Sunfish.
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Data Analysis

Watershed -- drains southern Randolph County, south of the City of Asheboro; headwaters in Asheboro near the intersection of US 49/64/220. **Habitat** -- very high quality (3rd greatest in 2006 of any fish site); a typical Carolina Slate Belt type stream (riffles, runs, pools, undercut banks, root mats, boulder pools); great riparian zones. **2006** -- diverse and overall abundant, but 8 of 19 species represented by only 1 or 2 fish per species; decrease in the number of fish from 1999, but increase in the diversity of suckers; slightly less dominance by Bluehead Chub than in 1999. **1999 and 2006** -- 20 species known from site; dominant species both years were Bluehead Chub and Redlip Shiner.

Benthic Macroinvertebrate Sample

Waterbody	Location	Date	Bioclassification
Little River	SR 1340	08/24/06	Excellent

County	Subbasin	8 digit HUC	Index Number	Latitude	Longitude
Montgomery	15	03040104	13-25-(11.5)	352311	794956

Level IV Ecoregion	Stream Classification	Drainage Area (mi2)	Stream Width (m)	Stream Depth (m)
Carolina Slate Belt	C, HQW	105.5	20	0.3

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	100	0	0	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
none	---	---

Water Quality Parameters

Temperature (°C)	24.2
Dissolved Oxygen (mg/L)	6.7
Specific Conductance (µS/cm)	80
pH (s.u.)	6.8
Water Clarity	clear

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	16
Bottom Substrate (15)	10
Pool Variety (10)	4
Riffle Habitat (16)	9
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	7
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	74

Substrate	Bedrock, rubble, boulder, gravel, sand
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Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/24/06	10085	105	34	5.1	3.8	Excellent
08/13/01	8581	93	30	4.6	3.4	Excellent
08/22/96	7198	98	39	5.1	3.9	Excellent
07/15/88	4613	106	40	4.8	3.7	Excellent
07/31/85	3611	104	40	4.3	3.6	Excellent

Taxonomic Analysis

EPT and overall taxa richness have been remarkably consistent at this location for the last 20 years. Nevertheless, several new EPT taxa were collected in 2006 and included the burrowing mayfly *Ephemera sp.*, the stonefly *Acroneuria arenosa*, and the caddisflies *Micrasema wataga*, and *Helicopsyche borealis*.

Data Analysis

Nearly every community metric at this station has remained stable since sampling started 20 years ago. These data demonstrate stable and favorable water quality in the Little River watershed upstream of this location.

Benthic Macroinvertebrate Sample

Waterbody	Location	Date	Bioclassification
Little River	NC 731	08/23/06	Excellent

County	Subbasin	8 digit HUC	Index Number	Latitude	Longitude
Montgomery	15	03040104	13-25-(19)	351147	795605

Level IV Ecoregion	Stream Classification	Drainage Area (mi2)	Stream Width (m)	Stream Depth (m)
Triassic Basins	C, HQW	252	25	0.3

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	100	0	0	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
none	---	---

Water Quality Parameters

Temperature (°C)	26.5
Dissolved Oxygen (mg/L)	9
Specific Conductance (µS/cm)	78
pH (s.u.)	6.5
Water Clarity	clear

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	17
Bottom Substrate (15)	11
Pool Variety (10)	4
Riffle Habitat (16)	9
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	7
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	76

Substrate	Gravel, sand, rubble, silt
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Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/23/06	10082	85	31	4.7	4	Excellent
08/15/01	8589	72	29	5	4.3	Good
08/21/96	7196	76	29	5.3	4.2	Good

Taxonomic Analysis

The 2006 sample produced both the highest EPT taxa richness and total taxa richness values ever measured at this station. New, intolerant EPT taxa for this location included the mayfly *Stenonema lenati*, the stoneflies *Paragnetina sp.*, *Acroneuria arenosa*, and the caddisflies *Agapetus sp.*, *Hydropsyche incommoda*, and *Psychomyia flavida*. In addition, the number of pollution tolerant oligochaetes have decreased from three in 1996 to only one in 2006. These data suggest slightly improved conditions in this portion of the Little River watershed.

Data Analysis

Every community metric has exhibited gradual improvement since sampling was initiated at this site in 1996. In addition, the EPTN has increased from 106 (1996), to 118 (2001), to 164 in 2006. These data suggest improving conditions along this segment of the Little River.

Benthic Macroinvertebrate Sample

Waterbody	Location	Date	Bioclassification
West Fork Little River	SR 1311	08/24/06	Good

County	Subbasin	8 digit HUC	Index Number	Latitude	Longitude
Montgomery	15	03040104	13-25-15	352855	795103

Level IV Ecoregion	Stream Classification	Drainage Area (mi2)	Stream Width (m)	Stream Depth (m)
Carolina Slate Belt	C	19.4	5	0.3

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	100	0	0	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
none	---	---

Water Quality Parameters

Temperature (°C)	23.9
Dissolved Oxygen (mg/L)	4.9
Specific Conductance (µS/cm)	72
pH (s.u.)	6.6
Water Clarity	clear

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	15
Bottom Substrate (15)	13
Pool Variety (10)	9
Riffle Habitat (16)	10
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	9
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	82

Substrate	Rubble, bedrock, boulder, gravel
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Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/24/06	10086	NA	26	NA	4	Good
08/13/01	8580	38	26	4.2	4	Excellent
08/22/96	7199	NA	30	NA	4	Excellent

Taxonomic Analysis

Although the 2006 sample decreased to a Good bioclassification, the EPT taxa richness has been quite stable since 1996. Nevertheless, a new intolerant mayfly taxa (*Habrophlebiodes sp.*) was collected (at this site) for the first time as was the intolerant caddisfly (*Psilotreta frontalis*). In addition, the long lived, intolerant stonefly *Acroneuria abnormis* was common here in 2006 and has either been common or abundant from each of the previous samples. These data suggest, that despite the lowered bioclassification in 2006, the West Fork Little River catchment remains stable.

Data Analysis

Although the bioclassification was down in 2006, the EPT sample produced the same number of EPT taxa as did the more intensive (Full-Scale) sample from 2001 and was only two EPT taxa short of receiving an Excellent bioclassification. In addition, the EPTBI has been identical from each of the three sample efforts. Also, the EPTN in 2006 (132) was higher than that measured in 1996 (113) and was down just slightly (most likely the result of the more intense Full-Scale sample) from the 143 measured in 2001. These data suggest stable conditions in this stream segment.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
W Fk Little R	SR 1311	05/09/06	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Montgomery	15	3040104	352855	795101	13-25-15	Carolina Slate Belt

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	19	--	9	0.4	Yes

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	90	0	10	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	13.7
Dissolved Oxygen (mg/L)	9.4
Specific Conductance (µS/cm)	56
pH (s.u.)	6.3

Water Clarity	Very slightly turbid
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Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	15
Pool Variety (10)	10
Riffle Habitat (16)	16
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	8
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	97

Substrate	Cobble, boulder
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/09/06	2006-34	19	52	Good
04/17/01	2001-20	16	52	Good
04/23/96	96-30	14	56	Excellent

Most Abundant Species	Bluehead Chub and Redlip Shiner	Exotic Species	None
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Species Change Since Last Cycle	Losses -- Whitemouth Shiner and White Sucker. Gains -- Golden Shiner, Creek Chub, Flat Bullhead, Chain Pickerel, and Eastern Mosquitofish.
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Data Analysis

Watershed -- drains rural northeastern Montgomery and southwestern Randolph counties; no municipalities. **Habitat** -- very high quality habitats (greatest score of any fish site in 2006); a typical Carolina Slate Belt stream; high gradient riffles; plunge pools; great riparian. **2006** -- diverse and very abundant (n = 1,131), but only 1 species of sunfish; open canopy at new bridge and some nutrients contributed to dominance by Bluehead Chub (38% of all fish collected). **1996 - 2006** -- 23 species known from site, but only 1 native species of sunfish, Pumpkinseed and Bluegill not collected at the site and Green Sunfish not collected since 1996; dominant species have been Bluehead Chub and Redlip Shiner; Bluehead Chub dominance has increased from 13 to 29 to 38% since 1996, may signify increase in nonpoint nutrient sources.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Densons Cr	SR 1323	07/27/04	Good-Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Montgomery	15	03040104	352313	795206	13-25-20-(9)	Carolina Slate Belt

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	30.2	--	7	0.3	Yes

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	100	0	0	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	25.9
Dissolved Oxygen (mg/L)	6.0
Specific Conductance (µS/cm)	55
pH (s.u.)	6.0

Water Clarity	Slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	12
Pool Variety (10)	9
Riffle Habitat (16)	12
Left Bank Stability (7)	5
Right Bank Stability (7)	5
Light Penetration (10)	7
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	83

Site Photograph



Substrate	Cobble, boulder, bedrock
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
07/27/04	2004-137	20	44	Good-Fair

Most Abundant Species	Redbreast Sunfish	Exotic Species	Green Sunfish
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Species Change Since Last Cycle	N/A; new site in 2004.
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Data Analysis

Watershed -- drains rural, central/north-central Montgomery County, north of the Town of Troy; site is above an old breached dam and ~1,000 ft. below the Town of Troy Reservoir dam; riparian zone is part of the Town of Troy's protected buffer corridor funded through the Clean Water Management Trust Fund. **Habitat** -- a typical Carolina Slate Belt type stream (very rocky with good instream and riparian habitats); riffles, side snags, deadfalls, angular rock; low flow; stream became very turbid when walking in the channel. **2004** -- high percentage of tolerant fish present (Flat Bullhead, Eastern Mosquitofish, Redbreast Sunfish and Green Sunfish); suckers absent, represented by only young-of-year (Creek Chubsucker, White Sucker, Brassy Jumprock, and Spotted Sucker); three other species also represented solely by young-of-year (Golden Shiner, Whitemouth Shiner, and Black Crappie); stream probably went dry during 2002 drought; sampled as part of a NCSU Urban Fish Study. Carolina Darter, a species of Special Concern, was collected. A low flow affected stream.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Bridgers Cr	SR 1519	04/26/06	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Montgomery	15	3040104	351937	795101	13-25-24	Carolina Slate Belt

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C,HQW	7.3	--	6	0.3	Yes

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	60	0	35	5 -- residential

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	19.4
Dissolved Oxygen (mg/L)	8.9
Specific Conductance (µS/cm)	74
pH (s.u.)	5.8

Water Clarity	Clear
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Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	15
Pool Variety (10)	7
Riffle Habitat (16)	14
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	8
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	91

Substrate	Cobble, boulder, gravel
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
04/26/06	2006-28	15	54	Excellent
04/22/96	96-27	17	52	Good

Most Abundant Species	Highfin Shiner	Exotic Species	Green Sunfish
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Species Change Since Last Cycle	Losses -- Brassy Jumprock, Warmouth, and Largemouth Bass. Gains -- Creek Chub and Green Sunfish.
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Data Analysis

Watershed -- drains a small, rural area in east-central Montgomery County; no municipalities; tributary to the Little River; stream may go dry during low flow periods. **Habitat** -- a typical Carolina Slate Belt type stream; good riparian zones; riffles; shallow pools; undercuts; water clear, but stained. **2006** -- no intolerant species; slight increase in the number of fish and in the percentage of species with multiple age classes. **1996 and 2006** -- total number of species = 19, but no intolerant species, maybe related to flow and size of stream, Fieryblack Shiner, Highback Chub, and Piedmont Darter may not inhabit very small Carolina Slate Belt streams; Carolina Darter, a species of Special Concern, collected both years.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Rocky Cr	SR 1549	05/09/06	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Montgomery	15	3040104	351800	795429	13-25-30-(0.5)	Carolina Slate Belt

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C,HQW	24.6	0	8	0.4	Yes

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	50	0	0	50 -- rural residential

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	14.1
Dissolved Oxygen (mg/L)	10.0
Specific Conductance (µS/cm)	47
pH (s.u.)	6.5

Water Clarity	Slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	14
Bottom Substrate (15)	8
Pool Variety (10)	9
Riffle Habitat (16)	7
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	7
Left Riparian Score (5)	5
Right Riparian Score (5)	3
Total Habitat Score (100)	70

Site Photograph



Substrate	Cobble, boulder, sand, silt
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/09/06	2006-36	15	54	Excellent
04/17/01	2001-19	18	54	Excellent

Most Abundant Species	Redlip Shiner	Exotic Species	Green Sunfish
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Species Change Since Last Cycle	Losses -- Whitemouth Shiner, Fathead Minnow, Creek Chubsucker, Spotted Sucker, Flat Bullhead, and Piedmont Darter. Gains -- Creek Chub, Green Sunfish, and Largemouth Bass.
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Data Analysis

Watershed -- drains rural central Montgomery County; one tributary (Warner Creek) drains the Town of Troy; tributary to the Little River. Habitat -- three shallow riffles; *Podostemum*; runs, side snags, undercuts, poor quality (Chinese privet) riparian zones. **2006** -- decline in the number of fish; diversity of suckers and darters slightly lower than expected. **2001 and 2006** -- consistent percentages and dominance by Redlip Shiner and Bluehead Chub; 21 species known from site; no change in NCIBI scores or ratings.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Cheek Cr	SR 1563	04/26/06	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Montgomery	15	3040104	351424	794914	13-25-36	Carolina Slate Belt/Triassic Basins

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	10	--	5	0.3	Yes

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	100	0	0	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	18.6
Dissolved Oxygen (mg/L)	7.1
Specific Conductance (µS/cm)	77
pH (s.u.)	6.1

Site Photograph



Water Clarity	Slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	16
Bottom Substrate (15)	10
Pool Variety (10)	8
Riffle Habitat (16)	12
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	10
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	83

Substrate	Cobble, gravel, sand
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
04/26/06	2006-27	17	58	Excellent
10/26/99	99-72	18	56	Excellent
06/15/99	99-48	18	56	Excellent
04/13/99	99-09	16	58	Excellent
09/21/98	98-70	14	58	Excellent

Most Abundant Species	Bluehead Chub and Redlip Shiner
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Exotic Species	Green Sunfish (collected for first time in 2006 from the watershed)
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Species Change Since Last Cycle	Losses -- Whitemouth Shiner, Brassy Jumrock, and Redear Sunfish. Gains -- Flat Bullhead and Green Sunfish.
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Data Analysis

Watershed -- drains a small, rural area in southeastern Montgomery County; no municipalities; timbered watershed; tributary to the Little River. **Habitat** -- a typical Carolina Slate Belt type stream (shallow riffles, pools, snags, and undercuts); riparian zones bordered by NCWRC Gamelands and USFS Uwharrie National Forest. **2006** -- Brassy Jumrock not collected, had been present in all previous collections. **1998 - 2006** -- consistently high total habitat scores, average = 88; specific conductance averages ~ 75 µS/cm; for its size, an abundant and diverse community, 20 species known from site; dominant species include Bluehead Chub, Redlip Shiner, Highback Chub, and Redbreast Sunfish; Special studies conducted in 1998 and 1999. Qualifies as High Quality Waters with Excellent ratings and habitats, if so petitioned.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Cheek Cr	SR 1541	04/26/06	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Montgomery	15	3040104	350950	795402	13-25-36	Carolina Slate Belt/Triassic Basins

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	32.3	0	7	0.3	No

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	95	0	5	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	19.8
Dissolved Oxygen (mg/L)	6.3
Specific Conductance (µS/cm)	110
pH (s.u.)	6.0

Water Clarity	Slightly turbid
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Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	14
Bottom Substrate (15)	4
Pool Variety (10)	7
Riffle Habitat (16)	4
Left Bank Stability (7)	3
Right Bank Stability (7)	3
Light Penetration (10)	9
Left Riparian Score (5)	4
Right Riparian Score (5)	5
Total Habitat Score (100)	58

Substrate	Gravel, sand, boulder, bedrock
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
04/26/06	2006-26	21	50	Good
04/23/96	96-29	19	54	Excellent

Most Abundant Species	Tessellated Darter, Redbreast Sunfish, and Green Sunfish	Exotic Species	Comely Shiner and Green Sunfish (both collected for the first time in 2006 from the watershed).
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Species Change Since Last Cycle	Losses -- American Eel, Rosyside Dace, Highback Chub, Highfin Shiner, and Brassy Jumrock. Gains -- Whitemouth Shiner, Comely Shiner, Yellow Bullhead, Eastern Mosquitofish, Green Sunfish, Bluegill, and Largemouth Bass.
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Data Analysis

Watershed -- drains rural southeastern Montgomery County; no municipalities, timbered and agricultural watershed; 3X larger than upper site on Cheek Creek; site is 0.5 mi. above confluence with the Little River. **Habitat** -- entrenched; good forested bluff on right; bare and unstable vertical banks; large trees as deadfalls; low flow conditions. Specific conductance doubled between 1996 and 2006 (55 vs. 110 µS/cm, respectively). **2006** -- high diversity, but low abundance; high percentage of tolerant fish, Green Sunfish abundance equal to that of the Redbreast Sunfish. **1996 and 2006** -- 26 species known from site; Tessellated Darter the dominant species, Bluehead Chub and Redbreast Sunfish also abundant; percentage of tolerant fish increased from 19 to 44% due to abundance of Green Sunfish; Fantail Darter not known from watershed.

Benthic Macroinvertebrate Sample

Waterbody	Location	Date	Bioclassification
Mountain Creek	SR 1150	08/21/06	Excellent

County	Subbasin	8 digit HUC	Index Number	Latitude	Longitude
Richmond	10	03040104	13-28-(4)	350521	795007

Level IV Ecoregion	Stream Classification	Drainage Area (mi2)	Stream Width (m)	Stream Depth (m)
Carolina Slate Belt	WS-IV, CA	64	11	0.3

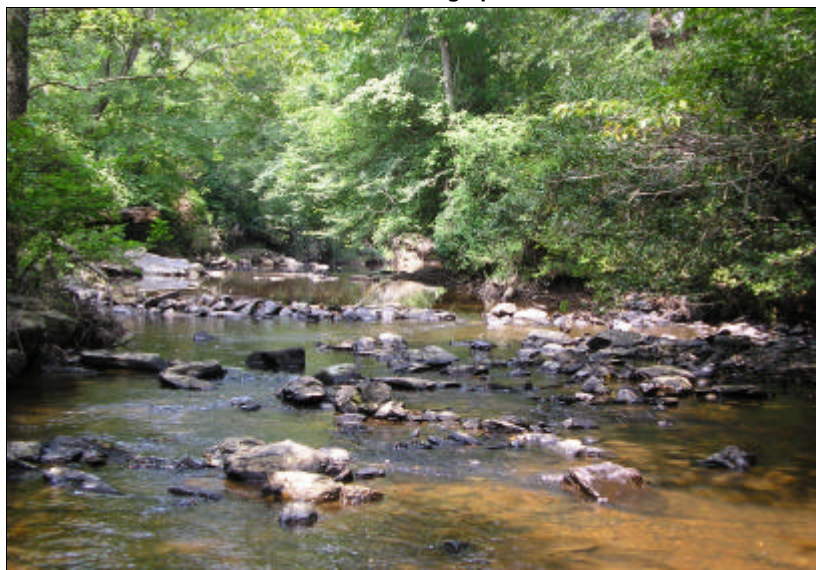
Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	90	0	0	10-Road

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
none	---	---

Water Quality Parameters

Temperature (°C)	24.7
Dissolved Oxygen (mg/L)	7.5
Specific Conductance (µS/cm)	88
pH (s.u.)	6.7
Water Clarity	slightly turbid

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	17
Bottom Substrate (15)	12
Pool Variety (10)	5
Riffle Habitat (16)	13
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	9
Left Riparian Score (5)	2
Right Riparian Score (5)	5
Total Habitat Score (100)	79

Substrate Rubble, Gravel, Sand, Boulder, Bedrock, and Silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/21/06	10076	NA	32	NA	4	Excellent
08/15/01	8588	NA	25	NA	3.7	Good
08/21/96	7194	NA	30	NA	3.9	Excellent

Taxonomic Analysis

The 2006 sample produced the highest EPT richness ever measured at this location and taxa collected for the first time included the mayflies (*Plauditus punctiventris*, *Baetis flavistriga*, *Habrophlebiodes sp.*, *Plauditus dubius*, *Proclleon sp.*) and the stonefly, *Acroneuria arenosa*.

Data Analysis

In addition to producing the highest EPT richness, the 2006 sample also produced the highest EPTN (149) measured at this location. With the exception of the 2001 sample, this segment of Mountain Creek has maintained a very stable EPT richness. While EPT taxa richness declined in 2001, the EPTBI and EPTN remained similar to values measured from the 1996 sample and was only three EPT taxa short of an Excellent rating. Overall, these data suggest favorable and stable water quality in the Mountain Creek catchment.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Bioclassification
Mountain Cr	SR 1150	04/25/06	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	Index Number	Level IV Ecoregion
Richmond	10	3040104	350519	795007	13-28-(0.5)	Carolina Slate Belt

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
WS-IV	65.1	--	12	0.4	No

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	90	0	0	10 road, SR 1150

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
None	---	---

Water Quality Parameters

Temperature (°C)	26.0
Dissolved Oxygen (mg/L)	8.4
Specific Conductance (µS/cm)	62
pH (s.u.)	6.2

Water Clarity	Clear, slightly stained
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Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	12
Pool Variety (10)	10
Riffle Habitat (16)	7
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	7
Left Riparian Score (5)	4
Right Riparian Score (5)	5
Total Habitat Score (100)	80

Substrate	Cobble, gravel, sand, bedrock, boulder outcrops
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
04/25/06	2006-25	20	56	Excellent
04/15/96	96-12	16	52	Good

Most Abundant Species	Redlip Shiner	Exotic Species	Roanoke Bass (collected for the first time from the watershed in 2006; 161 and 180 mm total length).
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Species Change Since Last Cycle	Losses -- Fieryblack Shiner, Brassy Jumprock, and Pirate Perch. Gains -- Rosyside Dace, Dusky Shiner, Coastal Shiner, Sandbar Shiner, Creek Chub, Flat Bullhead, and Roanoke Bass.
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Data Analysis

Watershed -- drains rural, north-northwestern region of Richmond County; the Town of Ellerbee drains into Little Mountain Creek; tributary to Blewett Falls Reservoir. **Habitat** -- a typical Carolina Slate Belt type stream; some good deep, rocky pools. **2006** -- high diversity and abundance; Redlip Shiner very abundant. **1996 and 2006** -- 23 species known from site; substantially more species and fish in 2006 than in 1996, especially numbers of Bluehead Chub, Redlip Shiner, Redbreast Sunfish, Fantail Darter, and Tessellated Darter.