

Executive Summary

This Annual Report on Fairfax County's Streams presents a summary of water quality data and an assessment of current stream conditions and trends countywide. Several data sources were used to prepare this report, including monitoring data collected by staff of the Department of Public Works and Environmental Services (DPWES), the Virginia Department of Environmental Quality (VDEQ), and volunteer monitors with the Northern Virginia Soil and Water Conservation District and the Audubon Naturalist Society. This report documents overall stream conditions based on the abundance and diversity of fish and benthic macroinvertebrate (aquatic insect) communities. In addition, the potential human health risk associated with wading or swimming in streams is assessed based on fecal-associated bacteria.

The monitoring program is intended to serve the needs of the stormwater management program and to support various initiatives, including the Board of Supervisors' *Environmental Excellence for Fairfax County; a 20-year Vision* (Environmental Agenda), by providing a comprehensive analysis of stream conditions throughout the county, while simultaneously addressing requirements and/or needs set forth in local, state, and federal regulations, including the:

- Chesapeake Bay 2000 Agreement Initiative – Virginia's Tributary Strategies.
- Municipal Separate Storm Sewer System (MS4) Permit for Fairfax County - under the Virginia Pollutant Discharge Elimination System (VPDES) established by the Clean Water Act and administered by the Virginia DCR.
- Total Maximum Daily Load allocations (TMDLs) established by the VDEQ

Results

Bacteria Monitoring: As recommended by the EPA and the Virginia Department of Environmental Quality (VDEQ), Fairfax County completed its two-year transition in 2005 to using *E. coli* instead of fecal coliform as the indicator of possible fecal contamination in stream water. Fewer sites violated the water quality standard for *E. coli* in 2005 than in the previous year (Figure E1). However, Fairfax County concurs with officials from VDEQ and the Virginia Department of Health, who caution that ***it is impossible to guarantee that any natural body of water is free of risk from disease-causing organisms or injury.***

Based on historical and ongoing bacteria monitoring data, the Fairfax County Health Department issues the following statement related to the use of streams for contact recreation:

"In summary, any open, unprotected body of water is subject to pollution from indiscriminate dumping of litter and waste products, sewer line breaks and contamination from runoff of pesticides, herbicides, and waste from domestic and wildlife animals. Therefore, the use of streams for

contact recreational purposes, such as swimming, wading, etc., which could cause ingestion of stream water or possible contamination of an open wound by stream water, should be avoided.”

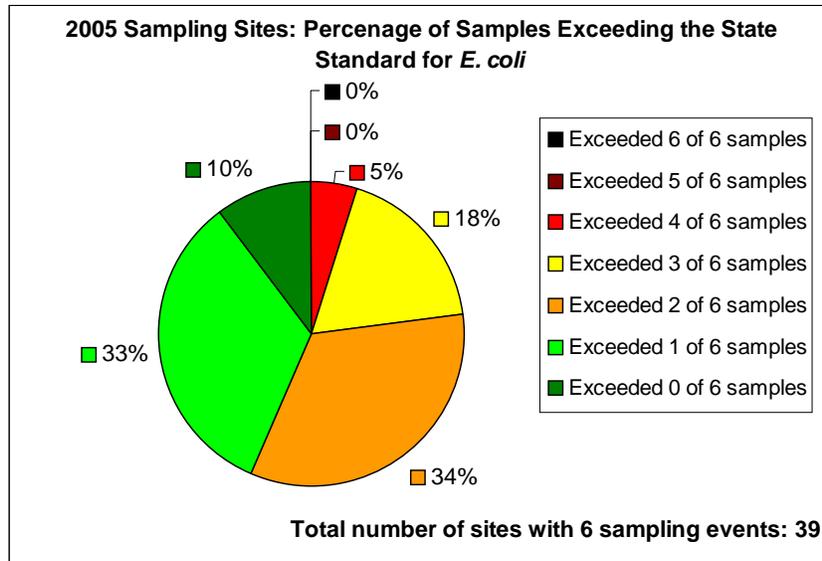


Figure E1: Percentage of sites with exceedences of the state’s water quality standard for *E. coli* (235 cfu per 100mL).

Additional information related to the use of streams for contact recreation is available on the Health Department’s Web site at:

www.fairfaxcounty.gov/service/hd/resourcewater.htm

Biological Monitoring: Results from the fish and benthic macroinvertebrate monitoring in 2005, by both county staff and volunteers, are similar to previous years’ results. Most streams are in “fair” to “very poor” condition or “unacceptable” (Figure E2). These three lowest rating classes (as well as the “unacceptable” from the volunteer data) for the macroinvertebrate indices, generally correspond to the VDEQ “impaired waters” classification - which indicates the State’s minimum water quality standards are not being met . The percentage of sites classified as “good” and “excellent” again showed a very slight decline this year. These sites typically would be considered “unimpaired” by the state’s aquatic life use standard. In 2005, more sites were found to be in better condition with respect to fish communities. However, strong conclusions cannot be drawn from short-term, relatively minor changes in biological communities. Small fluctuations in countywide stream conditions are typical from one year to the next and may not constitute true trends. True and meaningful trends can be confidently inferred only after several years’ data have been compiled. It can be inferred, however, that approximately three quarters of the stream ecosystems in the county are currently impacted or impaired.

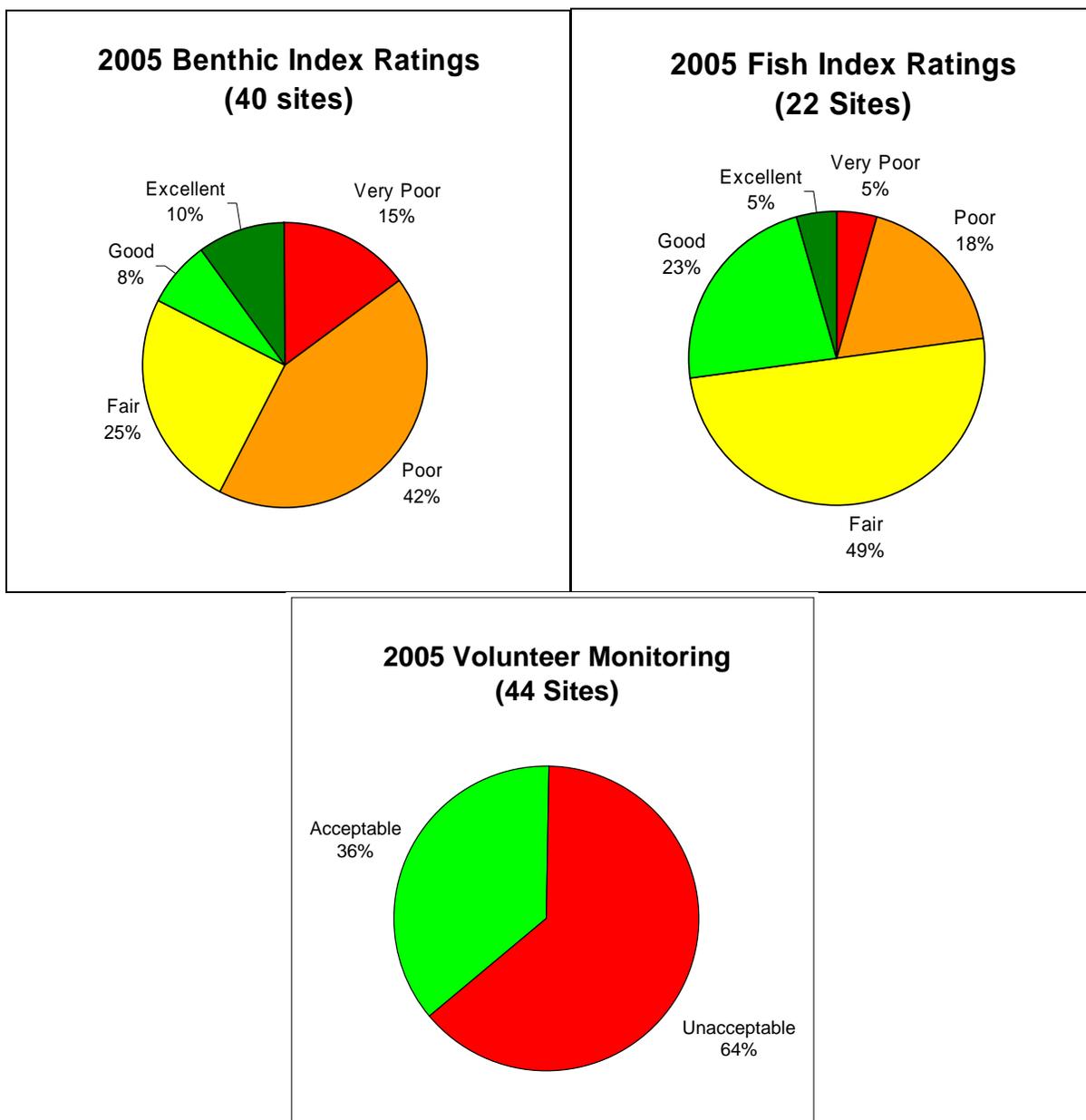


Figure E2: Ratings of 2005 biomonitoring sites based on the Fish and Benthic Index of Biotic Integrity and volunteer monitoring (benthics).

Countywide Stream Quality Index: A stream quality index (SQI) was developed to establish a performance measure for a key natural resource (streams) that is visible and of great interest to the public. The index, which is based on benthic macroinvertebrate data and spans a possible range from 1 to 5, suggests a small increase in overall stream quality from 2004. Nevertheless, it still is below the value for the baseline study data from 1999 (Table E1) and again, it is imprudent to make broad statements about trends on so few years' data.

Table E1: Stream quality index (SQI) values for sampling completed in 1999, 2004 and 2005.

Sampling Year	Percentage of Total Sites					Index Value
	Very Poor	Poor	Fair	Good	Excellent	
1999	11	34	32	14	9	2.76
2004	23	40	17	13	7	2.41
2005	15	43	25	8	10	2.55

Virginia DEQ list of Impaired Waters: A summary of the Virginia Department of Environmental Quality's Draft 2006 Water Quality Assessment and Impaired Waters Report is included in Section 5. VDEQ identifies streams that are in poor quality (impaired), which do not meet state water quality standards and are not suitable for their intended uses such as swimming, fishing, or aquatic life. The 2006 draft report lists 32 water bodies with a total of 101 impairments within or bordering Fairfax County. Many of these water bodies are listed for multiple impairments based on elevated levels of pollutants, high levels of contaminants in fish, or a reduced number of aquatic organisms (aquatic plants, macroinvertebrates and/or fish). The number of stream segments and overall impairments has increased significantly since the last published report in 2004. Once a water body is listed as impaired, the state (VDEQ and DCR) goes through a process to identify pollutant sources within the watershed and develops implementation plans to reduce pollutants and meet water quality standards. The implementation plans can require VPDES permittees, including the county, to implement additional stormwater controls and management practices to reduce pollutants discharging to a water body from the municipal separate stormwater sewer system.

Waters listed as impaired for aquatic life uses typically exhibit substantially suppressed ecosystems. Scores for biological integrity indices of these waters rank at or below 50% of the scores for natural (unimpaired) reference waters. This impaired condition is analogous to "very poor," "poor" and many of the "fair" streams as rated by the macroinvertebrate index used in this annual report.

Additional information on DEQ's water quality program and the 2006 report are available at:

<http://www.deq.state.va.us/water/>

This Annual Report, past Annual Reports (including past Health Department stream reports), appendices and protocols are available on the stream quality assessment program page located at:

<http://www.fairfaxcounty.gov/dpwes/stormwater/streams/assessment.htm>