Appendix 2-A

Use Support Ratings for all Monitored Waters In the South Fork New River & Fox Creek Watersheds

Draft 2010 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	All designated uses are monitored and supporting
1b	Designated use was impaired, other management strategy in place and no standards violations for the parameter of interest (POI)
1nc	DWQ have made field determination that parameter in exceedance is due to natural conditions
1r	Assessed as supporting watershed is in restoration effort status
1t	No criteria exceeded but approved TMDL for parameter of interest
2	Some designated uses are monitored and supporting none are impaired Overall only
2b	Designated use was impaired other management strategy in place and no standards violations Overall only
2r	Assessed as supporting watershed is in restoration effort status overall only
2t	No criteria exceeded but approved TMDL for POI Overall only
3a	Instream/monitoring data are inconclusive (DI)
3b	No Data available for assessment
3c	No data or information to make assessment
3n1	Chlorophyll a exceeds TL value and SAC is met-draft
3n2	Chlorophyll a exceeds EL value and SAC is not met first priority for further monitoring-draft
3n3	Chlorophyll a exceeds threshold value and SAC is not met first second priority for further monitoring-draft
3n4	Chlorophyll a not available determine need to collect-draft
3t	No Data available for assessment –AU is in a watershed with an approved TMDL
4b	Designated use impaired other management strategy expected to address impairment
4c	Designated use impaired by something other than pollutant
4cr	Recreation use impaired no instream monitoring data or screening criteria exceeded
4cs	Shellfish harvesting impaired no instream monitoring data-no longer used
4ct	Designated use impaired but water is subject to approved TMDL or under TMDL development
4s	Impaired Aquatic Life with approved TMDL for Aquatic Life POI or category 5 listing
4t	Designated use impaired approved TMDL
5	Designated use impaired because of biological or ambient water quality standards violations and needing a TMDL
5r	Assessed as impaired watershed is in restoration effort status

NC 2010 Integrated Report

All 13,123 Waters in NC are in Category 5-303(d) List for Mercury due to statewide fish consumption advice for several fish species

AU_Number	AU_Name	AU_Description	LengthArea	AU_Units	Classification
Category	Parameter	Reason for Rating	Use Category	Collection Year	303(d)year

New River Basin — North Fork New River Watershed 0505000101

10-2-21-8-1	Middle Fork Little Horse Creek	From source to Little Horse Creek	4.5	FW Miles	C;Tr:+
1	Ecological/biological Integrity Benthos	Excellent Bioclassification	Aquatic Life	2008	
10-2-28	Millpond Branch	From source to North Fork New River	2.0	FW Miles	C:+
1	Ecological/biological Integrity Benthos	Excellent Bioclassification	Aquatic Life	2003	
10-2-(1)	North Fork New River	From source to Three Top Creek	14.1	FW Miles	C;Tr:+
1	Ecological/biological Integrity Benthos	Excellent Bioclassification	Aquatic Life	2008	
1	Ecological/biological Integrity FishCom	Good Bioclassification	Aquatic Life	2008	
10-2-(12)	North Fork New River	From Three Top Creek to New River	36.5	FW Miles	C:+
1	Ecological/biological Integrity Benthos	Excellent Bioclassification	Aquatic Life	2008	
1	Fecal Coliform (recreation)	No Criteria Exceeded	Recreation	2008	
1	Water Quality Standards Aquatic Life	No Criteria Exceeded	Aquatic Life	2008	
10-2-15	Rich Hill Creek	From source to North Fork New River	4.9	FW Miles	C;Tr:+
1	Ecological/biological Integrity Benthos	Excellent Bioclassification	Aquatic Life	2008	
10-2-10	Roundabout Creek	From source to North Fork New River	4.0	FW Miles	C;Tr:+
1	Ecological/biological Integrity Benthos	Excellent Bioclassification	Aquatic Life	2008	
10-2-13	Three Top Creek	From source to North Fork New River	13.2	FW Miles	C;Tr:+
1	Ecological/biological Integrity Benthos	Good Bioclassification	Aquatic Life	2008	
3a	Ecological/biological Integrity FishCom	Not Rated Bioclassification	Aquatic Life	2008	

New River Basin — South Fork New River Watershed 0505000102

10-1-37	Cranberry Creek (Mulberry Creek)	From source to South Fork New River	18.9	FW Miles	B;Tr:+
1	Ecological/biological Integrity Benthos	Excellent Bioclassification	Aquatic Life	2008	
1	Ecological/biological Integrity FishCom	Good Bioclassification	Aquatic Life	2008	
10-1-3-(1)	East Fork South Fork New River	From source to Watauga County SR 1524	2.3	FW Miles	WS-IV;Tr:+
5	Ecological/biological Integrity Benthos	Fair Bioclassification	Aquatic Life	2003	2008
10-1-3-(8)	East Fork South Fork New River	From .8 mile downstream of Watauga Co SR 1524 to S Fk New River	0.5	FW Miles	WS-IV;CA:+
1	Ecological/biological Integrity Benthos	Good Bioclassification	Aquatic Life	2008	

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AU_Number	AU_Name	AU_Description	LengthArea	AU_Units	Classification
Category	Parameter	Reason for Rating	Use Category	Collection Year	303(d)year

New River Basin — **South Fork New River Watershed 0505000102**

⊙	**10-1-9-(6)**	**Howard Creek**	From the Appalachian State University Raw Water Supply Intake Dam to South Fork New River	**3.6 FW Miles**		C;Tr,HQW
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008		
3a	**Ecological/biological Integrity FishCom**	Not Rated Bioclassification	Aquatic Life	2008		
⊙	**10-1-35-4**	**Little Peak Creek**	From source to Peak Creek	**2.8 FW Miles**		B;Tr:+
4s	**Ecological/biological Integrity Benthos**	Poor Bioclassification	Aquatic Life	2008	2000	
⊙	**10-1-10**	**Meat Camp Creek**	From source to South Fork New River	**10.4 FW Miles**		C;Tr:+
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2008		
3a	**Ecological/biological Integrity FishCom**	Not Rated Bioclassification	Aquatic Life	2008		
⊙	**10-1-2-(15)**	**Middle Fork South Fork New River**	From 0.4 mile downstr of US Hwy 221 & 321 to South Fk New River	**0.5 FW Miles**		WS-IV;CA:+
1	**Ecological/biological Integrity Benthos**	Good-Fair Bioclassification	Aquatic Life	2008		
3a	**Ecological/biological Integrity FishCom**	Not Rated Bioclassification	Aquatic Life	2008		
⊙	**10-1-2-(6)**	**Middle Fork South Fork New River**	From Brown Branch to Boone Dam	**3.5 FW Miles**		WS-IV;Tr:+
1	**Ecological/biological Integrity Benthos**	Good-Fair Bioclassification	Aquatic Life	2003		
⊙	**10-1-32b**	**Naked Creek**	From 0.4 miles above Jefferson WWTP to South Fork New River	**2.5 FW Miles**		C:+
1	**Ecological/biological Integrity Benthos**	Good-Fair Bioclassification	Aquatic Life	2008		
5	**Ecological/biological Integrity FishCom**	Fair Bioclassification	Aquatic Life	2008	2010	
⊙	**10-1-10-2**	**Norris Fork**	From source to Meat Camp Creek	**4.3 FW Miles**		C;Tr:+
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008		
⊙	**10-1-27-(2)**	**Obids Creek**	From a point 0.9 mile downstream of NC Hwy 163 to South Fork New River	**2.8 FW Miles**		WS-IV;Tr:+
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008		
1	**Ecological/biological Integrity FishCom**	Good Bioclassification	Aquatic Life	2008		
⊙	**10-1-35-3**	**Ore Knob Branch**	From source to Peak Creek	**0.9 FW Miles**		B;Tr:+
4s	**Ecological/biological Integrity Benthos**	Poor Bioclassification	Aquatic Life	2003	2000	
⊙	**10-1-35-(2)a**	**Peak Creek**	From Water Supply Dam at Appalachian Sulphides, Inc to Ore Knob Branch	**2.1 FW Miles**		B;Tr:+
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008		

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AU_Number	AU_Name	AU_Description	LengthArea	AU_Units	Classification
Category	Parameter	Reason for Rating	Use Category	Collection Year	303(d)year

New River Basin — **South Fork New River Watershed 0505000102**

10-1-35-(2)b	**Peak Creek**	From Ore Knob Branch to South Fork New River	**2.9 FW Miles**		B;Tr:+
4s	**Ecological/biological Integrity Benthos**	Poor Bioclassification	Aquatic Life	2008	2006
10-1-15-1	**Pine Orchard Creek**	From source to Elk Creek	**3.5 FW Miles**		C;Tr:+
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2008	
10-1-24	**Pine Swamp Creek (Pine Swamp)**	From source to South Fork New River	**5.5 FW Miles**		C:+
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008	
10-1-38	**Prathers Creek**	From source to South Fork New River	**11.1 FW Miles**		B;Tr:+
1	**Ecological/biological Integrity FishCom**	Good-Fair Bioclassification	Aquatic Life	2008	
10-1-31-(2)	**Roan Creek**	From 0.5 mile upstream of mouth to South Fork New River	**0.4 FW Miles**		WS-IV;Tr,CA:+
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008	
1	**Ecological/biological Integrity FishCom**	Good Bioclassification	Aquatic Life	2008	
10-1-25-2a	**South Beaver Creek(Lake Ashe)**	From source to Lake Ashe	**5.1 FW Miles**		C;Tr:+
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008	
10-1-(20.5)	**South Fork New River**	From a point 0.4 mile upstream of Couches Creek to a point 2.8 mile upstream of Obids Creek	**21.8 FW Miles**		WS-V;HQW
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008	
10-1-(26)b	**South Fork New River**	From Obids Creek to a point 0.6 miles upstream of Roan Creek	**6.6 FW Miles**		WS-IV;HQW
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2008	
1	**Fecal Coliform (recreation)**	No Criteria Exceeded	Recreation	2008	
1	**Water Quality Standards Aquatic Life**	No Criteria Exceeded	Aquatic Life	2008	
1	**Water Quality Standards Water Supply**	No Criteria Exceeded	Water Supply	2008	
10-1-(3.5)a	**South Fork New River**	From Winkler Creek to 0.1 miles downstream of Hunting Lane	**0.3 FW Miles**		C:+
5	**Ecological/biological Integrity Benthos**	Fair Bioclassification	Aquatic Life	2003	2008
1	**Ecological/biological Integrity FishCom**	Good Bioclassification	Aquatic Life	2008	
1	**Fecal Coliform (recreation)**	No Criteria Exceeded	Recreation	2008	
1	**Water Quality Standards Aquatic Life**	No Criteria Exceeded	Aquatic Life	2008	

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AU_Number	AU_Name	AU_Description	LengthArea	AU_Units	Classification
Category	Parameter	Reason for Rating	Use Category	Collection Year	303(d)year

New River Basin — **South Fork New River Watershed 0505000102**

⊙	**10-1-(3.5)b**	**South Fork New River**	From 0.1 mile downstream Hunting Lane to US Hwy.221/421	**5.1 FW Miles**		C:+
5	**Ecological/biological Integrity Benthos**	Fair Bioclassification	Aquatic Life	2008	2008	
1	**Ecological/biological Integrity FishCom**	Good Bioclassification	Aquatic Life	2008		
1	**Fecal Coliform (recreation)**	No Criteria Exceeded	Recreation	2008		
1	**Water Quality Standards Aquatic Life**	No Criteria Exceeded	Aquatic Life	2008		
⊙	**10-1-(33.5)**	**South Fork New River**	From Dog Creek to New River	**22.5 FW Miles**		B;ORW
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2008		
1	**Fecal Coliform (recreation)**	No Criteria Exceeded	Recreation	2008		
1	**Water Quality Standards Aquatic Life**	No Criteria Exceeded	Aquatic Life	2008		
⊙	**10-1-18ut4**	**UT MILL CR**	Source to MILL CR	**1.3 FW Miles**		
1	**Ecological/biological Integrity Benthos**	Not Impaired Bioclassification	Aquatic Life	2007		
⊙	**10-1-(14.5)ut4**	**UT S FK NEW R**	Source to S FK NEW R	**1.0 FW Miles**		
3a	**Ecological/biological Integrity Benthos**	Data Inconclusive	Aquatic Life	2007		
⊙	**10-1-4-(3.5)b**	**Winkler Creek**	From Winkler Creek Road (SR #1549) to South Fork New River	**1.7 FW Miles**		C;Tr:+
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2008		

New River Basin — **Fox Creek-New River Watershed 0505000103**

⊙	**10-3**	**Grassy Creek**	From North Carolina-Virginia State	**4.1 FW Miles**		C;Tr:+
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008		
1	**Ecological/biological Integrity FishCom**	Good-Fair Bioclassification	Aquatic Life	2008		
⊙	**10b**	**New River (North Carolina Portion)**	From first point of crossing state line to last point of crossing state line	**6.4 FW Miles**		C;ORW
3a	**Copper**	Standard Violation	Aquatic Life	2006		
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2008		
3a	**Zinc**	Standard Violation	Aquatic Life	2006		

APPENDIX 2-B

BIOLOGICAL (BENTHIC & FISH) SAMPLE SITE DATA SHEETS

STATION ID*	WATERBODY	ASSESSMENT UNIT #	DESCRIPTION	COUNTY	SITE LOCATION	SAMPLE RESULTS
Benthic Sample Sites						
KB130*	Ut. S. Fk. New R.	10-1-(14.5)ut4	Source to South Fork New River	Watauga	SR 1353	07 - Not Rated
KB140*	Ut. S. Fk. New R.	10-1-(14.5)ut4	Source to South Fork New River	Watauga	SR 1353	07 - Not Rated
KB2	S. Fk. New R.	10-1-(20.5)	From a point 0.4 mile upstream of Couches Creek to a point 2.8 mile upstream of Obids Creek	Ashe	SR 1169	08 - Good 03 - Excellent
KB3	S. Fk. New R.	10-1-(26)b	From Obids Creek to a point 0.6 miles upstream of Roan Creek	Ashe	NC 16-18	08 - Excellent 03 - Excellent
KB16	S. Fk. New R.	10-1-(3.5)b	From 0.1 mile downstream Hunting Lane to US Hwy.221/421	Watauga	US 421	08 - Fair 03 - Fair
KB10	S. Fk. New R.	10-1-(33.5)	From Dog Creek to New River	Ashe	US 221	08 - Excellent 03 - Excellent
KB20	Meat Camp Cr.	10-1-10	From source to South Fork New River	Watauga	SR 1333	08 - Excellent 03 - Good
KB21	Norris Fk.	10-1-10-2	From source to Meat Camp Creek	Watauga	SR 1337	08 - Good 03 - Excellent
KB22	Pine Orchard Cr.	10-1-15-1	From source to Elk Creek	Watauga	SR 1369	08 - Not Impaired 03 - Excellent
KB1	M. Fk. S. Fk. New R.	10-1-2-(15)	From 0.4 mile downstr of US Hwy 221 & 321 to South Fk New River	Watauga	SR 1522	08 - Good-Fair 03 - Good-Fair
KB108	Pine Swamp Cr.	10-9-5	From source to S. Fork New River	Alleghany	SR 1128	08 - Good 03 - Good
KB5	S. Beaver Cr.	10-1-25-2a	From source to Lake Ashe	Ashe	SR 1147	08 - Good 03 - Good
KB6	Obids Cr.	10-1-27-(2)	From a point 0.9 mile downstream of NC Hwy 163 to South Fork New River	Ashe	SR 1192	08 - Good 03 - Good
KB12	E. Fk. S. Fk. New R.	10-1-3-(8)	From .8 mile downstream of Watauga Co SR 1524 to S Fk New River	Watauga	SR 1522	08 - Good '03 - Good
KB7	Roan Cr.	10-1-31-(2)	From 0.5 mile upstream of mouth to South Fork New River	Ashe	SR 1588	08 - Good 03 - Excellent
KB8	Naked Cr.	10-1-32b	From 0.4 miles above Jefferson WWTP to South Fork New River	Ashe	NC 16-88	08 - Good 03 - Good-Fair
KB139*	Naked Cr.	10-1-32b	From 0.4 miles above Jefferson WWTP to South Fork New River	Ashe	SR 1589	08 - Good-Fair
KB11	Peak Cr.	10-1-35-(2)a	From Water Supply Dam at Appalachian Sulphides, Inc to Ore Knob Branch	Ashe	SR 1599	08 - Excellent 03 - Good
KB13	Peak Cr.	10-1-35-(2)b	From Ore Knob Branch to South Fork New River	Ashe	SR 1599	08 - Poor '03 - Poor
KB14	L. Peak Cr.	10-1-35-4	From source to Peak Creek	Ashe	SR 1595	08 - Poor 03 - Poor
KB15	Cranberry Cr.	10-1-37	From source to South Fork New River	Ashe	SR 1603	08 - Excellent 03 - Excellent
KB17	Winkler Cr.	10-1-4-(3.5)b	From Winkler Creek Road (SR #1549) to South Fork New River	Watauga	SR 1549	08 - Excellent 03 - Excellent
KB18	Howard Cr.	10-1-9-(6)	From the Appalachian State University Raw Water Supply Intake Dam to South Fork New River	Watauga	SR 1328	08 - Excellent 03 - Good
KB126*	Grassy Cr.	10-3	From North Carolina-Virginia State	Ashe	SR 1548	08 - Good
KB34	New R.	10b	From first point of crossing state line to last point of crossing state line	Alleghany	SR 1345	08 - Excellent 03 - Excellent

* New station location; therefore, no data from the previous cycle.

Station ID*	Waterbody	Assessment Unit #	Description	County	Site Location	Sample Results
Fish Community Sample Sites						
KF6	Howard Cr.	10-1-9-(6)	From the Appalachian State University Raw Water Supply Intake Dam to South Fork New River	Watauga	SR 1306	08 - Not Rated 98 - Not Rated
KF8	M. Fk. S. Fk. New R.	10-1-2-(15)	From 0.4 mile downstr of US Hwy 221 & 321 to South Fk New River	Watauga	SR 1522	08 - Not Rated 98 - Excellent
KF24	Meat Camp Cr.	10-1-10	From source to South Fork New River	Watauga	SR 1333	08 - Not Rated 98 - Not Rated
KF14	Naked Cr.	10-1-32b	From 0.4 miles above Jefferson WWTP to South Fork New River	Ashe	NC 16/88	08 - Fair 98 - Fair
KF13*	Obids Cr.	10-1-27-(2)	From a point 0.9 mile downstream of NC Hwy 163 to South Fork New River	Ashe	SR 1192	08 - Good
KF15*	Prathers Cr.	10-1-38	From source to South Fork New River	Alleghany	SR 1302	08 - Good-Fair
KF20*	Roan Cr.	10-1-31-(2)	From 0.5 mile upstream of mouth to South Fork New River	Ashe	SR 1588	08 - Good
KF12	S. Fk. New R.	10-1-(3.5)b	From 0.1 mile downstream Hunting Lane to US Hwy.221/421	Watauga	US 421	08 - Good 98 - Good

* New station location; therefore, no data from the previous cycle.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
S FK NEW R	US 421	KB16	08/19/08	Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.220833	-81.640000	10-1-(3.5)b	Southern Crystalline Ridges and Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C:+	35	3088	15	0.2

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

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
Town of Boone, Jimmy Smith WWTP	NC0020621	4.82

Water Quality Parameters

Temperature (°C)	23.7
Dissolved Oxygen (mg/L)	9.0
Specific Conductance (µS/cm)	276
pH (s.u.)	7.6
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	10
Bottom Substrate (15)	6
Pool Variety (10)	10
Riffle Habitat (16)	14
Left Bank Stability (7)	6
Right Bank Stability (7)	2
Light Penetration (10)	2
Left Riparian Score (5)	2
Right Riparian Score (5)	1
Total Habitat Score (100)	58

Site Photograph

Substrate mix of cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10551	75	19	5.80	4.88	Fair
11/04/03	9302	---	11	---	4.25	Fair
08/20/03	9257	67	24	5.46	4.81	Good-Fair
08/17/98	7734	71	22	5.68	4.14	Good-Fair
07/12/93	6261	69	18	6.17	3.80	Fair

Taxonomic Analysis

The 2008 sample is dominated by taxa that are pollution-tolerant. Abundant mayflies found here in 2008 included: *Pseudocloeon propinquum, Plauditus dubius* group, *Heterocloeon anoka, Isonychia,* and *Baetis flavistriga* . Other abundant taxa here that are considered generalists and are tolerant were the caddisfly *Cheumatopsyche* and the dragonfly *Calopteryx.*

Data Analysis

The South Fork New River at US 421/221 rated Fair in 2008, the same rating as in 2003. There have been eight samples collected here from 1984 through 2008. Of the seven summer samples (all Full Scale samples) this site rated Fair four times and Good-Fair thrice. This site is just downstream of the Boone WWTP. The 2004 Basinwide Assessment Report noted a gradual decrease in the Biotic Index here (indicating a slightly more pollution-sensitive benthic community) in relation to reductions in NH3 and TKN from effluent from the Boone WWTP beginning in 1998. Unfortunately this trend did not continue in 2008 and the Biotic Index is now back to the level it was in the mid 1990's which indicates a more pollution-tolerant benthic community. This watershed is also heavily agricultural. A large silt load covers 40% of the benthos of this reach limiting habitat for aquatic macroinvertebrates. There is very little substrate over 10 inches in length in this reach. Overall habitat quality here is low and has been since at least 2003 (scores of 58, 59 and 60).

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
S FK NEW R	US 421	05/22/08	KF12	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.220736	-81.639974	10-1-(3.5)b	Southern Crystalline Ridges & Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C, +	34.2	3100	13	0.4	No

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	70	15	10	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
Town of Boone WWTP (0.9 miles upstream)	NC0020621	4.8

Water Quality Parameters

Temperature (°C)	11.7
Dissolved Oxygen (mg/L)	8.5
Specific Conductance (µS/cm)	126
pH (s.u.)	6.0

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	16
Bottom Substrate (15)	5
Pool Variety (10)	4
Riffle Habitat (16)	10
Left Bank Stability (7)	5
Right Bank Stability (7)	5
Light Penetration (10)	5
Left Riparian Score (5)	5
Right Riparian Score (5)	3
Total Habitat Score (100)	**63**

Site Photograph

Substrate gravel, sand, boulder, silt.

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/22/08	2008-49	22	56	Good
06/08/98	98-51	20	52	Good

Most Abundant Species Western Blacknose Dace.

Exotic Species Rock Bass, Rainbow Trout, Brown Trout.

Species Change Since Last Cycle **Gains --** Kanawha Minnow, Greenside Darter, Kanawha Darter, Appalachia Darter. **Losses --** Bluegill.

Data Analysis

Watershed -- this large site is located in the northeast corner of Boone and drains the entire southern-most tip of the New River basin in Watauga County, including the catchments of Winkler Creek, Middle Fork South Fork New River, and East Fork South Fork New River. **Habitats** -- shallow runs, with a few large riffles, and a few shallow side pools; the canopy was open due to the river's width, but the banks were generally healthy; substrates were highly embedded in this reach of the river; conductivity was elevated because of Boone's WWTP. **2008** -- an extremely diverse and abundant (n=2058) community of fish was collected, including eight intolerant taxa, three of which were not previously collected; Western Blacknose Dace (n=524) comprised 25% of the sample, and Central Stoneroller represented 24% (n=484). **1998-2008** -- although many more fish were collected in 2008, little difference exists between the trophic structures and NCIBI values between samples, suggesting that little has changed in this watershed over a 10 year period (in spite of upstream fish kill in 2003); overall, the fish community continues to thrive here, and suggests good water quality.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
S FK NEW R	**SR 1169**	**KB2**	**08/18/08**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.299167	-81.468056	10-1-(20.5)	Southern Crystalline Ridges and Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
WS-V; HQW	143	2830	25	0.3

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

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
Town of Boone, Jimmy Smith WWTP	NC0020621	4.82

Water Quality Parameters

Temperature (°C)	23.4
Dissolved Oxygen (mg/L)	7.6
Specific Conductance (µS/cm)	105
pH (s.u.)	9.2
Water Clarity	slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	11
Bottom Substrate (15)	8
Pool Variety (10)	0
Riffle Habitat (16)	7
Left Bank Stability (7)	2
Right Bank Stability (7)	5
Light Penetration (10)	2
Left Riparian Score (5)	1
Right Riparian Score (5)	1
Total Habitat Score (100)	42

Site Photograph

Substrate mix of cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/18/08	10547	99	38	4.84	3.78	Good
08/21/03	9263	98	45	4.19	3.33	Excellent
08/18/98	7737	101	48	4.61	3.64	Excellent

Taxonomic Analysis

Small changes in rare and in some cases common taxa were the main differences between the 2008 collection and past collections. Only one taxonomic group showed any drastic changes: the dragonfly family Gomphidae. In both 1998 and 2003 four taxa were found in the samples but in 2008, this group was absent. One unusual chironomid taxa was found in 2008: *Polypedilum* sp. P. The infrequently collected caddisfly *Oecetis avara* was first collected here in 2008. There are only 37 BAU records of this species. Overall EPT and total diversity remains high here.

Data Analysis

This South Fork New River site rated Good in 2008, a decrease from Excellent in both 1998 and 2003. An increase in the Biotic Index indicates that a more pollution-tolerant community resides in this reach than did in previous years. The number of EPT taxa was also lower in 2008 compared with 1998 and 2003. This reach earned a low habitat scorce due to limited in-stream habitat including substrate sizes that consisted mostly of sand, silt and gravel. The water quality at SR 1169 is an improvement from the next site upstream of here (at US 421, approximately 20 miles upstream). That site rated Fair in 2008.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
S FK NEW R	**NC 16/18**	**KB3**	**06/19/08**	**Excellent**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.393056	-81.407222	10-1-(26)b	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
WS-IV;HQW	205	2660	40	0.3

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	60	30	10	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
Town of Boone, Jimmy Smith WWTP	NC0020621	4.82

Water Quality Parameters

Temperature (°C)	23.1
Dissolved Oxygen (mg/L)	9.1
Specific Conductance (µS/cm)	66
pH (s.u.)	8.5
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	15
Bottom Substrate (15)	12
Pool Variety (10)	6
Riffle Habitat (16)	12
Left Bank Stability (7)	5
Right Bank Stability (7)	6
Light Penetration (10)	2
Left Riparian Score (5)	1
Right Riparian Score (5)	5
Total Habitat Score (100)	69

Site Photograph

Substrate mix of bedrock, boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
06/19/08	10474	106	54	4.26	3.48	Excellent
08/22/03	9271	104	58	3.67	3.12	Excellent
08/18/98	7742	95	48	4.01	3.44	Excellent
07/14/93	6270	104	51	3.41	2.75	Excellent
07/11/90	5375	97	50	3.79	3.11	Excellent

Taxonomic Analysis

A large number of taxa were collected here in 2008. The number of EPT taxa collected was 54, only 4 fewer than in 2003, but the total number of taxa collected was slightly higher in 2008 than 2003 (106 versus 104). A diverse aquatic macroinvertebrate community resides in this reach of the South Fork New River. Abundant taxa in past years were generally both collected again in 2008 and were also abundant. Some noteable taxa were first collected at the site in 2008, including: the mayflies *Drunella lata, Eurylophella aestiva* and *Anthopotamus* (all common in the sample); the stoneflies *Acroneuria mela* and *Agnetina annulipes* (both rare in the sample); and the caddisfly *Apatania* (common in the sample).

Data Analysis

This South Fork New River site rated Excellent again in 2008 as it has following each prior sampling event since 1987. The 2008 sample was collected one to two months earlier in the year than past samples, but still within the summer basinwide sampling window. This earlier sampling may have accounted for a few taxa not seen in previous samples (e.g. *Drunella lata, Eurylophella aestiva*). Though the total number of aquatic invertebrate taxa collected in 2008 was greater than in all previous years, the Biotic Index was also higher suggesting a slightly more pollution-sensitive community than in past years.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
S FK NEW R	US 221 BELOW CRANBERRY CREEK	KB10	08/22/08	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.473889	-81.336944	10-1-(33.5)	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
B;ORW	300	2545	25	0.4

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	50	25	25	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
Town of Boone, Jimmy Smith WWTP	NC0020621	4.82

Water Quality Parameters

Temperature (°C)	22.6
Dissolved Oxygen (mg/L)	7.2
Specific Conductance (µS/cm)	82
pH (s.u.)	8.1
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	13
Bottom Substrate (15)	11
Pool Variety (10)	10
Riffle Habitat (16)	10
Left Bank Stability (7)	3
Right Bank Stability (7)	6
Light Penetration (10)	0
Left Riparian Score (5)	1
Right Riparian Score (5)	4
Total Habitat Score (100)	63

Site Photograph

Substrate mix of bedrock, boulder, cobble, gravel and sand

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/22/08	10563	102	49	4.41	3.26	Excellent
08/23/03	9272	112	47	4.62	3.43	Excellent
08/20/98	7749	112	55	4.24	3.57	Excellent
07/15/93	6273	103	46	4.06	3.09	Excellent

Taxonomic Analysis

A large number of taxa continue to inhabit this downstream section of the South Fork New River. Many pollution-sensitive taxa are abundant here, including the mayflies: *Heterocloeon curiosum, Acerpenna macdunnoughi, Serratella serratoides, Stenacron pallidum,* and *Leucrocuta.* The pollution-sensitive stonefly *Acroneuria arenosa* and the caddisflies *Brachycentrus numerosus* and *Helicopsyche* were also abundant here in in 2008. Most taxa collected in 2008 were also collected in previous years.

Data Analysis

This site has consistently rated Excellent since 1990. A total of thirteen samples have been collected from this location since 1983. The number of Total Taxa and EPT Taxa have remained high and the Biotic Index has been consistent in showing a pollution-sensitive aquatic community residing here. The site upstream of here (NC 16-88, approximately 18 miles upstream) was also Excellent. The US 221 site is the farthest downstream basinwide site on the South Fork New River. The South Fork and North Fork New River converge approximately 15 miles downstream of this site and then flow northward to Virginia a further five miles downstream. There are no permitted discharges between the US 221 site and the North Carolina-Virginia border, suggesting that an Excellent water quality rating could continue downstream to Virginia.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
M FK S FK NEW R	**SR 1522**	**KB1**	**08/19/08**	**Good-Fair**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.201389	-81.650000	10-1-2-(15)	Southern Crystalline Ridges and Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
WS-IV;CA:+	12	3100	5	0.2

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	0	0	0	100 (golf course/greenway trail)

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

Water Quality Parameters

Temperature (°C)	18.3
Dissolved Oxygen (mg/L)	9.3
Specific Conductance (µS/cm)	111
pH (s.u.)	6.9
Water Clarity	slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	15
Bottom Substrate (15)	6
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	2
Right Bank Stability (7)	3
Light Penetration (10)	2
Left Riparian Score (5)	0
Right Riparian Score (5)	2
Total Habitat Score (100)	56

Site Photograph

Substrate mix of cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10550	---	27	---	4.19	Good-Fair
11/04/03	9307	---	29*	---	2.99	Good
08/20/03	9259	---	24	---	3.26	Good-Fair
08/17/98	7732	---	31	---	2.99	Good
07/12/93	6260	---	37	---	2.97	Excellent

*value corrected for seasonality

Taxonomic Analysis

In general, the EPT taxa found in the Middle Fork of the South Fork New River in 2008 were typical of previous collections. However, the most recent collection contained fewer EPT taxa than most of the past sampling efforts. This site supports an increasingly pollution-tolerant benthic community. Abundant taxa found in 2008 were cosmopolitan species (e.g. *Isonychia, Cheumatopsyche, Plauditus dubius* group) with few pollution-sensitve species.

Data Analysis

This site rated Good-Fair in 2008, the same rating it received in summer 2003. The four summer basinwide collections have seen this site go from Excellent and Good in 1993 and 1998 respectively, to Good-Fair in 2003 and 2008. The Biotic Index indicates that the benthic community is becoming more tolerant of aquatic pollution with sensitve species no longer residing in this reach. This site is located just downstream of Boone Golf Club, a large expanse of open area with only a narrow grass riparian zone and few trees. Silt and sand comprised 30% of the benthic area, limiting interstitial benthic habitats and increasing embeddedness. Additionally, there is a small reservior 1.6 miles upsteam of this site and three minor dischargers (>1.5 miles upstream) that may be affecting the benthic community here. In October 2003, one of these dischargers, Blowing Rock Water Treatment Plant (WTP), spilled approximately 3,000 gallons of sodium hydroxide into the Middle Fork South Fork New River (BAU memorandum B-20031113). There does not appear to be any long term effect of this event on the macroinvertebrate community at SR 1522.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
M FK S FK NEW R	SR 1522	05/22/08	KF8	Not Rated

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.20128	-81.649851	10-1-2-(15)	Southern Crystalline Ridges & Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
WS-IV, CA, +	12	3100	5	0.5	No

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	50	20	10	20 (golf course)

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

Water Quality Parameters

Temperature (°C)	12.3
Dissolved Oxygen (mg/L)	9.3
Specific Conductance (µS/cm)	92
pH (s.u.)	6.4

Water Clarity: Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	20
Bottom Substrate (15)	8
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	3
Right Bank Stability (7)	5
Light Penetration (10)	8
Left Riparian Score (5)	2
Right Riparian Score (5)	2
Total Habitat Score (100)	**75**

Site Photograph

Substrate: cobble, gravel, boulder, silt, sand.

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/22/08	2008-50	14	38	Not Rated
06/09/98	98-53	16	58	Excellent

Most Abundant Species: Mottled Sculpin.

Exotic Species: Green Sunfish, Bluegill, Rainbow Trout, Brown Trout.

Species Change Since Last Cycle: **Gains --** Green Sunfish, Rosyside Dace, Bluehead Chub, Creek Chub. **Losses** -- Rock Bass, New River Shiner, Kanawha Minnow, Longnose Dace, Greenside Darter, Kanawha Darter.

Data Analysis

Watershed - a large trib to the South Fork New River; drains the southern-most tip of the basin. **Habitats** - riffles, runs, swift chutes, and a few snag pools; high substrate embeddedness; bordered by a golf course (left) and a fenced cattle operation (right) with narrow riparian widths; the four NPDES facilities (combined discharge of 1.0 MGD, 1.9 to 7.0 miles above) may have elevated the instream waste concentration during droughts. **2008** - a diverse and abundant community of fish (n=803) was collected, including two intolerant taxa (Tounguetied Minnow, and Rainbow Trout); however six of ten NCIBI metrics fell during this assessment. **1998-2003** -- the decline in bioclassification, and particularly the loss of four sparsely populated intolerant species (Rock Bass, New River Shiner, Kanawha Minnow, and Kanawha Darter - 18 individuals combined) may be related to a 2003 spill of sodium hydroxide (3,000 gal.), that occurred in Blowing Rock. These losses may be explained by the combined effects of this spill, and the urban nature of this stream. In light of these extremes, this site was Not Rated; it has likely seen impressive recovery toward its previous bioclass and may continue to improve.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
E FK S FK NEW R	SR 1522	KB12	08/19/08	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.202222	-81.648889	10-1-3-(8)	Southern Crystalline Ridges and Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
WS-IV;CA:+	7.2	3100	5	0.1

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	0	25	0	75 (golf course)

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

Water Quality Parameters

Temperature (°C)	18.5
Dissolved Oxygen (mg/L)	8.9
Specific Conductance (µS/cm)	61
pH (s.u.)	6.1
Water Clarity	slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	3
Instream Habitat (20)	11
Bottom Substrate (15)	6
Pool Variety (10)	4
Riffle Habitat (16)	12
Left Bank Stability (7)	2
Right Bank Stability (7)	2
Light Penetration (10)	2
Left Riparian Score (5)	2
Right Riparian Score (5)	0
Total Habitat Score (100)	44

Site Photograph

Substrate mix of boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10549	---	31	---	3.54	Good
11/04/03	9306	---	3	---	5.21	Poor
08/20/03	9258	---	31	---	3.06	Good
08/17/98	7731	---	32	---	3.29	Good
07/12/93	6259	---	37	---	3.34	Excellent

Taxonomic Analysis

The EPT taxa found in the East Fork of the South Fork New River in 2008 were similar to past basinwide collections. Some taxa were collected in lower abundances (e.g. *Isonychia*) and some have yet to reestablish (e.g. *Maccaffertium pudicum* and *Ceratopsyche sparna*) following an acute, unknown event that occurred in 2003 after the basinwide sampling event for that year. In terms of EPT richness the benthic community has recovered to summer 2003 levels. This site still supports a pollution-intolerant benthic community.

Data Analysis

This site rated Good in 2008, the same classification it received in summer 1998 and 2003. The loss of benthic fauna in late 2003 following an acute, unknown event does not appear to have been permanent. This site was sampled in November 2003 as a reference site after a spill in the Middle Fork South Fork New River (BAU memorandum B-20031113). This East Fork site has no dischargers upstream nor any larger reserviors which may have been the source of the problems seen in late 2003. Despite the ample evidence of being located just downstream of Boone Golf Club (e.g. grass clippings and golf balls in stream) the benthic fauna at this site appears less affected by the golf course in 2008 than the Middle Fork South Fork New River.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
WINKLER CR	**SR 1549**	**KB17**	**08/19/08**	**Excellent**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.198333	-81.673611	10-1-4-(3.5)a	Southern Crystalline Ridges and Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr:+	5.5	3145	6	0.2

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

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

Water Quality Parameters

Temperature (°C)	16.2
Dissolved Oxygen (mg/L)	9.6
Specific Conductance (µS/cm)	46
pH (s.u.)	6.0
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	10
Bottom Substrate (15)	3
Pool Variety (10)	10
Riffle Habitat (16)	16
Left Bank Stability (7)	6
Right Bank Stability (7)	7
Light Penetration (10)	10
Left Riparian Score (5)	4
Right Riparian Score (5)	5
Total Habitat Score (100)	76

Site Photograph

Substrate mix of mostly bedrock and boulder with some cobble and gravel

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10548	---	36	---	2.93	Excellent
08/21/03	9262	---	39	---	2.36	Excellent
08/17/98	7733	---	34	---	2.89	Good
07/12/93	6258	---	37	---	2.02	Excellent

Taxonomic Analysis

EPT taxa collected in 2008 were very similar to past samples here. Abundant taxa included the mayflies *Baetis pluto, Epeorus vitreus, Maccaffertium modestum, M. pudicum* and *Paraleptophlebia*. Six stonefly taxa were found at Winkler Creek with *Leuctra* and *Tallaperla* being dominant. Caddisflies were well represented with 12 taxa present, but only *Ceratopsyche sparna, Cheumatopsyche* and *Dolophilodes* were abundant. The less commonly collected caddisfly, *Mystacides* nr. *alafimbriata,* was found to be common here in 2008.

Data Analysis

The benthic site on Winkler Creek is near the headwaters of South Fork New River, and is located within and near the town limits of Boone. Much of the catchment upstream of the site is forested; only a very minor portion is urban.

Winkler Creek rated Excellent in 2008, the same as in 2003 and 1993. The number of EPT taxa collected here has remained stable since the first sampling effort in 1993. The low Biotic Index indicates a pollution-intolerant benthic community residing in this section of Winkler Creek.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
HOWARD CR	SR 1306	05/21/08	KF6	Not Rated

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.241748	-81.66127	10-1-9-(6)	Amphibolite Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr,HQW	7.9	3198	7	0.4	No

	Forested/Wetland	Residential/School	Agriculture	Other (describe)
Visible Landuse (%)	85	15	0	0

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

Water Quality Parameters

Temperature (°C)	15.1
Dissolved Oxygen (mg/L)	9.3
Specific Conductance (µS/cm)	45
pH (s.u.)	6.5

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	20
Bottom Substrate (15)	12
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	10
Left Riparian Score (5)	4
Right Riparian Score (5)	4
Total Habitat Score (100)	**91**

Site Photograph

Substrate abundant flat rocks, cobble, gravel, boulder.

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/21/08	2008-48	17	--	Not Rated
06/08/98	98-52	12	--	Not Rated

Most Abundant Species Central Stoneroller.

Exotic Species Rock Bass, Redbreast Sunfish, Green Sunfish, Bluegill, Rainbow Trout, Brown Trout.

Species Change Since Last Cycle **Gains --** Green Sunfish, Bluegill, Tonguetied Minnow, Bluehead Chub, Longnose Dace, Appalachia Darter. **Losses** -- Creek Chub.

Data Analysis

Watershed -- a tributary to the North Fork New River located one watershed south of the Meat Camp Creek catchment in northeast Watauga County; drains the primarily forested area just north of Boone. **Habitats** -- high quality instream habitats consisting of excellent riffles, bedrock chutes, and pools; great canopy coverage offering abundant shade to the stream; very stable banks with a diverse mix of undisturbed vegetation in the riparian zones. **2008** -- a highly diverse mix of cold, cool, and warm water species was collected from this mountain stream, including four intolerant taxa (Rock Bass, Tonguetied Minnow, Appalachia Darter, and Rainbow Trout); Central Stonerollers represented 25% of the catch, and the six new species collected were represented by low abundances (maximum of 8 individuals). **1998-2008** -- a total of 18 fish species have been collected from this location, including two species of sucker, four species of sunfish (three of which are warm water exotics, suggesting alteration of the original population), six species of minnow, two darter species, and two trout species; overall, this stream appears healthy, and is supporting a rich community of fish through good quality water and habitats.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
HOWARD CR	**SR 1328**	**KB18**	**08/19/08**	**Excellent**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.244444	-81.650000	10-1-9-(6)	Southern Crystalline Ridges and Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr;HQW	10	3128	6	0.1

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

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

Water Quality Parameters

Temperature (°C)	19.6
Dissolved Oxygen (mg/L)	8.3
Specific Conductance (µS/cm)	100
pH (s.u.)	7.0
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	14
Bottom Substrate (15)	12
Pool Variety (10)	10
Riffle Habitat (16)	16
Left Bank Stability (7)	7
Right Bank Stability (7)	6
Light Penetration (10)	10
Left Riparian Score (5)	5
Right Riparian Score (5)	4
Total Habitat Score (100)	89

Site Photograph

Substrate mix of boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10552	---	44	---	2.19	Excellent
08/20/03	9254	---	35	---	2.35	Good
08/17/98	7735	---	40	---	2.64	Excellent
07/13/93	6262	102	52	3.85	2.87	Excellent
07/26/88	4633	---	38	---	3.22	Excellent

Taxonomic Analysis

Howard Creek conatains a pollution-intolerant macroinvertebrate community dominated by taxa that one would expect to find in a minimally disturbed small mountain watershed (e.g. *Litobrancha recurvata, Neoephemera purpurea*). Shredders, such as the stoneflies *Tallaperla* and *Pteronarcys proteus,* were abundant in 2008.

Data Analysis

Howard Creek rated Excellent in 2008, an increase from Good in 2003. As noted in the 2003 report, the Good rating was one EPT taxon away from an Excellent rating. Data from 1988 to 2008 show consistently high water quality with a diverse and pollution intolerant macroinvertebrate community. Residential and commercial development appears to be increasing in this watershed but the sampled reach did not appear to be affected by this as of August 2008.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
MEAT CAMP CR	**SR 1335**	**05/21/08**	**KF24**	**Not Rated**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.271611	-81.658809	10-1-10	Amphibolite Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	10.7	3300	7	0.2	Yes

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	80	0	15	5 (road)

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

Water Quality Parameters

Temperature (°C)	13.2
Dissolved Oxygen (mg/L)	9.8
Specific Conductance (µS/cm)	42
pH (s.u.)	6.5

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	12
Pool Variety (10)	0
Riffle Habitat (16)	16
Left Bank Stability (7)	6
Right Bank Stability (7)	5
Light Penetration (10)	5
Left Riparian Score (5)	5
Right Riparian Score (5)	3
Total Habitat Score (100)	**75**

Site Photograph

Substrate cobble, gravel, boulder.

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/21/08	2008-47	10	--	Not Rated
06/09/98	98-54	11	--	Not Rated

Most Abundant Species Mottled Sculpin.

Exotic Species Rock Bass, Rainbow Trout, Brown Trout.

Species Change Since Last Cycle **Gains --** Bluehead Chub, Rainbow Trout. **Losses** -- White Sucker, Northern Hogsucker, Rosyside Dace.

Data Analysis

This site was moved about 2.7 miles upstream from the SR 1333 crossing (above Rittle Fork and Cobb Creek) to serve as a regional reference site. **Watershed** - a tributary to the South Fork New River that drains part of rural northeast Watauga County. **Habitats** - the 100% riffle habitats are high quality, but there are no functional pools in this 600 foot reach, and the lower 2/3 is completely without a canopy; however, bank stabilities are still good, and the substrates show relatively low levels of embeddedness, which suggests minor amounts of upstream sedimention. **2008** - a fairly diverse mix of cold and cool water species was collected, including three intolerant taxa (Rock Bass, Kanawha Darter, and Rainbow Trout) and almost four times the abundance was observed at this new location (n=1060 vs. 271); Mottled Sculpin (cold water benthic insectivore) represented 84% of the sample. **1998-2008** - although separated by a few miles and Not Rated, the fish taxa collected at these two locations reflect similar trophic structures (in spite of the high number of Mottled Sculpin at SR 1335); overall, the fish community suggests good water quality characteristics in this catchment.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
MEAT CAMP CR	**SR 1333**	**KB20**	**08/20/08**	**Excellent**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.264444	-81.621944	10-1-10	Southern Crystalline Ridges and Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr:+	20	3080	10	0.2

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

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

Water Quality Parameters

Temperature (°C)	15.2
Dissolved Oxygen (mg/L)	8.7
Specific Conductance (µS/cm)	57
pH (s.u.)	7.0
Water Clarity	slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	15
Pool Variety (10)	10
Riffle Habitat (16)	16
Left Bank Stability (7)	6
Right Bank Stability (7)	7
Light Penetration (10)	10
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	97

Site Photograph

Substrate mix of bedrock, boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/20/08	10554	---	39	---	2.80	Excellent
08/20/03	9255	---	35	---	2.81	Good
08/17/98	7736	---	39	---	2.69	Excellent
07/13/93	6263	---	31	---	2.52	Good
03/05/90	5205	---	37	---	2.60	Good

Taxonomic Analysis

In 2008 Meat Camp Creek contained 39 EPT taxa, equaling the largest number of taxa collected from this stream. Many of the species collected in 2003 and previous samples were found in 2008. Most of these taxa are sensitive to aquatic pollution. Several taxa appeared for the first time here in 2008. These included the caddisflies *Neophylax consimilis* (abundant in the sample), *Goera fuscula* (common), *Ceratopsyche morosa,* and *Neureclipsis* (both rare in the sample). The pollution-sensitive mayfly *Stenacron pallidum* (common) and *Tricorythodes* (rare) also appeared at this site for the first time in 2008.

Data Analysis

Meat Camp Creek rated Excellent in 2008. The Good rating received in 2003 was only one EPT short of an Excellent bioclassification. The number of EPT collected here during the five collections since 1990 suggest a stable, pollution-sensitive macroinvertebrate community at the site. Riparian habitat along this reach shows little disturbance and a variety of in-stream microhabitats exist for macroinvertebrate colonization despite a large percentage of bedrock. Water temperatures in Meat Camp Creek were the lowest recorded for all sites in this part of the HUC in 2008.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
NORRIS FK	SR 1337	KB21	08/19/08	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.280000	-81.676667	10-1-10-2	Amphibolite Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr:+	3.3	3320	3	0.2

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

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

Water Quality Parameters

Temperature (°C)	17.5
Dissolved Oxygen (mg/L)	8.4
Specific Conductance (µS/cm)	36
pH (s.u.)	6.9
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	3
Instream Habitat (20)	18
Bottom Substrate (15)	15
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	4
Right Bank Stability (7)	4
Light Penetration (10)	7
Left Riparian Score (5)	2
Right Riparian Score (5)	3
Total Habitat Score (100)	78

Site Photograph

Substrate mix of boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10553	---	35	---	2.11	Good
08/20/03	9256	---	36	---	1.56	Excellent

Taxonomic Analysis

Taxa collected in 2003 that were not found in 2008 included the caddisflies *Fattigia pele, Parapsyche cardis, Brachycentrus spinae* and *Apatania*. New caddisflies for this site in 2008 included *Ceratopsyche bronta, Pycnopsyche gentilis* and a second (unidentified) species of *Pycnopcyshe, Polycentropus* and *Lype diversa.* The stoneflies *Suwallia* and *Isoperla* nr *holochlora* were present in 2003 though absent in 2008, while *Paragnetina immarginata* was absent in 2003 and present in 2008. These taxa differences resulted in a slightly higher EPT Biotic Index in 2008 compared with 2003. However, overall this site contains a pollution-intolerant macroinvertebrate community.

Data Analysis

Norris Fork at SR 1337 received a classification of Good in 2008, though the addition of a single EPT taxon would have pushed the classification up to Excellent. The difference in the number of EPT taxa between 2003 and 2008 is very small, but the difference in EPT Biotic Index values is relatively large. Many of the rare but highly intolerant taxa collected in 2003 were absent in 2008. Some recent development has occurred upstream of the site. Higher silt levels were seen in 2008 corresponding to ongoing land clearing activities here. A large number of lots were for sale at the time of sampling suggesting that development would continue in the watershed. Despite this, the EPT Biotic Index in Norris Fork was the second lowest in this part the HUC (formerly subbasin 1).

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
PINE ORCHARD CR	**SR 1369**	**KB22**	**08/20/08**	**Not Impaired**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
WATAUGA	1	05050001	36.313333	-81.617222	10-1-15-1	Amphibolite Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr:+	2.6	3080	4	0.2

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

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

Water Quality Parameters

Temperature (°C)	16.1
Dissolved Oxygen (mg/L)	8.5
Specific Conductance (µS/cm)	46
pH (s.u.)	6.5
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	14
Bottom Substrate (15)	12
Pool Variety (10)	10
Riffle Habitat (16)	16
Left Bank Stability (7)	6
Right Bank Stability (7)	5
Light Penetration (10)	10
Left Riparian Score (5)	4
Right Riparian Score (5)	2
Total Habitat Score (100)	83

Site Photograph

Substrate mix of boulder, cobble, and gravel with a large amount of silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/20/08	10555	---	36	---	2.09	Not Impaired
08/21/03	9260	---	33	---	1.64	Excellent

Taxonomic Analysis

Small differences exist with the taxa collected at the site between 2003 and 2008, but overall the benthic community here remains diverse and pollution-sensitive. *Neophylax consimils* , a pollution-intolerant case-making caddisfly, was abundant in 2003 and absent in 2008. However, two other taxa, *N. mitchelli* and *N. oligius,* were common in 2008. Abundant taxa collected in 2008 included these pollution-sensitive taxa: the mayfly, *Drunella conestee* ; the stonefly *Malirekus hastatus* ; and the caddisfly *Dolophilodes.*

Data Analysis

Pine Orchard Creek had the lowest EPT Biotic Index of any stream in this part of the HUC (formerly subbasin 1) indicating a very pollution-intolerant benthic community here. The classification for the site in 2003 was derived using High Quality Small Mountain Stream (HQSMS) criteria, which are used for stream sites with undisturbed drainage areas under 3.5 square miles. Recent aerial photos and streamside observations show the presence of disturbance from residences, agriculture, and state roads and highways in the watershed, therefore HQSMS criteria can not be applied to the site for 2008. Additionally, since no criteria have been completed for stream sites with drainage areas under 3.0 square miles with disturbance present, this site is given a classification of Not Impaired for 2008 (it would have been classified as Good with large-stream criteria). One notable difference in habitat at the site was an increase in silt from 2003 to 2008 (40% in 2008 versus 0% in 2003 by visual estimation).

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
PINE SWAMP CR	**OFF SR 1179 AT MOUTH**	**KB108**	**08/18/08**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.312500	-81.464444	10-1-24	Southern Crystalline Ridges and Mountains

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C:+	11	2820	8	0.3

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

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

Water Quality Parameters

Temperature (°C)	21.2
Dissolved Oxygen (mg/L)	7.1
Specific Conductance (µS/cm)	30
pH (s.u.)	6.4
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	11
Bottom Substrate (15)	10
Pool Variety (10)	10
Riffle Habitat (16)	10
Left Bank Stability (7)	2
Right Bank Stability (7)	6
Light Penetration (10)	7
Left Riparian Score (5)	2
Right Riparian Score (5)	3
Total Habitat Score (100)	66

Site Photograph

Substrate mix of bedrock, boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/18/08	10546	---	34	---	3.82	Good
08/19/03	9253	---	30	---	3.14	Good

Taxonomic Analysis

Macroinvertebrates collected in Pine Swamp Creek differed slightly between 2003 and 2008, with four more EPT taxa collected in the latter year. Taxa abundant in the sample were similar between 2003 and 2008, but rare and common taxa varied. New taxa that appeared in 2008 included the caddisflies *Ceratopsyche bronta, C. morosa* and the mayfly *Ephoron leukon*. The stonefly *Isoperla*, common in 2003, was not collected in 2008. The macroinvertebrate community residing in Pine Swamp Creek in 2008 appears to be slightly more pollution-tolerant than in 2003.

Data Analysis

Pine Swamp Creek at SR 1179 rated Good in 2008 despite the lack of a healthy riparian zone upstream. Active cow pastures and tree farms constitute a sizeable portion of the visible watershed upstream of the sampling reach. A large amount of silt was visible in this stream (30% of the substrate by visual estimation). Though more EPT taxa were found in 2008 than 2003, the Biotic Index for these macroinvertebrates was higher, suggesting a response to either chemical or physical stressors at the site.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
S BEAVER CR	**SR 1147**	**KB5**	**08/18/08**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.354167	-81.468056	10-1-25-2a	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr:+	3.0	3020	3	0.2

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

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

Water Quality Parameters

Temperature (°C)	16.3
Dissolved Oxygen (mg/L)	7.5
Specific Conductance (µS/cm)	48
pH (s.u.)	6.8

Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	15
Bottom Substrate (15)	12
Pool Variety (10)	6
Riffle Habitat (16)	14
Left Bank Stability (7)	7
Right Bank Stability (7)	2
Light Penetration (10)	10
Left Riparian Score (5)	5
Right Riparian Score (5)	0
Total Habitat Score (100)	75

Site Photograph

Substrate mix of bedrock, boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/18/08	10411	---	35	---	2.83	Good
08/21/03	9264	---	31	---	2.68	Good

Taxonomic Analysis

The taxa collected in 2008 from South Beaver Creek were very similar to those collected in 2003. The list of abundant taxa in both years were nearly identical. Addional taxa seen in 2008 were mostly rare in abundance with a few exceptions, such as the mayflies *Stenacron pallidum, Maccertium modestum* and *Leucrocuta* (all common in the sample). Generally, the macroinvertebrate community residing in this reach is pollution-sensitive and diverse.

Data Analysis

South Beaver Creek rated Good in 2008, the same rating as in 2003. One additional EPT taxon would have resulted in an Excellent bioclassification. Based on only two samples, the macroinvertebrate community at this site appears stable, diverse and pollution-sensitive. Drought conditions in 2008 resulted in most of the root mats being exposed. Typically, this type of habitat is heavily colonized by aquatic macroinvertebrates.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
OBIDS CR	**SR 1192**	**KB6**	**08/08/08**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.345278	-81.404444	10-1-27-(2)	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
WS-IV;Tr:+	8.7	2700	5	0.2

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

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

Water Quality Parameters

Temperature (°C)	18.5
Dissolved Oxygen (mg/L)	7.6
Specific Conductance (µS/cm)	38
pH (s.u.)	6.3
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	17
Bottom Substrate (15)	11
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	2
Right Bank Stability (7)	6
Light Penetration (10)	2
Left Riparian Score (5)	1
Right Riparian Score (5)	5
Total Habitat Score (100)	71

Site Photograph

Substrate mostly cobble with some boulder and gravel

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/08/08	10410	---	31	---	3.28	Good
08/19/03	9252	---	32	---	3.16	Good

Taxonomic Analysis

The EPT taxa collected from Obids Creek in 2008 are very similar to those from the 2003 collection. An exception to this was the baetid mayfly *Baetis tricaudatus* , which was abundant in 2003 and absent in 2008. Despite this, all six other taxa from the mayfly family Baetidae were found here in 2008. Other "missing" taxa in 2008 were the heptageniid mayflies *Maccaffertium pudicum* and *M. ithaca* , which were common and abundant respectively. One rare taxon, *Mystacides* nr *alafimbriata,* was found in 2008. Only 17 records of this species exist in the BAU database going back to 1985. Four of these records, however, are in the New River drainage. Overall, 31 EPT taxa were found in 2008, one fewer than the number in the 2003 collection.

Data Analysis

Obids Creek rated Good in 2008, the same rating as in 2003. The taxa collected in both years are generally intolerant to aquatic pollution. A slight increase in the EPT Biotic Index reflects the few taxonomic differences and abundances between 2003 and 2008. The open canopy here has resulted in a higher water temperature than other nearby sampled streams of similar size. Additionally, cattle appear to have direct access to the stream which could be limiting in-stream habitat quality.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
OBIDS CR	**SR 1192**	**05/09/08**	**KF13**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.345566	-81.4042353	10-1-27-(2)	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
WS-IV; Tr:+	8.3	2710	6	0.4	No

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

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

Water Quality Parameters

Temperature (°C)	15.5
Dissolved Oxygen (mg/L)	9.3
Specific Conductance (µS/cm)	37
pH (s.u.)	6.4

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	13
Pool Variety (10)	9
Riffle Habitat (16)	16
Left Bank Stability (7)	2
Right Bank Stability (7)	7
Light Penetration (10)	7
Left Riparian Score (5)	1
Right Riparian Score (5)	5
Total Habitat Score (100)	**84**

Site Photograph

Substrate Cobble, boulder, gravel, and silt

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/09/08	2008-37	17	50	Good

Most Abundant Species Mottled Sculpin and Central Stoneroller

Exotic Species Warpaint Shiner, Brown Trout, Rock Bass, Redbreast Sunfish, and Smallmouth Bass

Species Change Since Last Cycle **N/A**

Data Analysis

This is the first fish community sample collected at this site. **Watershed** -- drains southeastern Ashe County; no municipalities within the watershed; tributary to South Fork New River, site is ~ 600 ft. upstream from the creek's confluence with the river. **Habitat** -- high gradient riffles and plunge pools; *Rhododendron* - and Eastern Hemlock-lined banks; grasses and pastures in the riparian zones; unstable left bank; livestock with access to the stream. **2008** -- diversity of cyprinids and intolerant species were slightly lower than expected; proximity to the river enables the site to serve as a nursery area for Age 1 Rock Bass (n=124 collected) and Smallmouth Bass (n=26 collected); and two endemic species (Kanawha Darter and Appalachia Darter) were collected.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
ROAN CR	SR 1588	KB7	08/20/08	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.408056	-81.401944	10-1-31-(2)	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
WS-IV; Tr; CA:+	7.0	2660	7	0.2

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

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

Water Quality Parameters

Temperature (°C)	21.9
Dissolved Oxygen (mg/L)	7.5
Specific Conductance (µS/cm)	41
pH (s.u.)	6.9
Water Clarity	slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	3
Instream Habitat (20)	15
Bottom Substrate (15)	12
Pool Variety (10)	8
Riffle Habitat (16)	16
Left Bank Stability (7)	6
Right Bank Stability (7)	5
Light Penetration (10)	7
Left Riparian Score (5)	2
Right Riparian Score (5)	2
Total Habitat Score (100)	76

Site Photograph

Substrate mix of boulder, cobble, gravel and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/20/08	10558	---	32	---	3.18	Good
08/18/03	9245	---	44	---	3.03	Excellent
08/18/98	7741	---	39	---	2.61	Excellent
07/14/93	6271	---	39	---	3.02	Excellent

Taxonomic Analysis

Most taxonomic differences between 2003 and 2008 pertained to rare taxa. Exceptions to this were: the stone-cased caddisfly *Glossosoma,* which was abundant in 2003 but absent in 2008; the stoneflies *Isoperla* and *Malirekus hastatus* and the caddisfly *Rhyacophila fuscula,* which were all common in 2003 though absent in 2008. The caddisfly *Triaenodes ignitus* appeared here in 2008 (and was common in the sample) but had not been found in previous collections.

Data Analysis

Roan Creek declined from Excellent in the first three samples collected here from 1993 through 2003, to Good in 2008. Four additional EPT taxa would be required for the site to attain a classification of Excellent in 2008. The EPT Biotic Index suggests a slightly more pollution-tolerant macroinvertebrate community than in past years. Overall however, the species residing in this reach contribute to a pollution-sensitive macroinvertebrate community. Noticeable amounts of silt in 2008, (30% by visual estimation compared to 0% in 2003) may have reduced the number of EPT taxa residing here by filling benthic interstitial habitat.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
ROAN CR	SR 1588	05/19/08	KF20	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.407949	-81.401772	10-1-31-(2)	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
WS-IV, Tr, CA+	6.7	2694	5	0.3	No

	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
Visible Landuse (%)	30	15	55	0

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

Water Quality Parameters

Temperature (°C)	12.5
Dissolved Oxygen (mg/L)	10.4
Specific Conductance (µS/cm)	38
pH (s.u.)	6.1

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	8
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)	2
Right Riparian Score (5)	2
Total Habitat Score (100)	**77**

Site Photograph

Substrate gravel, cobble, sand, boulder.

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/19/08	2008-41	14	48	Good

Most Abundant Species Mottled Sculpin

Exotic Species Rock Bass, Smallmouth Bass, Brown Trout.

Species Change Since Last Cycle **N/A**

Data Analysis

New basinwide site. **Watershed** -- a tributary to the South Fork New River that drains the southeastern central edge of Ashe County, located southeast of Jefferson. **Habitats** -- good riffles and runs, with one good pool that was holding trout; moderately embedded substrates, but cattle are fenced out of the stream, allowing generally healthy banks; narrow vegetated riparian widths on both sides of the stream and a canopy that provides equal amounts of sun and shade. **2008** -- a very abundant (n=1273), fairly diverse, and trophically balanced community of mostly cool and cold water fish species was collected, including four intolerant taxa (Rock Bass, Smallmouth Bass, Kanawha Darter, and Appalachia Darter); Mottled Sculpin represented 53% of the sample; in light of the agricultural land use in the watershed and lasting drought conditions, this stream appears fairly healthy as indicated by its instream habitats, water parameters, and its abundance of fish.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
NAKED CR	NC 16/88	KB8	08/20/08	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.408889	-81.433333	10-1-32b	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C:+	7.1	2750	5	0.2

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

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

Water Quality Parameters

Temperature (°C)	24.4
Dissolved Oxygen (mg/L)	7.3
Specific Conductance (µS/cm)	122
pH (s.u.)	8.4
Water Clarity	slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	15
Bottom Substrate (15)	8
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	5
Right Bank Stability (7)	3
Light Penetration (10)	2
Left Riparian Score (5)	2
Right Riparian Score (5)	2
Total Habitat Score (100)	63

Site Photograph

Substrate a mix of boulder, cobble, gravel sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/20/08	10557	---	34	---	4.37	Good
08/19/03	9250	70	30	4.92	4.11	Good-Fair
08/18/98	7739	71	32	5.16	4.18	Good-Fair
07/14/93	6269	84	36	4.65	3.77	Good

Taxonomic Analysis

Naked Creek at NC 16-88 contains a typical benthic fauna for this part of the New River Basin. Abundant taxa collected in 2008 (and in most previous years) included the mayflies *Acentrella, Baetis flavistriga, Maccaffertium ithaca,* and *M. modestum*. Abundant caddisflies were *Ceratopsyche sparna, Cheumatopsyche, Hydropsyche betten*i and *Leucotrichia pictipes*. A few more EPT taxa were collected in 2008 than in recent samples. New taxa to this location in 2008 were the caddisflies *Neureclipsis, Oligostomis, Hydatophylax argus* and the stonefly *Pteronarcys proteus*.

Data Analysis

The few additional EPT taxa found in 2008 elevated this sample from Good-Fair to Good. Though this stream reach is entirely within an agricultural area (corn production), the headwaters of some small tributaries to this stream originate in Mount Jefferson State Park. A forested riparian buffer along this section of stream could aid in maintaining the Good bioclassification or possibly improving it.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
NAKED CR	OFF SR 1589 140 METERS UPSTREAM OF MOUTH	KB139	08/21/08	Good-Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.412902	-81.406828	10-1-32b	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C:+	13	2650	7	0.2

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	0	0	50	50 (golf course)

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

Water Quality Parameters

Temperature (°C)	20.8
Dissolved Oxygen (mg/L)	8.6
Specific Conductance (µS/cm)	140
pH (s.u.)	6.9
Water Clarity	slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	16
Bottom Substrate (15)	8
Pool Variety (10)	8
Riffle Habitat (16)	15
Left Bank Stability (7)	5
Right Bank Stability (7)	6
Light Penetration (10)	7
Left Riparian Score (5)	2
Right Riparian Score (5)	2
Total Habitat Score (100)	73

Site Photograph

Substrate: mix of boulder, cobble, gravel sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/21/08	10559	79	23	5.44	4.43	Good-Fair

Taxonomic Analysis

A greater number of taxa were collected here in 2008 compared with the former basinwide site in 2003. Coleoptera (beetles) and Gastropoda (snails) were the most notable groups that reflected greater diversity in 2008, with increases of five and four taxa respectively. Overall, most taxa collected in 2003 at the former basinwide site were also found in 2008 at the new site.

Compared with the upstream basinwide site on Naked Creek (at NC 16-88, which received a classification of Good), there were nine fewer EPT taxa. All abundant taxa collected upstream were found here. However, five taxa that were common in the upstream sample were absent at this site off SR 1589: the caddisflies *Neophylax consimilis, N. oligus,* and *Glossosoma;* and the mayflies *Epeorus vitreus* and *Maccaffertium pudicum*. The beetle *Cymbiodyta* (Hydrophilidae) was collected here in 2008; this is the first BAU record of the taxon in the New River drainage. This uncommon beetle has only been collected in 25 BAU samples since 1985.

Data Analysis

This site replaces the former basinwide site at SR 1585, which is about one stream-mile upstream. The former site is within a recently established gated community.

Naked Creek off SR 1589 rated Good-Fair in 2008, the same rating received at the former basinwide site at SR 1585 in 2003. The upstream basinwide site on Naked Creek at NC 16-88 rated Good in 2008. A golf course and the outfalls from two minor dischargers (Town of Jefferson WTP, permit NC0083470; Town of Jefferson WWTP, permit NC0021709) are situated between the upstream and downstream basinwide sites, and appear to have an effect on water quality at the downstream site.

According to the 2004 Basinwide Assessment Report, upgrades to the WWTP were ongoing at the time of sampling. The specific conductance measured 140 µmhos/cm in 2008, higher than in 2004 at SR 1585 (102 µmhos/cm). Also, habitat issues remain a problem here with large amounts of silt covering benthic surface and ongoing water withdrawals for lawn and golf course irrigation. At the time of the 2008 sampling event new homes were being constructed on the left side of the stream.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
NAKED CR	**off SR 1589**	**05/09/08**	**KF14**	**Fair**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.413027	-81.4070488	10-1-32b	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;+	12.4	2670	8	0.4	No

	Forested/Wetland	Suburban	Agriculture	Other (describe)
Visible Landuse (%)	40	30	30	0

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
Town of Jefferson WWTP	NC0021709	0.6

Water Quality Parameters

Temperature (°C)	15.6
Dissolved Oxygen (mg/L)	8.1
Specific Conductance (µS/cm)	104
pH (s.u.)	6.2
Water Clarity	Turbid

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	15
Bottom Substrate (15)	6
Pool Variety (10)	4
Riffle Habitat (16)	7
Left Bank Stability (7)	3
Right Bank Stability (7)	3
Light Penetration (10)	5
Left Riparian Score (5)	1
Right Riparian Score (5)	1
Total Habitat Score (100)	**50**

Site Photograph

Substrate Cobble, boulder, gravel, and silt

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/09/08	2008-36	20	36	Fair
06/09/98	98-55	12	34	Fair

Most Abundant Species Central Stoneroller

Exotic Species Warpaint Shiner, Brown Bullhead, Brown Trout, Rock Bass, Redbreast Sunfish, Pumpkinseed Sunfish, Smallmouth Bass, and Largemouth Bass

Species Change Since Last Cycle

Gains -- Spotfin Shiner, Warpaint Shiner, Spottal Shiner, Kanawha Rosyface Shiner, Brown Bullhead, Brown Trout, Redbreast Sunfish, Pumpkinseed Sunfish, Smallmouth Bass, Largemouth Bass, and Greenside Darter.
Losses -- Blacknose Dace, Creek Chub, and Bluegill.

Data Analysis

1998 site was ~2.2 miles upstream at NC 16/88. **Watershed** -- drains south-central Ashe County, including the Town of Jefferson; golf course residential community is within the immediate watershed; WWTP discharge is ~ 2 miles upstream; tributary to the South Fork New River; site is ~ 700 ft. upstream from the creek's confluencewith the river. **Habitat** -- lowest total habitat scores of any fish site in the basin in 2008; runs, riffles, slick periphyton; eroded vertical banks; open canopy within the golf course. **2008** -- diversities of darters, cyprinids, and intolerant species were lower than expected; the percentage of tolerant fish (primarily White Sucker and Redbreast Sunfish) was elevated for a mountain stream; high percentage of Omnivores+Herbivores; proximity to the river enables the site to serve as a nursery area for Age 1 Rock Bass (n=250) and a source of temporary migrants (Spotfin Shiner, Warpaint Shiner, Spottail Shiner, Kanawha Rosyface Shiner, and Greenside Darter); and the most nonindigenous species and the second greatest conductivity at any fish site in the basin in 2008. **1998 & 2008** -- 23 species known from the stream, including 2 endemic and 9 nonindigenous species.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
PEAK CR	**OFF SR 1599 350 METERS UPSTREAM OF ORE KNOB BR**	**KB11**	**06/19/08**	**Excellent**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.420833	-81.319444	10-1-35-(2)a	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
B;Tr:+	9.0	2700	6	0.2

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

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

Water Quality Parameters

Temperature (°C)	18.0
Dissolved Oxygen (mg/L)	8.3
Specific Conductance (µS/cm)	38
pH (s.u.)	6.3
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	20
Bottom Substrate (15)	12
Pool Variety (10)	10
Riffle Habitat (16)	16
Left Bank Stability (7)	6
Right Bank Stability (7)	7
Light Penetration (10)	10
Left Riparian Score (5)	2
Right Riparian Score (5)	5
Total Habitat Score (100)	93

Site Photograph

Substrate mix of bedrock, boulder, cobble, gravel and sand

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
06/19/08	10473	---	44	---	2.32	Excellent
08/18/03	9248	---	31	---	2.53	Good
08/19/98	7746	---	35	---	2.77	Good
04/08/96	7032	74	37*	4.01*	2.47	Excellent
07/15/93	6275	---	35	---	2.61	Good

* values corrected for seasonality

Taxonomic Analysis

A diverse and pollution-sensitive aquatic community resides in this section of Peak Creek (above the confluence of Peak Creek and Ore Knob Branch). In 2008, the number of EPT taxa was higher than in recent collections here (an April 1991 Full Scale sample yielded 50 EPT). Generally, the aquatic macroinvertebrate community was similar to past samples with abundant, pollution-sensitive taxa such as: the mayflies *Drunella cornutella, Paraleptophlebia, Stenacron pallidum,* and *Heptagenia*; and the caddisflies *Glossosoma, Ceratopsyche slossonae, Dolophilodes,* and *Neophylax oligius*. In 2008 an extremely rare caddisfly, *Hydropsyche carolina*, was found in Peak Creek. Only one other record exists for this taxon in the North Carolina BAU database going back to 1983.

Data Analysis

This section of Peak Creek rated Excellent in 2008. The second highest EPT totals and the lowest EPT Biotic Index summarize the 2008 sample here and highlight the high water quality conditions in this stream. An undisturbed riparian zone, diverse in-stream benthic surfaces and a mostly forested watershed have resulted in favorable conditions for macroinvertebrate colonization in this stream (as indicated by the high habitat score received).

The location name for this site was formerly "SR 1599."

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
PEAK CR	SR 1599 DOWNSTREAM OF ORE KNOB BRANCH	KB13	08/21/08	Poor

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.425000	-81.325000	10-1-35-(2)b	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
B;Tr:+	11	2680	8	0.3

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

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

Water Quality Parameters

Temperature (°C)	19.3
Dissolved Oxygen (mg/L)	8.7
Specific Conductance (µS/cm)	170
pH (s.u.)	3.1

Water Clarity: slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	16
Bottom Substrate (15)	3
Pool Variety (10)	10
Riffle Habitat (16)	16
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)	82

Site Photograph

Substrate: mix of bedrock, boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/21/08	10561	---	3	---	2.62	Poor
08/18/03	9247	---	6	---	1.91	Poor
01/13/99	7798	---	5*	---	1.60	Poor
08/19/98	7747	---	23	---	3.10	Good-Fair
04/08/96	7026	30	14*	4.18*	2.10	Fair

* values corrected for seasonality

Taxonomic Analysis

In 2008 only three EPT taxa were collected: *Pycnopsyche gentilis* (one specimen), a second unidentified species of *Pycnopsyche* (three specimens), and *Hydropsyche venularis* (one specimen). Precipitate from acid mine drainage covered the caddisflies and/or their cases. It is quite apparent that the benthic community is very highly stressed at the site.

Data Analysis

This reach of Peak Creek, below the confluence of Ore Knob Branch, received the same classification of Poor in 2008 as in 2003. It appears that in both wet and dry years the highly stressed macroinvertebrate community here borders on extirpation. As seen in the photo, an orange precipitate covered all instream surfaces. The 2004 Basinwide Assessment Report stated that proposed mitigation efforts were planned (in 2004). Unfortunately that work was not initiated, though site stabilization efrorts continue at the mine site itself. Approximately one mile upstream of this site is station KB 11, which earned a classification of Excellent in 2008. Despite the diverse aquatic community residing just upstream, this reach continues to suffer from the acid mine drainage received from Ore Knob Branch.

The location name for this site was formerly "BIG PEAK CR RD."

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
L PEAK CR	SR 1595	KB14	08/21/08	Poor

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.427778	-81.344444	10-1-35-4	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
B;Tr:+	2.3	2615	3	0.1

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

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

Water Quality Parameters

Temperature (°C)	17.8
Dissolved Oxygen (mg/L)	7.7
Specific Conductance (µS/cm)	76
pH (s.u.)	5.9
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	3
Instream Habitat (20)	18
Bottom Substrate (15)	12
Pool Variety (10)	5
Riffle Habitat (16)	16
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)	86

Site Photograph

Substrate mix of boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/21/08	10560	---	7	---	2.12	Poor
08/19/03	9249	---	6	---	1.95	Poor
08/19/98	7744	---	7	---	2.02	Poor
04/08/96	7030	16	6*	3.58*	1.77	Poor
04/16/91	5551	---	5	---	2.01	Poor

*values corrected for seasonality

Taxonomic Analysis

Only seven EPT taxa were found in Little Peak Creek in 2008. Abundant taxa collected here were similar to previous samples (*Leuctra, Tallaperla*, and *Diplectrona modesta*). Three larger-bodied case caddisflies were present (all common in the sample): *Hydatophylax, Pycnopsyche gentilis,* and a second unidentifed species of *Pycnopsyche*. Acid mine drainage from Ore Knob continues to suppress macroinvertebrate diversity and densities here.

Data Analysis

Little Peak Creek rated Poor in 2008, the same rating that it has always received. Acid mine drainage creates a toxic situation for aquatic macroinvertebrates here.

By current BAU protocols this site would not be assigned a classification due to the small drainage area. However, due to the depauperate benthic community, in the judgment of BAU biologists the site is among the worst in the state and the classification is justified.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
CRANBERRY CR	SR 1603	KB15	08/21/08	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.456389	-81.315000	10-1-37	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
B;Tr:+	35	2585	13	0.2

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

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

Water Quality Parameters

Temperature (°C)	22.5
Dissolved Oxygen (mg/L)	7.9
Specific Conductance (µS/cm)	41
pH (s.u.)	6.9
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	13
Bottom Substrate (15)	11
Pool Variety (10)	6
Riffle Habitat (16)	15
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	7
Left Riparian Score (5)	3
Right Riparian Score (5)	3
Total Habitat Score (100)	75

Site Photograph

Substrate mix of boulder, cobble, gravel, sand and silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/21/08	10562	93	45	3.96	3.07	Excellent
08/18/03	9246	106	52	4.08	3.07	Excellent
08/19/98	7748	79	42	3.78	3.11	Excellent

Taxonomic Analysis

Cranberry Creek contained a large number of aquatic macroinvertebrate taxa in 2008. The species composition was similar to the 1998 and 2003 collections. Abundant taxa at this site in 2008 included: *Dolophilodes, Neophylax oligius, Paraleptophlebia,* and *Neoephemera purpurea*.

Data Analysis

Cranberry Creek rated Excellent in 2008. Total taxa and EPT taxa numbers were similar among all three samples collected here. The Biotic Index indicates a pollution-sensitive community residing in this lower section of Cranberry Creek. This watershed contains a large number of tree farms with some mixed agriculture and residences.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
CRANBERRY CR	SR 1600	05/08/08	KF2	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.46944444	-81.32694444	10-1-37	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;+	36.8	2560	14	0.4	No

	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
Visible Landuse (%)	20	55	25	0

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

Water Quality Parameters

Temperature (°C)	15.4
Dissolved Oxygen (mg/L)	9.1
Specific Conductance (µS/cm)	39
pH (s.u.)	5.7

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	16
Bottom Substrate (15)	8
Pool Variety (10)	4
Riffle Habitat (16)	14
Left Bank Stability (7)	2
Right Bank Stability (7)	3
Light Penetration (10)	0
Left Riparian Score (5)	1
Right Riparian Score (5)	1
Total Habitat Score (100)	**53**

Site Photograph

Substrate Cobble, gravel, sand, and boulders

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/08/08	2008-33	22	56	Good
06/30/98	98-59	20	60	Excellent

Most Abundant Species Mottled Sculpin and Bluehead Chub

Exotic Species Warpaint Shiner, Redlip Shiner, Tennessee Shiner, Saffron Shiner, Rock Bass, and Smallmouth Bass

Species Change Since Last Cycle **Gains --** Tonguetied Minnow, Warpaint Shiner, Tennessee Shiner, Saffron Shiner, Kanawha Rosyface Shiner, and Creek Chub. **Losses --** Western Blacknose Dace, White Sucker, Brown Trout, and Greenside Darter.

Data Analysis

Watershed -- drains eastern Ashe County; no municipalities within the watershed; tributary to South Fork New River, site is ~ 1 mile upstream of the creek's confluence with the river. **Habitat** -- straight channel, stream widening is occurring; 100% open canopy; very narrow riparian zones; unstable banks with high erosion potential; and shallow pools; a popular fishing site. **2008** -- more total species, species of cyprinids (15), and intolerant species (9) were collected at this site than at any other site, except for at the South Fork New River (also 22 species). **1998 & 2008** -- twice as many fish collected in 2008 than in 1998; a very diverse fish community is present, 26 species known from the site, including 16 species of cyprinids, 4 species of darters, 6 endemic species (Tonguetied Minnow, New River Shiner, Kanawha Rosyface Shiner, Kanawha Minnow, Kanawha Darter, and Appalachia Darter), and 7 nonindigenous species; and species present in 1998, but absent in 2008 were represented by 1-5 fish/species.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
PRATHERS CR	off SR 1302	05/07/08	KF15	Good-Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	1	05050001	36.4967511	-81.3205856	10-1-38	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
B;Tr	13.7	2520	7	0.4	No

	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
Visible Landuse (%)	50	10	40	0

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

Water Quality Parameters

Temperature (°C)	17.2
Dissolved Oxygen (mg/L)	8.7
Specific Conductance (µS/cm)	42
pH (s.u.)	7.2

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	14
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	4
Right Bank Stability (7)	4
Light Penetration (10)	4
Left Riparian Score (5)	2
Right Riparian Score (5)	2
Total Habitat Score (100)	**75**

Site Photograph

Substrate Cobble and boulder

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/07/08	2008-32	19	46	Good-Fair

Most Abundant Species Central Stoneroller

Exotic Species Warpaint Shiner, Redlip Shiner, Tennessee Shiner, Saffron Shiner, Brown Trout, Rock Bass, and Smallmouth Bass

Species Change Since Last Cycle **N/A**

Data Analysis

This is the first fish community sample collected at this site. **Watershed** -- drains western Alleghany County; no municipalities within the watershed; much of watershed is with livestock pasture, no riparian zones, and an open canopy; tributary to South Fork New River, site is ~ 750 ft. upstream from the creek's confluence with the river. **Habitat** -- high gradient stream, primarily riffles, runs, and some plunge pools; fairly open canopy; narrow riparian zones. **2008** -- Central Stoneroller accounted for 57% of all the fish collected; high percentage of Omnivores+Herbivores, indicative of nonpoint source nutrients and an open canopy; and two endemic species (Kanawha Rosyface Shiner and Kanawha Darter) were present.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
GRASSY CR	SR 1549	05/08/08	KF16	Good-Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ASHE	1	05050001	36.5522927	-81.355517	10-3	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr:+	10.6	2480	8	0.3	No

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	90	0	0	10 (South Fork New River)

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

Water Quality Parameters

Temperature (°C)	18.0
Dissolved Oxygen (mg/L)	8.5
Specific Conductance (µS/cm)	84
pH (s.u.)	7.7
Water Clarity	Very slightly turbid (easily silted)

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	14
Pool Variety (10)	8
Riffle Habitat (16)	16
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	9
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	**95**

Site Photograph

Substrate Cobble, boulder, and silts on the rocks

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/08/08	2008-35	18	40	Good-Fair

Most Abundant Species Bluehead Chub and Central Stoneroller

Exotic Species Redlip Shiner, Saffron Shiner, Brown Trout, Rock Bass, Green Sunfish, and Smallmouth Bass

Species Change Since Last Cycle **N/A**

Data Analysis

This is the first fish community sample collected at this site. **Watershed** -- drains southern Grayson County, VA and northeast corner of Ashe County; no municipalities within the watershed; tributary to the New River, site is ~ 50 ft. from the creek's confluence with the river. **Habitat** -- greatest habitat score of any fish community site in the basin in 2008, although much of the watershed is without canopy cover in pasture with cattle; high gradient boulder plunge pools; site is atypical. **2008** -- 82% of all the fish collected were Bluehead Chub, Central Stoneroller, and Mountain Redbelly Dace; very high percentage of Omnivores+Herbivores were collected, indicative of nonpoint sources of nutrients and open canopy upstream of the reach; proximity to the river enables the site to serve as a nursery area for Age 1 Rock Bass and Smallmouth Bass; one endemic species (Appalachia Darter) was collected; and the greatest pH of any fish community site in the basin in 2008 due to photosynthetic activity by the upstream periphyton.

Appendix 2-C

Ambient Monitoring Systems
Station Data Sheets

Station ID	Waterbody	AU#	Location	Impaired (By Parameter)	Impacted (By Parameter)
K2100000	South Fork New R.	10-1-(3.5)	US 221/421 at Perkinsville	Fecal Coliform (10.9%)	---
K3250000	South Fork New R.	10-1-(26)	NC 16/88 near Jefferson	---	Fecal Coliform (7.1%)
K4500000	South Fork New R.	10-1-(33.5)	US 221 near Scottville	Copper (11.1%) Iron (22.2%) Zinc (11.1%)	---

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

Location: S FORK NEW RIV AT US 221 AND 421 AT PERKINSVILLE
Station #: K2100000 **Hydrologic Unit Code:** 05050001
Latitude: 36.22088 **Longitude:** -81.63978 **Stream class:** C +
Agency: NCAMBNT **NC stream index:** 10-1-(3.5)

Time period: 01/27/2005 to 12/16/2009

	# results	# ND	EL	Results not meeting EL #	%	%Conf	Percentiles Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	57	0	<4	0	0		7.6	8.2	8.5	9.8	11.8	13	13.7
	57	0	<5	0	0		7.6	8.2	8.5	9.8	11.8	13	13.7
pH (SU)	57	0	<6	0	0		6.7	6.9	7.2	7.5	7.8	7.9	8.4
	57	0	>9	0	0		6.7	6.9	7.2	7.5	7.8	7.9	8.4
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				86	101	118	156	179	219	310
Water Temperature (°C)	57	0	>29	0	0		1.8	3.5	6.9	14	19.1	20.8	25.7
Other													
TSS (mg/L)	18	10	N/A				2.5	2.5	3	5.5	6.2	24.8	68
Turbidity (NTU)	57	4	>50	2	3.5		1	1	1.5	2.3	4.5	9.9	150
Nutrients (mg/L)													
NH3 as N	57	38	N/A				0.02	0.02	0.02	0.02	0.02	0.04	0.08
NO2 + NO3 as N	57	0	N/A				0.24	0.98	1.3	1.7	2.15	3	3.9
TKN as N	57	15	N/A				0.2	0.2	0.2	0.24	0.28	0.38	0.89
Total Phosphorus	57	0	N/A				0.03	0.04	0.06	0.1	0.2	0.26	0.48
Metals (ug/L)													
Aluminum, total (Al)	10	2	N/A				50	50	60	83	114	206	210
Arsenic, total (As)	10	10	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	10	10	>2	0	0		1	1	1.8	2	2	2	2
Chromium, total (Cr)	10	10	>50	0	0		10	10	21	25	25	25	25
Copper, total (Cu)	10	7	>7	0	0		2	2	2	2	2	3	3
Iron, total (Fe)	10	0	>1000	0	0		190	191	230	265	325	487	500
Lead, total (Pb)	10	10	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	8	8	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	10	10	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	10	4	>50	0	0		10	10	10	11	16	21	21

Fecal Coliform Screening(#/100mL)

# results:	Geomean:	# > 400:	% > 400:	%Conf:
55	89.1	6	10.9	

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

Location: S FORK NEW RIV AT NC 16 AND 88 NR JEFFERSON

Station #: K3250000 **Hydrologic Unit Code:** 05050001

Latitude: 36.39473 **Longitude:** -81.40750 **Stream class:** WS-IV HQW

Agency: NCAMBNT **NC stream index:** 10-1-(26)

Time period: 02/01/2005 to 12/17/2009

	# results	# ND	EL	Results not meeting EL #	%	%Conf	Percentiles Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<4	0	0		7.6	8.3	8.5	9.8	11.5	13.1	14.6
	58	0	<5	0	0		7.6	8.3	8.5	9.8	11.5	13.1	14.6
pH (SU)	58	0	<6	0	0		6.7	7.1	7.4	7.7	8.1	8.6	9.4
	58	0	>9	2	3.4		6.7	7.1	7.4	7.7	8.1	8.6	9.4
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				45	61	68	73	80	100	656
Water Temperature (°C)	58	0	>29	0	0		2.3	4.7	8.2	15.4	21.9	24.4	27.1
Other													
TSS (mg/L)	18	9	N/A				2.5	2.5	3.9	6.2	6.6	68.4	576
Turbidity (NTU)	58	2	>50	3	5.2		1	1.2	1.7	2.8	5.2	22	380
Nutrients (mg/L)													
NH3 as N	58	40	N/A				0.02	0.02	0.02	0.02	0.02	0.04	0.12
NO2 + NO3 as N	58	0	>10	0	0		0.15	0.38	0.51	0.6	0.77	0.85	1
TKN as N	56	25	N/A				0.2	0.2	0.2	0.2	0.26	0.37	2.5
Total Phosphorus	58	11	N/A				0.02	0.02	0.02	0.02	0.03	0.05	3.8
Metals (ug/L)													
Aluminum, total (Al)	9	0	N/A				110	110	120	150	200	310	310
Arsenic, total (As)	9	9	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	9	9	>2	0	0		1	1	2	2	2	2	2
Chromium, total (Cr)	9	9	>50	0	0		10	10	25	25	25	25	25
Copper, total (Cu)	9	8	>7	0	0		2	2	2	2	2	2	2
Iron, total (Fe)	9	0	>1000	0	0		200	200	220	280	380	480	480
Lead, total (Pb)	9	9	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	8	0	>200	0	0		14	14	16	18	22	29	29
Mercury, total (Hg)	8	8	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	9	9	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	9	8	>50	0	0		10	10	10	10	10	10	10

Fecal Coliform Screening(#/100mL)

# results:	Geomean:	# > 400:	% > 400:	%Conf:
56	21.8	4	7.1	

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: S FORK NEW RIV AT US 221 NR SCOTTVILLE
Station #: K4500000 **Hydrologic Unit Code:** 05050001
Latitude: 36.47378 **Longitude:** -81.33649 **Stream class:** B ORW
Agency: NCAMBNT **NC stream index:** 10-1-(33.5)

Time period: 02/01/2005 to 12/17/2009

	# results	# ND	EL	Results not meeting EL #	%	%Conf	Percentiles Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<4	0	0		5.6	7.9	8.5	9.5	11.4	13.4	14.6
	58	0	<5	0	0		5.6	7.9	8.5	9.5	11.4	13.4	14.6
pH (SU)	58	0	<6	0	0		6.6	7	7.4	7.7	8	8.4	9
	58	0	>9	0	0		6.6	7	7.4	7.7	8	8.4	9
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				35	56	68	72	78	83	148
Water Temperature (°C)	58	0	>29	0	0		1.1	4	8	15.4	22.6	25.6	27
Other													
TSS (mg/L)	19	10	N/A				2.5	2.5	6.2	6.2	14	48	354
Turbidity (NTU)	58	3	>50	4	6.9		1	1.2	1.7	3.1	6.6	27.4	260
Nutrients (mg/L)													
NH3 as N	57	42	N/A				0.02	0.02	0.02	0.02	0.02	0.03	0.1
NO2 + NO3 as N	57	0	N/A				0.08	0.33	0.45	0.62	0.74	0.86	0.95
TKN as N	56	26	N/A				0.2	0.2	0.2	0.2	0.26	0.4	3
Total Phosphorus	57	10	N/A				0.02	0.02	0.02	0.02	0.04	0.08	0.8
Metals (ug/L)													
Aluminum, total (Al)	9	0	N/A				64	64	92	200	1765	17000	17000
Arsenic, total (As)	9	9	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	9	9	>2	0	0		1	1	2	2	2	2	2
Chromium, total (Cr)	9	9	>50	0	0		10	10	25	25	25	25	25
Copper, total (Cu)	9	6	>7	1	11.1		2	2	2	2	3	24	24
Iron, total (Fe)	9	0	>1000	2	22.2		280	280	335	470	1925	20000	20000
Lead, total (Pb)	9	8	>25	0	0		10	10	10	10	10	15	15
Mercury, total (Hg)	8	8	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	9	8	>88	0	0		10	10	10	10	10	12	12
Zinc, total (Zn)	9	5	>50	1	11.1		10	10	10	10	13	71	71

Fecal Coliform Screening(#/100mL)

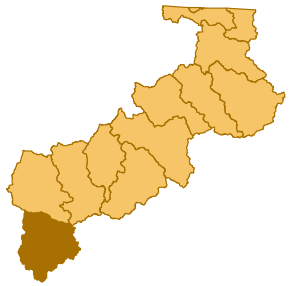
# results:	Geomean:	# > 400:	% > 400:	%Conf:
56	16.5	3	5.4	

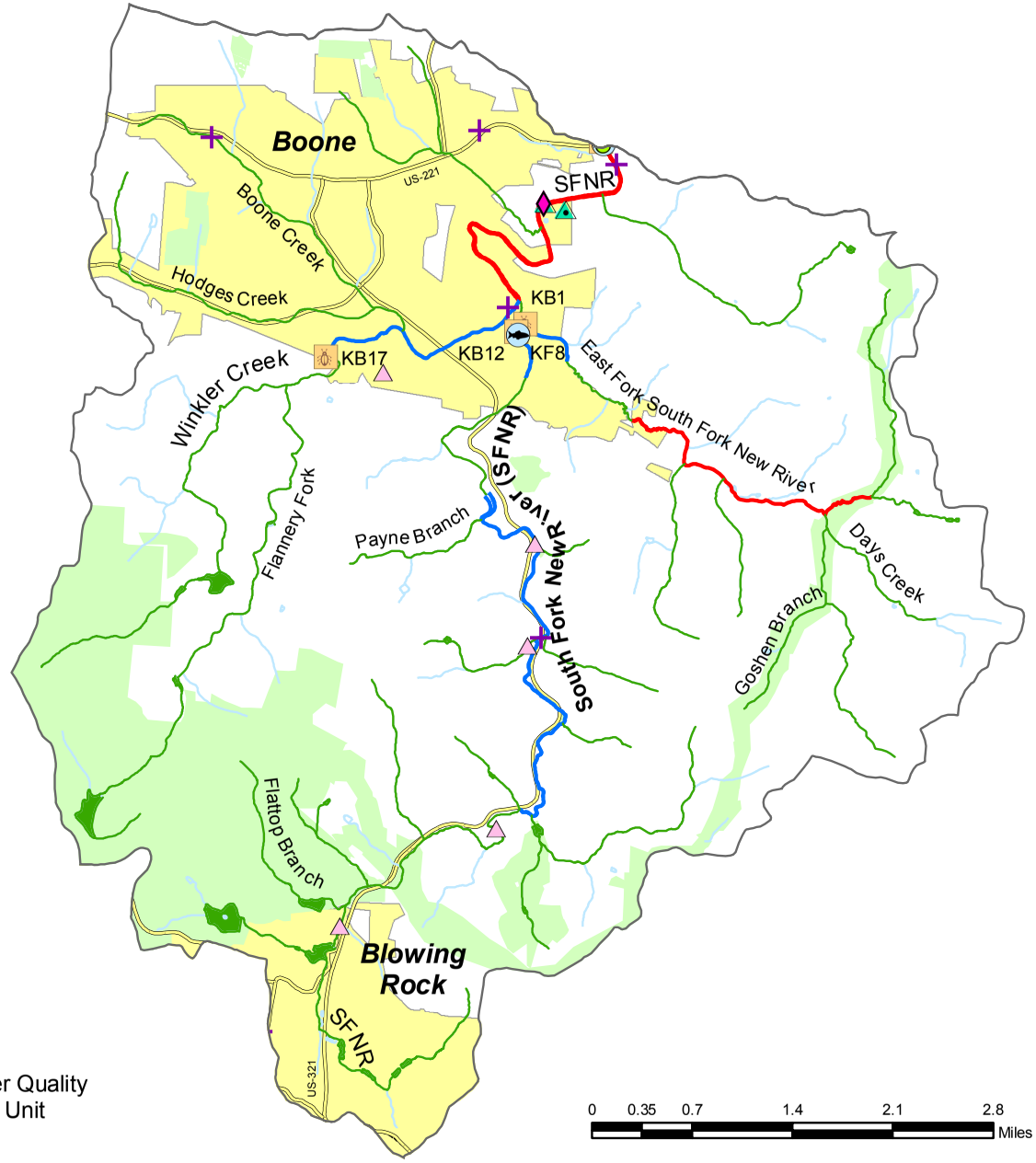
Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : 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

Appendix 2-D

12-Digit Subwatershed Maps

Headwaters South Fork New River Subwatershed (050500010201)





NC Division of Water Quality
Basinwide Planning Unit
January 2011

Legend

- 12-Digit HUCs
- County Boundary
- Municipalities
- Conservation Land
- Major Roads
- Hydrology

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

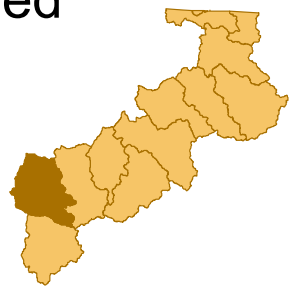
Monitoring Stations

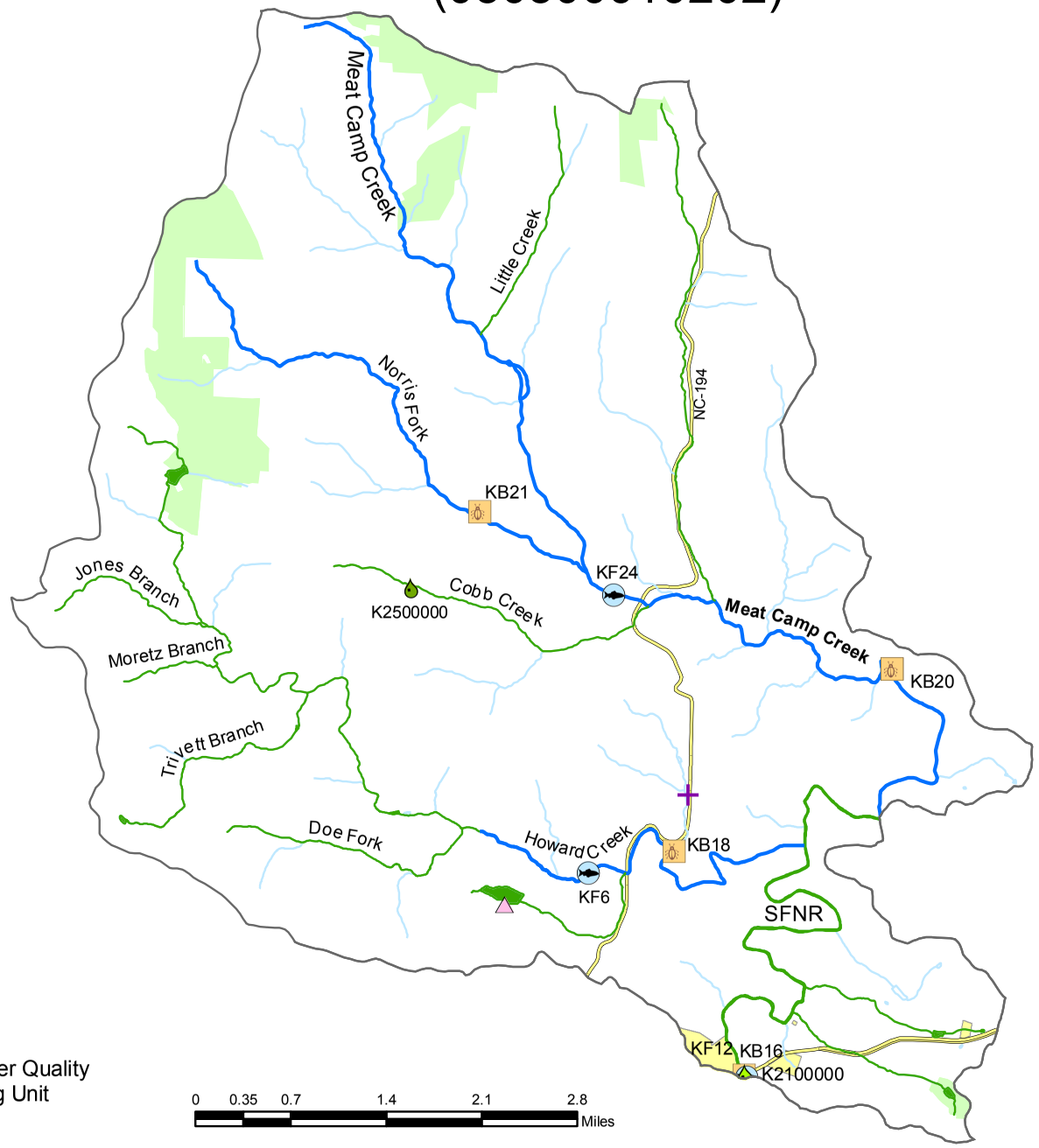
- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater

Meat Camp Creek-South Fork New River Subwatershed (050500010202)





Legend

- 12-Digit HUCs
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- Municipalities
- Conservation Land
- Major Roads
- Hydrology

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

Monitoring Stations

- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

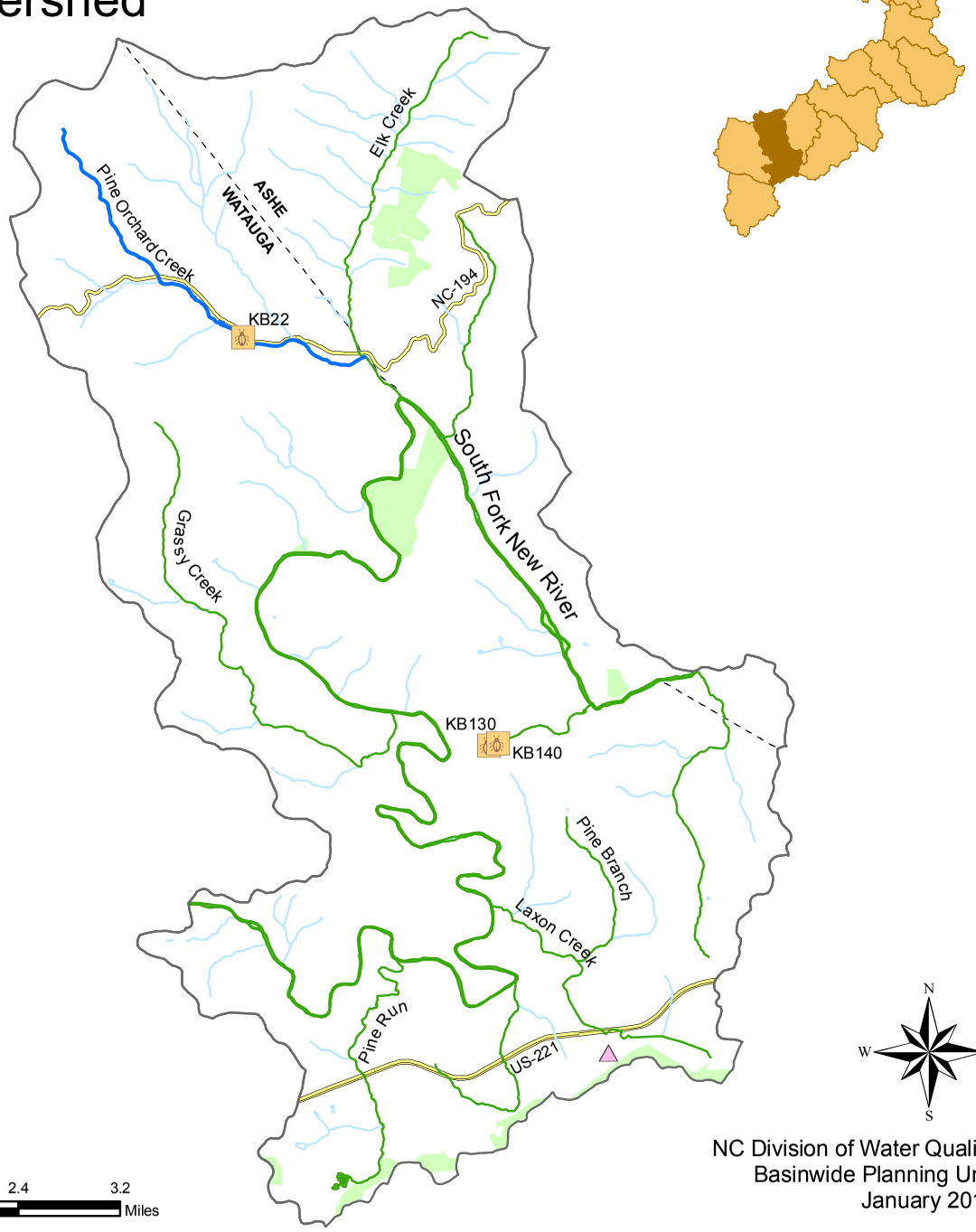
Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater

NC Division of Water Quality
Basinwide Planning Unit
January 2011

2-D.4

Elk Creek-SFNR Subwatershed (050500010203)



Legend

- 12-Digit HUCs
- County Boundary
- Municipalities
- Conservation Land
- Major Roads
- Hydrology

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

Monitoring Stations

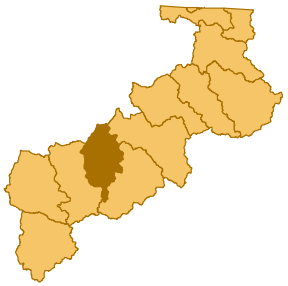
- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

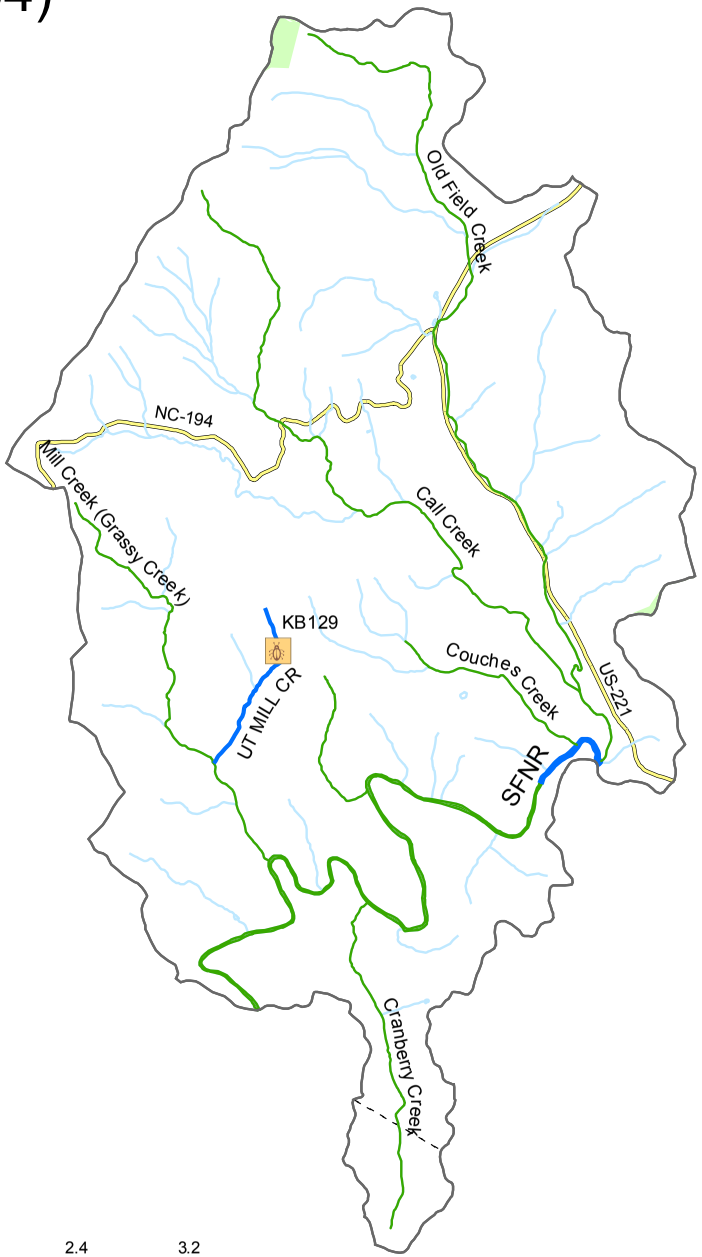
Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater

NC Division of Water Quality
Basinwide Planning Unit
January 2011

Old Fields Creek-SFNR Subwatershed (050500010204)





Legend

- 12-Digit HUCs
- County Boundary
- Municipalities
- Conservation_Land
- Major Roads
- Hydrology

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

Monitoring Stations

- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater

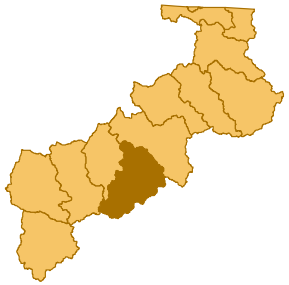
0 0.4 0.8 1.6 2.4 3.2 Miles

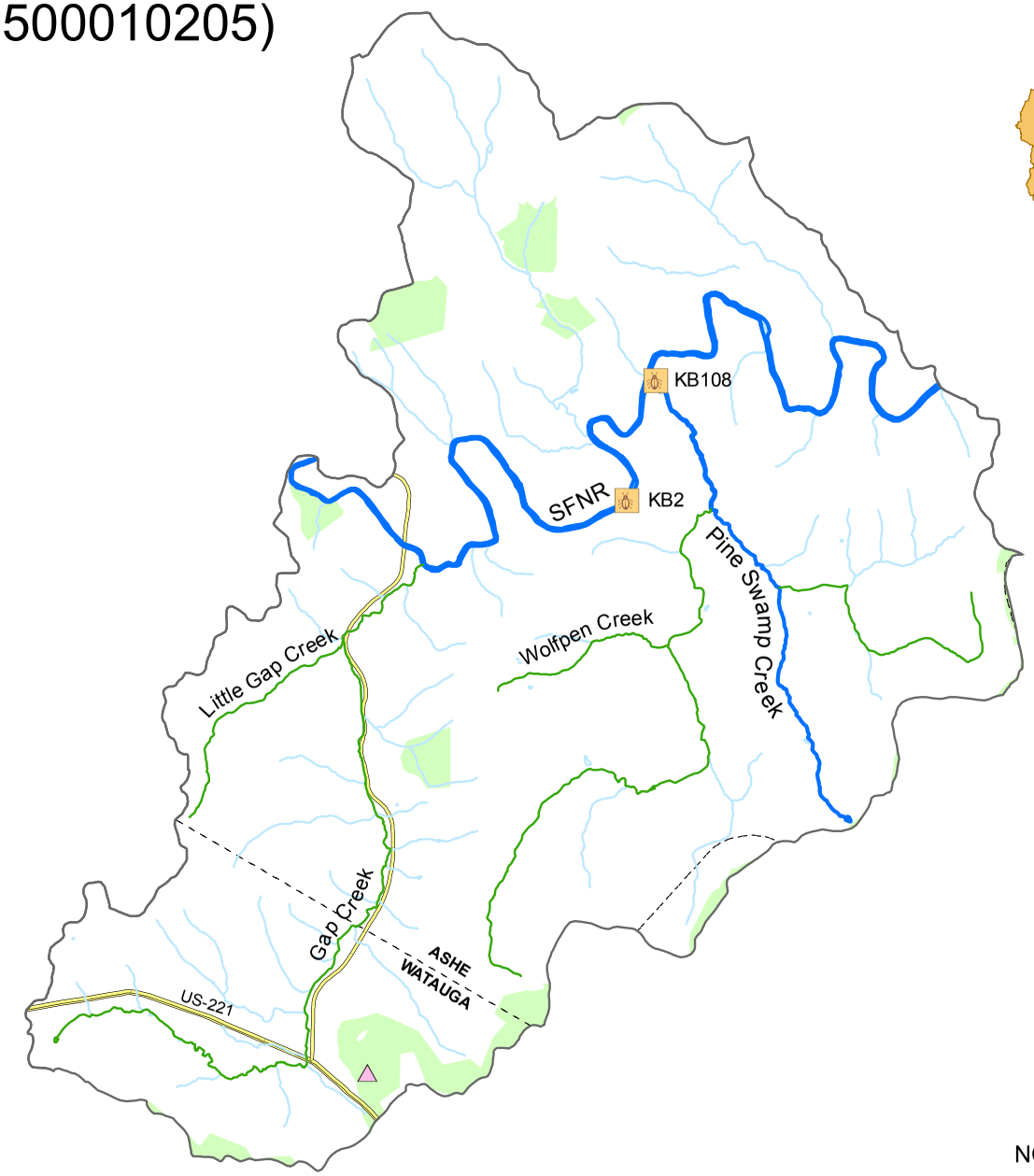
N W E S

NC Division of Water Quality
Basinwide Planning Unit
January 2011

2-D.6

Pine Swamp Creek-SFNR Subwatershed (050500010205)





Legend

- 12-Digit HUCs
- County Boundary
- Municipalities
- Conservation_Land
- Major Roads
- Hydrology

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

Monitoring Stations

- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater

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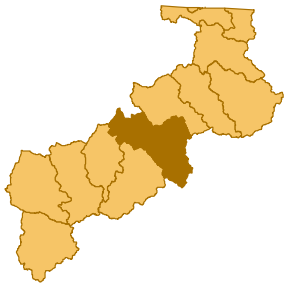
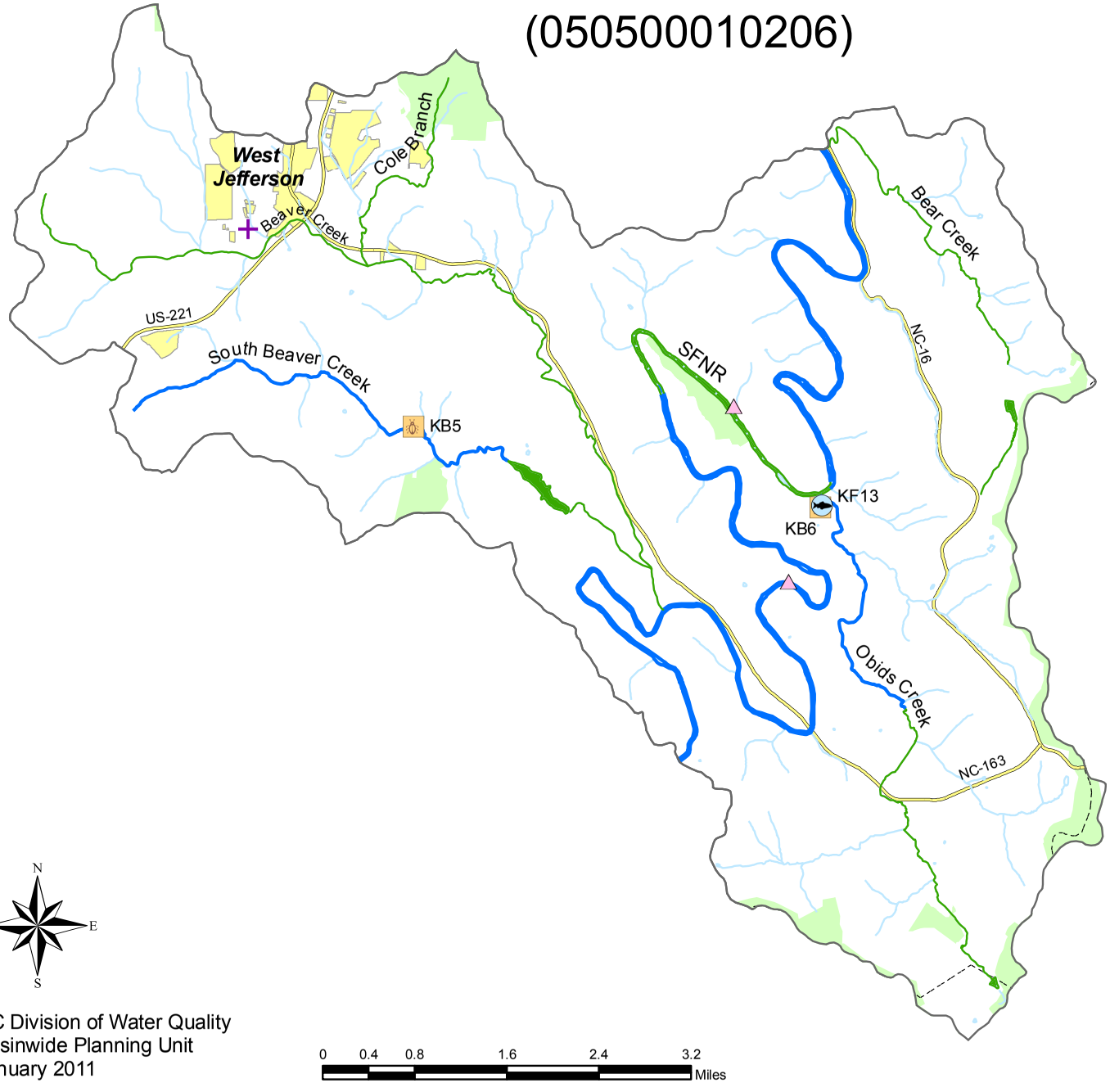
S

NC Division of Water Quality
Basinwide Planning Unit
January 2011

Beaver Creek-SFNR Subwatershed (050500010206)





Legend

- 12-Digit HUCs
- County Boundary
- Municipalities
- Conservation_Land
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- Hydrology

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

Monitoring Stations

- Random Ambient Stations
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- Fish Community
- Benthos
- USGS Gages

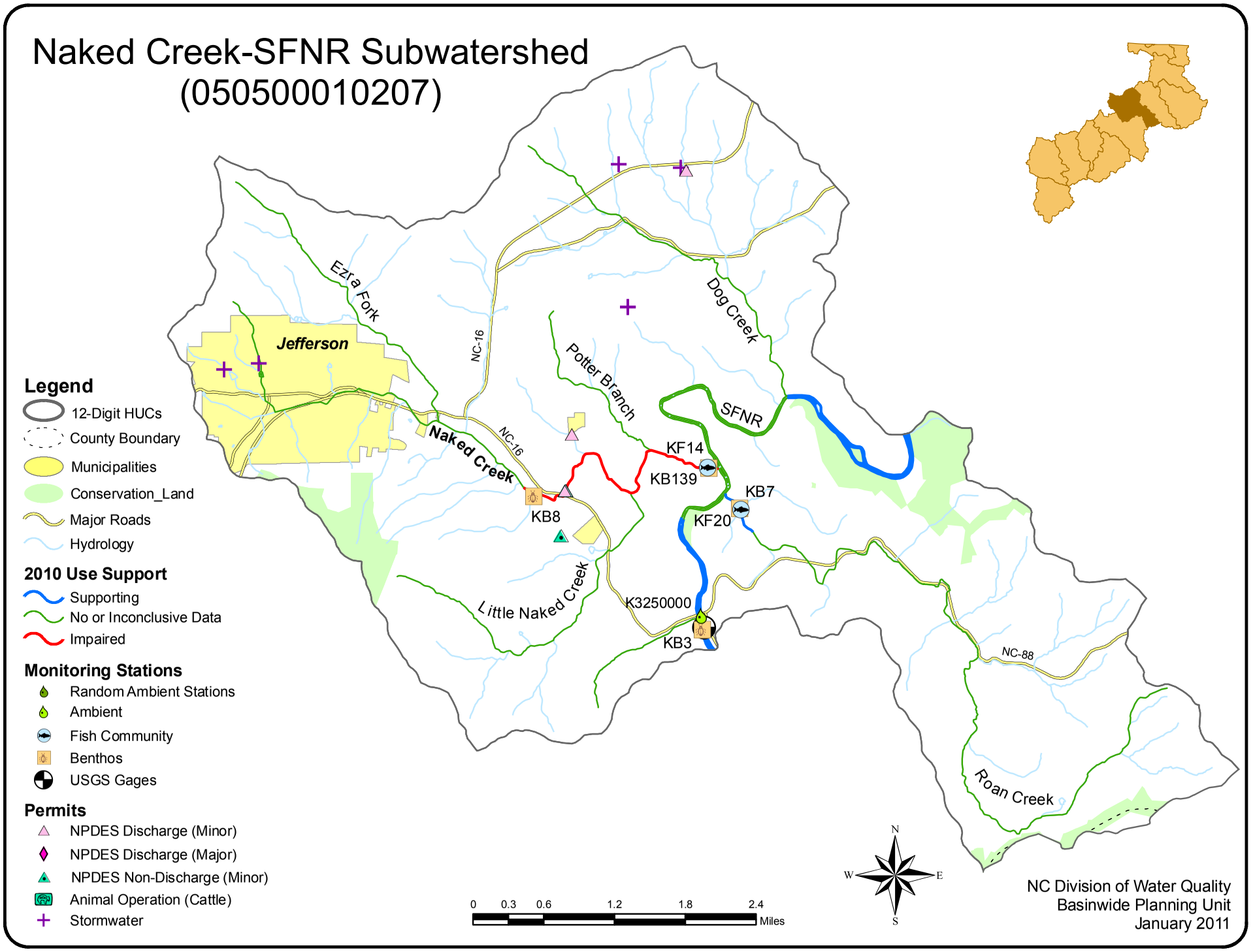
Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater

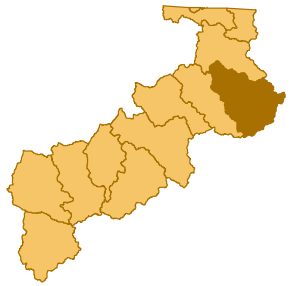
NC Division of Water Quality
Basinwide Planning Unit
January 2011

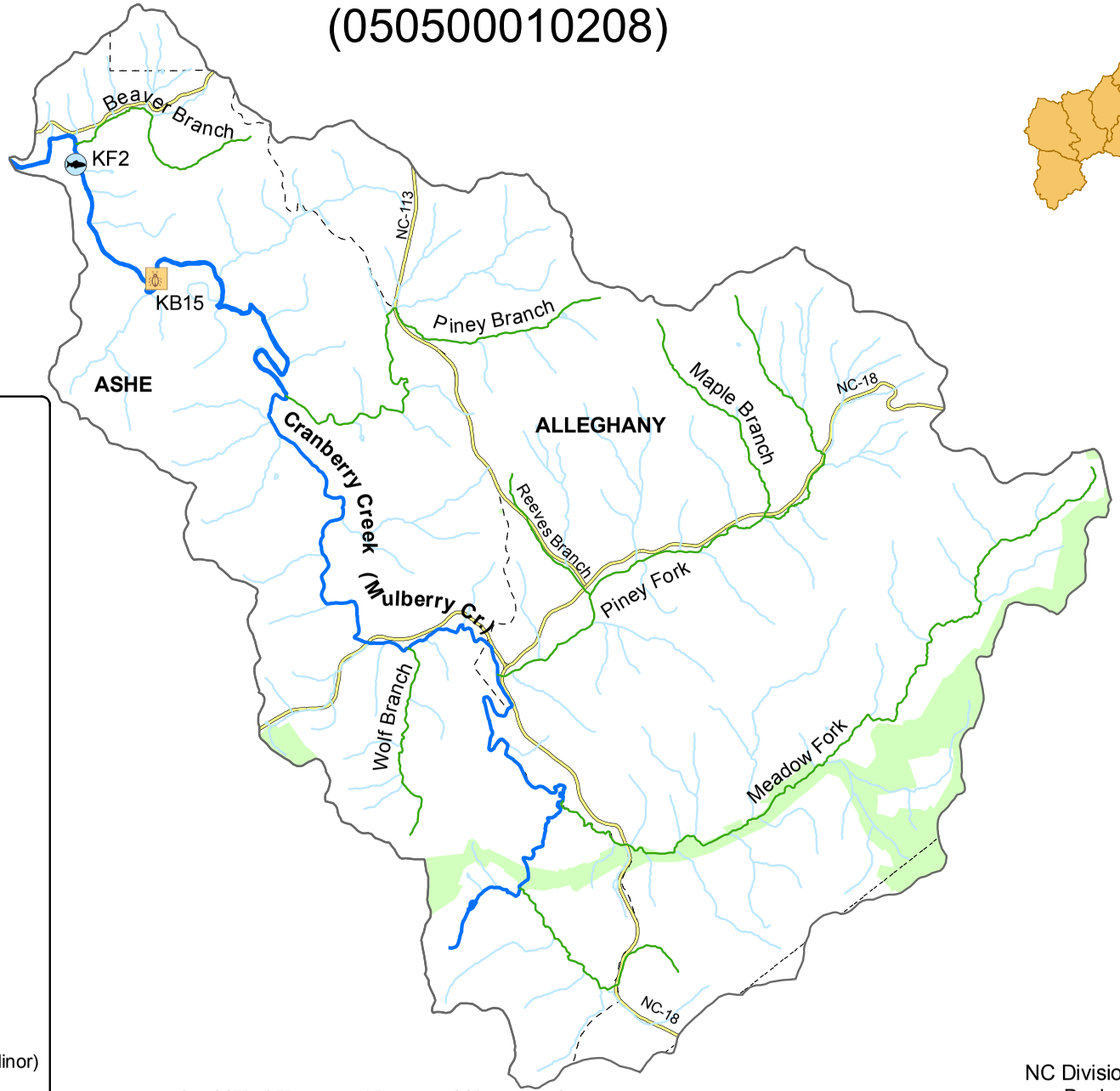
2-D.8

Naked Creek-SFNR Subwatershed (050500010207)



Cranberry Creek-SFNR Subwatershed (050500010208)





Legend

- 12-Digit HUCs
- County Boundary
- Municipalities
- Conservation_Land
- Major Roads
- Hydrology

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

Monitoring Stations

- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater

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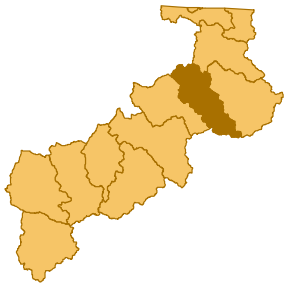
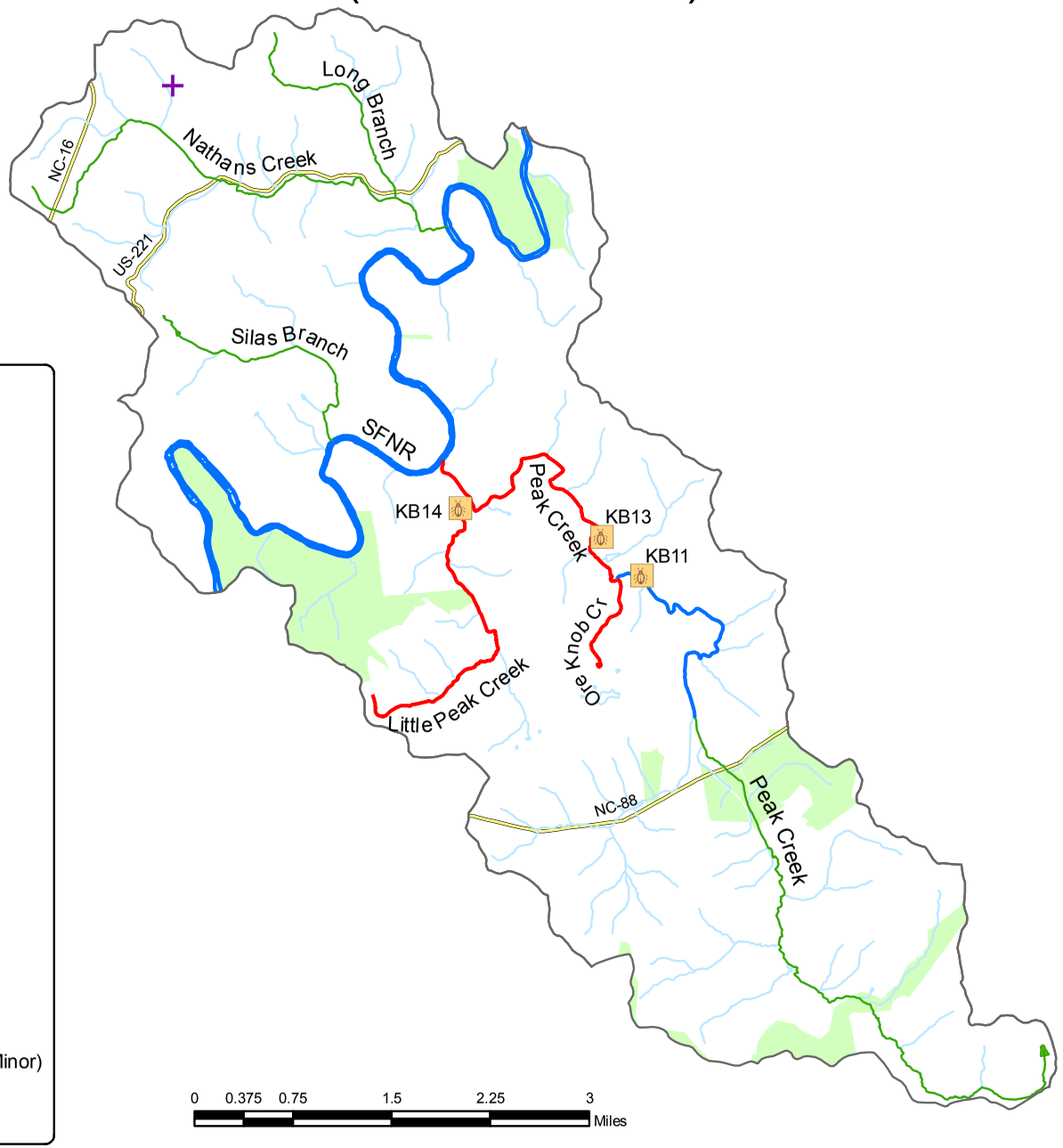
S

NC Division of Water Quality
Basinwide Planning Unit
January 2011

2-D.10

Peak Creek-SFNR Subwatershed (050500010209)





Legend

- 12-Digit HUCs
- County Boundary
- Municipalities
- Conservation_Land
- Major Roads
- Hydrology

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

Monitoring Stations

- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater

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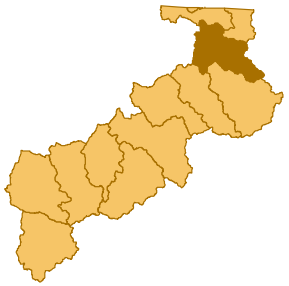
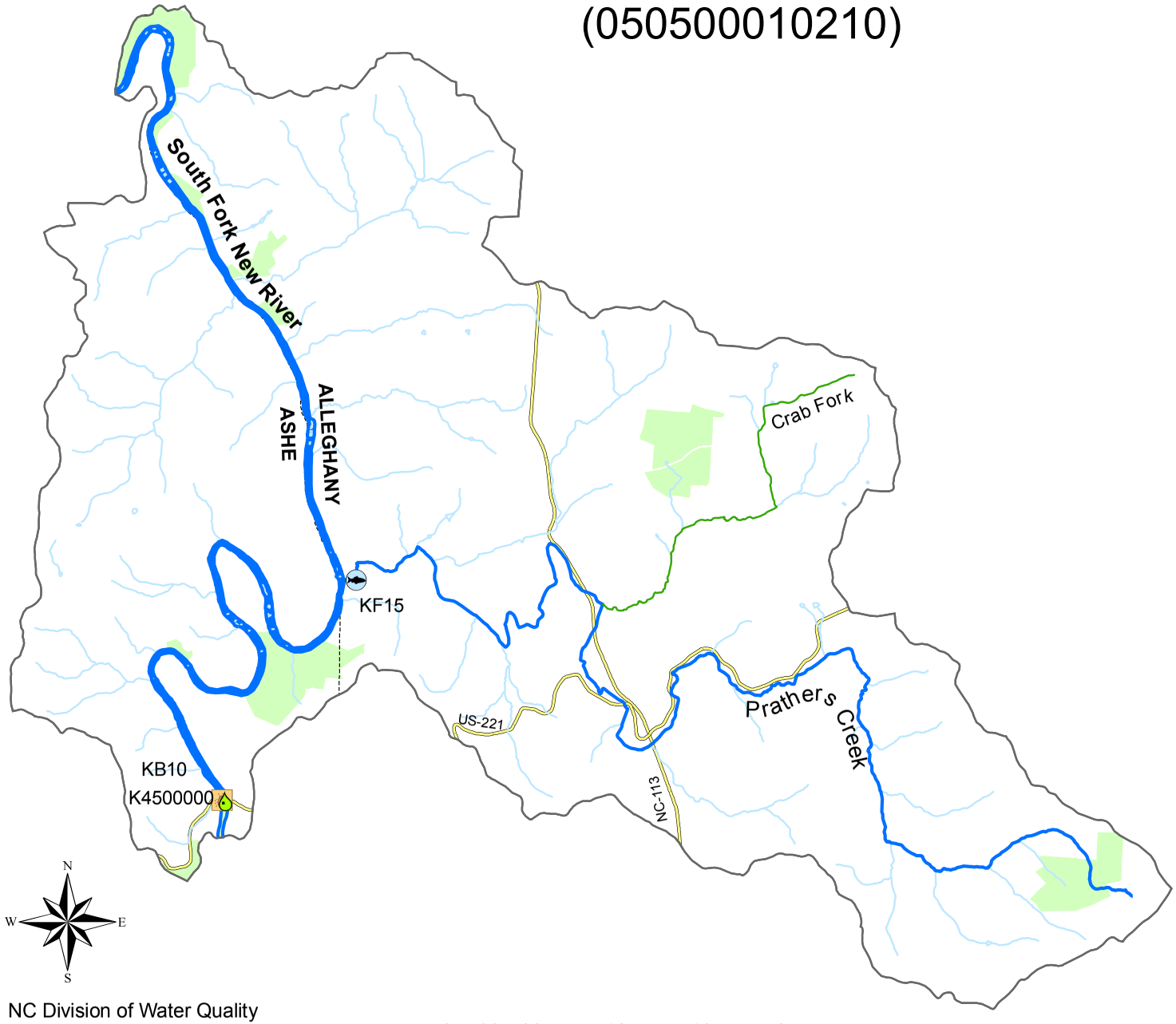
Prather Creek-SFNR Subwatershed (050500010210)





Legend

- 12-Digit HUCs
- County Boundary
- Municipalities
- Conservation_Land
- Major Roads
- Hydrology

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

Monitoring Stations

- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater

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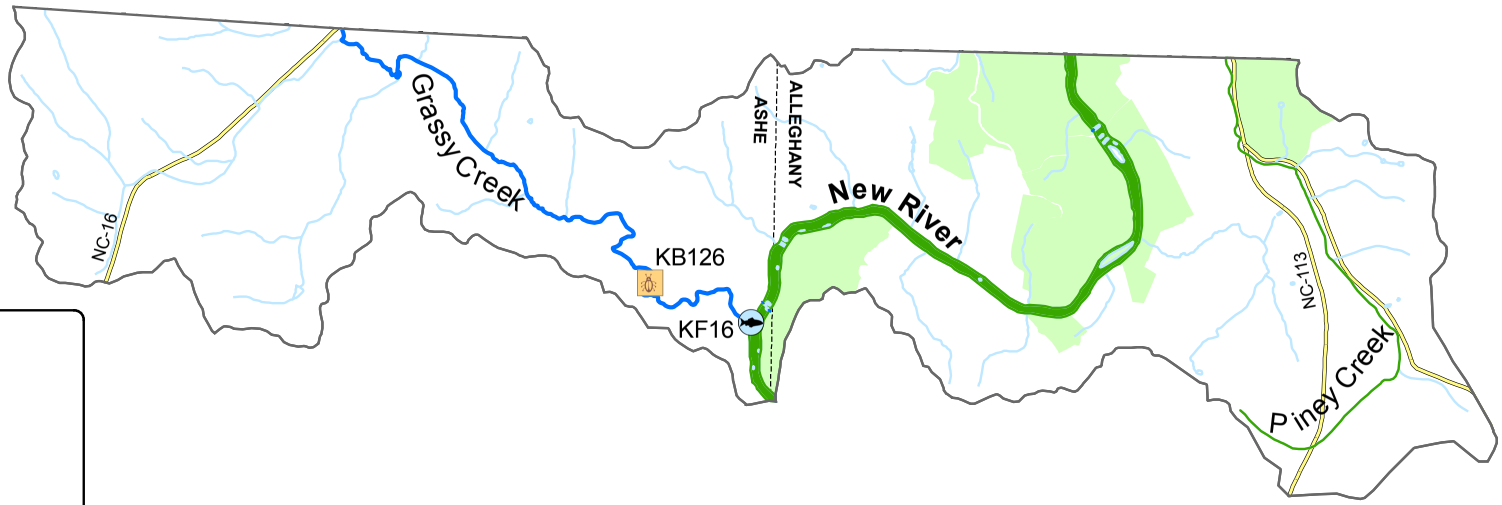
Grassy Creek-New River Subwatershed (050500010302)



Legend

- 12-Digit HUCs
- County Boundary
- Municipalities
- Conservation_Land
- Major Roads
- Hydrology

2010 Use Support

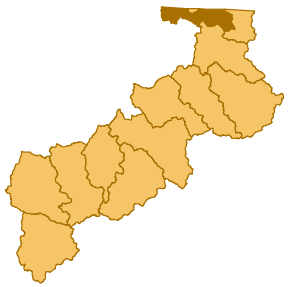
- Supporting
- No or Inconclusive Data
- Impaired

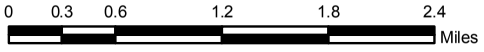
Monitoring Stations

- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

Permits

- NPDES Discharge (Minor)
- NPDES Discharge (Major)
- NPDES Non-Discharge (Minor)
- Animal Operation (Cattle)
- Stormwater





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