

Annual Report on Fairfax County's Streams. It was determined that annual Countywide conditions and trends were best determined from a probability-based sampling procedure, rather than the targeted sampling approach employed in the *Stream Protection Strategy Baseline Study*. The biological monitoring program focused on bacteria levels, biotic integrity, and stream quality. Three biological monitoring sites were located within the Little Rocky Run watershed. Additionally, there were three coliform bacteria monitoring sites located within Little Rocky Run and Johnny Moore watersheds. There were also six sites monitored by Audubon Naturalist Society (ANS) and Northern Virginia Soil and Water Conservation District (NVSWCD) volunteer groups within the two watersheds. The index scores and condition ratings for the 2004 sampling locations based on benthic macroinvertebrate and fish data are shown in Table 1-9.

Table 1-9 Table 1-9: Benthic and Fish Indices from 2004 Sampling

Sampling Site ID	Stream Order	Benthic Index Score	Rating	Fish Index Score	Rating
Little Rocky Run (LR0401)	3	27.36	Poor	25	Fair
Little Rocky Run (LR0402)	1	30.80	Poor	No fish sampling	
Little Rocky Run (LR0403)	1	15.56	Very Poor	No fish sampling	

In 2006, Fairfax County Stormwater Planning Division published the *2006 Annual Report on Fairfax County's Streams*. The 2005 and 2006 reports can be found on the Fairfax County website at: <http://www.fairfaxcounty.gov/dpwes/stormwater/streams/streamreports.htm>. The biological monitoring program focused on bacteria levels (fecal-related), benthic macroinvertebrates, fish communities, and water chemistry. There was one randomly selected biological and bacteriological monitoring site located within the Little Rocky Run watershed. Additionally, there was one ANS volunteer monitoring site located on Little Rocky Run. Page 38 of the 2006 annual report contains a detailed map showing monitoring results from 1999 through 2005.

Data from this report provided further documentation of water quality and habitat issues in the watershed and will provide additional focus in development of the Watershed Management Plan.

Virginia Department of Environmental Quality Water Quality Data

None of the stream segments in either the Little Rocky Run watershed or the Johnny Moore Creek watershed are listed as Category 5 impaired water bodies in the 2006 305(b)/303(d) Water Quality Assessment (WQA) Integrated Report prepared by the Virginia Department of Environmental Quality (DEQ). United States Environmental Protection Agency (EPA) Category 5 impaired water bodies are defined as "impaired or threatened and a TMDL is needed." Two segments from the watersheds are listed in the *2006 Integrated List of All Assessed Waters in Virginia*. A 4.98-mile segment of Little Rocky Run (VAN-A23R_LIP01A06) is designated as a Virginia Category 2B, which is a subcategory to EPA Category 2. EPA Category 2 waters meet some of their designated uses, but there are insufficient data to determine if remaining designated uses are met. Virginia Category 2B waters are of concern to the state, but no water quality standards exist for an identified pollutant, or the water exceeds a state screening value. The waters

are considered fully supporting their uses with observed effects. Map 1-6 shows the location of the 303(d) impaired waters.

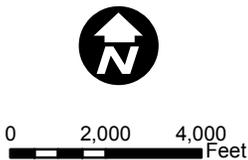
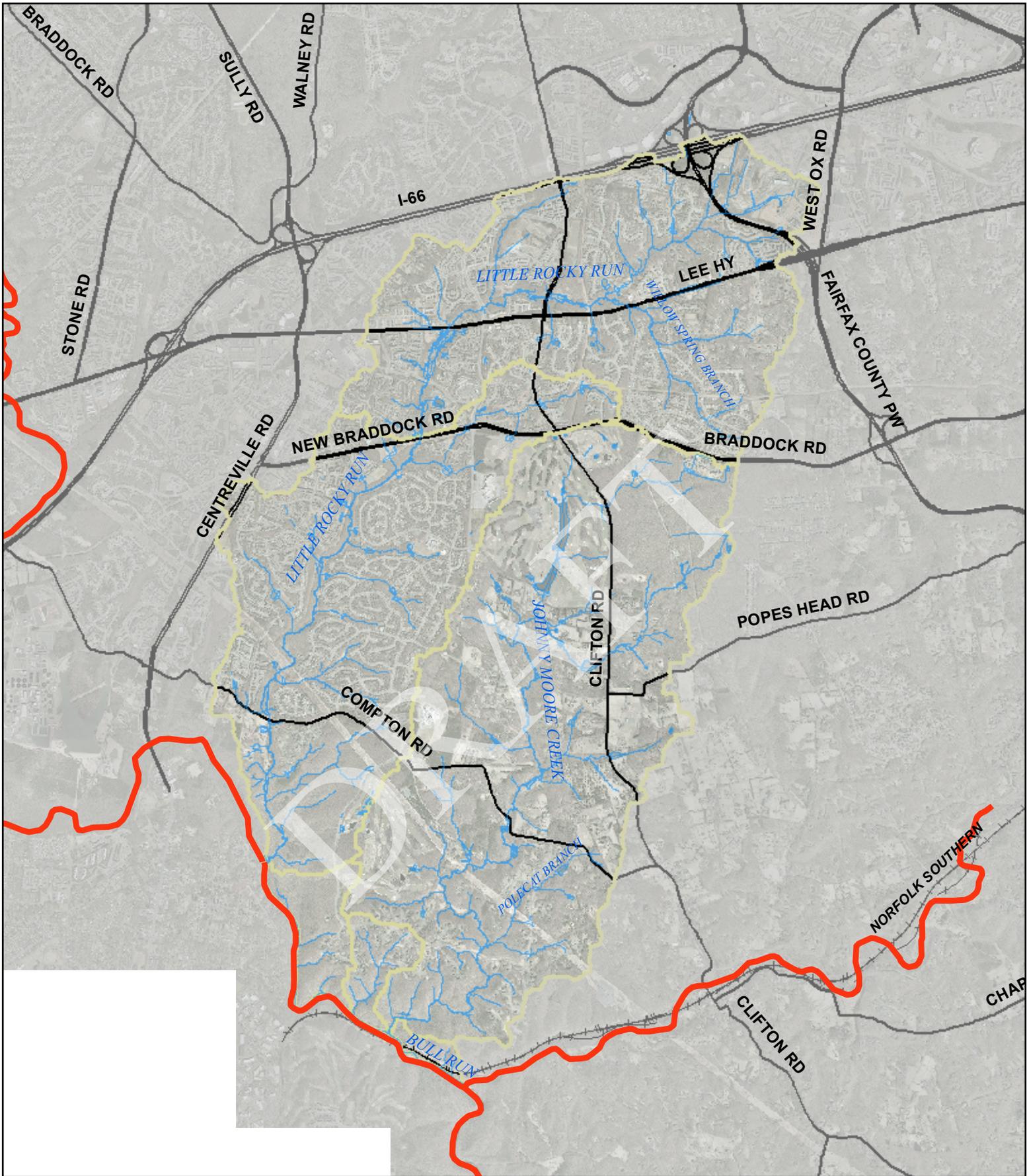
A 3.78-mile segment of Johnny Moore Creek (VAN-A23R_JOH01A02) is listed as a Virginia Category 3C, which is a subcategory to EPA Category 3. EPA Category 3 waters are defined as those that have insufficient data to determine whether any designated uses are met. Virginia Category 3C waters may have data collected by a citizen monitoring group or other organization which indicate water quality problems, but the methodology or data quality has not been approved for a determination of attainment of designated uses. These waters are considered to have insufficient data with observed effects. These waters will be prioritized for follow-up monitoring.

There have been changes in the criteria for identifying impaired waters since the 2002 assessment. One significant change was the assessment of fish tissue data. In order to protect human health, waters were listed as impaired when two or more of the human health surface water criteria were exceeded in samples collected at the same station. In addition, Virginia Department of Health (VDH) approved a trigger value for mercury.

Once a water body has been listed as impaired, DEQ must develop a TMDL report identifying the sources causing the water quality problem and the reductions needed to resolve it, and submit the report to the EPA for approval. Upon approval, DEQ must develop a TMDL Implementation Plan to restore water quality. Once the TMDL report is approved by EPA, the loading reductions are incorporated into Fairfax County's Virginia Stormwater Management Program (VSMP) permit to discharge stormwater into waters of the state. As a result, the loading reductions become mandatory for the County.

A report titled *Benthic TMDL Development for Bull Run, Virginia* was prepared by the Louis Berger Group, Inc. in June 2006 and submitted to DEQ. EPA Region III approved the TMDL for aquatic life use impairments on Bull Run (VAN-A23R-01) on September 26, 2006. Bull Run was first listed on Virginia's Section 303(d) list in 1994, and again in 1998 and 2002. It was listed more specifically as an impaired water, due in part to benthic impairment, on the 2004 WQA 305(b)/ 303(d) Integrated Report. It was also listed in the 2004 WQA Integrated Report due to exceedances of the water quality standards for fecal coliform bacteria and PCB concentrations in fish tissue samples. DEQ conducted bioassessments at the DEQ monitoring station located at the intersection of Bull Run and Route 28, which indicated a moderately impaired benthic macroinvertebrate community, resulting in the 303(d) listing.

The June 2006 report documented efforts to determine and identify the stressors (causal pollutants) and sources within the watershed. Several candidate stressors were reviewed in the report, including: dissolved oxygen, temperature, pH, metals, organic chemicals, nutrients, toxic compounds, and sediments. These were evaluated based on available monitoring data, field observations, and consideration of potential sources in the watershed. Sedimentation, caused by higher runoff flows, was identified as a primary stressor impacting benthic macroinvertebrates in this segment of Bull Run. Potential sources of sediment loading in the watershed included urban stormwater runoff, stream bank erosion, and sediment loss from habitat degradation associated with urbanization. The report suggested that reducing sediment loadings through stormwater control and restoring instream and riparian habitat to alleviate the impacts of urbanization on the river were key to improving the benthic community.



- Virginia 303(d) Impaired Waters
- Streams
- Watershed Management Areas
- Major Roads
- Railroad

Map 1-6
Virginia 303(d) Impaired Waters
Little Rocky Run / Johnny Moore
Creek Watersheds

The report indicated that the overall sediment load in the Fairfax County municipal separate storm sewer system (MS4) area contributing to Bull Run should be decreased by 77.1 percent. The Fairfax County MS4 area includes the Virginia Department of Transportation (VDOT) and Fairfax County Public Schools as permit holders. The *Watershed Management Plan* will focus on reducing sediment loading in the watershed by addressing stormwater control, stream bank erosion, and riparian buffers.

A report titled *Bacteria TMDLs for Popes Head Creek, Broad Run, Kettle Run, South Run, Little Bull Run, Bull Run and the Occoquan River, Virginia* was prepared by George Mason University and the Louis Berger Group, Inc. in August 2006. EPA Region III approved this TMDL on November 12, 2006. Segments of the streams covered by the TMDL were listed as impaired on Virginia's 1998 303(d) TMDL Priority List and Report because of violations of the state's water quality standard for fecal coliform bacteria. These segments were also included on Virginia's 2002 303(d) Report on Impaired Waters and the 2004 305(b)/303(d) WQA Integrated Report. The impaired segment of Bull Run (VAN-A23R-01) begins at the confluence with Cub Run and continues to the confluence with Popes Head Creek. Four out of 34 samples (11.8 percent) collected between January 1, 1998 and December 31, 2002 were recorded as exceeding the instantaneous fecal coliform bacteria criterion of 400/100 ml.

At the time of the TMDL listings, the Virginia bacteria standard was expressed in fecal coliform bacteria. However, the standard has recently changed and is now expressed in *E. coli*. Virginia's current bacteria water quality standard currently states that *E. coli* bacteria shall not exceed a geometric mean of 126 *E. coli* counts per 100 ml of water for two or more samples within a calendar month, or an *E. coli* concentration of 235 counts per 100 ml of water at any time. The TMDL was expressed in *E. coli* by converting modeled daily fecal coliform concentrations to daily *E. coli* concentrations using an in-stream translator.

The report indicated that the overall *E. coli* load in the Fairfax County MS4 area (including VDOT and the Fairfax County Public School permit holders) contributing to Bull Run should be decreased by 89 percent. The report suggested possible methods for reducing *E. Coli* such as: septic tank education, septic system repair/replacement program, sanitary sewer inspection and management, more restrictive ordinances on pet waste, improved garbage collection and control, and improved street cleaning. The *Watershed Management Plan* will consider recommendations for reducing *E. coli* in the Little Rocky Run and Johnny Moore Creek watersheds.

Virginia Natural Heritage Resource

The Virginia Natural Heritage Resources Database describes the status and rank of rare plant and animal species for subwatersheds in Virginia. Little Rocky Run and Johnny Moore Creek are both located within the Lower Bull Run subwatershed, which is within the Middle Potomac – Anacostia -Occoquan watershed. Two resources were listed in the database for the Lower Bull Run subwatershed. The Manassas stonefly was given a state ranking of SH (possibly extirpated). The trailing stitchwort vascular plant was given a state ranking of S1 (critically imperiled). Neither of these resources was given a federal or state status for endangerment.

1.3.2 POLICY

Infill and Residential Development Study, 2000

The *Fairfax County Infill and Residential Development Study, Draft Staff Recommendations Report* was released by the County in July 2000. Any residential development occurring proximate to or within already established neighborhoods is referred to as infill development. The primary focus of this study was the identification of recommendations to better address issues associated with the impacts of new residential development on its immediate surroundings. The issues that have been cited most frequently as problems associated with infill development with respect to the immediate environs were divided into four main categories on which staff presented recommendations: Site Design and Neighborhood Compatibility (SC), Traffic and Transportation (TR), Tree Preservation (TP), and Stormwater Management and E&S Control (SW). Problems associated with infill development may negatively impact upper parts of the Little Rocky Run watershed where the most development has taken place.

The following recommendations from the report which address water quality and stormwater management may be evaluated as part of the *Little Rocky Run and Johnny Moore Creek Watershed Management Plan*.

- TP 1: Reduce grading to increase tree preservation;
- TP 3: Request conservation easements where appropriate;
- SW 1: Improve the awareness, planning, and financial resolution capability of the County for land disturbing projects upstream of sensitive sites;
- SW9: Require additional conditions associated with stormwater detention/water quality waivers to address potential problems associated with land disturbance;
- SW10: Require reports from applicants that identify baseline data for properties downstream, corrective measures planned for implementation in the event that impacts occur, and a commitment to implement those measures;
- SW11: Enhance the use of Best Management Practices (BMP) through additional guidance on BMP selection and enhanced design standards in the PFM; and,
- SW13: Modify requirements and procedures as they relate to the consideration of stormwater management during the zoning process.

Fulfilling the Promise: The Occoquan Watershed in the New Millennium , 2003

The New Millennium Occoquan Watershed Task Force prepared a report titled *Fulfilling the Promise: The Occoquan Watershed in the New Millennium* in January 2003. The Board of Supervisors established the Task Force to provide an assessment of issues facing the Fairfax County portion of the Occoquan watershed; to examine gaps in programs not being carried out by local, State and regional agencies; to define the role of volunteer organizations that have interests in the watershed; and to provide a vision for the future management of the watershed. The report presented recommendations on: the reservoir, streams and ecosystems, land use and open space, tree preservation, erosion and sediment control and stormwater management, onsite sewage disposal, citizen involvement, and regional coordination.