

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
DAN R	NC 704	NB8	08/10/09	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.514722	-80.303056	22-(1)b	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C;Tr	169.0	886	19	0.2

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

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

Water Quality Parameters

Temperature (°C)	26.0
Dissolved Oxygen (mg/L)	10.8
Specific Conductance (µS/cm)	49
pH (s.u.)	8.2
Water Clarity	clear

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	8
Pool Variety (10)	10
Riffle Habitat (16)	16
Bank Erosion (7)	7
Bank Vegetation (7)	7
Light Penetration (10)	10
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	92

Substrate	Mix of boulder, cobble, gravel, sand, and silt.
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Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/10/09	10747	106	52	4.16	3.38	Excellent
07/07/04	9403	91	45	3.89	3.42	Excellent
08/23/99	7981	85	41	4.17	3.26	Good
08/23/94	6686	57	28	3.85	3.51	Good
07/12/90	5379	94	48	4.46	3.65	Excellent

Taxonomic Analysis

Several intolerant macroinvertebrate taxa were collected at this sampling location such as the mayflies *Epeorus vitreus*, *Seratella serratoides*, and *Ephoron leukon*; the long-lived stoneflies *Acroneuria abnormis*, *Paragnetina ichusa/media*, and *Pteranarcys spp.*; and the caddisflies *Brachycentrus appalachia*, *B. lateralis*, *B. numerosus*, and *Goera spp.* Rarely collected taxa found at this site included *Brachycercus spp.* and *Brachycentrus lateralis*. Aquatic beetle fauna were extremely rich (13) at this sampling location.

Data Analysis

This portion of the Dan River continues to reflect Excellent water quality based on macroinvertebrate communities. The NCBI and EPTBI has remained low at the site since sampling began in 1984 and the highest total taxa richness (106) and EPT taxa richness (52) on record at this sample site was collected during the 2009 season. EPT abundance was also high at 216. This portion of the Dan River in North Carolina is relatively undisturbed by metropolitan areas found further downstream. A pollution intolerant macroinvertebrate community continues to reside at this sampling location. If requested, this site qualifies for reclassification as an Outstanding Resource Water or High Quality Water due to continued Excellent bioclassifications.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
DAN R	SR 1695	NB9	08/11/09	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.401944	-80.138333	22-(8)	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
WS-V	335.0	700	40	0.2

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

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

Water Quality Parameters

Temperature (°C)	27.8
Dissolved Oxygen (mg/L)	10.5
Specific Conductance (µS/cm)	53
pH (s.u.)	7.2

Water Clarity slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	20
Bottom Substrate (15)	13
Pool Variety (10)	9
Riffle Habitat (16)	7
Bank Erosion (7)	6
Bank Vegetation (7)	6
Light Penetration (10)	2
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	78

Site Photograph



Substrate Mostly bedrock, boulder, and cobble with less gravel and sand.

Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/11/09	10749	100	42	4.62	3.82	Good
07/07/04	9404	87	43	4.89	4.07	Good
08/23/99	7984	72	37	4.56	3.93	Good
08/23/94	6688	45	20	4.74	3.83	Good-Fair

Taxonomic Analysis

Several intolerant EPT taxa were collected including the mayflies *Epeorus vitreus*, *Ephoron leukon*, and *Serratella serratoides*; the stoneflies *Acroneuria abnormis* and *Paragnetina fumosa*; and the caddisflies *Brachycentrus lateralis* and *Polycentropus spp.* The intolerant beetles *Optioservus trivittatus*, *Promoresia elegans*, and *Psephenus herricki* were also common. Rare EPT taxa collected at this sampling station included *Trycorythodes robacki* and *Ceraclea mentiea* listed as "vulnerable to extirpation" by Morse *et al.* (1997) and Significantly Rare by the North Carolina Natural Heritage Program (2006) respectively.

Data Analysis

This site continues to exhibit Good water quality based on macroinvertebrate fauna. The NCBI and EPTBI has remained relatively similar since sampling began in 1994. Total taxa richness and EPT taxa richness steadily increased beginning in 1999 elevating the bioclassification from Good-Fair to Good; where it has remained. Consistent good water quality at the site is likely attributed to the mostly forested upstream land use with minimal anthropogenic activities.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
N DOUBLE CR	SR 1504	NB15	08/10/09	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.440000	-80.311020	22-10	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C	12.0	785	8	0.1

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	70	10	20	

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

Water Quality Parameters

Temperature (°C)	22.3
Dissolved Oxygen (mg/L)	10.3
Specific Conductance (µS/cm)	58
pH (s.u.)	6.4

Water Clarity	clear
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	14
Pool Variety (10)	10
Riffle Habitat (16)	7
Bank Erosion (7)	5
Bank Vegetation (7)	5
Light Penetration (10)	10
Left Riparian Score (5)	4
Right Riparian Score (5)	5
Total Habitat Score (100)	83

Site Photograph



Substrate	Mostly gravel and sand with some cobble substrate.
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Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/10/09	10746	---	31	---	4.27	Good
06/28/04	9396	---	31	---	3.42	Good
08/23/99	7982	---	25	---	3.95	Good-Fair
08/23/94	6687	---	17	---	5.05	Fair

Taxonomic Analysis

Various pollution sensitive EPT taxa were collected at this monitoring station in 2009 including the stoneflies *Acroneuria abnormis*, *Leuctra spp.*, and *Tallaperla spp.* *Tallaperla* has never been collected at this station. The intolerant mayflies *Leucrocota spp.*, *Heptagenia marginalis*, and *Stenacron pallidum* were common. Pollution-sensitive caddisflies such as *Chimarra spp.* and *Polycentropus spp.* were abundant and common respectively. The rarely collected mayfly *Seratella serrata* was also collected in 2009.

Data Analysis

This stream retained its bioclassification of Good in 2009 suggesting minimal upstream pollution input. EPT richness remained the same as in 2004, however, EPTBI was elevated. This higher EPTBI may be due to the emergence of some intolerant taxa found in 2004 such as *Pycnopsyche spp.* Empty *Pycnopsyche spp.* cases were found at the site suggesting the insects had already emerged preventing collection. Despite the presence of small infrequent riffles, this station continues to exhibit good water quality most likely due to minimal anthropogenic input and a mostly forested catchment.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
SNOW CR	SR 1673	NB17	08/10/09	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.434444	-80.147778	22-20	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
C	34.0	650	11	0.1

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

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

Water Quality Parameters

Temperature (°C)	27.2
Dissolved Oxygen (mg/L)	9.5
Specific Conductance (µS/cm)	80
pH (s.u.)	6.8

Water Clarity	clear
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	8
Pool Variety (10)	8
Riffle Habitat (16)	5
Bank Erosion (7)	3
Bank Vegetation (7)	5
Light Penetration (10)	7
Left Riparian Score (5)	5
Right Riparian Score (5)	4
Total Habitat Score (100)	68

Site Photograph



Substrate	Mostly sand with minimal cobble and gravel.
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Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/10/09	10748	---	29	---	4.48	Good
07/07/04	9405	---	31	---	4.33	Good
09/13/00	8308	---	29	---	4.08	Good
08/23/99	7983	---	18	---	4.29	Fair
08/23/94	6689	---	22	---	4.04	Good-Fair

Taxonomic Analysis

Both mayfly and caddisfly taxa new to this location were collected in 2009 including the caddisflies *Brachycercus spp* and *Glossosoma spp*. These macroinvertebrates are considered sensitive to pollution and usually are not present in degraded water quality conditions. Additionally, the moderately caddisfly intolerant *Polycentropus spp* was common at this site consistent with samples collected since 2000. *Leuctra spp* was the only stonefly collected at this location.

Data Analysis

The bioclassification at this site has remained Good since 2000. It was reassessed following the Fair rating it received in 1999 pending its addition to the 303(d) list. The EPTBI in 2009 is slightly elevated compared to past samples, however, EPT taxa richness has remained consistent between 29 and 31 beginning in 2000. Overall, water quality has improved at the site since 1999 when presumably this location suffered from low flows and/or temporary bridge construction impacts. No NPDES dischargers are currently active upstream from this macroinvertebrate monitoring station.

BENTHIC MACROINVERTEBRATE SAMPLE

Waterbody	Location	Station ID	Date	Bioclassification
MAYO R	SR 1358	NB28	08/11/09	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
Rockingham	2	03010103	36.535520	-79.990620	22-30-(1)	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Stream Depth (m)
WS-V	261.0	720	40	0.3

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

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

Water Quality Parameters

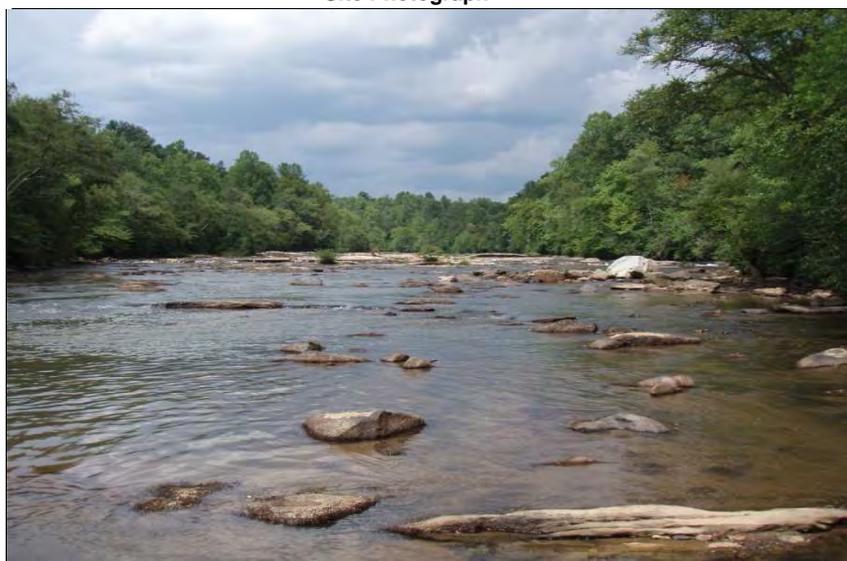
Temperature (°C)	26.6
Dissolved Oxygen (mg/L)	10.2
Specific Conductance (µS/cm)	53
pH (s.u.)	7.3

Water Clarity	clear
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	12
Pool Variety (10)	10
Riffle Habitat (16)	16
Bank Erosion (7)	7
Bank Vegetation (7)	6
Light Penetration (10)	5
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	89

Site Photograph



Substrate	Mostly bedrock and rubble with some boulders, gravel, and sand.
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Sample Date	Sample ID	ST	EPT	BI	EPT BI	Bioclassification
08/11/09	10807	91	48	4.03	3.37	Excellent
07/08/04	9406	78	33	4.74	4.13	Good
08/23/99	7985	70	32	4.27	3.45	Good
08/22/94	6685	64	38	3.58	3.20	Good
08/08/89	5035	79	42	4.79	4.00	Good

Taxonomic Analysis

In 2009, a diverse macroinvertebrate community was observed at this sampling location. EPT richness (48) was the highest yet recorded during Basinwide sampling at this site. Many intolerant EPT taxa were collected including but not limited to the mayflies *Drunella allegheniensis*, *Epeorus vitreus*, and *Serratella serratoides*; the stoneflies *Leuctra* spp., *Paragnetina fumosa*, and *Pteranarcys* spp, and the caddisflies *Brachycentrus lateralis*, *B. nigrosoma*, *B. numerosus*, *Ceraclea mentiea*, *Micrasema wataga*, and *M. bennetti*. Rarely collected EPT taxa included *Heterocloeon petersi*, *Rhithrogena* spp., *Brachycentrus lateralis* and *Ceraclea mentiea*. Intolerant beetles present included *Promeresia elegans*, *Psephenus herricki*, *Optioservus ovalis*, and *O. trivittatus*.

Data Analysis

The Mayo River Basinwide sampling location received a bioclassification of Excellent in 2009 suggesting an improvement in water quality from past benthic samples. This may reflect a reduction in non point pollution inputs as a result of the prolonged drought. The NCBI and EPTBI has remained stable throughout basinwide sampling at this location, however, total taxa richness and EPT taxa richness increased significantly in 2009 compared to past samples. A history of Good ratings (1989-2004) and recent Excellent rating (2009) suggests improved water quality and very little anthropogenic activity upstream. Further sampling should occur in the near future to determine if macroinvertebrate fauna continue to reflect improved water quality at this location. The presence of so many intolerant and rare taxa in this stretch of river suggests further investigation(s) are needed to assess its potential for reclassification.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
ARCHIES CR	SR 1415	05/11/09	NF1	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.55	-80.43277778	22-2	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	9.3	1180	7	0.4	No

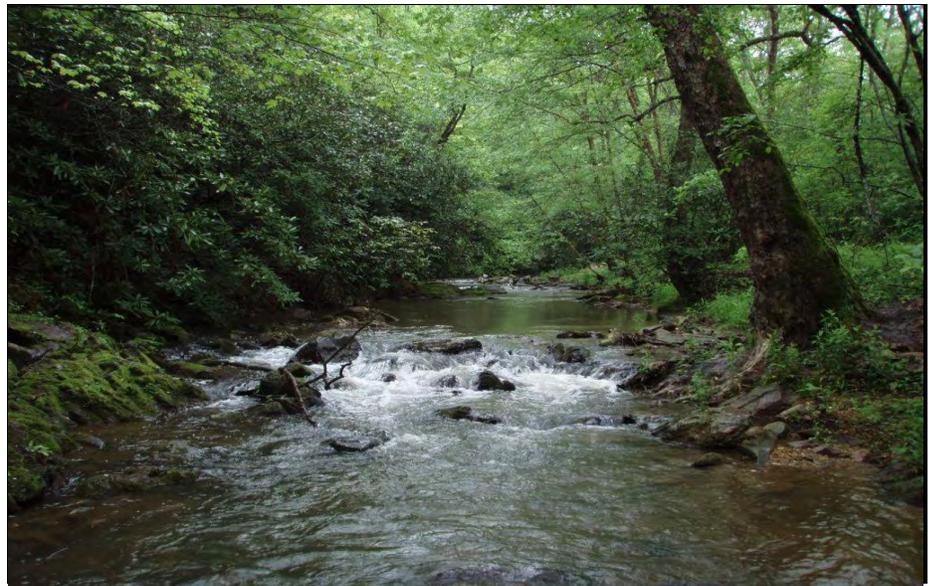
Visible Landuse (%)	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
	70	5	25	0

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

Water Quality Parameters

Temperature (°C)	15.3
Dissolved Oxygen (mg/L)	9.2
Specific Conductance (µS/cm)	49
pH (s.u.)	6.0
Water Clarity	Slightly turbid

Site Photograph



Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	12
Pool Variety (10)	10
Riffle Habitat (16)	16
Erosion (7)	7
Bank Vegetation (7)	7
Light Penetration (10)	9
Left Riparian Score (5)	5
Right Riparian Score (5)	3
Total Habitat Score (100)	93

Substrate	Bedrock, cobble, boulder, sand
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/11/09	2009-28	22	54	Excellent
04/19/04	2004-09	21	54	Excellent

Most Abundant Species 2009

Redlip Shiner (23%), Bluehead Chub (21%)

Exotic Species 2009

Brown Trout, Smallmouth Bass

Species Change Since Last Cycle

Gains -- Brown Trout (n=1). **Losses** -- none.

Data Analysis

Watershed -- drains southern Patrick County, VA and a very small portion of the extreme northwest corner of Stokes and northeastern Surry counties; no municipalities in the watershed; tributary to the Dan River; site is ~ 0.7 miles upstream of the creek's confluence with the river. **Habitats** -- very high quality instream and riparian habitats, site would have qualified as a regional reference site except the watershed landuse did not appear to be as greatly forested (~ 50 %) as required to meet the criteria (≥ 70 %). **Water Quality** -- specific conductance has always been low (37 and 49 µS/cm). **2009** -- greatest number of intolerant species (n=4) and lowest percentage of tolerant fish (3%) of any site in 2009; not a NCWRC Hatchery Supported Trout waters, but one stocked Brook Trout, 200 mm TL was collected. **2004 & 2009** -- 22 species known from the site, including 5 species of darters and the endemic Cutlip Minnow [Special Concern], Roanoke Hogsucker [Significantly Rare], Blacktip Jumprock, and Riverweed Darter [Special Concern]; dominant species are the Bluehead Chub and Redlip Shiner. Based on this site's most recent Excellent rating, the site qualifies at minimum for High Quality Waters (HQW) designation.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
ELK CR	SR 1433	05/11/09	NF4	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.5238889	-80.3075	22-5	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	8.5	890	7	0.4	No

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

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

Water Quality Parameters

Temperature (°C)	15.3
Dissolved Oxygen (mg/L)	9.2
Specific Conductance (µS/cm)	48
pH (s.u.)	6.3

Water Clarity	Slightly turbid, easily silted
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	17
Bottom Substrate (15)	12
Pool Variety (10)	9
Riffle Habitat (16)	16
Erosion (7)	6
Bank Vegetation (7)	3
Light Penetration (10)	4
Left Riparian Score (5)	1
Right Riparian Score (5)	2
Total Habitat Score (100)	75

Site Photograph



Substrate	Bedrock, boulder, cobble, gravel, silt, sand
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/11/09	2009-29	18	52	Good
04/20/04	2004-13	21	44	Good-Fair

Most Abundant Species 2009	Bluehead Chub (34%)	Exotic Species 2009	Smallmouth Bass
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Species Change Since Last Cycle

Gains -- White Sucker, Northern Hogsucker. **Losses** -- Mountain Redbelly Dace, Cutlip Minnow, Creek Chub, Golden Redhorse, Brown Trout. All species gained or lost were represented by 1 fish/species, except for Golden Redhorse and White Sucker (n=5 and 8, respectively).

Data Analysis

Watershed -- drains primarily southern Patrick County, VA and a very small portion of northwestern Stokes County; no municipalities in the watershed; tributary to the Dan River, site is ~ 0.8 miles above the creek's confluence with the river. **Habitats** -- high gradient stream with plunge pools and riffles; narrow riparian zones offering minimal shading to the stream, banks have re-vegetated since 2004. **Water Quality** -- specific conductance has always been low (41 and 48 µS/cm). **2009** -- a slight increase in the diversity of suckers and a greater abundance of piscivores (i.e., Smallmouth Bass) were largely responsible for the improved NCIBI score and rating; other metrics were unchanged. **2004 & 2009** -- 23 species known from the site, including 5 species of darters, 4 species of suckers, the endemic Cutlip Minnow [Special Concern], Roanoke Hogsucker [Significantly Rare], and Riverweed Darter [Special Concern], but only one species of sunfish; dominant species is the Bluehead Chub.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
PETERS CR	SR 1497	05/12/09	NF6	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.4938889	-80.2713889	22-6	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	28.6	830	11	0.4	Yes

Visible Landuse (%)	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
	75	0	25	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)	11.2
Specific Conductance (µS/cm)	57
pH (s.u.)	5.4

Water Clarity	Slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	16
Bottom Substrate (15)	12
Pool Variety (10)	10
Riffle Habitat (16)	11
Erosion (7)	4
Bank Vegetation (7)	7
Light Penetration (10)	10
Left Riparian Score (5)	3
Right Riparian Score (5)	5
Total Habitat Score (100)	83

Site Photograph



Substrate	Cobble, boulder, gravel, sand, silt.
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/12/09	2009-30	27	50	Good
04/21/04	2004-14	24	54	Excellent

Most Abundant Species 2009	Bluehead Chub (24%)	Exotic Species 2009	Bluegill
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Species Change Since Last Cycle

Gains -- Central Stoneroller, Bull Chub, Golden Shiner, Northern Hogsucker, Golden Redhorse, V-lip Redhorse. **Losses** -- Bigeye Jumprock, Smallmouth Bass, Chainback Darter. All species gained or lost were represented by 1 or 2 fish/species, except for V-Lip Redhorse, Golden Redhorse, and Central Stoneroller (n=6, 7, and 19, respectively).

Data Analysis

Watershed -- drains a portion of the southern part of Patrick County, VA and north-central Stokes County; no municipalities in the watershed; tributary to the Dan River, site is ~ 1.9 miles above the creek's confluence with the river. **Habitats** -- a regional reference site; riffles, deep snag pools; good canopy over the stream. **Water Quality** -- pH less than the water quality standard of 6.0 s.u. **2009** -- 6 species of suckers collected, the most of any site in 2009 (Wolf Island Creek also had 6 species); the loss of the intolerant Bigeye Jumprock [State Threatened], and the intolerant Smallmouth Bass were responsible for the decline in the NCIBI score and rating; other metrics were unchanged. **2004 & 2009** -- very diverse community, 30 species known from the site, including 7 species of suckers, 6 species of darters and the endemic Roanoke Hogsucker [Significantly Rare], Bigeye Jumprock, Blacktip Jumprock, and Riverweed Darter [Special Concern]; the loss of the Bigeye Jumprock and Smallmouth Bass and the decline from Excellent to Good warrants additional monitoring in 2014.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
BIG CR	SR 1471	05/13/09	NF2	Good-Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.4725	-80.34888889	22-9	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C;Tr	32.7	890	8	0.4	No

Visible Landuse (%)	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
	75	5	20	0

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

Water Quality Parameters

Temperature (°C)	13.7
Dissolved Oxygen (mg/L)	13.0
Specific Conductance (µS/cm)	52
pH (s.u.)	6.0

Water Clarity	Slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	16
Bottom Substrate (15)	5
Pool Variety (10)	10
Riffle Habitat (16)	7
Erosion (7)	4
Bank Vegetation (7)	7
Light Penetration (10)	9
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	73

Site Photograph



Substrate	Sand, gravel, boulder, bedrock
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/13/09	2009-33	19	42	Good-Fair
04/20/04	2004-10	17	48	Good

Most Abundant Species 2009	Bluehead Chub (47%)	Exotic Species 2009	Bluegill
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Species Change Since Last Cycle

Gains -- Central Stoneroller, White Shiner, Mountain Redbelly Dace, Blacktip Jumprock, Flat Bullhead.
Losses -- Green Sunfish, Riverweed Darter, Roanoke Darter. All species gained or lost were represented by 1-9 fish/species.

Data Analysis

Watershed -- drains eastern Surry and northwestern Stokes counties; no municipalities in the watershed; tributary to the Dan River. **Habitats** -- gravel riffles, runs, pools, woody debris, bank erosion is moderate to severe in places. **Water Quality** -- dissolved oxygen saturation at 125% indicating high early morning periphyton production. **2009** -- more than twice as many fish collected in 2009 than in 2004 (888 vs. 413), primarily Bluehead Chub and Crescent Shiner; highest percentage of omnivores+ herbivores of any site (49%, indicative of non-point source nutrient enrichment; the loss of two intolerant darters, Roanoke Darter and Riverweed Darter, and one species of sunfish were responsible for the decline in the NCIBI score and rating. **2004 & 2009** -- 22 species known from the site, including 4 species of darters and the endemic Roanoke Hogsucker [Significantly Rare], Blacktip Jumprock, and Riverweed Darter [Special Concern]; dominant species is the Bluehead Chub.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
N DOUBLE CR	SR 1504	05/12/09	NF5	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.43972222	-80.31111111	22-10	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	12.4	790	8	0.4	Yes

Visible Landuse (%)	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
	75	15	10	0

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

Water Quality Parameters

Temperature (°C)	15.0
Dissolved Oxygen (mg/L)	10.2
Specific Conductance (µS/cm)	52
pH (s.u.)	6.1

Water Clarity	Very slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	14
Bottom Substrate (15)	4
Pool Variety (10)	8
Riffle Habitat (16)	12
Erosion (7)	6
Bank Vegetation (7)	7
Light Penetration (10)	9
Left Riparian Score (5)	3
Right Riparian Score (5)	5
Total Habitat Score (100)	73

Site Photograph



Substrate	Sand, gravel, some cobble
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/12/09	2009-32	20	50	Good
04/20/04	2004-11	18	42	Good-Fair

Most Abundant Species 2009	Bluehead Chub (32%), Crescent Shiner (25%)	Exotic Species 2009	Bluegill
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Species Change Since Last Cycle	Gains -- Satfin Shiner, Golden Redhorse, Bluegill, Roanoke Darter. Losses -- Flat Bullhead, Largemouth Bass. All species gained or lost were represented by 1-5 fish/species.
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Data Analysis

Watershed -- drains west-central Stokes County; no municipalities in the watershed; tributary to the Dan River, site is ~ 2.7 miles upstream of the creek's confluence with the river. **Habitats** -- a regional reference site; primarily gravel/sand runs; one riffle at the upper end, some snags, undercuts; high quality riparian zone on the right. **2009** -- the number of fish collected in 2009 was ~ 1.5 times more than in 2004 (811 vs. 539), primarily Crescent Shiner which increased almost 10-fold; the slight increase in the diversity of suckers and darters and a more balanced trophic structure (i.e., less dominance by the omnivorous Bluehead Chub) were responsible for the increased NCIBI score and rating; no lingering drought impacts. **2004 & 2009** -- 22 species known from the site, including 4 species of darters and the endemic Roanoke Hogsucker [Significantly Rare]; dominant species is the Bluehead Chub.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
S DOUBLE CR	SR 1483	05/12/09	NF7	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.43138889	-80.29805556	22-11	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
B	16.4	750	7	0.5	No

Visible Landuse (%)	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
	70	10	20	0

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

Water Quality Parameters

Temperature (°C)	12.9
Dissolved Oxygen (mg/L)	10.5
Specific Conductance (µS/cm)	47
pH (s.u.)	5.9

Water Clarity	Slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	14
Bottom Substrate (15)	3
Pool Variety (10)	10
Riffle Habitat (16)	5
Erosion (7)	6
Bank Vegetation (7)	6
Light Penetration (10)	9
Left Riparian Score (5)	3
Right Riparian Score (5)	4
Total Habitat Score (100)	65

Site Photograph



Substrate	Sand, gravel, bedrock outcrops
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/12/09	2009-31	21	48	Good
04/20/04	2004-12	22	46	Good

Most Abundant Species 2009

Bluehead Chub (27%), Redbreast Sunfish (20%)

Exotic Species 2009

Bluegill

Species Change Since Last Cycle

Gains -- Central Stoneroller, Blacktip Jumprock, Bluegill. **Losses** -- Mountain Redbelly Dace, Flat Bullhead, Green Sunfish, Chainback Darter. All species gained or lost were represented by 1-5 fish/species.

Data Analysis

Watershed -- drains west-central Stokes County; no municipalities in the watershed; tributary to the Dan River, site is ~ 0.8 miles upstream of the creek's confluence with the river. **Habitats** -- borders the Sauratown Mountains Level IV ecoregion; gravel riffles and runs, silty pools with bedrock outcrops; re-vegetated left bank. **Water Quality** -- lowest specific conductance of any site in 2009, has always been low (46 µS/cm in 2004). **2009** -- slightly more total fish and a lower percentage of tolerant fish were largely responsible for the very slight increase in NCIBI score and rating, no other changes in the other metric scores; no lingering impacts from droughts. **2004 & 2009** -- 25 species known from the site, including 5 species of darters and the endemic Roanoke Hogsucker [Significantly Rare] and Blacktip Jumprock; dominant species is the Bluehead Chub.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
SNOW CR	SR 1652	05/13/09	NF8	Good-Fair

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.46166667	-80.14972222	22-20	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	22.7	750	9	0.4	No

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

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

Water Quality Parameters

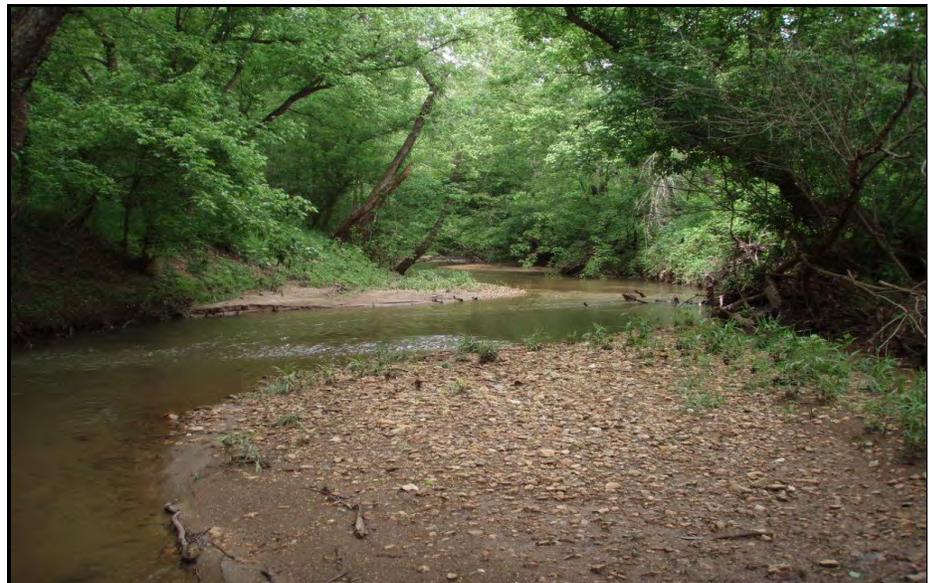
Temperature (°C)	13.9
Dissolved Oxygen (mg/L)	12.2
Specific Conductance (µS/cm)	66
pH (s.u.)	6.2

Water Clarity	Very slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	16
Bottom Substrate (15)	4
Pool Variety (10)	6
Riffle Habitat (16)	10
Erosion (7)	4
Bank Vegetation (7)	7
Light Penetration (10)	10
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	72

Site Photograph



Substrate	Sand, gravel, cobble, silt
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/13/09	2009-34	19	44	Good-Fair
04/21/04	2004-15	16	46	Good

Most Abundant Species 2009	Bluehead Chub (38%)	Exotic Species 2009	Bluegill
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Species Change Since Last Cycle	Gains -- Central Stoneroller (n=9), Northern Hogsucker (n=4), Blacktip Jumprock (n=1), Bluegill (n=14). Losses -- Flat Bullhead (n=6).
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Data Analysis

Watershed -- drains northeastern and north-central Stokes County; no municipalities in the watershed; tributary to the Dan River. **Habitats** -- shallow riffles, runs, side snags, bedrock outcrop pool at the end of the reach. **2009** -- 3 times more fish collected in 2009 than in 2004 (746 vs. 249), primarily Bluehead Chub, Redlip Shiner, and Crescent Shiner (69% of all the fish collected); a slight increase in sucker diversity was offset by the abundance of omnivores, primarily Bluehead Chub, indicative of nonpoint source nutrient enrichment, which slightly decreased the NCIBI score and rating; no lingering effects from the drought. **2004 & 2009** -- only 20 species known from the site, including the endemic Roanoke Hogsucker [Significantly Rare] and Blacktip Jumprock; interestingly Snow Creek was the only site in the basin from which the Johnny Darter or the Tessellated Darter was not collected in 2004 or 2009, its absence is unexplained; dominant species is the Bluehead Chub.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
TOWN FORK CR	SR 1955	05/13/09	NF9	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
STOKES	1	03010103	36.26416667	-80.2325	22-25b	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	28	680	10	0.4	No

Visible Landuse (%)	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
	25	15	60	0

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

Water Quality Parameters

Temperature (°C)	16.7
Dissolved Oxygen (mg/L)	12.4
Specific Conductance (µS/cm)	95
pH (s.u.)	6.9

Water Clarity	Very slightly turbid
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	18
Bottom Substrate (15)	8
Pool Variety (10)	7
Riffle Habitat (16)	15
Erosion (7)	6
Bank Vegetation (7)	7
Light Penetration (10)	7
Left Riparian Score (5)	3
Right Riparian Score (5)	3
Total Habitat Score (100)	79

Site Photograph



Substrate	Bedrock shelves, gravel, cobble
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/13/09	2009-35	21	52	Good
04/21/04	2004-16	21	48	Good

Most Abundant Species 2009	Fantail Darter (34%)	Exotic Species 2009	Bluegill, Green Sunfish
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Species Change Since Last Cycle	Gains -- Mountain Redbelly Dace (n=5). Losses -- V-lip Redhorse (n=5).
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Data Analysis

Watershed -- drains south-central Stokes and northern Forsyth counties, north and east of the City of Winston-Salem metropolitan area; three NPDES activities in the watershed (005005770 and 007007007) with a combined flow of 0.107 MGD; tributary to the Dan River. **Habitats** -- shallow gravel riffles, runs, bedrock riffles with *Podostemum*, side snag pools. **Water Quality** -- dissolved oxygen saturation at 128% due to afternoon photosynthetic activity by the periphyton. **2009** -- 2.2 times more fish collected in 2009 than in 2004, primarily an increase in the number of Fantail Darter (from 16% to 34%) and a decrease in the dominance of the Bluehead Chub (from 38% to 21%); these changes (decreasing the percentage of omnivores+herbivores and increasing the percentage of insectivores) slightly increased the NCIBI score but not the rating. **2004 & 2009** -- 22 species known from the site, including 5 species of sucker, 3 species of darters, and the endemic Roanoke Hogsucker [Significantly Rare]; dominant species is the Fantail Darter and Bluehead Chub.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
BIG BEAVER ISLAND CR	US 311	05/14/09	NF10	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ROCKINGHAM	2	03010103	36.3825	-79.98083333	22-29	Triassic Basins

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	23.8	570	6	0.4	No

Visible Landuse (%)	Forested/Wetland	Urban	Agriculture	Other (describe)
	25	50	25	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)	8.8
Specific Conductance (µS/cm)	64
pH (s.u.)	6.3

Water Clarity	Clear, easily silted
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	14
Bottom Substrate (15)	6
Pool Variety (10)	8
Riffle Habitat (16)	10
Erosion (7)	1
Bank Vegetation (7)	7
Light Penetration (10)	9
Left Riparian Score (5)	3
Right Riparian Score (5)	4
Total Habitat Score (100)	67

Site Photograph



Substrate	Gravel, cobble, sand
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/14/09	2009-38	26	56	Excellent
04/22/04	2004-18	22	52	Good

Most Abundant Species 2009	Bluehead Chub (27%)	Exotic Species 2009	Bluegill
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Species Change Since Last Cycle

Gains -- Creek Chub, Golden Redhorse, V-lip Redhorse, Blacktip Jumprock, Redfin Pickerel, Largemouth Bass, Roanoke Logperch. **Losses** -- Golden Shiner, Northern Hogsucker, Glassy Darter, Chainback Darter. All species gained or lost were represented by 1 or 2 fish/species, except for Glassy Darter, Northern Hogsucker, Golden Redhorse, and Redfin Pickerel (n=4, 7, 9, and 28, respectively).

Data Analysis

Watershed -- drains north-central Stokes and northwest Rockingham counties, including the western area of the towns of Madison and Mayodan; tributary to the a ier site is ~0. mi es a o e the cree s co ue ce ith the ri er. **Habitats** -- severe bank erosion in places, but bank vegetation and canopy are of high quality; riffles, runs, side undercuts and snags, large coarse woody debris, large debris dam at end of reach. **2009** -- ~ 3.5 times more fish collected in 2009 than in 2004 (866 vs. 247), primarily Bluehead Chub, Redlip Shiner, Fantail Darter, and Crescent Shiner (71% of all the fish collected); the collection of 28 piscivorous Redfin Pickerel resulted in a more balanced trophic structure, increasing the NCIBI score and rating; one specimen of the Federally Endangered Roanoke Logperch was collected. **2004 & 2009** -- very diverse community with 30 species known from the site, including 6 species of darters, 6 species of suckers, and the endemic Roanoke Hogsucker [Significantly Rare], Blacktip Jumprock, and Roanoke Logperch; dominant species is the Bluehead Chub.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
PAWPAW CR	SR 1360	05/14/09	NF14	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ROCKINGHAM	2	03010103	36.50444444	-79.96277778	22-30-6-(2)	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	8.1	750	7	0.3	No

Visible Landuse (%)	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
	65	2	33	0

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

Water Quality Parameters

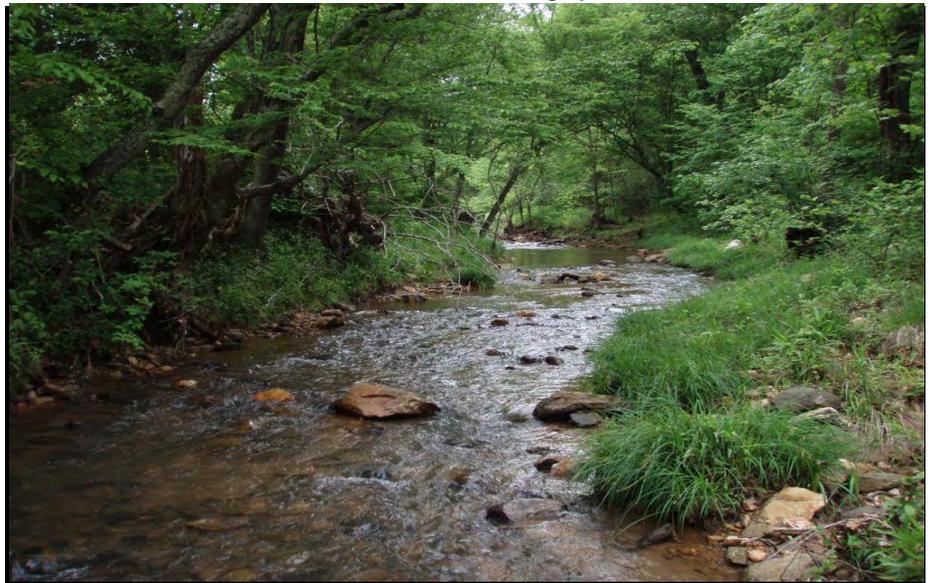
Temperature (°C)	14.4
Dissolved Oxygen (mg/L)	9.2
Specific Conductance (µS/cm)	57
pH (s.u.)	6.1

Water Clarity	Clear, easily silted
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	17
Bottom Substrate (15)	10
Pool Variety (10)	4
Riffle Habitat (16)	15
Erosion (7)	5
Bank Vegetation (7)	6
Light Penetration (10)	7
Left Riparian Score (5)	3
Right Riparian Score (5)	3
Total Habitat Score (100)	75

Site Photograph



Substrate	Cobble, gravel
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/14/09	2009-36	21	52	Good
04/22/04	2004-17	18	44	Good-Fair
08/03/90	90-08	23	48	Good

Most Abundant Species 2009	Bluehead Chub (22%)	Exotic Species 2009	Green Sunfish, Bluegill
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Species Change Since Last Cycle	Gains -- White Sucker (n=4), Golden Redhorse (n=18), Pumpkinseed (n=10), Warmouth (n=2). Losses -- White Shiner (n=8).
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Data Analysis

Watershed drainage area is approximately 0.1 miles a o e the cree confluence with the river. **Habitats** -- good gradient with riffles and runs, shallow pools, narrow riparian zones. **2009** -- almost twice as many fish collected in 2009 than in 2004 (979 vs. 527), primarily Redlip Shiner, Crescent Shiner, Central Stoneroller, and Fantail Darter (45% of all the fish collected); greater diversities of sunfish and suckers and a very slight improvement in the trophic structure were responsible for the increased NCIBI score and rating. **1990 - 2009** -- 27 species known from the site, including 4 species of darters and the endemic Roanoke Hogsucker [Significantly Rare] and Bigeye Jumprock [State Threatened]; the dominant species is the Bluehead Chub; the intolerant Bigeye Jumprock and Roanoke Darter have not been collected since 1990; the loss of two intolerant species, one of which is an endemic species of sucker, and the absence another species of sucker since 1990 from this site warrants repeat assessment in 2014.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
HOGANS CR	NC 704	05/14/09	NF11	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ROCKINGHAM	2	03010103	36.3816593	-79.9076818	22-31	Triassic Basins

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	23	600	8	0.4	Yes

Visible Landuse (%)	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
	95	0	0	5 (road)

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

Water Quality Parameters

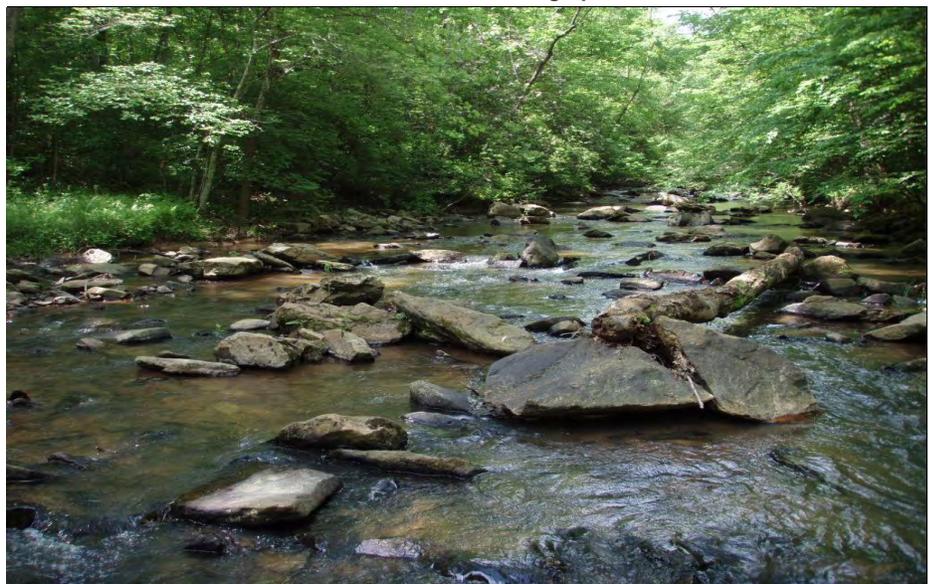
Temperature (°C)	16.0
Dissolved Oxygen (mg/L)	9.1
Specific Conductance (µS/cm)	62
pH (s.u.)	6.3

Water Clarity	Clear
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	19
Bottom Substrate (15)	12
Pool Variety (10)	10
Riffle Habitat (16)	16
Erosion (7)	6
Bank Vegetation (7)	7
Light Penetration (10)	10
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	95

Site Photograph



Substrate	Cobble, boulder, gravel, silt
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/14/09	2009-37	24	54	Excellent
04/22/04	2004-19	17	48	Good

Most Abundant Species 2009	Redlip Shiner (31%)	Exotic Species 2009	Green Sunfish, Bluegill
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Species Change Since Last Cycle	Gains -- White Shiner, Satinfish Shiner, Golden Redhorse, V-lip Redhorse, Green Sunfish, Pumpkinseed, Bluegill, Largemouth Bass, Riverweed Darter, Glassy Darter. Losses -- Rosyside Dace, Golden Shiner, Blacktip Jumprock. Species gained or lost were represented by 1-10 fish/species.
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Data Analysis

Watershed drains south east of Rockingham County into the watershed tributary to the area site is ~ . mi es a o e the cree s co ue ce ith the ri er our sma aci ities or mo ie home ar s ithi the cree s atershed (total w=0.251 MGD). **Habitat** -- a regional reference site; borders the Northern Outer Piedmont Level IV ecoregion, atypical Triassic Basin habitats; highest score of any site in the basin in 2004 and 2009; high gradient boulder and cobble riffles, runs, deep, long pools. **2009** -- 2.3 times more fish collected in 2009 than in 2004, primarily Redlip Shiner; with a greater diversity of sunfish and more species with multiple age classes in 2009 than in 2004 the NCIBI score and rating increased; other metric scores were unchanged; no lingering drought impacts. **2004 & 2009** -- 27 species known from the site, including 6 species of suckers, 5 species of darters, and the endemic Roanoke Hogsucker [Significantly Rare], Blacktip Jumprock, and Riverweed Darter [Special Concern]; dominant species is the Redlip Shiner; extremely low flows during the 2002 drought may have impacted the community in 2004; as a regional reference site and with an Excellent rating, if requested the site qualifies as High Quality Waters. Based on this site's most recent Excellent rating, the site qualifies at minimum for High Quality Waters (HQW) designation.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
JACOBS CR	NC 704	05/20/09	NF12	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ROCKINGHAM	2	03010103	36.37944444	-79.87638889	22-32-(3)	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	36.2	565	8	0.4	No

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

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

Water Quality Parameters

Temperature (°C)	11.6
Dissolved Oxygen (mg/L)	9.5
Specific Conductance (µS/cm)	76
pH (s.u.)	6.1

Water Clarity	Clear
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	17
Bottom Substrate (15)	4
Pool Variety (10)	4
Riffle Habitat (16)	3
Erosion (7)	2
Bank Vegetation (7)	4
Light Penetration (10)	8
Left Riparian Score (5)	3
Right Riparian Score (5)	5
Total Habitat Score (100)	55

Site Photograph



Substrate	Sand, gravel
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/20/09	2009-39	22	50	Good
04/22/04	2004-20	19	50	Good

Most Abundant Species 2009	Redlip Shiner (26%)	Exotic Species 2009	Bluegill
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Species Change Since Last Cycle

Gains -- Rosyside Dace, Mountain Redbelly Dace, Creek Chub, Golden Redhorse, Flat Bullhead, Bluegill, Chainback Darter. **Losses** -- Margined Madtom, Snail Bullhead, Green Sunfish, Largemouth Bass. All species gained or lost were represented by 1-4 fish/species, except for Bluegill, Creek Chub, and Golden Redhorse, (n=6, 8, 12, respectively).

Data Analysis

Watershed -- drains southwestern Rockingham County; no municipalities in the watershed; tributary to the Dan River, site is ~ 1.6 miles above the creek's confluence with the river to the southeast. **Watershed** -- 00 5 a d 00 700 total watershed flow = 0.01 MGD). **Habitats** -- gravelly and sandy runs, side snags and deadfall pools, scour pools, boulders and bluff along the right bank; left bank has re-vegetated since 2004; site still suffers from very substantial nonpoint source erosion and sedimentation; habitat score was the lowest of any site in 2004 and 2009. **2009** -- 2.6 times more fish collected in 2009 than in 2004 (459 vs. 176), primarily Redlip Shiner; piscivores absent; no other changes in the metric scores. **2004 & 2009** -- 26 species known from the site, including 5 species of suckers, 5 species of darters, and the endemic Roanoke Hogsucker [Significantly Rare]; dominant species are the Redlip Shiner and Bluehead Chub.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
ROCK HOUSE CR	SR 2127	05/20/09	NF18	Good

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ROCKINGHAM	3	03010103	36.42055556	-79.79055556	22-34-(2)	Triassic Basins

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
WS-IV	23	510	9	0.3	No

Visible Landuse (%)	Forested/Wetland	Rural Residential	Agriculture	Other (describe)
	75	5	20	0

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

Water Quality Parameters

Temperature (°C)	13.1
Dissolved Oxygen (mg/L)	9.6
Specific Conductance (µS/cm)	84
pH (s.u.)	6.7

Water Clarity	Clear, easily silted
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Habitat Assessment Scores (max)

Channel Modification (5)	5
Instream Habitat (20)	14
Bottom Substrate (15)	4
Pool Variety (10)	6
Riffle Habitat (16)	7
Erosion (7)	6
Bank Vegetation (7)	7
Light Penetration (10)	9
Left Riparian Score (5)	5
Right Riparian Score (5)	5
Total Habitat Score (100)	68

Site Photograph



Substrate	Sand, gravel, some cobble
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/20/09	2009-40	24	52	Good
04/23/04	2004-22	17	48	Good

Most Abundant Species 2009

Bluehead Chub (23%), Fantail Darter (18%)

Exotic Species 2009

Bluegill, Redear Sunfish

Species Change Since Last Cycle

Gains -- Central Stoneroller (n=21), Rosyside Dace (n=4), Swallowtail Shiner (n=10), Creek Chub (n=10), V-lip Redhorse (n=15), Redear Sunfish (n=1), Largemouth Bass (n=2), Chainback Darter (n=1). **Losses** -- Green Sunfish (n=34).

Data Analysis

Watershed -- drains central Rockingham County; no municipalities in the watershed; tributary to the Dan River, site is ~ 0.6 miles above the creek's confluence with the river. **Habitats** -- sand and gravel bars, very shallow sandy runs, side pools, high quality banks and riparian zones, but stream still exhibits some substantial nonpoint source erosion impacts. **2009** -- 2.7 times more fish collected in 2009 than in 2004 (1149 vs. 417), primarily Fantail Darter and Bluehead Chub; most fish collected from any site in 2009; less dominance by the omnivorous Bluehead Chub resulted in a more balanced trophic structure and a slight increase in the NCIBI score; no lingering drought effects. **2004 & 2009** -- 25 species known from the site, including 5 species of darters and the endemic Roanoke Hogsucker [Significantly Rare]; dominant species is the Bluehead Chub.

FISH COMMUNITY SAMPLE

Waterbody	Location	Date	Station ID	Bioclassification
WOLF ISLAND CR	SR 1767	05/20/09	NF20	Excellent

County	Subbasin	8 digit HUC	Latitude	Longitude	AU Number	Level IV Ecoregion
ROCKINGHAM	3	03010103	36.48138889	-79.55861111	22-48	Northern Inner Piedmont

Stream Classification	Drainage Area (mi2)	Elevation (ft)	Stream Width (m)	Average Depth (m)	Reference Site
C	43.2	510	10	0.4	No

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

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

Water Quality Parameters

Temperature (°C)	16.5
Dissolved Oxygen (mg/L)	8.8
Specific Conductance (µS/cm)	103
pH (s.u.)	6.5

Water Clarity	Clear
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Habitat Assessment Scores (max)

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

Site Photograph



Substrate	Sand, gravel, silt
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Sample Date	Sample ID	Species Total	NCIBI	Bioclassification
05/20/09	2009-41	28	56	Excellent
04/23/04	2004-23	21	50	Good

Most Abundant Species 2009	Bluehead Chub (25%), Crescent Shiner (18%)	Exotic Species 2009	Bluegill, Redear Sunfish
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Species Change Since Last Cycle	Gains -- Rosyside Dace, Mountain Redbelly Dace, Blacktip Jumprock, Pumpkinseed, Redear Sunfish, Largemouth Bass, Black Crappie, Glassy Darter, Chainback Darter, Roanoke Darter. Losses -- Notchlip Redhorse, Green Sunfish, Smallmouth Bass. All species gained or lost were represented by 1-4 fish/species.
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Data Analysis

Watershed -- drains the northeast corner of Rockingham County; headwaters begin northwest of the Town of Reidsville; tributary to the Dan River; one small NPDES facility in the headwaters (NC0078271, $Q_w = 0.0084$). **Habitats** -- large deadfalls and coarse woody debris, stick riffles, snag pools, wide riparian zones with mature trees; stream still exhibits substantial nonpoint source erosion with channel and riparian bank instabilities. **2009** -- ~4 times more fish collected in 2009 than in 2004 (719 vs. 177), primarily Bluehead Chub, Redlip Shiner, Crescent Shiner, and Bluegill; most diverse community of any site, including 6 species of suckers; increased abundance and species richness of darters and sunfish were largely responsible for the increase in NCIBI score and rating, no lingering drought effects. **2004 & 2009** -- very diverse community with 31 species known from the site, including 6 species of sucker, 5 species of darters, and the endemic Roanoke Hogsucker [Significantly Rare] and Blacktip Jumprock; dominant species is the Bluehead Chub.