Biological Summary – Millstone Creek

Significant Observations. Benthic macroinvertebrate samples were collected from three locations in this small catchment using protocols developed by the North Carolina Division of Water Quality. No implementation of best management practices have been initiated at this point. Surveys were conducted in November (2014) and March (2015). Samples were collected from sites on the East and West Branches of this tributary and also from a site below the confluence of the two Branches. The catchment is within an active pasture and cattle have had direct access to the stream and the two headwater branches. Productive habitat is limited at all three locations.

The East Branch of this tributary had accumulated significant Coarse Particulate Organic Matter (CPOM) suggesting that flow is somewhat restricted in this small feature. The benthic fauna was dominated by tolerant taxa including midges (*Zavrelimyia* in the fall and *Tanytarsus* in the spring) and amphipods. No EPT organisms were collected from either survey. The data from this location resulted in a poor bioclassification using the small stream classification criteria of DWQ (Biotic Index values for small piedmont streams and adding a fall and spring correction factors).

Much less CPOM were seen in the West Branch suggesting that there's enough flow to move this material and there were some rubble and small boulders in the reach surveyed. Despite slightly higher apparent flow very low numbers of EPT organisms were collected (EPT = 2 in the fall and EPT = 1 in the spring). The fauna at this location was also dominated by very tolerant taxa (mostly midges). The very high biotic index at this location also resulted in a Poor bioclassification during both surveys.

The most downstream location was sited approximately 50 meters below the confluence of the two branches, but above a section of this tributary that losing stream-like features. The instream habitat at this location becomes slightly more heterogeneous and we noted the presence of bank habitat. Taxa richness increases (including EPT taxa which increased only slightly) at this location. The fauna from both investigations were dominated by tolerant taxa (mostly midges). The biotic index values decline slightly at this site, but are within the Fair bioclassification.

These samples were both collected prior to the implementation of any Best Management Practices. Benthic insect samples will be collected from these three locations as management practices are implemented.

Table 1. Benthic Macroinvertebrates collected from the Millstone Creek Project. Randolph County, November, 2014 and March 2015.

Millstone Creek Project, Randolph Co.						
Collection Location	East Branch		West Branch		Below Confluence	
Collection Date (mo/year)	11/14	4/15	11/14	4/15	11/14	4/15
Taxa Name (Biotic Index value)						
Ephemeroptera						
Family Baetidae						
Centroptilum spp (3.8)					R	
Family Heptageniidae						
Maccaffertium modestum (5.7)			R			
Family Leptophebiidae						
Paraleptophlebia spp (1.2)					C	
Plecoptera						
Family Nemouridae						
Amphinemura spp (3.8)						R
Trichoptera						
Family Limnephilidae						
Ironoquia punctatissima (6.7)				R		
Family Phryganeidae						
Ptilostomis spp (5.9)					R	
Diptera: Miscellaneous families						
Family Ceratopogonidae						
Palpomyia (complex) (5.7)						R
Family Dixidae						
Dixa spp (2.5)		C	R	R	C	
Family Simuliidae						
Simulium spp (4.9)				R	R	A
Family Tabanidae						
Chrysops spp (6.7)				R		R
Family Tipulidae						
Pseudolimnophila spp (6.2)						R
Tipula spp (7.5)	C		C			
Chironomidae						
Chironomus spp (9.3)				R		
Conchapelopia group (8.4)	C	R	A	C	C	R

Cryptochironomus fulvus (6.7)		R				R
Endochironomus spp (7.8)				R		
Diamesa spp (6.6)		C		C		R
Dicrotendipes neomodestus (7.9)						C
Micropsectra spp (2.4)	C				A	
Microtendipes spp (4.6)	C				C	
Orthocladius clarkei gp (C/O sp 54) (5.6)		R				A
Parametriocnemus spp (3.9)		R		C		C
Paratendipes spp (5.6)	R	C				R
Polypedilum illinoense grp. (8.7)			R			
Polypedilum convictum (4.9)						R
Procladius spp (8.8)					C	
Rheotanytarsus spp (6.5)			C			
Tanytarsus spp (6.6)	R	A		A		A
Tvetenia discoloripes gp. (E sp. 3) (3.6)						R
Zavrelimyia spp (8.6)	A		C		R	
Coleoptera						
Family Dytiscidae						
Hydroporus spp (7.0)				R	C	R
Family Hydrophillidae						
Enochrus spp (8.5)					R	
Sperchopsis tessellatus (4.4)					A	
Odonata						
Family Calopterygidae						
Calopteryx spp (7.5)					C	
Family Libellulidae						
Plathemis lydia (9.8)					R	
Oligochaeta						
Family Lumbriculidae (7.0)						C
Family Tubificidae						
Limnodrilus hoffmeisteri (9.4)						R
Crustacea						
Family Asellidae						
Lirceus spp (7.4)		R	C	C	R	
Family Cambaridae (immature)				R		R
Family Gammaridae						
Crangonyx spp (7.2)	A	A	C	C	R	C
Mollusca						

Family Physidae						
Physella spp (8.7)	C	C			A	
Family Sphaeriidae						
Sphaerium spp (7.2)	C		R	R		R
Total Taxa Richness	10	11	11	15	18	17
EPT Taxa Richness	0	0	2	1	3	1
EPT Abundance	0	0	2	1	5	1
Biotic Index	7.16	6.37	7.43	7.05	6.02	5.88
BI Seasonal Correction*	7.26	6.57	7.53	7.25	6.12	6.08
Number of taxa = 2.5 or less	1	1	1	1	3	0
Bioclassification	Poor	Poor	Poor	Poor	Fair	Fair
* Seasonal correction +0.1 fall, +0.2 spring						