Loudoun Watershed Watch
Protecting the Water Resources of Loudoun County

December 19, 2005

Mr. James Beckley
Water Quality Data Liaison
DEQ, Richmond, VA

Dear James,

This is in response to your request for stream monitoring site referrals based on citizen monitoring data. I am writing on behalf of Loudoun Watershed Watch and Loudoun Wildlife Conservancy.

First, let me share some thoughts about additional stream monitoring in Loudoun County. I believe it is important to recognize that approximately 80% of the waters in Loudoun County have not been sampled by DEQ. Of the 20% of the waters that have been sampled, 75% of these waters do not meet water quality standards and are impaired. I used the data provided in your 2004 combined 303(d)/305(b) report to develop these data. Water sampling done for the TMDL's, sampling we have done in the Catoctin Creek watershed, and water sampling done by Loudoun Soil and Water Conservation District throughout the county suggest that we can project these same percentages for waters in the entire county. That is, we can reasonably project that at least 75% of the waters in Loudoun County do not meet water quality standards.

DEQ's Water Monitoring Strategy for Loudoun County

DEQ's "Water Quality Monitoring Consolidated Guidance Memorandum (DEQ Guidance Memo: 04-2005) dated February 2, 2004, provides guidance in Section 2.2, Developing Annual Water Monitoring Plans (MONPLANS), on how DEQ establishes their monitoring plans for each watershed. There appears to be four relevant criteria that are applied in Loudoun County as follows:

1. Department of Conservation and Recreation Non-Point Source rankings, watershed areas, and station densities;
2. Requests from citizens;
3. Locations that need additional data identified in the 305(b) assessment as Waters of Concern; and
4. Locations that need data in support of TMDL development.

In considering how these criteria should be applied to Loudoun County streams, some issues come to mind. Perhaps the top priority for establishing new sampling stations in Loudoun should not be the 305(b) Waters of Concern. Based on our projections, it should be relatively easy to find additional impaired waters, but to what purpose? We already have TMDL's on most streams, and the load reductions will need to be applied in the impaired as well as in the unsampled waters in the watershed (is that not right?).

Rather it would seem to make sense to give priority to establishing new stations that will assist in the TMDL development **and implementation process** (it is unclear to us why the criteria seems to exclude "TMDL implementation"?). That is, new sampling stations should be located so they will be useful in assessing progress being made to restore water quality consistent with the TMDL. New stations should also be used to help identify the stream segments in a watershed that are most contaminated so these segments can be targeted in the first phase of the TMDL implementation process. How we go about accomplishing the latter and whether this is something that DEQ can assist with, I don't know, but it does seem to be what will be most useful at this time to support our efforts to upgrade the quality of our waters. Most of our recommendations have these goals in mind.

The Problem of Sediments

A further consideration is the Virginia Tributary Strategy Program that puts new emphasis on reducing sediment loads from tributaries to the Potomac River. This is a major problem in Loudoun County, and as the Benthic TMDL for Goose Creek and Little River showed, is likely having a major impact on aquatic life in Loudoun streams. Yet, this is an impact largely unassessed by DEQ, and the current DEQ monitoring strategy seems to give this type of monitoring a low priority. Loudoun County has been the fastest growing county in the U.S. for several years and development has dramatically changed landuse throughout the county. There are more impervious surfaces and fewer forested lots in all our watersheds. Yet these stress factors that are impacting the aquatic life in our streams have not been meaningfully addressed in DEQ's monitoring plans and, consequently, in our TMDLs.

Stream Monitoring Strategy Plan for Loudoun County

In 2004 DEQ participated in two meetings organized by LWW to develop a comprehensive, water quality monitoring plan for Loudoun County. That planning process yield three principal goals for monitoring in the county:

1. Characterize and assess stream health;
2. Provide trend assessments and forecasts; and
3. Evaluate TMDL Implementation and Watershed Management Plans.

We believe that DEQ's monitoring plans for Loudoun County have focused on the first two goals more than the third. That is why we are raising the question of DEQ's priorities as we recommend establishing new monitoring stations. The reasons for DEQ's past priorities are understandable. DEQ stations were originally located to assess stream health using the fewest stations possible. Stations were located at mouths of

streams and major tributaries. Over the years DEQ has been locked into these original station locations in order to generate the trend data that is also important.

Need for a New Plan

There is now a new paradigm – one that is shifting our emphases away from identifying impaired waters to one of restoring water quality. Are DEQ's monitoring strategy and priorities keeping up with this changing model? Does a shift in focus to TMDL implementation and sediment reduction require a different set of monitoring stations, a different frequency of monitoring, a different emphasis on benthic monitoring versus bacteria monitoring? We are not sure, but these are issues that need to be addressed. A first step could be a joint LWW and DEQ "Loudoun County Stream Monitoring Strategy Workshop" to address these issues. Is this a possibility?

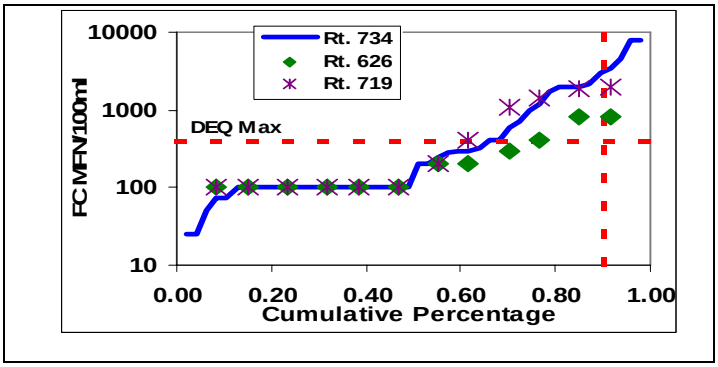
Stream Waters in Loudoun County Referred to DEQ for Follow-up Action –

Anyway, these are our reflections as we put together our recommendations to DEQ. With that said, let us proceed with a list of waters in Loudoun County that do seem to be impaired based on DEQ sampling, LWW/LWC bacteria sampling, and LWC benthic sampling. These finding are discussed in more detail in our updated watershed profiles in the "State of Loudoun Streams: 2005" report available on the LWW website at www.loudounwatershedwatch.org.

I am including waters that should be classified as impaired in the upcoming combined 303(d) and 305(b) report based on existing DEQ data, and waters that need to be sampled to obtain enough data to determine their status.

1. **Beaverdam Creek in the Goose Creek Watershed** – Fecal bacteria levels at two DEQ monitoring stations in unimpaired waters (1ABEC011.19 – Rt. 626, and 1ANOB005.49 – Rt. 719) are similar to the downstream DEQ station in impaired waters (1ABEC004.76 – Rt. 734). These data show that water quality standards are not being met, and the impairment should be extended to include all of Beaverdam Creek and NF Beaverdam Creek.

DEQ Fecal Coliform Bacteria Data for Beaverdam Run Watershed 1996-2004



2. **Catoctin Creek Watershed** –
   a. **Bacteria Monitoring** -- Bacteria water quality standards are exceeded at all 12 LWW/LWC bacteria monitoring stations in the Catoctin Creek Watershed. Graphs of these data are attached, and show that all waters in the Catoctin Creek Watershed should be classified as impaired. However, DEQ does not have a

monitoring station in the mid-section of the mainstem of Catoctin Creek (Rt. 673 area). This will create a potential anomaly where an unsampled stream segment will be surrounded by impaired segments.

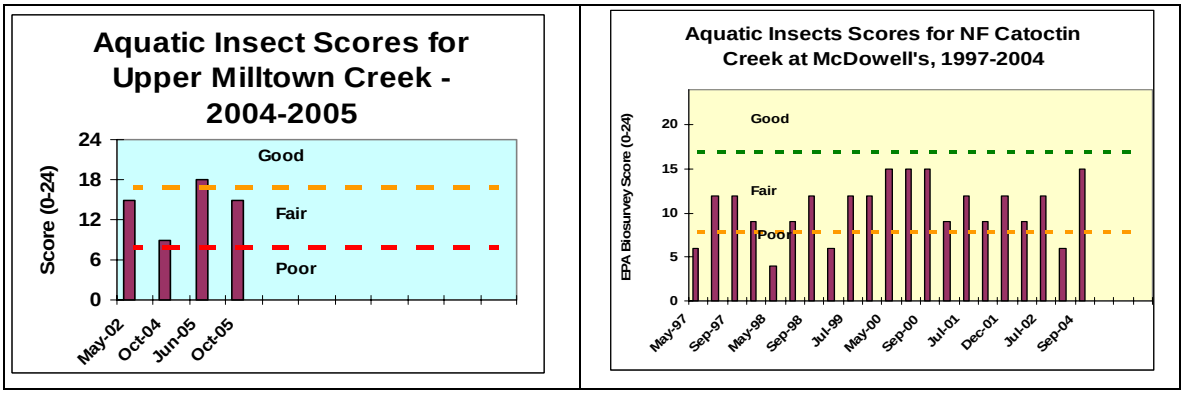
b. **Benthic Monitoring** -- Benthic monitoring by LWC show the following problem areas:

i. **Milltown Creek** – benthic conditions are generally "fair" upstream of Rt. 287.

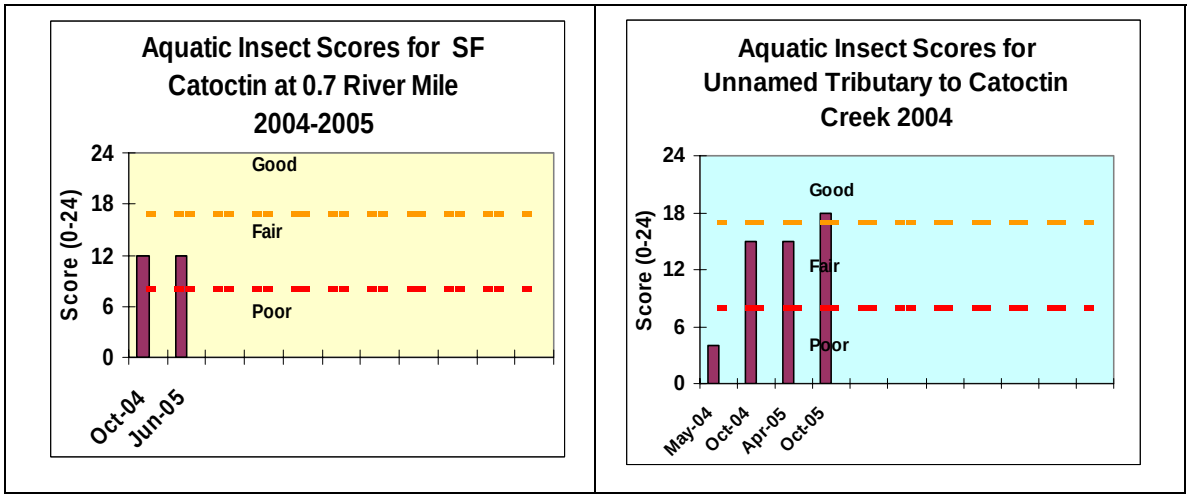
ii. **South Fork Catoctin near mouth** – benthic conditions are in the fair range.

iii. **North Fork Catoctin near mouth** – benthic conditions are generally "fair" to "poor."

iv. **Unnamed Tributary at Cottage Grove Ln** – benthic conditions range from poor to good.

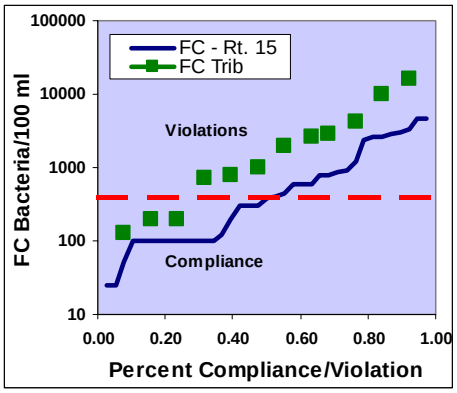


v. **Benthic TMDL** -- There is already one benthic impairment in the watershed along the South Fork Catoctin Creek at Purcellville. At some point in the future, this and any other benthic impairments will need to be address because it is unlikely that measures to restore bacteria quality will be effective in restoring benthic conditions. DEQ should begin now to determine the extent of the benthic problems so a future benthic TMDL can be properly developed.



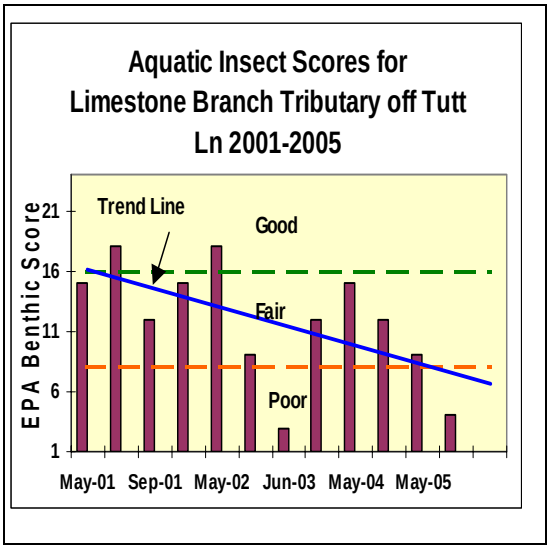
3. **Limestone Branch** –
   a. **Bacteria Water Quality** -- Bacteria monitoring at two DEQ stations (1AXAQ00.85 and 1ALIM001.16) show that water quality standards are exceeded at both stations. The existing impairment on the mainstem of the stream should be extended to include the unnamed tributary as well.

Fecal Coliform Bacteria Levels in Limestone Branch and in Unnamed Tributary, 1995-2004.



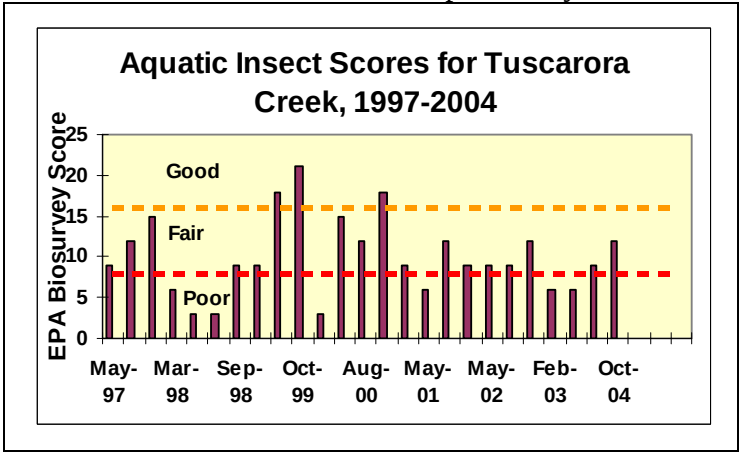
   b. **Trend Station Location** -- DEQ trend station 1ALIM001.16 was likely located immediately downstream of Rt. 15 as a cost saving measure – one station to cover the whole watershed. It is, however, located immediately downstream of the confluence of the mainstem and the southern unnamed tributary, and it reflects the combined conditions in both drainages. It is unclear why new monitoring stations were not established upstream of the confluence on the mainstem and on the unnamed tributary when the TMDL was done other than, again, for cost saving purposes. Continuing to sample downstream of the confluence will not allow a distinction to be made regarding the pollution contribution of each water drainage and the restoration progress being made in each drainage. Now that the monitoring goals should be changed from classification to TMDL assessment, the monitoring sites should be changed to better conform with this new goal. It is recognized that DEQ does not like to change trend stations, but to properly assess the TMDL, the station as currently located is not particularly useful.
   c. **Benthic Conditions** – LWC has two benthic stations in the watershed, one on each of the two unnamed tributaries. The station off Tutt Lane that is on the southern tributary that has been unsampled by DEQ shows fair to poor conditions, and these conditions are deteriorating. There is a golf course subdivision upstream that was caused increased flows, stream bank erosion, sediment in the stream, and unstable substrate conditions. DEQ should establish a benthic station on this tributary to determine whether a benthic impairment is warranted. If so, the TMDL IP should include measures to address this impairment which is likely caused by the streambank erosion causing flows from the subdivision/golf course and downstream pastures. It should be noted that there are not many livestock in this subwatershed since it drains the Beacon Hill subdivision, Morvan Park, and a portion of Raspberry Falls subdivision. Therefore, restoration efforts under the

bacteria TMDL directed at excluding livestock from the stream will likely have little affect on the problems in this subwatershed. LWW and LWC will speak out if the TMDL attempts to go forward without addressing the aquatic life problem that is probably the more serious of the two. There will be only one TMDL in this watershed, and we need to do it right. We request that DEQ please begin to develop the necessary benthic data to make this happen.



4. **Lower Goose Creek, Tuscarora Creek** – LWC has a benthic station on Tuscarora Creek downstream of the Rt. 15 By-Pass around Leesburg. Benthic conditions at this station are fair to poor. DEQ has considered establishing a benthic station near the mouth at the Goose Creek golf course and the site was in DEQ's 2005 Follow-up list. It is unclear whether DEQ did sampled this stream. It is not in the 2006 sampling plan. I tried collecting a grab sample of benthics there for a training course we held in the fall at a nearby park and found very few insects – consistent with our findings upstream near Leesburg.

   It would be useful to have benthic data on this stream so it could be included in the benthic TMDL for the nearby Goose Creek. In fact, there is the possibility that Tuscarora Creek, which discharges into Goose Creek just above DEQ's benthic monitoring station, is a source of degradation for Goose Creek. Knowing this will be important when the Goose Creek benthic TMDL IP is established.

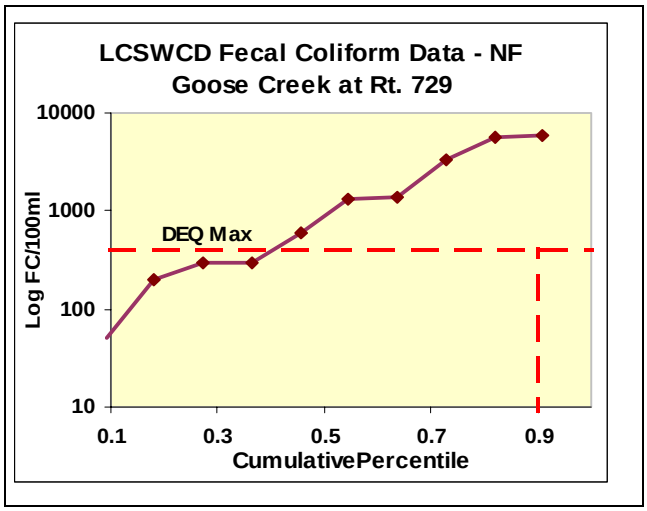


5. **North Fork Goose Creek –**
   a. **Historical DEQ Bacteria Data** -- The North Fork Goose Creek watershed has one DEQ monitoring station that assesses 4.29 miles or 8% of the 50.22 creek miles in the watershed. DEQ has chemical and bacteriological data from this site (located at the 5.69 river mile) dating back to 1970. The remaining 92% of the watershed was unassessed.
   b. **LSWCD Bacteria Data** -- LSWCD has fecal coliform monitoring data at three stations in unimpaired segments downstream and upstream of the impaired

segment in the North Fork Goose Creek, and in Crooked Run show there are poor water quality conditions similar to those in the impaired segment.

c. **New DEQ Bacteria Data** – In FY 2006 DEQ established two new monitoring stations in the watershed. One is located near the mouth of Crooked Run that will allow DEQ to classify the stream. The second is located in the upper portions of NF Goose Creek that will allow DEQ to classify this mid-section. These stations will greatly add to the official knowledge of this watershed. The TMDL study found that water quality is poor throughout the Goose Creek watershed in Loudoun County, and these added data will help to bring the classifications of the streams in line with the TMDL study findings.

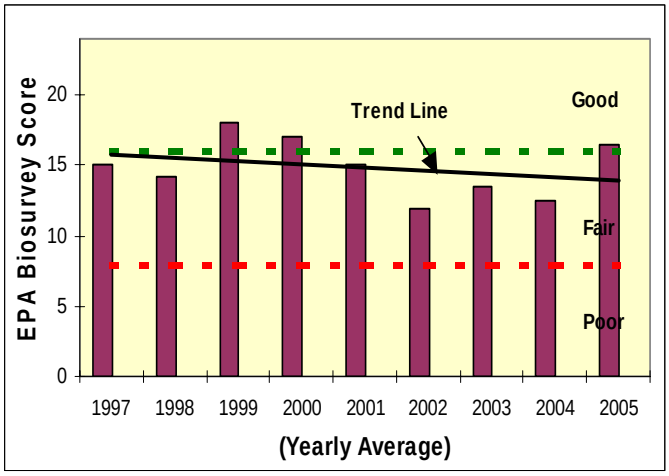
d. **Is a New Station at the Mouth Needed**? – It is interesting that DEQ decided to add new stations in Crooked Run and the mid-portion of NF Goose Cr., but not at the mouth of the NF Goose Cr. The important question now is what will happen with the first 5 miles of the NF Goose Creek once 12 sets of samples are collected at the Crooked Run station by June 2007? If the data show that Crooked Run is impaired, will DEQ extend the impairment in the NF Goose down to the mouth even though there is no data for this section? Or will DEQ decide to establish another station at the mouth (the old 1ANOG000.91 station), wait 4 years until the sampling cycle returns to the Goose Creek watershed, and then collect 12 samples over the next two years (lets see, it is now July 2013) and then determine the appropriate classification for this section of the North Fork Goose Creek? Hopefully DEQ will decide upon the first course so that we can have a better identification of the problem areas when the TMDL IP comes around, hopefully before 2013. The attached graph showing the LSWCD data collected at a station within the 5-mile segment under question. These data show that the water quality standard is exceeded over half the time.



e. **Benthic Conditions** -- LWC has a benthic monitoring station just downstream of DEQ's new site on Crooked Run at Rt. 727. The graph shows that the conditions

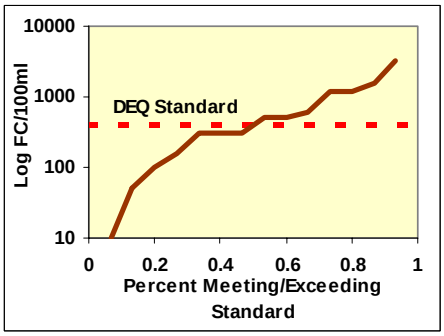
are in the "fair" range, but that there is a downward trend. Crooked run is the drainage for intensive new development around Purcellville and Lincoln, and conditions in the stream are reflecting this added stress. It is recommended that the benthics in this stream be studied so any impairment can be considered at the same time as the other benthic impairments in the Goose Creek watershed.

Aquatic Insect Data for Crooked Run Downstream of Rt. 727, 1997-2005.



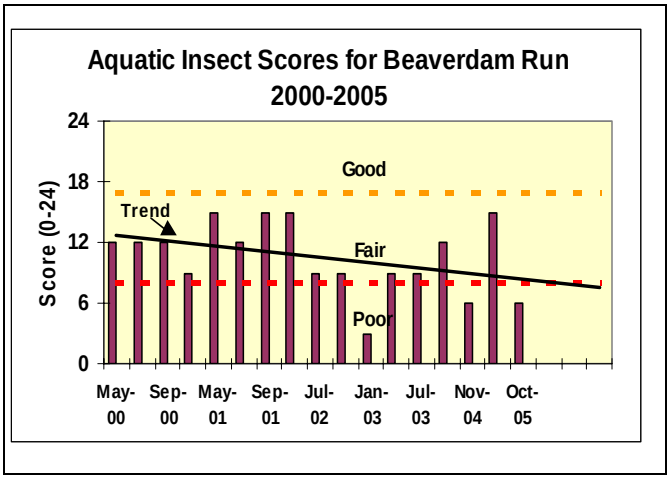
6. **Piney Run** -- LSWCD has collected fecal coliform data in Piney Run at two sites upstream and downstream from the DEQ site since 1999. The data, plotted as cumulative percentages, show that 40% to 50% of the samples exceed 1000, and that water quality standards are not being met in the upstream area not classified by DEQ. Most of the sources of pollution are likely in the unclassified, upper portions of the watershed. However, classifying all waters as impaired may not be important as long as the load reductions under the TMDL are applied watershed wide.

LCSWCD Fecal Coliform Data for Piney Run in Unimpaired Segment at Rt. 685, 2000-2003.

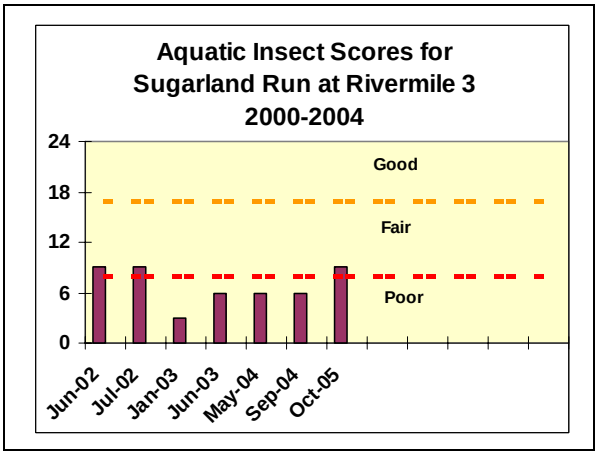


7. **Broad Run** -- Broad Run is a difficult stream to monitor because there are few roads that cross it making access very limited, and there are few riffle areas above the fall line. However, Beaverdam Run, its major tributary, can easily be monitored as it has been for several years by LWC. It is gratifying that DEQ has established several new monitoring stations, both ambient and benthic, in the watershed for their FY 2006 sampling cycle including an ambient station at the mouth of Beaverdam Run. Having a benthic station on Beaverdam Run would have met all the needs in the watershed,

and it is recommended that benthic samples be collected if resources allow. We have found riffles upstream off of Gloucester Parkway. The site was monitored twice in 2003 and yielded scores in the "poor" category on both occasions. The LWC benthic data for the LWC trend station on Beaverdam Run upstream of Rt. 641 shows the deteriorating conditions.



8. **Sugarland Run** – Benthic conditions in Sugarland Run continue to be poor as showed in the plot of the LWC data. There is already a benthic impairment on the stream, and no action is planned for the near future. This is a low priority stream because of the intense development.



9. **Dutchman's Creek** – DEQ has not sampled this small watershed that drains directly to the Potomac for many years, and there is no other bacteria data available at this time. LWC collected a couple of benthic samples at two locations in 2004 and conditions were good. However, there is considerable development in the Lovettsville community and the Dutchman's Creek watershed. It is recommended that DEQ's former station, 1ADUT000.62, near the mouth be monitor again.

10. **Summary of Recommendations and Priorities** – A map showing the Loudoun County waters that need DEQ attention has been posted on the LWW website at: www.loudounwatershedwatch.org/pdf/Monitoring_Nomination_2005_Map01.pdf. A table that lists the waters, the location of the needed actions, and LWW's suggested priority is provide in the following:

Watershed	Location	Priority
Bacteria Stations:		
Limestone Branch	Mainstem upstream of confluence	1
Limestone Branch	Southern tributary near mouth	2
Catoctin Creek	Rt. 673 – Featherbed Rd.	3
Piney Run	Upstream of impairment	4
Dutchman's Creek	1ADUT000.62	5

Benthic Stations:		
North Fork Catoctin	Near mouth	1
South Fork Catoctin	Near mouth	2
Limestone Branch	Southern tributary off Tutt Ln.	3
Tuscarora Creek	Downstream of Rt. 15 bypass	4
Crooked Run	Rt. 727	5
Beaverdam Run, Broad Run	Gloucester Pkway	6
New Impairments Needed:		
Beaverdam Creek	All of Beaverdam and NF Beaverdam Creeks	
Milltown Creek	1AMIH001.98	
Unnamed Tributary-Catoctin Creek	1AXJT002.2	
Limestone Branch Tributary	1AXAQ00.85	