Appendix 3-A

Use Support Ratings for all Monitored Waters In the Little River & Chestnut 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 — **Little River-New River Watershed 0505000104**

10-9-7	**Bledsoe Creek**	From source to Little River	**5.9 FW Miles**	C;Tr	
1	**Ecological/biological Integrity Benthos**	Good-Fair Bioclassification	Aquatic Life	2008	
10-9-10	**Brush Creek**	From source to Little River	**27.8 FW Miles**	C;Tr	
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2007	
1	**Ecological/biological Integrity FishCom**	Good Bioclassification	Aquatic Life	2008	
10-9-12	**Crab Creek**	From source to Little River	**7.8 FW Miles**	C;Tr	
1	**Ecological/biological Integrity Benthos**	Good-Fair Bioclassification	Aquatic Life	2007	
5	**Ecological/biological Integrity FishCom**	Fair Bioclassification	Aquatic Life	2008	2010
10-6-(2)	**Elk Creek (North Carolina Portion)**	From U.S. Hwy. 221 to New River	**7.4 FW Miles**	C:+	
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008	
1	**Ecological/biological Integrity FishCom**	Good Bioclassification	Aquatic Life	2008	
10-9-9	**Glade Creek**	From source to Little River	**8.3 FW Miles**	C;Tr	
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2008	
1	**Ecological/biological Integrity FishCom**	Good Bioclassification	Aquatic Life	2008	
10-9-10-2	**Laurel Branch (Laurel Creek)**	From source to Brush Creek	**5.2 FW Miles**	C;Tr	
1	**Ecological/biological Integrity Benthos**	Not Impaired Bioclassification	Aquatic Life	2008	
10-9-(6)	**Little River**	From dam at Sparta Lake to NC 18 (Blevins Crossroads)	**17.5 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	
10-9-(11.5)	**Little River (North Carolina Portion)**	From NC 18 (Blevins Crossroads) to New River (state line)	**3.6 FW Miles**	C;HQW	
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2003	
10-9-(1)a	**Little River (Sparta Lake)**	From source to Sparta Lake at Pine Swamp Creek	**11.6 FW Miles**	C;Tr	
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2008	
1	**Ecological/biological Integrity FishCom**	Good Bioclassification	Aquatic Life	2008	

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 — **Little River-New River Watershed** — **0505000104**

10-9-11	**Moccasin Creek**	From source to Little River		**4.4 FW Miles**	C	
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2006		
10-9-5	**Pine Swamp Creek**	From source to Little River		**5.2 FW Miles**	C;Tr	
1	**Ecological/biological Integrity Benthos**	Good Bioclassification	Aquatic Life	2008		
1	**Ecological/biological Integrity FishCom**	Good Bioclassification	Aquatic Life	2008		
10-9-12ut8ut4	**UT CRAB CR**	Source to CRAB CR		**0.7 FW Miles**		
1	**Ecological/biological Integrity Benthos**	Not Impaired Bioclassification	Aquatic Life	2008		
10-9-12ut8	**UT UT CRAB CR**	Source to UT CRAB CR		**4.5 FW Miles**		
1	**Ecological/biological Integrity Benthos**	Not Impaired Bioclassification	Aquatic Life	2007		
10-9-4	**Waterfalls Creek**	From source to Little River		**4.3 FW Miles**	C;Tr	
1	**Ecological/biological Integrity Benthos**	Excellent Bioclassification	Aquatic Life	2006		
10-9-9-1	**Wolf Branch**	From source to Glade Creek		**2.8 FW Miles**	C;Tr	
1	**Ecological/biological Integrity Benthos**	Not Impaired Bioclassification	Aquatic Life	2006		

APPENDIX 3-B

BIOLOGICAL (BENTHIC & FISH) SAMPLE SITE DATA SHEETS

Station ID**	Waterbody	Assessment Unit #	Description	County	Site Location	Sample Results
KB35	Elk Cr.	10-6-(2)	From U.S. Hwy. 221 to New River	Alleghany	SR 1344	08 - Good 03 - Good
KB37	Little R.	10-9-(1)a	From source to Sparta Lake at Pine Swamp Creek	Alleghany	SR 1128	08 - Excellent 03 - Good
KB38	Little R.	10-9-(6)	From dam at Sparta Lake to NC 18 (Blevins Crossroads)	Alleghany	SR 1424	08 - Excellent 03 - Excellent
KB100	Little R.	10-9-(6)	From dam at Sparta Lake to NC 18 (Blevins Crossroads)	Alleghany	NC 18	08 - Excellent 03 - Excellent
KB41	Brush Cr.	10-9-10	From source to Little River	Alleghany	SR 1422	07 - Good 03 - Excellent
KB47*	Brush Cr.	10-9-10	From source to Little River	Alleghany	SR 1444	06 - Excellent
KB42	Laurel Br.	10-9-10-2	From source to Brush Creek	Alleghany	SR 1105	08 - Not Impaired 03 - Good
KB73*	Moccasin Cr.	10-9-11	From source to Little River	Alleghany	NC 18	06 - Good
KB49	Crab Cr.	10-9-12	From source to Little River	Alleghany	SR 1450	07 - Good-Fair 03 - Good
KB132*	Ut. Ut. Crab Cr.	10-9-12ut8	Source to Ut. Crab Creek	Alleghany	NC 18	07 - Not Impaired
KB133*	Ut. Ut. Crab Cr.	10-9-12ut8	Source to Ut. Crab Creek	Alleghany	Ab. Ut. Crab Cr.	07 - Not Impaired
KB128*	Ut. Crab Cr.	10-9-12ut8ut4	Source to Crab Cr.	Alleghany	400 meters S. of state line	07 - Not Impaired
KB97*	Waterfalls Cr.	10-9-4	From source to Little River	Alleghany	SR 1132	06 - Excellent
KB36	Pine Swamp Cr.	10-9-5	From source to Little River	Alleghany	SR 1128	08 - Good 03 - Good-Fair
KB82*	Pine Swamp Cr.	10-9-5	From source to Little River	Alleghany	SR 1126	06 - Excellent
KB101	Bledsoe Cr.	10-9-7	From source to Little River	Alleghany	SR 1172	08 - Excellent 03 - Good
KB40*	Bledsoe Cr.	10-9-7	From source to Little River	Alleghany	SR 1171	06 - Good-Fair
KB46*	Bledsoe Cr.	10-9-7	From source to Little River	Alleghany	US 21	06 - Not Impaired
KB104	Glade Cr.	10-9-9	From source to Little River	Alleghany	SR 1422	08 - Excellent 03 - Good
KB98*	Wolf Br.	10-9-9-1	From source to Glade Cr.	Alleghany	SR 1117	06 - Not Impaired
Fish Community Sample Sites						
KF17*	Brush Cr.	10-9-10	From source to Little River	Alleghany	SR 1433	08 - Good
KF18*	Crab Cr.	10-9-12	From source to Little River	Alleghany	NC 18	08 - Fair
KF3	Elk Cr.	10-6-(2)	From U.S. Hwy. 221 to New River	Alleghany	SR 1341	08 - Good 98 - Good
KF4	Glade Cr.	10-9-9	From source to Little River	Alleghany	SR 1422	08 - Good 98 - Good
KF7	Little R.	10-9-(1)a	From source to Sparta Lake at Pine Swamp Creek	Alleghany	SR 1128	08 - Good 98 - Good-Fair
KF19*	Pine Swamp Cr.	10-9-5	From source to Little River	Alleghany	SR 1128	08 - Good

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

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
NEW R	**SR 1345**	**KB34**	**08/19/08**	**Excellent**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.552222	-81.183333	10b	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C; ORW	823	2335	125	0.4

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

Upstream NPDES Dischargers (>1MGD or <1MGD and within 1 mile)	NPDES Number	Volume (MGD)
Town of Boone, Jimmy Smith WWTP	NC0020621	4.82
United Chemi-Con, Inc.	NC0000019	1.018

Water Quality Parameters

Temperature (°C)	26.1
Dissolved Oxygen (mg/L)	---
Specific Conductance (µS/cm)	75
pH (s.u.)	8.0
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	18
Bottom Substrate (15)	13
Pool Variety (10)	6
Riffle Habitat (16)	3
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	0
Left Riparian Score (5)	3
Right Riparian Score (5)	0
Total Habitat Score (100)	61

Site Photograph

Substrate mix of gravel, sand; some boulder, cobble, bedrock

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10535	105	50	4.58	3.42	Excellent
08/21/03	9236	86	51	3.61	3.13	Excellent
08/19/98	7721	73	37	4.40	3.53	Good
07/26/93	6278	102	47	4.70	3.61	Excellent
07/11/90	5376	99	49	4.88	3.52	Good

Taxonomic Analysis

Despite having 11 prior sampling events, there were still several EPT taxa reported for the first time at the site in 2008, including: *Acroneuria evoluta, Apatania, Protoptila, Mystacides, Oecetis avara,* and *Triaenodes perna/helo*. Also collected for the first time at the site was the midge *Cricotopus nostocicola*; there are only nine other records for the species in the BAU database.

Data Analysis

The site is 4.6 northwest of Sparta. The site receives water from the North Fork and South Fork New River catchments along with smaller catchments in Virginia.

The site has undergone yearly summer benthic sampling from 1983 through 1990, then once each five years beginning in 1993. The site has received ratings of either Good or Excellent following each sampling event. EPT Richness range from 37 to 51; NCBI values from 3.61 to 5.53. EPT richness in 2008 is near the highest value for the site; NCBI value is near the middle of the range. Overall the benthic community at the site has generally been stable since 1983.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
ELK CR	**SR 1341**	**05/07/08**	**KF3**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.5575	-81.2169444	10-6-(2)	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;+	17.4	2470	10	0.4	No

	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
Visible Landuse (%)	80	5	15	0

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

Water Quality Parameters

Temperature (°C)	11.9
Dissolved Oxygen (mg/L)	9.6
Specific Conductance (µS/cm)	50
pH (s.u.)	5.8
Water Clarity	Slightly-moderately turbid

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)	3
Right Bank Stability (7)	3
Light Penetration (10)	5
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	**84**

Site Photograph

Substrate Cobble, boulder, bedrock, and silts and sands in the pools

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/07/08	2008-31	20	48	Good
06/30/98	98-60	17	48	Good

Most Abundant Species Central Stoneroller

Exotic Species Whitetail Shiner, Saffron Shiner, Rock Bass, Redbreast Sunfish, and Smallmouth Bass

Species Change Since Last Cycle **Gains** -- Kanawha Minnow, Redbreast Sunfish, Greenside Darter, and Appalachia Darter. **Losses** -- Mottled Sculpin.

Data Analysis

Watershed -- drains northwestern Alleghany County; no municipalities within the watershed; tributary to the New River. **Habitat** -- unstable banks along both shorelines; fairly open canopy; riffles, bedrock shelves, veins, and pools; better habitat downstream than upstream from the bridge; beaver dam upstream from the bridge. **2008** -- Central Stoneroller accounted for 41% of all the fish collected in 2008; high percentage of Omnivores+Herbivores, indicative of nonpoint sources of nutrients. **1998 & 2008** -- almost twice as many fish collected in 2008 than in 1998, the number of Central Stoneroller doubled; 21 species known from the site, including 11 species of cyprinids, 4 endemic species (Kanawha Rosyface Shiner, Kanawha Minnow, Kanawha Darter, and Appalachia Darter), and 5 nonindigenous species; and Mottled Sculpin was represented by only 1 fish in 1998 and was absent in 2008.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
ELK CR	**SR 1344**	**KB35**	**08/19/08**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.569722	-81.206944	10-6-(2)	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C:+	21	2360	8	0.2

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

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

Water Quality Parameters

Temperature (°C)	21.9
Dissolved Oxygen (mg/L)	---
Specific Conductance (µS/cm)	58
pH (s.u.)	6.4
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	19
Bottom Substrate (15)	11
Pool Variety (10)	6
Riffle Habitat (16)	14
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	10
Left Riparian Score (5)	1
Right Riparian Score (5)	5
Total Habitat Score (100)	84

Site Photograph

Substrate mix of boulder, cobble; some gravel, sand, silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10536	---	30	---	3.14	Good
08/18/03	9219	---	34	---	3.52	Good
08/20/98	7723	---	34	---	3.36	Good
07/26/93	6286	---	36	---	3.48	Excellent

Taxonomic Analysis

The site has been sampled on four occassions. The 30 EPT taxa collected in 2008 is the lowest number for the site.

Several taxa were recorded for the first time in 2008, including: *Caenis* (rare in the sample); *Stenacron interpunctatum* (common); and *Apatania* (rare). Neither *Glossosoma* nor *Ceratopsyche morosa* were collected in 2008; both taxa were reported from the first three sampling events at the site.

Data Analysis

The site is 0.4 stream-miles above the confluence with New River and within 0.2 miles of the Virginia border.

The drop in the number of EPT taxa collected between 2003 and 2008 may be indicative of impacts to the benthic community, though that is offset by the decrease in the EPT BI value. As in 2003, periphyton was noted on the boulders and cobbles, which indicates some nutrient enrichment at the site.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
LITTLE R	SR 1128	KB37	08/19/08	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.467778	-81.133333	10-9-(1)a	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr	14	2875	9	0.3

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	60	0	0	40 (road, firing range)

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

Water Quality Parameters

Temperature (°C)	17.3
Dissolved Oxygen (mg/L)	---
Specific Conductance (µS/cm)	40
pH (s.u.)	6.0
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	14
Bottom Substrate (15)	12
Pool Variety (10)	5
Riffle Habitat (16)	7
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	9
Left Riparian Score (5)	5
Right Riparian Score (5)	2
Total Habitat Score (100)	70

Site Photograph

Substrate mostly sand, gravel, silt; some bedrock, boulder, cobble

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10534	102	42	3.74	3.27	Excellent
04/05/06	9828	103	42*	4.05*	2.32	Excellent
08/18/03	9218	75	36	4.03	3.53	Good
08/20/98	7724	72	37	3.94	3.18	Good
07/26/93	6303	84	45	3.32	2.53	Excellent

* values corrected for seasonality

Taxonomic Analysis

The number of EPT taxa collected in 2008 is siginificantly higher than in 1998 and 2003, though still lower than in 1993. There are a few notable differences in the EPT taxa present between 1993 and the following years. Two ephemerellids, *Drunella conestee* and *Serratella serratoides* , were both abundant in the 1993 sample but have not been recorded from any sampling event since. Also, *Drunella cornutella* was abundant in 1993, rare in 1998, and absent in each following sampling event. *Serratella deficiens* was also abundant in 1993 and absent from each summer sampling event since, though it was common in the spring sample collected in 2006.

Data Analysis

The site is 2.7 miles SSW of Sparta, and is the site most upstream of the three basinwide sites on Little River.

The increase in EPT Richness and lower NCBI values in 2008 compared to the prior summer sampling events in 1998 and 2003 suggests better recent water quality. Those changes have improved the classification of the site from Good 1998 and 2003 to Excellent in 2008. However, both EPT Richness and NCBI values have not returned to the standards set in 1993.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
LITTLE R	**SR 1128**	**05/06/08**	**KF7**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.46777778	-81.13277778	10-9-(1)a	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	14.1	2870	10	0.3	Yes

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

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

Water Quality Parameters

Temperature (°C)	9.9
Dissolved Oxygen (mg/L)	10.3
Specific Conductance (µS/cm)	35
pH (s.u.)	5.5

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	10
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	7
Right Bank Stability (7)	6
Light Penetration (10)	8
Left Riparian Score (5)	5
Right Riparian Score (5)	3
Total Habitat Score (100)	**85**

Site Photograph

Substrate Cobble and silt

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/06/08	2008-28	16	50	Good
07/01/98	98-61	15	44	Good-Fair

Most Abundant Species Redlip Shiner and Rosyside Dace

Exotic Species Highback Chub, Redlip Shiner, Brown Trout, Redbreast Sunfish, and Tessellated Darter

Species Change Since Last Cycle **Gains** -- Highback Chub, Mountain Redbelly Dace, and Longnose Dace. **Losses** -- Tonguetied Minnow and Rainbow Trout.

Data Analysis

Watershed -- drains southern Alleghany County; no municipalities within the watershed. **Habitat** -- snags and undercuts; silts along the margins and atop the rocks; cobble riffles and runs; wide riparian zone on the left, but narrow along the right bank; site is a popular fishing spot. **2008** -- diversity of Rock Bass+Smallmouth Bass+Trout and Intolerant species were slightly lower than expected; percentage of tolerant fish (White Sucker, Creek Chub, and Redbreast Sunfish) was slightly greater than expected for a mountain stream; lowest pH of any fish community site in the basin in 2008. **1998 & 2008** -- 18 species known from the site, including 3 endemic species (Tonguetied Minnow, Kanawha Darter, and Appalachia Darter) and 6 nonindigenous species; ~ 6 times more fish collected in 2008 than in 1998 (1,444 vs. 224) ; Mountain Redbelly Dace constituted 9% of the fauna in 2008, but absent in 1998; and species present in 1998, but absent in 2008 were represented by 1 or 3 fish each.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
LITTLE R	SR 1424	KB38	08/18/08	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.517222	-81.083611	10-9-(6)	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C	36	2600	16	0.3

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	20	0	80	0

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

Water Quality Parameters

Temperature (°C)	20.9
Dissolved Oxygen (mg/L)	8.7
Specific Conductance (µS/cm)	61
pH (s.u.)	7.0
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	18
Bottom Substrate (15)	13
Pool Variety (10)	6
Riffle Habitat (16)	14
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	4
Left Riparian Score (5)	2
Right Riparian Score (5)	1
Total Habitat Score (100)	76

Site Photograph

Substrate mix of cobble, boulder, gravel, sand; some silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/18/08	10530	111	47	3.90	3.00	Excellent
08/21/03	9232	104	49	4.11	3.23	Excellent
08/20/98	7726	80	41	3.94	2.95	Excellent
07/26/93	6277	98	48	3.98	2.92	Excellent

Taxonomic Analysis

Several taxa were recorded for the first time from the site in 2008, including: *Rhithrogena, Anthopotamus distinctus, Paragnetina ichusa/media, Apatania, Ceratopsyche walkeri,* and *Hydropsyche scalaris*.

Data Analysis

The site is 2.2 miles ENE of Sparta, which is entirely included in the catchment above the site.

NCBI values have been very similar between the four most recent sampling events at the site, as have EPT Richness values with the exception of 1998. The site has rated as Excellent following each sampling event since 1993 at the site, though a spring sampling event in 1989 resulted in classification of Fair. Improvements to the Sparta WWTP (permit NC0026913; discharge 0.6 million gallons per day) occurred in 1990 and apparently improved water quality at the site.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
LITTLE R	**NC 18**	**KB100**	**08/18/08**	**Excellent**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.543056	-81.021389	10-9-(6)	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C	99	2410	30	0.4

	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)	23.4
Dissolved Oxygen (mg/L)	8.9
Specific Conductance (µS/cm)	46
pH (s.u.)	7.2
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	12
Bottom Substrate (15)	13
Pool Variety (10)	6
Riffle Habitat (16)	12
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	0
Left Riparian Score (5)	5
Right Riparian Score (5)	0
Total Habitat Score (100)	67

Site Photograph

Substrate mostly bedrock and boulder; some sand, cobble, gravel, silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/18/08	10531	129	59	3.96	2.80	Excellent
08/20/03	9233	89	47	3.96	3.40	Excellent
08/20/98	7727	84	46	3.53	2.72	Excellent
07/27/93	6288	89	49	3.73	2.84	Excellent
07/11/90	5377	93	44	4.36	3.15	Excellent

Taxonomic Analysis

The 59 EPT taxa from 2008 was the most ever recorded for the site, which has been sampled a total of nine times; the previous high for a summer sample was 49, last attained in 1993. The site has received a classification of Excellent following each sampling event except for August 1986, when it received a rating of Good. Several EPT taxa are reported for the first time in 2008: *Heterocloeon anoka, Heterocloeon curiosum, Maccaffertium exiguum, Anthopotamus distinctus, Micrasema bennetti, Hydropsyche venularis, Hydroptila,* an unamed species of *Nectopsyche* , and *Neophylax fuscus* .

Data Analysis

The site is 2.6 stream-miles upstream of the Virginia border and six miles ENE of the town of Sparta, which is entirely included in the catchment above the site. This is the furthest downstream of the three basinwide sites on Little River. Cattle were present in a pasture on the west side and had unhindered access to the river at the reach sampled.

EPT Richness for the seven summer sampling events at the site prior to 2008 has been rather stable, with a range of 44 to 49 taxa collected, making the 59 EPT taxa recorded for 2008 anomalous. NCBI values have ranged from 3.53 (in 1998) to 4.50 (in 1986 and 1988), putting the 2008 value of 3.96 near the middle of the range.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
PINE SWAMP CR	SR 1128	05/06/08	KF19	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.4759215	-81.1166911	10-9-5	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	5.3	2760	7	0.4	No

	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
Visible Landuse (%)	50	30	20	0

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

Water Quality Parameters

Temperature (°C)	12.4
Dissolved Oxygen (mg/L)	10.0
Specific Conductance (µS/cm)	29
pH (s.u.)	6.1

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	20
Bottom Substrate (15)	13
Pool Variety (10)	8
Riffle Habitat (16)	16
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	8
Left Riparian Score (5)	4
Right Riparian Score (5)	5
Total Habitat Score (100)	**91**

Site Photograph

Substrate Cobble, boulder, and angular bedrock

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/06/08	2008-29	16	52	Good

Most Abundant Species Mountain Redbelly Dace and Rosyside Dace

Exotic Species Highback Chub, Redlip Shiner, Brown Trout, Rock Bass, Redbreast Sunfish, and Tessellated Darter

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

Data Analysis

This is the first fish community sample collected at this site. **Watershed** -- drains southern Alleghany County; no municipalities within the watershed; tributary to the Little River, site is ~ 60 ft. upstream from the creek's confluence with the river. **Habitat** -- runs, riffles, plunge pools, undercuts, and overhangs; riparian zone of multifloral rose then pasture along the left banks. **2008** -- percentage of tolerant fish (Creek Chub, White Sucker and Redbreast Sunfish) was slightly greater than expected for a mountain stream; one endemic species (Kanawha Darter) was present; and the lowest conductivity of any fish site, along with Brush Creek, in the basin in 2008.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
PINE SWAMP CR	**SR 1128**	**KB36**	**08/19/08**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.475556	-81.116667	10-9-5	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr	5.3	2805	5	0.2

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	50	20	30	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)	---
Specific Conductance (µS/cm)	38
pH (s.u.)	5.6
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	12
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	9
Left Riparian Score (5)	3
Right Riparian Score (5)	2
Total Habitat Score (100)	83

Site Photograph

Substrate mix of cobble, boulder, bedrock; some gravel, sand

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/19/08	10533	---	34	---	2.72	Good
04/04/06	9827	---	41*	---	2.69	Excellent
08/18/03	9217	---	26	---	3.63	Good-Fair
08/20/98	7725	---	34	---	3.52	Good
07/27/93	6290	---	33	---	3.45	Good

* value corrected for seasonality

Taxonomic Analysis

A few taxa were collected for the first time in 2008: *Baetisca* , which was rare in the sample; *Chimarra* and *Dolophilodes* , two philopotamid genera, which were common and abundant respectively.

Data Analysis

The site is about two miles south of Sparta and just upstream of the confluence with Little River.

The number of EPT taxa collected in 2008 returned to the previous high of 34 (in 1998) for a summer sampling event at the site. The EPT BI in 2008 was significantly lower than for any prior summer sampling event. There is currently very little evidence for water-quality impacts to the stream at the site.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
BLEDSOE CR	**SR 1172**	**KB101**	**08/18/08**	**Excellent**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.497222	-81.118611	10-9-7	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr	5.6	2795	4	0.2

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

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

Water Quality Parameters

Temperature (°C)	20.0
Dissolved Oxygen (mg/L)	7.6
Specific Conductance (µS/cm)	72
pH (s.u.)	5.8

Water Clarity: clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	17
Bottom Substrate (15)	13
Pool Variety (10)	6
Riffle Habitat (16)	7
Left Bank Stability (7)	7
Right Bank Stability (7)	7
Light Penetration (10)	2
Left Riparian Score (5)	0
Right Riparian Score (5)	4
Total Habitat Score (100)	68

Site Photograph

Substrate: mix of gravel, cobble, sand; some boulder, silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/18/08	10532	---	42	---	3.75	Excellent
04/05/06	9831	---	25*	---	3.32	Good-Fair
08/20/03	9231	---	30	---	3.39	Good
08/19/98	7722	---	21	---	4.67	Good-Fair
07/26/93	6287	---	33	---	3.31	Good

* value corrected for seasonality

Taxonomic Analysis

The 42 EPT taxa collected in 2008 greatly surpasses the previous high of 33 collected in 1993. Several taxa were reported for the first time from the site in 2008 (all rare in the sample), including: *Plauditus cestus, Baetisca berneri, Leucrocuta, Tricorythodes, Ceratopsyche morosa,* and *Rhyacophila carolina*. There were also a few taxa present in 2008 that had not been recorded from the site since the sampling event in 1993: *Serratella serratoides*, which was abundant in 1993 and common in 2008; *Heptagenia marginalis*, abundant in 1993 and rare in 2008; *Tallaperla,* rare in 1993 and common in 2008.

Data Analysis

The site is in the town of Sparta and 0.8 stream-miles above the confluence with Little River.

Despite the location within the town of Sparta, the suboptimum habitat, and a silty cover of *aufwuchs* over the cobbles and boulders, the site attained a classification of Excellent in 2008. Less surprising is the relatively high EPT BI score for a mountain sample not associated with a discharger.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
GLADE CR	SR 1422	05/06/08	KF4	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.49972222	-81.03638889	10-9-9	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	13.6	2520	7	0.5	Yes

	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)	16.2
Dissolved Oxygen (mg/L)	9.2
Specific Conductance (µS/cm)	32
pH (s.u.)	5.9

Water Clarity	Slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	15
Bottom Substrate (15)	5
Pool Variety (10)	6
Riffle Habitat (16)	15
Left Bank Stability (7)	4
Right Bank Stability (7)	4
Light Penetration (10)	5
Left Riparian Score (5)	5
Right Riparian Score (5)	4
Total Habitat Score (100)	**68**

Site Photograph

Substrate Sand, silt, and bedrock

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/06/08	2008-30	20	52	Good
07/01/98	98-62	19	50	Good

Most Abundant Species Redlip Shiner and Mountain Redbelly Dace

Exotic Species Highback Chub, Redlip Shiner, Tennessee Shiner, Brown Trout, Black Crappie, and Tessellated Darter

Species Change Since Last Cycle **Gains** -- Tonguetied Minnow, Highback Chub, Black Crappie, and Appalachia Darter. **Losses** -- Bigmouth Chub and Kanawha Rosyface Shiner.

Data Analysis

Watershed -- drains east central Alleghany County; no municipalities within the watershed; tributary to the Little River, site is ~ 0.3 miles above the creek's confluence with the river. **Habitat** -- runs, bedrock riffles, fairly open canopy; sands and silts in the pools; bottom substrate showed evidence of excessive sedimentation from upstream landuse practices. **2008** -- Redlip Shiner and Mountain Redbelly Dace, both common along the silty banks, accounted for almost 60% of the fish collected; percentage of Omnivores+Herbivores was slightly elevated and indicative of nonpoint source nutrient inputs; Rock Bass and Smallmouth Bass were absent. **1998 & 2008** -- ~6 times more fish collected in 2008 than in 1998 (1,862 vs. 297), Redlip Shiner increased almost 16 fold and Mountain Redbelly Dace increased 20 fold; 23 species known from the site, including 14 species of cyprinids, 6 endemic species (Tonguetied Minnow, Bigmouth Chub, 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 2 or 4 fish each.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
BRUSH CR	SR 1433	05/05/08	KF17	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.4858811	-81.0049272	10-9-10	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	18.1	2570	10	0.4	No

	Forested/Wetland	Urban	Agriculture	Other (describe)
Visible Landuse (%)	30	0	70	0

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

Water Quality Parameters

Temperature (°C)	17.7
Dissolved Oxygen (mg/L)	9.0
Specific Conductance (µS/cm)	29
pH (s.u.)	6.2

Water Clarity: Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	13
Pool Variety (10)	6
Riffle Habitat (16)	16
Left Bank Stability (7)	5
Right Bank Stability (7)	5
Light Penetration (10)	2
Left Riparian Score (5)	2
Right Riparian Score (5)	2
Total Habitat Score (100)	**75**

Site Photograph

Substrate: Cobble, gravel, and soft silts along the banks

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/05/08	2008-27	19	52	Good

Most Abundant Species: Mountain Redbelly Dace

Exotic Species: Highback Chub, Redlip Shiner, Rainbow Trout, Brown Trout, and Tessellated Darter

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

Data Analysis

This is the first fish community sample collected at this site. **Watershed** -- drains the southeastern corner of Alleghany County; no municipalities within its watershed; tributary to the Little River. **Habitat** -- runs, riffles, and swiftly flowing chutes; side snag pools; minimal canopy and riparian zones along both banks. **2008** -- Mountain Redbelly Dace and Bluehead Chub accounted for 39% of all the fish collected; moderate percentage of Omnivores+Herbivores, indicative of nonpoint source nutrients and an open canopy; percentage of tolerant fish (White Sucker and Creek Chub) was slightly greater than expected for a mountain stream; three endemic species (Kanawha Minnow, Kanawha Darter, and Appalachia Darter) were present; and the lowest conductivity of any fish site, along with Pine Swamp Creek, in the basin in 2008.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
BRUSH CR	**SR 1422**	**KB41**	**10/02/07**	**Good**

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.516111	-81.012500	10-9-10	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr	32	2500	8	0.1

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

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

Water Quality Parameters

Temperature (°C)	11.9
Dissolved Oxygen (mg/L)	9.4
Specific Conductance (µS/cm)	38
pH (s.u.)	6.2
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)	14
Left Bank Stability (7)	3
Right Bank Stability (7)	3
Light Penetration (10)	7
Left Riparian Score (5)	1
Right Riparian Score (5)	2
Total Habitat Score (100)	69

Site Photograph

Substrate mix of cobble, sand; some boulder, gravel, silt, bedrock

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
10/02/07	10345	88	36*	4.87*	3.46	Good
08/20/03	9230	83	42	3.94	3.34	Excellent
08/20/98	7728	62	36	4.04	3.56	Good
07/27/93	6289	96	40	4.73	3.38	Good

* values corrected for seasonality

Taxonomic Analysis

Sampling for this site was last done in October of 2007; all other sampling events occurred in July or August. There were four EPT taxa present (rare in the sample) in October that were not present in the summer samples; of those only one taxon (*Isoperla lata*) shows a seasonal distribution in North Carolina mountain stream sites (it has not been recorded from summer mountain samples). EPT Richness was decremented by one to compensate for the seasonality of the species.

There are five EPT taxa that have been identified from each of the three summer samples and not present in the October sample. Of those, four taxa show a moderate to strong seasonal distribution for mountain stream sites with peak occurrence in the summer and much reduced occurrence in the fall: *Serratella serratiodes* (common in 2003); *Epeorus vitreus* (abundant in 2003); *Micrasema wataga* (common in 2003); and *Neophylax oligius* (abundant in 2003). The four taxa have low tolerance values, ranging from 1.2 to 2.6.

Data Analysis

The site is about six miles east of Sparta, 2.9 miles NW of the closest point on the Blue Ridge Parkway, and 5.2 stream-miles above the confluence with Little River.

Seasonal effects are evident when comparing taxa from the October sample from 2007 with samples from summer in prior years. Reduced EPT richness and a higher NCBI value in 2007 compared to 2003 may be due to seasonal effects and not a decline in water quality between the two years.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
LAUREL BR	SR 1105	KB42	08/18/08	Not Impaired

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.420833	-81.008333	10-9-10-2	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr	2.7	2705	4	0.2

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

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

Water Quality Parameters

Temperature (°C)	16.0
Dissolved Oxygen (mg/L)	8.6
Specific Conductance (µS/cm)	42
pH (s.u.)	5.6
Water Clarity	clear

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	19
Bottom Substrate (15)	12
Pool Variety (10)	8
Riffle Habitat (16)	16
Left Bank Stability (7)	6
Right Bank Stability (7)	6
Light Penetration (10)	9
Left Riparian Score (5)	3
Right Riparian Score (5)	4
Total Habitat Score (100)	87

Site Photograph

Substrate mix of cobble, boulder, gravel, sand; some silt

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/18/08	10529	---	26	---	3.51	Not Impaired
04/04/06	9824	100	36*	4.58*	2.73	Good
08/18/03	9216	66	33	4.12	3.53	Good
08/21/98	7729	49	28	3.72	2.91	Good
09/03/92	6008	---	14	---	4.21	Fair

* values corrected for seasonality

Taxonomic Analysis

No unambiguously new taxa were collected in 2008 at the site. The EPT collection method was used in 2008 rather than the Full-Scale method used for the three prior sampling events, complicating comparison of 2008 taxonomic results with those prior events.

Data Analysis

The site is about 8.6 miles southeast of Sparta in southeast Alleghany County, and 0.3 stream-miles from the confluence with Brush Creek.

Current BAU criteria do not allow for classification of stream sites with drainage areas under 3.0 square miles except in unusual circumstances (such as for Little Peak Creek at SR 1595/Ashe County).

Due to the small size of the stream it was decided for the latest sampling effort to use EPT rather than Full-Scale collection methods (as was used for the prior three sampling events at the site); part of the reason for the decrease in EPT Richness between 2008 and the prior summer sampling event in 2003 is certainly due to the differenct collection methods used. The EPT BI is better for comparison of conditions when those two sampling methods are used; there is no evidence of change in water quality between 2003 and 2008 using that metric.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
CRAB CR	NC 18	05/05/08	KF18	Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ALLEGHANY	3	05050001	36.5495584	-81.0023167	10-9-12	New River Plateau

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	11.2	2450	8	0.4	No

	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
Visible Landuse (%)	60	10	30	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)	9.7
Specific Conductance (µS/cm)	50
pH (s.u.)	6.7

Water Clarity	Clear

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	12
Pool Variety (10)	10
Riffle Habitat (16)	16
Left Bank Stability (7)	4
Right Bank Stability (7)	4
Light Penetration (10)	2
Left Riparian Score (5)	1
Right Riparian Score (5)	4
Total Habitat Score (100)	**77**

Site Photograph

Substrate Slick bedrock, boulders, silts on the substrate

Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/05/08	2008-26	14	38	Fair

Most Abundant Species Mountain Redbelly Dace and Central Stoneroller

Exotic Species Redlip Shiner, Saffron Shiner, Rainbow Trout, and Tessellated Darter

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

Data Analysis

This is the first fish community sample collected at this site. **Watershed** -- drains the northeastern corner of Alleghany County; no municipalities within the watershed; site is ~ 1.5 miles upstream of the creek's confluence with the Little River. **Habitat** -- runs and riffles; side undercuts, bedrock pools; minimal riparian zone along the right shoreline and minimal canopy. **2008** -- more fish were collected at this site (n = 2,368) than at any other site in the basin in 2008; Central Stoneroller, Mountain Redbelly Dace, and Bluehead Chub constituted 65% of all the fish collected; high percentage of Omnivores+Herbivores, indicative of nonpoint source nutrients and an open canopy; diversity metrics lower than expected -- total, cyprinid, Rock Bass+Smallmouth Bass+Trout, and Intolerant diversities; and two endemic species (Kanawha Darter and Appalachia Darter) were present.

Appendix 3-C

Ambient Monitoring Systems
Station Data Sheets

Station ID	Waterbody	AU#	Location	Impaired (By Parameter)	Impacted (By Parameter)
K7900000	New R.	10	SR 1345 at Amelia	Copper (22.2%) Iron (44.4%) Zinc (22.2%)	Fecal Coliform (7.1%)
K9600000	Little R.	10-9-(6)	SR 1426 near Edwards Crossroads	Copper (11.1%) Iron (11.1%) Zinc (11.1%) Fecal Coliform (10.7%)	---

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

Location: NEW RIV AT SR 1345 AT AMELIA
Station #: K7900000 **Hydrologic Unit Code:** 05050001
Latitude: 36.55190 **Longitude:** -81.18172 **Stream class:** C ORW
Agency: NCAMBNT **NC stream index:** 10

Time period: 02/01/2005 to 12/08/2009

	# 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		5.2	7.8	8.4	9.5	11.4	13.7	15.4
	57	0	<5	0	0		5.2	7.8	8.4	9.5	11.4	13.7	15.4
pH (SU)	58	0	<6	0	0		6.7	7.1	7.4	7.7	8.1	8.4	9.1
	58	0	>9	1	1.7		6.7	7.1	7.4	7.7	8.1	8.4	9.1
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				42	55	61	66	73	77	94
Water Temperature (°C)	58	0	>29	0	0		0.7	3.8	7.8	15.7	22.9	26.4	27.7
Other													
TSS (mg/L)	19	9	N/A				2.5	2.5	6.2	6.2	18	171	280
Turbidity (NTU)	58	1	>50	4	6.9		1	1.4	1.9	4.1	11.8	31.1	450
Nutrients (mg/L)													
NH3 as N	57	45	N/A				0.02	0.02	0.02	0.02	0.02	0.04	0.1
NO2 + NO3 as N	57	1	N/A				0.05	0.24	0.36	0.55	0.73	0.8	0.87
TKN as N	57	24	N/A				0.2	0.2	0.2	0.2	0.28	0.53	2.8
Total Phosphorus	57	8	N/A				0.02	0.02	0.02	0.03	0.04	0.1	0.96
Metals (ug/L)													
Aluminum, total (Al)	9	0	N/A				60	60	83	320	7975	16000	16000
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	8	>50	0	0		17	17	25	25	25	25	25
Copper, total (Cu)	9	6	>7	2	22.2		2	2	2	2	9	15	15
Iron, total (Fe)	9	0	>1000	4	44.4		220	220	240	520	10550	20000	20000
Lead, total (Pb)	9	8	>25	0	0		10	10	10	10	10	13	13
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	7	>88	0	0		10	10	10	10	10	13	13
Zinc, total (Zn)	9	5	>50	2	22.2		10	10	10	10	41	73	73

Fecal Coliform Screening(#/100mL)

# results:	Geomean:	# > 400:	% > 400:	%Conf:
56	24.9	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: LITTLE RIV AT SR 1426 NR EDWARDS CROSSROADS

Station #: K9600000 **Hydrologic Unit Code:** 05050001

Latitude: 36.52465 **Longitude:** -81.06939 **Stream class:** C

Agency: NCAMBNT **NC stream index:** 10-9-(6)

Time period: 02/01/2005 to 12/08/2009

	# 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		5.9	7.9	8.5	9.9	11.7	13.3	15.1
	58	0	<5	0	0		5.9	7.9	8.5	9.9	11.7	13.3	15.1
pH (SU)	58	0	<6	0	0		6.4	7.2	7.4	7.8	8	8.4	9.4
	58	0	>9	1	1.7		6.4	7.2	7.4	7.8	8	8.4	9.4
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				35	42	47	50	54	61	86
Water Temperature (°C)	58	0	>29	0	0		0.6	4.4	8.4	14.5	20.2	23.7	26.4
Other													
TSS (mg/L)	18	8	N/A				2.5	2.5	3.1	6.2	6.2	72.7	178
Turbidity (NTU)	58	6	>50	2	3.4		1	1	1.5	2.3	4	15.2	110
Nutrients (mg/L)													
NH3 as N	1	1	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
NO2 + NO3 as N	1	0	N/A				0.65	0.65	0.65	0.65	0.65	0.65	0.65
TKN as N	1	1	N/A				0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Phosphorus	1	0	N/A				0.03	0.03	0.03	0.03	0.03	0.03	0.03
Metals (ug/L)													
Aluminum, total (Al)	9	0	N/A				51	51	66	120	240	18000	18000
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	1	11.1		2	2	2	2	2	17	17
Iron, total (Fe)	9	0	>1000	1	11.1		89	89	190	200	340	19000	19000
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	25	25
Zinc, total (Zn)	9	8	>50	1	11.1		10	10	10	10	10	80	80

Fecal Coliform Screening(#/100mL)

# results:	Geomean:	# > 400:	% > 400:	%Conf:
56	85.1	6	10.7	

Key:

result: number of observations

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

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

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

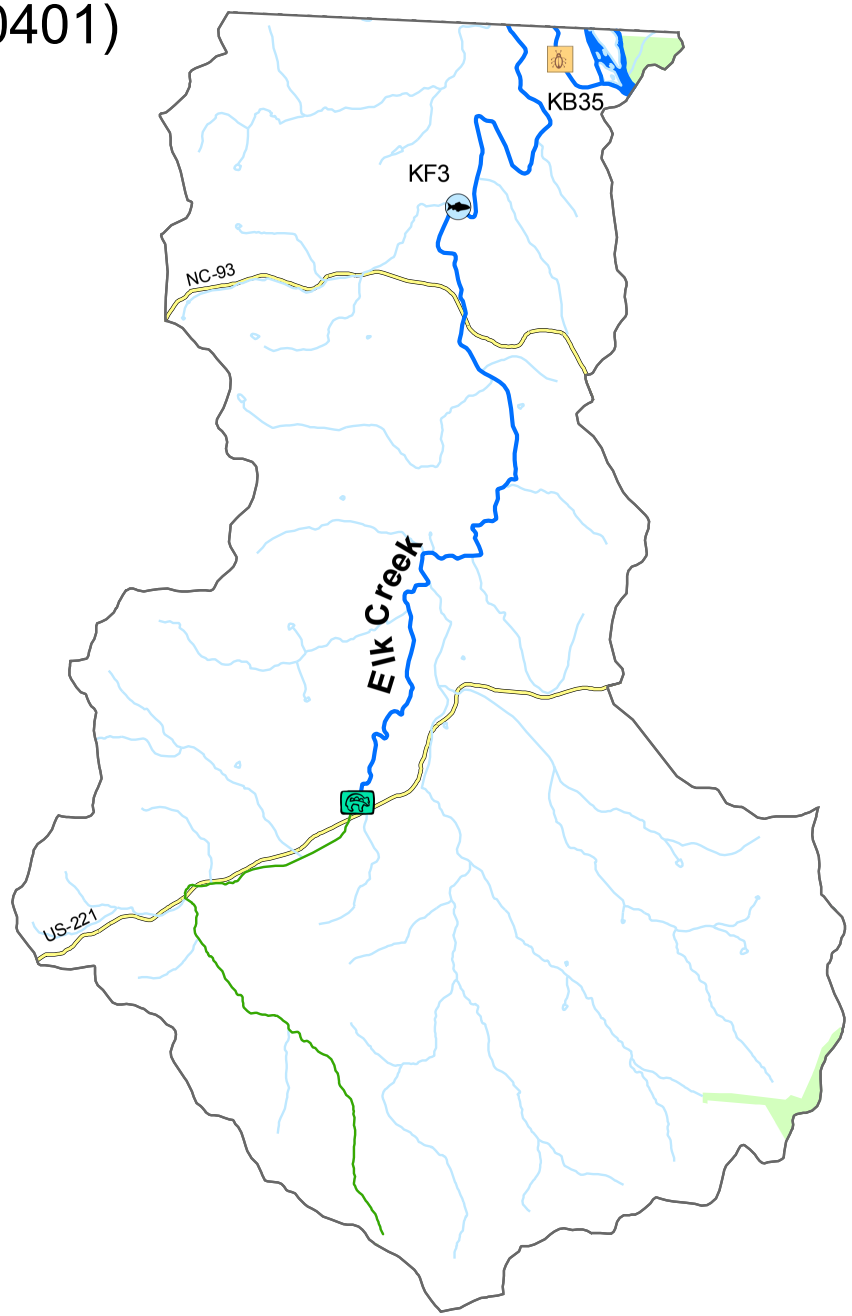
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)

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

Appendix 3-D

12-Digit Subwatershed Maps

Elk Creek Subwatershed (050500010401)



Legend

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

2010 Use Support

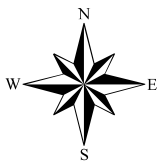
- Supporting
- No or Inconclusive Data
- Impaired

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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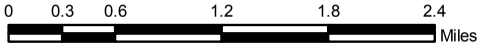
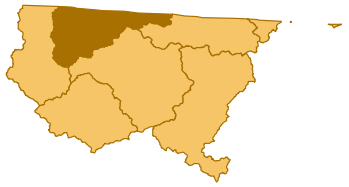
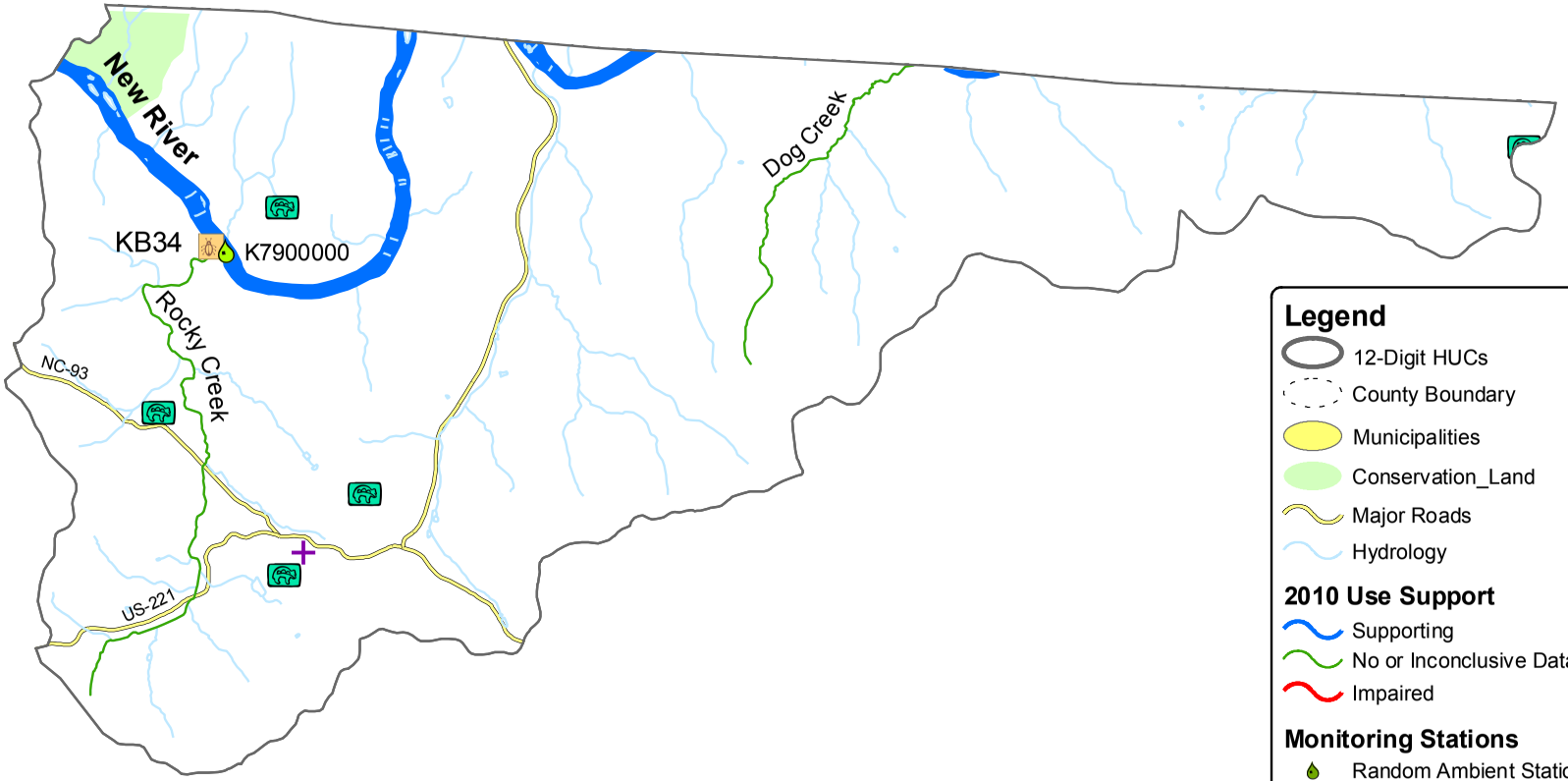
Basinwide Planning Unit
January 2011



Brush Creek Subwatershed (050500010403)





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

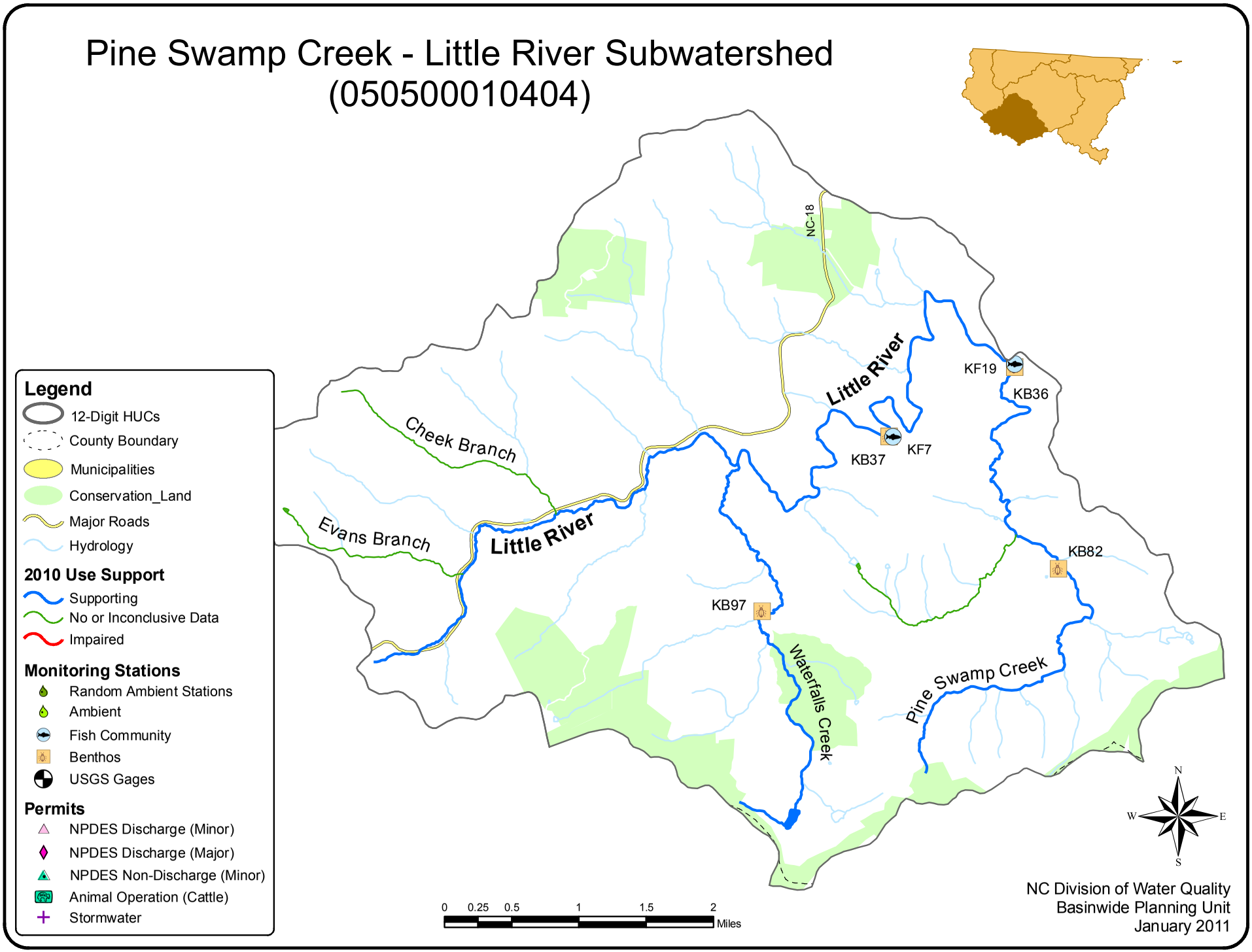
N
W E
S

NC Division of Water Quality
Basinwide Planning Unit
January 2011

0 0.3 0.6 1.2 1.8 2.4
Miles

3-D.4

Pine Swamp Creek - Little River Subwatershed (050500010404)



Legend

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

2010 Use Support

- Supporting
- No or Inconclusive Data
- Impaired

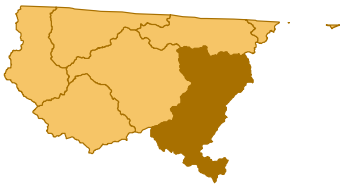
Monitoring Stations

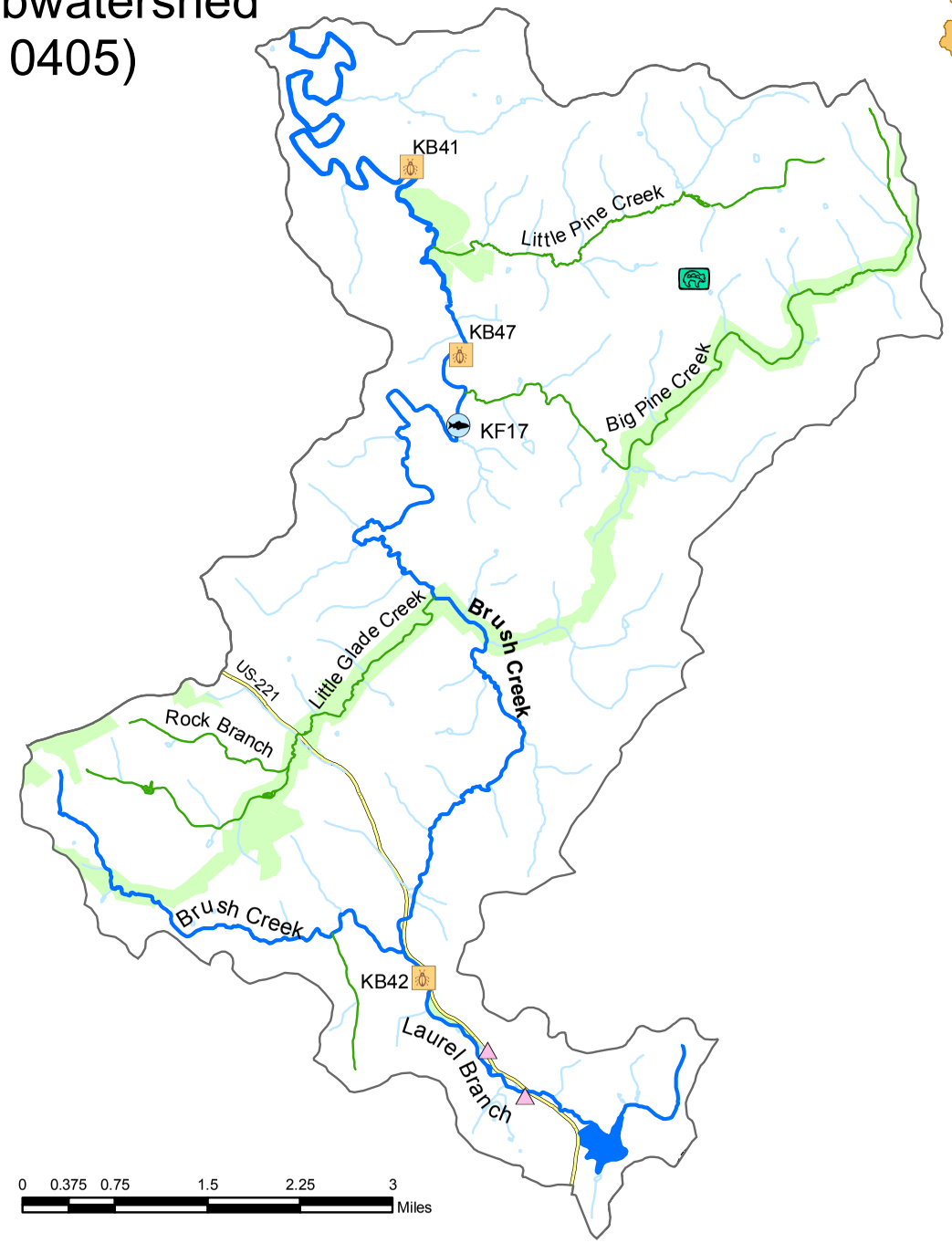
- Random Ambient Stations
- Ambient
- Fish Community
- Benthos
- USGS Gages

Permits

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

Brush Creek Subwatershed (050500010405)





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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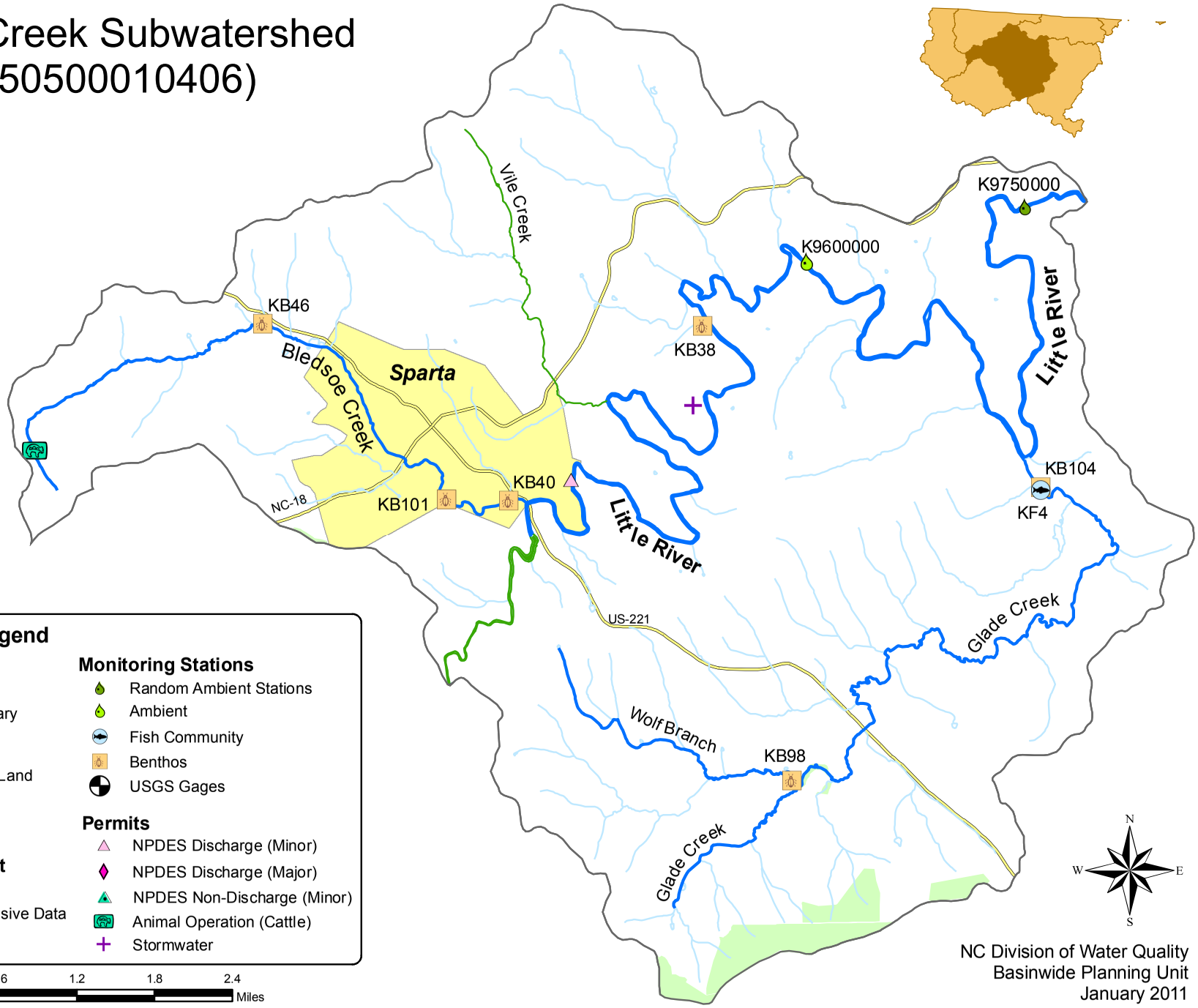
3-D.6

Glade Creek Subwatershed (050500010406)



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 0.3 0.6 1.2 1.8 2.4 Miles

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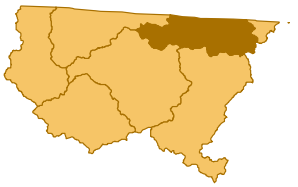
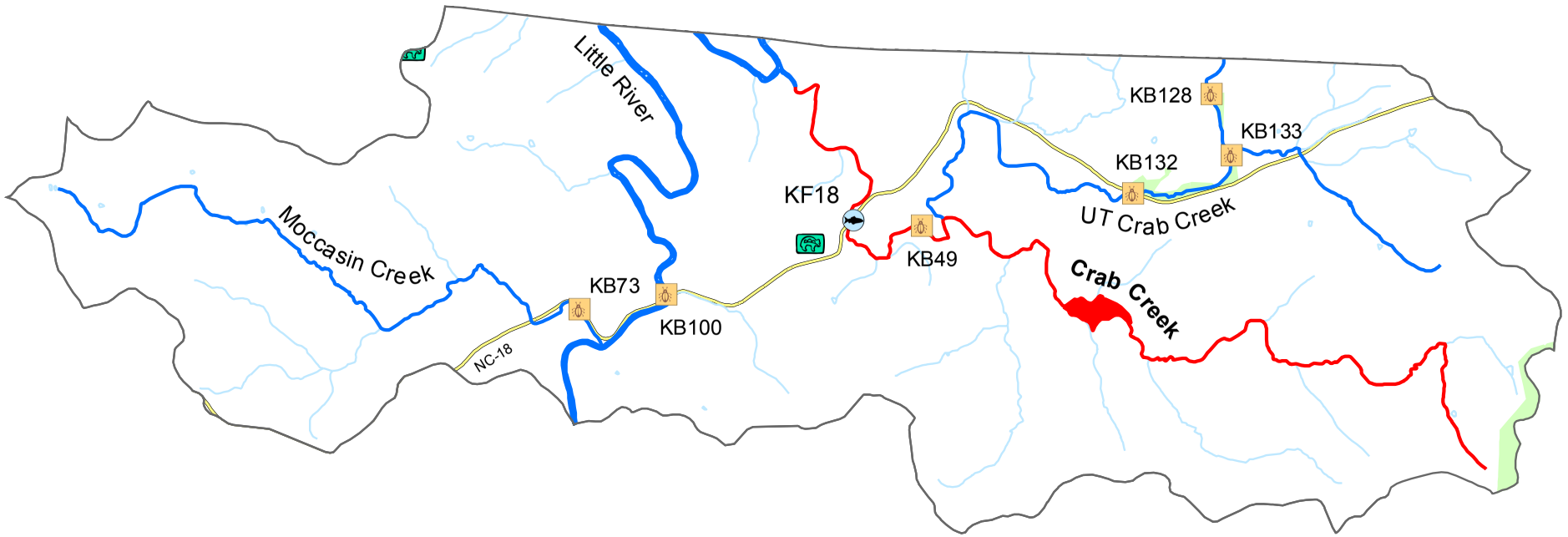
Crab Creek-Little River Subwatershed (050500010407)





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 0.25 0.5 1 1.5 2 Miles

N W E S

NC Division of Water Quality
Basinwide Planning Unit
January 2011

3-D.8