Annual Report on the
ENVIRONMENT



2004




Fairfax County, Virginia

Environmental Quality Advisory Council

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ANNUAL REPORT
on the
ENVIRONMENT

2004

Fairfax County, Virginia

Environmental Quality Advisory Council

Printed on recycled paper

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INTRODUCTION

This year's Annual Report on the Environment has been prepared by the Environmental Quality Advisory Council (EQAC). Staff support for the coordination and printing of the Report has been provided by the Planning Division of the Department of Planning and Zoning.

The Annual Report on the Environment, which is an update on the state of the County's environment, serves a threefold purpose. Initially, it is intended to assist the Board of Supervisors in evaluating ongoing environmental programs and to provide the basis for proposing new programs. The document also aids public agencies in coordinating programs to jointly address environmental issues. In addition, the report is directed to citizens who are concerned with environmental issues.

The Report contains chapters on major environmental topics including: land use and transportation; air quality; water resources; solid waste; hazardous materials; ecological resources; wildlife management; and noise, light, and visual pollution. Within each chapter are: a discussion of environmental issues; a summary of relevant data; and a discussion of applicable government programs. Where relevant, discussions of legislative issues are provided. Most of the chapters conclude with recommendations that identify additional actions that EQAC believes are necessary to address environmental issues.

This report covers activities affecting the environment in 2003; however, in some cases, key activities from 2004 are also included.

While the Environmental Quality Advisory Council has prepared and is responsible for this Report, contributions were made by numerous organizations. Many of the summaries provided within this report were taken verbatim from materials provided by these organizations. EQAC therefore extends its appreciation to the following organizations:

Audubon Naturalist Society
Clean Fairfax Council, Inc.
Coalition for Smarter Growth
Fairfax County Deer Management Committee
Fairfax County Department of Health
Fairfax County Department of Systems Management for Human Services
Fairfax County Department of Planning and Zoning
Fairfax County Department of Public Works and Environmental Services
Fairfax County Department of Transportation
Fairfax County Executive's Office
Fairfax County Environmental Coordinator
Fairfax County Fire and Rescue Department
Fairfax County Non-Motorized Transportation (Trails) Committee
Fairfax County Park Authority
Fairfax County Police Department, Division of Animal Services
Fairfax Joint Local Emergency Planning Committee
Fairfax Water
George Mason University, Departments of Biology and Environmental Science and Policy
Illuminating Engineering Society of North America
International Dark-Sky Association
Interstate Commission on the Potomac River Basin
Metropolitan Washington Airports Authority (MWAA)

Metropolitan Washington Council of Governments (COG)
Northern Virginia Conservation Trust
Northern Virginia Regional Commission
Northern Virginia Regional Park Authority
Northern Virginia Soil and Water Conservation District
Reston Association
Upper Occoquan Sewage Authority
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Environmental Quality
Virginia Department of Transportation
Virginia Outdoor Lighting Taskforce

In addition, EQAC wishes to acknowledge the efforts of the County's interagency Environmental Coordinating Committee, which coordinated the staff responses to the recommendations within EQAC's 2003 *Annual Report on the Environment*.

FAIRFAX
COUNTY

V I R G I N I A

Board of Supervisors
County of Fairfax
12000 Government Center Parkway
Fairfax, VA 22035

Chairman Connolly and Members of the Board:

EQAC is pleased to present the 2004 Annual Report on the Environment. In this report, we discuss various environmental issues in Fairfax County and make recommendations as to what actions the county should take to resolve identified problems. The Report consists of eight chapters – each chapter addressing a different aspect of the environment. The chapters this year have been rearranged to reflect the order of topics listed in the newly adopted environmental vision for Fairfax County. EQAC commends the Board for adoption of this document, *Environmental Excellence for Fairfax: A 20-Year Vision,* and we look forward to working with the Board in pursuit of these goals.

I would like to mention some significant points made in the Report.

EQAC joins with the Board in recognizing the extraordinary impact of land use and transportation decisions in the county on the environment and our quality of life. We support increased growth and utilization of transit nodes, most specifically existing and planned Metro stations, where appropriate in the county.

Air Quality has been a focus of EQAC's report in the last few years. We commend the Board for moving forward with a comprehensive agenda for the county on clean air and for adding the position of Air Quality Planner back into the budget. We thank Kambiz Agazi for the exceptional work he did in understanding and presenting the issue to the Board and the public, and for clarifying choices in the program. We thank the Board for its continued support of telecommuting and for supporting the proposed clean air legislation in the General Assembly. We urge continued support and funding of the county's clean air program.

Since the late 90's, the county has engaged in a progressive and systematic approach to assessing the health of our streams and then moving forward with watershed protection and restoration efforts. Staff in the Department of Public Works and Environmental Services are to be congratulated for their program and their work. The Countywide Stream Protection Strategy and Watershed Management Planning Program, the perennial stream mapping project and the related changes to the Chesapeake Bay Preservation Ordinance are examples where the county is making good progress. However, funding, as always, is an issue. There is an "environmental debt" that has been building for many decades. We urge the Board of Supervisors to move forward with funding for a Stormwater Environmental Utility Fee to fund the building and maintenance of needed and existing stormwater practices.

Each chapter of this year's Annual Report contains the remainder of our recommendations. We urge you to consider and act on each of these.

This report covers 2003, but also includes significant actions from 2004 that could impact EQAC's comments and recommendations. We recognize that the report does not capture all ongoing actions; if we tried to accomplish this, the report would never be finished.

As previous reports have done, we would like to commend the outstanding efforts of some groups whose actions improve and safeguard the environment in Fairfax County. The Northern Virginia Soil and Water Conservation District (NVSWCD) continues to provide excellent education programs, to consult with the county on innovative stream restoration work, to have a large and successful stream monitoring program, and to be available to citizens and developers alike for site work consultation. The Northern Virginia Conservation Trust (NVCT) continues to obtain easements on privately owned environmentally sensitive land. Volunteers from the Audubon Naturalist Society provide valuable data on water quality. Fairfax ReLeaf continues to promote tree preservation and tree replacement programs. The Park Authority staff continues to have a few people, working with a very small budget, who are slowly enhancing environmental efforts in the county's parks. The members of EQAC thank all these groups, and all others who work to preserve and enhance the environment of the county.

EQAC would also like to thank and commend the county staff for their continued outstanding work. We thank them especially for providing the data for this report and their willingness to meet with EQAC to discuss various issues. We commend the county's Environmental Coordinating Committee's (ECC) continued efforts at managing environmental action within the county. We appreciate the ECC's willingness to meet with EQAC twice a year and to discuss issues of environmental significance.

EQAC would especially like to thank and acknowledge two individuals. First, Noel Kaplan of the Environment and Development Review Branch, Department of Planning and Zoning. Noel provides county staff support to EQAC. Noel sets up and tapes every EQAC meeting, follows up on actions generated from the meetings, and coordinates the inputs and publication of the Annual Report. Although the members of EQAC write the Annual Report, it is Noel who makes publication of the document possible. EQAC thanks him for his hard work and long hours in our support.

Second, Kambiz Agazi, Environmental Coordinator, Office of the County Executive, who also attends all our meetings and provides advice and suggestions. His insight and overview of county environmental activities are invaluable. EQAC thanks him for his assistance and valuable contributions.

Every year, Fairfax County's programs continue to improve and advance in their efforts at environmental stewardship. If there would be one message to summarize EQAC's 2004 Annual Report on the Environment it would be to stay the course. We encourage you to continue to both support and fully fund these valuable efforts at protecting the county's environment and enhancing the quality of life for its citizens.

The members of EQAC thank the Board of Supervisors for their leadership and look forward to working with you to achieve the goals of the Environmental Excellence Vision for Fairfax County in the coming year.

Respectfully submitted,

Stella M. Koch, Chairman
Environmental Quality Advisory Council

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SCORECARD
Progress Report on 2003 Recommendations

I. WATER RESOURCES

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC strongly recommends that Fairfax County develop a method that incorporates into their land use considerations a protocol that would assist them on the individual and cumulative effects of such decisions on the county's waterways.	Staff concurs with EQAC's recommendation. This recommendation is in the process of being addressed at both the watershed scale and the project-specific scale. The county has begun a multi-year effort to develop watershed management plans for all county watersheds. At the project-specific scale, the BOS has authorized public hearings to revise submission for zoning applications to require more detailed information on stormwater management facilities and the adequacy of downstream drainage.	EQAC is pleased that the recommendation is in the process of being addressed. EQAC notes that land use planning and transportation planning that take into account impacts on the county's streams are the single most effective tools for the protection of streams and rivers.	In process, with more to be done.
2. EQAC continues to strongly support the full funding and implementation of a Comprehensive countywide Steam Management Program.	Staff agrees with this recommendation and it is in the process of being addressed. A major aspect of this recommendation is being pursued through the Watershed Management Planning initiative – under which the staff will develop watershed master plans for the entire county over the next six years. The Stream Physical Assessment project supports the development of the watershed management plan and was started in 2002. This is now complete. The baseline Stream Protection Strategy (SPS) report released in January, 2001 included broad stream restoration and preservation recommendations. The county updated its base stream map of all stream channels through the recently completed Perennial Streams Mapping Project.	EQAC's recommendation is on the way to being satisfied – if the county continues with its current activities in this area. EQAC continues to be concerned about the funding needed to complete the watershed master plans and to implement the recommendations. EQAC continues to emphasize this recommendation.	In process, with more to be done.

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. EQAC recommends the funding of the Stormwater Utility Program/Watershed Protection and Restoration Program. The Program should place equal importance between environmental protection, restoration, and monitoring as compared to infrastructure improvement and maintenance. The Program should also include a Watershed Board to oversee the Program. Also, the Program should encourage bioretention and recharge to aquatic systems and other innovative practices.	Staff agrees with the overall thrust of this recommendation and is in the process of addressing most of the recommendation. Staff is currently developing a Stormwater Environmental Utility implementation strategy. The March, 2002 Conceptual Plan for a Comprehensive Stormwater Management Program offers a balanced approach to environmental programs, watershed planning, infrastructure improvements, and maintenance requirements. The concept of a Watershed Board for general program guidance needs to be developed further before staff can evaluate whether this would be a constructive move. In the interim, the Stormwater Management Business Team will provide general program guidance with the assistance of EQAC and the guidance of the ECC.	EQAC continues to emphasize this recommendation. EQAC supports the staff process that hopefully will lead to a mid-2005 approval of a funding source for watershed protection and restoration. EQAC is concerned about the continued availability of funds for a Comprehensive countywide Steam Management Program without such a dedicated source of funds.	No.
4. EQAC recommends posting of affected county streams with a health warning for fecal coliform bacteria until such time that the county conducts a study as to the source of microbiological threats.	Posting of individual streams in Fairfax County is not a viable solution to public awareness. Contamination levels of streams are intermittent. Routine posting of streams would be resource intensive and generally ineffective. The Health Department has issued a general advisory to avoid contact with any open unprotected body of water for recreational purposes such as swimming and wading. This advisory is disseminated to the public via a number of channels – including the Health Department's Web page and the Fairfax County Annual Stream Water Quality Report. A pamphlet on the implications of high fecal coliform bacteria levels is being developed in conjunction with the Northern Virginia Soil and Water Conservation District, and this will be distributed to Fairfax County libraries.	EQAC disagrees that posting is not a viable solution. While the efforts to disseminate information on the problems of contamination in the county's streams are helpful, they are passive in nature and do not go far enough. The majority of the county's citizens remain unaware of the problems with fecal coliform bacteria. EQAC continues to recommend that the county's streams be posted if testing shows contamination.	No.

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
5. EQAC recommends a pilot program of monitoring and studying the effectiveness of stormwater detention facilities.	This recommendation is being partially addressed at this time. The Kingstowne Environmental Monitoring Program is used in evaluating the efficiencies of erosion and sediment controls installed in the Kingstowne development. Also, a second nearby monitoring station has been installed to evaluate nutrient loads from the Silver Springs segment of Dogue Creek. Staff also oversees monitoring activities associated with ad hoc projects. While a comprehensive countywide program to monitor the effectiveness of stormwater management ponds and BMPs would be desirable, it would be cost prohibitive.	EQAC agrees that a comprehensive program would be cost prohibitive. However, EQAC's recommendation is for **selective** monitoring with the purpose of determining efficiencies. EQAC continues to endorse such a program.	Some small amount.
6. EQAC recommends that increased emphasis be placed on monitoring and enforcement of predevelopment stormwater management controls.	The Public Facilities Manual (PFM) Section 11-0109.5 does require temporary/permanent detention to accommodate the increased runoff caused by changed soil and surface conditions effectively during and after development. With the exception of adequate outfall requirements, the PFM does not specify the minimum standards of detention pertaining to volume and velocity that must be provided during construction. Staff concurs that there is a gap in the stormwater management design that could result in impacts to the county's streams during construction activities. Staff recommends that they collaborate with the local professional civil engineering community to define, clarify, and implement the county's design and plan submission requirements pertaining to PFM section 11-0109.5.	EQAC concurs with the staff recommendation to improve the PFM in regard to stormwater management design. However, EQAC also stresses the importance of monitoring and enforcement of existing stormwater management controls (and, of course, any new controls as they are implemented).	No.

II. AIR QUALITY

Air Quality Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends full funding for staff in the Health Department supporting air quality management activities in the county.	The Health Department concurs with the recommendation. The county's capacity to monitor air quality issues at current levels are being met as long as staff are able to keep the equipment properly functioning; however, there are no funds for new equipment purchases. Equipment manufactures have indicated that the life expectancy for a continuous air monitoring analyzer is five years, yet monitoring equipment in excess of 15 years is still being used. Currently, monitoring staff is working beyond capacity with the present network.	The old monitors can be expected to fail beyond repair at any time and should be replaced. Furthermore, sufficient manpower should be provided to enhance operations and maintenance of the air quality network and to provide a more thorough analysis of the monitoring data.	No.
2. EQAC continues to be concerned about coordination and integration of critical analysis and conclusions about air quality management in the county. EQAC recommends close coordination and communication between EQAC and the county.	The recommendation is being addressed. The county is strengthening its air quality planning and management capability through a mechanism that differs from EQAC's proposal of last year to increase staff for these purposes. The staff agrees with and fully supports EQAC's recommendation to continue and intensify close coordination. Coordination and communication between EQAC and county staff have advanced significantly over the last two years.	EQAC's concerns continue. We are pleased with progress to date, but continue to be concerned regarding the county's ability to monitor its efforts in a systematic and strategic manner.	Some progress, but more needs to be done.

III. ECOLOGICAL RESOURCES

Ecological Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the county BOS develop and implement a countywide Natural Resource Management Plan. Two tasks should be done first: complete a countywide Baseline Natural Resource Inventory and adopt a unified Natural Resource Conservation Policy.	Staff concurs with EQAC's recommendation. A countywide Baseline Natural Resource Inventory survey is being conducted by the Urban Forestry Division of the Department of Public Works and Environmental Services that can eventually take into account all terrestrial biotic resources, including flora and fauna existing on private and public properties. In addition, the Fairfax County Park Authority recently adopted a 2002-2006 Natural Resource Management Plan for Park Authority lands. The Stormwater Planning Division is coordinating the development of watershed plans the each of the county's watersheds.	This is a long-standing EQAC recommendation. EQAC notes that efforts are underway that support EQAC's recommendation. EQAC supports these efforts and reiterates its recommendation.	Improved progress, but more needs to be done.
2. EQAC recommends continued support for the public-private partnership with the Northern Virginia Conservation Trust (NVCT) and further recommends the existing three-year agreement be extended.	The Fairfax County Park Authority supports this recommendation and the recommendation is in the process of being addressed.	EQAC commends the BOS for creating the original public-private partnership with NVCT. The BOS did fund NVCT for an additional year past the term of the original three-year Memorandum of Understanding (MOU). However, a new MOU was not put into place. EQAC supports a continuing partnership with NVCT, not a year-to-year program. Therefore, EQAC recommends that a multi-year MOU be accomplished.	Program funded, but no MOU.
3. EQAC recommends that the BOS continue to support proposals to amend Virginia State Code §15.2-96 1, allowing the county to enact tree preservation ordinances.	Due to unwillingness by local Virginia State policy makers to patronize a similar proposal adopted in the 2003 Legislative Program, the BOS Legislative Committee chose not to include the proposal in the 2004 Legislative Program. Virginia State Delegate Mark D. Sickles did patronize a bill that contained most of the same tree preservation amendments contained in the 2003 proposal. Delegate Sickles actions did not result from a proposal submitted as part of Fairfax County's 2004 Legislative Program.	EQAC is extremely disappointed that the Fairfax County's 2004 Legislative Program did not include any proposal for tree preservation. However, EQAC is pleased that one of the local delegates did submit a bill incorporating tree preservation amendments. EQAC continues to recommend that the BOS continue to pursue legislation that would allow a tree preservation ordinance.	No.

IV-1. IMPACTS OF DEER IN FAIRFAX COUNTY

Deer Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the Board of Supervisors continue to implement and monitor the comprehensive deer management program as set forth in the November 1998 Integrated Deer Management Plan and refined by the Deer Management Committee in the summer of 1999 and in subsequent meetings.	This recommendation continues to be addressed. The Fairfax County Park Authority continues to work with the county Wildlife Biologist to move toward the objectives stated in the countywide Deer Management Program. Diligent efforts of Park Authority and Police Department staff have reduced the herd population in several parks to the point where previously bare forest floors are again covered in wildflowers and seedling trees and shrubs.	EQAC notes that actions taken to date continue to support EQAC's recommendation, but the results are a long way from restoring natural areas to the former levels of biodiversity. The changes noted in several parks are encouraging; however, actions to manage the deer population need to continue and to be increased.	In process.
2. EQAC strongly endorses on-going public input into the Deer Management Plan.	This recommendation continues to be addressed. The Deer Management Committee has met in the past to review and comment on the results of management efforts and on staff recommendations. The frequency of committee meetings has decreased as the program has become more routine. Public input is frequently obtained through participation and interaction with various committees, advisory commissions, and civic meetings.	These efforts are providing the desired public input and should be continued.	Yes.
3. EQAC strongly commends active participation of the Fairfax County Park Authority in the deer management program.	This recommendation continues to be addressed. The Park Authority continues to work within the guidelines of its Wildlife Conflict Resolution Policy to reduce and mitigate the impact of an overabundant white-tailed deer population. The agency is continually researching ways to minimize the effect the herd has on parks. Park staff works with the county Wildlife Biologist, his staff, and police officers to carry out herd reduction activities.	EQAC encourages continued participation by FCPA in deer management.	Yes.

Deer Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
4. EQAC believes the deer management program must address problems of small private property owners.	The Virginia Department of Game & Inland Fisheries (DGIF) will issue permits to property owners experiencing damage from any wildlife, but many citizens are not aware of this program. DGIF and Fairfax County have increased efforts to inform citizens of this program. Additionally, state code now allows an extended urban archery deer-hunting season. The county Deer Management Web page provides information about methods available to private property owners.	While the staff response outlines some options available to small private property owners, more needs to be done. EQAC recognizes that this problem is complicated by the overlay of existing State regulations and recommends that county program officers work closely with State officials to ease these where possible.	In process.
5. EQAC believes the management program must accomplish: (1) immediate, sustained reduction of deer population; (2) ongoing monitoring of availability of methods for maintaining population limits; and (3) consideration of development and its effects on ecosystem health and biodiversity.	The deer management program continues to reduce local herds to levels consistent with long-term carrying capacity of remaining habitats. Managed hunts, sharpshooting, and private/public partnerships are combined to apply the necessary control pressure to first stabilize and then reduce deer herds. Fairfax County continues to monitor developments and progress of non-lethal methods of deer herd control. There are several strategies within the recently completed FCPA Natural Resource Management Plan that relate to wildlife conflict resolution, continued evaluation of forest habitat values, and the impacts of park and private development on the biodiversity and ecosystem health in the parks.	The Deer Management Program is making inroads into the overpopulation of deer in the county. However, this needs to continue until all local herds have been reduced to levels consistent with carrying capacity.	In process.
6. EQAC strongly recommends the Board of Supervisors continue to provide for a vigorous and enhanced program of public education as is now being done by the Division of Animal Services and on the county Web site.	Educational efforts have been underway since the start of the Deer Management Program. The Fairfax County Wildlife Biologist is working with Channel 16 to produce three one-half hour wildlife programs. Publications available in the Fairfax County Library system will be updated and expanded annually. Celebrate Fairfax provides an opportunity to reach a large number of county citizens. An interactive display on wildlife concerns was again part of the Public Safety display.	The county certainly has been conducting a vigorous program of public education. This program needs to be continued and enhanced such as suggested by county staff.	Yes.

IV-2. IMPACTS OF GEESE IN FAIRFAX COUNTY

Geese Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC finds the current programs are effective and should be continued.	The Animal Services Division concurs with EQAC's recommendation and intends to continue and expand the current programs.	EQAC continues to support continuation and expansion of current efforts.	Yes.
2. EQAC feels that the current programs need to be replicated in many other areas of the county.	The Fairfax County Wildlife Biologist, in association with GeesePeace, conducts a series of volunteer training sessions prior to the spring nesting season each year. To date, approximately 170 volunteers/cooperators have been trained to addle eggs under the accepted protocol.	The training of volunteers, and other efforts to control the geese population, should continue.	In process.
3. EQAC recommends enhanced public education outreach to sensitize Fairfax County residents to the pollution problems caused by geese and the programs available for addressing them.	The Animal Services Division is presently partnered in a public/private partnership with GeesePeace. This organization provides information to county residents who experience problems with Canada geese. The pollution of surface waters by geese is an issue that has been incorporated into the array of educational efforts now being used.	EQAC recommends continuation of public education efforts.	In process.
4. EQAC recommends enhanced public outreach to acquaint Fairfax County residents with the destructive role excessive goose populations play in our marshland habitats.	The Animal Services Division continues to work in cooperation with State and Federal officials to gather data on the effects of resident goose populations upon local tidal marshlands. This information will be provided to the public through existing methods. The Division is working with Channel 16 to produce programming to cover Canada geese.	EQAC encourages the collection of these data and the dissemination to Fairfax County citizens.	In process.

IV-3. WILDLIFE BORNE DISEASES OF CONCERN IN FAIRFAX COUNTY

Wildlife Borne Diseases Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the BOS provide continued active support to the reorganized Stream Monitoring Program in which the Stream Protection Strategies Program of the DPWES will perform sample collection and field testing and the Health Department will perform lab testing and analysis functions. EQAC recommends that the county staff ensure the posting of advisories on the county Web site when polluted waters are identified.	Starting in December, 2003, the Stormwater Planning Division within DPWES began conducting regular sample collections from pre-existing sites. DPWES is currently in the process of redesigning the sampling structure to develop a representative set of monitoring locations that meets the information needs of the Health Department, but which also serves as an enhancement to the larger stream monitoring and watershed management programs. The resulting information will be made publicly available on an annual basis, and reports to the Environmental Committee of the BOS will be developed and reported as needed.	EQAC continues to support this recommendation, encouraging the BOS to provide active support to the reorganized Stream Monitoring Program. EQAC notes that making information publicly available on polluted waters annually does not address EQAC's recommendation that this be done as polluted waters are identified.	In process.
2. The Health Department should continue and enhance its excellent public education programs.	This recommendation is in the process of being implemented and is being enhanced as EQAC has recommended. The Health Department has translated some of its more essential West Nile Virus public education material into Spanish, Korean, Vietnamese, and basic Chinese and is in the process of evaluating the impact of this program with a study that will be concluded before FY2005.	As stated, EQAC believes the Health Department's efforts are creating excellent public education programs.	Yes.

Wildlife Borne Diseases Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. The Police Department should continue its animal control program and, in conjunction with the Health Department, expand public education initiatives in key areas such as rabies and wildlife contributions to pollution of surface waters.	The Animal Services Division routinely provides the public with information on rabies and other wildlife borne diseases. Rabies is addressed on the Animal Services Web page. The Animal Control Section has developed a program to canvass neighborhoods in areas which exhibit a high number of positive rabies cases. This program provides education to the public on rabies and ensures that owners of domestic animals are in compliance with county ordinances concerning rabies vaccinations.	EQAC supports the current efforts.	Yes.
4. EQAC recommends that the BOS provide active support to the newly instituted program for epidemiology and abatement of insect vector-borne diseases such as West Nile Virus and malaria. EQAC also recommends that the BOS monitor this program.	This recommendation is being addressed. The BOS has provided and continues providing support for the newly instituted program for epidemiology and abatement of insect vector-borne diseases. The Health Department has provided periodic reports on the program and the Health Department periodically informs the BOS in more direct manners.	EQAC supports the current efforts.	Yes.

VI. HAZARDOUS MATERIALS

Hazardous Materials Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC continues to recommend an aggressive pubic education campaign on how to properly dispose of household/residential, commercial, and industrial hazardous waste. The "HHW Disposal Program" can be used. The county should partner with the Northern Virginia Board of Realtors and request them to distribute the flyer to all new residents, buying or renting, who they work with.	DPWES contacted the Government Affairs Committee of the Northern Virginia Association of Realtors (NVAR). The "HHW Disposal Program" flyer was printed in NVAR's monthly magazine in March, 2004 and will be reprinted from time to time. This magazine is distributed to 7,500 members. In addition, NVAR will provide a link from its Web site to the DPWES Web site. An electronic copy of the pamphlet was sent out.	EQAC is pleased that DPWES was successful with this recommendation. This is one avenue to try to reach many people and businesses. EQAC believes more homeowners and home businesses need to be educated about the hazardous materials located in homes and home offices. EQAC continues to believe creative partnering with NVAR and other organizations may be able to accomplish this with little cost to the county.	Yes.

Hazardous Materials Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
2. Financing for the printing of Hazardous Waste and Environmental Crime materials might be available through federal grants with the Emergency Management Program. It is suggested the county discuss the possibilities with Fire & Rescue, FJLEPC, and the Emergency Management Coordinator.	Fire & Rescue reports that staff from the Emergency Management Office (EMO) provided information the funding is available from the Office of National Preparedness, Federal Emergency Management Agency. The funds have been made available to the county and are for hazard preparedness for disasters or emergencies resulting from natural disasters or accidental or man-made events. EMO Staff advised that an educational awareness program that addresses hazardous material releases and other situations that citizens are requested to report would meet the criteria established for funding for this grant. Staff previously checked with EPA and learned a limited amount of educational materials were provided for in-house copying and distribution on previous occasions. Current information from EPA indicates an uncertainty of whether there will be funding for educational programs. Staff has requested that personnel who regularly review available grant programs examine these programs for specific language that may be appropriate for funding the printing of hazardous waste and environmental crime educational materials. This includes grant program review personnel in Fire and Rescue and the EMO. Staff will continue to follow through to access funding that is currently available as well as continuously get updates from grant program review personnel to determine if additional funding becomes available.	EQAC recognizes all staff's good work with this effort and hopes continued efforts will find funding to help with this informational and educational outreach effort.	Yes.

Hazardous Materials Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. Environmental crimes require citizen's eyes. EQAC recommends an advertisement and educational campaign to state what types of hazardous materials and other environmental situations citizens are requested to report including who they are to contact. This could be done through community association newsletters, press release stories to the media, and age appropriate material sent home through the schools.	Fire and Rescue reports that there has been limited activity for improving the community education program for environmental crimes since the 2002 EQAC Recommendation. Fire and Rescue's Hazardous Materials & Investigative Services Branch (HMIS) participated in four different community events, including Celebrate Fairfax and Fall for Fairfax. At each of these events, photographic displays of environmental crimes scenes are presented with handout literature provided to visitors. The information provided includes the brochure from the FJLEPC on how to report spills, leaks, or releases of hazardous materials, coloring books with an environmental theme, and refrigerator magnets with telephone numbers to report releases of hazardous materials and environmental crimes. HMIS has also attended neighborhood association meetings as requested and has also provided information for neighborhood association newsletters. HMIS is listed as the contact for four headings of "Environment' at the county Web site. HMIS utilizes citizen contact made during incidents and telephone calls for educational purposes. Press releases are issued when a significant environmental impact occurs as a result of a release of hazardous materials. Daily information is provided to citizen inquires for proper disposal of HHW materials.	EQAC realizes this is a task that is not easily, if at all, measurable. This must be an on-going effort. HMIS has, and is, making great efforts with this campaign. EQAC continues to suggest two additional venues for citizen education: The Police Academy for citizens active with Neighborhood Watch and the Police Citizen Advisory Councils; and the Citizen Community College programs being offered through some District Councils and Police Districts.	Yes. Continuous effort is necessary.

VII-1. NOISE

Noise Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that in regard to airport noise that Fairfax County (1) support the use of runways with the least impact, especially during sleep hours; (2) work with local, state, and federal groups to encourage airlines to restrict use of noisy aircraft during sleep hours; and (3) encourage the design and construction of new runways and taxiways to make best use of compatible land and water.	Staff supports the consideration of EQAC's suggestions, where applicable, during the Part 150 (which address noise abatement issues) and Environmental Impact Studies that are underway for National and Dulles Airports. Staff notes that much of EQAC's recommendations address issues not under the control of Fairfax County; however, DPZ intends to track on comment on the ongoing studies and will support EQAC's recommendation in their comments.	The current staff approach should continue.	In process.

VII-2. LIGHT POLLUTION

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the Board of Supervisors monitor and evaluate the effectiveness of the recently enacted Outdoor Lighting Ordinance to determine any areas in which enhancements and modifications may be needed.	The new Ordinance became effective on June 17, 2003. Overall, it is believed that the new standards are working well and will be effective in the reduction of glare. However, some issues have arisen which may require minor adjustments to the county's lighting standards in the future. Staff recommends that the outdoor lighting standards be re-evaluated in a few years to determine if any amendments are required.	EQAC agrees with the staff approach.	In process.

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
2. EQAC recommends that the Board of Supervisors direct that exterior lighting fixtures installed on Fairfax County facilities and properties be consistent with the new Ordinance.	All new exterior lighting fixtures installed on Fairfax County facilities and properties are required to, and will adhere to, the new Ordinance. The retrofitting of the 500 to 600 older exterior lighting fixtures located at county facilities is not being pursued at this time. There are no funds available for the initial conversion of these existing light fixtures. Furthermore, some of the fixtures would need to be increased to a higher wattage in order to meet current lighting standards. No funds exist for the higher annual operation and maintenance costs for the increased intensity required.	EQAC is pleased that all new fixtures will be in compliance with the Ordinance. See recommendation #3 for EQAC's discussion and disagreement with staff over the costs of replacing older fixtures.	Yes for new fixtures.
3. EQAC recommends that the Board of Supervisors direct that all older lighting fixtures under county control that do not meet the above standards be replaced on a phased basis.	At the present time, there are no funds available for the initial conversion of the existing streetlights or the additional annual operation and maintenance (O&M) payments for the increased intensity required for some of the older fixtures (some of the older fixtures do not meet current lighting standards – replacing them with cutoff fixture would require an increase in wattage).	EQAC reiterates the recommendation. Additionally, saying that replacing some fixtures with cutoff optics would result in cost increases is flawed logic. Since these do not meet lighting standards, they should be replaced with upgraded wattage lights. The replacement, with cutoff optics, would be cheaper than a replacement without cutoff optics. However, the use of cutoff optics will reduce the wattage required. Overall, estimates are that the cost of conversion will be repaid by lower O&M costs within a three to five year period.	No.

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
4. EQAC recommends that the Board of Supervisors ensure that the Fairfax County Public Schools and the Fairfax County Park Authority fully comply with the new Ordinance.	The Fairfax County Park Authority ensures that all new and replacement lighting is in compliance with the new Ordinance. Fairfax County Public Schools (FCPS) is compliant with the new Ordinance. In addition, as lighting fixtures are replaced for maintenance purposes, FCPS is changing the fixtures to be in compliance. Most building-mounted lighting completed prior to June, 2003 does not meet the current Ordinance. These fixtures will be upgraded to meet the Ordinance through normal attrition.	EQAC supports to approach of the Park Authority and the Schools. EQAC encourages a phased replacement of the older fixtures rather than just relying on attrition.	Yes, for the most part with the exception of older fixtures.
6. EQAC recommends that the Board of Supervisors fully support county staff efforts to disseminate its new booklet and provide information of the county Web site to promote public awareness of light issues. EQAC also recommends that the BOS support county staff efforts to develop any additional technical information needed for the education of architects, contractors, electricians, and builders to what the county permits in the field of illumination.	A booklet entitled "A Guide to Fairfax County's Lighting Standards" was prepared by staff and distributed in September, 2003. This booklet provides an overview of the outdoor lighting standards that became effective on June 17, 2003. In addition, staff has assisted many builders, architects, and engineers in the design of outdoor lighting for both new developments and redevelopment of existing sites.	EQAC comments the staff on an outstanding booklet.	Yes.

VII-3. VISUAL POLLUTION AND URBAN BLIGHT

Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC strongly urges the BOS to again consider the Fairfax County Sign Task Force report and either implement its findings or reconstitute the Task Force to find alternatives that are more palatable to the Board and the citizens of the county.	The Virginia General Assemble did adopt an amendment to Virginia Code as recommended by the Task Force that provides authority for Fairfax County to enter into an agreement with the Commonwealth Transportation Commissioner to enforce Virginia Code that prohibits advertising within the limits of any highway. However, this enforcement agreement will not apply to political signs and special event signs that may remain in the right-of-way for no more than three days after the election or special event. The staff of the Zoning Enforcement Branch of the Department of Planning and Zoning is in the process of formulating a proposed approach for implementing an enforcement program should the BOS decide to enter into such an agreement.	EQAC reiterates its support of the general premises underpinning the Task Force recommendations.	Partial.
2. EQAC support the general premise underpinning each of the Task Force's recommendations, but believes that before the county seeks any amendments to the Code and introduces new programs of its own, a study should be performed to determine the impact on existing programs, staffing, and budget, and that a cost benefit analysis be performed to determine the extent to which the proposed amendments or additions would contribute to reducing visual pollution in a cost-effective manner.	As part of the pilot sign enforcement program mentioned in Recommendation #1 above, staff will identify the impacts. A cost benefit analysis for a sign removal program will be conducted upon the conclusion of the initial pilot program.	EQAC supports the staff approach.	In process.

LAND USE AND TRANSPORTATION

Land Use and Transportation Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
1a. EQAC recommends that the county produce an updated version of the "State of the Plan, An Evaluation of Comprehensive Plan Activities between 1990-1995 with an Assessment of Impacts through 2010" (originally published in 1996) to reflect current population shifts, build out, and infill development.	This EQAC recommendation has been partially addressed during the 2003 Plan Monitoring Year, which is a component of the Comprehensive Plan Review Cycle. During the 2003 Plan Monitoring Year, Comprehensive Plan amendments between 1995 and 2003 were quantified and analyzed to determine how potential build-out has changed. The "State of the Plan" document included an in depth policy and implementation evaluations in order to identify needed changes in policy or implementation approaches. However, since the mid-1990s Plan Review Cycle, the county's approach for policy and implementation has changed; the Policy Plan is now reviewed by functional area. Therefore, staff does not believe that there is a need to reproduce the 1996 State of the Plan document.	EQAC still believes that a single document will be valuable in planning.	No.
1b. EQAC recommends the county upgrade or replace the Urban Development Information System (UDIS), which was developed in the 1970s and is still the primary information system for mapping land use.	The UDIS should not be considered the only alternative for meeting EQAC's recommendation. UDIS is a methodology for linking information between disparate databases containing land parcel information. UDIS has the capability to collect and/or generate annual information on most of what EQAC suggested be incorporated into UDIS. Staff concurs with EQAC that the functionality of UDIS should be reviewed and the feasibility of incorporating additional capabilities (such as impervious surfaces) be considered as part of the review process.	While UDIS has undergone some modifications, EQAC continues to recommend replacement or upgrade of UDIS to incorporate all of EQAC's specific recommendation.	Partial.

Land Use and Transportation Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
1c. EQAC recommends that the Board of Supervisors and county Department of Planning and Zoning continue to consider land use and transportation issues together when revising the Comprehensive Plan. The county should collect data that allows analysis of the macro effects of land use and transportation decisions. These data should support models that integrate congestion, air quality, commuting patterns, and health effects.	The evaluations of proposed Plan amendments consider land use and transportation impacts on a micro, not macro, level. The county's Department of Transportation is beginning a comprehensive review of the county's Transportation Plan. The air quality component of EQAC's recommendation can be considered at a number of levels. At the local level, the idea of incorporating air quality modeling analysis into land use decisions would not be appropriate for site-specific development or Plan amendment proposals, but may have merit for larger scenarios.	EQAC reiterates its recommendation.	Partial.
1d. EQAC recommends that the BOS consider mixed-use principles when locating future public facilities so they are within walking/biking distance of major population centers.	The Public Facilities Section of the Policy Plan contains policies and locational standards that encourage many public uses to be accessible, conveniently located, and in support of community identity. Staff concurs with the recommendation and will continue to strengthen and refine Plan and Capital Improvement Program (CIP) policies that relate to the EQAC recommendation.	EQAC encourages staff to continue the improvement of Plan and CIP policies to promote mixed-use principles.	In process.

Land Use and Transportation Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
2a. EQAC commends the BOS for actively supporting teleworking among the county staff. EQAC urges the BOS to continue funding the program and to increase the goal to 50% of the eligible workforce.	The county's goal for teleworkers is 20% of the positions considered eligible for telework by 2005. This would represent 1,000 teleworkers. By March, 2004, the number of teleworkers has risen to 673. This 20% goal is aggressive.	EQAC concurs that the 20% goal is aggressive and agrees with the staff.	Yes.
2b. EQAC recommends that the BOS take a leadership role in teleworking by establishing an aggressive program directed at convincing each employer in the county to achieve a minimum "Level 3" Employer Services Participation Program.	At a joint press conference held on February 11, 2004, the Fairfax County Board Chairman, the Metropolitan Washington Council of Governments (COG), and the Greater Washington Board of Trade announced a new effort to encourage 50,000 more commuters to telework by 2005. Plans are underway for a fall, 2004 Washington Area Conference on Telework that will specifically challenge major employers in the metro area to meet the COG goal of 20% teleworking by 2005. Regional efforts such as these are most effective in bringing attention to telework.	Regional efforts are certainly effective and worthwhile. Fairfax County should remain involved in them. However, Fairfax County has established a leadership role in teleworking and should continue this leadership role by establishing an aggressive Fairfax County program aimed at employers in the county.	Partial.
2c. EQAC recommends that the BOS work with the Federal government to encourage increases in teleworking. EQAC recommends that the BOS work with the Congressional Delegation to secure resources to establish teleworking sites in the county.	Fairfax County is an active partner with members of its state and federal delegations to secure funding for telework initiatives and for passage of legislation that supports telework.	EQAC encourages the continuation of seeking increases in teleworking and for supporting funding.	In process.

Land Use and Transportation Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
3a. EQAC recommends that the BOS provide annual funding to the Non-Motorized Transportation Committee to implement those projects that have the greatest potential for increasing non-motorized methods of transportation.	In December, 2003, the Board endorsed the Non-Motorized Transportation Committee's Trails Plan priorities. In the past, the Board has provided funding by magisterial district for trail projects. Although little money has been available in recent years to support trail construction, the Board has provided $2.5 million in the FY 2005 budget. In June, 2003, the Board approved the composition of a Pedestrian Task Force. One of this Task Force's missions is to produce a 10-Year Capital Plan for pedestrian facilities. This should be complete in 2004.	EQAC continues to recommend that trail projects be funded, reversing the trend of recent years. EQAC recommends that the BOS endorse the Capital Plan produced by the Pedestrian Task Force and fund the projects with the greatest potential for increasing non-motorized transportation.	In process.
3b. EQAC recommends that the BOS work with Metro and the Fairfax Connector to increase the number of stops available within communities, to explore a multiple size fleet that can penetrate further into communities, and to increase the number of runs per day on existing routes during peak hours.	Bus service planning is done on an ongoing basis, but service is done within fiscal constraints. When warranted and fiscally possible, service levels are increased. Also, service areas are increased in response to development. However, when warranted and due to periodic needs to reduce budgets, service areas and levels are decreased. Two examples of increased service levels and areas of service are the Dulles Corridor and the Richmond Highway Corridor.	EQAC concurs with staff that planning should be done on an ongoing basis and that service should be increased when warranted.	In process.

Land Use and Transportation Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
3c. EQAC recommends that the Health Department and the Public Affairs Office produce and disseminate brochure(s) explaining the interrelationship between commuter choices and public health.	The specific recommendation to develop and distribute a new brochure has not been addressed. The Air Quality Subcommittee of the Environmental Coordinating Committee is considering recommendations to expand the distribution of public outreach materials produced by Clean Air Partners, EPA, and others. Staff recommends that the consideration of the development of a new brochure be deferred pending completion and implementation of Subcommittee recommendations.	EQAC continues to believe that a brochure showing the linkage between commuter choices and public health is needed.	No.
3d. EQAC recommends that the BOS urge the State Police to fully enforce HOV restrictions and to increase the penalty for HOV violations.	The Fairfax County Police Department assists the Virginia State Police on targeted HOV violation campaigns several times a year. However, the State Police are the primary enforcement agency. Based on existing staffing, it would be difficult for the State Police to more fully enforce HOV violations short of some type of photo enforcement. The issue of increasing fines has not been addressed. The Fairfax County Police Department and the Department of Transportation concur with the recommendation to increase the fine. They would seek to have 50% of the fine returned to the county. This funding could be earmarked for enhanced enforcement and education.	EQAC continues to recommend increased HOV enforcement and increased fines. EQAC supports the position of the Fairfax County Police Department and Department of Transportation.	No.

CHAPTER I

LAND USE AND TRANSPORTATION

I. LAND USE AND TRANSPORTATION

A. ISSUES AND OVERVIEW

This Chapter considers the environmental aspects of land use and transportation, both separately and as they relate to each other from an environmental perspective.

According to the Fairfax County Comprehensive Plan, "If current trends continue, the supply of land presently planned for residential development will be all but exhausted shortly after the turn of the century [2000]."[1] As we approach this "buildout," the focus of land use across the county is shifting from new development to revitalization and redevelopment. Each acre in the county becomes more valuable every day. The desire to maximize land utilization or productivity puts a strain on all types of land, from residential to commercial to parkland.

While the amount of available land has decreased, the Plan potential has been increasing. The potential is the number of units that can be built in the county according to the current Plan. It changes as requests are evaluated and adopted by the Board. Since 1989, there have been 80,585 new townhouses and multifamily units added and 927 single family homes removed from the Plan. This clearly demonstrates the increased intensity planned for the county.

At the same time, transportation systems across the county and metropolitan region are becoming increasingly congested. During rush hour, most highways in the county receive a failing grade for peak hour level of service. Over the past 15 years, highway construction in the Washington area outpaced population growth[2], yet congestion has still increased. This is due to increased per capita vehicle mileage that puts severe strains on the transportation infrastructure. The cost of congestion in the region is estimated at $667 per person in 2001, up from $320 in 1991.[3]

The same study estimates that, without the Metro system, each person would incur an additional 13.7 hours of congestion/year. Metro carries nearly 20% of all rush hour trips in the Metropolitan area, with a carrying capacity equivalent to 1,400 miles of roads, or roughly 11% of the road capacity.[4] The limiting factors to expanded Metro service are convenient access to Metro stations and train capacity. Currently, most Metro parking lots in Fairfax County are full by 8:00 A.M.

The buildout of our land use plan combined with the overload of our transportation infrastructure will continue to increase as the county population increases. Fairfax County is currently home to over one million people. It is projected to increase by

[1] Fairfax County Comprehensive Plan, 2003 Edition, Land Use Chapter
[2] "Where We are Growing", Southern Environmental Law Center, 2002
[3] Texas Transportation Initiative, 2003 Urban Mobility Study
[4] Washington Metropolitan Area Transit Authority, www.wmata.com/about/metromattersfactsheet.pdf

another 15 percent between 2000 and 2010, and yet another five to seven percent between 2010 and 2020. This growth will present a challenge to the Comprehensive Plan goals of maintaining an "attractive and pleasant quality of life."

As noted throughout this Annual Report, pressures from growth throughout the county directly effect our environment and consequently affect our quality of life, health, and natural experiences. The Comprehensive Plan specifically calls out strategies and patterns that can address land use and transportation together. Mixed-use development is an important tool to combine residential and commercial development to "enhance the sense of community" and to "increase transportation efficiency." It provides an opportunity for residents to live and work in the same area, thus reducing transportation needs while increasing the population density to support local businesses and mass transit.

The Board of Supervisors highlighted the effects of growth and congestion in their vision paper: **Environmental Excellence for Fairfax County, A 20-Year Vision**. A variety of tools were specifically called out, including mixed use development and Low Impact Development (LID). In addition, problems that at first seem tangential to the environment, such as neighborhood disruption through tear-down development and low income housing, were raised. Teardowns are becoming more common across the county, as single family homes are replaced with larger homes. The lack of low-income housing means workers cannot afford to live and work in Fairfax County and need to commute from outside the county, which exacerbates problems of both pollution and congestion.

1. Trends and Concepts

Other concepts that begin to combine land use and transportation are sprawl, smart growth, and new urbanism. Sprawl is the unrestricted growth out from the core of a city or a county. In the 1970s, Fairfax was one of the nation's fastest growing counties. Today that rapid growth that is happening beyond Fairfax County, in Loudoun and Prince William Counties. Loudoun County is now the fastest growing county in the nation, averaging 12.6% growth per year. This outer county sprawl directly affects Fairfax County through increased road congestion, changing property values, and inefficient use of Fairfax infrastructure.

Smart growth is the antithesis of sprawl; it can be defined as environmentally-sensitive land development with the goals of minimizing dependence on auto transportation, reducing air pollution, and making infrastructure investments more efficient. The Coalition for Smarter Growth lists the following principles for Smart Growth:

- Mix land uses;
- Take advantage of compact building design;

- Create housing opportunities and choices;
- Create walkable communities;
- Foster distinctive, attractive communities with a strong sense of place;
- Preserve open space, farmland, natural beauty, and critical environmental areas;
- Strengthen and direct development toward existing communities;
- Provide a variety of transportation choices;
- Make development decisions predictable, fair, and cost-effective; and
- Encourage community and stakeholder collaboration in development decisions.

Reston and the Orange Line corridor through Arlington are good examples of smart growth.

New Urbanism is a design movement that is going beyond smart growth into community building based on traditional urban centers. New Urbanists are working to improve land use by focusing on walkable communities and town centers.[5]

An important New Urbanist concept to encourage consistent planned development in a community is called **Form Based Codes**. These codes define an appropriate form of development and provide incentives for developers to adopt them. They have been successfully adopted as part of the Columbia Pike revitalization in Arlington County. The community worked through a series of **charettes** with a planning consultant to create a vision for the new "pike." Form Based Codes provide clear direction on the adopted vision, while incentives encourage developers to adopt the form as the Pike is redeveloped.

Other concepts that combine land use and transportation provide less dramatic changes to traditional subdivision development. **Clustering** provides residential development that allows homes to be built close together with the remaining acreage left as open space in perpetuity. The challenge with clustering is the lack of public trust that the open space will remain open. **Low Impact Development** (LID) is an approach that reduces the impact of development on a site. For example, LID will reduce the amount of impervious surface on a site and reduce the impact on trees and natural features. **Infill** is the process of filling in larger lots with multiple dwelling units or larger housing.

2. Macro Considerations

The concepts above focus on density and impact of development. Non-development oriented concepts provide options by changing how the transportation system is used. **Telecommuting**, or **telework**, is an example that reduces or eliminates the traditional commute to the office. Teleworkers work

[5] Charter of the New Urbanism at: http://www.cnu.org/about/index.cfm.

from home or at local work centers that provide infrastructure for a community of workers. **Affordable housing** provides an option for low-income workers to live closer to their jobs. This becomes increasingly important as property values rise and large numbers of county workers seek housing options outside the county. Analysis of commuting patterns shows that workers coming into the county are primarily arriving from the outer counties. This incoming work force puts a strain on our transportation system. Fairfax County residents who work outside the county are primarily commuting into Washington, D.C.[6] and have the option of using Metro.

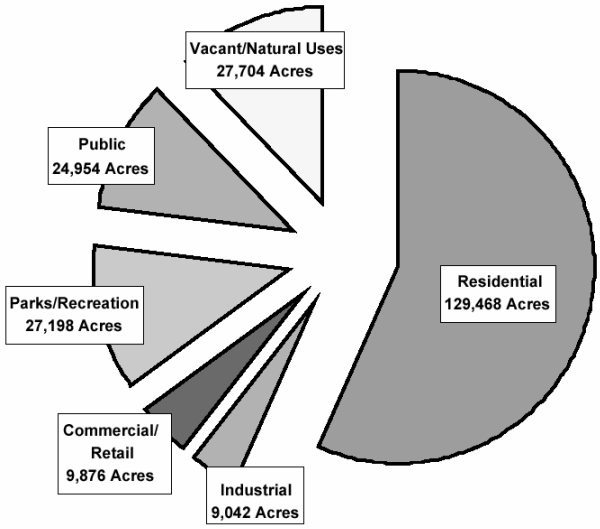
B. LAND USE

A prerequisite to understanding the interrelationship between land use and transportation is to first examine them separately. This section describes land use and land use decision-making in Fairfax County.

1. How Is Land Used In Fairfax County?

Land use in Fairfax County is analyzed yearly via the Urban Development Information System (UDIS). Fairfax County has 228,242 total acres of land, excluding areas in roads, water, or small areas of land unable to be zoned or developed. Those acres are organized into the following broad categories:

Figure I-1: Existing Land Uses in Fairfax County



Source: Fairfax County Department of Systems Management for Human Services, 2002.

Note: Land in Towns of Clifton, Herndon and Vienna included. Total acreage by year figures do not include areas in roads, water, or small areas of land unable to be zoned or developed.

[6] U.S. Census Bureau Commuting Patterns

- Residential—acres dedicated to living. Residential acres are measured by the number of dwelling units per acre (DU/AC). For example, a low-density neighborhood has a DU/AC from .1 to .5, a suburban neighborhood ranges from 1-20, and an urban center has a core DU/AC of 35-60.

- Commercial/Retail—acres developed for people to work or shop. Commercial space is measured by looking at the Floor Area Ratio (FAR), which is the ratio of gross floor area to the size of the lot. For example, an FAR of 0.5 means that a single story building can cover half the lot, a two-story building can cover ¼ the lot, and a four-story building can cover 1/8 of the lot. FAR does not include other impervious surfaces, such as parking lots.

- Industrial—acres zoned for industrial use. Industrial space is measured by FAR.

- Parks and Recreation—acres dedicated to public enjoyment and recreation.

- Public—acres owned by the public but not for parks or recreation, this includes: Fort Belvoir, Dulles Airport, the campus of George Mason University, county government facilities such as fire stations, landfills, police stations, training facilities, schools, and government centers; and other publicly-owned properties.

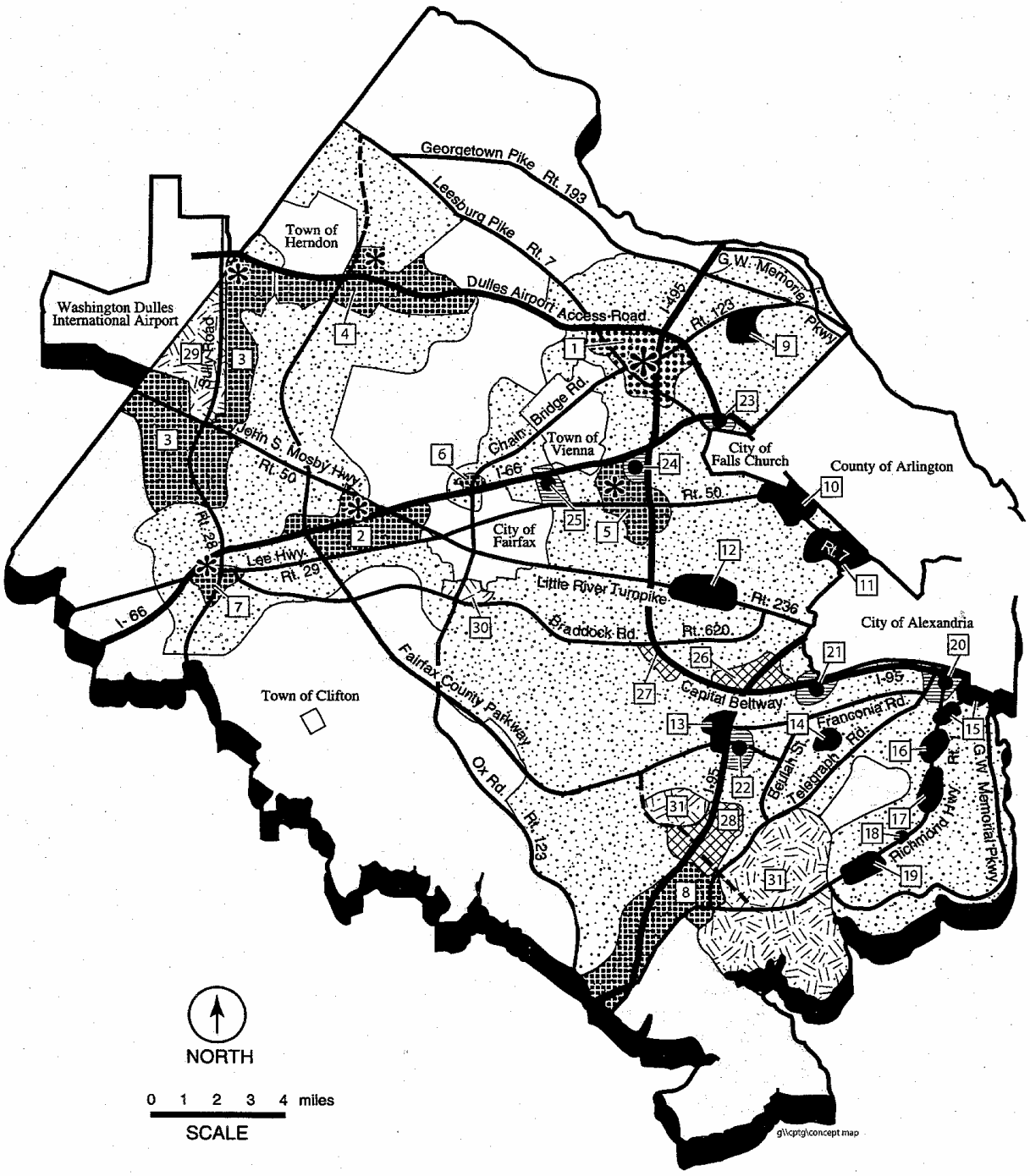
- Vacant—acres currently unused, either natural or vacant, but zoned for Residential, Industrial, or Commercial uses.

2. Land Use Planning

The Fairfax County Comprehensive Plan is a guide for making land use decisions in Fairfax County. The Plan was adopted in 1975 and revised in 1988 around 18 Goals for Fairfax County (a 19th goal was added later). The 2003 Edition consists of the Policy Plan plus the Area Plan for each of the four planning areas. The Policy Plan has ten functional sections. They are: Land Use, Transportation, Housing, Environment, Human Services, Public Facilities, Parks and Recreation, Revitalization, Economic Development, and Heritage Resources.

In 1990, the county's Concept Map for Future Development was developed. This map identified 31 mixed-use centers; the Concept Map has been revised slightly since then, but there are still 31 mixed-use centers shown (Figure 1-2). While the Concept Map was not formally adopted, it is an integral part of the Area Plans.

Figure I-2: Concept Map for Future Development



CONCEPT MAP FOR FUTURE DEVELOPMENT

CONCEPT MAP FOR FUTURE DEVELOPMENT

LOCATIONS OF MIXED-USE CENTERS

Urban Center
1. Tysons Corner Urban Center

Suburban Centers
2. Fairfax Center
3. Dulles (Route 28 Corridor)
4. Reston-Herndon
5. Merrifield
6. Flint Hill
7. Centreville
8. Lorton-South Route 1

Community Business Centers
9. McLean
10. Seven Corners
11. Baileys Crossroads
12. Annandale
13. Springfield (West)
14. Kingstowne
15. North Gateway and Penn Daw
16. Beacon/Groveton
17. Hybla Valley/Gum Springs
18. South County Center
19. Woodlawn

Transit Station Areas
20. Huntington Metro Station
21. Van Dorn Metro Station
22. Franconia/Springfield Metro Station
23. West Falls Church Metro Station
24. Dunn Loring Metro Station
25. Vienna Metro Station

LOCATIONS OF LARGE INSTITUTIONAL AND INDUSTRIAL AREAS

Industrial Areas
26. Beltway South
27. Ravensworth
28. I-95 Corridor

Large Institutional Land Areas
29. Washington Dulles International Airport
30. George Mason University
31. Fort Belvoir (Main Post and Engineer Proving Ground

LEGEND

Suburban Neighborhoods (Residential density ranges defined in Area Plans; 0.15-0.25 FAR* for neighborhood-serving non-residential use)

Low Density Residential Areas (Residential density of 0.1 to 0.5 du/ac **, specific density ranges in Area Plan; Non-residential use intensity 0.05 to 0.1 FAR)

Tysons Corner Urban Center
Core (1.0-1.65 FAR; 35-60 du/ac)
Non-Core (0.25-1.0 FAR; 8-45 du/ac)

Suburban Centers
Core (0.3-0.8 FAR; 15-35 du/ac)
Non-Core (0.15-0.30 FAR; 5-25 du/ac)

Community Business Centers (0.20-0.50 FAR; 5-25 du/ac; if a core is designated, intensities of up to 0.70 FAR may be allowed)

Transit Station Areas (0.30-1.00 FAR; 8-45 du/ac)

Industrial Areas (0.25-0.50 FAR for Industrial Uses)

Large Institutional Land Areas

* FAR - floor area ratio
** du/ac - dwelling units per acre

In 1995, a study of the Plan was prepared entitled: State of the Plan, An Evaluation of Comprehensive Plan Activities Between 1990-1995 with an Assessment of Impacts Through 2010. This study outlined a series of recommendations for the county to improve its ability to meet the Plan goals. Many of those recommendations are still applicable.

Currently, the Policy Plan is reviewed by functional sections. The Parks and Recreation section was reviewed in 2003. The Transportation Section is being reviewed in 2004 and 2005. A comprehensive review of the complete Policy Plan is not anticipated in the future due to the overall complexity of the complete document. The Area Plans are reviewed regularly. The North County Area Plan Reviews started in 2004. The South County Area Plan Review process will start in 2005.

Another important ordinance that affects land use is the county's Chesapeake Bay Preservation Ordinance and amendments adopted on November 18, 2003 by the Board of Supervisors. This Ordinance codifies the county commitment to protect the Chesapeake Bay. An important aspect is the designation of Resource Protection Areas (RPAs) around all water bodies with perennial flow. RPAs are the corridors of environmentally sensitive land that lie alongside or near the shorelines of streams, rivers and other waterways. They include any land characterized by one or more of the following features:

(1) A tidal wetland;
(2) A tidal shore;
(3) A water body with perennial flow;
(4) A nontidal wetland connected by surface flow and contiguous to a tidal wetland or water body with perennial flow; and
(5) A buffer area that includes any land within a major floodplain or any land within 100 feet of a feature listed in (1)-(4).

The 2004 proposed Chesapeake Bay Supplement provides an excellent overview of land use factors in Fairfax County that affect the Chesapeake Bay.

The Comprehensive Plan plus the Chesapeake Bay Preservation Ordinance provide an outline for how and where development is planned to occur in Fairfax County. They can be used to analyze the **potential** development that can occur within the county. The **realization** of that potential is subject to many external variables.

3. Land Use Monitoring

Information on land use is primarily tracked using the Urban Development Information System (UDIS), which was developed in the 1970s. Background information on UDIS from the 1995 State of the Plan explains, "the Comprehensive Plan had detailed guidance for residential development, with a

dozen residential density ranges, but lacked guidance for the appropriate intensities (FAR) for non residential development… Since the 1970's UDIS has remained relatively unchanged with regard to Plan quantification capability. The Plan has, however, become increasingly complex, with intensity recommendations for most non residential areas."

Recommendations to improve UDIS from the 1995 State of the Plan have not been implemented, and it is still the basis of the county's land use information as presented in Demographic Reports for 2002. Technologically, UDIS has not kept pace with other county systems that have migrated off the mainframe. Feeder systems that provide data for UDIS are at risk of not being able to provide the correct type and format of data. The county is currently stabilizing UDIS and preparing to review the business requirements for a future upgrade. This is a critical tool for understanding how land is used, and additional capabilities to better categorize and understand the ground truth should be added.

4. Land Use History and Buildout Projections

The Comprehensive Plan contains land use recommendations for all of the land in the county. As a practical tool, however, it is most effective when there is significant vacant land to be developed. That vacant land has been steadily decreasing as shown in Table I-1:

Table I-1
Vacant Land in Fairfax County

Year	Vacant Land (acres)	Total Planned Land (acres)	% Vacant
1980	75,550	234,744	32%
1985	66,685	232,941	29%
1990	45,042	230,678	20%
1995	37,006	229,366	16%
2000	29,529	228,541	13%
2002	26,258	228,242	12%
Planned land does not generally include public roads and water			
Source: Fairfax County Demographic Reports, 2002			

In 1990, when the Concept Map was created, approximately 20% of the county was vacant. This gave some flexibility to the planners. In 2002, with only 12% vacant and much of that fragmented, the decisions are much more constrained. Significant planning changes require interventions that will most likely affect existing developed land.

The current land use categories are shown in Table I-2 below:

Table I-2 Existing Land Uses		
Land by existing use	**Acreage**	**Percent of total**
Residential	129,468	56.7%
Industrial	9,042	4.0%
Commercial/ Retail	9,876	4.3%
Parks and Recreation	27,198	11.9%
Public	24,954	10.9%
Vacant & Natural	27,704	12.1%
Total	228,242*	100.0%
*Does not generally include public roads and water		
Source: Fairfax County Demographic Reports 2002		

Currently, 56% of the county land is developed for residential use, with 4.3% for Commercial/Retail. These numbers show the footprint of each use type, but they do not show the corresponding density. Commercial/Retail acreage in the county has a higher density than residential. It is difficult to determine the footprint of mixed-use acreage given the current data. It is also difficult to determine mixed-use density, and whether it is a function of DU/AC or FAR, or both.

As the current Plan is exercised and the county reaches build-out, the planned land use acreage is shown in Table I-3.

Table I-3 Planned Land Uses				
Land Use	**Planned Acreage**	**Percent of Total Land in the County**	**Vacant/Underutilized Land**	**Vacant Land as a percentage of Planned Acreage**
Residential	143,493	62.9%	24,225	17%
Industrial	8,310	3.6%	2,511	30%
Commercial	5,282	2.3%	804	15%
Public Facilities	27,225	11.9%	1,733	6%
Parks, Recreation, and Floodplains	43,788	19.2%	3,929	9%
Vacant and Natural	-	0.0%		
TOTAL	228,098	100.0%	33,202	15%
Source: Fairfax County Demographic Reports, 2002				

All vacant and natural land will be developed or become parkland. The ratios between the types will change with the residential increasing to 62% overall.

The table also includes an estimate of the vacant or underutilized acreage within each type. "Because of the complexities involved in determining whether nonresidential land is underdeveloped, estimates of underdeveloped acreage are only made for residential land."[7]

5. Plan Density Increases

The aggregate acreage available in the county is relatively constant, with occasional changes as land is converted to other uses, such as roads and drainage ponds. The Comprehensive Plan capacity, however, is constantly increasing as new density is allocated across the county. For purposes of allowing for a comparison of existing and planned development levels, Table I-4 shows the "existing conditions" for both nonresidential and residential development as they existed in Fairfax County in the years 1990, 1994, and 2002.

Table I-4
Existing Land Uses in Fairfax County: 1990, 1994, and 2002

Land Use	1990	1994	2002
Nonresidential (figures given in square feet of floor space, rounded to the nearest million)			
Office	67,000,000	75, 000,000	98, 000,000
Retail	33, 000,000	39, 000,000	47, 000,000
Institutional	29, 000,000	31, 000,000	37, 000,000
Industrial	34, 000,000	36, 000,000	40, 000,000
Total Nonresidential	**163,000,000**	**182,000,000**	**221,000,000**
Residential (figures given in dwelling units, rounded to the nearest hundred)			
Single Family Detached	163,000	169,700	184,200
Single Family Attached (e.g., Townhouses)	67,300	74,600	90,500
Multifamily	72,100	77,700	96,000
Total Residential	**302,500**	**322,000**	**370,600**

Source: Fairfax County Department of Planning and Zoning, 2004

[7] Fairfax County Demographic Reports, 2002

Residential and nonresidential growth in Fairfax County is expected to continue, and the county's Comprehensive Plan anticipates and guides this growth. Table I-5 presents one potential Comprehensive Plan "buildout" scenario based on Comprehensive Plan options that would serve to maximize residential development (as opposed to options that would maximize nonresidential development) in mixed use employment centers. This scenario is presented applying Comprehensive Plan guidance as it existed in 1989, 1991, 1995, and 2003. Prior to the Area Plan revisions in 1991, nonresidential potential could not be quantified due to lack of specific nonresidential development intensity guidance in the Comprehensive Plan; as such, nonresidential Plan capacity information is not provided for the year 1989.

Table I-5
Comprehensive Plan "Buildout" Capacity in Fairfax County Applying a Residential Plan Option Maximization Scenario

Land Use	1989	1991	1995	2003
Nonresidential (figures given in square feet of floor space, rounded to the nearest million)				
Office	-	158,000,000	182, 000,000	185, 000,000
Retail	-	48, 000,000	56, 000,000	65, 000,000
Institutional	-	37, 000,000	42, 000,000	44, 000,000
Industrial	-	74, 000,000	75, 000,000	70, 000,000
Total Nonresidential	**-**	**317,000,000**	**355,000,000**	**364,000,000**
Residential (figures given in dwelling units, rounded to the nearest hundred)				
Single Family Detached	216,100	212,200	212,800	215,200
Single Family Attached (e.g., Townhouses)	78,600	82,700	86,200	88,900
Multifamily	83,200	114,400	140,600	153,500
Total Residential	**377,900**	**409,300**	**439,600**	**457,600**

Source: Fairfax County Department of Planning and Zoning, 2004

The Comprehensive Plan is not a static document; major revisions to the Area Plans were adopted in 1991, and the Plan has been amended numerous times both through the Area Plans Review (APR) process and through Out-of-Turn Plan Amendments since that time. As can be seen in Table I-5, the general effect of these Plan amendments has been to increase potential development in Fairfax County; the "buildout" levels of total residential and total nonresidential development under the scenario presented in Table I-5 have increased since 1991.

The increase in buildout planned residential development levels, under the scenario presented in Table I-5, is summarized in Table I-6:

Table I-6
Residential Development: Plan Build Out, 1989-2003

Land Use	1989 Plan	1991 Plan	1995 Plan	2003 Plan	1989 - 2003 Change	1989 - 2003 Percent Change
Single Family Detached	216,100	212,200	212,800	215,200	(900)	**-1%**
Single Family Attached	78,600	82,700	86,200	88,900	10,300	**13%**
Multifamily	83,200	114,400	140,600	153,500	70,300	**84%**
Total	**377,900**	**409,300**	**439,600**	**457,600**	**79,700**	**21%**

Table I-6 clearly shows that the residential units are:

1. increasing in total number—as the population grows, Fairfax County is able to expand through Plan changes that increase the number of potential units; and

2. getting closer—the trend is to add more multi-family units (an 84% increase since 1989) while maintaining a consistent number of single family detached homes.

C. TRANSPORTATION

This section examines transportation and transportation decision making in Fairfax County.

1. How do People and Things Move About Fairfax County?

There are numerous options for people and things to move about the county.

- **Private, motorized transportation** is one of the most significant elements of transportation that has a major effect on the environment and is most closely related to land use and development. In modern times people have become more reliant on the use of automobiles for business, pleasure, and various daily functions and activities. The urban sprawl we have experienced in Fairfax County has greatly influenced this problem, causing major congestion on roadways, particularly during rush hour as many individuals are commuting long distances to and from their jobs.

- **Rail and rapid bus transit** has long been looked upon as a means of reducing traffic congestion and thereby creating a positive impact on

pollution and air quality. It also has a direct relationship to land use planning and development because rail transport centers are ideal locations for business, commercial and housing developments. There are numerous projects that have long been in the planning phase; due primarily to budget constraints, however, virtually none of them have reached the actual development phase.

- **Commercial vehicular transportation**, mainly trucks and buses, are another serious factor impacting our environment. Trucks, whether they are local, inter-county, or interstate, are serious contributors to our environmental crisis. In addition to many of them using "dirty" diesel fuel, they also have a negative impact on traffic congestion. Bus traffic includes school buses, most of which are transporting students during the morning rush hour. Many of these buses are old and are a hazard to the environment, again because of the type of fuel they use. In September, 2003, the Board of Supervisors approved a carryover of $2 million to begin the retrofitting of all county and Fairfax County Public School diesel vehicles such that they will burn fuel more cleanly.

- **Non-motorized transportation**, namely walking and biking, have been looked upon as viable alternatives for reducing traffic congestion and improving air quality. Not having sufficient infrastructure for walking and biking is a major deterrent to that form of transport, not to mention the frame of mind of the general public that has become automobile-dependent over the years, even for short trips. This component has an important relationship to land use planning and development in order to ensure that adequate facilities (walking and biking trails) are included in the plans.

- **"Virtual transportation"** has surfaced in recent years as another viable alternative to motorized transportation. Modern technology has created opportunities for people to work out of their homes using computers for telecommuting and e-commerce to perform their jobs. If these techniques become more widely accepted means of performing one's job, it would have a significant positive impact on reducing pollution and improving air quality.

  Fairfax County is a leader in this field with the Fairfax County Government Telework Program.

a. Vehicular Congestion and Volume to Capacity Ratio Maps

This section examines vehicular transportation options and the associated congestion that is experienced every day by drivers. Vehicle congestion on roadways is typically measured by volume to capacity (V/C) ratio. The Fairfax County Department of Transportation's Planning Division created a map for this report that shows the current and projected V/C ratios on major Fairfax County roadways. As V/C increases from zero to one, the volume approaches the road capacity. Over one, there is more volume than the road

can support. The Level of Service (LOS) is a measure of congestion; once V/C reaches one, the road is fully saturated, and the LOS is graded an F for failing.

Current V/C ratios on county highways are shown in Figure I-3. Major portions of the Beltway, I-66, and the Fairfax County Parkway already have a failing LOS.

Projected V/C ratios for 2025 are shown in Figure I-4. This information considers population growth and settlement projections. Comparing the current V/C ratio map with the future V/C ratio map provides many insights into how the transportation infrastructure grows with population. Some observations:

(i) The failing Highways are still failing, some much worse and others actually better:

- I-66 West of the City of Fairfax will get increasingly more congested, while I-66 east of Fairfax will get less congested.

- The Beltway will become considerably more congested, with V/C ratios ranging from 1.5 to over two. Congestion in the "mixing bowl" area (the I-95/I-395/I-495 interchange area) will continue to get worse. The impacts of the reconstructed mixing bowl are not yet factored into the model; however, interchanges are modeled separately from segments and the data may not reflect the current improvements.

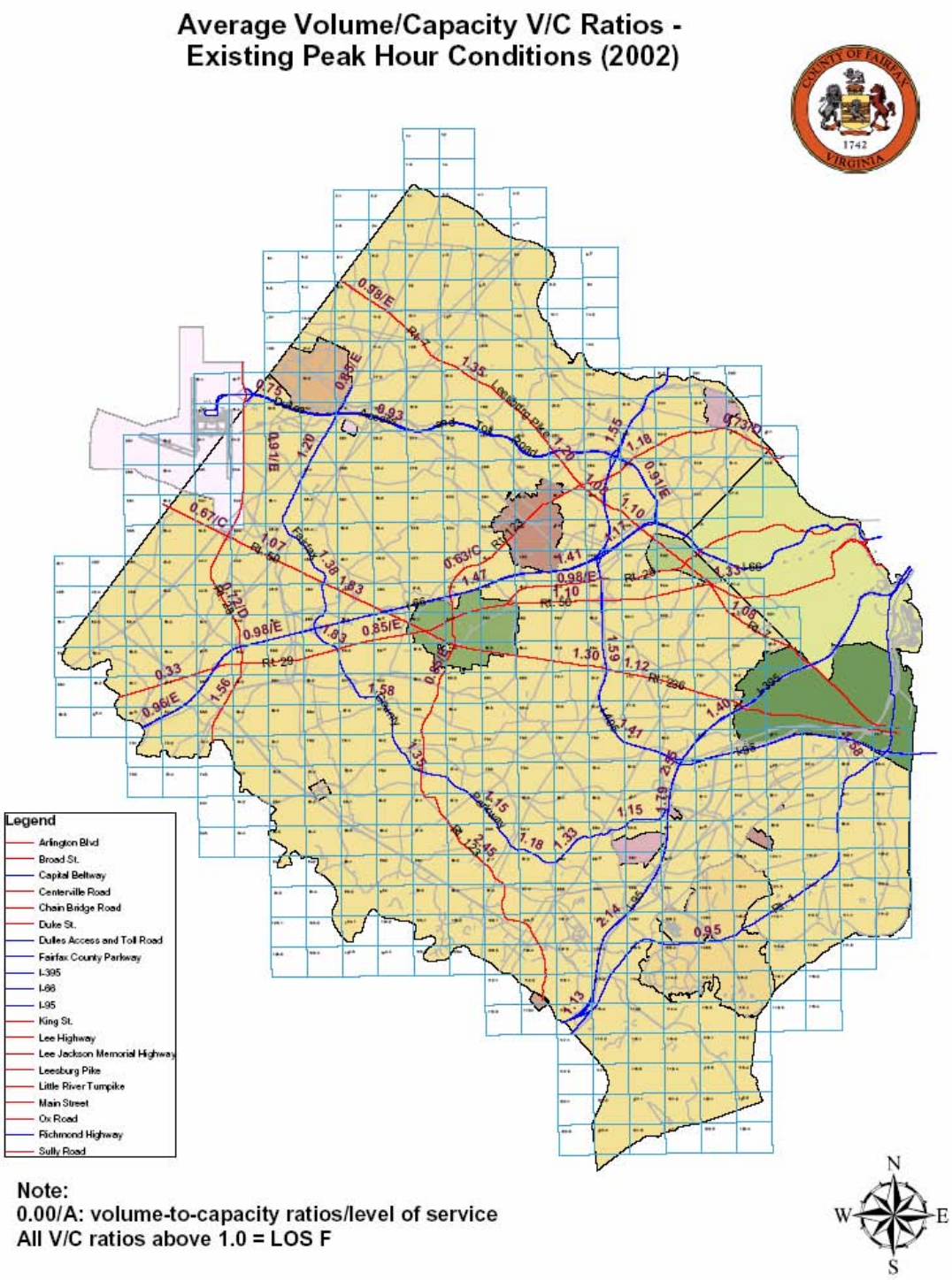
- I-95 outside the Beltway will get significantly worse, with V/C ratios increasing from 1.01-1.04 to 1.76 or greater.

(ii) Major roads closer to Washington D.C. will not change considerably over this period. This includes Route 29, Route 50, and Route 7 in and east of Tysons Corner. The current congestion has stabilized and increased volumes are not expected on these roads.

(iii) Major roads in the western part of the county will get more congested; this includes portions of Routes 28, 123, and 7 west of Reston. This will primarily be induced by commuters from outside the county.

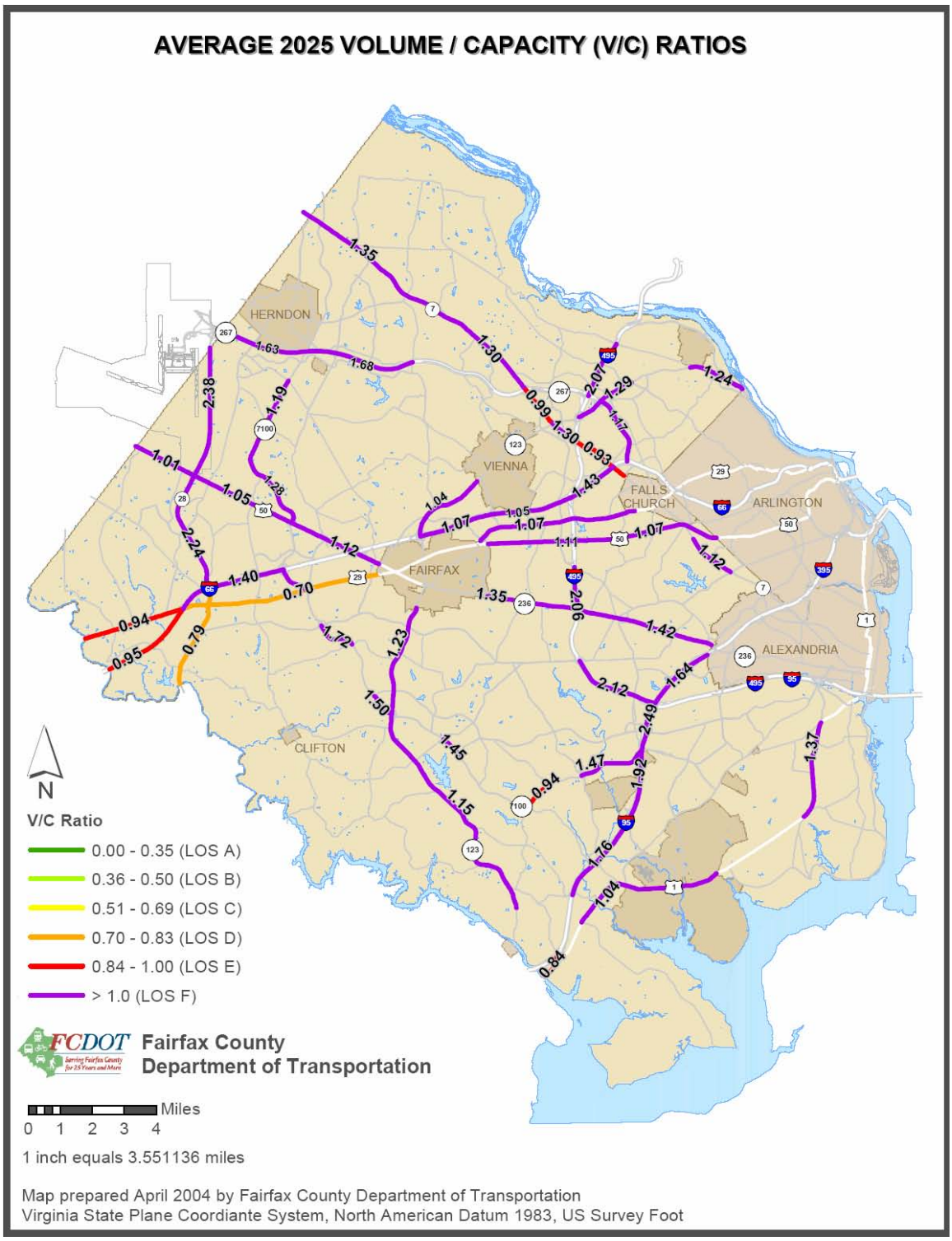
The maps do not include potential improvements from mass transit. In particular, the Dulles Rail extension will impact congestion in the Tysons Corner area, and an Orange Line extension to Centreville will impact congestion along I-66 throughout the county. The maps also do not show changes from the proposed High Occupancy Toll (HOT) lanes on the Beltway.

Figure I-3



Source: Fairfax County Department of Transportation

Figure I-4


AVERAGE 2025 VOLUME / CAPACITY (V/C) RATIOS
HERNDON
VIENNA
FALLS CHURCH
ARLINGTON
FAIRFAX
CLIFTON
ALEXANDRIA
N
V/C Ratio
0.00 - 0.35 (LOS A)
0.36 - 0.50 (LOS B)
0.51 - 0.69 (LOS C)
0.70 - 0.83 (LOS D)
0.84 - 1.00 (LOS E)
> 1.0 (LOS F)
FCDOT
Fairfax County
Department of Transportation
Miles
0 1 2 3 4
1 inch equals 3.551136 miles
Map prepared April 2004 by Fairfax County Department of Transportation
Virginia State Plane Coordiante System, North American Datum 1983, US Survey Foot

Both of these improvements have a dynamic component and are more difficult to model accurately. One of the recommendations of this Chapter is to continue studies to better model the effect of transit on congestion and other dynamic aspects of a modern transit system. These modeling improvements are being considered as part of the Transportation Section review of the Comprehensive Plan that is currently under way; the improvements need to be implemented to provide the Board with better data to make future transportation decisions.

b. Residential Commuting

An interesting statistic on commuter patterns is that over 50% of the residents in Fairfax County work in Fairfax County (see Table I-7), with another 17% working in the District of Columbia. Similarly, most of the workers in Fairfax County live in Fairfax County (see Table I-8); however over 80,000 workers commute to jobs in Fairfax County from Prince William and Loudon Counties. Only 12,000 workers commute to the county from the District of Columbia.

Table I-7
Where do Residents of Fairfax County Go to Work?

Destination	Number of Commuters from Fairfax County	Percent of Total Commuters from Fairfax County
Fairfax Co, VA	278,064	52.72%
District of Columbia	88,908	16.86%
Arlington Co, VA	48,670	9.23%
Alexandria City VA	27,641	5.24%
Montgomery Co, MD	16,943	3.21%
Loudoun Co, VA	16,420	3.11%
Fairfax City, VA	15,741	2.98%
Prince George's Co, MD	9,594	1.82%
Prince William Co, VA	7,013	1.33%
Falls Church City, VA	4,061	0.77%

Source: U.S. Census Bureau, Commuting Patterns of Fairfax County, Virginia Residents, 2000[8]

c. Transportation Options

Just as the Land Use plan has increased capacity in the same footprint through higher density, the transportation plan needs to accommodate more commuters through denser transportation options. Metro is a good example of denser transportation in a smaller footprint.

[8] http://www.fairfaxcounty.gov/comm/demogrph/publist.htm

Table I-8 Where to Workers in Fairfax County Come From?	
Origin	**Number of Commuters**
Fairfax Co, VA	278,064
Prince William Co, VA	44,322
Loudoun Co, VA	35,933
Montgomery Co, MD	22,148
Arlington Co, VA	20,476
Prince George's Co, MD	18,258
Alexandria City, VA	14,643
District of Columbia	12,244
Stafford Co, VA	7,249
Fauquier Co, VA	5,499
Manassas City, VA	5,145
Source: U.S. Census Bureau, Commuting Patterns of Fairfax County, Virginia Residents, 2000	

As a simple example of the space required for vehicular traffic, consider the Fairfax County Parkway. The 35 miles of roadway consume roughly:

35 miles * 4 lanes * 14 ft/lane = 237 acres

The Pentagon site covers a total of 583 acres, while the building itself sits on 29 acres. This does not count medians or access roads. A similar Metro right of way is a much denser alternative with higher capacity. As the county continues to grow, a multi-modal network that continues to increase density and maximize existing infrastructure is needed.

One successful multi-modal option that is already making a difference is the Burke Virginia Railway Express (VRE) subscription bus route. This is a subscription service that picks up commuters and gets them to the VRE station. The key to such a service is that it makes connections and is consistent.

Additional options that utilize creativity and provide effective multi-modal options are needed across the county. Combining multi-size buses, pedestrian options, and public outreach into a systematic plan will be needed to keep the county moving.

2. Transportation Decision Making

Management of transportation to maximize its usefulness and minimize its adverse impact on the environment is made very difficult because of the complex interrelationships of federal, state, regional, sub-regional and local entities that are all involved in Fairfax County transportation planning and funding. Local initiative in addressing transportation needs is further limited

because the State of Virginia owns and maintains every road in the county. Even subdivision cul-de-sacs are State roads.

The complexity of solving transportation problems in Fairfax County and mitigating the adverse environmental impact of inadequate or less than optimum projects can be better visualized by reading the Northern Virginia Transit Funding Resource Guide issued by the Northern Virginia Transportation Commission. This Resource Guide describes the many sources of funds that are available for transit projects and lists over 50 federal and 30 state and local funding programs. However, with governments at all levels being faced with a severely reduced capability to fund projects, they cannot provide funding levels to qualify for matching grants of funds from many of these sources.

A variety of funds are available from the Federal Government, but they all come with strings attached. Federal regulations, standards, and guidance must be met before consideration will be given as to whether Federal share contributions will be made available toward transportation needs.

In Virginia, the Commonwealth Transportation Board (CTB) has final approval authority over the six-year transportation program for the entire State. Under guidance of the CTB, the Virginia Department of Transportation (VDOT) is responsible for building, maintaining, and operating the State's roads, bridges, and tunnels.

For Fairfax County, the transportation goals are included in, and promulgated through, the Fairfax County Comprehensive Plan. Those projects that are to be funded by county resources are included in the county's Capital Improvement Program. However, transportation projects that are to be funded through State and Federal funding are included in the VDOT Six Year Transportation Program.

The Northern Virginia Transportation Coordinating Council has developed a Northern Virginia 2020 Transportation Plan, which is a comprehensive study identifying a multi-modal transportation solution to provide safe, efficient and economical choices for travel and transport of goods. The Plan has become part of the broader planning effort of the Transportation Planning Board of the Council of Governments (TPB of COG). Specific projects will be submitted by the Commonwealth of Virginia for inclusion in Washington region's financially Constrained Long Range Plan (CLRP) as funding streams open up.

A further description of the interplay of planning and funding of projects between agencies in the Metropolitan Washington area can be found in A Citizens Guide to Transportation Decision-Making in the Metropolitan Region, which is available from the TPB of COG.

An example of a coordinated project is the Pike Transit Initiative, which is a 12-month study effort sponsored by the Washington Metropolitan Area Transit Authority (WMATA). The study will analyze alternatives for a new high-capacity and environmentally friendly transit service along Columbia Pike from the Pentagon/Pentagon City area to Baileys Crossroads. Working closely with local jurisdictions, neighborhoods, and community groups, the study team will develop a preferred transit investment (e.g., light rail, streetcar, or bus rapid transit) for the corridor that will support the county's redevelopment initiatives.

3. Programs, Projects, and Analyses

a. Walking and Biking Facilities

There are many potential environmental improvements that can be brought about by providing greater opportunities for non-motorized means to commute, travel, or obtain recreation. They include reducing air pollution caused by traffic congestion; reducing water pollution caused by roadway and parking lot construction made necessary by traffic demands; reducing noise pollution caused by on-road vehicles; and reducing energy consumption required to operate motorized vehicles.

Improved non-motorized transit access by connecting hike/bike paths to the Metro stations and bus stops was one of the major considerations for the 2002 update of Fairfax County's Countywide Trails Plan. The Non-Motorized Transportation (Trails) Committee continues to improve the trail connections to transit facilities by working with Metro (WMATA), the Virginia Department of Transportation (VDOT), and the county's Department of Transportation (FCDOT), and will review and provide comments during the Dulles Corridor rapid transit stations access planning process. In addition, the FCDOT is conducting a study to inventory and improve bus stop access and safety. The county's Pedestrian Program Manager should review and comment on Metro station studies and the related rezoning and special exception applications to improve the pedestrian access and safety to those facilities. Convenient and safe pedestrian access will encourage more people to use transit facilities, therefore reducing vehicular usage and related pollution in the environment.

The Fairfax County Pedestrian Task Force was established with a mission to develop a plan for implementing safe and effective pedestrian facilities and to develop a coordinated and collaborative education/outreach program. The Task Force was to have begun its work in 2004.

The Countywide Trails Plan added on-road bike routes as a new category of trails. These trails are proposed along routes suitable for commuting, and for travel to places for recreational purposes. It is expected that the planned on-road bike routes will be installed with future highway improvements

according to the Trails Plan. Currently, there are on-road bike lanes located on Dranesville Road and sections of Beulah Road and Telegraph Road.

The Countywide Trails Plan is developed to provide the general locations of the proposed trails. It does not provide details such as intersection design or mid-block crossing of the street. Those details are examined during the site plan or subdivision plan review process. The site reviewer may need additional training to better detect more of the needs for safe crossing, or seek advice from the county's Pedestrian Program Manager.

The dream of a multi-use trail crossing Fairfax County from the Occoquan River near Route 123 to the Potomac River at Great Falls is becoming a reality. The Cross-County Trail (CCT) will ultimately be 34 miles long and is 90% complete, missing a few sections, mostly in the northern part of the county. The commuting routes are complete except for the section between King Arthur Road and Route 236 in Fairfax. The connections to the Washington & Old Dominion trail – a great regional transportation and recreation trail – and to the Vienna Metro Access trail at the City of Fairfax, will provide vital links to transportation systems across the region. A link is also provided to the Franconia-Springfield Metrorail station. Other connections, such as to the Fairfax County Parkway trail, the Reston trail system, and various roadside trails will allow trail users to reach work, shopping, recreation, and school destinations without resorting to the automobile.

The Non-Motorized Transportation (Trails) Committee has been severely hampered in carrying out its mission by lack of funding. $1,000,000 was authorized for Trails and Sidewalks improvements by the Board of Supervisors in FY 1998, but nothing was provided in FY 1999. In FY 2000, the Board authorized $2,500,000, then funding went down to $1,000,000 for FY 2001 and was cut to zero for FY 2002, 2003 and 2004. The funding level has been restored to $2,500,000 for FY 2005. The program requires regular funding in order to assist the county in meeting its environmental goals.

b. Employer Services Program

Fairfax County has a teleworking option for the county staff. An even more significant application of teleworking or telecommunication is part of the county's Employer Services Program. The Fairfax County Employer Services Program (ESP) was established in 1997; its basic purpose is to work with employers to provide alternative means of commuting to their places of employment. These alternatives include Metro/rail, bus services, carpooling, vanpooling, telecommuting, bicycling, and walking. ESP provides various services to employers to enable them to implement any of the above-mentioned alternatives.

The Fairfax County government marked two years of telework expansion with an expo on October 23, 2003, at the Government Center. Over 500 employees dropped by to view the displays, try the technology at the Cyber Café, and talk to teleworkers, telemanagers, and information technology (IT) experts. Marketing opportunities, such as the Expo, spike an interest in telework that is then followed by an increase in the number of employees who sign-up for telework. Articles about telework are also included in the employee newsletter, the Courier, with a similar result.

The increased publicity on teleworking has resulted in more than a quadrupling of the number of teleworkers, from 138 in December 2001 to over 730 today. The county has passed the three-quarters mark towards its goal of 1,000 teleworkers (a number that is based on the Council of Government's goal of 20% of the regions' eligible workforce teleworking by 2005). When Fairfax County reaches that goal, it is estimated that county teleworkers will save 59,000 commuting hours and 1.8 million commuting miles in a year.

As a result of aggressive marketing and on-going training, teleworkers are now found in almost every county department. Using CITRIX technology, employees can securely access most of the computer applications that they use at the office. Job categories are increasingly varied. Sample job titles for county teleworkers include analysts of all types, administrative assistants, accountants, programmers, social workers, inspectors, engineers, detectives, crime analysts, deputy sheriffs, and recreation and park specialists. Directors and assistant directors telework. The range of jobs widens as more employees discover that there are at least eight hours of work they can do from another location ---once a week or every other week.

Fairfax County government is an active participant in regional efforts to increase the number of teleworkers to meet the 2005 goal. The county's Department of Transportation—Employer Services Section, in partnership with the COG, maintains an aggressive program of outreach to Fairfax County employers who are looking to offer commuting alternatives to their employees. A description of the Employer Service Program can be found on the county's Web site at:
http://www.fairfaxcounty.gov/fcdot/Employer.htm.

The support from the Board of Supervisors and the County Executive, plus the marketing and training campaign and technology enhancements, are working. Increased interest in telework is evident in the number of employees who participated in the Expo and who attend training sessions, ask for information via email and phone, and sign up for telework. There are now teleworkers in departments that previously had none. Managers have expressed an interest in telework as a way to continue business operations during inclement weather or emergencies. The county's active

partnership in regional efforts to expand telework keeps it current on best practices and identifies the county as a resource for other businesses on teleworking.

D. THE INTERRELATIONSHIP BETWEEN LAND USE AND TRANSPORTATION

1. How are Land Use and Transportation Interrelated?

The above discussion presented land use and transportation as separate environmental issues. This section outlines projects that have combined elements of both via special studies or revitalization districts that incorporate mixed use.

2. Programs, Projects, and Analyses

Fairfax County has adopted numerous overall objectives and policies for implementing the interrelated goals it has established for land use and transportation. The establishment of Urban Centers, Suburban Centers, and Transit Station Areas in critical locations in the county is a fundamental prerequisite to achieving many of those objectives. Beginning with the establishment of the Tysons Corner Urban Center and continuing through the recent establishment of the Reston-Herndon Suburban Center and Transit Station Areas and the Merrifield Suburban Center, the county is making some progress toward the ultimate achievement of its interrelated transportation and land use goals.

a. Tysons Corner Urban Center

Over the last several decades, Tysons Corner has evolved from a rural crossroads into a substantial suburban business center. The Comprehensive Plan recognizes Tysons Corner as the only area in Fairfax County that is classified as an Urban Center. The Comprehensive Plan envisions a Tysons Corner Urban Center that contains a mixture of high density office, retail, and residential uses and parks (including urban parks and active recreation facilities) in a pedestrian-oriented urban environment. As envisioned in the Comprehensive Plan, the highest development intensities and the most "urban" areas of Tysons Corner will be located within walking distance of future rail stations. Under the Comprehensive Plan, locating rapid rail transit stations in Tysons Corner will allow increased intensity for non-residential and residential development for areas in proximity to each station.

The Dulles Corridor Rapid Transit Project is discussed in Section d. Alternatives evaluated in the Draft Environmental Impact Statement for that project would place none, three, four, or six rail stations in Tysons Corner. The Comprehensive Plan acknowledges that road improvements alone are not adequate to achieve the urban design goals established for Tysons Corner. Rapid rail transit, circulation systems to interface with rail transit, High Occupancy Vehicle (HOV) facilities, and transportation demand management are all critical to developing Tysons Corner. While it is obvious that Tysons Corner is yet to fully achieve the urban environment that is envisioned, the integration of land use and transportation planning that is reflected in the Comprehensive Plan provides the means by which that vision might be realized. That vision will not be realized if rail service is not brought to Tysons Corner.

b. Reston-Herndon Area Suburban Center and Transit Station Areas

On May 21, 2001, the Board of Supervisors adopted an amendment to the Comprehensive Plan that created the Reston-Herndon Suburban Center and Transit Station Areas. The Reston-Herndon Suburban Center surrounds the Dulles Airport Access Road from Hunter Mill Road to Centerville Road. The Suburban Center includes three of the four Transit Station Areas in the Dulles Corridor (i.e., the Wiehle Avenue Station, the Reston Parkway Station, and the Herndon-Monroe Station). As set forth in the Comprehensive Plan, the concept for future development of this Suburban Center envisions a mixed use employment center. The purpose of the new plan for the Suburban Center area is to encourage a more urban and transit-oriented development pattern. The objective is to create, at each Transit Station Area in the Suburban Center, a pedestrian-oriented core area consisting of mixed-use development that includes support services while maintaining transitional areas at the edges of the Transit Station Area.

Options for development in the Transit Station Areas allow higher intensities based upon compliance with specified conditions. Those options are designed to be site specific. Agreement on funding to design and build the Bus Rapid Transit phase of the Dulles Corridor Rapid Transit Project, including funding for construction of transit stations in the median of the Dulles Airport Access Road, will allow consideration of the transit-oriented options. The rail-oriented mixed-use options, which allow the highest intensities in the Transit Station Areas, may be considered once a Full Funding Grant Agreement or comparable funding agreement to design and build the rail phase of the Dulles Corridor Rapid Transit Project has been executed. The three transit stations in this Suburban Center are located in the median of the Dulles Airport Access Road. The physical locations of these stations provide a unique opportunity to bring people and activities into closer proximity to the transit station platforms by developing mixed use projects in the air rights over the stations. The Comprehensive Plan

does not include any specific land use recommendations for air rights development. It does, however, recognize the potential value of such development and recommends that appropriate level of land use planning for future air rights development be explored.

c. The Merrifield Suburban Center

On June 11, 2001, the Board of Supervisors adopted an amendment to the Comprehensive Plan that created the Merrifield Suburban Center. The area of the Merrifield Suburban Center is located approximately south of I-66, north of Woodburn Road, west of Holmes Run, and east of Long Branch Stream Valley and Prosperity Avenue. The area is served by the Dunn Loring – Merrifield Metro Station and has regional and local access from I-66, I-495, Route 29, Route 50, and Gallows Road. As set forth in the Comprehensive Plan, the vision for the Merrifield Suburban Center includes two core areas: one focuses on development near the transit station and the second is planned to evolve into a town center. A new "Main Street" would connect the two core areas. The interrelationship of transportation and land use is evident in the Comprehensive Plan for this Suburban Center, particularly in the following planning objectives for the Suburban Center:

(a) Encourage revitalization and redevelopment of portions of the Merrifield Suburban Center to create more attractive and functionally efficient commercial and residential areas with pedestrian-friendly and transit-oriented environments.

(b) Encourage mixed-use development that includes pedestrian and auto circulation systems that integrate the development both internally and externally, resulting in transit-oriented and pedestrian-friendly environments.

(c) Encourage the development of additional housing (including affordable dwelling units) in the Merrifield Suburban Center so that employees may live near their workplace and transit services, in order to reduce the number and length of commuter auto trips.

(d) Develop a cohesive roadway system that provides a more extensive grid of streets to serve the town center, Transit Station Area, and the area between.

(e) Develop a cohesive pedestrian circulation system linked to open spaces such as plazas, courtyards, greenways, and parkland in order to facilitate walking and reduce reliance on private automobiles.

(f) Develop mass transit options, transportation strategies and planned highway improvements to mitigate traffic impacts in the Merrifield Suburban Center and in adjacent residential neighborhoods.

d. Dulles Corridor Rapid Transit Project

Rail service has been envisioned in the Dulles Corridor since construction of Washington Dulles International Airport in the late 1950s, when the right-of-way for future rail was reserved in the median of the Dulles Airport Access Road. As discussed earlier in this section of the report, the Fairfax County Comprehensive Plan integrates land use and transportation planning for the area from Tysons Corner to Dulles Airport based on the expectation that rail service through Tysons Corner to Dulles Airport will be constructed. It is critical that the Dulles Rail project be funded and constructed if those plans are to be realized.

The Draft Environmental Impact Statement (EIS) for the Dulles Corridor Rapid Transit Project includes an option to commit to rail service in the corridor without interim steps, including bus service in lieu of rail. The Draft EIS also includes options for serving Tysons Corner with rail, while the bus rapid transit options would bypass Tysons Corner. It is essential that, if the land use and transportation objectives for this critical corridor are to be realized, rail service must be provided and Tysons Corner, as the designated urban center of Fairfax County, must be served by that rail service. While it is important to implement rail service in the corridor, it is also important that issues that were overlooked or not fully evaluated in the Draft EIS be considered and resolved in a manner consistent with the goals and objectives of the Comprehensive Plan. The issues that need further evaluation and consideration include: (a) the noise that will be generated from rail service, especially at elevated tracks, as well as from the additional vehicular traffic that will be generated along the corridor; (b) the increased need for feeder bus service centering on the transit stations; (c) the impact on surrounding neighborhoods of increased densities that can be granted in the vicinity of rail stations; (d) the increased traffic, and its impact, from development generated by the availability of rail service; and (e) adequate provision for pedestrian access to transit stations.

E. RECOMMENDATIONS

1. Land Use

a. As the county approaches build out, it is important to review the goals and direction of land use policies as directed in the Comprehensive Plan. EQAC recommends that the county produce an updated version of the State of The Plan, An Evaluation of Comprehensive Plan Activities between 1990-1995 with an Assessment of Impacts through 2010 (originally published in 1996) to reflect current population shifts, build-out, and infill development.

b. EQAC recommends that the county continue the process to upgrade or replace the Urban Development Information System (UDIS), which was developed in the 1970s and is still the primary information system for mapping land use. The new system should apply current technology in a manner that will improve the county's ability to evaluate planning and development issues, to better account for Comprehensive plan options, to capture real time plan changes, and to include additional data to plan and manage development and growth, such as:

   i. Existing and Planned Commercial and industrial intensity;
   ii. Existing and Planned Mixed-use types and intensity;
   iii. Vacant and underused lots with redevelopment potential; and
   iv. Environmental data such as impervious surfaces.

c. EQAC recommends that the BOS and the county's Department of Planning and Zoning continue to consider land use AND transportation together when revising the Comprehensive Plan. To start this process the county should develop and collect data that allows analysis of the macro effects of land use and transportation decisions.

   These data should support models that integrate congestion, air quality, commuting patterns, and health effects for use in future decisions.

d. EQAC recommends that the BOS consider mixed-use principles when locating future public facilities such as libraries and recreation centers, so they are within walking/biking distance of major population centers.

2. Teleworking

a. EQAC commends the Board of Supervisors for actively supporting teleworking among the county staff. We are encouraged that the county is steadily increasing participation toward twenty percent. We urge that the Board continue to aggressively support the program.

b. EQAC recommends that the Board of Supervisors maintain its leadership role in improving the environment through greater use of teleworking by establishing

an aggressive program directed at encouraging employers in the county to adopt or expand telework opportunities.

c. EQAC recommends that the Board of Supervisors work with the Federal government to encourage an increase in teleworking. Further, we recommend the BOS work closely with the Virginia Congressional Delegation to secure resources to establish teleworking sites within the county.

3. Transportation

a. EQAC commends the Board of Supervisors for funding the Non-Motorized Transportation (Trails) Committee in FY 2005. EQAC recommends that the Board continue to provide annual funding to this Committee to implement those projects that have the greatest potential for increasing non-motorized methods of transportation within the county.

b. EQAC is looking forward to the results of the 2004 Transportation Update to the Master Plan. We recommend that direction be given to model transit improvements as well as dynamic attributes such as HOT lanes.

c. EQAC recommends that the county focus on improving transit utilization through a systematic plan that focus on multiple options within a community. For example, the Virginia Railway Express (VRE) Burke EZ Bus provides a convenient alternative to commuting to the Burke VRE station. This can be combined with pedestrian improvements, more connector bus options, and biking trails that together provide a diverse transportation plan.

d. EQAC recommends that the county instruct the Health Department and the Public Affairs Office to produce and disseminate brochure(s) explaining the interrelationship between commuter choices and public health. This should include information about the various alternatives discussed in this chapter.

e. EQAC recommends that the Board of Supervisors urge the State Police to fully enforce HOV restrictions and to increase the penalty for HOV violations. EQAC recommends that the Board request that HOV fines be increased to $500 for the second offense, with 50% of the fine returned to the respective county.

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Fairfax County Citizens Handbook
http://www.walkable.org/
http://www.lendleaserei.com/

An excellent bibliography of additional resource materials on the land use and transportation can be found at www.washingtonregion.net/html/furtherreading.html

CHAPTER II

AIR QUALITY

II. AIR QUALITY

A. ISSUES AND OVERVIEW

1. Introduction

After more than four years of expressing increasingly focused concern about air quality management in Fairfax County, the past two years has seen a flurry of activity beginning in about July, 2002, principally generated by activities in the Office of the County Executive ("CE") and the Environmental Coordinating Committee ("ECC"), and apparently largely in response to concerns expressed by the Environmental Quality Advisory Council ("EQAC"). EQAC recognizes and applauds the recent efforts by the Board of Supervisors ("BOS") and county staff in promoting and encouraging clean air initiatives and practices. Some of these efforts, which are shown below, were submitted to the Environmental Protection Agency on March 1, 2004 ("EPA") as part of the State of Virginia's State Air Quality Implementation Plan ("SIP"). These efforts clearly demonstrate the Board's leadership and commitment to the idea of clean air excellence. Unless otherwise noted, the information shown on the initiatives shown below was current as of November 17, 2003.

- Gas can replacements: Portable gas cans account for a significant amount of emissions escaping into the air every day. By using newer gas cans with features such as shut off valves, harmful gasoline fumes can be reduced by 75 percent. Fairfax County currently owns an estimated 300 gas cans that can be replaced.

- Use of low Volatile Organic Compound (VOC) paints: Besides reducing emissions of ozone-forming compounds, low-VOC paints improve indoor air quality by reducing eye or respiratory irritation caused by exposure to paint fumes.

- Diesel retrofits: The Board of Supervisors has already approved reprogramming of the electronic controls on certain school buses and installation of diesel oxidation catalysts on school buses and other diesel powered county equipment. The Board approved $2 million as part of the FY 2005 Carryover Budget to begin the diesel retrofit program. In addition, funds in the amount of $1.5 million have been made available for the retrofit of the Connector buses with the catalyzed diesel particulate filters.

- Episodic ban on the use of gasoline powered lawn and garden equipment: county and contractor mowing and trimming operations will be deferred on Ozone Action days (Code Red Days), except on specialized turf areas at the golf courses and athletic field complexes. The county will continue a replacement policy to purchase low-emissions lawn and garden equipment that reduce ozone precursor emissions.

- Episodic ban on the use of VOC-containing paints: Deferring the use of VOC-containing paints and coatings on Ozone Action days (Code Red Days) will reduce VOC emissions (an ozone precursor) and overall ground-level ozone formation on Code Red Days.

- Episodic ban on the refueling of non-essential gasoline powered cars and equipment: In order to better monitor the effectiveness of this measure, a report of any refueling that occurs on a Code Red Day will be given to Agency Directors the next day. This will allow for follow-up action without restricting vital functions that require refueling.

- Episodic ban on the use of VOC-containing pesticides: Both the active and inert ingredients of many pesticides are reactive in the formation of ozone. Under this policy, county and contractor applications of pesticides would be deferred on Code Red Ozone Action days.

- Telework on Code Red days: The Board of Supervisors continues to champion this effort. The County Executive encourages teleworking on Code Red Days by encouraging approved teleworking employees to telework even if they were not scheduled for that day. Currently (August, 2004), more than 730 county employees telework two to four days per month. An expansion plan is underway to raise that number to 1,000 by 2005. Telework expansion reflects the Fairfax County Board of Supervisors' support of the regional goal set by the Metropolitan Washington Council of Governments -- to reach a level of 20 percent of the eligible workforce teleworking one day per week or more by 2005. On Thursday, October 23, 2003, the county sponsored a Telework Expo in the Government Center Atrium and Forum. The Expo was a way to inform more employees about the benefits and possibilities of telework. In addition, the Expo contained a compilation of information and activities about the county's telework effort. The Expo also recognized the departments and employees who have contributed to the county's telework effort. The Land Use and Transportation chapter contains additional discussion of telework issues.

- Participation as a Clean Air Partner: Fairfax County government has been a member of Clean Air (ENDZONE) Partners since 1998, and has been proactive in efforts to inform county employees and residents about air quality programs and ways to reduce air pollution. The county has included information about air quality issues on its Web site. The county has a notification program that involves the posting of Ozone Action Day forecasts on Fairfax County Government Cable Television Channel 16, and the county Web site, as well as sending e-mail notifications to all county employees. These messages include appropriate actions to take to reduce contributions to ozone formation. Some actions currently practiced by Fairfax County government when a Code Red Day is forecast include: the refueling of vehicles after sunset; the restriction on the use of non-essential motorized operating equipment; encouraging employees to

telework and teleconference to participate in meetings off site; and the offering of free trips on the Fairfax Connector and on Metrobus. On Tuesday, Nov. 4, at the University Conference Center and Inn at the University of Maryland's College Park campus, Fairfax County was given an honorable mention by Clean Air Partners in the category of "Outstanding Ozone Action Days Program." The county was recognized for its efforts in establishing voluntary actions to reduce ground-level ozone through an Ozone Action Days plan, its efforts to encourage and facilitate public awareness of air quality issues, and its efforts to encourage employees to take personal voluntary actions.

- Best Practices in Pesticide Application: The Fairfax County Park Authority has implemented an integrated pest management (IPM) program at golf facilities and athletic field complexes. The Park Authority's approach to select pesticide applications is one of prevention rather than a curative one. This approach greatly reduces the amount of product (VOC emissions) required to keep turf healthy and allows the IPM program to be more effective.

- Alternative Fueled Vehicle Purchases: The county favors purchase of hybrid-drive vehicles when appropriate for replacement of vehicles being retired. In addition to the 27 hybrid vehicles that have already been purchased, it is anticipated that the county will purchase an additional 30 hybrid vehicles by May 2005.

Additionally, EQAC is especially pleased with the more recent efforts of the county's Air Quality Subcommittee ("AQS"), and encourages the BOS to implement all of the recommendations that were presented by the AQS to the Board's Environmental Committee as shown in the "Clean Air Café Menu" and in the Subcommittees' interim report dated April 19, 2004 entitled "Improving Air Quality in the Washington Metropolitan Region - Fairfax County's Commitment to Air Quality Excellence - 2004 Air Quality Protection Strategy Recommendations."

Though EQAC is encouraged by this progress, we remain concerned about the timing and the focus of critical analysis associated with air quality management options and actions that may need to be taken immediately in Fairfax County. Even though the county is moving in the right direction, we are concerned that the county continues to allow and perhaps even support the atrophying of program capabilities in the Health Department that are vital to this whole effort.

While we recognize and defer to the efforts of the county to establish their own approach to the management of air quality, we are concerned that the availability of existing expertise in this area has apparently eroded, particularly in the Health Department. This is inconsistent with our recommendation and basic suggestion that, at a minimum, the county needs to maintain expertise to understand trends and consequences associated with air quality management. While the approach of the county appears to be to focus on the relationship with the Washington Metropolitan Council of Governments ("MWCOG" or "COG") and planning activities associated

with that relationship, EQAC remains extremely concerned that our ability to actually measure air quality progress in the county and understand the relationship between that progress and the atmospheric chemistry in the immediate area and in the region that contributes to that progress is actually decreasing. It is ironic that at the very time that the county has committed to substantially beefing up its efforts as they relate to air quality management, the existing expertise and institutional memory associated with health issues, past air quality trends, and the management of the air quality monitoring network in the Health Department is disappearing and is not being replaced.

a. NOx SIP Call

The NOx SIP Call continues to move forward, consistent with our descriptions over the past three years in previous Annual Reports. The SIP Call was implemented in 2003 in New England and the Mid-Atlantic, including some areas in the Metropolitan Washington Region. The program was implemented in the rest of the eastern United States, including Northern Virginia, in May, 2004. Expected net reductions as a result of this SIP Call are in the range of 60-70% and so the hope should be, as we have stated in the past, that we would see something in the neighborhood of a 20% reduction in NOx for Fairfax County as a result. These NOx reductions are an important part of the Washington region's State Implementation Plan (SIP), a plan to reduce ozone pollution in our region. Actual reductions in the metropolitan area along with reductions of transported NOx will be critical to attaining the standard during the next three ozone seasons.

A primary concern that we have with the NOx SIP Call is that it allows trading of emission credits and, as a result, emission reductions on a point source basis cannot necessarily be predicted. There are four major power plants in the Washington area and it is our understanding that in some, if not all, of these cases those power plants are emitting considerable quantities of NOx in this area as a result of decisions to purchase emission reduction allowances outside of the Washington Metropolitan air shed.[1] A particular concern for the Washington area is the Potomac River Generating Plant in Alexandria. Because the plant produced NOx emissions in 2003 well in excess of its state operating permit, the Virginia Department of Environmental Quality (DEQ) pursuing enforcement actions against the plant.

Although it should not theoretically have any direct impact on the overall effect of the NOx SIP call, the implications of New Source Review ("NSR") reform are also of concern to us since those reforms may result in additional generation of NOx at some coal burning facilities in the future.[2]

[1] Three of these plants are in Maryland (Morgentown, Chalk Point, and Dickerson) and one is in Virginia (the Potomac River Generating Plant in Alexandria).

[2] NSR notwithstanding, the NOx SIP Call mandates the achievement of fixed statewide NOx emissions budgets in Virginia by 2007. Even so, concern about this issue is apparently shared by the Metropolitan Washington Air Quality Committee ("MWAQC"), since the Chairman wrote a letter expressing concern on the subject to then Administrator Whitman in January of last year.

b. Planning for the New Eight-Hour and Particulate Matter Standards

Efforts of the EPA to develop an implementation strategy that meets the mandate of the Supreme Court upholding the new eight-hour ozone standard are ongoing. EPA published final non-attainment designations for the eight-hour ozone standard in April 2004. The Metropolitan Washington area, which includes Fairfax County, was designated a moderate non-attainment area. EPA plans to revoke the one-hour ozone standard in June 2005. Once the one-hour standard is revoked, the 8-hour standard will be in force. Over the next few years, the Washington region must develop a new SIP showing how it will attain the eight-hour ozone standard by 2010. The new SIP must be submitted to EPA by June, 2007. The Metropolitan Washington Air Quality Committee (MWAQC), the air quality planning body for the Washington region, is starting to plan for development of the eight-hour SIP and identification of additional emission control measures. All of this serves to make the point that the advent of the new eight-hour standard continues to leave little doubt that this new standard will inevitably make air quality management activities in the county considerably more difficult.

EPA is also in the process of designating non-attainment areas for particle pollution, also known as $PM_{2.5}$. The Washington region, including Fairfax County, expects to be designated non-attainment for particle pollution effective February, 2005.

The county in 2003 once again had exceedances of both the one-hour and the eight-hour standard[3]. However, the 2003 ozone season was an improvement over 2002, with fewer exceedances of both the 1-hour and 8-hour standards. As the county moves away from the one-hour standard and toward the eight-hour standard, the direct implications of chronic non-attainment, especially of the eight-hour standard, will become a much more serious matter in Fairfax County. How the county is preparing to address all of this is not yet clear to EQAC.

c. Severe Area SIP Planning

In February, 2004, MWAQC approved a new "Severe Area" SIP for submittal (by March 1, 2004) to EPA by Maryland, Virginia, and the District. Upon its redesignation as a "severe" non-attainment area in February 2003, the Washington region was required to prepare a new SIP to show compliance with the more stringent severe area requirements. An interim SIP submittal in August, 2003 fulfilled some of these requirements. The remainder of the requirements were fulfilled by the March, 2004 submittal. The new SIP includes an updated attainment demonstration reflecting revised MOBILE6-based motor vehicle emissions budgets, the demonstration of 3% per year rate of progress (ROP) from 1999-2002 as well as from 2002-2005, the adoption of contingency measures for failure to make ROP during those periods, and the submission of Reasonably Available Control Measures (RACMs). There are other requirements as well.

[3] Even though we are not yet required to meet the eight-hour standard in Fairfax County, we have monitored for "compliance" with the eight-hour standard for the past two years.

In developing this SIP, the Metropolitan Washington Air Quality Committee (MWAQC) identified a series of control measures that they believe will allow us not only to demonstrate progress toward, but in fact to attain, the ozone NAAQS (National Ambient Air Quality Standards) by November 15, 2005.[4] These include new regulations requiring redesigned fuel containers, low-VOC paints and consumer products, and changes to certain business practices that result in high VOC emissions. These regulations are in place and will be fully implemented in the Washington area by January, 2005

An additional portion of the region's emission control strategy is a "voluntary bundle" of emission reductions from innovative programs implemented by local governments. These programs include a gas can exchange, use of low-VOC paints, purchase of wind power, retrofitting of diesel school buses and purchases of alternative fueled vehicles. Fairfax County was a leader in committing to implement these critical programs.

d. Conformity Planning Requirements and Status

The purpose of conformity is to assure that planning for transportation activities is consistent with air quality management goals. In non-attainment areas such as the Metropolitan Washington Area, transportation planning cannot be allowed to proceed if: (1) it contributes to the creation of new air quality violations; (2) it contributes to the worsening of existing air quality violations; or (3) it delays the attainment of ambient air quality standards.

The August 2003 SIP submittal contained revised motor vehicle emission budgets, which were approved by EPA as of December 31, 2003. These budgets were slightly revised in the March, 2004 submittal.

EPA is in the process of developing final guidelines for conformity under the eight-hour ozone standard. These guidelines, which were issued in July, 2004, will help the Washington region develop a plan for demonstrating conformity for the eight-hour ozone standard once the one-hour standard is revoked in June, 2005.

2. Air Quality Status in Northern Virginia

a. Ground-level Ozone

The Metropolitan Washington, D.C. area, including Fairfax County, is currently classified as a severe non-attainment area for the one-hour ozone standard and a moderate non-attainment area for the eight-hour ozone standard. For all other Federal Air Quality standards, the area remains in attainment. With respect to $PM_{2.5}$, the existing primary standard is set at 15 $\mu g/m^3$ and, although compliance

[4] The details of this SIP, such as they are, can be reviewed on the COG Web site at www.mwcog.org/environment/air.

with the standard is not yet required, we exceeded the standard in 2002 and came very close to exceeding it in 2001.

b. Ozone Exceedances in 2003

Attainment of the ozone standard in the Metropolitan Washington, D.C. area will require three years with no more than three ozone exceedances at any one monitor in the region. An exceedance day (for the one-hour standard) occurs when an ozone-monitoring site exceeds the NAAQS of 124 ppb for at least one hour. In 2003, there were three ozone exceedance days for the one-hour standard in the Washington region and two exceedance days in Fairfax County.[5] On the two days of exceedances in Fairfax, one monitor registered an exceedance on only one day while another exceeded on both days.

Monitors in Fairfax County recorded violations of the eight-hour ozone standard on five days during the 2003 ozone seasons. Violations occurred at four different county monitors. The Washington region registered seven violations of the eight-hour standard during the 2003 season.

Obviously, no matter what we conclude regarding compliance with the one-hour standard (and the only conclusion is that we remain woefully out of compliance), the situation for the eight-hour standard, which will be the new standard at the end of next year, is disastrous. Any way you cut it, the picture is anything but pretty.

c. Air Quality Trends in Fairfax County

Although many believe that air quality in Fairfax County is improving, the best that can be said is that the pattern of ongoing violations of the one-hour ozone standard has continued at more or less the same level since 1994. The pattern of violations worsened considerably in 2002 and in fact ended up being as bad as, or worse than, anything we've seen since 1993. The same was generally true for the whole metropolitan area. In 2003, the county reported two exceedances of the 1-hour standard at four different sites, which is serious cause for concern given what many considered to be a much easier ozone season. Data for the entire Washington region disclose other violations at other monitors not located in the county. In 2002, there were nine Code Red days (unhealthy for all citizens) and 19 Code Orange days (unhealthy for sensitive groups). In 2003, there were three Code Red days and four Code Orange days. To summarize, 2002 saw a dramatic worsening in that trend. 2003 appears to have been more or less a replay of 2001, only worse. If we look at the eight-hour standard, the situation is much worse. This indicates

[5] Notably, there appears to be some disagreement on the actual number of exceedant days, based on the apparent position of the County that they do not have to count ozone violations at the Franconia monitor, which is operated by the state of Virginia. On the other hand, if one makes reference to the Virginia data, it discloses other violations at McLean, Chantilly and Annandale as well. I would be interesting to see what the position of the EPA is on this issue, based on the requirements of the CAA. One wonders whether the struggle within Fairfax County over the funding and maintenance of the monitoring system might in some way be related to the notion that if we don't know about violations (i.e., monitor them) they can't possibly be of concern to us.

that the county cannot afford to reduce or diminish its recent air quality planning efforts.

Table II-1
Regional Ozone Exceedances, 2003

Date	Location	Maximum One-Hour Ozone (ppm)
June 25	Mount Vernon, VA*	0.132
	Arlington, VA	0.126
	Lee Park, VA*	0.137
	Prince George's Equestrian Center, MD	0.141
	Rockville, MD	0.125
	Southern Maryland	0.133
June 26	Prince George's Equestrian Center, MD	0.137
August 14	Mount Vernon, VA*	0.127

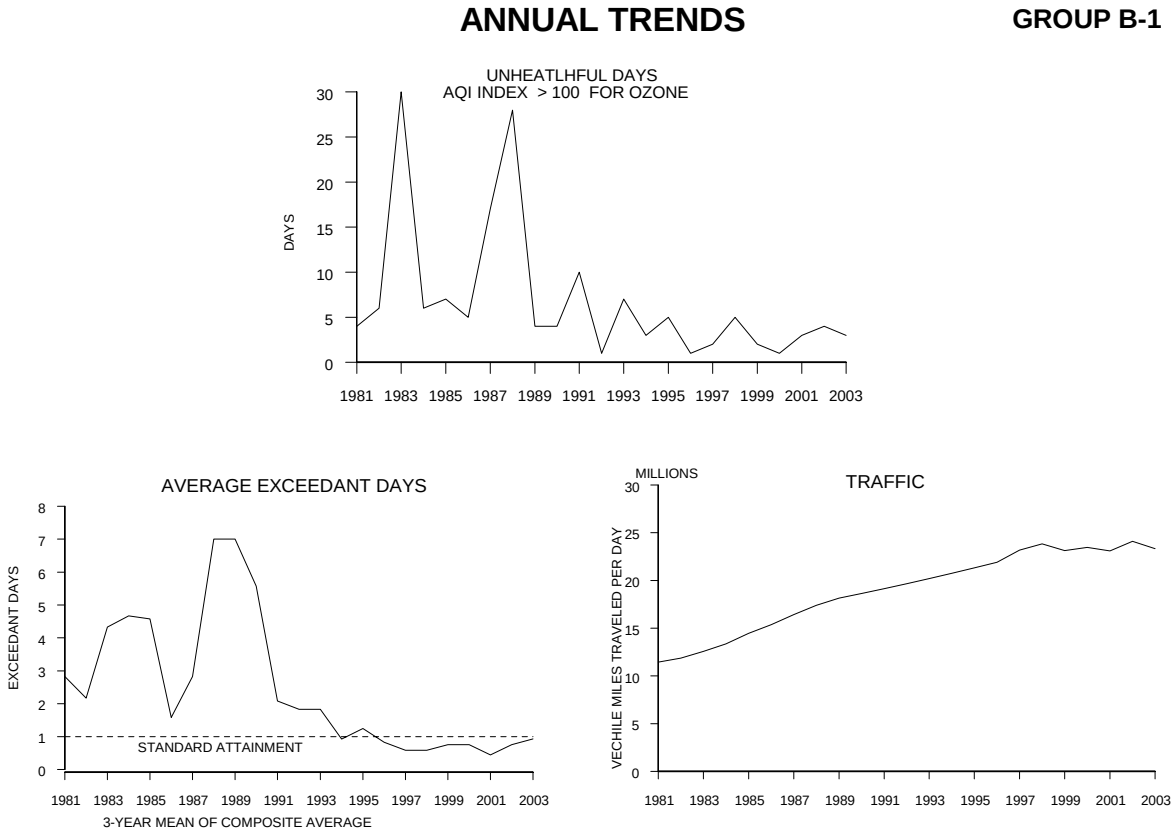
*Fairfax County Monitoring Station
Source: Metropolitan Washington Council of Governments

Table II-2
Regional Ozone Exceedances, 2003, Eight Hour Average

Date	Number of Stations that Exceeded the Standard	Maximum Value in the Metropolitan Statistical Area; Maximum 8-Hour Ozone (ppm)
June 24	14	0.107
June 25	17	0.125
June 26	16	0.126
June 30	4	0.100
August 14	4	0.95
August 22	1	0.085
August 28	1	0.086

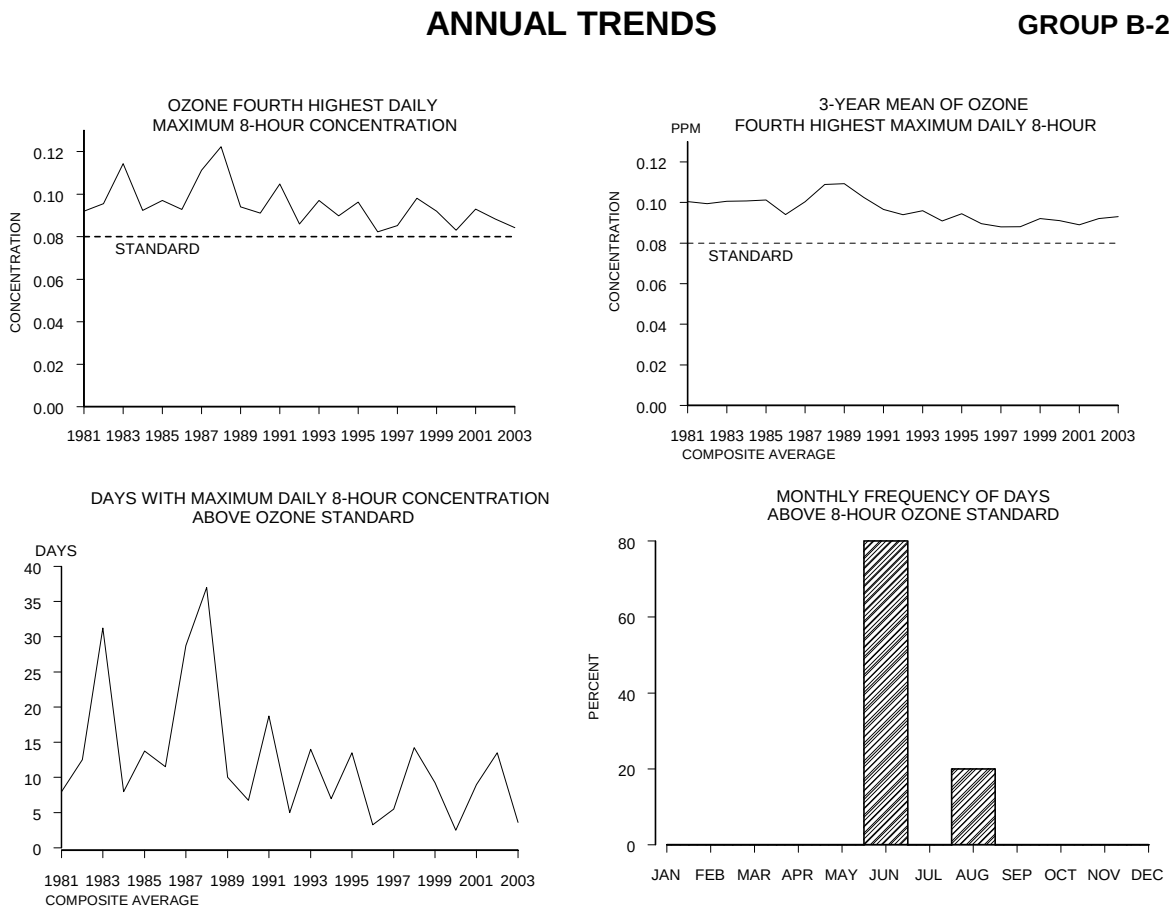
Source: Metropolitan Washington Council of Governments

Figure II-1: Air Quality Trends in Relation to a One-Hour Ozone Standard



Source: Fairfax County Department of Health

Figure II-2: Air Quality Trends in Relation to an Eight-Hour Ozone Standard



Source: Fairfax County Department of Health

B. MAJOR PUBLIC AGENCY RESPONSIBILITIES

1. Introduction

Although compliance with National Ambient Air Standards (NAAQS) and resulting air quality management responsibilities is a function of Federal law, in Fairfax County we have a bifurcated situation where these responsibilities have been split between the State of Virginia and the regional metropolitan planning organization (MPO). MPOs are set up under the CAA in metropolitan areas with populations in excess of 50,000. In more difficult situations, MPOs are multi-jurisdictional, as is the case in the Washington MPO. Members of MPOs are appointed by the governors and mayors of affected jurisdictions to represent areas included in the MPO. The MPO works with state departments of transportation and transit providers in identifying transportation needs and priorities. They make transportation investment decisions for the metropolitan area and, by default, for the individual regions encompassed within the MPO.

2. Commonwealth of Virginia

a. Virginia State Air Pollution Control Board

This Board is authorized to propose policies and procedures for air quality regulatory programs, including emissions standards for landfills and vehicles.

b. Department of Environmental Quality

This Department is responsible for establishing standards for air quality monitoring and vehicular inspection and maintenance programs.

3. Region – The National Capital Region Transportation Planning Board (TPB), the Metropolitan Washington Council of Governments (COG), and the Metropolitan Washington Air Quality Committee (MWAQC)

The TPB serves as the designated MPO for the Washington region. The TPB is staffed by the Department of Transportation Planning, which is part of COG. Members of the TPB are appointed, and Fairfax County currently has two members of the Board of Supervisors sitting on the TPB. The TPB's activities are coordinated through COG with the MWAQC, which is the designated entity responsible for air quality planning in the Metropolitan Statistical Area identified under Section 174 of the CAA. Other programs, such as those responsible for forecasting demographic changes, are also managed by COG. In this way, COG works toward solutions to regional problems related to air and water quality, transportation, and housing. COG is also responsible for issuing air quality indices on a weekly basis.

a. MWAQC Technical Advisory Committee

This Committee reviews technical issues and documents before they are submitted to MWAQC for review and approval. The Chairman of the Committee for 2004 is Hon. Dana T. Kauffman, a member of the Fairfax County Board of Supervisors.

b. Forecasting Subcommittee

This Subcommittee considers how to monitor and report the new eight-hour ozone standard and how to devise guidelines for issuing health alerts during the ozone season.

c. Attainment Subcommittee

This Subcommittee considers evidence for the case that the Washington non-attainment area can attain the one-hour ozone standard with the control measures already adopted.

d. Conformity Subcommittee

This Subcommittee reviews Air Quality Conformity Determinations prepared by the TPB to ensure that regional transportation plans are consistent with plans to improve air quality. This includes verifying that estimated emissions from mobile sources, such as cars, trucks, and buses, do not exceed the mobile budget, a cap on regional mobile emissions contained in the region's air quality plan.

e. Air Quality Public Advisory Committee

This Committee has been set up to provide a vehicle to brief citizens on actions pending before MWAQC. This Committee functions as an important source of feedback from the public on air quality concerns in the metropolitan area.

4. County of Fairfax

a. Department of Health, Division of Environmental Health, Community Health and Safety Module

This Division is authorized by the Fairfax County Code, Chapter 103, in cooperation with federal and state agencies, to conduct an air monitoring program. In the past, this Division has provided consultative services to those requesting assistance in indoor air quality issues and other air quality-related matters. If there is a substantial threat to public health, on-site investigations are supposed to be provided concerning indoor air quality and exposure to toxic substances in non-occupational, indoor environments. A representative from the Health Department should sit as a member of the MWAQC Technical Advisory Committee and function as a conduit to communicate with the county on air quality issues of

concern to MWAQC. Based on staff losses over the past year, we do not believe staff support is currently available in the Health Department to support these activities. At the present time, the county's Environmental Coordinator represents Fairfax County on the MWAQC Technical Advisory Committee.

During a time of increasing responsibility to coordinate and manage the increasingly complex body of information relevant to air quality planning in Fairfax County, it is indeed ironic that county staffing for these activities has decreased almost in proportion to the need. During the 1980s, Fairfax County maintained a fully staffed air quality management operation, and into the 1990s much of that capability remained until the 1996-1997 time-frame. Even in the face of acknowledged concern over degraded air quality, our county air quality capability has been systematically reduced to the point where the only function that can even be minimally fulfilled is monitoring. It would appear that there is some support in the county to reduce the monitoring activities, and as things stand now, we are extremely concerned about the capability of the county to carry out its obligations to maintain even existing monitoring responsibilities.

b. Department of Transportation

This agency is responsible for the planning and the coordination of improvements that reduce both congestion and the vehicle miles traveled.

C. PROGRAMS, PROJECTS, AND ANALYSES

1. Regional Air Quality Planning

In response to our recommendation in 2002 that the county establish air quality planning capabilities in the Health Department, the decision was made to identify staff responsibilities in the Office of the County Executive to coordinate air quality efforts on behalf of the county. Those efforts are evolving and EQAC is involved, in a limited way, in reviewing and advising with respect to those activities. We are not convinced that the approach to the complex issue of air quality management in the metropolitan area will succeed and a better approach, in our view, would have been to hire a full-time program manager in the Health Department, as we recommended in 2002. EQAC will continue to do everything it can to try to cooperate with the county in their efforts to identify short-term strategies that can result in compliance with the ozone NAAQS. Meanwhile, we underscore our observations over the past four years that the complex nature of regional air quality planning needs is such that the county needs independent, timely, and expert advise that is based on the authority of the agency responsible for this issue in Fairfax County, which, at the present time, is the Health Department.

While we appreciate the focus of the County Executive's Office in more proactive involvement with COG in coordinating regional planning, we continue to believe that the county needs to have a more independent basis for assessing its own air quality

planning needs. We continue to strongly advocate that the county needs professional expertise to understand the complex relationship between its own circumstances and planning requirements in order to be most effective in addressing air quality management needs in Fairfax County. We continue to be concerned, especially this year, about the need to tighten the links between planning and air quality management in the short term.

D. CONCLUSIONS AND OBSERVATIONS

1. In August of 2002, at the request of the Deputy County Executive, EQAC provided a summary of our concerns regarding air quality management needs in Fairfax County that included recommended staffing needs and related job description(s). We concluded our observations at that time by stating that "…planning capability will mean nothing unless the results of that capability can be adequately integrated into county activities." In November 2002, at about the time that we released our 2002 Annual Report recommending the hiring of a full-time air quality planner, the county embraced a two-track approach to air quality management that culminated in a series of announcements at the February 12, 2003 ECC/EQAC meeting dealing with air quality management. Since that time, EQAC interaction with the county has occurred principally through our interactions with the ECC and for the most part has been focused on long-term issues associated with the management of land-use/transportation issues associated with the Comprehensive Plan. This seems primarily to have been an outgrowth of our concerns about the possible relevance in Fairfax County of the concept of "Smart Growth". Meanwhile, in 2003 the county developed its own approach to air quality planning, and following discussions with MWAQC, developed an Air Quality Subcommittee designed to develop recommendations for the ECC and BOS on local and regional air quality issues. In April of 2004, the AQS presented its recommendations to the BOS Environmental Committee. EQAC is pleased with the work of the Subcommittee that included a variety of air quality management strategies as shown in the interim report and Clean Air Café menu that was presented to the Board's Environmental Committee. EQAC recommends that the Board adopt and implement the recommendations shown in the menu and report.

2. We seem to be at an interesting point with respect to air quality management in Fairfax County. It is laudable that the County is now focused on the issue of air quality management and that the management in the Office of the County Executive has supported efforts at lower levels to coordinate and interact on a more regular basis with COG and others involved in regional planning. We are especially pleased that the county has come forward with SIP (VOC and NOx) emission reduction strategies for both short-term ozone action days and long-term ongoing initiatives. These efforts played a significant role in the Washington region's ability to develop and submit a severe area SIP that may be more acceptable to the EPA. The pattern of ongoing violations, however, discloses a problem that requires reductions that must have immediate impacts on the actual attainment of the standard in the very near future and it is not clear, based on our analysis of the severe area SIP and the other activities that are

presently under way, how the county or, in fact, the region intends to address that problem. As indicated above, we are further concerned about the loss of key support in the Health Department to support these activities just when they are needed most.

3. Based on the discussions that have occurred between EQAC, the ECC and the Planning Commission, we understand the problems and concerns and even the limitations associated with the long range nature of land use planning as it relates to transportation and air quality. We will continue to interact in that venue to try to constructively address the issues that have been discussed there. Meanwhile, we continue to welcome the opportunity to be as interactive as possible with the Air Quality Subcommittee and its activities.

   In general, we have a basic concern that the approach of the county is neither systematic nor strategic. In this respect, we would draw the attention of those who read this report to our previous annual reports discussing the need for capability at both higher and lower levels in the system to recognize and communicate about the long-term nature of the air quality problems and the identification of real options for assisting in solving those problems in a more strategic and systematic process in line with the county's vision and policy. This will inevitably involve some thinking out of the box that is not likely to occur in the context of the Air Quality Subcommittee activities, we fear. Some of the issues that we have identified in this report reflect our limited perspective on issues that might be of concern in this context. Those issues include: (1) the concern by many people that the COG mechanism is running into some problems and may need to be modified; (2) the reality that the eight-hour standard is coming and that we will need to identify a position to address that reality very soon; (3) $PM_{2.5}$ is coming and the impacts of both $PM_{2.5}$ and the eight-hour standard on conformity need to be considered now. If this is happening, it would be welcomed news but it would be unfortunate news in the sense that if it is happening we should know about it now; (4) the NOx SIP call aside, it appears that, based on information we have received in the recent past, that we have our own NOx problems in the immediate area. Again, it may be that someone in the county is already aware of this and is acting on it, but as was just observed in the previous point, if that is the case we should have heard about it.

   The general nature of our observations here is that while we appreciate the fact that the county wishes to take hold of this problem and deal with it, we still have reason to believe that, for one reason or another, the county is not seeing the whole picture and critical information and analysis is not occurring. More importantly, the essence of this critical information and analysis is not getting into the hands of the Board of Supervisors, nor as far as we can tell, is it getting into the hands of the county Executive, either.

E. RECOMMENDATIONS

1. We recommend full funding for staff in the Health Department supporting air quality management activities in the county. With respect to air quality management, our weakness has become our institutional capability to track air quality trends and help set the stage to understand where local controls are most needed. Health Department staff are now so busy addressing other issues that they can no longer provide sufficient assistance with air quality matters. We are very concerned that our monitoring capability risks becoming compromised, and we have now heard concerns expressed about that both at the state and regional levels. We strongly support maintenance, including replacement of expertise in the county Health Department so that they can provide appropriate coordination and support for the activities for the Air Quality Subcommittee. The emphasis here, initially, needs to be on the ability to restore historic perspective on trends and atmospheric science associated with the formation of ozone. The maintenance and management of the monitoring network is critical to this exercise, and the Health Department should be in a position to provide support and management so that, if necessary, the monitoring network can be expanded. Finally, we continue to believe that Air Quality Planning capability is necessary in the Health Department.

2. We continue to be concerned about coordination and integration of critical analysis and conclusions about air quality management in the county. We recognize that the county has decided not to accept our suggested approach to staffing up for air quality management and planning purposes and have decided to pursue their own path on this subject. In general, we are pleased with the work of the AQS in identifying both quantifiable and qualifiable emission reduction measures and strategies as well as promoting clean air education programs and initiatives, however, we continue to be concerned regarding the county's ability to maintain this effort in a systematic and strategic manner. We continue to recommend close coordination and communication between EQAC and the county on immediate activities necessary to comply with the ozone standard in 2005 and on into the future.

3. EQAC is pleased with the work of the county's Air Quality Subcommittee that included a variety of air quality management strategies as shown in the interim report and Clean Air Café menu that was presented to the Board of Supervisors' Environmental Committee. EQAC recommends that the Board adopt and implement the recommendations shown in the menu and report.

LIST OF REFERENCES

2002 Annual Air Quality Report, Fairfax County Health Department, Community Health and Safety Section, Division of Environmental Health (report not officially released as of the writing of the Air Chapter of the ARE. Early draft received in October 2003 and data corrected as necessary).

Agency Responses to the Environmental Quality Advisory Council Recommendations Contained within the 2002 Annual Report on the Environment, (memorandum from the County Executive to the Board of Supervisors dated March 27, 2003).

Information for the 2002 EQAC Annual Report, (memorandum from the Acting Director, Department of Health to the Director, Department of Planning and Zoning dated June 12, 2003).

2003 Annual Report on the Environment – Regional Comments, (memorandum from the Deputy Regional Director of the Northern Virginia Regional Office to the Department of Planning and Zoning, Fairfax County, referencing information and contacts for the State of Virginia).

Virginia DEQ Web site, www.deq.state.va.us/ozone/ (information on ozone exceedances, including history).

Declaration on Air Quality Leadership, (memorandum from the County Executive to Senior Management Team dated February 12, 2003).

Implementation of Available Ozone Action Best Practices, (memorandum from the County Executive to Senior Management Team dated July 21, 2003, describing the background and objectives for the Air Quality Sub-Committee and attaching its Charter).

State Implementation Plan ("SIP" or "Severe Area SIP") to Improve Air Quality in Washington, DC – MD – VA Region, (final SIP and appendices available at the MWCOG Web site (www.mwcog.org/environment/air/)).

Air Quality Management/Fairfax County, (memorandum from the Environmental Quality Advisory Council to the Deputy County Executive dated August 28, 2002).

Correspondence dated November 15, 2002, from the Deputy County Executive to EQAC describing the intentions of the county with respect to air quality in response to the August 28, 2002, memorandum from EQAC.

Fairfax County Web site, http://www.fairfaxcounty.gov/dpwes/environmental/air.htm (information on ozone exceedances, including history and the work of the AQS).

CHAPTER III

WATER RESOURCES

III. WATER RESOURCES

A. OVERVIEW

The water resources of Fairfax County include its streams, groundwater, ponds and lakes. These serve as sources of drinking water, recreation, and habitat for a myriad of organisms. One-third of the land in the Fairfax County Park system, approximately 7,000 acres, is stream valley parkland. These stream valleys are significant corridors for the county trails system and wildlife.

1. Streams

Fairfax County is criss-crossed by a variety of natural streams, often called runs or creeks. These streams are considered flowing water habitats. Rainfall soaks into the earth and drains to low points within the surrounding land, then emerges from the ground as seeps, springs, and trickling headwaters. These tiny threads of running water join with others in the same drainage area to create a stream system. A stream is a system of fresh water moving over the earth's surface. There is a natural progression in size from the smallest tributaries to the largest rivers into which they eventually flow. Perennial streams flow throughout the year and intermittent streams flow only part of the year. There are approximately 850 miles of perennial streams within Fairfax County.

2. Watersheds

A watershed is an area from which the water above and below ground drains into a particular stream, river system, or larger body of water. Everyone in Fairfax County lives in a watershed with a name and drainage boundaries. The larger stream watersheds usually have sub-basins. There are 30 separate drainage basins or watersheds within the county (Figure III-1). For example, the largest watershed in Fairfax County, Difficult Run (58 square miles) has ten streams which drain into the main stream, Difficult Run. It, in turn drains into the Potomac River. The Potomac River watershed is a subbasin of the even larger watershed, the Chesapeake Bay watershed, which is 64,000 square miles and extends from New York through Pennsylvania, Delaware, West Virginia, Maryland, Virginia, and the District of Columbia. All Fairfax County streams are in the Potomac River watershed and subsequently the Chesapeake Bay watershed.

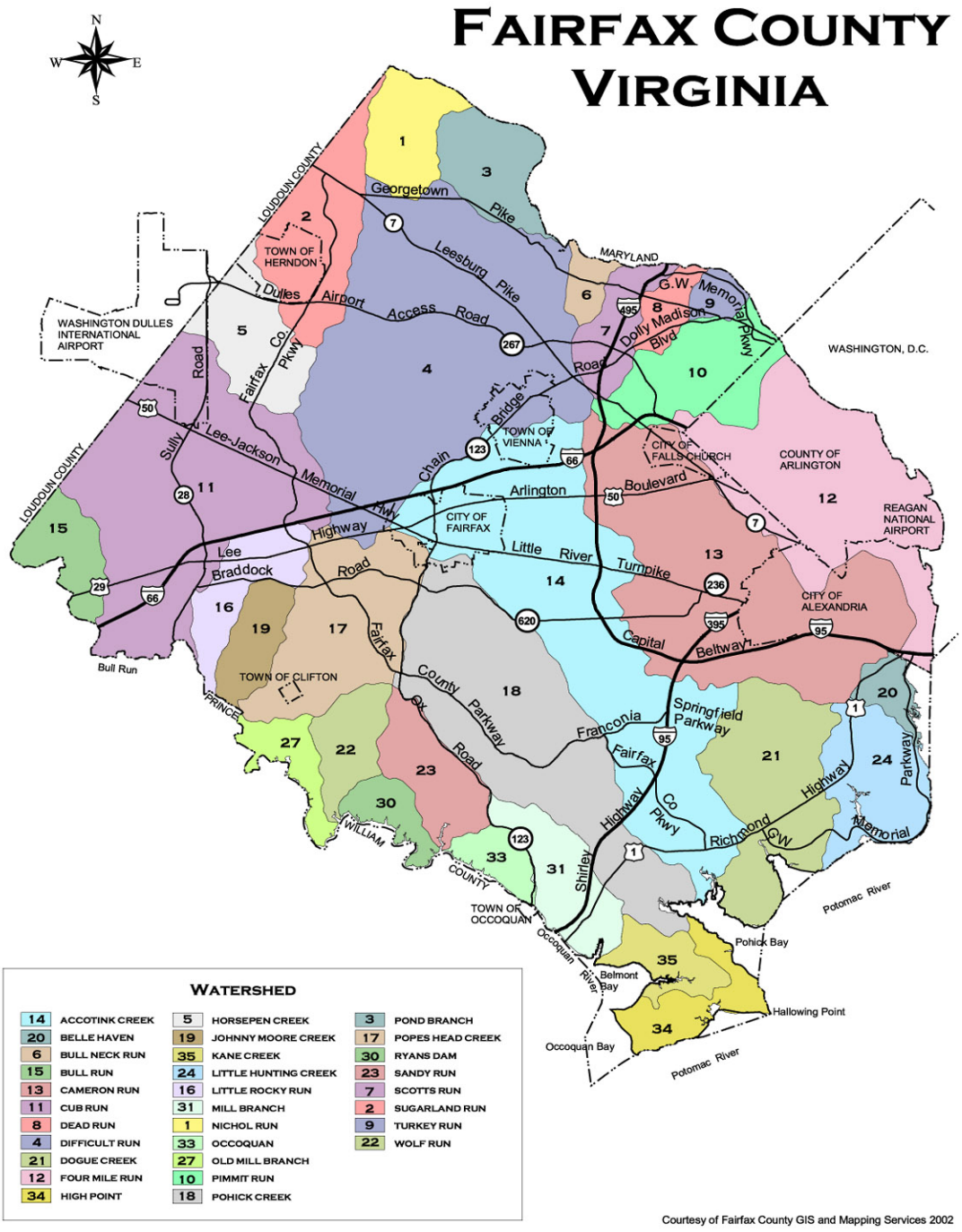


Figure III-1: Fairfax County Watershed Map

3. Stream Ecosystems and Communities

Within a stream are shallow areas called riffles where the velocity is rapid and the bottom consists of boulders, stones, gravel, and/or sand. Dissolved oxygen levels are high because water is flowing over rocks, mixing air into the tumbling water. Alternating with riffles are deeper pools and runs where water speed slows and small particles of mineral and organic matter fall to the bottom and oxygen levels are reduced. Each of these stream regions has a diverse community of plants and animals which spend all or part of their life cycles in the water.

4. Communities

The aquatic food chain begins with leaves and other decaying plant and animal material called detritus. These are carried into the stream from the surrounding forests and fields by wind and water runoff. Food sources also include aquatic vegetation such as algae. Bottom–dwelling (benthic) Macro (large) invertebrate (back-boneless) animals eat this organic matter. These include snails, clams, aquatic worms, and crustaceans such as crayfish. Also ecologically important are the aquatic insect larvae such as stoneflies, mayflies, caddisflies, and true flies. In turn, these macroinvertebrates are eaten by fish, birds, and other streamside wildlife, such as frogs, salamanders, and small mammals.

5. Oxygen

Oxygen is vital to organisms that live in a stream just as it is to terrestrial animals. Submerged animals use oxygen dissolved in the water. Most aquatic insect larvae, such as mayflies and stoneflies, absorb oxygen through their body walls but many are aided by the use of structural gills. Fish absorb oxygen by drawing water in through the mouth where it passes over internal gills. High levels of dissolved oxygen are essential to the life functions of a healthy stream community**.**

6. Trees, Wetlands, and Buffers

A buffer of trees lining the banks of streams is another essential part of a healthy stream system. The temperature in a stream greatly affects how much oxygen it can hold. Since warmer water holds less oxygen, trees are vital along the bank or edge of stream or river. Shade from the tree canopy maintains cool water temperatures so the water will hold more oxygen.

Tree cover also provides food and floating detritus for shelter when leaves and branches fall into a stream. Streamside forests offer food, nesting sites, and protection to a great diversity of streamside wildlife, including birds, turtles, beaver, and snakes. Tree roots stabilize fragile stream banks and give cover to fish, crayfish, and aquatic insects. Forested buffers absorb high percentages of excess nutrient runoff.

Wetland areas adjacent to streams can be forested or open wetlands. These wetlands serve as transitions to stream channels and help to attenuate the effect of stormwater and remove pollutants.

7. Nutrients

Nitrogen and phosphorus are nutrients essential to the growth and development of all plants. An overabundance of either, however, can damage stream ecosystems dramatically. Forested buffers can retain and utilize as much as 89% of the nitrogen and 80% of the phosphorus runoff associated with land use practices. In excess, these nutrients become major pollutants causing the rapid growth of algae in streams, rivers, lakes, and estuaries. When the algae dies and begins to decay, the bacteria breaking down the algae use up the dissolved oxygen necessary for other aquatic life.

8. Groundwater and the Water Cycle

Most of the water on earth, almost 98%, is in liquid form, in the oceans, lakes, ponds, rivers, and streams. Of the remaining 2%, some water is frozen in the polar ice and glaciers, some in the soil and some in the atmosphere in the form of vapor, and some in the bodies of living organisms.

Water is evaporated from the oceans, and in much smaller amounts, from moist soil surfaces, from the leaves of plants, and from the bodies of other organisms. This water, now water vapor, is carried up in the atmosphere by air currents. Eventually these water molecules fall to the Earth's surface as rain or snow. Much of the water that falls onto the land runs off into streams, then rivers, and eventually reaches the ocean.

Some of the water that falls on the land percolates down through the soil until it reaches a zone of saturation. In the zone of saturation, all pores and cracks in the rocks and soils are filled with water (groundwater). The upper surface of the zone of saturation is called the water table. This groundwater provides the base flow in streams and is the reason that streams and rivers have flow when it is not raining. It is this groundwater that is the source of water in wells and provides water for plants through their roots. Eventually all groundwater reaches the oceans, thereby completing the water cycle.

B. POLLUTANTS AND OTHER IMPACTS ON STREAMS

1. Point and Nonpoint Source Pollution

Water-polluting substances originate from either nonpoint or point sources. Nonpoint sources (NPS) include surface runoff, atmospheric deposition, and groundwater flow. Because of their diffuse and intermittent nature, NPS are difficult to control. NPS pollutant loads are greatest following rainfall events. A significant part of the NPS load

consists of nutrients, including nitrogen and phosphorus (organic matter, fertilizer), that are substances that stimulate algal growth. Other NPS pollutants are sediment (from eroding lands, construction sites, and stream banks during high-flow, high-velocity conditions), toxics (oil, paint, chemicals, and metals), pathogens-fecal coliform bacteria (animal waste, failing septic systems, and leaking sewer systems), and trash.

Point sources are specific locations that discharge pollutants. They are relatively constant and provide a steady flow of pollutants. In the Potomac Basin, most point sources are either wastewater treatment plants (WWTPs) or industrial discharges. Point sources contribute relatively small portions of the nutrient loads during high flows and the majority during low flows.

2. The Effect of Imperviousness on Streams

As development occurs, impervious surface increases as driveways and buildings are placed on land that once had trees and other vegetative cover that absorbed water and its contents. With the increase in impervious surface and loss of vegetative cover, there is a concurrent increase in the amount and speed of stormwater running off the land carrying sediment to nearby streams. Sediment is a major nonpoint source pollutant reaching streams and rivers that drain to the Chesapeake Bay. Silt and sand scour stream channels, which erodes the banks and causes loss of tree cover. This, in turn, allows water temperature increases. This silt and sediment also cover the bottom, covering where macroinvertebrates live, cutting off their oxygen supply. This change in bottom substrate usually results in a change in the diversity of organisms--a loss in the numbers and kinds of animals and plants in streams. There is usually a concurrent increase in the numbers of floods that occur where water spills over the banks of streams and onto adjacent lowlands. Over time, this increased flooding and sediment deposition leads to channel widening, loss of pools and riffles, and increased pollutant levels. In urban and suburban watersheds, rain flows off impervious surfaces like parking lots and highways, carrying oil and other automobile wastes into streams. During summer storms, these heated surfaces contribute to raising the temperature of water runoff into streams.

C. STREAM AND WATERSHED ANALYSES

Ongoing testing is conducted by the, the Fairfax County Department of Public Works and Environmental Services (DPWES), Fairfax County Health Department, the Virginia Department of Environmental Quality (VDEQ), and other organizations and agencies. The Audubon Naturalist Society, the Northern Virginia Soil and Water Conservation District, and the Health Department Adopt-A-Stream program also provide volunteer help and data. At present, the Health Department and the Department of Public Works and Environmental Services are both doing comprehensive monitoring of Fairfax County streams. The summary of all these data should provide the first comprehensive understanding of the condition and health of Fairfax County's streams.

1. Countywide Stream Assessments

a. Countywide Stream Protection Strategy Baseline Study

i. History

In September, 1997, the Fairfax County Board of Supervisors requested that staff from the Department of Public Works and Environmental Services (DPWES) evaluate the Montgomery County Maryland, Countywide Stream Protection Strategy to determine its applicability in addressing water quality issues and provided an initial allocation of $250,000. Upon completion of the evaluation in 1998, the Board approved an additional $250,000. Work was initiated in September of 1998, was completed by December, 2000, and was published in January, 2001. This study gives a holistic ecological assessment of all county streams.

ii. Study Parameters

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All major nontidal streams and tributaries within the 30 watersheds of the county have been assessed. The field component of this assessment involved the collection of data from a total of 138 sites/reaches, 13 of which were established as Quality Assurance/Quality Control (QA/QC) sites. Of the 125 principal monitoring sites, 114 were reflective of conditions within Fairfax County and 11 were sampling locations in nearby Prince William Forest Park and used to aid in the development of "reference conditions" to which all sites were compared. Data collected on the health of streams included the following four components, and a numeric ranking for overall quality was assigned (See Figures III-2 through III-5):

1) Fish taxa present (numbers and diversity of fish);
2) Index of biotic integrity (the numbers and kinds of benthic macroinvertebrates present);
3) General evaluation of localized watershed and stream features including stream channel and adjacent steam valley habitat and stream morphology; and
4) Calculations of the overall percent impervious cover within each watershed based on upon available Fairfax County geographic information system (GIS) data.

The county will continue long term monitoring of streams with a five-year rotating schedule of sampling so that each site will be resampled at least every five years. Additional data on smaller tributary streams will continue to be provided by volunteer water quality monitors from the Northern Virginia Soil and Water Conservation District and Audubon Naturalist Society. (See below for description of these Volunteer Monitoring Programs.)

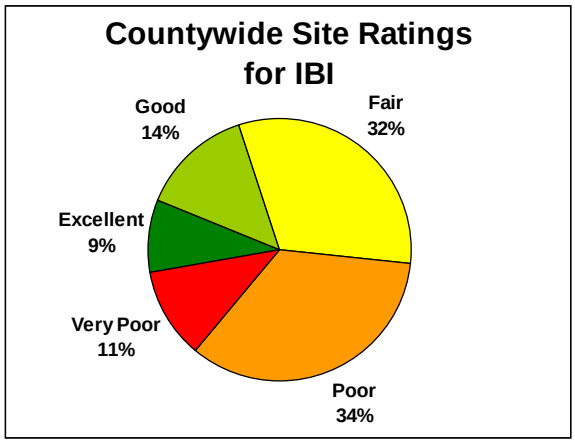

Figure III-2. Percentage of SPS monitoring sites scoring in each of the five IBI quality categories.

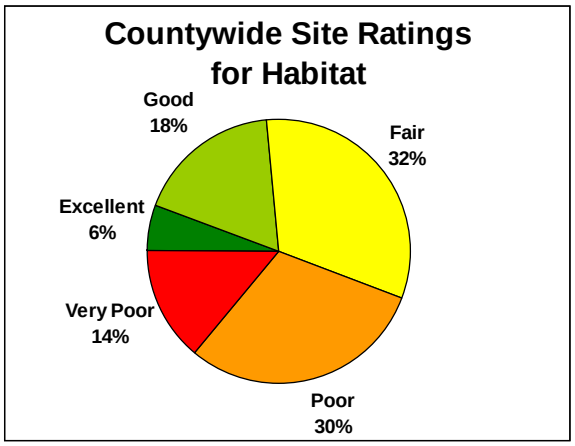

Figure III-3. Percentage of SPS monitoring sites scoring in each of the five Habitat quality categories.

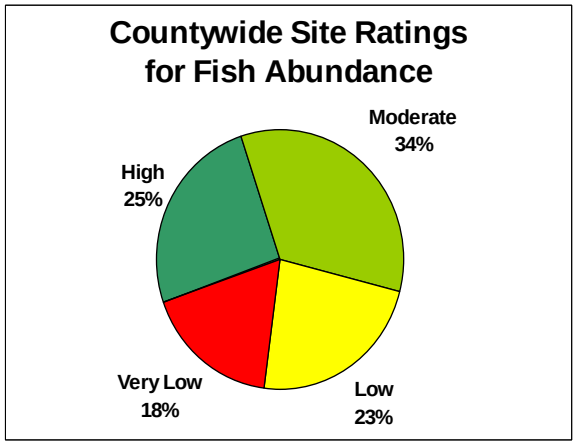

Figure III-4. Percentage of SPS monitoring sites scoring in each of the four Fish Abundance categories.

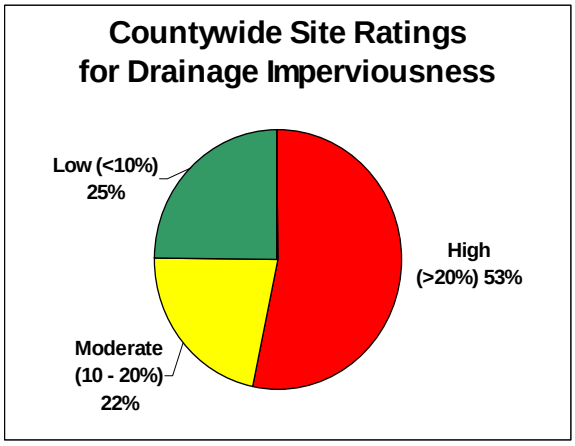

Figure III-5. Distribution of Imperviousness at SPS monitoring sites.

Source of Figures III-2 through III-5: Fairfax County Department of Public Works and Environmental Services, *Fairfax County Stream Protection Strategy, Baseline Study*, January, 2001.

iii. Ranking and Results

The ultimate numeric score for each sampling location reflects the site's degree of departure from reference or "highest-quality" conditions. These composite values were then assigned to one of the following qualitative categories: Excellent, Good, Fair, Poor, and Very Poor.

Using an indicator of biological integrity (IBI) as a basis, the county stream sites were ranked: Excellent - 8.6%; Good – 14.7%; Fair – 31%; Poor 32.8%; and Very Poor –12.9%. Those watersheds that were in good and excellent health had the least amount of impervious surface and the watersheds that were most heavily degraded had the greatest impervious surface (Figure III-6).

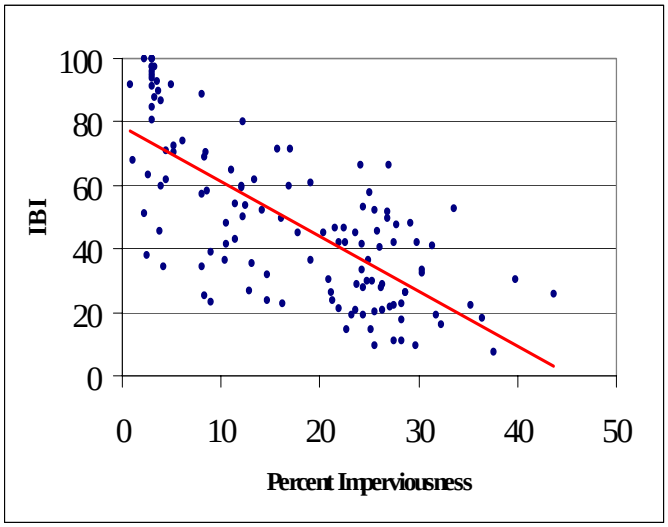

Figure III-6. Trend line indicating that biological integrity, as measured by an Index of Biotic Intetrity (IBI) for benthic macroinvertebrates, generally decreases with increasing percent imperviousness. Source: Fairfax County Department of Public Works and Environmental Services, *Fairfax County Stream Protection Strategy, Baseline Study*, January, 2001.

iv. Recommended Management Strategies

Based on overall stream rankings and projected development within each watershed, three management categories were established to provide recommendations for future efforts:

1) Watershed Protection – Watersheds in this category will be areas with low development density and which currently possess streams with biological communities that are relatively healthy and have a composite ranking of Good or Excellent. The primary goal of this category is to preserve biological integrity by taking active measures to identify and protect, as much as possible, the conditions responsible for the current high quality rating of these streams.

2) Watershed Restoration Level I -- Watersheds in this category have a composite rating of Fair or, rarely, Poor and a projected imperviousness of less than 20%. The primary goal of this category is re-establish healthy biological communities by taking active measures to identify and remedy causes of stream degradation, both broad scale and site-specific.

3) Watershed Restoration Level II -- Watersheds here have a composite rating of Poor, Very Poor, or, rarely, Fair and a projected imperviousness of greater than 20%. This category will likely be categorized by high development density and significantly degraded stream segments. The

primary goal is to prevent further degradation and to take active measures to comply with Chesapeake Bay initiatives.

The report is online at:
http://www.fairfaxcounty.gov/dpwes/environmental/sps_main.htm.

v. 2003 Update on Countywide Stream Assessment

The Stream Protection Strategy (SPS) program completed sampling at 29 randomly selected sites for benthic macroinvertebrates in the spring. In addition, 14 of those sites have been sampled for fish during the summer. The 11 reference sites within Prince William Forest Park have been, and will continue to be, monitored on an annual basis**.**

The report for 2003 should be available on line as data analysis is completed at:
http://www.fairfaxcounty.gov/gov/DPWES/environmental/SPS_Main.htm.

vi. Countywide Stream Physical Assessment

The fieldwork to assess 800 miles of streams was completed in the spring of 2003. The study was completed in February, 2004. The stream assessment will provide the majority of the field reconnaissance information for the watershed plans.

b. Volunteer Water Quality Monitoring Programs

i. Northern Virginia Soil and Water Conservation District (NVSWCD)

The Northern Virginia Soil and Water Conservation District (NVSWCD) manages a water quality monitoring program in Fairfax County, which is conducted by qualified volunteers. The program includes training and certification of monitors, data management and analysis, and quality control. Four times a year, volunteers conduct a biological assessment, using the Save Our Streams protocol. They determine the general quality of the water by evaluating the type and diversity of aquatic macroinvertebrates. They also record their observations of the surrounding watershed, including land uses, the amount of streamside and stream bank vegetation, tree canopy, and signs of erosion and other pollution. The monitors conduct water chemistry tests for temperature, turbidity, and nitrates to assess the water quality. In 2003, 64 sites reported winter data, 95 reported in the spring, 127 in the summer, and 43 in the fall.

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ii. Audubon Naturalist Society (ANS)

ANS also manages a volunteer water quality monitoring program in the region that currently includes 22 monitors in Fairfax County, with an average of four

monitors for each of the seven sites in Fairfax County. Two sites are in E. C. Lawrence Park and are monitored by Park staff. The ANS program uses a modified version of the EPA's Rapid Bioassessment II protocol, which includes assessment of in-stream and streamside habitat parameters and a survey of benthic macroinvertebrate populations. There are three required monitoring sessions (May, July, and September) and an optional winter monitoring session between December and February. ANS staff performs data entry and quality control activities. ANS also furnishes all monitoring equipment and training. Monitor training includes macroinvertebrate identification (order and family level), protocol practicum, habitat assessment, and benthic macroinvertebrate adaptations. Monitors are recruited in semi-annual introductory workshops. The water quality monitoring program is part of a larger watershed awareness program that includes slide show and video presentations, watershed walks, and other presentations.

iii. Fairfax County Park Authority

Site staff at Ellanor C. Lawrence Park have conducted stream studies (primarily of benthic macroinvertebrates) at Walney Creek, Big Rocky Run, and Courthouse Spring Branch four times in the per year. No data were collected in 2003 at Huntley Meadows Park due to a vacant staff position.

2. Fairfax County Water Quality Report

In the past the Division of Environmental Health in the county Health Department has collected water quality data on Fairfax streams. In 2003, the program was transferred to DPWES to be integrated into other watershed monitoring and planning efforts under way in that agency. Fewer than 300 samples were collected in 2003, as opposed to 1,434 stream samples from the previous year. Heavy rains during the early months of the year and the training and transfer of the sampling equipment to DPWES staff in July resulted in the low number of samples. Using data collected in 2003 would be biased to winter sampling months when fecal coliform counts are at their lowest and would not present a true picture of trends. The Health Department is in the process of creating a summary database for the years from 1985 to 2003, the last year of full sampling by that agency. This database will be posted on line when it is complete.

The overall water quality of the streams in Fairfax County is considered fair for fecal coliform bacteria and good for chemical and physical parameters by the Health Department**.**

The report is online at http://www.fairfaxcounty.gov/service/hd/strannualrpt.htm.

PLEASE NOTE…The data below are from 2002, the last year of full sampling by the Health Department. It is assumed that, since the trends in the county for water quality have been relatively consistent over the last few years, this is a reasonable estimate of the water quality of the streams and waterbodies in the county last year.

a. Fecal Coliform Bacteria

These bacterial organisms, most notably Escherichia coli, or E. coli, are found in the intestinal tracts of warm-blooded animals, including humans, and therefore can be indicative of fecal contamination and the possible presence of a pathogenic organism. In surface waters, Virginia Water Quality Standards have been changed as of January, 2003 to reflect a dual standard for fecal coliform bacteria: 1) An instantaneous maximum allowable standard of 400 fecal coliform bacteria (F.C.)/100 ml of water and 2) a geometric mean standard of 126 F.C./100 ml of water or single sample maximum of 235 F.C./100 ml based on a site specific log standard deviation in freshwater systems.

--In the watersheds tested, Fairfax County streams met the previous standards of < 200 F.C./100 ml (considered good) 17% of the time. Several streams had readings exceeding 1,000 F.C./100 ml.

Because of excessive and persistently high coliform bacteria counts in Accotink Creek and Four Mile Run, TMDL (Total Maximum Daily Load) processes are underway in each watershed. For more information, see the section of this chapter entitled "Special Stream Reports and Programs" beginning on page 71.

b. Dissolved Oxygen

The presence of dissolved oxygen (D.O.) is essential for aquatic life, and the type of aquatic community is dependent to large extent on the concentration of dissolved oxygen present. Dissolved oxygen standards are established to ensure the growth and propagation of aquatic ecosystems. The minimum Virginia state standard for dissolved oxygen is 4.0 mg/l.

--Ninety-nine percent (94%) of the samples collected for determination of D.O. were above the 4.0 mg/l range. The majority of the samples below the acceptable range were recorded in June and July.

The Mill Branch sampling station showed readings below 4.0 only 50% of the time (two out of four samples collected in 2000). This sampling site is located downstream from a debris landfill and could indicate that organic contaminants are entering the stream. This site has been dropped from the sampling schedule after four samples were collected in 2000 and it was determined that the amount of available water to sample was insufficient for proper evaluation. This sampling site is monitored by Virginia's Department of Environmental Quality-Waste Management Division.

c. Nitrate Nitrogen

Nitrate Nitrogen is usually the most prevalent form of nitrogen in water because it is the end product of aerobic decomposition of organic nitrogen. Nitrate from natural sources is attributed to the oxidation of nitrogen in the air by bacteria and to the decomposition of organic material in the soil. Fertilizers may add nitrate directly to water resources. Deposition of nitrogen compounds from air pollution also occurs. Nitrate concentrations can range from a few tenths to several hundred milligrams per liter. In non-polluted water, they seldom exceed 10 mg/l. Nitrate is a major component of human and animal wastes, and abnormally high concentrations suggest pollution from these sources.

--The samples for nitrate nitrogen ranged from a low of 0.07 mg/l to a high of 13.5 mg/l. The overall nitrate nitrogen geometric mean was 0.5 mg/l, well below the maximum limit of 10 mg/l. Four samples were above the maximum contaminant level of 10 mg/l. Station 25-04 (Old Mill Branch watershed) accounted for three of the four samples over 10mg/l.

d. Phosphorus (Total)

Phosphorus is found in natural water in the form of various types of phosphates. Organic phosphates are formed in the natural biological process--by organisms existing in the water, contributed to sewage in body wastes and food residues, and/or formed in the biological treatment process for sewage. Condensed phosphates and orthophosphates are found in treated wastewater, laundry detergent, commercial cleansing compounds, and fertilizers. Phosphorus is essential to the growth of organisms and is usually the nutrient that limits growth of organisms in a body of water. Therefore, the discharge of raw or treated sewage, agricultural drainage, or certain industrial wastes may stimulate nuisance quantities of photosynthetic aquatic organisms and bacteria.

-- There is no established limit for phosphorus in stream water. This year's geometric mean of 0.10 mg/l does not indicate a significant increase over the prior year's average.

e. Temperature

The existence and composition of an aquatic community also depends greatly on the temperature characteristics of a body of water. The maximum standard for free flowing streams is 89.9^{o} F (32^{o} C).

--The temperature range for all stream water samples collected in 2002 was 28^{o} F for the low in February and 80^{o} F for the high in June. The average temperature was 54^{o} F.

f. Heavy Metals and Toxins

The presence of heavy metals in stream water indicates the possible discharge of household and industrial waste into streams. Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver are monitored for based on their occurrence in industrial and household waste, their potential health hazards, and as part of the Virginia Department of Environmental Quality water requirements.

-- All results are within required limits.

g. pH

Stream pH is an important factor in aquatic systems. The pH range of 6.0 – 9.0 generally provides adequate protection of aquatic life and for recreational use of streams.

--The pH ranged from a low reading of 5.0 to a high of 8.7 for all samples. Four samples were above the 8.5 limit and sixteen samples were below the 6.0 limit. Follow up testing indicated normal pH.

h. Summary

The average geometric mean for fecal coliform bacteria at several of the stream sample sites approaches or exceeds 1,000 f.c./100 ml. (This is definitely not in the good range). The chemical and physical parameters have remained constant over the past five years. Therefore, the Health Department considers the overall water quality of Fairfax County watersheds fair for fecal coliform bacteria and good for chemical and physical parameters.

The Health Department ends its Water Quality Summary Statement with the following caveat:

"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 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."

3. Health Department Volunteer Monitoring Program (Adopt-A-Stream)

This program, which was administered by the Environmental Services Section of the Health Department, was initiated in 1989 in response to the recommendation of the county's Environmental Quality Advisory Council. Its objective is to make people aware of stream pollution issues and to establish a network for reporting pollution incidents. This program became the responsibility of the DPWES in July, 2003.

4. Virginia Department of Environmental Quality (DEQ)

The DEQ performs long-term trend monitoring at 14 streams in Fairfax County, or streams that border the county. Additionally, DEQ will be focusing resources at eight monitoring stations in the county, which will be sampled for two years beginning in July, 2004. DEQ will be doing biological monitoring in four stations in the county. Failure to meet designated water quality standards may result in a stream being placed on the 303(d) list for impaired state waters.

a. Occoquan River and Basin Management

The Occoquan River straddles the southern border of Fairfax County and the northern border of Prince William County. The River has been dammed near the town of Occoquan. The Occoquan Reservoir, created by the damming, serves as one of two primary sources of drinking water for Fairfax Water (formerly the Fairfax County Water Authority), which operates a facility and withdraws water from the Reservoir. Because of its use as drinking water, water quality in the Reservoir is highly monitored and water from sewage treatment plants entering the Reservoir is highly treated.

i. Upper Occoquan Sewage Authority (UOSA)

The following information has been excerpted directly from information provided by UOSA:

UOSA operates an advanced water reclamation facility in Centerville, Virginia and serves the western portions of Fairfax and Prince William Counties, as well as the Cities of Manassas and Manassas Park. The water reclamation plant includes primary-secondary treatment followed by advanced waste treatment processes: chemical clarification, two-stage carbonation, multimedia filtration, granular activated carbon adsorption, post carbon filtration, breakpoint chlorination, and dechlorination. The plant's capacity was 32 million gallons a day (mgd) and is being expanded to a capacity of 54 mgd (Contract 54). Most of these UOSA new facilities are substantially complete and operational.

UOSA operates under a Virginia Pollutant Discharge Elimination System (VPDES) Permit. The permit limits and 2003 plant performance are listed in Table III-1**.**

2003 was a very wet year, resulting in high flows to the UOSA plant. According to the National Oceanographic and Atmospheric Administration, North Carolina, Virginia, and Maryland had their wettest January-November on record. Precipitation in Virginia had already exceeded the record annual total for the state by the end of November, 2003.

Table III-1. UOSA Permit Requirements and 2003 Performance		
Parameter	**Limit**	**Performance**
Flow	32 mgd	31.3 mgd
Chemical oxygen demand	10.0 mg/l	4.6 mg/l
Turbidity	0.5 NTU	0.1 NTU
Total Suspended Solids	1.0 mg/l	0.65 mg/l
Total Phosphorus	0.1 mg/l	0.05 mg/l
Surfactants	0.1 mg/l	0.026 mg/l
Total Kjeldahl Nitrogen	1.0 mg/l	0.57 mg/l
Disinfection Minimum Chlorine Residual	0.6 mg/l	0.7 mg/l
Dechlorination Chlorine Residual (mg/l)	Non detect	Non detect

Source: Upper Occoquan Sewage Authority

In 2003, the maximum 30-day average flow of 35.25 mgd was above the design flow of 32 mgd. The influent highest rolling 30-day flow was observed in March at 39.82 mgd. The excess flows were diverted to the Equalization Retention Ponds and subsequently treated during days of lower flows**.** During 2003, UOSA was able to use some of its expanded treatment facilities, which was key to managing the high flows encountered during the year.

UOSA produces and treats two types of residuals: biosolids from conventional treatment and lime solids from chemical treatment. Biosolids are anaerobically digested, which produces stable compounds that are conditioned with lime and ferric chloride, and dewatered and hauled off-site to be land applied or landfilled. The lime solids are thickened and dewatered and landfilled in a permitted industrial landfill.

ii. Occoquan Watershed Monitoring Laboratory (OWML)

The Occoquan Watershed Monitoring Program (OWMP) is administered by the OWML and has been in operation since 1972. It is funded by Fairfax Water and the six jurisdictions within the watershed: Fairfax, Prince William, Loudoun, and Fauquier Counties; and the Cities of Manassas and Manassas Park. The program consists of nine (9) stream monitoring stations (automated flow monitoring at all and storm sampling at most) and four (4) Occoquan Reservoir stations. Base flow sampling in the streams and all sampling in the Reservoir is done manually. In addition to surface and bottom water samples, profiles of DO, temperature and pH are also obtained at the Reservoir stations. Sampling is done weekly during the growing seasons and biweekly or monthly (if ice is present) in winter. The water quality data that have been provided in past years indicates little change in water quality in the watershed. The Lake Manassas program is used for monitoring water and sediment at seven (7) stream stations and eight (8) lake stations. The eutrophication status of the Occoquan Reservoir and Lake Manassas were within the same range as before, moderately eutrophied but holding steady.

The OWML monitors quarterly for organic synthetic organic compounds (SOCs) in the watershed in a program established under the recommendation of EQAC in 1982 for water samples. In 1988, the OWML began monitoring sediment and fish samples within the reservoir for SOCs. The Lake Manassas program also funds monitoring of SOCs at its stations. The most frequently detected SOC is Atrazine, usually detected in springtime and early summer when it is being land applied. Concentrations "are usually lower" than the maximum contaminant level (MCL) of three micrograms/liter for drinking water. The pesticide Dual (metolachor) and phthalates are regularly found in concentrations one or more order of magnitude below the MCL.

No sampling results were available for 2003.

b. Noman M. Cole Jr. Pollution Control Plant (NMCPCP)

The NMCPCP, located in Lorton, is a 54 million gallon per day (mgd) advanced wastewater treatment facility that incorporates preliminary, primary, secondary, and tertiary treatment processes to remove pollutants from wastewater generated by residences and businesses in Fairfax County. The original plant, which began operation in 1970 at a treatment capacity of 18 million gallons a day (mgd), has undergone two capacity and process upgrades to meet more stringent water quality standards. After treatment, the wastewater is discharged into Pohick Creek, a tributary of Gunston Cove and the Potomac River. The plant operates under a VPDES permit. The plant is required to meet effluent discharge quality limits established by the Virginia Department of Environmental Quality (DEQ). Table III-2 presents the facility's performance and current effluent monthly limitations.

Table III-2
NMCPCP Permit Requirements and 2003 Performance Averages

Parameter	Limit	Performance
Flow	54 mgd	44.93 mgd
$CBOD_5$	5 mg/l	< 2 mg/l
Suspended Solids	6 mg/l	1.7 mg/l
Total Phosphorus	0.18 mg/l	<0.05 mg/l
Chlorine Residual	Non Detect	Non Detect
Dissolved Oxygen	6.0 mg/l (minimum)	8.3 mg/l
pH	6.0-9.0 (range)	7.1
Fecal Coliform Bacteria	200/100ml	< 1./100ml
Total Nitrogen	No Limit	< 7.8 mg/l

Source: Department of Public Works and Environmental Services

Construction to expand the plant treatment capacity to 67 mgd began in 1997, with completion planned by the end of 2004. This includes process upgrades to

remove ammonia to less than one mg/l and total nitrogen to less than eight mg/l in order to meet Virginia Water Quality Standards and the Chesapeake Bay Program goals for total nitrogen. Also included in the project are: flow equalization tanks, a new/upgraded laboratory for water quality testing, upgraded odor control systems, new instrumentation and control systems, and a new septage receiving facility.

In 2003, 63,962 wet tons of sludge were generated and incinerated.

In August, 2004, the Virginia Secretary of Natural Resources announced proposed changes to nutrient discharge limits for sewage treatment facilities in Virginia's portion of the Chesapeake Bay watershed. These proposed changes will have substantial implications to NMCPCP and will be discussed in greater detail in next year's Annual Report.

5. Special Stream Reports and Programs

a. TMDLs (Total Maximum Daily Loads)

A total of 17 waterbodies with drainage areas in Fairfax County are included in Virginia's listing of impaired waters for 2002. Of the listed waterbodies, 11 are riverine systems totaling 51.85 miles, five are estuarine with a total area of 23.18 square miles and one is a drinking water reservoir (Occoquan) with an area of 1,700 acres. Nine of the 17 waterbodies are multijurisdictional. The cause of the impairment for the majority of riverine systems is either fecal coliform or benthic standards. For the estuarine waterbodies, the cause of impairment for the majority is PCBs in fish tissue. Twelve of the 17 water bodies were listed for the first time in 2002. According to the schedule, six waterbodies require TMDL studies to be completed by 2010, with the rest by 2014. Four new TMDLs are being proposed by the Virginia Department of Environmental Quality. Popes Head Creek and Bull Run TMDLs are to be developed by 2006 and the lower section of Accotink and Difficult Run by 2008.

i. Accotink Creek TMDL

Due to excessive fecal coliform bacteria counts, a 4.5 mile segment of Accotink Creek in Fairfax County, beginning at the confluence of Crook Branch and Accotink Creek to the start of Lake Accotink, was placed on the 1998 Virginia 303(d) TMDL (Total Maximum Daily Load) list. A TMDL is a highly structured, watershed-specific plan for bringing an impaired waterbody into compliance with the Clean Water Act goals. A two-year study began in December, 1998, headed by the U.S. Geological Survey, in partnership with the Virginia Department of Conservation and Recreation (DCR), the Virginia Department of Environmental Quality (DEQ), and Fairfax County. The initial study was complete in fall of 2001. The sample collection and analysis, which began in April, 1999, to determine the "type" of fecal coliform bacteria found in

streams is now complete. Results of this analysis are discussed in Chapter 7 of this report, with Figure VII-2-1 (see page 210) presenting a breakdown of sources of fecal coliform bacteria. The most significant identified sources were geese, humans, and dogs, with ducks, cats, seagulls, raccoons, rodents, cattle, and deer also identified as sources. A draft TMDL has been published by the Virginia Department of Environmental Quality. The draft TMDL includes a goal to reduce the human sources of fecal coliform bacteria by 99%. A study by USGS initiated in the August of 2001 will identify and isolate the specific sources of human fecal coliform bacteria. The study will be conducted over a three-year period. During 2002, an extensive Dry Weather Screening program was undertaken in the Accotink Creek Watershed as part of the ongoing efforts to detect illicit connections and improper discharges. In 2003, due to large amounts of rain, scheduling sampling campaigns became extremely difficult. Only one in April was completed. To date, five sampling campaigns of the eight planned have been completed. Throughout the final campaigns, there will be continued focus on storm drains that flow during dry periods and sampling of locations with elevated fecal coliform bacteria levels. The USGS paper on sampling Accotink Creek can be viewed on-line at: http://water.usgs.gov/pubs/wri/wri034160/wrir03-4160.htm.

ii. Four Mile Run TMDL and the Four Mile Run Program

Although only the very upper reaches of Four Mile Run occur in Fairfax County, it is important to note the existence of a TMDL for Four Mile Run and the participation of Fairfax County in the Four Mile Run Program.

The Four Mile Run Program is the oldest continually active program of the Northern Virginia Regional Commission (NVRC). The four jurisdictions (Arlington County, Fairfax County, the City of Falls Church and City of Alexandria) through which Four Mile Run flows are involved in the program. The program was founded in 1977 to ensure that future development would not result in increased flooding in the watershed. Today, all development and redevelopment is analyzed through the Four Mile Run Computer Model to determine whether on-site detention of stormwater is necessary to prevent downstream flooding. In 1998, the Four Mile Run Agreement was amended to address urban water quality issues in addition to flooding.

The Four Mile Run Fecal Coliform Study to determine the sources of fecal coliform bacteria in the watershed using DNA was completed in 2000. The study found that waterfowl contribute over one-third (31%) of that bacteria that could be matched. Eighteen percent of the bacteria originated from humans, 13% from dogs, 6% from deer, 19% from raccoons and 13% from other sources. Bacteria from humans appear to be highly localized. There were indications in that, without regard to specific host animals, E. coli bacteria seem to regrow, through cloning, within the storm drains and stream sediments,

which in turn perpetuates bacteria levels. Efforts are underway to study this hypothesis.

NVRC was given a grant from the Virginia Department of Environmental Quality (DEQ) for the development of a TMDL (Total Maximum Daily Load) for bacteria in Four Mile Run, which was approved by the EPA on May 31, 2002. The draft implementation plan was presented for public comment on December 10, 2003; its focus is on the reductions of fecal coliform bacteria from human and canine sources by 98 percent. The plan was finalized on December 20, 2003 and can be viewed on-line at: www.novaregion.org/bacteriaimplementation.htm

iii. Bull Run TMDL

NVRC has been approached by the Virginia Department of Environmental Quality concerning the development of TMDLs for impaired streams in the Occoquan watershed. The first two will be for streams outside Fairfax County, Licking Run and Cedar Run. However a TMDL for degradation of the streams benthic community is scheduled to be completed for Bull Run in Fairfax by 2008.

b. Kingstowne Stream Restoration Project

In 1998, Fairfax County, the Northern Virginia Soil and Water Conservation District, the U.S. Natural Resources Conservation Service, and two citizens groups (the Friends of Huntley Meadows and the Citizens Alliance to Save Huntley) formed a partnership to restore a stream in the Kingstowne area of the County. The Kingstowne stream is a tributary of Dogue Creek and is upstream of Huntley Meadows Park. Started in October and finished by December, 1999, the Kingstowne Stream Restoration Project is now functional. The project used principles of geomorphology and soil bioengineering to create gentle meanders that slow the velocity of flow and natural vegetation to stabilize the stream banks. Testing has substantiated that erosion has been brought under control and water quality downstream is improved. During 2003, 19 storm event samples and 12 base flow samples were collected and analyzed to determine pollutant loads in Dogue Creek. Based on the monitoring data, the sediment removal efficiencies were achieved for all storm events. The NVSWCD continues to monitor the project, which continues to improve bank and floodplain stability**.**

c. Gunston Cove Aquatic Monitoring Program

Gunston Cove is the site of the outfall of Fairfax County's Noman M. Cole, Jr. Pollution Control Plant. The primary objective of this George Mason University program is to determine the status of the ecological communities and physical-chemical environment in the Gunston Cove area of the tidal Potomac for evaluation of long-term trends. This should provide the basis for well-grounded management

strategies to improve water quality and biotic resources in the tidal Potomac. It was recommended in this final report that long term monitoring should continue.

Water quality has generally improved since the 1980s. Algae are at lower levels than in the mid 1980s, probably due to lower phosphorus levels in the water, and zooplankton (microscopic "animals' found in surface waters) levels have increased. Benthic (bottom dwelling) organism levels are greater in the river channel than in the cove.

In the cove in 2002, white perch has remained dominant at steady levels over the period, suggesting a supportive environment. Bay anchovy and blueback herring comprised a significant percentage of the total trawl catch. Brown bullhead has declined since 1984. Banded killifish dominated the seine collection and may reflect an increase in habitat as submerged aquatic vegetation has increased in the cove.

The report suggests goals to reduce man-made stresses that we can, and reduce or manage those we cannot, eliminate. Specific management practices to control point and non-point sources, protect and enhance stream buffers and tidal wetlands, and avoid further exotic species introductions are recommended. Continued of monitoring program to assess effective management is also recommended.

d. Wetlands Mitigation Monitoring

The Virginia Department of Transportation is currently monitoring two wetlands mitigation projects, one with between Dranesville Road and Sugarland Run in Dranesville District and one near Roberts Parkway Overpass and Virginia Railway Express-Burke station in Braddock District. Both sites were created to mitigate impacts from the construction of the Fairfax County Parkway and both require five-year success monitoring. The Braddock site was just planted in 2003 and the Dranesville site has been monitored for one year.

e. Illicit and Potential Hazardous Material Discharges

In calendar year 2003, the Hazardous Materials and Investigative Services Section of the Fairfax County Fire and Rescue Department responded to 32 reports involving improper disposals of various hazardous materials and solid waste, 16 pipeline incidences, 39 various types of product release and 191 petroleum product releases. Hurricane Isabel accounted for ten incidences where petroleum products or vessels were impacted by floodwaters.

f. Investigations of Contamination caused by Leaking Underground Storage Tanks

There were 53 reported incidences investigated by the Virginia Department of Environmental Quality, of which 23 remain open for on-going scrutiny.

D. PONDS AND LAKES

All ponds and lakes in Fairfax County are man-made by excavation and/or the damming of streams. These open water impoundments have their own aquatic communities and have many of the same organisms as streams. Most provide recreational opportunities for humans. Due to increased runoff in more urbanized areas, they are often subject to heavy sediment and nutrient loads. Heavy sedimentation means that most of the lakes have to be dredged on a regular basis in order to maintain pond or lake depth. Heavy nutrient loads result in large algal and plant blooms over the warmer months of the year.

1. Reston Lakes

Reston has several large lakes (Lake Newport, Lake Anne, Lake Thoreau, and Lake Audubon) which are managed by the Reston Association and have been monitored for algae growth and sedimentation since 1981.

a. Management Initiatives

The invasive weed hydrilla has become a severe problem and triploid sterile grass carp were released in two lakes in 2002 in order to control growth of the weed. Accelerated sedimentation, algae blooms, and nuisance exotics continue to be the primary problems in Reston Lakes.

A shoreline and stream bank stabilization project using biologs, erosion cloth, and plantings on a 1,000 foot section of Snakeden Branch. The upper 200 feet was done in partnership with several organizations, and the lower 600 feet was completed with a private firm. Reston Association staff also worked on several shoreline and stream bank stabilization projects with several clusters and individual homeowners. RA staff also installed several areas of native submerged aquatic vegetation to re-establish fish habitat and improve water quality.

Waterfowl management initiatives are on-going in an effort to curb the large Canada Goose population on Reston's lakes. In the spring of 2003, 39 goose nests were located and 155 eggs were addled.

Also in 2003, the Reston Association received a multi-million dollar grant for a stream restoration project in Reston. The project will help to fund the implementation of the Reston Watershed Management Plan over a ten-year period. The project, conducted by Wetland Studies and Solutions, will establish a stream mitigation bank in Reston. The project will be coordinated by Reston Association staff and will be overseen by a team of natural resource regulatory agencies.

Reston Association completed a brochure about rain barrels to educate residents and is working on educating the public about having on-site stormwater control.

b. Monitoring and Results

The lakes are monitored for dissolved oxygen, temperature, pH, total phosphorus, clarity, chlorophyll (the green pigment found in algae), and the presence of plankton (small unicellular organisms found in the upper surfaces of waters). The 2003 monitoring was conducted six times (April through September) during the year by Aquatic Environment Consultants. In 2003, fecal coliform and *E. coli* testing were conducted in Lake Audubon because two swimming events take place each year in this lake. In 2003, two Reston Association ponds, Bright and Butler, were added to the monitoring regime. Spring and summer of 2003 had cool temperatures and excessive rain, with May through September averaging 3.3 inches above the 30 year average. Excess runoff may have been the cause of some unique conditions found in the lakes in 2003. Most of these lakes have large surface algae populations and therefore lower water clarity during summer and early fall. This classifies them as eutrophic, a term which comes from the Greek for "well nourished," and is most probably an indicator of high nutrient, most specifically phosphorus, levels in the lakes**.**

i. Lake Anne

Dissolved Oxygen levels were improved over previous years. The aeration system remained functional save for a few days throughout the summer and is credited with the DO improvement. The temperature profile was cooler than any season since the installation of the aeration system. The surface water warmed slightly through July and August, with the average temperature being 20.9^{o} C. The pH levels were below those of previous seasons. Blooms of green and blue-green algae did occur throughout the season, with the largest blue-green algal bloom recorded in September of 2003.

ii. Lake Audubon

Lake Audubon had a ruptured sewer main sometime during June or July that leaked into the waters feeding the lake. The temperature/dissolved oxygen profile for Lake Audubon showed stratification throughout the monitoring season (different "layers" of water had different DO and temperature readings). Water temperatures were below long-term averages. The pH levels were also below long-term averages. The algal blooms on the lake did not come close to the extreme conditions of last year. Normal populations of zooplankton (small microscopic animals that float on the surface of the water) were significantly reduced after the sewage leak. These organisms are important because they "feed" on algae.

iii. Lake Thoreau

Temperatures were below average in 2003. Dissolved oxygen levels in certain "layers" of the lake decreased during summer months as early as May, 2003 but

the overall oxygen levels remained good. The numbers of algae present were the lowest of any of the lakes in Reston and were just above average for the season. Zooplanton numbers were relatively low for the season.

iv. Lake Newport

Water temperatures were below long-term averages. Thermal stratification was present throughout the season. This lake had the highest oxygen depletion of any of the lakes, with the dissolved oxygen overall saturation being the lowest recorded. Lake Newport's algal density is the highest of any of the Reston lakes, this year in July setting a new record. Blue-green and green algae were the most abundant types. There was an extremely large blue-green algae bloom in August. Seasonal density of alga was nearly four times the 12 year average and seasonal biomass was over three time the average, all due to the July *Anabaena* (a blue-green) algal bloom.

2. Pohick Watershed Lakes

The six Pohick watershed lakes (Barton, Braddock, Huntsman, Mercer, Royal, and Woodglen) are inspected annually for dam structure but are not monitored for biological or chemical parameters.

3. Lake Barcroft

The Lake Barcroft Watershed Improvement District (WID) is a local taxing district authorized by Virginia Law for conservation purposes. In 1999, Lake Barcroft had about 15,000 cubic yards of dredge spoil from the lake to dispose of. In order to avoid the costs associated with hauling it to a landfill, they rented a huge topsoil screening machine and excavator to load it, converting the waste material into topsoil by filtering out all the sticks, stones, beverage cans and other debris. The topsoil was then made available to local residents for a modest delivery fee. Some innovative BMPs (Best Management Practices), such as flow regulators, check dams, a diversion debris trap, a stormwater injection pit, and street sweeping program have been implemented by the WID. These BMPs are being studied for both their capacity to reduce pollution and improving water quality in the lake and its tributaries, possibly leading to Countywide implementation. The WID also has a program to purchase and distribute high quality lawn fertilizer (that has been formulated without phosphorus) in 50-pound bags and sell it to homeowners. They also did a fish flesh study by sending edible portions of fish removed for analysis of toxins and heavy metals. Fish studied were Largemouth Bass, Bluegill and Black Crappie. None of the counts were over EPA warning levels.

4. Lake Accotink

Lake Accotink is owned and managed by the Fairfax County Park Authority. County government has authorized the expenditure of $6,000,000 to dredge and remove 200,000 cubic yards of sediment from the lake. The Fairfax County Park Authority

provides a boat and operator to the Fairfax County Health Department, which conducts water quality tests from four surface points from May through August. Results from the sampling were within the required limits as mentioned in the Health Department Stream Report. This sampling will now be part of the DPWES monitoring program.

5. Other Ponds and Lakes

There are other significantly sized private and public lakes within the county. Many are centered within developments and have dwellings built along the banks of the lakes. There are also numerous smaller ponds throughout the county that are found within communities, commercial developments or on farm properties. Some are associated with golf courses and many serve as stormwater management ponds.

E. STORMWATER MANAGEMENT

1. Status of Stormwater Utility (Environmental Stormwater Utility) Concept in Fairfax County

In December of 1998, a draft report by the Stormwater Utility Advisory Group (SUAG) to the Board of Supervisors was circulated for review. The report addressed several issues relating to the implementation of a stormwater service charge program for Fairfax County. Activities were suspended leading up to the fall, 1999 Board of Supervisors elections. DPWES is evaluating the need to conduct a more comprehensive public information campaign to articulate need and gain wider public support. During the summer of 1999, the firm of Camp, Dresser and McKee (CDM) was requested to develop a concept paper/report on framing significant aspects of the county's existing stormwater control program and present ideas and recommendations on the essential elements of future stormwater program. CDM submitted a draft report in December of 1999. A final edition was completed by March, 2000. Work on public outreach is proceeding but any further action awaits full funding and the implementation of the stormwater utility fee program by the county.

2. Status of NPDES Requirements

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System Permit (MS4), a five year permit, was reissued by the Virginia Department of Environmental Quality (DEQ) in January, 2002. Total Maximum Daily Loads (TMDLs) are tied into the new permit. The Stormwater Planning Division and the Maintenance and Stormwater Management Division incorporated into the new permit a more comprehensive stormwater management program. This program includes the comprehensive Watershed Management Planning effort and long term biological monitoring, infrastructure mapping, inspections and maintenance, retrofitting developed areas with water quality control facilities, and a more rigorous public outreach and education. The Maintenance and Stormwater Management Division of

DPWES will perform inspection of privately owned stormwater management facilities on a regular basis (every five years). Water quality will be monitored at six storm sewer outfalls four times a year (seasonally), and 100 outfalls per year will be monitored during dry weather to determine the presence of illicit discharges.

During 2003, the county continued to evaluate BMPs (best management practices), undertook ten stormwater management ponds, continued with the monitoring of dry weather outfalls, and inspected over 1,600 stormwater control facilities.

The 2003 Annual MS4 (Municipal Separate Storm Sewer System) Report was submitted by the county and accepted by the Virginia Department of Environmental Quality.

3. Regional Stormwater Management Program

a. Background

Since the early 1980s, the county's *Public Facilities Manual* (PFM) has included a provision that encourages the concept of regional stormwater management. As opportunities arose, major developers as well as county staff pursued regional stormwater management primarily through the development process. An overall plan identifying the most appropriate locations for regional facilities was needed to improve this process.

In January 1989, the Board of Supervisors adopted a plan prepared by the engineering firm of Camp, Dresser and McKee. The plan, intended to be a pilot program, consists of a network of 134 detention facilities that will directly control 35 square miles of drainage area. To date, over 46 regional ponds in the Regional Stormwater Management Plan have been constructed. Currently there are 28 facilities in various stages of implementation. Eighteen potential facilities are in the final design phase either as county managed projects or via developers through rezoning commitments. Five regional pond facilities are currently in the bonding or construction phase.

This Stormwater Management Plan has been reevaluated, and recommendations for change have been made, by the Regional Pond Subcommittee, which is an ad hoc subcommittee of the Fairfax County Environmental Coordinating Committee. The Department of Public Works and Environmental Services is responsible for chairing and the work production of the Subcommittee. This Subcommittee was tasked by the Board of Supervisors on January 28, 2002 to examine the role of regional ponds as well as other alternative types of stormwater controls as watershed management tools. Public meetings (attended by over 100 people) were held in late 2002, and the report was submitted to, and subsequently accepted by, the Board of Supervisors. The Subcommittee identified 61 recommendations to improve Fairfax County's stormwater management program and to clarify the role of regional ponds in that program. The general consensus is that regional ponds do play a part in the

county's stormwater management program, but their size and usage can be reduced by the use of better site designs and low impact development practices. The Subcommittee is currently coordinating the development of an implementation plan for all 61 recommendations, including a timeline and defined agency roles and assignments. This new plan, when implemented, should facilitate the merging of stormwater management goals within the watershed protection and restoration goals and should allow for the use of more innovative low-impact development and stormwater management techniques in Fairfax County.

b. Creation of new Stormwater Planning Division (SWPD)

Created in February, 2000 by the Director of DPWES after approval by the Board of Supervisors, this new division is to review current countywide policies affecting the ecosystem and stormwater management issues. SWPD is to promote policies to improve and protect the quality of life and support the environmental goals of the county.

c. Changes in County Mowing Policy at Stormwater Management Ponds

During the summer of 2000, in support of the interim tree policy adopted by the Board of Supervisors in 1999, the county revised the pond-mowing program. The interim tree policy provides opportunities for planting trees beyond the areas currently allowed under the Public Facilities Manual. The mowing program reduces the area mowed in and around a stormwater management pond by an average of 60% per pond.

d. Stormwater Pond Retrofit to Shallow Marsh Wetlands

The Maintenance and Stormwater Management Division of DPWES has noted the following: In 2002, 12 stormwater ponds that are maintained by the county, serving a total of 344 drainage acres, were retrofitted with shallow marsh wetlands in the pond floors. To date there are 1,487 dry-ponds in the county and less than 467 provide water pollution treatment. That leaves nearly 1,020 existing dry ponds which could potentially be retrofitted for pollution treatment. Of the 467 ponds that currently provide water quality treatment, there are a sizeable number that could be modified with new technologies to enhance their treatment capacities. It is estimated that approximately ten additional ponds will be planted this year.

4. Stormwater Treatment Facilities in Fairfax County

Fairfax County has various types of stormwater treatment facilities. Dry ponds are designed to fill up with water during a storm but return to a "dry" state within a few hours or a few days depending on its functional requirements. Wet ponds contain water year-round. The county maintains 1,093 stormwater management facilities, including 971 on-site dry ponds, 33 regional ponds, 47 underground chambers, 32 percolation trenches, five wet ponds, three bioretention areas, and two manufactured BMPs. In

2003, the county inspected each facility at least once, mowed 802 dam embankments, and performed 251 maintenance work orders at 203 facilities.

There are 2,164 privately maintained facilities in the county: 285 wet ponds; 473 dry ponds; 113 sand filters; 49 manufactured BMPs; 322 percolation trenches; 496 roof top detention areas; 44 parking lot detention areas; 376 underground detention facilities; and six bio-retention areas. These facilities are inspected once every five years. A total of 550 such facilities were inspected in 2003.

5. Infill and Residential Development Study

The combination of development patterns in the county and a growing concern over water quality issues led to the May, 1999 request from the Board of Supervisors for the "Infill and Residential Development Study." The study was completed and released to the public in 2000. The Board of Supervisors accepted the final recommendations at a public hearing on January 22, 2001. The Study staff has reviewed the effectiveness of current policies regarding erosion control and storm drainage with the dual goals of minimizing any impacts of stormwater from a proposed development on downstream property and limiting the impacts of stormwater management facilities on a neighborhood. Recommendations include:

1) An enhanced erosion and sediment control program, including the revoking of land disturbing permits during egregious violations;
2) Allowance of the use of chemical erosion prevention products, and bonded fiber matrix on highly sensitive soils or on steep slopes;
3) Adoption of innovative BMPs;
4) Amendment of the Public Facility Manual to include Super Silt Fence requirements, Storm Drain Inlet Protection Devices, and Faircloth Skimmers;
5) Improved requirements for early review of stormwater management facilities as part of the rezoning process;
6) Improved requirements for evaluating the adequacy of stream channels for increased runoff due to new developments;
7) Development of a BMP monitoring program; and
8) Enhanced education programs for citizens, staff, and industry regarding E&S control.

Actions in 2002 to fulfill the recommendations included the following:

1) Development of an alternative Inspection program has been completed and approved by the Virginia State Soil and Water Conservation Board in December of 2002.
2) Changes in improved siltation and erosion control amendments in the PFM now include Super Silt Fences and the start of the approval process for including Faircloth Floating Skimmers.
3) A Study concerning the impact of extended detention of the one-year storm was started in January, 2002.

Implementation of the recommendations continues. In 2003 significant progress was made towards the fulfillment of the stormwater and erosion and sedimentation (E&S) control initiatives. It is anticipated that the proposed Adequate Outfall Public Facilities Manual amendments will be finalized in 2004.

F. NONPOINT SOURCE POLLUTION PROGRAMS

1. Chesapeake Bay Program and Agreements

The Chesapeake Bay Program (CBP) is a cooperative arrangement among three states (Virginia, Pennsylvania, and Maryland), the District of Columbia, and the Federal government (represented by the Environmental Protection Agency) for addressing the protection and restoration of the water quality, habitats, and living resources of the Chesapeake Bay and its tributaries. These commitments are not legally binding. Each state determines how it will meet the various commitments and the approaches to implementation often vary greatly among states. All streams in Fairfax County are tributaries of the Potomac River, which flows into the Chesapeake Bay. Three Chesapeake Bay Agreements have been signed, focusing on reducing pollutants in the Bay and its tributaries**.**

2. The Virginia Chesapeake Bay Preservation Act and Regulations

The Virginia Chesapeake Bay Preservation Act was passed as part of Virginia's commitment to the second Chesapeake Bay Agreement goals to reduce nonpoint source phosphorus and nitrogen entering the Bay. Pursuant to the requirements of the Chesapeake Bay Preservation Act and Regulations, the Chesapeake Bay Local Assistance Department (CBLAD) and the Chesapeake Bay Local Assistance Board (CBLAB) have reviewed Fairfax County's Comprehensive Plan for consistency with the Act and Regulations.

On March 19, 2001 the Chesapeake Bay Local Assistance Board determined that Fairfax County's Phase II program is consistent, with conditions, with the Chesapeake Bay Preservation Act and Regulations. Released in September, 2004 the county has proposed amendments to address the four consistency recommendations: 1) map of the county's Chesapeake Bay Preservation Area components; 2) a shoreline erosion inventory and implementation strategies for use by the Wetlands Board in approving shoreline erosion structures; 3) inventory and development of plan for public waterfront access; and 4) development of policies that address the recommendations for water quality as discussed in the "Infill and Residential Development Study."

The agricultural portion of the Chesapeake Bay Preservation Ordinance requires landowners with land in agricultural uses to have conservation plans. The Northern Virginia Soil and Water Conservation District (NVSWCD) prepares soil and water quality conservation plans and provides technical assistance in the implementation of approved plans. NVSWCD has written plans for all Agricultural and Forestal Districts

that have Resource Protection Areas within their limits. Currently, NVSWCD is working extensively with horse owners and keepers, since a large percentage of agricultural land use in Fairfax County is related to horse operations. These operations require innovative land management and careful nutrient management to prevent and reduce pollution in runoff to nearby streams.

In 2003, 14 soil and water quality conservation plans were developed for 1,000 acres; 23,348 linear feet of RPAs were included. Cumulatively, 9,859 acres and 260,091 linear feet of RPAs are covered by water quality conservation plans that have been developed since 1994 when the program began. County regulations require conservation plans for establishing and renewing Agricultural and Forestal Districts. As noted in the Ecological Resources chapter of this report, there are 40 Local and four Statewide Agricultural and Forestal Districts in the county. NVSWCD also develops conservation plans for landowners receiving state cost-share money for installing agricultural BMPs, such as manure storage and composting structures or fencing animals out of streams. NVSWCD continues to distribute a brochure it developed for Fairfax County horse-keepers: Agricultural *Best Management Practices for Horse Operations in Suburban Communities*.

On July 7, 2003, the Board of Supervisors adopted a revised Chesapeake Bay Preservation Ordinance in order to comply with amendments to the State's Chesapeake Bay Preservation Area Designation and Management Regulations (see section K of this chapter). Of particular note was the incorporation of changes to the designation criteria for Resource Protection Areas (RPAs) to more directly reference water bodies with perennial flow, resulting in a significant expansion to the county's RPA network. A related effort to map all perennial streams in the county (see section G of this chapter) has been completed, and revised maps of Chesapeake Bay Preservation Areas have been prepared.

3. Erosion and Sedimentation Control and Enforcement-Fairfax County Department of Public Works and Environmental Services

DPWES is planning the implementation of organizational improvements to the Environmental and Facilities Inspection Division (EFID, formerly the Site Inspection Branch) that will result in a greater emphasis and a higher quality of inspection services associated with erosion and sediment control. They will be developing a new quality assurance program and will be training Field Specialists (a newly established position). Field Specialists will be responsible for resolving all erosion and sediment control violations. DPWES will be developing a prioritized inspection program, in accordance with guidelines established by the Virginia Department of Conservation and Recreation, that will consider slope, soil type, proximity to streams, and extents of buffer areas to determine an overall rating for any given site. These proposed resource requirements and organizational improvements are being led by the county's Environmental Coordinator.

a. Inspections

In 2003, the EFID conducted 29,110 Erosion and Sediment (E&S) control inspections, an increase of 36% over 2002. There was an average of approximately 1,400 major plan projects and 1,600 minor plan projects ongoing at any given time in 2003. Currently, 35 site inspectors perform these Erosion and Sediment Control inspections along with other site inspection duties.

In 2003, EFID issued an average of 28.1 Notices of Violation (NOVs) per month for violations of Chapter 104 of the *Fairfax County Code*. This represents a 60% increase over last year's NOV rate. It is hypothesized that the unusually wet weather, including Hurricane Isabelle, likely contributed to the increase in NOVs.

b. Lake Martin

Litigation against two of the upstream developers for off-site damages associated with land development activities has been completed; the developers have been ordered to pay for restoration activities. The county has engaged the services of a consultant to prepare a plan to remove 6,100 cubic yards of sediment from Lake Martin. Additionally, plans to retrofit two upstream existing stormwater management ponds to protect stream channels that drain into Lake Martin have been drafted. Revisions to the project site were completed in May of 2004. However there is a shortfall in available funds for implementation of the project.

c. Virginia Department of Conservation and Recreation (DCR) Division of Soil and Water

i. Program review

The Fairfax County Erosion and Sediment Control Program was given an "inconsistent" rating for each of the four components: Administration, Plan Review, Inspection, and Enforcement. DCR is currently working with the county doing reviews based on a Corrective Action Agreement to bring the program to Consistent Status. The reviews should be completed in the fall of 2004.

ii. Complaints

DCR received two complaints in Fairfax County since July 1, 2003, with both having been abated.

4. Occoquan Basin Nonpoint Pollution Management Program

The Northern Virginia Regional Commission continued in its role as staff to the Occoquan Basin Nonpoint Pollution Management Program. The program was established in 1982 to provide an institutional framework for maintaining acceptable

levels of water quality in the Occoquan Reservoir, one of the two major sources of drinking water for much of Northern Virginia. With the release of the 2000 Census data, staff determined that were approximately 363,000 people residing in the Occoquan watershed as of the year 2000. This represents a four-fold increase in population from when statistics were first collected in 1977. The Occoquan Program has initiated an update to its 1992 Northern Virginia BMP (Best Management Practice) Handbook. The main emphasis will be on the inclusion of previously innovative, but now accepted, techniques such as rain gardens and some non-structural BMP techniques with demonstrated removal efficiencies.

a. Modeling

In October, 2001, the Occoquan Policy Board and Technical Advisory Committee approved a fundamental change in the management structure for the Occoquan Model. A standing Modeling Subcommittee has been created to oversee the model development, which will be handled by Occoquan Watershed Monitoring Laboratory. The result will be a state-of-art model that will be able to take quick advantage of advances in modeling technology.

b. Storm Drain Marker Program

NVRC, along with the four local governments that share the watershed, has launched a program designed to place more than 1,100 colorful durable vinyl markers on storm drains. These markers will alert citizens of the potential harm from dumping. Also, NVRC has developed door hangers, in English and Spanish, informing citizens of the program and providing telephone numbers. This program continued in 2003.

5. Soil and Water Conservation Technical Assistance

In calendar year 2003, NVSWCD:

- Reviewed 56 sites plans and provided comments to DPWES on the erosion and sediment controls, water quality protection, and stormwater management aspects of site development plans in the Pohick Creek Watershed and within three miles of the Potomac River. NVSWCD also reviews DPWES, Fairfax County Park Authority (FCPA), and School Board projects and any other plans, as requested, which appear to have particular difficulties involving soil types and slopes.

- Reviewed and commented to the county's Department of Planning and Zoning (DPZ) on 233 rezoning and special exception applications, with particular attention to the properties of soils, the potential for erosion, the impact on drainage, stormwater management, and the surrounding land uses and environment.

- Provided information about soils to 292 consultants, engineers, developers, realtors, and citizens.

- Provided land management assistance to individual homeowners and homeowner associations via 595 phone calls, e-mail or office visits, and 217 site visits. Solutions were recommended for drainage, erosion, and other natural resource problems.

- Provided technical advice to 67 pond owners.

- Demonstrated the *Enviroscape* watershed model 14 times to a total of 351 people, who learned about watersheds and how man's activities on the land directly affect water quality in nearby lakes and streams.

- Coordinated two stenciling outreach programs that educated 740 homeowners about pollutants that reach streams via storm drains—pollutants such as used motor oil, anti-freeze fluid, paint, pet waste, excess fertilizer, and yard debris. These projects were carried out by youth groups and culminated in stenciling a reminder message, "Dumping Pollutes—drains to our stream" on storm drains through the neighborhoods.

NVSWCD created and distributes the *Citizens Water Quality Handbook*, a practical guide to water quality, that contains chapters on watersheds, water conservation, nonpoint source pollution, stream management, wetlands protection, water quality monitoring, environmentally friendly lawn care, specific suggestions for "making a difference," and a listing of agencies and organizations that provide services, information, and help related to water quality.

The *Citizens Water Quality Handbook* has been revised, updated, and renamed the *Water Quality Stewardship Guide*. It is available on line at http://www.fairfaxcounty.gov/nvswcd/waterqualitybk.htm.

Don't Dump Oil, a Spanish language brochure, explains that dumping used oil into storm drains is not only illegal, but can harm people and the environment.

A guidebook entitled "*Maintaining BMP's- A Guidebook for Private Owners and Operators in Northern Virginia"* was published in February, 2000 by the Northern Virginia Regional Commission. The guidebook specifically targets homeowners/civic associations and small businesses that may have responsibility for BMP maintenance. The guidebook addresses simple maintenance tasks, how to plan for long-term BMP maintenance costs and where to go for additional information.

In 2003, NVSWCD distributed 3,953 brochures.

6. Virginia Department of Forestry Technical Assistance

In 2003, the Virginia Department of Forestry provided technical assistance for the development and installation of a rain garden at Daniel's Run Park Elementary School. They also gave over 20 presentation that included topics such stream restoration workshops and watershed/water quality presentations to students, homeowner associations, garden clubs, and professional groups.

7. Stream Valley Reforestation

In 2003, the Virginia Department of Forestry partnered with volunteers from various organizations such as the Difficult Run Conservancy, the Potomac Conservancy, 4-H Clubs, Chesapeake Bay Foundation, and the NVSWCD to plant approximately 2,000 seedlings along 1,300 linear feet along stream valleys throughout Fairfax County.

8. Stream Bank and other Stabilization Projects

a. Accotink Creek Watershed

The Fairfax County Department of Public Works Stormwater Management Division, the Northern Virginia Soil and Water Conservation District, and the Virginia Department of Forestry sponsored two stream bank stabilization projects in the Accotink Watershed. In 2002, 11 root wads were used for stabilization of 300 linear feet of stream bank. The end result of the project is the reduction of sediment in the Accotink Creek Watershed. This installation continues to perform well and has proven itself during the excessive amounts of rain in 2003.

b. Old Farm Pond at Mason District Park Reconstruction and Turkeycock Run Project

The Fairfax County Park Authority (FCPA) finished reconstruction of the old farm pond at Mason District Park (which replaces the existing dam), has installed new structures, installed an overlook at the pool edge, and created a wetland area with boardwalk access. Prior to the reconstruction, stream reaches of Turkeycock Run below the pond had been adversely affected; the increase in pool surface will create stormwater protection for those stream segments.

The FCPA is also planning a restoration of Turkeycock Run that will begin in 2003 as the Mason District Pond restoration is completed.

c. Hidden Pond Park Stream Retrofit

The Fairfax County Park Authority will add BMP (Best Management Practice) controls to an existing facility to protect the portions of the stream above the pond, allow for restoration of stream health, and reduce sedimentation in the pond. The project went out to bid in June, 2003. The second phase of this project will include

reconstructing a forebay just above Hidden Pond and dredging some areas in the pond to restore habitat. The project had been scheduled for construction beginning in 2004. The Park Authority has plans to selectively dredge the upstream end of the main pond.

d. Huntley Meadows Park - Dogue Creek and Barnyard Run

The Fairfax County Park Authority and the Department of Public Works and Environmental Services are working on a bond project that would use bioengineering and conventional stabilization practices to protect the stream reaches of Barnyard Run and Dogue Creek above Huntley Meadows Park.

e. Difficult Run Watershed

The DPWES Maintenance and Stormwater Management Division partnered with the Northern Virginia Soil and Water Conservation District, the Virginia Department of Forestry, and the Reston Association to construct two stream bank stabilization projects, one in Difficult Run mainstem and one in Snakeden Branch, utilizing bioengineering techniques. The Hunter Valley Riding Club assisted in the mainstem Difficult Run Project. Approximately 1,300 linear feet of stream bank was stabilized using root wads, coconut fiber matting, and native vegetation in the Snakeden Branch and a section of mainstream Difficult Run.

9. Septic System Permitting and Repairs

Improperly built and maintained septic systems can often be a source of pollution to surface and ground waters. Approximately 30,000 homes and business are served by septic tank systems in Fairfax County. The county's Health Department has reported that, in Fiscal Year 2003, 205 new septic systems were constructed, 776 Septic Tank Repair Permits were issued (repairs ranged from total replacement of the system to minor repairs such as broken piping), and there were 721 Septic System Repair Permit approvals. Areas of marginal or highly variable soil remain a concern for future failing septic systems. The Health Department inspects new septic systems that are installed as well as the repair of malfunctioning systems. Further, the Health Department enforces requirements pertaining to failing septic systems when such systems are identified (either through a neighborhood survey or by citizen complaint). However, staff resources do not allow for routine inspections of operating systems.

During 2003, three Sewer Extension and Improvement projects extended sewer to 94 homes. It should be noted that this does not mean that all 94 homes had malfunctioning septic systems; typically, neighborhoods considered for sewer line extensions have a few failing systems along with conditions that evoke concerns about the potential for more widespread failure (e.g., ages of septic systems; lack of replacement area in case of failure).

10. Sanitary Sewer Maintenance and Repair

In 2003, 187 miles of old sewer lines and 34 miles of new sewer lines were inspected. Approximately 139,000 miles of sanitary sewer lines were rehabilitated. Over the past six years, repairs add up to 170 miles of sewer lines. 25 dig-up repairs and 91 trenchless point repairs were completed.

11. Storm Sewer Maintenance and Repair

In 2003, 167.5 miles of storm drainage pipe were verified as to location and inspected for deficiencies and maintenance items.

G. PERENNIAL STREAM MAPPING PROJECT

A project to field identify perennial streams was initiated in September of 2001 in response to Fairfax County Board of Supervisors' direction as a result of an Environmental Quality Advisory Council (EQAC) resolution relating to the mapping and protection of additional stream segments under the county's Chesapeake Bay Preservation Ordinance. Funding was approved on September 10, 2001. During the fall of 2001, staff developed a draft protocol for field identifying the boundaries between intermittent and perennial streams. Fieldwork was completed by November 2003 and serves as the basis for delineating perennial stream segments for Resource Protection Area buffers as required by the Chesapeake Bay Preservation Ordinance. On November 17, 2003, the Board of Supervisors adopted the new maps, thus increasing by 52% the amount of stream miles protected (from 638 to 968 stream miles).

H. WATERHED PLANNING AND MANAGEMENT

1. Countywide Watershed Planning

The Fairfax County Department of Public Works Stormwater Planning Division has commenced a five to seven year watershed planning program to develop new management plans for all 30 county watersheds. The current master drainage plans were developed for the county in the mid 1970s. Consultants have been selected for the stream physical assessment tasks for the development of the watershed management plans. The first group of watershed areas totals 43% of the county and includes the following watersheds:

- Little Hunting Creek;
- Popes Head Creek;
- Cameron Run;
- Cub Run/Bull Run; and
- Difficult Run.

The first Stakeholder and Public Involvement Meeting was for Little Hunting Creek. The final Draft Little Hunting Creek watershed Plan was presented in December, 2003. It is expected to be adopted soon.

The Popes Head Creek Watershed advisory group was formed in September, 2003 and the Cameron Run Watershed citizen advisory group began its work in November of 2003.

The physical stream assessment of 800 miles of streams throughout the county was completed in the spring of 2003; the stream assessment will provide the majority of the field reconnaissance information for the watershed plans.

2. Reston Watershed Plan

The Reston Association Board of Directors authorized the development of a Watershed Management Plan and establishment of a stakeholders group (the Reston Association Watershed Action Group--ResWAG). Work on the project was initiated in 2001 and was completed and presented in July of 2002. Work was done by the environmental firm GKY and Associates. Focus has been directed to implementation and watershed education outreach programs. The Reston Association has signed a Memorandum of Understanding with the county to coordinate the Reston Watershed Planning efforts with the county Watershed Planning efforts.

3. New Millennium Occoquan Watershed Task Force

In 2002, the Board of Supervisors celebrated the 20th anniversary of the downzoning of nearly 41,000 acres of land in the Watershed for the purpose of protecting the Occoquan Reservoir (one of two sources of drinking water for the majority of Fairfax residents) from nonpoint source pollution. Included in this celebration was the establishment of the New Millennium Occoquan Watershed Task Force, which was established by the Board to provide guidance on appropriate watershed management efforts 20 years after the downzoning. The Task Force presented a series of recommendations addressing watershed management issues on January 27, 2003. The recommendations of the Task Force provide an assessment of issues facing the Fairfax County portion of the Occoquan watershed, examine the gaps in programs being carried out by local, state, and regional agencies, help define the role of volunteer organizations that have interests in the watershed, and provide a vision for the future management of the watershed. On July 7, 2003, county staff presented the Board of Supervisors with an implementation plan responding to each of the 29 recommendations of the report.

I. GROUND WATER ASSESSMENT

The United States Geological Survey (USGS) maintains a series of wells throughout the nation to monitor groundwater levels and drought. Two are located in Virginia; one such well (Site 385638077220101) in Fairfax County has been maintained since 1976. This

well provides continuous real-time data that is used by the USGS to assess ground water levels. You can find the information on this well by going to http://groundwaterwatch.usgs.gov.

Neither Fairfax County nor the Virginia Department of Environmental Quality monitors for groundwater levels or groundwater water quality data.

J. DRINKING WATER SUPPLY

The county's water supply comes from the Potomac River, the Occoquan Reservoir, Goose Creek, community wells, and private wells. Fairfax Water (FW), formerly known as the Fairfax County Water Authority (FCWA), provides drinking water to most Fairfax County residents. FW also provides drinking water to the Prince William County Service Authority, Loudoun County Sanitation Authority, Virginia America Water Company (City of Alexandria and Dale City), Town of Herndon, Fort Belvoir, and Dulles Airport. However the City of Fairfax receives its water from the Goose Creek Reservoir in Loudoun County, and the City of Falls Church buys its drinking water from the Washington Aqueduct's Dalecarlia Plant on the Potomac River. Much of the information provided in this section of the Annual Report has been excerpted from guidance provided by Fairfax Water.

With the exception of some wells, prior to use the water must be treated. Fairfax Water provided 48.99 billion gallons of drinking water in 2003.

Table III-3
Fairfax Water -Water Supply Sources , 2003

Sources	Gallons (in billions)
Occoquan Reservoir (Lorton/Occoquan)	19.84
Potomac (Corbalis)	29.01
Wells	0.01
Purchased	0.05
Untreated	0.08
TOTAL	48.99

Source: Fairfax Water

1. Wells

a. Fairfax Water and Public Wells

In 2003, FW operated two wells in Fairfax County, both in the Riverside manor Community. These two wells and their distribution systems were monitored monthly for bacteriological quality and annually for Volatile Organic Compounds

(VOCs). In addition, the wells were tested semiannually for metals, nutrients, solids, odors, color, pH, alkalinity, and turbidity. During 2003, one of the wells "slightly" exceeded the Secondary Maximum Contaminant Level (SMCL) for odor. These are non-enforceable limits relating to the aesthetic quality of drinking water. Lead and copper monitoring in accordance with EPA and Virginia Department of Health (VDH) Waterworks Regulations was performed on both distribution systems in 2001. The system met all EPA Lead and Copper regulatory requirements and was placed on an Ultimate Reduced Monitoring schedule by VDH due to the low levels found. The next scheduled collection is during 2004.

Tests of FW Riverside Manor Well system indicate the presence of radon in the water. Radon is naturally occurring substance and it is not unusual to be present in groundwater resources in Fairfax County. Health effects from radon exposure have found to be far greater from indoor air as opposed to water. For this reason, the Fairfax County Health Department advises residents who may be concerned about radon in their homes to test the indoor air levels. Radon is not currently regulated in public drinking water systems.

b. Private Wells

There are approximately 12,000 single family residences that are served by individual well water supplies in Fairfax County. In 2003, 163 New Well Permits were issued for single family residences. There were 396 wells closed in 2003.

2. Lorton and Corbalis Systems Monitoring Results and Reports

a. Trihalomethanes, Chloramines, and other By-products of Water Treatment

Trihalomethanes are by-products of chlorination water treatment and are thought to be carcinogenic.

b. Trihalomethanes (THM) Monitoring Project

The 2003 distribution system running quarterly averages were below the Maximum Contaminant Levels (MCL) for total trihalomethanes (TTHM) of 80 µg/L. The 2003 running quarterly averages for TTHMs were 13 µg/L and 37µg/L for the Corbalis and Lorton distribution systems, respectively.

c. Disinfectant/Disinfection By-products (D/DB-P) Rule

EPA has promulgated Stage I of the D/DB-P Rule, which lowers the total THM MCL from 100 µg/L to 80 µg/L. This rule took effect in January of 2002 (TTHM - Total Haloacetic Acids, Bromate, and Chlorite and the Disinfectants, Chlorine, Chloramine, and Chlorine Dioxide).

In addition, the disinfection by-product "Haloacetic Acid 5" (HAA5) will be regulated at a level of 60 µg/L. The 2003 HAA5 distribution system running quarterly averages were below the Maximum Contaminant Level (MCL) of 60 µg/L. The 2003 running quarterly averages for HAA5s, as reported to the Virginia Department of Health, were 13 µg/L and 37 µg/ L for the Corbalis and Lorton distribution systems, respectively.

The rule also sets a Maximum Residual Disinfectant Level (MRDL) for chlorine of 4 µg/L in drinking water. The MRDL for chlorine was 3.4 mg/L in 2003.

d. Heavy Metals

FW tests drinking water quarterly for Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Lead, Magnesium, Mercury, Nickel, Potassium, Selenium, Silver, Thallium, and Zinc and on a monthly basis for Iron, Manganese, and Sodium. The levels of these metals monitored in 2003 continue to be below their MCL or SMCL. "The concentration levels for the unregulated metals were within an expected range." The report is available for review on the web at www.fairfaxwater.org.

e. Enhanced Surface Water Treatment Rule (ESWTR)

The ESWTR assumes revisions to the current Surface Water Treatment Rule may be necessary to provide additional protection from pathogenic organisms. The fist step toward developing the ESWTR was the microbiological monitoring required under the Information Collection Rule. The first year of the data has been used to develop requirements for the interim ESWTR. The long-term ESWTR will be based on additional data collection and refinement. The proposed ESWTR will provide for a sanitary survey of the entire system, a maximum contaminant level goal for cryptosporidium of zero, and treatment requirement alternatives. Possible additional requirements may include notifying the state as soon as possible about persistent turbidity levels above the performance standards that might not necessarily be violations.

f. Other Monitoring Programs

Fairfax Water monitored 3,313 distribution taps for total coliform bacteria in 2003. Each month's compliance report was within the regulatory limits for the Virginia Department of Health and the EPA's Total Coliform Rule**.**

During 2003, the FW Laboratory monitored the surface waters and finished drinking water for 42 Volatile Organic Compounds (VOC) and 39 Synthetic Organic Compounds (SOC). No VOCs were detected in source waters except for trace amounts of MtBE (Methyl tertiary butyl ether), a non-regulated parameter. MtBE is a gasoline additive that has received public attention recently. In some parts of the U.S., MtBE has been detectable in high amounts in source waters. The

only VOCs detected in the finished water systems were TTHMs and trace amounts of MtBE. The few SOCs that were detected were detected in both the finished and source waters and were at trace levels significantly below the maximum contaminant levels (MCLs). Specific information on these trace levels can be found in the FW Annual Report on Water Quality for 2003. The report can be accessed on the web at www.fairfaxwater.org.

During 2002, FW monitored 53 customer taps for lead and copper in accordance with the EPA regulations. FCWA met all EPA and VDH requirements for this rule and has been put on Ultimate Reduced Monitoring status due the prolonged low results. The next scheduled monitoring will be in the summer of 2005.

g. Residuals Disposal

Residuals occur as the result of heavy sediment loads entering the freshwater intakes and having to be removed from the water prior to treatment. "Maryland and Virginia farmers consider the high calcium carbonate content of the dewatered residuals to be beneficial soil additives." Residuals generated at Corbalis are presently being applied by contract to agricultural lands in Maryland and Virginia. FW is studying the possible use of polymers in lieu of lime in the dewatering process. If polymer condition dewatering becomes feasible, the solids volume for disposal may decrease.

h. Consumer Confidence Reports

Federal regulations require water suppliers to provide annual reports on the quality of the drinking water to their customers through the Consumer Confidence Report (CCR) Rule. FW customers received their first annual CCR in the summer of 1999. The 2003 Water Quality Report is available for review on the FW Web site at http://www.fairfaxwater.org.

3. Source Water Assessments

The 1996 Amendments to the Safe Drinking Water Act (SDWA) provided for source water assessment and protection programs designed to build a prevention barrier to drinking water contamination. Under SDWA, states are required to develop comprehensive Source Water Assessment Programs that identify the areas that supply public tap water, inventory contaminants, and assess water system susceptibility to contamination. Fairfax Water, through a grant from the Virginia Department of Health, has completed an inventory of potential sources of contamination and a survey of land use activities within the Potomac and Occoquan Watersheds. The Virginia Department of Health is currently reviewing the complete Source Water Assessment. This is available for review on the FCWA website at http://www.fairfaxwater.org.

4. Facilities Management

a. New Treatment Plant in Lorton

FW is building a new state-of–the–art 120 mgd (million gallons per day) water treatment plant, expandable to 160 mgd, to replace the existing Lorton and Occoquan treatment plants in Lorton. In addition to flocculation and sedimentation, the Griffith Water Treatment Plant will include advanced treatment processes of ozone disinfection and biologically active, deep bed, GAC (granular activated carbon) filtration. Construction of the plant began in the spring of 2000 and was approximately 90% completed as of July, 2004. Full use of the plant is currently scheduled by the contractor for end of 2004. The raw water pumping station associated with the new plant is completed and has a capacity of 120 mgd, expandable to 160 mgd.

b. Potomac Water Treatment Plant (Corbalis)

This plant located near Herndon, Virginia is currently treating up to 150 million gallons a day taken from an offshore intake on the bottom of the Potomac River. The third 75 mgd phase, which will bring the plant capacity up to 225 mgd, is currently under design with construction to begin in 2003 and service in 2007. The plant is designed for an ultimate capacity of 300 mgd. This utilizes ozone as a primary disinfectant, flocculation-sedimentation, biologically active filters with carbon caps, and chloramine final disinfection.

5. Regional Cooperative Water Supply Agreements

In order to protect the ecosystem of the Potomac River during low flow periods, the three major water utilities in the Metropolitan Washington area have signed water allocation agreements for water use during these low flow periods. Two upstream dams, Jennings-Randolph on the Potomac River and the Savage River Dam, along with Seneca Lake in Montgomery County, Maryland, are storage facilities for drinking water supplies during low flow periods. While the Potomac River has flows that average above 7,000 million gallons a day, the river has often reached flows well below that, usually in late summer and early fall. The lowest recorded flow in this region was 388 mgd at Little Falls in September during the drought of 1966. This is an adjusted figure that does include the withdrawal allocation of 290 mgd. In 1981, the three major metropolitan water utilities, including Fairfax Water, signed the Low Flow Allocation Agreement, which creates a protocol for allocation of water from the Potomac during periods of low water. The current environmental flow recommendations are 300 mgd downstream of Great Falls and 100 mgd downstream of Little Falls. In 2002, the Maryland Department of Natural Resources revisited this issue of the flow level necessary to support aquatic habitat in the Potomac River and was unable to replicate the methodology use to create the present low flow requirements in the agreement. Further efforts are underway to determine the scientific research necessary to make a recommendation.

On April 8, 2003, the Maryland Power Plant Research Program and the Interstate Commission on the Potomac River Basin sponsored a one-day workshop with a panel of nationally recognized experts on habitat assessment to investigate and develop methods to evaluate the environmental flow-by requirements. Their conclusion of the present low-flow agreement is that: "Existing biological data and understanding are inadequate to support a specific, quantitative environmental flow-by." At this workshop, members of the special panel collectively considered and debated the various methodologies applicable to the Potomac River to address the flow-by issue. The final product of the workshop is a set of recommendations for 1) the best method or approach, given current financial resource limitations, to address the Potomac Flow-by Study objectives, and the level of confidence associated with their recommendations, and 2) an alternative long-term method or approach which could better accomplish those objectives, yet might exceed current resources or available data, and recommended guidelines for achieving the objectives in a longer time-frame. The entire report can be viewed at:
http://www.esm.versar.com/pprp/potomac/default.htm.
Click on the word workshop to see the findings for the day and a list of the panel present.

a. Interstate Commission on the Potomac River Basin (ICPRB) Cooperative Water Supply Operations (CO-OP)

The ICPRB plays several important roles in providing for the region's current and future water supply needs. The CO-OP Section facilitates the agreement among the three major water utilities (Fairfax Water is one) that require water suppliers to coordinate resources during times of low flows in the Potomac River. The Water Resources Section also provides technical water resources management assistance to the jurisdictions throughout the basin. Flow in the Potomac was more than adequate to meet drinking water withdrawal needs by the regions major utilities in 2003. There were no releases from upstream reservoirs necessary to augment water supplies.

b. Metropolitan Washington Area Council of Governments (COG) Water Supply and Drought Awareness Plan

In response to the droughts of 1998 and 1999, COG brought together a task force in May, 2000 to coordinate regional responses during droughts to reduced availability of drinking water supplies. The plan consists of two components: (1) a year round plan emphasizing wise water use and conservation; and (2) a water supply and drought awareness and response plan. The Interstate Commission on the Potomac River Basin handles the administration of the coordinated drought response for water withdrawals from the Potomac River and during low flows. Additionally, the CO-OP Section works with COG and the Drought Coordination Committee to assist in providing accurate and timely information to basin residents during low-flow conditions in the Potomac. In process is a campaign targeted to specific audiences to reduce water use based on the Arizona Water Use It Wisely campaign. Based on

a poll conducted in February, 2002 for COG, many respondents did not have a basic knowledge of the water supply system. Those most likely to practice water conservation were women over 45. Those least likely to conserve water were males 18 to 24, non-bill payers, lower income residents, and renters in Washington, D.C.

K. NEW LAWS OR REGULATIONS

1. Amendments to the Chesapeake Bay Regulations

On December 10, 2002, the Chesapeake Bay Local Assistance Board (CBLAB) adopted its final amendments to the Chesapeake Bay Preservation Area Designation and Management Regulations. These amendments include a revised method to assign Resource Protection Areas (RPAs) to perennial streams. Fairfax County had until December, 2003 to submit its revised Chesapeake Bay Preservation Ordinance to CBLAB. As noted earlier in this chapter, the Board of Supervisors adopted a revised Ordinance on July 7, 2003 and accepted the revised perennial stream maps as a basis for implementation in November of 2003. CBLAB has determined that the county's revised Ordinance is consistent with the Chesapeake Bay Preservation Act and Chesapeake Bay Preservation Area Designation and Management Regulations.

2. Amendments to the Erosion and Sediment Control Ordinance

The Erosion and Sediment Control Ordinance was amended on August 4, 2003 to include the following:

- A requirement, as a condition of permit issuance, for the identification of the individual who will be in charge of and responsible for carrying out the land-disturbing activity prior to issuance of a land-disturbing permit (the requirement was previously a condition of plan approval);

- A revision to the definition of "land-disturbing activities" as the term relates to shoreline erosion control projects; the revision established that any land-disturbing activity outside of tidal waters associated with such projects is not exempt from being considered as a land-disturbing activity;

- An amendment to the definition of "land-disturbing activities" to include the placement of pavement or other impervious surfaces over existing pervious areas; and

- The incorporation of the following references:

    - The requirement for utilities and railroad companies to file general erosion control specifications annually within the commonwealth;

- The exemption of State agency projects from local ordinances; and

- The requirement for the county's approved inspection program to be in compliance with the Virginia Erosion and Sediment Control Law.

L. AWARDS

Fairfax County received recognition by the Chesapeake Bay Program as a Gold Award recipient for the second time since 1997 under the Chesapeake Bay Partner Community program. "The Chesapeake Bay Partner Community Award recognizes, encourages and supports local government in the Chesapeake Bay watershed whose actions demonstrate their commitments to protecting and restoring the Chesapeake Bay, its rivers and its streams."

M. OVERVIEW

2003 was a watershed year for stream protection and restoration efforts in Fairfax County:

-The new Chesapeake Bay Preservation Ordinance, passed in 2003, increased protection to all perennial streams by changing the performance criteria for development within the Resource Protection Areas. The new language added requirements in the information to be provided with applications for construction permits and changes to the procedures and criteria for the granting of exceptions to the Ordinance. Civil and criminal penalties are available to address violations. The DPWES perennial stream mapping project finished its work in October, 2003 and the Board of Supervisors adopted the new maps as the basis for administration of the Chesapeake Bay Preservation Ordinance on November 17, 2003, thus increasing by 52% the amount of stream and shoreline miles protected from 638 to 968 miles (including 118 miles of shoreline).

-Completion of the Watershed Management Plans for each of the county's 30 watersheds is under way; the final Draft Little Hunting Creek Watershed Plan was presented in December, 2003. The Popes Head Creek Watershed Advisory group was formed in September, 2003 and the Cameron Run Watershed citizen advisory groups were initiated in November, 2003. This countywide Watershed Restoration and Protection Strategy is the result of the recommendations of the 2001 Stream Protection Strategy Report started in 1998 and presented in 2001.

-The New Millennium Occoquan Watershed Task Force report, co-chaired by the Northern Virginia Regional Commission, was presented to the Board of Supervisors on January 23, 2003. The Task Force was established as part of the 2002 Board of Supervisors' celebrations of the 20th Anniversary of the downzoning of nearly 41,000 acres of land in the Occoquan Watershed for the purpose of protecting the Occoquan Reservoir. On July 23, 2003, county staff presented the BOS with an implementation plan responding to each of the 29 recommendations of the report.

-During 2003, the Environmental Coordinating Committee's Regional Pond Subcommittee continued its work to develop a unified position on regional ponds. The Subcommittee identified 61 recommendations to improve Fairfax County's stormwater management program and to clarify the role of regional ponds within that program. The recommendations address the use of regional ponds, suggest the inclusion of other innovative and non-structural techniques, and suggest changes in the Public Facilities Manual, stormwater policies, codes and ordinances. The Subcommittee is currently in the process of developing an implementation plan for all recommendations, including a time line and assignments.

-Much of the local work of monitoring the streams in Fairfax County is now being coordinated in the Stormwater Planning Division of the Department of Public Works and Environmental Services (DPWES); beginning in 2005, the Stormwater Planning Division will assume responsibility for the annual Stream Water Quality Report that is currently prepared by the Health Department.

This year's work adds to the previous years' works not already mentioned above:

-Infill and Residential Development Study Report, accepted by the Board of Supervisors in January of 2001, which had 29 separate recommendations addressing stormwater, erosion. and sediment control issues.

-The reformation of the Environmental Coordinating Committee under the Deputy County Executive and the work and guidance of the Environmental Coordinator have done much to coordinate environmental planning within the county.

-In September, 2002, the Board of Supervisors adopted an amendment to the Policy Plan volume of the Comprehensive Plan to revise criteria that are used to evaluate residential development proposals. This amendment includes a heightened emphasis on environmental protection, including stormwater management. *Developments should minimize off-site impacts on water quality by commitments to state of the art best management practices for stormwater management and low-impact site design techniques. . . . The volume and velocity of stormwater runoff from new development should be managed in order to avoid impacts on downstream properties. Where drainage is a particular concern, the applicant should demonstrate that off-site drainage impacts will be mitigated and that stormwater management facilities are designed and sized appropriately. Adequate drainage outfall should be verified and the location of drainage outfall (onsite or offsite) should be shown on development plans.*

However, Fairfax County streams and watersheds continue to be impacted by four basic problems:

-Although progress has been made in this area with the addition of language to the Policy Plan volume of the county's Comprehensive Plan, watershed and stream protection need to be maximized in land use planning and site design decisions; the cumulative effects of land use decisions on Fairfax County's streams need to be considered adequately.

-Secondly, stormwater runoff and erosion continue to be the largest problems within Fairfax County streams. **A key requirement for controlling stormwater discharge is to limit post development runoff to that which does not exceed pre-development runoff rates.** The notion of "adequate outfall' theoretically exists but does not seem to exist in real time. Most Fairfax County streams have increased runoff flows that exceed the capacity of their stream channels. This has created an ongoing erosion cycle that includes eroding stream banks, heavy sediment loads, and sedimented stream bottoms. This erosion cycle persists for years, if not decades, until the stream channel widens to accommodate the flow. This has resulted in erosion problems throughout the county on trail systems, homeowners' backyards, business' landscapes, and transportation infrastructure such as bridge abutments. In addition, these ongoing erosion patterns have resulted in numerous large and small ponds and lakes throughout the county having enormous sediment deposition, which then requires frequent maintenance and dredging to maintain depth. Sediment on stream bottoms results in reduced habitat and diversity, and compromises food webs within watersheds. Sediment also compromises the quality of, and increases the expense of, treating the drinking water within the Occoquan Reservoir. Poor land use planning, inadequate enforcement of soil and erosion laws, and inadequate stormwater management in past years has significantly contributed to these erosion problems. Only a few streams, such as Walney Creek in E. C. Lawrence Park, remain undisturbed and excellent examples of healthy streams in Fairfax County.

-Thirdly, at times, high levels of fecal coliform bacteria occur in specific streams throughout the county.

-Lastly, although much of the responsibility for stream protection and restoration efforts have been coordinated within DPWES, conflicting results have occurred as stormwater management strategies and policies suggested within one area of DPWES have conflicted with waivers granted by others, often resulting in degraded stream habitat.

Much credit needs to be given to Fairfax County for pursuing its efforts in stream restoration and protection. All of these efforts indicate a significant change in county policy and practice towards the protection and restoration of county streams. However, as long as the rate of stream degradation surpasses stream protection and restoration efforts in Fairfax County streams, the trend will continue to be a downward one.

N. RECOMMENDATIONS

1. EQAC cannot over-emphasize and support the importance of creating a Stormwater Environmental Utility Fee Program for funding of the county's watershed protection and restoration needs. The Stormwater Environmental Utility Fee program is essential to carrying out the recommendations of the Comprehensive Watershed Plans being created throughout the county.

2. EQAC recommends that increased emphasis be placed on monitoring and enforcement of predevelopment stormwater management controls and the re-examination of "adequate outfall" requirements.

   Recent research has shown that over 60% of the sediments in damaged streams are the direct result of stream bank erosion. Streams can become damaged by the changes brought about by changes in stream hydrology and increased flow during the pre-development clearing phase. The stream sees an overall increased flow due to the increased runoff caused by the clearing. This is not just the increase in peak flow, but the increase in the total volume of the water entering the stream. These increased flows start the cycle of damage, and once the stream is damaged it may take years or decades for the stream banks to revegetate and restabilize. Also, expensive stream bank stabilization projects may be required. Prevention of such damage would not only be good for the environment but would also be cost effective. Prevention of this damage can be assisted by strict monitoring and enforcement of the stormwater management control system prior to construction and not allowing predevelopment runoff flows to increase during the development phase.

3. EQAC strongly recommends that Fairfax County (the Board of Supervisors, the Planning Commission, the Board of Zoning Appeals, the Fairfax County Park Authority and various county agencies) continue to develop methodology that incorporates into their land use considerations a protocol that would assist them on the individual and cumulative effect of such decisions on the county's waterways. EQAC urges them to use this information to protect the county's waters, including its lakes, streams, and drinking water supply reservoir. EQAC commends the Board for adopting Residential Development Criteria that include criteria supporting the provision of adequate drainage outfalls and innovative water quality measures; EQAC views this action as a step in the direction of satisfying this recommendation.

   Land use planning and transportation planning are the single most effective tools for the protection of streams and rivers. Structure siting, Best Management Practices, and Low Impact Development techniques could be more effectively used within the county to protect local streams.

4. EQAC continues to strongly support the full funding and implementation of the comprehensive countywide watershed management program.

   Fairfax County's stream and other water resources are a legacy to preserve and protect for today's citizens and future generations. The well conceived and well–done countywide stream assessment report was released in January, 2001. This underlying scientific examination of existing stream conditions is being used to create a well-coordinated and well-planned effort to establish priorities to protect, restore, and monitor changes to these resources using watershed and sub-watershed based strategies. EQAC strongly endorses the ongoing work of the county Board and staff in the watershed planning efforts.

EQAC continues to support:

a) Coordination of ongoing assessments of existing watersheds, to include point and non-point sources, including amounts of impervious surface and vegetative cover;

b) Maintenance and inspection of county BMPs at the highest level;

c) Provision of funding at a level that is adequate to create and implement a fully functional stream protection program;

d) The coordination of all relevant water quality and stream data and data analysis from all sources within the DPWES Stream Protection Strategy and watershed management program; and

e) The granting of a minimum number of waivers and the authority given so that all waivers must be reviewed and either accepted or denied by the stormwater management program responsible for watershed planning (i.e., the Stormwater Planning Division of DPWES).

5. This watershed protection and restoration program should also include the following:

a) Equal importance should be devoted to environmental protection, restoration, and monitoring as compared to infrastructure improvement and maintenance.

b) A Watershed Board should be established to oversee such a program and to ensure that the above conditions are met. While EQAC realizes that there is some concern about how such a board would function, EQAC feels that such a board would best be able to consider input from all stakeholders interested in watershed restoration and protection at the countywide policy level.

c) This also should include structures and practices and a timely approval process that encourages bioretention and recharge to aquatic systems, and other innovative practices to be used in the county.

6. EQAC continues to recommend posting of county streams with a health warning for fecal coliform bacteria until such time that the county conducts a study as to the source of microbiological threats. EQAC recommends that the county initiate such a study within 12 months and subsequently implement a plan to address the sources of actual threats to public health.

County streams have continued to show high coliform bacteria counts. A Total Maximum Daily Load (TMDL) for coliform bacteria has been developed for Accotink Creek and Four Mile Run due to excessive coliform bacteria counts. The sources of the pollution have been identified and steps need to be taken to remediate the problem. Human coliform bacteria have been found to be present in significant amounts. Until such a time as remediation is made, EQAC recommends the posting of signs in county streams with high coliform bacteria counts and/or a broad public information campaign that contains the following from the 1999

Health Department report: *"The use of streams for contact recreational purposes, such as swimming, wading, etc. which could cause the ingestion of stream water or possible contamination of an open wound by stream water, should be avoided"*.

7. EQAC is pleased to note the MS4 requirement to develop a long-term watershed monitoring program to verify the effectiveness and adequacy of stormwater management goals and identify areas of water quality improvement or degradations. EQAC further recommends a pilot program of monitoring or study on the effectiveness of stormwater detention facilities.

   While the overall reports, the Health Department Report and the Stream Protection Strategy Baseline Study (DPWES), indicate that Fairfax County streams have degrees of degradation, the specific causes are unclear. In some cases such as Kingstowne, there is adequate monitoring, and remediation, when required, has occurred. In other cases, such as Lake Martin, citizens were placed in the unfortunate position of having to monitor and document the degradation due to failed or inadequate stormwater facilities and inadequate soil and erosion enforcement.

   EQAC is, however, unclear as to which structures and requirements are effective and working well in what conditions in Fairfax County. The continued granting of stormwater waivers appears to contribute to degradation of streams despite claims to the contrary. Data should be collected.

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CHAPTER IV

SOLID WASTE

IV. SOLID WASTE MANAGEMENT

A. ISSUES AND OVERVIEW

Fairfax County's solid waste program had a remarkable year in FY2004. As usual, the county exceeded its contractual obligations to the Covanta Energy Resource Recovery Facility (E/RRF) as well as collecting waste from over 40,000 homes in County Sanitary Districts with few complaints. This year, however, was a year of challenges and accomplishments. The business area faced the challenge of responding to a weather emergency in the form of Hurricane Isabel that devastated many homes in one sanitary district and generated record amounts of brush throughout the county.

The county staff also prepared a 20 year solid waste management plan (SWMP) for submission to the Virginia Department of Environmental Quality. The county accomplished the development of the SWMP by involving thousands of citizens in identifying issues they wanted addressed and strategies for resolving those issues over the next few years. The detailed recommendations of the SWMP will be discussed later.

The Solid Waste Management Program succeeded in being certified as an Environmental Enterprise (EE) program in Virginia. One of the major requirements of the EE designation is having a management system with environmental policies and procedures. The organization must also identify environmental goals and objectives and define how the organization will achieve and maintain those goals.

The recycling program also received a national award for its efforts in organizing an America Recycles Day in conjunction with Herndon High School. The acknowledgement brought with it a check for $7,500 to support continuing recycling and public education efforts.

Credit cards can now be used to pay for disposing of waste at the Citizens' Disposal Facilities at I-66 and I-95. This innovative approach coordinated the use of credit cards into the existing information, financial accounting and banking systems that support the ongoing management activities for the disposal program.

There are two solid waste divisions within the county government, the Division of Solid Waste Collection and Recycling (DSWC&R) and the Division of Solid Waste Disposal and Resource Recovery (DSWDRR). These two divisions form a single business area, the Solid Waste Management Program. DSWC&R has a new director, who was selected after an extensive search following the retirement of the previous director.

This year, the business area has focused attention on implementing its goals from the Strategic Plan developed last year as part of the County Executive's ongoing Framework for Excellence. These goals were mirrored and reemphasized in budgets that support the business area's portion of the county's vision elements by:

- ***Maintaining And Enhancing An Integrated Solid Waste System***
  (County Vision Linkage to Three Elements: Maintaining Safe and Caring Communities, Practicing Environmental Stewardship, and Corporate Stewardship)

- ***Achieving Financial Viability Through Sound Financial Practices***
  (County Vision Linkage: Corporate Stewardship)

- ***Maintaining Or Improving Internal Management System***
  (County Vision Linkage: Maintaining Healthy Economies)

- ***Providing Excellent Customer Service***
  (County Vision Linkage to Three Elements: Maintaining Safe and Caring Communities, Maintaining Healthy Economics, and Creating a Culture of Engagement)

- ***Enhancing The Community And Protecting The Environment***
  (County Vision Linkage to Three Elements: Maintaining Safe and Caring Communities, Practicing Environmental Stewardship, and Creating a Culture of Engagement).

1. Contractual Issues and Landfill Capacity

Covanta Fairfax, Inc. and its parent company, Covanta Energy, emerged from bankruptcy on March 5, 2004 after almost two years. Covanta was acquired by Danielson Holding Company. All required payments to the county had been satisfied previously. Maintenance and operation at the waste-to-energy facility had continued without disruption throughout the bankruptcy. This year, the facility processed over 1,084,000 tons of waste. It served a valuable community function by also being approved as a disposal site for the emerald ash borer that infected several ash trees in the county. In response to a request from the Virginia Department of Agriculture, the Energy/Resource Recovery Facility (E/RRF) was able to handle all the wood chips generated by the destruction of the trees and assure the 100% containment of the spread of the insects. Likewise, arrangements have been made to process contaminated nursery stock (sudden oak plant death disease) in the facility to prevent the spread of that disease to healthy plants in the area.

Due to routine maintenance outages at the E/RRF, significant weather events, and an increase in Fairfax County waste, the county bypassed 70,307 tons of waste to landfills during the year, based upon contingency contracts that were in place. Having these contracts in place was invaluable in expediting those situations when bypass capacity was needed.

The E/RRF continued to receive about 19% of its waste from jurisdictions outside the county. However, as of February 2004, the District of Columbia elected to landfill its waste and not use the E/RRF as part of its new contracted services.

Additional agreements brought waste to the E/RRF from Fort Belvoir, Prince William County exchange of waste, and Alexandria Sanitation. Roughly 95% of the Guaranteed Annual Tonnage (GAT of 930,750 tons) waste was generated by Fairfax County residents in FY2004.

2. Solid Waste Management Plan (SWMP)

The development of the SWMP continued this year by engaging the community to identify its needs for waste collection, recycling, transportation, and disposal management for the next 20 years. A public opinion survey was conducted at many major events such as Celebrate Fairfax, Fall for Fairfax, and other community events. Thousands of residents were contacted or attended community meetings to discuss their concerns with collection, recycling, customer service, and other issues. This information formed the basis for the seven significant recommendations of the SWMP:

- Emphasize source reduction and reuse as a priority public outreach message to residents.
- Increase curbside recycling to include plastic bottles, cardboard, and mixed paper.
- Include all businesses in the recycling program.
- Study and evaluate improvements needed in residential waste collection.
- Continue to use the Energy/Resource Recovery Facility after 2011 when the construction bonds are paid.
- Explore ways to deal with construction/demolition/debris (CDD) wastes so that more is recycled and methods are available to dispose of CDD once the private landfills close.
- Expand public outreach and education to residents and the schools about waste generation rates and the need to recycle more to maintain disposal capacity at the E/RRF.

The SWMP contained an issue about the county increasing its oversight role in residential waste collection. Following the public hearing on May 10, 2004, the Board of Supervisors decided not to make any immediate changes in residential collection practices. The SWMP was submitted to the Virginia Department of Environmental Quality on June 22, 2004.

As a result of the concerns and issues that some residents had raised about the need for a thorough review of residential waste collection practices throughout the county, the Solid Waste Management Program Task Force was appointed by the Board of Supervisors to investigate the customer service, environmental, and operational issues that surround residential waste collection practices in the county. The Task Force will have its report to the Board by May 10, 2005.

3. Use of Credit Cards

The citizens' disposal facilities began accepting credit cards on a pilot basis this year in an effort to better serve our customers. As part of the evaluation, staff will evaluate the

impact of the transaction costs on the overall price that customers will pay to dispose of waste.

4. Solid Waste Disposal Fee

The contract waste disposal fee, offered to companies that sign agreements with the county, remained at $39.95 per ton for FY2004. The contract disposal fee covers transportation and disposal of waste, but does not fully cover all community benefit programs supported by the Solid Waste Program.

The fee for FY2005 will be raised by $2.50 to $42.45 per ton for all Fairfax County waste. The increase is due to the tip fee increase from Covanta Fairfax that resulted in part from:

- Contractual reductions in the rate paid by Virginia Dominion Power for electrical capacity.
- Increased operations and maintenance costs (reagents to prevent pollution of the air and ash).
- Reduced revenue from investments.

Fees for residents and commercial cash customers to use the citizens' disposal facilities increased in FY2004 to $55 per ton for trash. The increase was necessary to cover the additional costs of handling and transporting this waste for disposal. No increases in this rate are anticipated for FY2005, although the cost of individual materials such a yard waste will increase to $42.45 for residents who bring their yard waste to a disposal site.

The tip fee traditionally covered the cost of community benefit programs such as household hazardous waste, recycling education and outreach, and code enforcement. In recent years, the tip fee had not covered all the costs of these community benefit programs, so reserves and funding from the General Fund have been needed. In FY2004, that amount was $1.8 million. Staff will continue to monitor the situation closely to ensure that costs are met, contractual requirements fulfilled, and changes to procedures are made as required.

B. PROGRAMS, PROJECTS, AND ANALYSIS

1. Waste Disposal

a. I-95 Sanitary Landfill

i. Groundwater Monitoring

Groundwater Protection Standards (GPS) were established for the I-95 Landfill on November 20, 2000, through an amendment to the facility permit. Based on

the results and chemical analysis, the concentration of some constituents appear to exceed their respective groundwater standards in particular wells during monitoring events in 2002 and 2003. These wells are located very close to the buried waste. Pursuant to the landfill permit, VDEQ was notified. Exceeding the GPS limits required the county to perform an Assessment of Corrective Measures (ACM). In accordance with Waste Management Regulation 9 VAC 20-80-250.D.6.g, the Assessment of Corrective Measures report was submitted to VDEQ in August, 2002. VDEQ's comments were addressed in the revised ACM and Corrective Action Plan (CAP) which was submitted on April 30, 2004 for approval. The report includes the nature and extent of groundwater contamination, risk assessment and proposed corrective action. The county has proposed to implement a five-part remedy for the I-95 Landfill. Proposed components of the program consist of:

- Institutional controls;
- Engineering controls;
- Monitored natural attenuation;
- Accelerated bioremediation (reductive dehalogenation); and
- Direct oxidation

The county will implement institutional controls in accordance with the post closure care plan. A variety of engineering controls (leachate collection, landfill gas system, and placement of cover) will be used. As presented in the ACM, the concentration of most regulated constituents began to attenuate relatively abruptly after engineering controls were implemented during the 1990s. Natural attenuation will be enhanced by injection of food grade material that will enhance microbial activity via reductive dehalogenation. Direct oxidation will be employed in one area of the facility. Two common forms of permanganate (potassium and sodium) will be used. Both are strong oxidizing agents. This will be done in the selected areas. A Corrective Action Monitoring Plan has been submitted to VDEQ along with the Corrective Action Plan (CAP). Staff will continue to perform the groundwater monitoring to comply with the VDEQ's requirements of assessment monitoring. Further, staff will monitor the additional parameters at supplemental locations as specified in the CAP. These proactive steps will be used at the I-95 Landfill to assure protection of the groundwater resources. These advanced steps are believed to be among the first used at a Virginia landfill.

ii. Landfill Closure

On January 16, 2003, VDEQ approved the closure and post Closure plan for Phases III and IV of the I-95 Sanitary Landfill, which cover approximately 135 acres. Phases III and IV will be subdivided into four units of 34 acres. A final cap, to minimize the surface water infiltration into the landfill, will be placed and a landfill gas control system will be installed to control the migration of

landfill gas. Placement of the closure cap started during May 2003, and is expected to be completed by 2006.

iii. Landfill Gas System and Air Emissions

The I-95 Landfill also has one of the largest landfill gas collection systems installed at any facility in the state of Virginia, with over 300 extraction wells installed specifically for the purpose of collecting methane gas for utilization. The collected landfill gas is distributed to a variety of devices, including five enclosed flares and two power plants operated by Michigan Cogeneration Systems (MCS), generating over 6.1 megawatts of electricity.

The gas distribution pipeline, which the county and MCS installed between the I-95 Landfill and the Noman M. Cole, Jr. Pollution Control Plant (NMCPCP), continues to convey landfill gas to NMCPCP for the biomass incineration facility. This pipeline is over three miles in length and continues to result in significant savings in energy costs at the NMCPCP, estimated in 2002 at nearly $1 million for the year.

The establishment of the gas control systems, significantly ahead of State and federal requirements, has not only provided the landfill with outside revenue sources, but has significantly contributed to an improvement in air quality in the county.

The county is in compliance with the VDEQ's air regulations. Quarterly methane gas surface emission and perimeter monitoring are performed regularly. Annual air emission reports have been submitted to VDEQ. VDEQ has found all to be acceptable.

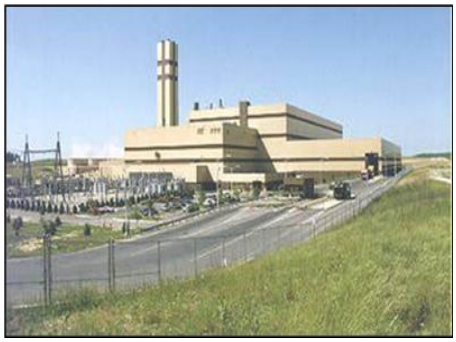
iv. Ash Testing

Incinerator ash is accepted at the I-95 Landfill from the COVANTA Energy/Resource Recovery Facilities located in Alexandria and Lorton. Ash is placed in a double composite, lined landfill with leachate collection and detection systems. Construction of Phase IIB of the ash landfill is in progress, and the project will be completed by November, 2004.

Ash resulting from the combustion process reduces the waste to only 10% of its original volume and about 25% of its weight. Ash generated by the E/RRF is disposed in a much smaller area of the I-95 Landfill when compared to the amount of space needed to dispose of the same quantity of municipal solid waste. Ash produced at both the facilities was analyzed by an independent lab and found to be well within permit limits for all constituents.

One constituent of potential concern is cadmium in the ash. Staff intends to support and publicize an existing program for the return/exchange or recycling of rechargeable nickel-cadmium (NiCad) batteries by retailers such as Wal-Mart, Radio Shack, and Best Buy stores. The batteries are ultimately disposed in a safe location. Even small efforts will reduce the amount of cadmium in the ash.

v. Energy/Resource Recovery Facility (E/RRF)



The E/RRF, owned and operated by Covanta Fairfax, Inc. (CFI), continues to operate within accepted industry standards as evidenced by the independent engineering report from Dvirka and Bartilucci in April 2004. The report states, "CFI has complied with the requirements of the Service Agreement, as amended, and has complied with the requirements of the various Facility permits." Operational upgrades to the Facility have improved the overall performance of the Facility and helped maintain a higher availability of 93.3% in FY2003. These changes included:

- Renovation of the ash conveyor gallery;
- Conversion of all bags in the baghouse to Ryton material;
- Modernization of pit crane number 3;
- Replacement of turbine generator governors; and
- Computerization of prevention and corrective maintenance requests tracking.

A dolomitic lime system was added to the E/RRF to further condition the ash and bind metals within the ash. This chemical process that prevents metals from leaching when landfilled, provides additional assurance to the pollution prevention system of the E/RRF.

The E/RRF continues to produce up to 80 megawatts of electricity that was sold to Dominion Virginia Power. This is enough energy to power about 75,000 homes. Covanta's Supplemental Waste program was thoroughly reviewed by the VDEQ and a determination was made that supplemental waste materials coming into the facility could include any waste disposed by a residential or commercial organization.

The Title V Permit continues under review with VDEQ.

vi. Quantity of Waste Generated

The Guaranteed Annual Tonnage (GAT) is 930,750 tons per year and remains fixed until February, 2011, when the service agreement between the county and Covanta terminates and the bonds are paid. In FY2004, the E/RRF processed over 1,080,000 tons of waste or over 90,000 per month. Due to scheduled outages and other reasons, about 70,300 tons of waste were bypassed to landfills during the fiscal year.

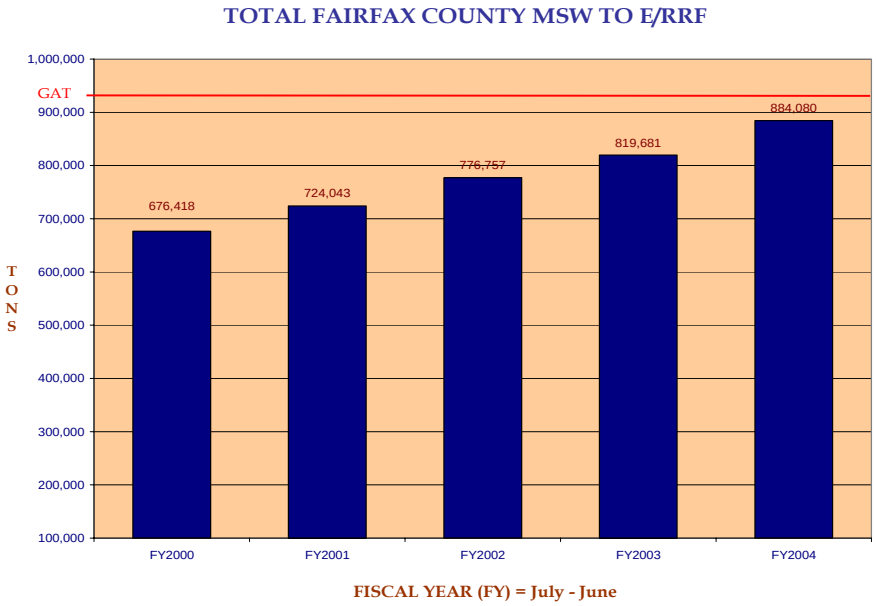


Figure IV-1. Total Fairfax County MSW to E/RRF FY2000-FY2004

The Solid Waste Management Plan (SWMP) projected waste disposal needs through 2024 and found that there will probably be capacity at the E/RRF to dispose of waste through 2024. To ensure that disposal capacity remains at the E/RRF, an increase in recycling amounts of about 120,000 tons per year will be needed.

One concern identified in the SWMP was the need to develop strategies for managing construction/demolition/debris (CDD) waste in the near future.

Local private CDD landfills will be filled in a few years and CDD capacity throughout the State is projected at only 7.1 years. While the rate of generation of CDD is slowing, there will still be significant amounts of CDD to be disposed or recycled in the future.

vii. Air Quality

The E/RRF's continuous emissions monitoring system (CEMS) samples flue gas emissions and alerts staff to any areas that need attention. Permit exceedances must be reported to the VDEQ with an explanation as to the circumstances of the event. The E/RRF continues to operate well within the permit parameters for air emissions. The following emissions results for certain constituents were documented by an independent lab test in June, 2003:

Table IV-1
Energy/Resource Recovery Facility Emissions Results: June, 2003

Parameter	Permit Limit	Average E/RRF Result
Sulfur Dioxide (SO_2)	29 ppm	8.8 ppm
Carbon Monoxide (CO)	100 ppm	9 ppm
Nitrogen Oxides (NOx)	206.3 pph	193 pph
Hydrochloric acid (HCl)	29 ppm	3.9275 ppm
Particulate matter (PM)	27 mg/dscm	5.1575 mg/dscm
Dioxin/furans	30 ng/dscm	0.688 ng/dscm
Mercury (Hg)	80 ng/dscm	1.39125 ng/dscm

ppm = parts per million pph = pounds per hour mg = milligram
ng = nanogram dscm = dry standard cubic meter

Source: Fairfax County Department of Public Works and Environmental Services

viii. Wastewater Discharge

Beginning in October, 2003, the average daily flow of wastewater from the E/RRF was significantly reduced from about 105,000 gallons per day (gpd) to about 45,000 gpd. This trend coincided with the end of the prolonged drought experienced by the area. Under drought conditions, the specific conductivity of water used for the cooling towers is elevated, requiring more blowdown of water to maintain the specific conductivity criteria. Cooling tower water is the major component of the facility's wastewater discharge.

ix. Materials Recovery

The E/RRF affords the ultimate in recycling of waste in that it takes waste and uses it to heat water to steam that turns turbines generating electricity. Moreover, once the process is complete, both ferrous and non-ferrous metals are recovered from the ash residue and recycled. In FY2003, 22,204 tons of

ferrous metal and 318 tons of non-ferrous metal were recovered and sold for recycling. This represented a 7% increase in ferrous metal recovery but a decrease of 129 tons in non-ferrous metal recycling.

x. I-66 Transfer Station, Landfill & Citizens' Recycling and Disposal Facility

The I-66 Transfer Station continues to handle roughly 75% of the waste destined for disposal in the county. The Transfer Station consolidates waste from small collection vehicles prior to transporting the waste to the E/RRF. Moreover, the Transfer Station plays a pivotal role when waste needs to bypass the E/RRF to landfills. The VDEQ inspected the Transfer Station and found that it was being operated within its permit limits.

The Transfer Station also serves as one of the county's two Citizens' Disposal Facilities (CDF), where residents can self-haul their waste and recyclables. Over 301,000 resident visits occurred at CDFs at the Transfer Station and I-95 Complex in FY2004, an increase of 8.3% over FY2003.

The Commercial Cash program became a permanent service to businesses this year, allowing many of the smaller companies to dispose of waste and pay with check or cash instead of having to post a disposal bond. To date about 3,525 commercial cash accounts have been established.

Another innovation has just begun at the CDF that allows residents and commercial cash accounts to pay by credit cards for waste disposal. This joint venture with other county departments will be in a pilot phase for six months to evaluate its costs and benefits to customers.

Transportation requirements to move waste from northern and western parts of the county continue to require the use of a contractor to provide the drivers and vehicles. Approximately 120 trailer loads of waste move from the Transfer

Station to the E/RRF daily, reducing by two-thirds the number of trucks traveling to the I-95 Complex.

A study is underway to determine the best configuration of the Transfer Station to accommodate residents who use the facility along with commercial waste collection vehicles. Part of the study will review the CDF area to ensure that space is being maximally used.

Testing and evaluation of low sulfur fuels for the transport vehicles continues. The purpose is to reduce air emissions as much as possible while continuing to provide the transport capacity required to dispose of increasing amounts of waste.

xi. Household Hazardous Waste (HHW) Program

Information regarding the Household Hazardous Waste Program and the reinvigorated Conditionally Exempt Small Quantity Generator (CESQG) service is provided in the Hazardous Materials chapter of this report.

xii. Program Enforcement

Staff continued to respond to an increasing number of complaints related to customer service and violations of Chapter 109 of the Code of Fairfax. With the consolidation of residential waste collection businesses, an increased number of customer complaints about missed service were handled in 2003. Also the enforcement staff had to deal with the effects of Hurricane Isabel.

xiii.Environmental Enterprise Designation

On Monday, August 4, 2003, the DEQ presented the Board of Supervisors with a certificate designating Fairfax County as an Environmental Enterprise. Both the Solid Waste Management Program and Vehicle Services are participants in the program. The Solid Waste Management Program includes the I-95 Complex, the I-66 Transfer Station, and Refuse Collection. The Vehicle Services program includes maintenance facilities located at Newington, West Ox Road, Alban Road, and Jermantown.

The designation is the result of an initiative begun by the county's Environmental Coordinating Committee (ECC) on June 29, 2001, when 29 persons from various county agencies participated in a one day environmental management system workshop. The ECC is a collaborative, interagency management committee, chaired by Deputy County Executive Robert A. Stalzer, that was established to ensure an appropriate level of coordination and review of the county's environmental policies and initiatives.

Participation in the Virginia Environmental Excellence Program is voluntary and on an organization by organization basis. To be considered for inclusion as an Environmental Enterprise, an organization must submit an application with the following information for each of its facilities under consideration:

- Policy statement outlining the facility's commitment to improving environmental quality;
- An evaluation of the facility's environmental impacts;
- Objectives and targets for addressing significant environmental impacts; and
- Description of the facility's pollution prevention program.

In addition, the organization must have a record of significant compliance with environmental laws and be in significant compliance with all applicable environmental requirements.

2. Waste Reduction and Recycling Programs

a. Overview of Recycling Programs

The Fairfax County Division of Solid Waste Collection and Recycling (DSWCR) is responsible for the management and implementation of the countywide recycling program to ensure compliance with Fairfax County's solid waste management code, Chapter 109, and state law and associated regulations. The VDEQ is responsible for administering regulations that require all municipalities in the Commonwealth to recycle at least 25 percent of the total volume (by weight) of municipal solid waste (MSW) generated in the jurisdiction. These regulations are codified as 9 VAC 20-130-10 and became effective on August 1, 2001. Annual reports documenting the recycling rate for the preceding calendar year are now due to the VDEQ by April 30 each year.

To comply with the requirement to measure and track the recycling rate, Fairfax County currently administers Chapter 109 which provides the requirements for solid waste collection, recycling and disposal for residences and commercial properties located within Fairfax County.

The county requires annual reports on the tonnages of recyclables collected by individual solid waste haulers permitted within the county, commercial businesses that generate regulated quantities of MSW, and the Material Recovery Facilities (MRFs) and other recycling entities operating in Fairfax County. These reports are due to the county by the end of February of each year. These reports are evaluated and compiled to calculate the countywide recycling rate, which for calendar year 2003 was 37%. The following chart (Figure 3) depicts the historical rates of recyclables generated in the county since the recycling program's inception in 1988.

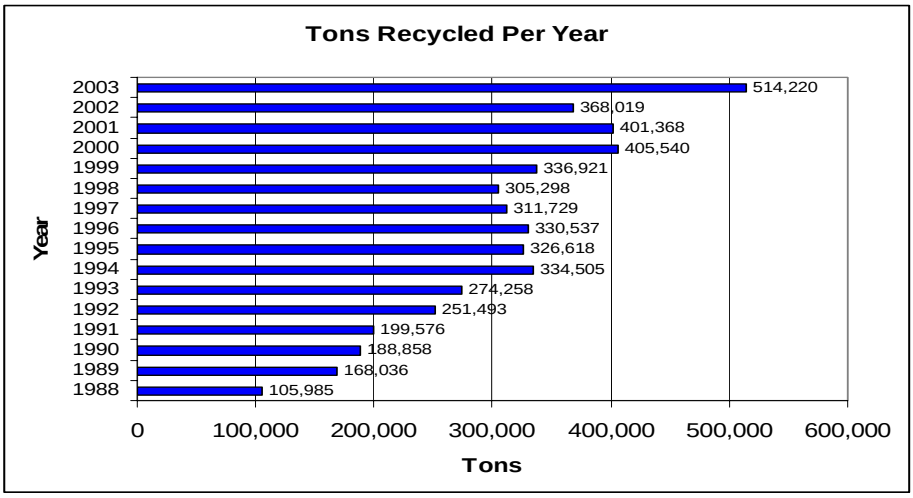


Figure IV-2 - Historical Quantities of Materials Recycled in Fairfax County

The recycling rate of 37% increased over the rate calculated for calendar year 2002, which was reported as 32%. The reasons for this are twofold: first, the quantity of paper collected for recycling in the county was increased by approximately 34,821 tons; and secondly, the amount of yard debris collected increased due to storm damage caused by Hurricane Isabel. Fairfax County exceeds the state's recycling requirement, where 25% of the total tonnage of MSW generated in the county must be recycled.

Several other factors, codified in Chapter 109, affect the ability of the county to increase the quantity of materials recycled. To thoroughly understand how recycling works in the county, it is important to distinguish between the types of recycling programs in effect in the county. The two major county recycling programs are the curbside residential collection of recyclables and business recycling program.

Curbside residential collection of recyclables is controlled by Chapter 109, which requires the collection of newspaper, glass food and beverage containers, metal food and beverage containers, and yard waste. Chapter 109 does not require private refuse collection companies to collect any other types of paper (including office paper or cardboard), nor does it require the collection of any plastic. However, in the County Sanitary Districts, the Solid Waste Management Program staff elected to expand curbside residential recyclables collection by including mixed paper (magazines, newspaper inserts, paperboard, cardboard, office paper etc.) and plastic bottles. This expansion has resulted in a 20% increase in the quantity of recyclables collected within Sanitary Districts as compared to the quantity of recyclables collected in residential areas served by private haulers operating in the county.

Business recycling in Fairfax County is limited by county guidelines which do not require participation by the majority of businesses operating in the county. Only the following businesses are required to recycle in the identified fashions:

- Office buildings - recycling is required only if the office building has more than 200 full-time employees. If recycling is required, then only the recyclable material generated in the highest quantity must be recycled.

- Commercial Business Centers (strip malls, large shopping malls, commercial business parks etc.) - recycling is required only if the businesses in the commercial business center generate more than 100 tons of refuse per year. If the commercial business center generates more than 100 tons of refuse per year, then only the recyclable material generated in the highest quantity must be recycled.

- Multi-family housing (apartment and condominium complexes only - not townhome developments) - recycling is required only if the building has more than 100 units; no recycling is required if the building has 99 units or less. If the building has more than 100 units, only newspaper and no other commodity must be recycled.

As demonstrated, the limitations on curbside collection and the business recycling thresholds limit the quantity of recyclables that can be collected in the county. In 2003/4, the Solid Waste Management Program staff addressed the need for increases in recycling through the completion of the state-mandated Solid Waste Management Plan. The Plan states that private waste collection companies should be required to provide expanded recycling services to their customers. This approach would allow for countywide collection of mixed paper, cardboard and plastic bottles at single family and townhouse developments throughout the county. Additionally, the Plan also supports the inclusion of additional businesses in recycling requirements. Staff is committed to supporting these changes to assist in the expansion of recycling activities within the county.

b. Other Collection and Recycling Programs

In addition to countywide recycling program management, the Solid Waste Management Program staff is responsible for the:

- Collection of refuse and recyclables from about 42,000 residences primarily on the east side of the county;
- Collection of refuse and recyclables from county buildings;
- Vacuum leaf collection for approximately 19,000 residences;
- The Recycling Drop Off Centers (RDOCs);
- Refuse removal due to evictions and other court orders; and
- All public outreach and education for recycling and waste management programs.

Brief descriptions and updates of programs are provided in the subsequent sections of this report.

i. Residential Recyclables Collection Programs

Residential recycling of several Principal Recyclable Materials (PRMs as defined by VDEQ regulations) became mandatory in 1992 for all single family homes, residential townhouses, apartment complexes, condominium units, and residential duplexes with curbside collection. PRM recycling became mandatory in 1993 for residential units and building complexes with dumpster service. As noted earlier, curbside residential collection of recyclables is controlled by Chapter 109 of the Fairfax County Code. As stated previously, privately-owned refuse and recyclables collection companies are not currently required by Chapter 109 to collect these additional types of recyclables. However, staff is working to revise the code provisions as part of the Solid Waste Management Plan implementation.

Weekly curbside collection of newspaper and glass and metal food and beverage containers is required to be conducted at all residences with curbside collection services provided either by county employees in the Sanitary Districts or by the other private haulers permitted to operate in the county. For multifamily dwellings such as apartment buildings or condominiums, recycling is required only if the building has more than 100 units; no recycling is required if the building has 99 units or less. If the building has more than 100 units, only newspaper and no other commodity must be recycled.

In order to ensure that new multifamily dwellings are designed (prior to construction) to provide adequate common areas for the installation and operation of recycling equipment, amendments were made to the Fairfax County Public Facilities Manual which became effective for new Site Plans submitted after September 1, 1993. The amendments require that, in any new construction of multifamily residential complexes with more than 100 units, a space be provided to accommodate recycling for the building. A Recycling System Statement on the Site Plan cover sheet identifies properties required to recycle, so that appropriate facilities may be designed prior to building construction. These requirements do not apply to townhome residential complexes that will have curbside collection of refuse and recyclables because they are provided with curbside recycling service.

ii. Yard Debris

Recycling of yard debris (small branches, leaves and grass) is also required in Fairfax County. Curbside collection of yard debris is required to be provided by the privately owned refuse and recyclables collection companies operating

in the county and the county staff providing similar service to approximately 42,000 customers in Sanitary District areas.

Woody materials, referred to as brush, comprise a portion of the overall quantity of yard debris collected in the county. Brush is managed at either the I-66 or I-95 facility and is ground into mulch. The mulch from these facilities is available for free to county residents who can self-haul the material to the end use location. Mulch is typically used as a top-dressing around decorative plantings to reduce weed growth and to maintain soil moisture. Leaves and grass comprise the balance of the total quantity of yard debris managed in the county. This material is sent to either of two composting facilities, where the material undergoes a biological decomposition to turn it into compost, which is used as a soil substitute. In 2003, Fairfax County recycled 119,039 tons of yard debris. Yard debris increased by approximately 12,221 tons in calendar year 2003, mostly due to the storm damage attributable to Hurricane Isabel.

County staff is aware of the impact of plastic bags on the production of compost from yard debris. When leaves, grass or brush is contained by the homeowner in plastic bags for collection at the curb, the plastic bags go to the composting facility where a bag spitting machine cuts the bags open to release the yard debris. This equipment revolves in a circular fashion during operation. While rotating, the split plastic bags entangle the yard debris, especially the brush, into a mass where the plastic bags cannot be removed. The yard debris contaminated with plastic bags cannot be composted because there is no feasible technique to remove the plastic bag from the entangled brush. Compost has little value on the open market when contaminated with plastic bags. Unfortunately, the collection of yard debris in transparent plastic bags is specifically allowed as provided by Chapter 109. The reason that yard debris is permitted to be collected in transparent bags is to allow the collection staff to discern that the bag contains yard debris rather than trash. The County Code also allows for the collection of yard debris in reusable containers and paper bags, which eliminates the plastic contamination problem. The Solid Waste Management Program staff is evaluating this situation for the long-term waste management program currently under review by a Board-appointed advisory group.

iii. Recycling Drop Off Centers (RDOCs)

Fairfax County operates eight Recycling Drop Off Centers located at various points throughout the county. The number of RDOCs has decreased from the fourteen available in 1995, since participation in curbside recyclables collection reduces the need for the RDOCs. However, the RDOCs provide additional recycling opportunities for residents or businesses served by privately-owned refuse and recyclables collection companies that are not required by Chapter 109 to collect these additional materials at the curb (mixed paper, cardboard and the Nos. 1 and 2 plastics bottles and jugs). These RDOCs are relied upon

by small commercial operations in the county to facilitate their recycling while significantly reducing their costs for refuse disposal. However, the RDOCs are part of the community benefit programs, which do not generate sufficient revenue to cover the cost of operation.

iv. Privately-Owned Solid Waste Collectors

For areas of the county where refuse and recyclables services provided by the county have not been requested via the Sanitary District Petition process, privately-owned and operated refuse and recyclables collection firms, permitted by the county, collect these materials curbside from residences and commercial businesses. The independent haulers do not operate within specific geographic areas but rather compete for individual homes, contracts with civic or homeowner's associations, and commercial or office contracts. As such, there are instances within the county where refuse and recyclables collection trucks from several companies operate on the same street on the same day. This creates the obvious issues of truck traffic, air emissions, safety, roadway use, and certain operational inefficiencies with respect to duplicating collection routes. Moreover, during 2003, the consolidation of collection companies continued. This was one area that was discussed in the Solid Waste Management Plan, and the Board of Supervisors has formed a task force to discuss competition and other service delivery issues associated with residential waste collection.

All solid waste haulers permitted in Fairfax County are required to report residential recycling tonnages annually to the county. Reports requesting this information are sent out at the end of the calendar year and are due to the county by the end of February. These reports provide an accounting of the tonnages of individual recyclable commodities collected by individual haulers for use in the preparation of the recycling rate report due to VDEQ annually. Private solid waste haulers typically rely on weight tickets to provide the tonnages of recyclables collected and are required to maintain documentation of recyclables collected on file in their office for review and inspection upon request of the county.

v. Commercial Recycling Programs

The county also administers a commercial recycling program that is mandatory for businesses operating in the county based on the quantity of refuse generated or the number of employees occupying the building. Those commercial properties generating 100 tons of waste annually or housing 200 office workers are required to recycle the predominant Principal Recyclable Material (PRM) in the waste stream, typically office paper, and report these quantities annually to the county.

vi. Voluntary Commercial Source Reduction Programs

The county has promoted source reduction within the private sector by using case studies to publicize the efforts and cost savings realized by businesses that have set up successful source reduction programs. Technical assistance is provided to the private sector to assist them in the development of voluntary and mandatory recycling and source reduction programs. Source reduction in Fairfax County is a challenge because of the lack of manufacturing base where source reduction activities typically are concentrated. The most effective voluntary source reduction strategy that is feasible for Fairfax County is the management of grass clippings and other yard debris in home composting systems or by simply leaving them on the lawn for natural decomposition.

vii. County Agency Routes

All county agencies serviced by county staff for the collection of refuse and recyclables participate in recycling for that particular location. In calendar year 2003, county agency locations recycled approximately 784 tons of materials. The Solid Waste Management Program staff provides all backup support to ensure adequate communication of the recycling requirements as well as operational support for general programs or other special activities as needed.

viii. Public Education and Outreach

Public education and outreach form the basis of any county's recycling efforts. To that end, the county's Solid Waste Management Program focuses on the development and implementation of creative education programs that can take advantage of our partnerships with county agencies, Fairfax County Public Schools, community organizations (i.e. Girl Scouts, Youth Groups, Jaycees), commercial businesses, and private haulers. Outreach programs consist of activities and displays at county festivals, the support and advertisement of several days every year specifically dedicated to recycling efforts, public speaking opportunities, and technical support of recycling activities and issues.

Annually, the Solid Waste Program participates in Clean Fairfax Council's Earth Day/Arbor Day event, Celebrate Fairfax, and Fall for Fairfax. These events are a major portion of the county's overall public outreach campaign and provide the program with the opportunity to provide technical guidance as well as practical information about the county's solid waste and recycling programs. In 2004, the Solid Waste Program won first place for design at the Celebrate Fairfax Event in June with an interactive display of equipment and programs. In FY2003, the Solid Waste Management Program had also won a blue ribbon for content for the Celebrate Fairfax event.

The Solid Waste Management Program is a significant financial sponsor of the annual Earth Day/Arbor Day event promoted by Clean Fairfax Council. This

year, the Solid Waste Management Program was a significant financial sponsor of the Johnie Forte Jr. Environmental Scholarship, which awarded six $500 scholarships to applicants from the Fairfax County Public Schools. Student groups receiving the grants are invited to the annual Earth Day/Arbor Day celebration at Northern Virginia Community College to make a presentation regarding the use of the grant to the community and the Board of Supervisors. The annual Fairfax County Business Recycling Awards are also presented at the same event; this year, awards were given to Raytheon Corporation, SAIC Corporation, and Green Spring Village.

This environmental grant program for school students is a portion of SCRAP, the Schools/County Recycling Action Partnership. The SCRAP partnership was created by the Fairfax County Public Schools and Fairfax County Division of Solid Waste Collection & Recycling to provide opportunities for the students of Fairfax County Public Schools to learn about recycling and other environmental issues and enhance recycling throughout the system. The Partnership functions in a cooperative and collaborative manner to assist in increasing the recycling awareness and practice at Fairfax County Public Schools (FCPS) by:

- Developing opportunities for students to learn about recycling and other environmental issues;
- Providing support for school recycling activities to assist achieving recycling goals; and
- Providing environmental science expertise to support student projects and activities.

The Partnership unites the resources of both organizations in a unique relationship to expand upon and enhance the existing FCPS recycling program for the benefit of the schools and the environment. In 2003, DSWCR created the SCRAPbook, a resource tool distributed to all science teachers in the FCPS system. This brochure details all of the opportunities provided by DSWCR and Clean Fairfax Council to aid in the instruction of students, including training and presentations, tours, and details of application for the Johnie Forte grant award.

The Solid Waste Program also promotes an annual Clean Your Files Week, geared to county agency staff to remind staff of the benefits of recycling of office paper. This effort was managed by the renewed efforts of the Employee Recycling Committee (ERC). The ERC meets monthly and works on projects beneficial to improving county employee participation in recycling. The group developed and implemented three major projects this year, which were: the Clean Your Files Week contest; the county employee's Earth Day celebration; and the Employee Recycling Committee Recycler of the Year award (the ERICA award).

The Clean Your Files Week contest provided an award, prizes, and publicity for the winning agency in the county's newspaper, the Courier. In 2004, free ice cream certificates donated by Ben & Jerry's were given to the schools/groups with the most creative Clean Your Files/closets recycling projects. The Earth Day celebration concentrated on the participation of many county agencies with responsibility for environmental protection and stewardship in the county. These agencies placed informational booths in the Government Center during the lunch hour so that all employees could better understand services provided by these agencies. The ERICA award went to the county employee who supported recycling efforts in the county and a formal presentation was made to the winners to demonstrate appreciation to that agency for allowing the employee to participate in recycling. All of these activities have strengthened the county employees' resolve and dedication to recycling.

America Recycles Day (November 15) (ARD) was celebrated with the Community Recycling Roadshow at Herndon High School. The theme of this event was to show how certain recycling activities can support the local community. DSWCR partnered with Students Against Global Abuse (SAGA), the student environmental club at Herndon High School, to collect computers, cell phones, and used tennis shoes in partnership with other community groups. ServiceSource collected used computers and other electronic equipment to support this organization that finds employment opportunities for persons with disabilities. OAR (Opportunities, Alternatives and Resources) collected used cell phones to be donated to women as communication tools to assist in the prevention of domestic abuse. The collection of used athletic shoes furthered the county's goal of collecting 5,000 pairs of shoes to be eligible to apply for a $25,000 grant for a NikeGrind athletic field surface to be installed in the county. DSWCR also launched a new promotional tool known as the Recycle Guys, animated characters that present a coordinated recycling message that is to be adopted area-wide through northern Virginia, DC, and Maryland to present a recognizable recycling message to the region. The 2004 ARD event featured a recognition ceremony for recycling program volunteers and the winners of a contest to name the Recycle Guys in Fairfax County. Fairfax County's America Recycles Day program was awarded first prize in the national America Recycles Day program as the best in the nation. A formal award was presented to Fairfax County at a Board of Supervisor's meeting in June by the staff of America Recycles Day, Inc.

Public outreach and education is accomplished through involvement in community events and public speaking opportunities as well as the Solid Waste Program's membership in the Lorton Citizens Alliance Team (LCAT), Business Advisory Committee, and Citizens' Advisory Committee on Solid Waste.

The Solid Waste Management Program takes full advantage of the Internet by placing pertinent information about timely subjects on its Web site. Information about the program's involvement in community events as well as new information about solid waste matters is updated on the Web at: www.fairfaxcounty.gov/gov/dpwes.

An extensive public outreach effort this year has focused on obtaining citizens' input for the development of the Solid Waste Management Plan. Staff has engaged citizens in defining the questions to be used for an online public opinion survey. Staff attended various community association and business group meetings and events to present information about the existing solid waste management program and the needs for the future. Brochures explaining the Plan and its elements were distributed and surveys collecting public input were disseminated. This public awareness and education effort continued through spring of 2004.

The Solid Waste Management Program staff is continuously solicited to make presentations to a variety of citizen's groups every month of the year and; staff makes every effort to accommodate the quantity of requests. Program staff prepared formal presentations on a variety of issues and is available to community groups upon request.

Staff is in the process of updating all of the written publications to account for changes in programs and activities. Publications are being rewritten to ensure the clarity of the contents and that they are informative and present information in a suitable fashion to address a particular question or issue. All publications will eventually be available on the county Web site to allow for the ease of access and printing for distribution. Additionally, the county maintains an automated recycling information line (324-5052) for resident access to recycling opportunity information.

The Solid Waste Management Program staff is also using the Web to disseminate information to citizens as well as the regulated community as a service to customers. An electronic e-mail to county collection customers has been developed to automatically send updates to customers on the program as well as updates regarding service due to inclement weather. A similar listserv tool was developed to give vacuum leaf collection customers the most up-to-date information on the exact date that the leaf collection will be conducted on their street to ensure that residents have time to rake leaves to the curb.

C. RECOMMENDATIONS

EQAC was asked to review the 20-year Solid Waste Management Plan (SWMP) developed by the county staff for submission to Virginia Department of Environmental Quality (VDEQ). EQAC enthusiastically supports all of the recommendations in the 20-year SWMP (see the EQAC resolution to the Board of Supervisors from April, 2004 [Appendix A]). After the public hearing regarding these recommendations, a Solid Waste Management Plan Task Force (SWMPTF) was formed which has been tasked with refining and supplementing the recommendations set forth by the county staff in the 20-year plan. EQAC is a member of the county's Solid Waste Management Plan Task Force (SWMPTF) and EQAC eagerly awaits the report of the task force, due out mid 2005.

EQAC continues to support efforts to remove waste from the solid waste stream through recycling, however, there is room for improvement. EQAC recommends the following:

1. The county should continue to work with the solid waste hauler community to increase curbside recycling to include multiuse paper and plastic in addition to the items already being collected for recycling.

2. The county should develop policies that change the recycling requirement for office buildings such that the requirement will apply to office buildings with more than 100 full time employees (FTEs)—the requirement now applies only to office buildings with more than 200 FTEs.

3. The county should develop polices that change the recycling requirement for commercial business centers (CBCs, or strip malls) such that the requirement will apply to CBCs that generate more than 50 tons per year of solid waste—the requirement now applies only to CBCs that generate more than 100 tons per year.

REFERENCES

The narrative and illustrations were supplied by the Division of Solid Waste Collection and Recycling and the Division of Solid Waste Disposal and Resource Recovery.

CHAPTER V

HAZARDOUS MATERIALS

V. HAZARDOUS MATERIALS

A. ISSUES AND OVERVIEW

1. Overview

Fairfax County hazardous materials (HAZMAT) concerns may be considered less significant as compared to other jurisdictions; the industrial base within the county is relatively "clean". Nevertheless, the county does have its share of problems. The main concerns are hazardous materials incidents involving spills, leaks, transportation accidents, ruptures, or other types of emergency discharges. Secondary is the use and disposal of hazardous materials in either daily household activities or by small quantity commercial generators. The final concern is the clean up and regulation of hazardous materials.

Although the news media is constantly reporting industrial and transportation related hazardous materials incidents, there is a general lack of awareness by the public of health and safety risks associated with the use, storage, and disposal of common household hazardous materials. Educating the public on the implications of these hazardous materials on peoples' lives remains a significant goal.

2. Hazardous Materials Incidents

a. Overview of 2003 Hazardous Materials Incidents

The Hazardous Materials and Investigative Services Section personnel respond to reported incidents and investigate complaints of potential and actual releases, many of a non-emergency nature. During CY 2003, Staff was involved with 427 complaints. One hundred ninety-one complaints were petroleum products releases (more than triple from the year before), and 39 complaints were various types of other product releases. Storm drains and creeks and/or streams were reported to have been directly contaminated in 43 cases. Many of these occurrences were the result of motor vehicle accidents that involved damaged fuel tanks and other automotive type fluid releases. In addition, 32 reports of improper disposal of various hazardous materials and solid waste were addressed. Hurricane Isabel accounted for 10 incidents where petroleum products or vessels were impacted by floodwaters or emergency generator operations. (1)

b. Hazmat Response Team Information

The Fire and Rescue Department's Operations and/or Hazardous Materials and Investigative Services Section respond to all reported incidents of

hazardous materials releases, spills, and discharges. The county has a well-equipped hazardous materials response team. The primary unit operates from Fire Station 34 in Oakton and three satellite units are stationed at Fire Station 1 in McLean, Fire Station 11 in Alexandria, and Fire Station 26 in Springfield. These units are strategically positioned to provide rapid response and adequate coverage throughout Fairfax County. Response personnel are trained and equipped to initiate product control and mitigation measures to prevent or minimize the adverse environmental impact and damage. All units are staffed 24 hours per day, seven days per week.

The Hazardous Materials Response Team responded to more than 900 incidents in CY 2003. These incidents included the release of products into the air, water, and soil. The majority of the incidents continue to be hydrocarbon and corrosive releases. In addition, there were hundreds of small releases involving products such as gasoline, diesel fuel, antifreeze, and hydraulic fluid that were handled by first responder units. The Team conducted regular training sessions, as well as practical exercises, with surrounding jurisdictions, as well as state and federal agencies. (1)

In addition to the efforts of the Operations Division and Hazardous Materials Investigative Services Section personnel, the Fire and Rescue Department maintains a contract with a major commercial hazardous materials response company to provide additional support for large-scale incidents. The Fire and Rescue Department is committed to protecting the environment and the citizens through proper enforcement of the Code or rapid identification, containment, and cleanup of hazardous materials incidents. (1)

3. Hazardous Materials in the Waste Stream

The disposal of household and small quantities of non-household hazardous materials into the waste stream continues to be a concern. Unlike hazardous materials incidents, the immediate impact is not as dangerous. However, the long-term impact can be just as severe. Hazardous materials in the waste stream are contaminating landfills. Sometimes hazardous materials are dumped illegally, which leads to stream and groundwater pollution and soil contamination. Household hazardous wastes are products used in and around the home that are flammable, corrosive, reactive, or toxic. These hazardous materials potentially can cause a safety problem if various household chemicals become mixed when disposed of with the regular trash. By disposing of household hazardous wastes separately in the appropriate manner, these materials can be properly handled and packaged to minimize exposure to potentially harmful chemicals and decrease the likelihood that these chemicals will enter the environment.

a. Used Automotive Oil and Fluids

A recent year-long study by the Northern Virginia Planning District Commission (NVPDC, now the Northern Virginia Regional Commission, or NVRC) for the Department of Environmental Quality estimates that approximately three to 4.5 million gallons of used oil, and approximately one million gallons of antifreeze, are "lost" in the environment each year through improper disposal by "do-it-yourselfers", or DIYers. DIYers change their own automotive fluids (including oil, oil filters, and antifreeze) and account for 40 to 50% of those owning passenger cars. Only 15 to 30% of DIYers are believed to properly recycle or dispose of used oil. One percent or less of DIYers recycle oil filters.

This study resulted in a recommendation to reestablish a Statewide used oil recycling program aimed at capturing what amounts to the 1989 Exxon Valdez oil spill every four years. As a part of the study, NVPDC developed a database of all known collection centers in Virginia – 471 private and 125 public. The study also revealed that there are about the same number of collection facilities in 1999 as in the late 1980s; however, the volume of oil generated has increased roughly 100,000 gallons per year because of more cars on the road. Convenience and public education were found to be major factors in whether DIYers recycle or not. (2)

b. Dumping into Storm Drains

Storm drains carry stormwater runoff from streets (see the Water Resources chapter of this report). This water is not treated and goes directly into local streams. All streams in Fairfax County eventually flow into the Potomac River, which empties into the Chesapeake Bay. Anything dumped down a storm drain will follow the same path as the stormwater runoff. (3)

The cleaning up of animal waste and the disposal of such wastes down storm drains, as well as the disposal of leaves down the storm drains, are attempts at doing a service that have the effect of introducing pollutants directly into county streams. There are deliberate disposals of chemicals, oils, and other items into the storm drains as "out-of-site, out-of-mind." In either situation, there is a misperception that the storm drains are part of the county sewage system and that the disposal of materials down these drains does not provide a direct impact to the environment.

4. Pipelines

The following was reported by the Fairfax Joint Local Emergency Planning Committee:

> "More than 3,000 companies operate some 1.9 million miles of natural gas and hazardous liquid pipelines in the United States. The pipeline network includes 302,000 miles of natural gas transmission pipelines operated by 1,220 firms, and 155,000 miles are hazardous liquid transmission pipelines operated by 220 outfits. In addition to transmission pipelines, 94 liquefied natural gas facilities operate in the United States." (4)

Pipelines traverse Fairfax County carrying refined petroleum for two companies and natural gas for three companies. The Office of Pipeline Safety in the U.S. Department of Transportation regulates pipeline design and the construction, operation, and maintenance of pipelines to ensure safe transportation of hazardous liquids and natural gas. (5)

5. Rail Transport of Hazardous Materials

Chemicals and materials that are hazardous have regularly been transported by rail. Accidents or leaks have been, and continue to be, a cause for concern. Post September 11 has introduced additional concerns.

Potential future shipments of nuclear radioactive waste by rail (and by truck) will travel through parts of the Washington, D.C. metropolitan area. Should an accidental or intentional incident occur, the effects and impacts could extend beyond that initial area.

The July 18, 2001 CSX Train fire in a Baltimore, Maryland tunnel was an unintended incident involving a train car with hazardous materials and had wide-range, long-term consequences. Major sections of the downtown were closed, businesses were impacted, Orioles' games had to be rescheduled, and portions of a major street were closed for five weeks.

Rail through Fairfax County is in the eastern and southern portions of the county and does not include tunnels. Residents are generally not located as close to the rails in Fairfax County as in other jurisdictions. However, some hazardous materials, alone or in combination, when released can affect areas up to miles from the initial site of the incident. It is conceivable that Fairfax County residents could be impacted with hazardous materials from a rail incident in another jurisdiction.

B. PROGRAMS, PROJECTS, AND ANALYSES

1. Fairfax Joint Local Emergency Planning Committee (FJLEPC)

Local Emergency Planning Committees are required by Section 301[c] of Title III of the Emergency Planning and Community Right-to-Know Act (EPCRA), a freestanding provision of the Superfund Amendments and Reauthorization Act

of 1986 (SARA). The main thrust of SARA is to identify and clean up waste sites that are potentially toxic. Title III has two important provisions: 1) it provides for emergency response planning to cope with the accidental release of toxic chemicals into the air, land, and water; and 2) the community right-to-know provisions of Title III help to increase the public's knowledge and access to information on the presence of hazardous chemicals in their communities and releases of these chemicals into the environment. Under Title III, states are required to organize into planning areas and to establish local Emergency Planning Committees.

The FJLEPC is comprised of representatives of the City of Fairfax, the County of Fairfax, the Town of Herndon, and the Town of Vienna. Committee members include local government officials, police, fire and rescue officials, environmental and governmental planners, public health professionals, hospital officials, public utility and transportation officials, representatives of business organizations, professional societies, civic organizations, and the media. These representatives meet six times a year. The FJLEPC collects information about hazardous materials; develops and updates, on an annual basis, the Hazardous Materials Emergency Response Plan (Plan); and provides information to the public about the use, storage, and manufacture of hazardous materials. The Plan also contains notification procedures in the event of an incident, on site means of detecting incidents, evacuation routes, clean-up resources, and identification of parties responsible for the site. The Annual Plan exercise was conducted at one of the participating business's location in October 2003. (1)

FJLEPC provides education and outreach to the public. Information is disseminated through public meetings, brochures, newsletters, and a Web site: http://www.lepcfairfax.org. During 2003, a newsletter was mailed to civic and homeowner associations which focused on emergency preparedness, disaster planning, and fireworks safety. Members represented the Committee at various county and neighborhood functions including Celebrate Fairfax and the Fall for Fairfax events. The Committee redesigned the Web site and is reviewing its publications for revisions. FJLEPC members are available to speak to businesses or citizens groups, as requested. (1)

2. Railroad Transportation Plan

The CSX Transportation, Hazardous Material Systems, has a hazardous material emergency response plan. A written copy of that plan is on file with FJLEPC and the Fairfax County Fire & Rescue Hazmat Station 34. The Web site for CSX is: www.csx.com.

3. Storm Drain Stenciling Program

The Northern Virginia Soil and Water Conservation District (NVSWCD) has a Storm Drain Stenciling Program which encourages youth and community

groups to educate the public about the dangers of dumping anything into storm drains. This is a two-part program that includes education and stenciling of the drains. The mandatory educational component must be completed prior to stenciling, and includes distributing flyers to all homes in the neighborhood regarding how to properly dispose of household and pet waste, yard debris, and used motor oil. Trained volunteers then stencil "Dumping Pollutes – Drains to Stream" on storm water inlets in pre-approved (Virginia Department of Transportation--VDOT) areas. This program has proven to be an effective, low-cost method of educating large segments of the population about water quality problems.

4. Household Hazardous Waste Program (HHW)

Fairfax County operates two HHW programs, one at the I-66 Transfer Station and the other at the I-95 Complex as a part of its recycling program for residents of Fairfax County. Both locations are open three days a week. Information on the locations, hours of operation, types of wastes accepted, and how to dispose of the wastes can be found on the county's Web site www.fairfaxcounty.gov/dpwes/trash/disphhw.htm. This information can be found under Public Works and Utilities and under Environment.

The HHW program has an overall community benefit, and therefore residents are not charged for disposal costs. The program receives its funding from the General Fund.

Household hazardous waste amounts will continue to increase as the population does. Capacity is available at the existing facilities to meet county needs through 2024.

FY 2004, there were 18,600 participants disposing of 373,220 pounds of HHW, a 13% increase in usage over FY 2003. The HHW included 5,175 gallons of antifreeze, 70,800 gallons of motor oil, 8,505 lead acid batteries and 180,400 gallons (or 451 tons) of latex paint. In FY 2003, there were 16,149 participants disposing of 359,840 pounds of HHW. This included 5,350 gallons of antifreeze, 71,842 gallons of motor oil, 8,107 lead acid battery cores, and 107,212 gallons of latex paint. From FY 2002 to FY 2003, there was a slight decrease in participation, total HHW pounds and gallons of antifreeze; there were, however, increases in lead acid batteries recycled and gallons of latex paint disposed. From FY 2003 to FY 2004 there was a slight increase in participation and total HHW pounds as well as lead acid batteries recycled and gallons of latex paint disposed. However, there were decreases in gallons of antifreeze and gallons of motor oil recycled.

Table V-1 lists the participation and cost for the past eleven years. The disposal costs of the HHW includes supplies and employees. (6)

Table V-1
Fairfax County Household Hazardous Waste Program:
Record of Fiscal Year Disposal

Fiscal Year	Participation	HHW total pounds	Cost per household
FY 2004	18,600 households	373,220	$22.92
FY 2003	16,140 households	359,840	$23.30
FY 2002	16,272 households	368,060	$20.97
FY 2001	15,312 households	356,275	$18.75
FY 2000	15,564 households	330,325	$18.33
FY 1999	15,222 households	396,019	$20.06
FY 1998	15,519 households	387,020	$24.28
FY 1997	13,219 households	397,266	$29.41
FY 1996	11,010 households	369,710	$34.58
FY 1995	11,066 households	246,138	$27.86
FY 1994	8,741 households	214,770	$41.57

Source: Fairfax County Department of Public Works and Environmental Services

5. Commercial Hazardous Wastes

The Conditionally Exempt Small Quantity Generator (CESQG) program has been reestablished on a limited basis, to include three collection events at the I-66 Transfer Station through the end of 2004. A CESQG is any business that generates less than 220 pounds or 27 gallons of HAZMAT during a month. There is a fee for disposal of HAZMAT that the CESQG pays directly to the contractor operating this program. Commercial hazardous waste generators that do not qualify as CESQGs should look to commercial hazardous waste disposal companies for support. For more information about CESQG and a list of commercial hazardous waste disposal companies, access the county's Web site. (7)

6. Recycling Rechargeable Batteries

Fairfax County collects batteries for recycling at the HHW facilities. Mercury and lithium batteries are the only household batteries accepted by this program. Other batteries may be safely thrown away (7). Information, including hours of operations, can be found at:
www.fairfaxcounty.gov/dpwes/trash/recyclingtrash.disphhw.htm .

Rechargeable batteries are commonly found in cordless power tools, cellular and cordless phones, laptop computers, camcorders, digital cameras, and remote control toys. Rechargeable Battery Recycling Corporation (RBRC) is an organization funded by the recyclable battery manufacturers in the US for the purpose of collecting used rechargeable batteries for recycling. RBRC works with retail outlets that sell these types of batteries to collect the used batteries

when customers bring them in to purchase new ones. There are a number of retail outlets in Fairfax County where rechargeable batteries are collected for recycling. (8)

RBRC recycles the following battery chemistries: Nickel Cadmium (NiCad), Nickel Metal Hydride (Ni-MH, Lithium Ion (Li-ion), and Small Sealed Lead (Pb) weighing less than 2 pounds. Battery Recycling Seals can be found on the batteries. Additional information on what happens to the batteries, collections sites, and "handy tips for using, storing, and recharging your rechargeable batteries" can be found on the Web site: www.rbrc.org. (9)

The Fairfax County Solid Waste Management Plan (SWMP) discusses this issue in its chapter on "Special Wastes." It reports an anticipated increase of 109 tons per year of batteries by 2025. The SWMP recommends promoting pubic/private recycling programs to increase special wastes recycling, including NiCad battery recycling. (10) With the increasing appetite for cell phones and cordless products using rechargeable batteries, this will be an important recycling issue in Fairfax County.

C. REPORTING ENVIRONMENTAL CONCERNS AND ISSUES

Environmental issues affect everyone living and working in the county. All environmental concerns and events negatively impacting the county should be reported. A list of contact information relating to environmental crimes is provided in Table V-2 below.

D. LEGISLATIVE UPDATE

During 2003, Virginia adopted the 2000 International Fire Code, which provided expanded language for the manufacture, storage, use, and transportation of hazardous materials. (1)

Table V-2 HOW TO REPORT ENVIRONMENTAL CRIMES	
Type of Incident	**Phone Number**
ANY ACTIVE RELEASE OF MATERIALS INTO THE ENVIRONMENT If the dumping of any substance into a stream, into a manhole, into a storm sewer, or onto the ground is witnessed, assumptions regarding the contents of the materials should not be made. 911 should be called immediately. When calling 911, be prepared to provide specific information regarding the location and nature of the incident. The local office of the U.S. Environmental Protection Agency (703-235-1113) can be called in addition to (but not instead of) 911.	**911**
HAZARDOUS MATERIALS-DANGEROUS If a suspected hazardous substance is being released, if lives are in danger, or if property is threatened, 911 should be called immediately. It is also appropriate to call 911 anytime an active release is witnessed.	**911**
HAZARDOUS MATERIALS-NO IMMEDIATE DANGER If a known discharge of hazardous materials has occurred in the past and no lives or property are in immediate danger; this must be reported to the Fairfax County Fire and Rescue Department's Hazardous Materials and Investigative Services Section at this number (includes Towns of Clifton, Herndon, and Vienna). If there is any question about whether a release may still be active or whether there may be any immediate danger, 911 should be called.	During working hours, call: **703-246-4386** After hours, call: **703-691-2131**
RELEASE OF ANY MATERIAL INTO THE ENVIRONMENT Any release of materials into the environment, whether hazardous or not, should be reported to the Northern Regional Office of the Virginia Department of Environmental Quality at the above number. If the release is an active one, call 911.	**703-583-3800**

Table V-2 (continued) HOW TO REPORT ENVIRONMENTAL CRIMES	
Type of Incident	**Phone Number**
EROSION AND SEDIMENTATION If the illegal removal of trees, the illegal clearing of land, and/or the illegal dumping of fill is suspected, contact Fairfax County's Code Enforcement Division at the number above. This number should also be contacted if siltation and other harmful effects of construction activity are occurring or observed on neighboring lands and waterways. All calls received during non-working hours will be responded to during the next business day.	**703-324-1937**
HEALTH HAZARDS In addition to the above contacts, if a health hazard is suspected, contact the Environmental Health Administration at the above number. The Health Department's Community Health and Safety Section (703-246-2300) can also be called. Asbestos-specific releases should also be reported to the Health Department.	**703-246-2205**

E. RECOMMENDATIONS

1. EQAC continues to recommend an aggressive public education campaign on how to properly dispose of household/residential, commercial, and industrial hazardous waste. Continuous partnering with the Northern Virginia Board of Realtors and solid waste haulers to distribute information to all new residents in the county is suggested. New residents would be anybody buying or renting a house, townhouse, or condominium. Creative use of other organizations is also encouraged.

2. The county should institute the recycling of NiCad batteries at the I-66 transfer station, the I-95 SW site, and other sites. With the growing popularity and use of rechargeable batteries products, especially cell phones, EQAC recommends an aggressive program to promote recycling of NiCad batteries. Commercial efforts should continue and even expand. Schools and other organizations should be encouraged to come up with creative initiative to promote significant increases in recycling rechargeable batteries

3. Efforts to locate financing to cover the printing cost of Hazardous Waste and Environmental Crime materials should continue as new sources of grants and funding may become available.

4. EQAC recommends continuing to advertise and educate the public regarding the types of hazardous materials and other environmental situations citizens are requested to report, including who they are to contact. Possible avenues are community association newsletters, press release stories to the media, and age appropriate material sent home through the schools.

REFERENCES

1. Fairfax County Fire & Rescue, Chief Michael P. Neuhard, June 17, 2004 memo.

2. Northern Virginia Planning District Commission, *Nvironment*, Vol.12, Number 1, Fall 1999, p1.

3. Northern Virginia Soil & Water Conservation District, *1999-2000 Annual Report*, page *10.*

4. *LEPC Connection: A Virginia Local Emergency Planning Committee Newsletter*, Fall 2000, p 1.

5. Fairfax Joint Local Emergency Planning Committee

6. Fairfax County Division of Solid Waste Disposal and Resource Recovery, Department of Public Works and Environmental Services, HHW Disposal Program, Cliff Taylor, June 30, 2004 memo

7 Fairfax County Web site; viewed September 23, 2004 www.fairfaxcounty.gov/dpwes/trash/recyclingtrash.htm

8. Email from Pamela F. Gratton, Fairfax County Division of Solid Waste Collection and Recycling, October 7, 2004

9. Rechargeable Battery Recycling Corporation (RBRC) web site viewed September 23, 2004. www.rbrc.org.

10. Solid Waste Management Task Force Plan, 2005, last modified 8/27/2004, as viewed on line September 23, 2004; www.fairfaxcounty.gov/dpwes.

11. Previous EQAC authors of this chapter and material

CHAPTER VI

ECOLOGICAL RESOURCES

VI. ECOLOGICAL RESOURCES

This chapter summarizes the status of ecological resources and the actions of public agencies and citizen groups in the management and preservation of these resources.

A. ISSUES AND OVERVIEW

Open space and natural habitat continue to be reduced in Fairfax County, primarily because of development (both residential housing and commercial buildings) and road building. As this resource is reduced, increased emphasis must be placed on protecting, preserving, and enhancing the remaining open space and natural habitat in Fairfax County.

Fairfax County contains a total of 227,788 acres (excluding roads, water, and small areas unable to be zoned or developed). Of this total, about 27,100 acres (11.9%) are in parks and recreation as of January, 2003. Another approximately 26,700 acres (11.7%) are vacant or in natural uses. However, not all this acreage can be considered as open space that is valuable for natural habitat. First, the park acreage consists of active recreation (ball fields, etc.) as well as passive recreation (stream valley parks, nature centers, etc.). Ball fields, while greatly needed in Fairfax County, do not do much for protecting natural habitat. In a like fashion, much private open space consists of mowed areas and isolated trees (not woodlands). Again, this does little for protecting natural habitat. Both active recreation areas and private open space, however, can help the environment by reducing storm water runoff (by allowing storm water to infiltrate into the soil).

Second, while vacant land is often wooded, this land is subject to development. Considering the continuing rapid pace of development in Fairfax County, much of this land will soon become residential space, office space, retail space, etc., and not provide much in the way of protecting natural habitat.

Therefore, Fairfax County needs to undertake stronger efforts in order to protect, preserve, and enhance the environmentally sensitive open space in the county. These efforts include the establishment of a countywide Natural Resource Inventory, followed by a countywide Natural Resource Management Plan. Additionally, the county needs an aggressive program seeking easements on privately owned environmentally sensitive land and, as opportunities arise, to purchase environmentally sensitive land.

Two significant efforts have occurred that should help in the county's preservation and protection of natural resources. First, the Fairfax County Board of Supervisors adopted an environmental vision for Fairfax County – *Environmental Excellence for Fairfax County: a 20-Year Vision*. This vision cuts across all activities in Fairfax

County and outlines guidelines that hopefully will be followed in future planning and zoning activities in Fairfax County.

Second, the Park Authority approved the Natural Resource Management Plan for park properties. Again, if this plan is implemented, improved preservation and protection of environmentally sensitive land should be the result.

EQAC continues to commend a number of organizations for their activities in protection, preservation, and enhancement of environmentally sensitive areas. These organizations include: the Northern Virginia Soil and Water Conservation District, the Virginia Department of Forestry, the Northern Virginia Conservation Trust, Fairfax ReLeaf, and the Fairfax County Park Authority and its staff.

B. PROGRAMS, PROJECTS, AND ANALYSES

1. The Fairfax County Board of Supervisors

In past years, this chapter of the Annual Report mentioned various organizations and programs supporting environmental efforts in Fairfax County. However, the Fairfax County Board of Supervisors, while mentioned many times, did not have a section in this chapter. The actions and decisions of the Fairfax County Board of Supervisors (BOS) do affect the county's natural resources. These actions and decisions include land use planning and zoning, transportation planning, allocation of staff resources, etc. The BOS has enacted a number of policies that do benefit the environment and many of these polices are embedded in county ordinances and the Policy Plan. However, there never has been an overarching vision dealing with the environment. This has now changed. The BOS has now adopted such an overarching vision -- *Environmental Excellence for Fairfax County: a 20-Year Vision*.

This vision is organized into six sections that cut across all areas in the county:

- Growth and Land Use;
- Air Quality and Transportation;
- Water Quality;
- Solid Waste;
- Parks, Trails, and Open Space; and
- Environmental Stewardship.

Some recommendations in this document that impact ecological resources include:

- Create more community parks for active and passive recreation – open spaces with native vegetation to sustain local wildlife and to create areas for walking, meditating, or bird watching;

- Continue to acquire open space before it is too late through direct purchase or conservation easements to create more trails, connect trails and provide passive and active recreation areas;

- Provide adequate resources to maintain and appropriately develop our parks for passive and active recreation;

- Encourage conservation easements for open space and trails either to private organizations, such as the Northern Virginia Conservation Trust and The Potomac Conservancy, or to government agencies like the Fairfax County Park Authority or the Northern Virginia Regional Park Authority;

- Encourage organizations, for example, those that work on stream monitoring and stream valley restoration, to involve schools and citizens of all ages in their work;

- Encourage citizen-based watershed stewardship groups and help them to work with all stakeholders to protect, enhance and improve the natural resources, and hence, the quality of life in their watersheds; and

- Establish an aggressive program of community groups to adopt natural areas such as parks, trails, and stream valleys.

The complete document can be viewed at:
http://www.co.fairfax.va.us/dpwes/environmental/env_excel.htm.

This document is very significant in its potential for protection, preservation, and restoration of the county's natural resources. EQAC commends the Board of Supervisors for adopting this vision and looks forward to the implementation of the recommendations.

2. Fairfax County Park Authority

The Fairfax County Board of Supervisors created the Fairfax County Park Authority (FCPA) in 1950, authorizing the Park Authority Board to make decisions concerning land acquisition, park development, and operations. As a

result, Fairfax County has a system of parks that serve a number of uses, including active recreation such as sports, historic sites and buildings, and preservation of environmentally sensitive areas such as forests and stream valley lands. For current information on the county's parks, visit the FCPA Web site at http://www.fairfaxcounty.gov/parks/.

a. Acquisition of Park Land by FCPA

The FCPA added approximately 1,171 acres in FY 2003. This brings the parkland inventory to a total of 22,908 acres. Included in this acreage is the partial transfer of the Laurel Hill property (the former Lorton Prison) from the Board of Supervisors. This singular action resulted in the acquisition of 867 acres – the largest transfer of land from the Board of Supervisors to the Park Authority.

b. Natural Resource Management Plan

In past reports, EQAC recommended that the county Board of Supervisors develop and implement a countywide Natural Resource Management Plan. EQAC noted that in order to do this, two tasks need to be accomplished first: complete a countywide Baseline Natural Resource Inventory and adopt a unified Natural Resource Conservation Policy.

EQAC's past recommendation on developing a countywide Natural Resource Management Plan has been partially fulfilled by FCPA. On January 14, 2004, the Park Authority Board approved the Natural Resource Management Plan (NRMP) for Park Authority property. The NRMP contains seven elements:

- Natural Resource Management Planning;
- Vegetation;
- Wildlife;
- Water Resources;
- Air Quality;
- Human Impact of Parklands; and
- Education.

The complete NRMP can be viewed at:
http://www.fairfaxcounty.gov/parks/nrmp.htm.

The first year of the implementation of the NRMP started July 1, 2004. However, the existing Natural Resource Management and Protection Section of the Park Authority staff will do the implementation of the plan. This is three people. While some park sites and partners will also assist in implementation, these three people are not adequate to get this plan

underway, especially considering that the Section has other duties and that no additional funds are available. For example, the plan needs to flow down to individual parks. Inventories for individual parks need to be done; however, inventories will occur only as needed as a result of planned development and as funding allows. Furthermore, site specific NRMPs will not occur for un-staffed parks.

The development of a site specific NRMP is taking place at Riverbend Park. Riverbend Park is working with The Nature Conservancy (along with the Natural Resource Management and Protection Section at Park Authority headquarters) to write a NRMP for the park using The Nature Conservancy's resource planning framework. This planning effort can serve as a pilot project that may be used as a model for creating plans for other parks.

While the Park Authority has made a great step forward with the adoption of the NRMP, more resources (people and funds) need to be devoted to the implementation of the plan. Furthermore, inventories of all parks need to be accomplished. The inventory needs to be extended to cover all of Fairfax County so that future planning for acquisition of sensitive lands can take place.

c. Greenways Program

Implementation of the Greenways Program began in 1997 with the Park Authority staff working with citizens groups participating in the Parks Round Table partnership. Unfortunately, the Park Authority staff stopped supporting the Round Table and the Parks Round Table lapsed. The Greenways concept is furthered through the county Comprehensive Plan, and through Park Authority policy, to "identify, protect, and enhance an integrated network of ecologically valuable land and surface waters for present and future residents of Fairfax County." FCPA helps accomplish this goal through the acquisition of land for Stream Valley Parks, and the development of a comprehensive trail network.

As is the case with Environmental Quality Corridors (EQCs), the ecological boundaries of Greenways may include both public and private open space. Under voluntary cooperative resource management agreements, the Park Authority could offer technical assistance for enhancing the Greenway benefits of private property. This could include the landowner voluntarily granting conservation easements. Groups such as The Nature Conservancy have used conservation easements successfully to protect environmentally sensitive lands, and The Nature Conservancy has found that many landowners support the goal of preserving these environmentally sensitive lands.

EQAC notes that the Greenways Program is valuable in that it can expand the protection of environmentally sensitive stream valleys. However, this program should be aggressively expanded through the use of obtaining conservation easements, where possible, on private properties. As noted above, The Nature Conservancy has been successful in this approach. Additionally, the Northern Virginia Conservation Trust (NVCT) has now obtained a number of easements in Northern Virginia, showing that this approach in Fairfax County is feasible. The Board of Supervisors should continue its cooperation with NVCT and aggressively pursue easements aimed at protecting and preserving environmentally sensitive lands.

The Greenways Program did move forward in 2003 with the acquisition of about 277 acres of stream valley land in 12 purchases, dedications, and transfers. These included:

- Kingstowne Park – 76.9 acres of stream valleys, ponds, and wetland mitigation areas adjoining the Piney Run Stream Valley. This is co-owned with the county.
- Laurel Hill – 867.1 acres of which about 100 acres are in the Giles Run Stream Valley;
- Horne Property – 238.1 acres of which about 50 acres are in the Bull Run watershed.
- Thomas-Brodie Property – 16.7 acres in the Difficult Run Stream Valley.

d. Invasive Plant Control Efforts

Invasive plants are a problem because they can out compete and replace native species. This change in vegetation disrupts the life cycles of many flora and fauna that depend on native vegetation. The Park Authority's Strategic Plan includes a strategy to develop invasive plant guidelines for consideration by the Environmental Coordinating Committee as a countywide standard. Invasives projects occur at staffed parks and in select parks when volunteers can assist in the efforts. While EQAC commends the volunteers and the Park Authority staff who are cooperating in removing invasives, an increased effort should be established using dedicated funds for this purpose.

One such project involving volunteers is the adoption of the Marie Butler Leven Preserve by a non-profit organization (Earth Sangha). Earth Sangha will demonstrate invasives removal and the use of native plants and trees at this preserve.

Examples of invasives control projects at staffed sites include Riverbend Park and Ellanor C. Lawrence Park. Riverbend Park is in the beginning of a

partnership with the Potomac Conservancy and The Nature Conservancy to bring volunteers to Riverbend and Scott's Run Nature Preserve to assist with the control of invasive species. This relationship began in May, 2004, when the Potomac Conservancy brought a group of Americorps volunteers to Riverbend for one week to eradicate invasives in the meadow and to construct a new trail.

At Ellanor C. Lawrence Park, site staff combated exotic plants through cutting and spraying. These plants included Microstegium, autumn olive, and oriental bittersweet.

e. Riparian and Bioengineering Projects

The Fairfax County Park Authority, along with and in partnership with other agencies, continues to work on stream stablization/bioengeering projects. See the Water Resources Chapter of this report for descriptions of these projects.

f. Fairfax County Park Foundation

Fairfax County citizens can donate to the Fairfax County parks through the Fairfax County Park Foundation. The Fairfax County Park Foundation is a 501(c)(3) not-for-profit organization and donations are tax deductible to the fullest extent allowed by law. The Foundation's mission is to raise funds to support the parks and land under the stewardship of the Fairfax County Park Authority. Less than half of the Park Authority's annual operating funds come from tax support. The Foundation's goal is to bridge the gap between income from tax support and user fees, and the cost to operate, maintain and preserve our park system. If you are interested in giving a tax-deductible donation to the Foundation, contact them at:

Fairfax County Park Foundation
12055 Government Center Parkway
Fairfax, VA 22035
(703) 324-8581
SupportParks@aol.com
http://www.FairfaxCountyParkFoundation.com

3. Northern Virginia Regional Park Authority

Three Northern Virginia Counties (Fairfax, Loudoun, and Arlington) and three cities (Alexandria, Fairfax, and Falls Church) participate in the Northern Virginia Regional Park Authority (NVRPA). NVRPA was founded in 1959 and

owns and operates 19 regional parks and owns 10,256 acres of land throughout the region.

The NVRPA often partners with other organizations to meet its mission of caring for the environment, overseeing urban forestland, protecting water resources, and preserving land for future generations. Some of these activities in 2003 included:

- U.S. Bureau of Land Management "Public Lands Appreciation Day" projects at Pohick Bay and the Washington and Old Dominion (W&OD) Trail;
- National Audubon Society's annual bird counts at Bull Run and at Pohick Bay;
- Friends of the Occoquan and Chesapeake Bay Restoration Fund-sponsored Occoquan River Semi-Annual Cleanup Days at Occoquan, Fountainhead, and Bull Run Marina;
- Alice Ferguson Foundation 15th Annual Potomac Watershed Cleanup Day at Pohick Bay;
- Virginia Division of Soil and Water Conservation's Urban Nutrient Management Program at NVRPA golf courses and athletic fields; and
- 3,000 native species tree planting project by volunteers along two and a half miles of the W&OD Trail.

Current information about the Northern Virginia Regional Park Authority can be found on its Web site: http://www.nvrpa.org/.

4. Fairfax ReLeaf

Fairfax ReLeaf is a non-profit (501(c)(3)), non-governmental organization of private volunteers who plant and preserve trees, restore habitat, and improve community appearance in Northern Virginia. They have testified to county officials and politicians that an unacceptably rapid rate of tree loss in Fairfax County continues. They state that the county has not taken effective steps to stem this loss of forest infrastructure. They are very active in tree plantings and are always eager to sign up new volunteers.

Fairfax ReLeaf remains very active in its efforts. For example, during fall, 2003, the organization worked with the following individuals/groups:

- Eagle Scout Sean Milligan improved the Difficult Run Stream Valley Park with 134 seedlings, consisting of a mix of bald cypress, buttonbush, red maple, river birch sycamore, willow oak, and 20 black willow stakes;

- Cox Cable and Home Stretch each sent a large group of volunteers to mulch and prune at the West Ox Transfer Station to give the small trees on the closed landfill a better chance of survival;

- The George Mason Women's Track & Cross Country team and STRIVE worked up and down the grass covered mound at Braddock Road and Fairfax County Parkway, planting, mulching, and protecting 143 trees;

- Several Boy Scout groups continued to support ReLeaf plantings at Rolling Road, Crossfield, and Old Creeke Elementary Schools;

- Girl Scouts assisted the Centreville Beautification Committee at a planting at Routes 28 and 29; and

- Tree Commissioners Laura Hoy and Debbie Foster both initiated and assisted with plantings in their Districts (Springfield and Sully).

For further information on Fairfax ReLeaf, visit its Web site at http://www.geocities.com/RainForest/5663. Fairfax ReLeaf can be reached at:

Fairfax ReLeaf
12055 Government Center Parkway
Suite 703
Fairfax, VA 22035
Telephone: (703) 324-1409
Fax: (703) 631-2196
Email: trees@fairfaxreleaf.org

5. Northern Virginia Conservation Trust

Past EQAC reports have recommended that the Fairfax County Board of Supervisors form public-private partnerships for the purpose of obtaining easements on environmentally sensitive land. EQAC pointed out that entities such as The Nature Conservancy use easements very successfully as a way of protecting environmentally sensitive properties. With the signing of a Memorandum of Understanding on June 20, 2001 between the Fairfax County Board of Supervisors and the Northern Virginia Conservation Trust (NVCT), such a public-private partnership now exists.

The Northern Virginia Conservation Trust (NVCT) was founded in 1994 as the Fairfax Land Preservation Trust. In 1999, it changed its name to The Northern Virginia Conservation Trust to better reflect the regional scope of the organization. NVCT is a 501(c)(3) nonprofit land trust dedicated to preserving and enhancing the natural and historic resources of Northern Virginia. NVCT also has formed public-private partnership with Arlington County and owns properties and/or easements in Arlington, Fairfax, Loudoun, Prince William, and Stafford Counties.

From the time NVCT accepted its first easement in 1999 through June 2004, NVCT has preserved 512 acres of open space in Fairfax County through easements, fee simple ownership, and partnerships. Table VI-1 shows the extent of these activities, many of which offer protection to stream valleys.

NVCT also has a public outreach program – Adventures in Conservation – to bring hands-on volunteerism and environmental education opportunities. These activities included the planting of over 1,500 native trees, the removal of tons of invasive plants, birding trips, and guided hikes.

EQAC encourages all landowners whose property contains environmentally sensitive land such as wetlands, stream valleys, and forests to consider contacting NVCT and learning more about easements. If these landowners grant an easement, they will not only protect sensitive land, but can realize some financial benefits. A perpetual easement donation that provides public benefit by permanently protecting important natural, scenic, and historic resources may qualify as a Federal tax-deductible charitable donation. Under the Virginia Land Conservation Act of 1999, qualifying perpetual easements donated after January 1, 2000 may enable the owner to use a portion of the value of that gift as a state income tax credit. Fairfax County real estate taxes could also be reduced if the easement lowers the market value of the property.

Additional information on NVCT can be found on its Web site at:
http://www.nvct.org.

Table VI-1
Fairfax County Open Space Preserved Through NVCT Efforts

Date	Name	District	Acres	Type
Dec 1999	Haldane Easement	Dranesville	4.2	One easement
Apr 2000	Ruckstuhl Easement	Providence	7	Four easements
Aug 2000	Davenport/Pimmit Run	Dranesville	1	Fee simple ownership
Dec 2000	Narins Easement	Dranesville	5	One easement
Dec 2000	Bliss Easement	Dranesville	5.6	One easement
May 2001	Elklick Woodland Preserve*	Sully	384	Grant funds for acquisition
Jul 2001	Rentsch Easement	Dranesville	5	One easement
Jul 2001	Cobb Easement	Dranesville	12	One easement
Aug 2001	Thornton Easement	Dranesville	5	One easement
Aug 2001	Lindsay Easement	Dranesville	5	One easement
Jan 2002	Backlick Run	Braddock	0.6	Fee simple ownership
Mar 2002	Little Hunting Creek	Mt. Vernon	2	Fee simple ownership
May 2002	Geschicter Easement	Mt. Vernon	34	One easement
Aug 2002	Solarz Easement	Dranesville	6	One easement
Dec 2002	Hanley I Easement	Lee	0.8	One easement
Dec 2002	Hanley II Easement	Lee	0.8	One easement
Dec 2002	Greenspring/Evans	Mason	1.58	One easement
Mar 2003	Sloan Easement	Hunter Mill	0.364	One easement
Apr 2003	Thompson House	Sully	1.56	One easement
May 2003	CBA Easement	Springfield	5.5	One easement
Jun 2003	Laughlin I Easement	Mt. Vernon	0.407	One easement
Jun 2003	Laughlin II Easement	Mt. Vernon	0.92	One easement
Jun 2003	Cobb II Easement	Dranesville	2.377	Easement amendment
Jun 2003	Gilliam/Clifton	Springfield	8.66	Fee simple ownership
Dec 2003	Ryan Easement	Mt. Vernon	9	One easement
Apr 2004	Hauge Easement	Mason	0.75	One easement
May 2004	Oak Hill Easement	Braddock	2.8	One easement
	Total Acres		**512**	

*Note: The Elklick Woodland Preserve includes two parcels of land purchased by the Fairfax County Park Authority with funds from an NVCT grant. An easement to NVCT has been recorded on 226 acres.

Source: *Spreadsheet of NVCT Fairfax Properties*, E-mail from Paul Gilbert, NVCT President, to Robert McLaren, August 16, 2004.

6. Northern Virginia Soil and Water Conservation District

The Northern Virginia Soil and Water Conservation District (NVSWCD) continues to provide leadership in the area of bioengineering techniques in streambank stabilization and in the general area of erosion and stormwater control. They work in partnerships with other agencies and organizations. For example, they have partnered with the Fairfax County Park Authority, Virginia Department of Forestry (VDOF), the Fairfax County Department of Public Works and Environmental Services, and the Reston Association. See the Water Resources Chapter in this report for descriptions of stream stabilization/bioengineering projects for which NVSWCD has provided leadership.

NVSWCD's annual seedling program emphasizes the role of vegetation in preventing erosion, conserving energy, and decreasing and filtering stormwater runoff. Those planted in riparian areas also help to protect stream channel stability and stream water quality, as well as improving the surrounding habitat. The 2003 seedling program offered citizens a "sun and shade" package of 14 native tree and shrub seedlings for a small cost. NVSWCD sold 412 packages in the 2003 program.

a. Fairfax County Soil Survey

Fairfax County used to have soil scientists on the staff, but in a budget cut several years ago, the office was abolished. In past Annual Reports, EQAC deplored this move and recommended that soil scientist expertise be brought back to the county staff. While the Board of Supervisors did not exactly follow this recommendation, it did satisfy the intent of EQAC's recommendation by funding NVSWCD to finish the county's soil survey. The funding for this became available to NVSWCD in Fiscal Year 2004 and will continue through Fiscal Year 2007. The field surveys will be complete in 2007, and the final reports and maps will be available in 2008.

NVSWCD is working with the Natural Resources Conservation Service (NRCS) in accomplishing the update of the Fairfax County soil survey. NVSWCD funds NRCS for this assistance (about $110,000 per year) with some of the monies provided by the Board of Supervisors. NRCS matches the funds provided, thereby leveraging the funds provided by the Board of Supervisors.

The Fairfax County soil survey update will modernize an existing soil survey. The update will enable the GIS system to use the soil survey information (a capability that did not exist). As a result, this update will enable planners, individuals, scientists, and anyone involved in land use

planning to make smart land use decisions that will work to save money and conserve valuable natural resources.

The resulting database and maps will incorporate the new information and scientific knowledge acquired about soils in the last 30 years. However, the updated maps will not eliminate the need for site-specific surveys when construction or changes in site use occur. The maps will better describe, characterize, and define the properties of the soil components within existing delineations. The map will also show that inclusions of other soil types can exist, but will not show the extent of smaller inclusions. Site-specific surveys will be need for this fine detail.

One new effort that is being done under the soil survey is the characterization of man-made soils (urban soils). The characteristics of urban soils can be quite different from native soils. One significant difference is the ability of water to infiltrate urban soils (much less than many native soils). Knowing where urban soils exist and the type of urban soil can be critical to stormwater control efforts that incorporate infiltration of water (rain gardens, grassy swales, etc.).

In a similar fashion, neighboring counties are updating their soil maps. Loudoun County updated its soil maps and incorporated those data into its GIS system. Loudoun County, however, recognizes that the soils map needs to be continuously updated (based on field site inspections) and has a county Soil Scientist to provide site-specific soil interpretations. In a like fashion, Fauquier County has also updated its soil survey and incorporated that data into its GIS. Fauquier County also has a county Soil Scientist Office to provide site-specific information.

Fairfax County also needs to maintain expertise in soils. At present, funding for the expertise will end after Fiscal Year 2007. However, the GIS maps will need to be maintained and updated, and this cannot be done without the appropriate expertise. Furthermore, expertise will be needed to interpret site-specific surveys. Without this expertise, problems will likely develop as uses are changed on sites. In addition, detailed knowledge of soils will be critical to future stormwater control efforts as well as other activities. One just needs to look at the recent slope failure on the newly widened Telegraph Road to see the importance of knowing soils and their characteristics. In this case, the failure of the slope due to clay soils jeopardized houses on the top of the hill. EQAC therefore recommends that the Board of Supervisors continue to fund soil scientist expertise past Fiscal Year 2007.

7. Fairfax County Wetlands Board

If you own property on the waterfront in Fairfax County, you may need a permit before you build or make improvements on your property. These activities, known as land disturbing activities, often require a permit if done in an area that has been identified as a tidal wetlands. Land disturbing activities include the following:

- Any construction project on or adjacent to a tidal body of water;
- Any construction project in which fill material is place in or near wetlands;
- Construction of bridges, tunnels or roads which may have an impact on wetlands, either tidal or non-tidal; or
- Projects designed to protect property adjacent to shorelines

For further information contact the Wetlands Board at:

Fairfax County Wetlands Board Staff
Department of Planning and Zoning, Planning Division
12055 Government Center Parkway, Suite 730
Fairfax, VA 22035-5504
(703) 324-1210
http://www.co.fairfax.va.us/dpz/environment/wetlands.htm

8. Virginia Department of Forestry

The Virginia Department of Forestry (VDOF) has provided forestry related services in Fairfax County for over 30 years. VDOF is also participating in several efforts aimed at improving riparian zones and stream bank stabilization projects. In these efforts, VDOF partnered with the Northern Virginia Soil and Water Conservation District, the Department of Public Works and Environmental Services, and the Reston Association. See the Water Resources Chapter in this report for further details. Also, see the Water Resources Chapter for details on VDOF riparian buffer reforestation efforts.

9. Virginia Department of Transportation

Unavoidable impacts to water resources with Fairfax County that occur during highway construction projects are mitigated as required by federal and state laws and regulations. The Virginia Department of Transportation (VDOT) is currently monitoring two wetland mitigation projects within Fairfax County.

- In the Dranesville District, VDOT created a wetland project along Dranesville Road near Sugarland Run to mitigate for construction

impacts from the Fairfax County Parkway. The site was planted in fall, 2002 and is currently being monitored for five years. The first year results from the monitoring show impressive results.

- In the Braddock District, VDOT constructed a wetlands project in 2003 near the Virginia Railway Express in Burke. These wetlands are being created to mitigate for construction impacts from the Roberts Parkway Bridge Overpass and the Springfield Interchange Improvement Project.

VDOT does use bioengineering techniques for transportation projects with associated riparian impacts. Stream restoration on a Pohick Creek tributary near Lorton Road started in the spring of 2004 as a part of VDOT's Richmond Highway widening project. VDOT is assessing other potential stream restoration sites within the State's right-of-way to compensate for stream impacts from road construction projects. VDOT also seeks opportunities to partner with Fairfax County agencies and private property owners on future bioengineering projects. EQAC encourages the Northern Virginia Soil and Water Conservation District and the Department of Public Works and Environmental Services to work with VDOT to identify possible stream restoration projects and to partner with VDOT in the accomplishment the identified projects.

VDOT includes landscaping in several construction projects to enhance road improvements. Fairfax County projects include:

- Ox Road between Burke Lake Road and Davis Drive (completed April 2004 and under a three-year establishment period);

- Fairfax County Parkway between Fawn Ridge Lane and Walnut Branch Road (completed December 2002 and under a three-year establishment period);

- Gambrill Road Park and Ride Lot (construction underway as of June 2004); and

- Richmond Highway widening from Lorton Road to Telegraph Road (construction underway as of June 2004).

VDOT is moving forward with efforts to control invasive vegetation and replace it with vegetation that is more desirable. VDOT contractors are removing invasive vines and trees along several interstate and primary routes in Fairfax County. For the past several years, VDOT removed vines overgrowing native trees and removed non-native invasive trees along the Interstate 66 corridor. In 2003, VDOT planted approximately 1,200 tree saplings, shrubs, and perennials (primary native species) to replace invasive vegetation. VDOT will monitor

these plantings to ensure their successful establishment. EQAC commends VDOT on the invasive plant removal and replacement effort and recommends that VDOT use only native species for replacement plantings.

VDOT maintains about 22 acres of wildflowers and native grasses planted throughout Fairfax County. In April, 2004, VDOT seeded about three acres of wildflowers and native grasses in several infield areas at Interstate 66 and Route 123.

10. Urban Forestry

a. Urban Forestry Division

In 2003, as part of the reorganization of the Land Development Service line of business, the Urban Forestry and East and West Environmental Facilities Review Divisions were scheduled to merge into the newly formed *Environmental and Site Review Division*, effective July, 2004. As part of this reorganization, the Urban Forestry Division (UFD) was renamed to *Urban Forest Management* (UFM). In addition, two sections of UFD, the Urban Forestry Section and Forest Pest Program, were renamed to the *Forest Conservation Section* (FCS) and the *Forest Pest Section* (FPS) respectively. UFM Staffing levels and core activities remained unaffected by this reorganization.

In 2003, Urban Forest Management completed a 5-year Strategic Plan. The strategic planning process included development of UFM Mission, Vision and Value statements. A Leadership Team then developed the following goals to be used to guide the county's urban forestry program over the next five years:

- Goal 1: Develop and implement an urban forest management plan that is ecosystem-based and addresses community values.
- Goal 2: Increase awareness of the value of a healthy urban forest and natural environment and the need for an urban forest program.
- Goal 3: Lead in the development of effective urban forestry policies and regulations.
- Goal 4: Provide the highest quality service for Fairfax County citizens.
- Goal 5: Form strong partnerships to achieve goals of mutual interest in the conservation of the urban forest and natural resources.
- Goal 6: Develop a work culture that fosters our adopted values.

In addition to finalizing a five-year Strategic Plan, in 2003, UFM:

- Identified strategies and resources needed to generate a comprehensive Urban Forest Management Plan.
- Continued mapping regional vegetation resources.
- Continued fulfilling its core responsibility to protect the county's vegetation resources threatened by land development and forest pest activities.

b. Gypsy Moth Program

The gypsy moth was first detected in Fairfax County in 1981. To avoid the environmental, economic, and health hazards associated with this pest, the Board of Supervisors enacted an Integrated Pest Management (IPM) Program to control the gypsy moth. The purpose of the program is to reduce gypsy moth populations below defoliating levels. The goal of the program is to minimize the environmental and economic impacts of the pest by limiting the amount of tree mortality and use of pesticides in the environment. The control methods considered annually are:

- **Mechanical**: the gypsy moth egg mass Search, Scrape, and Destroy Campaign and Burlap Banding for Gypsy Moth Caterpillars. These are citizen involvement programs.
- **Biological**: the release and monitoring of gypsy moth parasites and pathogens.
- **Chemical**: the aerial and ground applications of Diflubenzuron and Bacillus thurinaiensis (Bt) on high infestations.
- **Educational**: the self-help program and lectures to civic associations and other groups.

In calendar year 2004, gypsy moth caterpillar populations increased compared to previous years. Insect populations are cyclical in nature and it is impossible to determine whether this increase is a sign that outbreak populations are imminent. Although gypsy moth populations have increased, there was no defoliation in Fairfax County or the State of Virginia during the summer of 2004. The gypsy moth staff will continue to monitor populations in the fall of 2004, and ground treatment is probable in 2005.

c. Update on Effort to Control Cankerworm

The fall cankerworm is native to the United States and feeds on a broader range of trees than the gypsy moth. Periodic outbreaks of this pest are common, especially in older declining forest stands. The area of the county that had the most severe infestations of fall cankerworm was in the Mount Vernon and Lee Magisterial Districts. Typically this insect will defoliate in

the early spring when the trees are able to withstand the impacts and little long-term damage is expected; however, tree mortality is possible when combined with conditions that place stress on trees, such as drought. Nuisance to homeowners occurs when large numbers of caterpillars hang from the trees and migrate to the ground.

The Forest Pest Program conducted a large aerial treatment program during the spring of 2003. Staff monitored for adult female moths throughout the Mount Vernon and Lee Districts in January of 2001. The results of the winter 2003 – 2004 monitoring effort indicated that no aerial treatment was required in the spring of 2004.

The Forest Pest Program will monitor for fall cankerworm again this winter. It is expected that populations of this pest will be low in the near future.

d. Emerald Ash Borer

The emerald ash borer (Agrilus planipennis) is an exotic beetle from Asia and was discovered infesting ash trees in the state of Michigan in 2002. This beetle is known to attack only ash trees and can kill trees in as little as two years. After it was discovered, the United State Animal Plant Health Inspection Service (APHIS) established a quarantine around the infested area in order to contain the pest. Unfortunately, a tree nursery owner inside of the quarantine area illegally shipped infested ash trees to a nursery in Maryland. During the summer of 2003, 13 of the ash trees were planted at the Colvin Run Elementary School site (Dranesville District). These trees were removed by the Virginia Department of Agriculture and Consumer Services (VDACS) and incinerated.

The removed trees contained evidence that adult beetles had escaped into the environment. In order to prevent the beetles from becoming established in Fairfax County, APHIS and VDACS conducted an Emerald Ash Borer Eradication Program. It was ordered that all ash trees within a one-half mile radius of the school site must be removed and incinerated. This area included a total of 278 ash trees, 90 of which were on 29 privately owned properties. Recognizing that this eradication effort caused residential deforestation to 29 homeowners in Fairfax County, the United States Forest Service is providing $8,000 that will provide relief to the homeowners in purchasing replacement trees. The Virginia Department of Forestry (VDOF) is administering the federal funds, which will be distributed in the form of vouchers and issued to homeowners by Fairfax County government.

On December 12, 2003, the Commissioner of VDACS added the emerald ash borer to the list of insects that can be controlled by service districts. On January 26, 2004 the Board of Supervisors directed Forest Pest Section staff

to coordinate with VDACS in implementing the Emerald Ash Borer Eradication Program. Staff of the Forest Pest Program (FPP) began assisting VDACS shortly after the insect was added to the list and Board direction was given. FPP duties included surveying the area around Colvin Run Elementary for ash trees, conducting public notification meetings, preparing maps for tree removal contractors, monitoring contracted services, preparing mailings, and responding to media inquires.

Tree removals began on March 1 and were completed by March 31. Staff is monitoring the area around Colvin Run for the presence of any adult beetles. Monitoring is conducted by placing 50 "sentinel" trees at various areas around the school site. At the end of the summer, the sentinel trees will be removed and checked for life stages of the emerald ash borer.

e. Forest Conservation Section (FCS)

In 2003, the FCS continued to serve its traditional customers: citizens, builders, developers, planners, engineers, landscape architects, private arborists, and other county staff and agencies, including the Board of Supervisors (BOS), Planning Commission, Tree Commission, Environmental and Facilities Review Division (EFRD), Environmental and Facilities Inspections Division (EFID), Department of Planning and Zoning (DPZ), Office of Capital Facilities, and the School Board.

Table VI-2 summarizes the workload of the FCS based on the requests for assistance that were completed for FY 2001, 2002, and 2003. These figures demonstrate the number of requests for assistance has remained fairly constant over the three year period. In FY 2003, requests for assistance were down slightly from previous years for Department of Planning and Zoning (DPZ) requests. In April of 2004, however, the FCS and DPZ agreed to have FCS included in the initial agency routing for all zoning cases. It is anticipated that FCS will be spending a greater percentage of staff time on zoning cases in 2004 and subsequent years.

A significant amount of staff time in 2003 was also dedicated to field research for the vegetative cover study (see below). Ninety additional vegetative plots throughout the county were surveyed in 2003. Staff also participated on the Cluster Subdivision Amendments Team. Revisions to the county's Cluster Subdivision ordinances were mandated by State legislation. After over a year of work by the Team and numerous public hearings, the Board of Supervisors adopted the Cluster Subdivision Amendments in June, 2004. The Amendments provide for Cluster development by-right in certain zoning districts and situations, and require tree preservation planning and FCS review of by-right Cluster plans.

Staff continued to provide training to new inspectors in EFID on County Code requirements for vegetation preservation and planting, and to teach courses for the Engineers and Surveyors Institute on tree preservation techniques and county tree and landscape ordinances and policies.

Table VI-2
Urban Forest Management Workload
2001 through 2003

Type of Assignment	Number of Completed Requests		
	2001	***2002***	***2003***
Waivers	64	70	67
Zoning Cases	208	187	140
Land Development Services (LDS) Requests: Plan Review	786	723	736
LDS Requests: Site Inspections	725	743	732
Other (BOS, FCPA, Other County Agencies, etc.)	559	611	628
Hazardous Trees	25	27	15
Total Complete	**2,367**	**2,361**	**2,318**

f. Tree Preservation Task Force

The Tree Preservation Task Force met once on December 3, 2003 to conduct an annual review of the status of its recommendations and to discuss the following topics:

- Status of tree preservation legislation submitted by Fairfax County to the 2003 Virginia General Assembly to amend Code of Virginia §15.2-961.
- Review progress of the UFM Strategic Plan and countywide Urban Forest Management Plan.

The Tree Preservation Task Force will continue to meet and review the progress and effectiveness of the 37 recommendations that the Task Force forwarded to the Board of Supervisors in 1999. During 2004, the Tree Preservation Task Force is likely to examine the following issues:

- Cluster Subdivision Zoning Ordinance Amendments;
- The need for State enabling tree preservation legislation; and
- The need for a countywide Urban Forest Management Plan

The Tree Preservation Task Force activities for the year 2003 primarily focused on county staff forming a multi-agency committee (DPZ, DPWES, OCA) to examine new state enabling legislation dealing with by-right processing of cluster subdivisions which directly supports recommendation #4: "Request that DPZ staff bring the proposed cluster subdivision by right Zoning Ordinance Amendment to the Tree Preservation Task Force for discussion prior to the authorization of a public hearing by the Board of Supervisors."

As a result of staff efforts in 2003, on June 7, 2004 the Board of Supervisors adapted proposed amendments that allow for the use of cluster subdivision designs during the development of by-right uses. These amendments became effective on July 1, 2004 and contain provisions that could encourage the preservation of existing trees in levels that substantially exceed that typically found in conventionally designed subdivisions.

In 2003, UFM actively worked on Tree Preservation Task Force Recommendation #37 to "conduct periodic tree and forest cover analysis." This recommendation was addressed by an on-going effort to map the county's tree cover, and will be covered in detail later in this section.

Table VI-3 provides an update of the Tree Preservation Task Force 1999 Recommendations and an Implementation Matrix.

Table VI-3
Tree Preservation Task Force
1999 Recommendations and Implementation Matrix

REC.#	RECOMMENDATIONS	IMPLEMENTATION MECHANISM	STATUS
1	The Board should reconvene the Tree Preservation Task Force biannually, with additional meetings to be called as needed, but at a minimum annually. (Idea #23)	Board endorsement of recommendations	COMPLETE (ON-GOING)
2	The Tree Commission, as part of their Action Plan, should initiate a campaign for energy conservation through tree planting around houses and other structures for shade and windbreaks. (Idea #25)	Tree Commission's Action Plan and PFM Amendments	COMPLETE
3	As part of the Earth Day/Arbor Day proclamation, the Board should emphasize annually its support for tree preservation as well as planting. (Idea #18)	Board endorsement of recommendation and Earth Day/Arbor Day proclamation	COMPLETE

Table VI-3 Tree Preservation Task Force 1999 Recommendations and Implementation Matrix			
REC.#	RECOMMENDATIONS	IMPLEMENTATION MECHANISM	STATUS
4	Request that DPZ staff bring the proposed cluster subdivision by right Zoning Ordinance Amendment to the Tree Preservation Task Force for discussion prior to the authorization of a public hearing by the Board of Supervisors. (Idea #2)	Board endorsement of recommendation	COMPLETE
5	Emphasize the meeting of tree cover requirements through preservation instead of clearing and replanting and request commitments to higher tree cover percentages than the minimum requirements, during the negotiations of zoning applications where appropriate. (Ideas #1, #9)	Board endorsement of recommendation and PFM amendments	COMPLETE
6	Place greater emphasis on connectedness with other EQC areas and wildlife habitat when determining EQC boundaries in the zoning process. (Idea #5)	Board endorsement of recommendation	COMPLETE
7	Require applicants that have submitted zoning applications to show potential stormwater management facility locations on all development plans or plats even if the applicant has applied or will apply for a stormwater management waiver. This recommendation should be part of an overall review of stormwater management policies. (Idea #4)	Board endorsement of recommendation	COMPLETE
8	Request that EQAC incorporate in their annual report to the Board of Supervisors a status of forest cover retention efforts in the county, to include specific watersheds in critical danger. (Ideas #3 and #9)	Memorandum from Urban Forester to EQAC	COMPLETE

Table VI-3 Tree Preservation Task Force 1999 Recommendations and Implementation Matrix			
REC.#	RECOMMENDATIONS	IMPLEMENTATION MECHANISM	STATUS
9	Seek comments from the Urban Forestry Branch on proposed Plan Amendments. (Idea #8)	Discussion between Director of PD and UFD Director	COMPLETE
10	Request that staff, during the negotiation process of zoning cases, request conservation easements to provide long-term protection for designated tree preservation areas. (Idea #11)	Memo from County Executive to Directors of DPZ and DPWES	COMPLETE
11	Encourage staff to pursue the Zoning Ordinance enforcement process as the avenue for resolution in cases of actual or potential encroachment into common open space areas. (Idea #11)	Memo from County Executive to Directors of DPZ and DPWES	COMPLETE
12	Request that DPWES, VDOT, FCPA and NVRPA conduct research on, and train their staff in, the use of bioengineering techniques. (Idea #13)	1. Memo from Co. Exec. to Directors of DPWES and FCPA 2. Letter from BOS Chair to VDOT and NVRPA	COMPLETE
13	Request that the DPWES, VDOT, FCPA and NVRPA include the use of bioengineering techniques wherever feasible on projects in the county. (Idea #13)	1. Memo from Co. Exec to Directors of DPWES and FCPA 2. Letter from BOS Chair to VDOT and NVRPA	COMPLETE
14	The Board should support future programs for the eradication of invasive and exotic plant species by the Fairfax County Park Authority and other agencies. Encourage the FCPA to investigate alternative funding sources such as grants from the Northern Virginia Planning Commission, the Northern Virginia Soil and Water Conservation District, the Virginia Environmental Endowment and the Virginia Department of Environmental Quality (Idea #26)	Letter from Chair of the BOS to the FCPA	COMPLETE

Table VI-3
Tree Preservation Task Force
1999 Recommendations and Implementation Matrix

REC.#	RECOMMENDATIONS	IMPLEMENTATION MECHANISM	STATUS
15	Request that the Board support funding for an education campaign regarding invasive and exotic plants, to be initiated by the Fairfax County Park Authority in cooperation with the Northern Virginia Regional Park Authority. (Item #26)	Board endorsement of recommendation	COMPLETE
16	The BOS should review and continually re-evaluate its deer policy. (Item #28)	Board endorsement of recommendation	COMPLETE
17	On VDOT projects in Fairfax County the Board should encourage county staff to seek out alternative funding sources such as grant funds for tree and shrub planting and maintenance. (Idea #24)	Memo from County Executive to Fairfax County Department of Transportation	COMPLETE
18	The Board should consider providing cost-sharing funds for tree replacements/landscaping on VDOT projects or initiate county funded planting projects along State roadways in Fairfax County. (Idea #24)	Memo from County Executive to Fairfax County Department of Transportation	COMPLETE
19	The Board should support and encourage citizen and community groups and businesses to initiate planting projects along State roadways and on other public lands in Fairfax County. (Idea #24)	1. Publication of the TPTF recommendations in the Weekly Agenda 2. Consider funding tree planting projects through Fairfax ReLeaf 3. BOS request VDOT to distribute information regarding tree planting process and regulations	COMPLETE COMPLETE COMPLETE
20	The Board should encourage VDOT to provide increased funding for landscape maintenance in Fairfax County as well as encourage county and VDOT staff to seek out alternative sources for maintaining tree and shrub plantings similar to "Adopt-A-Highway." (Idea #24)	1. Letter from the Chair of the BOS to VDOT and State Forester 2. Letter from the Chair of the BOS to VDOT	COMPLETE

Table VI-3 Tree Preservation Task Force 1999 Recommendations and Implementation Matrix			
REC.#	RECOMMENDATIONS	IMPLEMENTATION MECHANISM	STATUS
21	Involve the private utility companies earlier in the construction process by inviting them to the pre-construction conference required by the Office of Site Development Services prior to commencing construction. (Idea #16)	Letter to Industry	COMPLETE
22	The members of the Industry Small Group of the TPTF should endorse the recommendations of the Task Force which provide incentives for tree preservation. (Ideas#16 and #17)	Board endorsement of recommendation and TPTF endorsement of PFM amendments	COMPLETE
23	Prepare a paper discussing issues related to, and options for adoption of, an ordinance as provided for by the "heritage and specimen" tree conservation enabling legislation. (Resources: staff time) If the enabling legislation is determined to be feasible to implement by county ordinance, have staff prepare an appropriate ordinance for adoption, along with such Zoning Ordinance and Subdivision Ordinance amendments as might be needed. (Resources: staff time; additional two years) (Idea #12)	Report to the TPTF	IN PROGRESS
24	Determine if it is appropriate to reduce the amount of on-site grading that is required to meet drainage requirements, and if so amend the PFM. (Idea #5)	Report to the TPTF	Withdrawn from Infill Recs
25	Evaluate the use of conservation easements on individual lots. Determine the appropriateness of allowing conservation easements on private lots to be counted toward BMP credits. (Ideas #7 and #11)	Report to the TPTF	IN PROGRESS

Table VI-3 Tree Preservation Task Force 1999 Recommendations and Implementation Matrix			
REC.#	RECOMMENDATIONS	IMPLEMENTATION MECHANISM	STATUS
26	Amend the PFM and Zoning Ordinance to increase the amount of credit that is given for preserving existing trees and to allow tree cover credit at a reduced rate for seedlings in tree coverage calculations and revise the allowable planting list in the PFM. (Ideas #1, #7 and #9)	ZO and PFM Amendments	IN PROGRESS
27	The Office of the County Attorney should meet with representatives of the State Corporate Commission to discuss tree preservation issues during utility installation in the context of the Chesapeake Bay Preservation Act. (Idea #16)	Meeting with the State Corporate Commission	IN PROGRESS
28	Require evidence that either 1) notice of plan submission to the county has been coordinated with the private utility companies or, 2) the proposed plan submission has been provided to the private utility company. (Idea #16)	Amendment to PFM, S.O., Z.O.	IN PROGRESS
29	Request that DPWES bring their stormwater management pond maintenance policy up for discussion and review to evaluate whether woody and non-woody vegetation is allowed to remain wherever possible. (Idea #14)	Board endorsement of recommendation	IN PROGRESS
30	Produce a brochure that promotes the planting, retention, maintenance and replacement of street and parking lot landscaping trees and mail it to county business owners. Mail brochure to all Chambers of Commerce and distribute through NVBIA. (Idea #20)	Memo from Co. Exec. to Director of DPWES to request production of brochure	IN PROGRESS
31	Request that the Environmental Coordinator provide an analysis of the effectiveness of the current system of using Site Inspectors for enforcement of tree preservation and planting requirements. (Ideas #10, #21)	Report to the TPTF	IN PROGRESS

Table VI-3
Tree Preservation Task Force
1999 Recommendations and Implementation Matrix

REC.#	RECOMMENDATIONS	IMPLEMENTATION MECHANISM	STATUS
32	Request that EQAC, as part of their Annual Report on the Environment, provide a status report on the recommendations of the 1995 and 1999 Tree Preservation Task Forces and an evaluation of tree preservation efforts in the county, with recommendations for improvements beyond those included in the Tree Preservation Task Force's recommendations. (Idea #23)	Annual Report on the Environment	IN PROGRESS
33	Amend the Residential Density Criteria and the Environment Section of the Comprehensive Plan to place a greater emphasis on forest cover retention, tree preservation and afforestation such as by adding new criteria that pertain specifically to these issues. (Ideas #3, #5, #7 and #9)	Comprehensive Plan Amendment	COMPLETE
34	Amend the Environment Section of the Comprehensive Plan to incorporate provisions that encourage the use of on-site infiltration techniques that recharge groundwater sources and protect the environment from concentrated run-off; discourage the placement of stormwater management facilities in an EQC unless the pond is regional-serving or the EQC has already been significantly degraded; to place a greater emphasis on the use of regional and off-site stormwater management facilities as opposed to individual on-site ponds; and to state that the preferred design of regional ponds when located in the EQC is either wet, extended dry or embankment-only. (Idea 4)	Comprehensive Plan Amendment	IN PROGRESS

Table VI-3 Tree Preservation Task Force 1999 Recommendations and Implementation Matrix			
REC.#	RECOMMENDATIONS	IMPLEMENTATION MECHANISM	STATUS
35	Amend the Planned Development District General and Design Standards in the Zoning Ordinance to place a greater emphasis on forest cover retention and tree preservation such as by adding new standards that pertain specifically to these issues. (Ideas #3, #6 and #9)	ZO Amendment	IN PROGRESS
36	Request that the DPWES allow the use of bioengineering techniques on site and subdivision plans and revise the Public Facilities Manual as necessary to allow for the use of bioengineering techniques. (Idea #13)	Amendment to the PFM	INFILL SW11
37	The Board should support the funding of a periodic tree and forest cover analysis as a routine funding item. It is anticipated that the analysis will be conducted every five years. (Idea #19)	Budget process	Grant proposal IN PROGRESS

g. Tree Commission Activities and Issues in 2003

In 2003, the Tree Commission finalized the construction of the 9-11 Memorial Garden. The Memorial consists of a formal landscaped garden on the grounds of the Fairfax County Government Center.

In addition to participating in numerous public events such as the Fairfax County Earth Day-Arbor Day Celebration and the county's Land Conservation Awards program, Commissioners also provided input on various land use and development proposals affecting trees and landscaping. The Commission continues to support and advocate for the passage of legislation dealing with tree preservation and the use of native and desirable landscape trees during development.

In 2003, the Commissioners continued to utilize their monthly meetings to research and discuss county tree and landscape issues and policy. Various speakers made presentations to the Commission. Urban Forest Management staff provided several presentations on the process of land development, including tree preservation and protection, tree cover requirements, and

landscaping requirements for new developments and for commercial revitalization projects.

h. Summary of Proposed/Anticipated Changes to Tree Preservation Enabling Legislation

In light of the considerable opposition encountered during two consecutive efforts in the 2002 and 2003 Virginia State Legislative Assemblies to amend the tree replacement provisions of § 15.2-961 to include tree preservation requirements, the Board of Supervisors decided not to include a tree preservation proposal in the 2004 Legislative Program.

However, recommendations made by the Tree Preservation Task Force, the New Millennium Occoquan Watershed Task Force, the Tree Commission, and the Environmental Quality Advisory Council, coupled with certainty that the county's efforts to protect air, water, soil and wildlife resources will be extremely difficult without concurrently protecting trees and forest covers, virtually ensures that Fairfax County will continue to seek opportunities to submit and promote tree preservation legislation.

i. Status of grant proposal for satellite mapping of the county's tree cover and analysis of tree cover data

In 2003, Urban Forest Management continued efforts to devise a countywide map for use as a layer on the county's geographic information system that will delineate the distribution of naturally occurring and landscaped vegetation, using the National Vegetation Classification System (NVCS).

In 2003, Urban Forest Management accomplished the following goals towards the mapping and identification of natural vegetation communities that exist in Northern Virginia using the National Vegetation Classification System:

- Cooperated with Fairfax County GIS Office in order to coordinate use of GIS/GPS software and computer equipment;
- Completed data collection in 300 vegetation sample plots;
- Partnered with the Virginia Natural Heritage Program to share vegetation sampling data and information about vegetation communities that exist in Northern Virginia; and
- Acquired 1,656 km^2 of satellite imagery in summer/fall of 2003.

Once Fairfax County is mapped using the National Vegetation Classification System, a vegetation map will be produced for each of the county's 30 major watersheds. These data should provide a valuable benchmark that can be used to formulate and evaluate the effectiveness of watershed management

and vegetation management policies. It is anticipated that Urban Forest Management will need to continue this mapping effort into 2004 and early 2005.

11. Agricultural and Forestal Districts

Landowners may apply to place their land in special Agricultural and Forestal (A&F) Districts that are taxed at reduced rates. A&F Districts, which are created by the Commonwealth of Virginia, must have 200 or more acres. A&F Districts of local significance, governed by the Fairfax County A&F District ordinance, must have at least 20 acres and must be kept in this status for a minimum of eight years.

Fairfax County's policy is to conserve and protect and to encourage the development and improvement of its important agricultural and forestlands for the production of food and other agricultural and forest products. It is also Fairfax County policy to conserve and protect agricultural and forestlands as valued natural and ecological resources that provide essential open spaces for clean air sheds, watershed protection, wildlife habitat, aesthetic quality, and other environmental purposes. The purpose of the Local Agricultural and Forestal District program is to provide a means by which Fairfax County may protect and enhance agricultural and forest lands of local significance as a viable segment of the Fairfax County economy and as an important economic and environmental resource. All district owners agree to no intensification of the use of their land for the life of the district.

For 2003, there were a total of 42 A&F Districts as shown in Table VI-4.

Table VI-4
Local and Statewide A&F Districts by Magisterial District (Number)

Magisterial District	No. of Local Districts	No. of Statewide Districts	Total No. of Districts
Dranesville	18	1	19
Mt. Vernon	3	1	4
Springfield	16	0	16
Sully	3	0	3
Total	**40**	**2**	**42**

Source: *Fairfax County 2003 Agricultural & Forestal District Annual Statistical Report*, Zoning Evaluation Division, Department of Planning and Zoning, Fairfax County, May 15, 2004.

As shown in Table VI-4, all the A&F Districts are in four of the county's nine magisterial districts. Two changes did occur in the number of A&F Districts

between 2002 and 2003. This was the loss of a Statewide A&F District in each of Mt. Vernon and Sully Magisterial Districts.

The first of these was the loss of the Mason Neck District (Mt. Vernon Magisterial District) on January 12, 2003. The majority of the A&F District (about 804 of 945.8 acres) was transferred to the Bureau of Land Management, United States Government. While the transfer actually took place in 2001, the Department of Tax Administration did not remove the district from the program until the district expired on January 12, 2003.

The second of these was the loss of the Stone Bridge District (Sully Magisterial District) on November 15, 2003. The Fairfax County Park Authority acquired the majority of this district (239 of 273 acres) in 2003. The remaining 34 acres under private ownership were removed from the program upon the expiration of the District.

The A&F Districts consisted of 2,811.59 acres at the end of 2003 as shown in Table VI-5.

Table VI-5
Local and Statewide A&F Districts by Magisterial District (Acreage)

Magisterial District	Acreage of Local Districts	Acreage of Statewide Districts	Total Acreage
Dranesville	604.55	470.99	1,075.54
Mt. Vernon	188.14	287.65	475.79
Springfield	1,074.74	0	1,074.74
Sully	185,52	0	185.52
Total	**2,052,95**	**758.64**	**2,811.59**

Source: *Fairfax County 2003 Agricultural & Forestal District Annual Statistical Report*, Zoning Evaluation Division, Department of Planning and Zoning, Fairfax County, May 15, 2004.

This is a reduction of 1,219.17 acres due to the expiration of the Mason Neck District and the Stone Bridge District mentioned above.

The Local A&F Districts vary from about 20 acres to about 200 acres. 87.5% of all Local A&F Districts are less than 100 acres; 72.5% are less than 50 acres. Table VI-6 shows the breakdown of the Local A&F Districts by size.

Table VI-6 Local A&F Districts by Size		
Size (Acres)	**Number of Districts**	**Percentage**
Less than 25	7	17.5%
25 - 49.99	22	55.0%
50 – 74.99	4	10.0%
75 – 99.99	2	5.0%
100 – 124.99	3	7.5%
125 – 149.99	0	0.0%
150 – 174.99	0	0.0%
175 – 199.99	2	5.0%
200 +	0	0.0%
Total	**42**	**100%**

Source: *Fairfax County 2003 Agricultural & Forestal District Annual Statistical Report*, Zoning Evaluation Division, Department of Planning and Zoning, Fairfax County, May 15, 2004.

The two remaining Statewide A&F Districts are Patowmack Farm in Dranesville Magisterial District (470.99 acres) and Belmont Bay Farms in Mt. Vernon Magisterial District (287.65 acres).

12. South Van Dorn Street Phase III Road Project

The U.S. Army Corps of Engineers issued a permit for the construction of South Van Dorn Phase III on May 28, 1996. Conditions contained in the permit required that no construction could start on the roadway until several conditions were completed. Three of these conditions are aimed at protecting Huntley Meadows Park.

One condition is that seven parcels of land (102 acres) adjacent to Huntley Meadows Park must be purchased by Fairfax County. This is in lieu of creating wetlands for the five acres of wetlands that will be destroyed in road construction. These 102 acres contain about 69 acres of wetlands and 33 acres of uplands. This action will ensure preservation of the wetlands contained in this 102-acre tract and will provide a valuable addition to Huntley Meadows Park.

The county now has possession of these seven parcels of land, which will be turned over the FCPA to become part of Huntley Meadows Park. The Corps also required that this land remain natural (as is the rest of Huntley Meadows Park).

Another condition by the Corps required stormwater management improvements on eight ponds in and around Greendale Golf Course. The last pond, at the intersection of South Van Dorn Street and King Centre Drive, was completed in June, 2002.

A third condition by the Corps required that Fairfax County submit a Monitoring and Maintenance Plan for these stormwater improvements. The plan details the monitoring and maintenance requirements for a ten-year period. The Corps approved the plan in October, 2001. The monitoring station was installed in July, 2002.

With the completion of all the conditions imposed by the Corps, construction of the extension of South Van Dorn Street to Telegraph Road started in September, 2002. Fairfax County is providing full-time inspection of the erosion and sediment control measures during construction. Clearing and initial grading operations were completed when rain and winter conditions halted construction. Heavy rains in spring and summer, 2003 further delayed the work. Construction did start up again in fall, 2003 with rough grading operations. Completion is now estimated by the end of 2004.

C. RECOMMENDATIONS

1. EQAC recommends that the county Board of Supervisors develop and implement a countywide Natural Resource Management Plan – an ecological resources management plan that can be implemented through the policy and administrative branches of the county government structure. Two necessary tasks should be accomplished first -- prepare and adopt a unified Natural Resource Conservation Policy, and complete a countywide Baseline Natural Resource Inventory. This is a continuing recommendation from past years. EQAC notes that slow progress is being made in this area due to efforts by the Fairfax County Park Authority staff in their efforts to establish a natural resources baseline inventory. The FCPA has developed a countywide Green Infrastructure Map that appears a basis for a Natural Resource Inventory. Additionally, the Urban Forestry Division is continuing efforts to devise a countywide map for use as a layer on the county's GIS that will delineate the distribution of naturally occurring and landscaped vegetation. However, these efforts must be supplemented by an inventory of the county that accounts for flora and fauna. The Park Authority has now prepared a Natural Resources Plan for management of the county's parks. EQAC fully supports these efforts, urging that they culminate in a countywide Resource Management Plan. EQAC also notes the accomplishment of the Park Authority in preparing and publishing a Natural Resources Plan for management of the county's parks and urges the Park Authority to fully implement this plan. This is a continuing

recommendation for past EQAC reports. EQAC's intent is that Fairfax County should have all the tools in place (the policy and the data) to create a plan that will support the active management and conservation of the county's natural resources.

2. In past Annual Reports, EQAC recommended that the county Board of Supervisors emphasize public-private partnerships that use private actions such as purchase of land and easement by existing or new land trusts to protect forests and other natural resources, including champion/historic trees. With the signing of a Memorandum of Understanding (MOU) between the Board of Supervisors and the Northern Virginia Conservation Trust, such a public-private partnership came into being. Thus, EQAC's recommendation has been satisfied. EQAC continues to commend the Board of Supervisors for this action and recommends continued support for this partnership. EQAC notes that the MOU is for a three-year period and therefore recommends continuing this MOU past the initial three years.

3. In reaction to the limited tree preservation authority provided by the County Code, and recommendations by the Tree Preservation Task Force, Fairfax County initiated a proposal to amend the Virginia State Code § 15.2-96 1, as part of its 2002 strong emphasis on tree preservation. Two bills were introduced in the 2002 Virginia State Legislative Assembly, but were tabled until the 2003 session due to opposition by the Virginia Building Association. However, this proposal lost its active status in early 2003. While components of the proposed language survived in other legislative proposals adopted by the Virginia General Assembly in 2003, the newly adopted language is primarily focused on tree replacement. EQAC recommends that the Board of Supervisors continue to support the proposals to amend the Virginia State Code § 15.2-961 by placing greater emphasis on preservation of existing trees.

4. Fairfax County no longer has Soil Scientist expertise on the county Staff. EQAC has in the past recommended that the Board of Supervisors reestablish this expertise. The Board of Supervisors did not establish staff positions in response to this EQAC recommendation; however, they did provide funding to the Northern Soil and Water Conservation District (NVSWCD) for mapping of the county's soils. This enabled NVSWCD to provide the needed expertise. There is, however, a continuing need for this expertise in the county. The recent incident on Telegraph Road, where a hillside slid into Telegraph Road and endangered homes at the crest of the hill, points out the soils problems that exist in the county. The increasing urbanization of the county has created new types of soils – urban man-made soils. These soils can have different characteristics in water infiltration and erosion. Therefore, as various projects are started in these soils, including stream restoration and other water control measures, expertise in these soils

are needed in the county. At present, the only place this expertise exists is in NVSWCD. EQAC therefore recommends that the Board of Supervisors continue the agreement with NVSWCD to provide soil scientist expertise.

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CHAPTER VII

WILDLIFE AND THE ENVIRONMENT IN FAIRFAX COUNTY

VII-1. IMPACTS OF DEER IN FAIRFAX COUNTY

A. OVERVIEW

The adverse impacts of white-tailed deer in Fairfax County are readily recognized as a problem by many of its residents. While the "problem" is seen from a variety of perspectives, there is a general consensus that the root cause is "overabundance" of deer in many local areas. There is also a general public perception that a deer management program is needed to address the "problem".

The road to an acceptable deer management solution, however, is not so easily determined. Some of the factors essential to a solution are subject to strenuous debate and attract a wide spectrum of opinion. For example, what is the optimum population level, and if population reduction is required, what means shall be used? The sport hunting community, recreational nature lovers, residential property owners, environmental preservationists, and animal rights/welfare groups have differing viewpoints on these issues.

B. BACKGROUND

1. Are Deer Overabundant in Fairfax County?

Caughly (1981) defined four contexts in which the term "overabundance" can be understood when referring to an animal species population. These definitions have since been widely used by most serious scholars in the wildlife management field and by public administrators responsible for wildlife management programs.

1. When the animals threaten human life or livelihood.

2. When the animals depress the density of, or destroy, particular favored species.

3. When the animals are too numerous for their own good.

4. When their numbers cause ecosystem dysfunction.

Where does Fairfax County stand vis-a-vis these four criteria? The available data strongly (even overwhelmingly) suggest that:

1. We experience an unacceptable number of deer-vehicle collisions resulting in deaths, injuries, and major property damage. Owners of commercial agricultural and nursery enterprises suffer substantial damage.

2. In many areas of the county, deer routinely leave their enclaves of "natural" habitat to forage in nearby gardens and yards, causing widespread damage to landscaping

and thus major economic loss to property owners. Through voracious browsing, deer are rapidly eradicating numerous threatened and endangered botanical species from the "natural" habitat. In addition, this loss of plant habitat is adversely affecting numerous vertebrate and invertebrate species of smaller physical size, such as many bird species, that are unable to compete with large herbivores.

3. Data for Fairfax County, based on Virginia Department of Game and Inland Fisheries (VDGIF) assessments spanning ten years, indicate that its various deer herds showed a single individual in excellent condition, a very few in good condition, most about evenly split between fair and poor condition, and a few emaciated individuals. This shows quite clearly that no longer can the available habitats meet the minimum nutritional requirements that would maintain the deer population in sound health. A 125-pound deer requires approximately 6.5 pounds of forage per day, or some 2,370 pounds of vegetation per year.

4. Many of our parklands and stream valleys show severe browse lines, nearly total eradication of understory, and loss of numerous species upon which the continuous process of woodland regeneration is dependent. These changes in turn lead to the inevitable loss of a wide variety of animal species. Thus, our remaining natural ecosystem is being severely deformed through the eruption of a single species that has become overdominant in the food chain.

According to each of Caughly's four criteria, it is apparent that Fairfax County has a serious overabundance of deer. In recognition of the public perception of a significant problem, the Board of Supervisors directed county staff to develop a plan for deer management. In October of 1997, county staff contracted with a consulting firm to "study and review existing data on deer, deer-habitat interactions, deer-human conflicts, and deer management proposals within the county." Staff also asked the consultants to recommend suitable methods for addressing the various problem areas. These studies and recommendations were presented in the Consultants Report (Natural Resource Consultants, December 1997). In 1998, the county created a new position and appointed a Wildlife Biologist who had broad experience with Fairfax County parks and parkland issues. In the summer of 1999, the County Executive convened an ad hoc Deer Management Committee of experts and stakeholders to discuss and evaluate the plan drawn up by the staff and the early implementation efforts. The report of this committee and its recommendations were forwarded to the Board of Supervisors in September, 1999 in advance of the season of peak deer problems, which occurs in the fall. The Board of Supervisors approved recommended measures to reduce the deer population to more sustainable and less destructive levels. Since then, the deer management program has made substantial progress in achieving significant population reductions in some of our most threatened parklands.

2. A Description of the Problem

a. Data on Deer Abundance in Fairfax County

To begin this discussion, the terms overabundance and overpopulation should be distinguished. Overabundance refers to population levels that have adverse impacts on the community and other species, while overpopulation refers to population levels of the species that are an imminent danger to itself through disease and starvation. This latter phenomenon is responsible for the population eruption and subsequent collapse of deer herds that has been a topic of scientific study for the past 60 years. While the following information supports a conclusion that deer are overabundant in Fairfax County, neither the data nor experts from a variety of sources have indicated that a level of overpopulation exists, though the relatively poor health of the county's deer suggest that we may be approaching overpopulation.

Data from the Virginia Department of Game and Inland Fisheries deer density surveys in Fairfax County parks prior to the county's deer management program showed deer densities from 90-419 deer/sq. mile (Table VII-1-1).

Table VII-1-1
Deer Density Surveys

Location	Est. Deer/Square Mile
Huntley Meadow Park	90-114
Riverbend Park	213
Meadowlark Gardens Park	90-115
Bull Run Regional Park	419
Fort Belvoir	90
Mason Neck NWR	-

(Source: W. Dan Lovelace, Wildlife Biologist, Virginia Department of Game and Inland Fisheries.)

While the many of the data are limited, taken collectively, the observations of professional park staff, poor health of evaluated deer, and high deer densities indicate that deer are overabundant and are negatively impacting the ecology of sizeable areas

of Fairfax County. Unfortunately, there are few reliable data available for densities and extent of damage on private lands and the adjacent small islands and corridors of natural habitat. Even though the information available is primarily anecdotal, it is voluminous, and there is a general public perception of a significant and growing problem of deer overabundance.

b. Causes of Overabundance in Urban/Suburban Areas

i. Urbanization/Changes in Habitat

Over recent decades, Fairfax County has transformed from a largely agrarian and woodland area to a multifaceted employment, residential, and retail area. Over 1,000,000 people reside in the 395 square miles of the county. Of this 395 square miles, about 140 square miles is wooded and open land and some three square miles is remaining agricultural land. This change from an agrarian area to a developed one has markedly decreased the amount of land usually regarded as suitable for deer habitat and has changed their food sources and movement patterns. This urban/suburban habitat of the county provides a fairly good nutritional base for deer, including manicured lawns, athletic fields, college campuses, golf courses, and landscaped residential communities.

Overabundance is particularly common where the course of development has left protected "islands" or "corridors" of deer habitat in or near urban and suburban areas. As the development process reduces the area of natural habitat, deer are forced into these remaining islands and corridors at very high population densities. Because the deer then deplete the forage plants in these enclaves, they venture out into the surrounding developed community in search of food. In such situations, conflicts with humans frequently arise in the form of deer-vehicle collisions and depredations on gardens and ornamental plantings (Flyger et al, 1983; Cypher & Cypher, 1988). Moreover, in such situations, natural predators (e.g., wolves, bobcats, mountain lions) have normally long since been eliminated and hunting is usually prohibited.

ii. Loss of Predators

The precolonial levels of deer in Virginia could be attributed to predation by bobcats, black bears, eastern gray wolves, and eastern mountain lions, in addition to the number taken by Native American hunters. While none of these predators depended solely on deer, the deer/predator interactions and the added effects of hunters kept the population levels low and well within the carrying capacity of the land. Increasing human populations and land development has virtually eliminated wildlife predators from the county. In the first half of this century, hunting had reduced the deer population to very low levels. However in the latter half of this century, with growing human population and reduction of huntable habitats,

recreational hunting has almost disappeared in the county. While the number of deer harvested through "Out of Season Kill Permits" has increased in recent years (Table VII-1-2), the combination of seasonal hunting and out-of-season kill permits does not affect the deer population at sufficient levels to prevent significant deer/human conflicts or ecological damage.

Table VII-1-2
Out of Season Kill Permits Issued For Deer Damage in Fairfax County
Virginia Department of Game and Inland Fisheries

Year	Permits	Number Taken
1989	5	25
1990	3	4
1991	19	41
1992	18	43
1993	42	222
1994	31	131
1995	65	193
1996	165	244
1997	147	310
1998	157	297
1999	216	377
2000	197	263
2001	148	398
2002	187	249
2003	173	311

(Source: Mark Pritt and Jerry Sims, Wildlife Biologists, Virginia Department of Game and Inland Fisheries.)

It should be noted that, while the number of out-of-season permits declined markedly in 2001, the number of deer taken increased even more dramatically. A similar pattern occurred in 2003. This is quite consistent with intensification of problems in a smaller number of areas as land clearing for development squeezes the deer population into smaller and more isolated patches of habitat.

c. Problems Created by Overabundance

i. Ecological Impact

Effects of a persistent and overabundant deer population include the loss of biodiversity and a negative effect on ecological and biotic systems. These can be seen in a declining understory (lower height plants and shrubs that serve as a food source for birds) and the appearance of browse lines, which occur when deer eat almost all the vegetation within their reach and the woods develop a "line" at the top of their reach. While few detailed deer/forest impact studies have been performed in the county, in a report to the Animal Services Division, Fairfax County Police Department, the Superintendent of Administration of the Northern Virginia Regional Park Authority noted that "the ever present browse line had now become a common sight in most of our parks. The deer have eaten all of the herbaceous and woody plant growth within their reach. This has eliminated an entire stratum of habitat from the parks."

The browse line and loss of understory are not the only indications of this ecological impact. There is an abundance of technical literature reporting the effects of a high deer population on plant communities when the lower ecosystem carrying capacity (see page 194) is exceeded. However, the apparent poor health of the county's deer indicates a level of deer density that reportedly exceeds even the higher biological carrying capacity. There are also numerous studies documenting the negative effects of overabundant deer on wildlife species. For other vertebrates, this may occur through direct competition for food sources or more often by altering the habitat. For example, in some areas of the county, the number of species of birds has markedly diminished through loss of the necessary habitat due to excessive browsing by deer.

As noted in the 1997 Consultant Report and throughout the scientific literature, "the consequences of a persistent, overabundant deer problem can be long-term loss of biodiversity and negative impact to functioning ecological and biotic processes." We have already begun to see a loss of biodiversity that will ultimately lead to a loss of ecosystem stability, with far more widespread and serious effects than the shorter-term effects of overabundant deer.

ii. Property Loss and Damage (Vehicular, Plantings)

There currently is no accurate system to track data regarding the total property loss due to deer/vehicle collisions. The Fairfax County Police Department does an excellent job of analysis of the data on deer-vehicle collisions that require a police presence in their aftermath or that are otherwise reported. The numbers appear to have increased, but the data (Table VII-1-3) do not show a consistent trend. For those accidents tabulated from January 1998 through 2002, the average damage per

vehicle was about $2,300 ($2,266 for CY 2002). Over this same period, the Virginia Department of Transportation picked up 4,507 carcasses of deer killed in vehicular collisions from rights-of-way in the county. In 2002, VDOT picked up 1,057 deer carcasses from the roadway and immediately adjacent right-of-way in Fairfax County, which represents a small increase from earlier years. This increase most likely represents normal variation from year to year.

Table VII-1-3
Deer-Vehicle Collisions in Fairfax County

Year	Non Injury	Injury Crashes	Fatal Crashes	Total
1993	154	6	0	160
1994	149	10	0	159
1995	127	6	0	133
1996	157	20	0	177
1997	168	17	1	186
1998	144	23	0	167
1999	177	18	1	196
2000	144	17	0	161
2001	143	22	0	165
2002	122	10	0	132
2003	160	19	0	179

(Source: Report prepared by Michael Uram, Fairfax County Police Department. Report prepared by Earl Hodnett, County Wildlife Biologist.)

Police and highway experts estimate that only 20-25 percent of deer impacting vehicles die at the scene (i.e., on the road or in the right-of-way); many receive injuries that are soon fatal, but die in the woods or in a nearby yard. Thus, a reasonable estimate would indicate some 18,000-22,500 deer-vehicle collisions in the county during the 1998-2002 period. One can reasonably infer that many, if not most, of these collisions result in property damage to the vehicle.

County personnel report an increasing number of complaints of damage to native and ornamental plants in Fairfax County. Referring again to the "Out of Season Kill Permits Issued for Deer Damage" (Table VII-1-2), an indication is given of homeowner attempts to address property loss primarily thought to be ornamental in nature. Further, although numerous deer management programs are available, such as planting less preferred species and fencing, the effectiveness of these methods declines dramatically with increased deer densities, leading to declining food

sources and willingness of deer to eat even undesirable plants. These activities may also tend to increase vehicular incidents, as deer must look farther afield for food sources.

iii. Disease

Another problem associated with deer overabundance is the prevalence of Lyme Disease. See Section VII-3 below in this chapter for a discussion of Lyme Disease.

In addition to these crashes which required a police presence, in 2002 there were 1,057 reported deer-vehicle collisions, and in 2003 the number increased to 1,371 reported collisions.

C. ISSUES IN ADDRESSING THE PROBLEM

To effectively manage the deer population, the implications and interrelationships of population dynamics, carrying capacity, public opinion, and methods for management must be understood and incorporated into the program.

1. Understanding Population Dynamics

The concept of population dynamics is crucial to understanding the current problem and the development of a workable solution. There are no simple mathematical models that can be applied to determining the growth of the population of a species in a particular area, and the least complex deer management models and programs based on solely on nutritional deer carrying capacity (see section on carrying capacity below) consider neither the deer population's interactions with the human population nor its interactions with a biodiverse ecosystem.

One important concept to understand is that of home range. Deer show a strong attachment to a home range, and it has been shown that deer forcibly relocated often die of malnutrition even if food is accessible in their new habitats. When natural dispersal from the home range occurs, it is usually the younger males that migrate. This has four implications for Fairfax County deer management:

1. Deer often occupy a home range that can include both a park and the surrounding community or islands and corridors of "natural" habitat plus the yards and gardens of adjacent residential communities;

2. A dramatic decrease in one area will not necessarily result, in the short term, in an increased dispersal of deer from other areas into the depleted area, with a consequent lessening of population density in those other areas;

3. Deer cannot be eliminated from the county under today's conditions, because the deer surviving in surrounding home ranges will, in the long term, undergo natural dispersal and repopulate the depleted areas. This implies that parks and the surrounding areas must be managed as a unit and that solving the problem in one area does not automatically translate to another area; and

4. The recent emergence of epizootic hemorrhagic disease (EHD), a viral disease fatal to deer but posing no threat to humans, may be a significant factor in natural reduction of the deer population over the next several years. EHD has sometimes been implicated as a significant factor in the boom-bust cycle observed within deer populations that have been the subject of long-term study. Within the past year, 53 deer fatalities due to EHD have been diagnosed in the southeastern portion of the county, and these diagnosed cases probably represent only a small fraction of those succumbing to the disease. Weather, the size and compactness of deer herds, and the overall health of the deer play a major role in EHD transmission. Thus, it is not possible to predict the future course of this disease within the county, except to note that it usually takes several years to run its course within a deer population and we appear to be in the early stages of an outbreak.

Other concepts that affect population dynamics include compensatory reproductive responses, survival, and predation. Again, it must be noted that deer management is not a simple mathematical equation; it must take into account many biological and behavioral factors, many of which are not fully understood, especially in an environment such as Fairfax County. For example, in many cases, as the size of an animal population decreases, the number of offspring increases, despite the fact that food is becoming less adequate. This phenomenon leads to the population eruption-crash cycles that are widely discussed in the scientific literature. More complete data and an improved understanding of the unique characteristics of Fairfax County must be collected and considered as the management program evolves.

2. Determining Carrying Capacity Goals

Carrying capacity is the level of a population that can be supported by an ecosystem or tolerated by the community. To determine the appropriate population level as a goal for a management plan, it is essential to distinguish among the following:

1. Biological carrying capacity, i.e., a species specific level that is primarily concerned with the population that can be supported with the available nutritional resources;

2. Cultural carrying capacity, i.e., a level that is driven by human concerns (the population that can be tolerated by the community at large); and

3. Ecosystem carrying capacity, i.e., the population level that can be supported by an ecosystem without disturbance of its stability or reduction of its biodiversity.

The biological carrying capacity is a traditional view that has been widely used by fish and game departments where a primary concern is to maintain adequate stocks of deer for sport hunting, but it does not adequately account for the effects of relatively high population levels on the ecosystem in which the species resides. The cultural carrying capacity is defined by Ellingwood and Spingnesti (1986) as the maximum number of deer that can coexist compatibly with local human communities before conflicting with some human interest. This level is driven by human values, economics, and desires independent of ecological considerations. DeCalesta (1998) used the term diversity carrying capacity in a more restrictive sense than ecosystem carrying capacity, but both concepts consider the maximum species population density that does not negatively impact diversity of fauna or flora, including diversity of habitat structure as well as species richness. He contends that deer impacts on biodiversity occur at population densities well below traditional definitions of ecosystem carrying capacity.

Thus, biological carrying capacity is the highest population density and is considerably in excess of cultural carrying capacity (human societal tolerance), which in turn accepts notably higher densities than ecosystem carrying capacity. Finally, diversity carrying capacity has the smallest maximum population density.

3. Considering Public Opinion

Goals for management and methods to use to reach those goals are very different issues; consensus or conflict among groups of constituencies may occur at either or both levels. Goals may vary from a biological carrying capacity level that meets hunting concerns to a much lower carrying capacity level based on an ecological or biodiversity perspective. Cultural carrying capacity may run the gamut of levels, depending on the varying values and tolerances of different constituencies within the community. Even where there is agreement on the level of deer density desired, the methods to reach those goals may be in dispute. Some groups may have a zero-tolerance for lethal means, whereas others may readily support managed hunts or sharpshooters.

As indicated in the 1997 Consultant Report, deer control action by the county should not be undertaken until it is determined that there is sufficient community and political support for it. Again, the need for data, this time in the form of public opinion surveys, is stressed. Additionally, the need to adequately educate the public about the issues is needed to ensure well-informed constituent responses.

D. METHODS FOR DEER POPULATION MANAGEMENT

1. Population Reduction Approaches

a. Let Nature Take its Course - Eruption/Collapse

This approach is based on using no human intervention to affect the deer population one way or the other. This has been studied by wildlife biologists for more than half a century. The findings are that the population goes through an eruptive phase with explosive population growth until it is far above biological carrying capacity. This is followed by eruptions of parasitic and infectious diseases (such as EHD) and by large-scale starvation, which causes the population to crash to perhaps 15-25 percent of its peak level. Thereupon, the herd recovers to begin the cycle anew. Some populations have been followed through five or six successive cycles. Although the deer population of Fairfax County can be considered to be in the early stages of the eruptive phase, it is well short of a peak. Public concerns about the current and expected future impacts on the community rule this out as an option.

b. Lethal Methods

i. Managed Hunting

Experiences with managed hunts over the past year indicate they have been highly cost effective, in that revenue has exceeded costs for personnel and materials. This is in sharp contrast to their initial use in 1998, when costs were high and relatively few deer were taken. The dramatic upturn in the learning curve is very encouraging. Necessarily, managed hunts are conducted primarily in parkland, and while the amount of deer population reduction in these local areas is no doubt ecologically beneficial, in terms of absolute numbers it has been insufficient to make an immediate noticeable difference in the overall problem.

ii. Archery Hunting

Archery hunting has proven an effective and acceptable means of deer control in residential areas where use of firearms is deemed too hazardous. Archery is a quiet and short-range method, with most deer being taken within less than 100 feet. During the 1998 public hunting season, 789 deer were taken in Fairfax County, of which 597 were taken by archery and the remainder by shotgun. In 1999, archery accounted for 686 of the total of 1,046 deer, and in 2000 accounted for 626 of 1,028 deer. With out-of-season kill permits, archery can be used year-round, even in residential neighborhoods. In 2003, the organized Urban Archery Program harvested 119 deer and an additional 854 were taken with archery equipment by individuals.

iii. Traditional Public Hunting

Under current restrictions outlined by VDGIF, the above figures show that traditional public hunting is not sufficient to address the problem, based on hunters' limited access to deer habitat and preference for antlered deer. Moreover, the habitat that is accessible is not where the major problem areas are located.

iv. Trap and Kill

This method has usually been conducted by darting with anesthetics and dispatching the animal by gunshot or a lethal drug. The former is less effective than sharpshooters while the latter leaves the meat unfit for human consumption. The use of drop nets and stun guns is explained in the 1997 Consultant Report as a possible lethal method. This method allows for release of non-targeted males and results in meat uncontaminated by drugs but is very cost inefficient.

v. Sharpshooters

The use of professional animal control personnel, police experts, or qualified and experienced volunteers has been proved to be a safe, cost-effective, and successful means of management if lethal methods are employed. Earlier experience with this method in Fairfax County has led to significant refinements and greatly improved cost-effectiveness, with a cost per deer taken ranging from $4.15 to $22.97. Once again, the number of deer removed from the population by this method is not sufficient to have more than a modest local effect. The sharpshooter program has been so effective in our larger parks that vegetation has begun to recover and the focus can now shift to some of our smaller parks.

vi. Reintroduce Predators

The reintroduction of the usual species of deer predators into an urbanized setting such as Fairfax County is biologically unworkable and publicly unacceptable.

c. Nonlethal Methods

i. Trap and Relocate

Experiments with this approach have been largely unsuccessful due to high initial mortality (up to 85%) of the relocated deer. Moreover, there are few locations within a reasonable distance of this area that would accept relocated deer, since most nearby areas have similar problems. The use of drop nets and stun guns is suggested in the 1997 Consultant Report as a possible method for deer capture. More traditional methods use anesthetic darts. This method is considered infeasible for Fairfax County.

ii. Contraception

Steroidal/hormonal contraception has proved very costly and difficult to implement and only very marginally effective. Immunocontraception (where the female's immune system is stimulated so as to prevent fertilization of eggs), on the other hand, holds some promise for deer management, but it is currently in an experimental stage. The Humane Society of the United States is conducting field studies at the enclosed National Institute of Standards and Technology site in Montgomery County, but due to difficulty with marking deer, the Humane Society is not yet conducting studies for free-ranging deer such as those in Fairfax County. The recent technical literature discusses requirements for sites chosen for pilot tests. All indications are that this is not a near term solution for the county but might hold promise for limiting populations in the future, once they have been reduced to desired levels.

2. Conflict Mitigation Approaches

Conflict mitigation is directed toward reducing the direct impacts of deer on the human population and thereby increasing the tolerance of the community for the existing deer population.

a. Supplemental Feeding

Conceptually, this approach is supposed to divert deer from the landscape plantings in gardens and yards. Supplemental feeding might somewhat improve the health of the existing deer population but would almost certainly drive it to even higher levels. Thus, consideration of this approach would be counterproductive for Fairfax County, since it does nothing to reduce the excess deer population.

b. Fencing

Fencing is only rarely effective, since deer are noted for leaping even eight foot fences. Thus, fencing is a costly and ineffective solution, especially when deer are seeking out preferred plant species.

c. Repellants

Repellants have had some limited success but are generally costly and most require frequent replenishment. Also, many of them have odors that are no more acceptable to humans than they are to deer.

d. Roadside Reflectors

Roadside reflectors divert light from vehicle headlights toward the sides of the roadway and are intended to frighten the deer away from the road, thereby reducing the likelihood of vehicle collisions. The method is useful in the evening and early morning hours when the majority of deer-vehicle collisions occur. While expensive, this technique has shown some promise in tests. The Virginia Department of Motor Vehicles has given the county a $40,000 grant to conduct studies of the effectiveness of roadside reflectors. The first test site was a section of Telegraph Road that has had a high incidence of deer-vehicle collisions. The initial results show promise but are confounded by three other factors: (1) construction activity in the area may have driven many deer away; (2) a high incidence of epizootic hemorrhagic disease that may have naturally reduced the population; and (3) an archery hunting program at Fort Belvoir that definitely reduced the population in that area. The county staff has identified and begun testing at additional test sites, but these also have problems that render data interpretation extremely difficult.

e. Underpasses

Construction of underpasses has been suggested as a way of providing deer with a safe means of getting to the other side of busy roads. Not only is it exceedingly costly, but there are no data available now or expected in the future that would pinpoint likely sites. This approach is regarded as wholly impractical.

f. Use of Less-Favored Plants

Landscaping with plant species that are less favored by deer has been advocated as a way of reducing depredation of yards and gardens. However, as Cypher & Cypher (1988) and numerous other wildlife biologists have shown, when deer populations exhaust the preferred plant species, they readily turn to those less-preferred. Thus, in the short term this approach might seem to work, but longer term experience indicates that it is relatively ineffective.

E. PUBLIC EDUCATION PROGRAM NEEDS

As noted above, an educated public that has an understanding of the population dynamics of deer, the concepts of carrying capacity, the different management options, and an understanding of the various values of the community in addressing ongoing management is essential to the successful implementation of a deer management program. The recommended public education program should encompass the following:

- The county Deer Management Web site already serves as a primary vehicle for making much of the information mentioned below more readily available and updatable. See: http://fairfaxcounty.gov/comm/deer/deermgt.htm

- Develop pamphlets that are easily read, easily mailed, available through various county offices and through the local Supervisors' offices. These should include information on:

  - Deer and deer biology;
  - Ecosystem and population dynamics in general, and as they relate to the interaction between deer and other species of both plants and animals;
  - Methods of population management, including their relative feasibility and cost-effectiveness for achieving both short-term and long-term goals;
  - The deer management program;
  - Permits required for implementation of private control measures;
  - Fencing and repellents;
  - Safe driving and how to avoid deer on the road;
  - Lyme disease and its prevention (See Section VII-3 of this report); and
  - Who to contact for additional information.

- Establish networking among the following agencies for provision of consistent public information:

  - Fairfax County Government offices;
  - Fairfax County Supervisors district offices;
  - Fairfax County Animal Services Division;
  - Nature Centers;
  - Health Departments;
  - State agencies, particularly Virginia Department of Game and Inland Fisheries and the Virginia Department of Transportation; and
  - The Humane Society.

- Compile and make available a comprehensive bibliography of literature on deer management in urban environments. (The references attached to this section provide a limited example.) Make this information available to schools, civic and technical groups, and interested individuals.

- Establish an archive of evidence documenting how deer can change the characteristics of a landscape. This should show:

  - Habitat characteristics before deer damage;
  - Habitat characteristics during and after deer damage;
  - Habitat characteristics during regeneration after deer population is reduced; and

  - Statistics and trends for vehicle/deer collisions, number of injuries/fatalities, and types of damage.

- Create a visual display of the above for use at schools, fairs, libraries, etc., and develop presentations for use at public meetings and meetings of civic groups.

- Establish a county self service telephone number for wildlife problems and public information. This could be a menu-driven hotline that would direct people to the proper location on the information network or to the appropriate county office.

F. PUBLIC AGENCY RESPONSIBILITY

The Animal Services Division of the Fairfax County Police Department has been assigned primary responsibility for deer management by the Board of Supervisors. However, due to the legal concept that ownership and disposition of wildlife is vested in the state, the Virginia Department of Game and Inland Fisheries exercises significant regulatory and permitting functions that affect Fairfax County's deer management activities. The Animal Services Division, in coordination with applicable land-holding agencies (e.g., Northern Virginia Regional Park Authority, Fairfax County Park Authority) and other public authorities, implements the Integrated Deer Management Plan on public lands. In addition, the Animal Services Division advises private business and residents in addressing deer management on privately owned parcels in Fairfax County. Deer management on federally owned tracts of land within Fairfax County (e.g., Mason Neck National Wildlife Refuge, Fort Belvoir, etc.) is the responsibility of the respective federal agencies and is subject to the applicable federal policies and regulations.

G. PROGRAM IMPLEMENTATION ACTIVITIES

An Integrated Deer Management Plan was developed by county staff subsequent to the Consultant Report received in December, 1997. The Board of Supervisors in November, 1998 directed that program implementation activities commence. Subsequently, in the summer of 1999, the County Executive convened a Deer Management Committee comprised of experts and various stakeholders to evaluate the plan and initial implementation efforts and to prepare recommendations for the Board of Supervisors for further implementation of the plan during the fall and winter of 1999-2000. This committee meets annually to review progress in program implementation and to make recommendations on additional approaches. The Animal Services Division of the Police Department prepares the annual Fairfax County Deer Management Report to the Board of Supervisors that contains extensive data on the program. The county Web site http://fairfaxcounty.gov/comm/deer/deermgt.htm provides additional material.

On December 8, 1997, the Fairfax County Board of Supervisors approved managed hunts for Riverbend Park and the Upper Potomac Regional Park, both in the Dranesville District. Plans by the Animal Services Division were approved by the Northern Virginia Regional Park Authority and the Fairfax County Park Authority for four managed hunts for each of the two locations. The hunts were planned for January and February of 1998. The managed hunts conducted in 1998 were largely unsuccessful in achieving planned program objectives and had associated costs that were difficult to justify. However, some of these costs could be attributed to greater-than-necessary safety measures that experience now indicates would not be needed in the future. In contrast, four managed hunts, involving 132 hunters, conducted in the fall and winter of 1999-2000 were very cost effective, with 195 deer taken at a cost per animal of $9.51. The seven managed hunts conducted in the fall and winter of 2000-2001 involved 223 hunters, who took a total of 351 deer at a cost per animal of $17.94. Of the 351 deer taken, 222 were donated to a program that feeds needy families. For 2001-2002 hunt season, the program returned a profit of $7.28 per animal because the permit fees collected exceeded program costs. This was also true in the 2002-2003 season, with a profit of $79.60 per animal taken.

The sharpshooter program, which utilizes Police Department Special Operations tactical teams, has been cost-efficient from the outset. These teams must engage in extensive marksmanship training on a regular basis in order to maintain the required proficiency. Instead of practicing on a target range, they are utilizing this required training time in a field setting with the deer more closely resembling operational targets. The harvested deer are collected by a charitable organization that provides meals to the needy. Even in the early part of the learning curve, this program has shown satisfactory harvest rates. Whereas, similar programs in most mid-Atlantic jurisdictions have harvests listed in hours per deer taken, Fairfax County in 2000 had a harvest rate of 1.54 deer per hour. From late December, 1999 through late January, 2000, fourteen sharpshooting sessions over a total of 41 hours were conducted, with a total harvest of 89 deer at a cost of $4.15 per animal. In the same period of 2000-2001, there were 23 sharpshooter sessions, totaling 94.75 man-hours, which took 146 deer, at a cost per deer taken of $22.97. In the 2002-2003 season, the sharpshooter program took 248 deer. In 2001, the cost per animal rose to $44.99 if all costs were attributed solely to the Deer Management Program, but this would be fallacious due to the fact that this activity represents proficiency training for the police tactical units which must be conducted anyway. A major reason for this increase in cost per animal is that most of the sites this year represented repeat visits to locations first addressed last year and the year before. As the herd population density decreases, the time expended on each animal increases, and this is further increased by the increased wariness of the surviving members of the herd. Thus, the costs are very much in line with expectations and will drop once again as more new sites are brought into future years' mix of new and old locations.

Clearly, the managed hunt and sharpshooter programs must be conducted largely in parkland due to safety considerations, but this is also where some of the most substantial benefits are to be achieved. From the outset, the Northern Virginia Regional Park Authority has taken a

position of active involvement and has reaped corresponding benefits. The Fairfax County Park Authority has more recently become actively involved and availed itself of the clear benefits offered by the program to the ecology of its parks. The FCPA reported in June, 2003 significant regeneration of the vegetative understory in two of our parks that were among the most overgrazed and have had herd reduction measures used for two successive years. This degree of success is very encouraging, and it is hoped that the FCPA will continue its active involvement in the program and thereby exercise the ecological stewardship that is so necessary to the biotic health of our parks and parkland. By mid-year 2004, the thinning of the herd in several of our larger parks had led to significant regeneration of vegetation so that the emphasis will now shift to smaller parks and those that have not yet had program activities implemented.

Out-of-season kill permits have, for some years, been one of the few legal avenues open to private property owners to permanently remove deer that are causing serious damage to their properties. Such permits are issued by the Virginia Department of Game and Inland Fisheries after verification of the damage. Generally, however, permits are only issued for holders of larger property parcels because of safety considerations. Fairfax County should work in coordination with the VDGIF to make these permits available on a wider basis to qualified residents.

Archery hunting is quite effective in suburban areas since it is much safer than the use of firearms due to the short range of the projectiles. In addition to those citizens who have the necessary skills and equipment, there are several commercial firms that offer specialized deer removal services. For the most recent year, 854 deer were harvested using archery equipment. Another 119 deer were taken under the county's Urban Archery Program. This reduction of the county's deer herd by 973 individuals demonstrates the effectiveness of archery as a tool in meeting program goals and as a method that can be safely employed in even heavily populated areas.

The use of roadside reflectors (strieter-lite technology) that reflect automobile headlights into wooded areas bordering the roadside has been suggested as a method of discouraging deer from crossing roadways in the evening and early morning hours, when most deer-vehicle collisions occur. In mid-November, 1999, the Board of Supervisors approved $10,000 for a pilot program to test strieter-lite reflectors in selected locations. In addition, a grant of $40,000 was received from the Virginia Department of Motor Vehicles for testing and evaluation of this technology at several locations in Fairfax County. Unfortunately, all of the test locations experienced confounding factors such as roadway modification, adjacent development, deer herd reduction through hunting and disease, etc, that made it impossible to draw reliable inferences from the collected data. In addition, the manufacturer of the reflectors has apparently discovered that the initial design was reflecting light in a part of the spectrum to which deer's eyes are relatively insensitive, and the design is now being changed. Such inferences as can be drawn from the data suggest that there is only a slight reduction in deer-vehicle collisions due to the use of reflectors. This conclusion appears to be borne out by tests in other eastern areas where there was an absence of confounding factors. The tests in Fairfax

County have shown this technology to have so little promise that it cannot be recommended for continuance.

Even though Fairfax County has not conducted a pilot project to test the feasibility of immunocontraception, this technology has shown a limited potential for the future. A program being conducted by the Humane Society of the United States on the campus of the National Institute of Standards and Technology in Montgomery County is being carefully monitored for possible applicability to Fairfax County. After the deer population has been reduced to generally acceptable levels, this methodology might provide a feasible method of sustaining these levels in some local herds for the long term. In mid-November, 2000, the Board of Supervisors approved $10,000 to develop a pilot demonstration program on deer contraception.

H. CONCLUSIONS

The need for a comprehensive deer management program for Fairfax County is not in serious dispute. However, there is perhaps a somewhat wider array of opinion about the appropriate context for determining carrying capacity level for the management program and the particular methodologies to employ in reaching program goals.

As noted in much of the reference literature, deer have traditionally been viewed as livestock and woodlands and meadows as pasture. Deer management models and programs have been based largely upon nutritional deer carrying capacity that does not consider issues of biodiversity, altered natural processes, natural herd demographics and behavior, or adverse impacts on mankind. The discrepancy of views can be seen in comparing a report by the Virginia Department of Game and Inland Fisheries with the Consultant's Report. The VDGIF report states that deer densities ranging from 90-419 deer per square mile have been reported in various county parks and that ideal deer densities are 15-20 deer/sq. mile of suitable habitat. However, the 1997 Consultant Report and much of the scientific literature argues that a deer density of no more than 8-15 deer/sq. mile is required to meet a biodiversity goal of deer management. Many of the assumptions upon which the Integrated Deer Management Plan for Fairfax County is based require adjustment based on continued environmental assessment of the county and to meet more precisely defined ecological goals.

It is evident that, while deer in Fairfax County have not reached a state of overpopulation (as earlier defined), they are near biological carrying capacity as shown by their poor physical condition and their relentless foraging outside their "natural" habitat. It is equally evident that, for the majority of citizens, deer have greatly exceeded cultural carrying capacity in terms of representing a serious vehicular hazard and their depredations on both private landscaping and our public parklands. There is now substantial evidence documenting the fact that ecological and biodiversity carrying capacities have long since been exceeded.

In light of the Environmental Quality Advisory Council's role as an advocate for protection of environmental quality, it is EQAC's view that a biodiversity approach is needed in Fairfax County. However, as cautioned in the 1997 Consultant Report, EQAC too cautions against attempts to move forward with a response without adequate data, a clearly articulated plan, and education and consensus building of all major stakeholders. While moving quickly may assuage the concerns of some vocal groups, a true solution must address the problem with a long-term approach, considering all major stakeholders. Management must address an ecological goal that is based on sound science and considers the value system of an educated community.

All of these caveats having been noted, the problem is of such proportions that every feasible approach must be employed not only to keep the burgeoning deer population in check, but more important, to systematically reduce it to sustainable levels. It is evident that the current managed hunt and sharpshooter programs have reached an admirable level of cost-effectiveness but are not reducing the countywide deer population at a rate sufficient to achieve the recommended biodiversity carrying capacity. Thus, it is incumbent upon the Board of Supervisors to continue to take increased and decisive action to address this problem over the long term, while recognizing that it is not going to be possible to please all of the people all of the time. It is likewise essential that the Fairfax County Park Authority continue its active participation in the deer management program in order to exercise the necessary stewardship of the ecological well-being of the county's parkland, which now constitutes nine percent of the land area of the county. The regeneration of parkland where the program has been implemented for several years shows clearly the benefits to be derived and makes it possible to schedule other parks for program activities.

I. RECOMMENDATIONS

1. EQAC recommends that the Board of Supervisors continue to implement and monitor the comprehensive deer management program set forth in the Integrated Deer Management Plan adopted in November, 1998 and refined by the County Executive's Deer Management Committee in the summer of 1999 and in subsequent periodic meetings. EQAC strongly supports the following broad goals encompassed in the plan and in the subsequent studies and evaluations:

    - Management based on reduction of local deer populations to sustainable levels.

    - Management based on a sound ecological approach that emphasizes biodiversity without preferential treatment of particular species.

    - Management based on an "in perpetuity" perspective that does not trade long-term interests for short-term gains.

- Protection, restoration, and enhancement of the natural areas and environments that have been subjected to degradation by deer overabundance.

2. EQAC strongly commends active participation of the Fairfax County Park Authority in the deer management program in order to provide enhanced stewardship of the parks, golf courses, and other parklands under its care and management. EQAC strongly endorses the joint efforts of the Park Authority and the Animal Services Division of the FCPD to take the program to parks that have not yet been served. Further, EQAC recommends that techniques be employed to concentrate deer in the safest parts of smaller parks when using sharpshooters in order to maximize safety for surrounding neighborhoods.

3. EQAC believes that, while some progress has been made, particularly through the use of archery, the Deer Management Program must address increased attention to the problems of small private (mostly residential) property owners who are suffering serious impacts from deer and develop means for them legally to exercise effective control measures. EQAC recognizes that this problem is complicated by the overlay of existing State regulations and recommends that our county program officers work closely with State officials to ease these where possible.

4. EQAC believes that the management program must continue to accomplish the following key objectives:

   - Immediate and sustained measures for reduction of the deer population in order to return the size of the local herds to levels consistent with the long term carrying capacity of their particular local habitats.

   - Ongoing monitoring and evaluation of new methods for maintaining population limits over the long term, such as immunocontraception and other experimental methods.

   - Consideration of development in the county and its effects on ecosystem health and biodiversity as these relate to deer management as well as to the quality of life generally.

5. Since public acceptance of, and participation in, deer management programs is more easily achieved when there is full public understanding of the problem, the available management options, and their costs and other consequences, EQAC strongly recommends that the Board of Supervisors continue to provide for a vigorous program of public education as is now being done by the Animal Services Division and on the county's Web site.

6. EQAC endorses ongoing public input into the plan, including surveys of public opinion and the inclusion of major stakeholders (home owners, environmental preservationists, public safety experts, wildlife biologists, public health experts, sport hunting groups, animal rights groups, etc.) in the continued refinement and implementation of the plan. EQAC fully supports continuation of both the input of a broad range of views and the use of spokespersons, such as

the County Wildlife Biologist, who can articulate program goals and the ongoing management approach to the varied community groups and viewpoints.

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Pat McElroy, Wildlife Biologist, Humane Society of the United States.

Greg Weiler, Manager, Mason Neck Wildlife Refuge, U.S. Fish and Wildlife Service, U.S. Department of the Interior.

LIST OF REFERENCES

NOTE: Most of the references listed below contain extensive bibliographies. The two symposia of 1997 contain between them 83 papers, each with its own separate bibliography, which, in the aggregate, offer hundreds of additional references for those wishing more detailed information on a variety of specific topics.

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VII-2. IMPACTS OF GEESE IN FAIRFAX COUNTY

A. OVERVIEW

Canada geese, once almost exclusively migratory, have to an increasing extent become year-round residents in Fairfax County. Although these resident populations are not evenly distributed throughout the county, many of our ponds and lakes, both large and small, and their adjacent shore areas have been occupied as permanent habitat. Geese have also become an increasing problem on parkland, golf courses and similar facilities. The problem is not so much the animals *per se* but rather the fecal contamination they bring to our water bodies and watercourses and their fouling of grassy open areas. Geese wastes are a well-documented source of fecal coliform bacterial contamination, which has reached alarming levels in many ponds, lakes, and reservoirs, even those forming part of our domestic water supply. An additional problem is the damage resident geese cause to our marshes, where they feed on sprouting plants so voraciously that some once plentiful botanical species have all but disappeared. Addressing these problems inevitably requires reducing the goose population, but this is complicated, because geese are protected by federal migratory waterfowl laws.

B. BACKGROUND

1. Origins of the Goose Problem in Fairfax County

In earlier times, the Canada goose was a strictly migratory bird with its nesting range in wilderness areas of Canada and its winter range well to the south of our area. Geese passed through our area twice a year on their migrations. By the late 1960s, some Canada geese had begun to establish resident populations in this region. This is thought to have begun with birds that were propagated to stock local hunting preserves. Since that time, local Canada goose populations have undergone a dramatic upsurgence. This increase now includes numerous populations of geese that have become permanent residents in the mid-Atlantic region rather than migrating. These permanent populations have become quite obvious in many parts of Fairfax County. Wildlife biologists estimate that the Canada goose population is increasing at about 15 percent annually, which indicates that problems associated with resident goose populations soon will increase to critical levels unless remedial actions are undertaken.

2. Environmental Impact of Geese

A primary impact of geese is environmental pollution, particularly pollution of streams, ponds, and lakes with fecal coliform bacteria from their wastes. The magnitude of the problem is illustrated in two examples below.

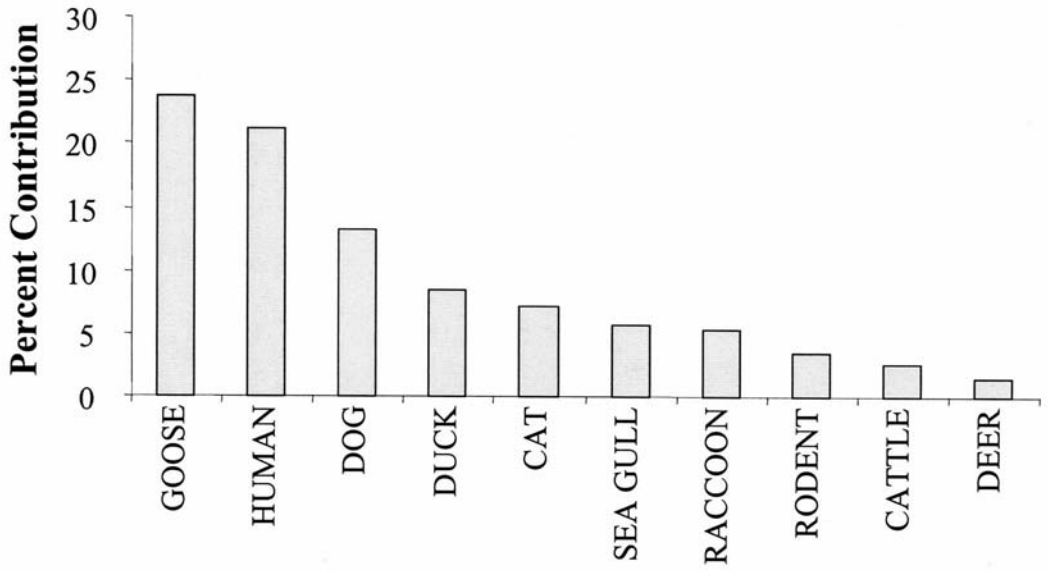
Several years ago, when the Evans Farm property in McLean was in the process of being rezoned for residential development, the farm pond, which was a prominent feature of the site, was extensively sampled to determine if it contained significant levels of pollution. It was known that a resident population of Canada geese was a major contributor to any pollution of the pond. Depending on where the water samples were taken in the pond, the levels of fecal coliform bacteria were found to be from 21 to 27 times those allowable in surface waters in the Commonwealth of Virginia. Drainage from this pond passed through an under-the-road culvert to a much larger pond on the other side of the highway that had two families of resident geese. This pond had fecal coliform counts about three times the allowable level.

More recently, an environmental pollution study was conducted to determine the total maximum daily load (TMDL) of fecal coliform contamination that should be permitted in a portion of Accotink Creek that feeds Lake Accotink. Federal Environmental Protection Agency (EPA) standards indicated that 98 percent of current levels of pollution should be eliminated, a truly draconian expectation. DNA tests to determine the sources of the extant fecal coliform bacteria pollution revealed that anseriform waterfowl (i.e., geese and ducks) accounted for 32 percent and other wildlife for about 17 percent of the total (see Figure VII-2-1). With waterfowl being federally protected species and other wildlife largely beyond our control, half of the current pollution load is effectively beyond the power of the county to eliminate in the near term.

Another major impact of resident geese is significant alteration of the ecology of our marshlands. While migratory geese visited marshes on their twice-yearly trips through our region, the stopovers were brief and were timed so that plants had either not yet sprouted or had matured sufficiently that they were not destroyed by feeding activity. However, populations of resident geese are permanent voracious foragers that feed on newly sprouting plants to the point that some plant species are nearly eliminated from the habitat. This is particularly true of plants such as wild rice, which reseed themselves annually and provide food to many animal species. When all of the sprouting plants are consumed before they can mature and produce seeds, there will be no new plants the following year. For example, where wild rice was once an abundant species, many of our marshes are now nearly devoid of it. Thus, because of the ways in which geese change the ecology of marshes they have caused loss not only of key plant species but also of the animal species that are dependent on those plants.

Figure VII-2-1

Sources of Fecal Coliform Pollution in Accotink Creek



C. ISSUES IN ADDRESSING THE PROBLEM

1. Goose Population Biology

Canada geese are large birds weighing 20-25 pounds, with a life expectancy of some 20 years. Geese mate for life and remain together as pairs year-round. If one of the pair dies or is killed, the other will find a new mate. Mating season is from early February through early April, with nesting season from late March through mid May. Geese begin to nest at three years of age. Eggs are laid approximately one per day until there are an average of five eggs per nest. Incubation (sitting the eggs) does not begin until all eggs have been laid. Eggs not being incubated are cool to the touch. Incubation time is 28-30 days. Normally, all eggs hatch on the same day. Maturation of goslings occurs from early May to early July.

Geese prefer isolated sites near water to nest, with small islands being a favored location. Nests usually are built on the ground in the open, but occasionally are located in brushy or marshy areas if flooding is not a problem. If chased from their accustomed area or if the nesting area has too many pairs, they will find alternative sites, sometimes farther away

from water, sometimes near other ponds in the vicinity, and occasionally on rooftops or other unlikely locations.

Migration is a learned process with which resident geese have not become familiar. Geese return to the general area of their birth to nest, sometimes to the exact site and at least to a nearby pond or lake. Migratory geese nest in Canada while geese nesting in our area are resident geese that were born here. Whereas migratory geese have a flight range of 2,000-3,000 miles, resident geese rarely venture more than 100-200 miles and then only in search of food, water, or safety. Migratory geese do not become resident unless they are injured and can no longer fly for long distances.

Molting season runs from early June to late July. Flight feathers are lost in June and the birds are unable to fly for several weeks, but by early August new flight feathers are fully developed and all birds (except for those injured) are able to fly again. During the molting period, geese need to be near water so they can escape from predators by swimming. They also need an easily accessible food supply during this time.

Natural predators of geese include foxes, raccoons, large owls, snapping turtles, and more recently, coyotes.

2. Considerations of Public Opinion

Many citizens find considerable aesthetic reward in having a few geese in areas where they can be observed and feel that the presence of such attractive wildlife creates a pleasant ambience. While this may be true, many others find the fouling of yards, open space, and water bodies to be unacceptable, especially where geese congregate in appreciable numbers. Moreover, most of the public is unaware, or at best only dimly aware, of the extent to which geese are major polluters of our ponds, lakes, and reservoirs, including some of our water supply sources. As the general public becomes better informed about the pollution aspects of goose populations, greater consensus on remedial approaches should result.

3. Federal Limitations on Remedial Action

Geese, as migratory waterfowl, are protected by federal laws administered by the U.S. Fish and Wildlife Service. Therefore, population reduction by lethal measures applied to adult or juvenile geese are generally not an option. The Fairfax County Park Authority has its own egg addling permit applicable to its parklands. In situations where adult birds are creating an extreme nuisance, the Department of Agriculture Wildlife Service can send staff to round up and relocate them. However, the Fish and Wildlife Service does issue permits for egg addling (including egg oiling) programs as a means of population stabilization. Fairfax County holds such a permit for programs anywhere in the county

under supervision and/or monitoring by the County Wildlife Biologist. Use of trained Border Collies to harass geese into leaving an area is not regulated so long as they do not directly attack or kill the geese.

D. METHODS FOR POPULATION MANAGEMENT

Population management methods that utilize immediate population reduction are not an option due to stringent federal regulations against killing geese once they are hatched. However, the methods outlined below are permissible and accepted approaches to controlling goose populations. Population stabilization coupled with measures that discourage geese from future nesting in an area has proved effective in longer term reductions of population.

1. Population Stabilization

Egg addling and egg oiling are quite effective in preventing eggs from hatching. Strictly speaking, egg addling is vigorous shaking of the egg at a fairly early stage in order to homogenize the contents. This will prevent further development of the egg. Egg oiling coats the surface of the shell with a vegetable oil such as corn oil, which will prevent oxygen from getting to the interior of the egg. This also is effective in halting further development of the egg. Sometimes both methods are referred to as "egg addling." When a clutch of eggs is thus treated, the goose will continue to attempt to incubate them for the normal period, but they will fail to hatch, thus limiting the population to the adult geese already present.

2. Population Exclusion

Most nuisance abatement measures are based on population exclusion. For example, trained Border Collies have been successfully employed to herd geese away from areas where they constitute a nuisance. The geese soon learn to avoid areas patrolled by the dogs, regarding them as unsafe, and they move to other areas where they do not feel threatened. This method of control has been particularly effective in large, relatively open areas such as golf courses. The major negative aspect of this method is the impact on adjacent properties. When the dogs herd the geese off of one property, they necessarily go to the one next door or in the near vicinity. Thus, while one locale is benefited, adjacent locales are afflicted through transference of the problem.

3. Special Foraging Areas

In some cases, an area can be set aside where a small population of geese can be resident without creating an undue nuisance. However, in such cases the aesthetic appeal of having the geese nearby must be balanced by adequate consideration of the water pollution and other waste problems created.

4. Landscaping Modifications

Altering landscaping can sometimes be an effective tool in discouraging geese from congregating near ponds. Bushy plantings, reeds and tall grasses, strategically placed around a pond, will be perceived by geese as a hiding place for predators, thus discouraging them from using that area.

5. Repellents

There are commercially available, nontoxic chemical repellents that discourage geese from eating grass. The disadvantage to this approach is the necessity for frequent reapplications, since each time the grass is mowed most of the repellent is removed along with the clippings.

6. Prohibition of Feeding

Feeding geese encourages them to become resident and to congregate in areas where a "free lunch" is provided. This exacerbates the very nuisance that one is attempting reduce. Also, feeding bread and various kitchen scraps is harmful to the geese's health even though they will avidly feed on such items.

7. Combined Approaches

Clearly, combinations of several of the above approaches can be far more effective than their use individually. For example, the use of trained Border Collies together with landscaping modifications can be quite effective in creating an "undesirable" habitat. If egg oiling is added to this for the few nests that may be established, significant reductions in usage of this area in following years can be achieved.

E. PUBLIC EDUCATION PROGRAM NEEDS

Public awareness of both the pollution problems caused by geese and of the mating and nesting cycle of geese is the key to being able to effectively address the "goose problem." At present, insufficient attention has been given by the public media to the pollution aspects of the problem. Since this pollution creates significant public health risks, the problem needs coverage on the county Web site and through informative bulletins to local homeowners associations.

F. PUBLIC AGENCY RESPONSIBILITY

The office of the County Wildlife Biologist within the Animal Services Division of the Fairfax County Police Department has been assigned primary responsibility for management of geese by the Board of Supervisors. However, due to the fact that Canada geese are federally protected waterfowl, the U.S. Fish and Wildlife Service exercises significant regulatory and permitting functions that govern Fairfax County's geese management activities. Fairfax County was the first local jurisdiction in the nation to be granted a master permit for egg addling programs and is thereby authorized to train citizens, as individuals or groups, to conduct egg addling under its monitoring and control. Except for federally issued hunting permits, intentional killing of hatched geese by humans is prohibited by federal law. In cases where it is necessary for adult geese or hatchlings to be removed from an area, this activity is conducted by the staff of the U.S. Department of Agriculture - Wildlife Services under permit from the U.S. Fish and Wildlife Service.

The population stabilization (egg oiling) program is highly cost effective since, once trained, all labor intensive activities are performed by local citizen volunteers. The only staff activities required are training, monitoring, and reporting under the terms of the federal permit.

G. PROGRAM IMPLEMENTATION ACTIVITIES

Goose management programs have been implemented at a number of locations in Fairfax County. Among the locations and the measures implemented under the Fairfax County permit and monitoring are:

1. Annandale
   a. Northern Virginia Community College - population stabilization and nuisance abatement, 4 years.
   b. Pinecrest Community - population stabilization and nuisance abatement, 3 years.
   c. Pinecrest Golf Course - population stabilization and nuisance abatement, 3 years.

2. Centreville
   a. Franklin Farms - population stabilization, 4 years.
   b. Westfields - population stabilization, 3 years.

3. Fairfax County
   a. Lake Barcroft - population stabilization and nuisance abatement, 5 years.
   b. Fairfax County Parks - population stabilization, 5 years.
   c. Copeland Pond - population stabilization and nuisance abatement, 4 years.

d. Brook Hills - population stabilization and nuisance abatement, 4 years.
e. Waters Edge - population stabilization and nuisance abatement, 3 years.

4. Oakton
   a. Fox Lake - population stabilization, 3 years.

5. Reston
   a. Reston Community - population stabilization, 4, years.

6. Vienna
   a. Trinity School - population stabilization, 4 years.
   b. Champion Lake - population stabilization, 3 years

All of these programs have demonstrated reasonable degrees of success in stabilizing populations. In some cases, populations have actually declined over time due to efforts to discourage geese from further attempts to nest there.

In 2002, there were 275 eggs addled under the county permit and approximately 1,200 under the separate Fairfax County Park Authority permit. In 2003, there were 255 eggs addled at 61 nest sites under the county permit and 674 eggs at 123 nest sites under the FCPA permit.

H. CONCLUSIONS

While geese in small numbers are regarded by many as a pleasant addition to the local ambience, large resident goose populations in many areas of the county constitute a major environmental nuisance and public health risk. Resident goose populations tend to congregate near ponds, lakes, and slow-flowing streams, which leads to contamination of these water bodies with high levels of fecal coliform bacteria. In addition, they foul the grassy open areas in the vicinity with their feces. The high growth rate of the resident goose population and the limitations on methods of control have raised this pollution to levels that are not only environmentally unacceptable but that now constitute a significant public health problem.

While there are already good programs in place to address these problems, they need to be replicated more widely in additional areas of the county. Moreover, more intensive public information campaigns and community outreach efforts are badly needed to actively involve a larger number of individuals and community organizations in population control programs.

I. RECOMMENDATIONS

1. EQAC finds the current programs are effective and should be continued and, where feasible, expanded.

2. EQAC feels that the current programs need to be replicated in many other areas of the county by training additional citizens and homeowner groups in goose population stabilization methodology.

3. EQAC recommends enhanced public education outreach to sensitize all Fairfax County residents and owners of nonresidential properties to the pollution problems caused by geese and the programs available for addressing them.

4. EQAC recommends enhanced public education outreach to acquaint all Fairfax County residents with the role excessive goose populations play in destruction of our marshland habitats.

ACKNOWLEDGMENTS

EQAC gratefully acknowledges the following individuals who have provided data and information included in this report:

Earl Hodnett, Wildlife Biologist, Animal Services Division, Fairfax County Police Department.

David Lawlor, Assistant Wildlife Biologist, Animal Services Division, Fairfax County Police Department.

Charles Smith, Resources Management Division, Fairfax County Park Authority.

USEFUL REFERENCES

The organization GeesePeace in America has an excellent and informative Web site that covers many aspects of the goose problem and methods of addressing them. It can be accessed at http://www.geesepeace.org

VII-3. WILDLIFE BORNE DISEASES OF CONCERN IN FAIRFAX COUNTY

A. OVERVIEW

There are a number of zoonotic diseases (those in which wildlife serves as a reservoir) that affect humans. Four such diseases of greatest concern in Fairfax County are West Nile Virus, Lyme Disease, Rabies, and the complex of diseases caused by fecal coliform bacteria. The causative agents, modes of transmission, and means of prevention are briefly discussed below.

B. BACKGROUND

1. West Nile Virus

West Nile Virus is transmitted to humans and other warm-blooded animals by mosquitoes that have fed on birds infected with the virus. Crows have been particularly implicated as a reservoir species, but it is known that many other bird species are also involved. Mosquitoes are intermediate carriers that convey the virus from birds to humans. There have also been several cases in Fairfax County of horses being infected. The principal intermediate carrier is *Culex pipiens*, the common house mosquito. There is currently no evidence for person-to-person transmission (except in the unusual situation of organ transplants or blood transfusions from infected donors). Some people infected with West Nile Virus apparently experience few, if any, symptoms. Others have mild flu-like symptoms such as low-grade fever, head and body aches, skin rash or swollen lymph nodes. In a few cases such as the elderly, children, and those with weakened immune systems, the infection may cause encephalitis (inflammation of the brain), meningitis (inflammation of the brain covering) or, rarely, death. Encephalitis and meningitis symptoms include rapid onset of high fever, severe headache, stiff neck, muscle weakness, and coma. The virus is of recent occurrence in this country, having been first identified in New York in 1999. However, it has now spread to practically every state in the lower 48 (with the possible exceptions of Oregon and Washington). The Centers for Disease Control and Prevention (CDC) of the U.S. Public Health Service predicts that California will be particularly hard hit next year because the disease has appeared there this year, and the usual pattern is an eruption of cases the year following first appearance. By the end of 2002, CDC had confirmed 161 cases, including 18 deaths, since 1999. For the year 2003, these figures had jumped to 4,156 reported cases and 284 deaths. This major outbreaks in early 2003 resulted in 2,000 cases in Colorado, 1,000 in Nebraska, and 800 in South Dakota. There is almost certainly major underreporting of incidence, since most of those infected apparently have mild symptoms that do not require a visit to the doctor, and even

for those actually infected and seeing a physician, the symptoms may be insufficient to trigger a report without confirmation by serologic tests.

a. Preventive Measures

i. Mosquito Habitat Elimination

An important preventive measure to reduce the chance of infection with West Nile Virus is to eliminate, wherever possible, standing water that provides a breeding habitat for mosquitoes. Any containers such as cans, pails, wheelbarrows, etc., should be emptied and stored in such fashion that water will not collect in them. Bird baths and similar containers should have the water changed every two or three days. Ponds can be stocked with the small fish *Gambusia* that feed on mosquito larvae. There are two species: *Gambusia affinis* and *G. holbrooki*. Both are highly effective in keeping ponds and lakes free of mosquito larvae. *Gambusia affinis*, the most common species, has become endemic in many areas of Eastern Virginia and can be readily transplanted from one pond to another.

ii. Insect Repellents

Since it is nearly impossible to completely eliminate the presence of mosquitoes, some of the most effective preventive measures available for mosquito-borne infections such as West Nile Virus and tick-borne Lyme disease are sprays or lotions containing DEET (N,N-diethyl-meta-toluamide). The active ingredient, DEET, was developed by the U.S. Department of Agriculture in 1946, originally for use by the military. The most convenient method of application to the exposed skin is as an aerosol spray. A recent study reported in the *New England Journal of Medicine* showed that the higher the concentration of DEET in the spray, the longer lasting the protection. In the case of mosquitoes, products containing 20% DEET were effective for four hours, those with 25% DEET were effective for five hours, and those with 35% DEET were effective overnight. It is estimated that there have been more than eight billion applications of DEET over the past 50 years with an excellent safety record. However, a study of DEET by pharmacologists at Duke University, reported in the November 2001 issue of the *Journal of Experimental Neurology*, indicated that frequent and prolonged DEET exposure might cause adverse neurological effects. It was recommended that use be limited to preparations containing no more than 30% DEET for adults and lower concentrations for children.

2. Lyme Disease

Lyme Disease, caused by the bacterial spirochete *Borrelia burgdorferi*, is transmitted to humans primarily, if not exclusively, by *Ixodes scapularis*, the common deer tick. Deer ticks are dark brown to black and about the size and shape of a sesame seed. The white-

tailed deer appears to be the primary reservoir, but rodents have also been implicated. Lyme Disease was first identified in Lyme, Connecticut, in the mid-1970s when a group of children developed arthritis-like symptoms. Within a few days to several weeks of receiving an infected tick bite, most victims will have a red, slowly expanding "bull's-eye" rash (red in the center, pink at the periphery) and such symptoms as malaise, fever, headache, and muscle and joint aches. The longer a case of Lyme Disease persists without treatment, the more severe, debilitating, and long lasting the symptoms are likely to be, such as arthritis and neurologic abnormalities. Many of the physicians treating Lyme Disease have found three or four week courses of doxycycline or amoxicillin to be effective treatments for early stages of the disease, but later stages may require intravenous antibiotics for a month or more.

Confirmed cases of Lyme Disease underwent a sharp increase through June, 1997 (Table VII-3-1). The decrease of the next two years may be attributable to greater public awareness of the threat represented by deer ticks and greater use of proper preventive measures when hiking and working in wooded areas. It is unclear, however, whether a decrease in deer population will lead to a corresponding decrease in Lyme Disease cases, since other animals can act as reservoir species and may inhabit areas within which deer populations decline. However, it is interesting to note that neighboring, semi-rural Loudoun County, which has a large deer population, has the highest per capita incidence of Lyme Disease cases reported in the Commonwealth. In 2001, there were 65 cases compared with 29 cases in 1999, according to the Loudoun County Health Department. This suggests a strong upward trend in incidence where there are large populations of white-tailed deer.

a. Preventive Measures

i. Vaccine

In our Annual Report for 1999, we noted that a new vaccine (Lymrix) for the prevention of Lyme Disease had just been released. In our Annual Report for 2000, we noted that there had been adverse reactions to the vaccine and advised consultation with your personal physician about the advisability of being vaccinated. As a result of an increasing number of adverse reactions, this vaccine was subsequently withdrawn from the market. While it is true that vaccination of those persons intensively exposed to deer ticks might have been helpful, for the vast majority of the population, consistent use of ordinary preventive measures should be entirely adequate. When engaged in activities that might result in exposure to deer ticks, proper clothing is a must, preferably long pants tucked into boot tops or spraying the lower legs, trouser bottoms, and sock tops with insect repellent, since most ticks are encountered close to the ground.

Table VII-3-1 Reported Lyme Disease Cases Meeting Centers for Disease Control (CDC) Case Definition Program Fairfax County		
Period Covered	**Reported Cases**	**Contracted outside of Fairfax County**
July, 1994-June, 1995	14	N.A.
July, 1995-June, 1996	22	N.A.
July, 1996-June, 1997	31	N.A.
July, 1997-June, 1998	16	8
July, 1998-June,1999	13	9
July, 1999-June, 2000	50	8
July, 2000-June, 2001	51	9
July, 2001-June, 2002	61	33
July, 2002-June, 2003	87	N.A.
July, 2003-June, 2004	109	N. A.

(Source: Fairfax County Department of Health)

ii. Insect repellent

The same DEET-containing repellents recommended for mosquitoes (see West Nile Virus above) are also highly effective for ticks. See the discussion of DEET-containing insect repellents in the West Nile Virus section above.

3. Rabies

Rabies is a viral disease that affects the nervous system and may have a latent period from a number of days to several weeks. During the latent period, between the time of an animal bite and the onset of overt symptoms, the virus is propagated along the nerve fiber sheaths until it reaches critical areas of the brain. While rabies has been present in this area for many years, it exists at a low level with the incidence appearing to cycle over a period of several years. This is attributed to the fact that infection, when it reaches the

symptomatic stage, is uniformly fatal. Thus, an infected animal may infect several others and there will appear to be a relatively high incidence, but when those animals die there are fewer carriers for a period of time when the incidence appears to be lower. Rabies is transmitted to humans and other mammals through the saliva of an infected animal almost always in the overtly symptomatic stage, which usually only lasts about ten days. During this time, an infected animal usually exhibits aberrant behavior, such as a nocturnal animal being around during the day, exhibiting signs of confusion, showing an unsteady gait, desperately seeking water but unable to drink, often aggressively approaching dogs and humans, etc. The main wildlife reservoirs in this area (and the number of cases in 2002) are raccoons (52), foxes (9), skunks (9), and, to a lesser extent, some bats. Domestic animals, e.g., dogs and occasionally cats, may act as secondary transmitters of the disease after having contracted it from a wildlife source. The incidence of rabies in animals fluctuates; for example, Fairfax County had 80 cases in 2002, 47 cases in 2003, and has had 52 cases by the end of July in 2004.

a. Preventive measures

The most important measure for prevention of rabies is to avoid being bitten by or direct contact with an animal that might be infected. If you encounter an animal that is behaving strangely or exhibiting symptoms such as excessive drooling, contact Fairfax County Animal Services Division at **703-830-3310** without delay. This also applies if you find a dead animal that you suspect may have died of rabies. Animal Services will send a professionally trained officer to impound the animal for quarantine and testing. If you are bitten or scratched or come in contact with the animal's saliva, seek immediate medical attention so a determination can be made as to whether you may require a course of preventive inoculations. The protective serum used for such inoculations has been substantially improved in recent years so that fewer doses are required, and those have fewer unpleasant side effects.

4. Fecal Coliform Bacterial Diseases

Fecal coliform bacterial diseases in humans are caused primarily through ingesting or wading or swimming in contaminated water. There are a number of bacteria that can be responsible, but the thing they share in common is being present in the gut and intestinal wastes of a variety of wildlife and domestic animals. The relatively new science of molecular genetic DNA testing has made it possible to reliably identify the particular animals responsible for the pollution of a given water sample. Studies carried out at several sites in Fairfax County indicate that Canada geese living in and about ponds and streams are principal contributors, while ducks, deer, raccoons, foxes, and domestic dogs and cats are also significant sources (see Figure VII-2-1 on page 210). When the wastes from these animal sources are deposited directly into, or washed into, streams and ponds, the pollution can build up to hazardous levels. For example, one pond in the McLean area, inhabited by Canada geese that had become resident, was extensively tested several years

ago and was found to have levels of fecal coliform bacterial contamination that ranged from 21 to 27 times the level allowable in surface waters in the Commonwealth of Virginia. Another occasional source of such contamination is from leaks, overflows, or ruptures in the public sanitary sewer system or private septic systems. While illness from such bacteria is usually not life threatening and is readily treated with antibiotics, exposure to waters that one has reason to believe may be polluted should be scrupulously avoided.

Several years ago, budgetary limitations led to consideration of eliminating the county's Stream Monitoring Program. EQAC intervened in the discussion, pointing out that this monitoring was environmentally critical and not duplicated in any other county programs. As a result, the Board of Supervisors directed that the program be continued. Recently, an agreement has been reached in which the Stream Monitoring Program for bacterial contamination is being reorganized. The collection of samples will now be handled by staff of the Department of Public Works and Environmental Services (DPWES) responsible for the watershed management program, since they are in the field on a regular basis and it is efficient for them to perform this function. Analysis of the samples will continue to be performed by the Department of Health laboratories. It is felt that this arrangement will provide for better and more efficient monitoring of the health and safety of our streams, lakes, and ponds.

a. Preventive measures

There is a general solution to this problem in which pollution of our surface waters is prevented in the first place. The main individual solution to the problem is to avoid disease caused by fecal coliform bacteria by not drinking water from sources whose pollution status is unknown and by not wading or swimming in water that is known to be, or suspected of being, polluted.

C. PUBLIC EDUCATION PROGRAM NEEDS

The Fairfax County Department of Health has available an excellent booklet entitled *Preventing Tick-borne Diseases in Virginia*. They also have a brochure entitled *Rabies and Animal Bites: What you should know and what you should do*. Additional information is available through the Health Department section of the county Web site http://fairfaxcounty.gov/living/healthhuman/health.htm#environmental

With the recent nearly epidemic explosion of West Nile Virus, there is near certainty of it becoming endemic in our area for the long term. Public education materials, comparable to those noted above, are available from our own county Health Department, especially at http://www.fairfaxcounty.gov/fightthebite. In addition, the Centers for Disease Control and Prevention of the U.S. Public Health Service has some recently-developed materials that are quite good.

Because of the frequently changing levels of pollution in our surface waters, it is not practical to create printed materials identifying those streams and ponds that are affected by fecal coliform bacterial pollution. However, our excellent county Web site is an ideal way for the public to receive frequent updates on results of the Stream Monitoring Program and notices about waters that should be avoided due to pollution.

The public media generally do a fairly good job of reporting the finding of rabid animals. Such incidents could also be posted on the county Web site as advisories.

D. PUBLIC AGENCY RESPONSIBILITIES

The primary public agency responsibilities lie in the following areas:

1. Public education;
2. Monitoring of disease incidence;
3. Monitoring of pollution and exposure hazards;
4. Providing animal control services; and
5. Providing mosquito abatement, where needed.

The Animal Services Division of the Fairfax County Police Department is responsible for animal control activities, such as impounding animals suspected of being rabid and similar wildlife-related activities. The Stormwater Planning Division of the Department of Public Works and Environmental Services will have responsibility for collection of water samples from streams, lakes and ponds. The Health Department has responsibility for most prevention and public education activities, water sample testing, and various monitoring and information gathering programs.

E. CONCLUSIONS

The upsurgence of West Nile Virus and Lyme Disease require continual monitoring and public education and are rapidly becoming serious public health issues. Rabies is a continuing low level, more or less steady state, problem. Waters polluted by excessive levels of fecal coliform bacteria require mitigation, where possible, and monitoring and posting to warn the public against exposure. Malaria, of which a very few scattered cases have been reported, will require careful monitoring and epidemiologic tracking as well as mosquito abatement.

F. RECOMMENDATIONS

The recommendations provided below address only the third section of this chapter (Wildlife Borne Diseases of Concern in Fairfax County). Recommendations addressing deer management and geese issues are found beginning on pages 204 and 215, respectively.

1. EQAC recommends that the Board of Supervisors provide continued active support to the reorganized Stream Monitoring Program in which the Stream Protection Strategies Program of the DPWES will perform sample collection and field testing and the Health Department will perform laboratory testing and analysis functions. EQAC recommends that county staff ensure the posting of advisories on the county Web site when polluted waters are identified. EQAC further recommends that the Board of Supervisors monitor the program through periodic reports to its Environment Committee.

2. EQAC recommends that the Health Department continue and enhance its excellent public education programs.

3. EQAC recommends that the Police Department continue its animal control program and, in conjunction with the Health Department, expand public education initiatives in key areas, such as control of rabies and of wildlife contributing to pollution of surface waters.

4. EQAC recommends that the Board of Supervisors provide active support to the newly instituted program for epidemiology and abatement of insect vector-borne diseases such as West Nile Virus. EQAC further recommends that the Board of Supervisors monitor this program through periodic reports to its Environment Committee by county staff.

ACKNOWLEDGMENTS

EQAC gratefully acknowledges the following individuals and organizations who have generously provided a variety of data and information included in this report and numerous helpful suggestions and recommendations:

Earl Hodnett, Wildlife Biologist, Animal Services Division, Fairfax County Police Department.

David Lawlor, Assistant Wildlife Biologist, Animal Services Division, Fairfax County Police Department.

Harriet Calloway, R.N., Epidemiologist, Fairfax County Health Department.

Laura Suzuki, R.N., MPH, Fairfax County Health Department.

John Ruthinoski, Fairfax County Health Department.

Jorge Arias, PhD., Fairfax County Health Department.

LIST OF REFERENCES

Fairfax County Department of Health. Preventing Tick-borne Diseases in Virginia.

Fairfax County Department of Health. Rabies and Animal Bites: What you should know and what you should do.

WILDLIFE AND THE ENVIRONMENT IN FAIRFAX COUNTY: SUMMARY OF RECOMMENDATIONS

Impacts of Deer in Fairfax County

1. EQAC recommends that the Board of Supervisors continue to implement and monitor the comprehensive deer management program set forth in the Integrated Deer Management Plan adopted in November, 1998 and refined by the County Executive's Deer Management Committee in the summer of 1999 and in subsequent periodic meetings. EQAC strongly supports the following broad goals encompassed in the plan and in the subsequent studies and evaluations:

    - Management based on reduction of local deer populations to sustainable levels.

    - Management based on a sound ecological approach that emphasizes biodiversity without preferential treatment of particular species.

    - Management based on an "in perpetuity" perspective that does not trade long-term interests for short-term gains.

    - Protection, restoration, and enhancement of the natural areas and environments that have been subjected to degradation by deer overabundance.

4. EQAC strongly commends active participation of the Fairfax County Park Authority in the deer management program in order to provide enhanced stewardship of the parks, golf courses, and other parklands under its care and management. EQAC strongly endorses the joint efforts of the Park Authority and the Animal Services Division of the FCPD to take the program to parks that have not yet been served. Further, EQAC recommends that techniques be employed to concentrate deer in the safest parts of smaller parks when using sharpshooters in order to maximize safety for surrounding neighborhoods.

5. EQAC believes that, while some progress has been made, particularly through the use of archery, the Deer Management Program must address increased attention to the problems of small private (mostly residential) property owners who are suffering serious impacts from deer and develop means for them legally to exercise effective control measures. EQAC recognizes that this problem is complicated by the overlay of existing State regulations and recommends that our county program officers work closely with State officials to ease these where possible.

4. EQAC believes that the management program must continue to accomplish the following key objectives:

- Immediate and sustained measures for reduction of the deer population in order to return the size of the local herds to levels consistent with the long term carrying capacity of their particular local habitats.

- Ongoing monitoring and evaluation of new methods for maintaining population limits over the long term, such as immunocontraception and other experimental methods.

- Consideration of development in the county and its effects on ecosystem health and biodiversity as these relate to deer management as well as to the quality of life generally.

5. Since public acceptance of, and participation in, deer management programs is more easily achieved when there is full public understanding of the problem, the available management options, and their costs and other consequences, EQAC strongly recommends that the Board of Supervisors continue to provide for a vigorous program of public education as is now being done by the Animal Services Division and on the county's Web site.

6. EQAC endorses ongoing public input into the plan, including surveys of public opinion and the inclusion of major stakeholders (home owners, environmental preservationists, public safety experts, wildlife biologists, public health experts, sport hunting groups, animal rights groups, etc.) in the continued refinement and implementation of the plan. EQAC fully supports continuation of both the input of a broad range of views and the use of spokespersons, such as the County Wildlife Biologist, who can articulate program goals and the ongoing management approach to the varied community groups and viewpoints.

Impacts of Geese in Fairfax County

1. EQAC finds the current programs are effective and should be continued and, where feasible, expanded.

2. EQAC feels that the current programs need to be replicated in many other areas of the county by training additional citizens and homeowner groups in goose population stabilization methodology.

3. EQAC recommends enhanced public education outreach to sensitize all Fairfax County residents and owners of nonresidential properties to the pollution problems caused by geese and the programs available for addressing them.

4. EQAC recommends enhanced public education outreach to acquaint all Fairfax County residents with the role excessive goose populations play in destruction of our marshland habitats.

Wildlife Borne Diseases of Concern in Fairfax County

1. EQAC recommends that the Board of Supervisors provide continued active support to the reorganized Stream Monitoring Program in which the Stream Protection Strategies Program of the DPWES will perform sample collection and field testing and the Health Department will perform laboratory testing and analysis functions. EQAC recommends that county staff ensure the posting of advisories on the county Web site when polluted waters are identified. EQAC further recommends that the Board of Supervisors monitor the program through periodic reports to its Environment Committee.

2. EQAC recommends that the Health Department continue and enhance its excellent public education programs.

3. EQAC recommends that the Police Department continue its animal control program and, in conjunction with the Health Department, expand public education initiatives in key areas, such as control of rabies and of wildlife contributing to pollution of surface waters.

4. EQAC recommends that the Board of Supervisors provide active support to the newly instituted program for epidemiology and abatement of insect vector-borne diseases such as West Nile Virus. EQAC further recommends that the Board of Supervisors monitor this program through periodic reports to its Environment Committee by county staff.

CHAPTER VIII

NOISE, LIGHT POLLUTION, AND VISUAL POLLUTION

VIII-1. NOISE

A. OVERVIEW

Noise is often considered to be unwanted sound; sound becomes undesirable when its intensity is such that it interferes with one's ability to hear something more desirable or when there is a desire to not hear anything at all (e.g., “silence is golden”).

Noise is a byproduct of our everyday lives. Citizens hear various noises and determine if the noise intensity is such that their quality of life is impacted—it’s often “in the ears of the beholder.” Noise that is perceived as a detriment to our quality of life due to its intensity, timing and/or its source is defined as noise pollution.

One key element of determining noise pollution is the measured intensity of noise and how it impacts society as a whole. Noise is measured by scientific instruments that receive the sound and determine its location and intensity as it radiates from the source. The resulting intensity levels and locations will allow for noise levels to be catalogued so it can be regulated when society objects to noise pollution.

Noise is a concern of our society, especially in urban areas. How it is regulated is based on scientific findings and not solely on human perception.

In a world of constant natural and manmade sounds, those that are perceived as “noise” vary among people in the community. The pivotal issue is the perceived impact or degree of annoyance from noise. To some, loud sounds coming from an airport is the sound of the economy working and growing. Conversely, others feel that this noise deprives them of their privacy and quiet. People can be startled by unexpected noise and usually do not understand why the generation of such noise is necessary.

Recent studies suggest a growing intolerance among citizens and communities for noise associated with airports, traffic, construction, and athletic events, etc. The impacts of noise on a community include:

- Diminished privacy and quiet at home or at an outdoor recreation experience, vacation or rest site (private cabin at the lake, river or beach);
- Interrupted sleep;
- Interrupted entertainment and conversation;
- Interruptions at work or school;
- Property damage such as broken windows; and
- Injury to wildlife, livestock, or pets

In the next sections of this report some key noise pollution concerns will be addressed, followed by recommendations to alleviate their impacts.

B. AIRPORT NOISE

1. Operations and Associated Noise Impacts at Ronald Reagan Washington National Airport and Washington Dulles International Airport

Fairfax County is served by Ronald Reagan Washington National Airport and Washington Dulles International Airport. According to information given by the Metropolitan Washington Airports Authority, in 2003, more than 31.2 million passengers traveled through Ronald Reagan Washington National Airport (National) and Washington Dulles International Airport (Dulles) on more than 595,000 flights. During the months of October, November, and December of 2003, over 161,400 flights served 8.1 million passengers. Many of these flights flew over neighborhoods throughout the metropolitan Washington region.

On a typical day, over 4,000 airplanes will fly in the skies over the Washington region. Most of these flights are to and from Ronald Reagan Washington National Airport ("National Airport"), Washington Dulles International Airport ("Dulles Airport"), Baltimore-Washington International Airport ("BWI"), or Andrews Air Force Base. Many additional flight operations also occur at the many general aviation airfields in the region.

Both National and Dulles Airports are heavily used and are an important part of the region's overall economy. Typically, more than 50,000 total flights are conducted each month at these airports. This activity is made up of commercial flights between the Washington area and 103 domestic and 29 international destinations. At National, most flights are short to mid-range jet aircraft flights operated by major airlines. All types and sizes of aircraft operate at Dulles.

Dulles sees approximately 34,000 flights each month, with more than 1,200 flights each day, with an increase of several hundred flights on Saturdays and Sundays. The scheduled operations between 7 A.M. and 10 P.M. show a typical pattern, with many flights in some hours and a relatively small number in other hours. Peaks are at 7 A.M., 12 P.M., 5 P.M., and 8 P.M., with low times at 5 A.M., 10 A.M., 2 P.M., 6 P.M., and 10 P.M.

National has about half as many flights as Dulles; approximately 18,000 flights go in and out each month. This breaks down to more than 700 flights each day, with an increase of several hundred flights on Saturdays and Sundays. Most flights occur between 7 A.M. and 10 P.M. National is under the Federal Aviation Administration's (FAA's) High Density Rule, which limits, with some exceptions, the air carriers to 37 scheduled operations per hour and the commuter carriers to 13 scheduled operations per hour.

The Metropolitan Washington Airports Authority (MWAA), which operates both National and Dulles Airports, monitors aircraft and community noise around the clock at 32 locations in the Washington, D.C. Metropolitan Area. The monitoring equipment evaluates different sound events and separates those events likely to have been caused from aircraft from the remaining events, which are attributed to the community. The

Metropolitan Washington Council of Governments' Committee On Noise Abatement and Aviation at National and Dulles Airports (CONAANDA) and the Airports Authority selected the monitoring sites from recommendations offered by the local governments.

In 2003, the Airports Authority's noise complaint centers at National and Dulles reported receiving 125 noise complaints from 70 different callers. National reported 91 complaints from 43 callers, while Dulles reported 34 complaints from 27 callers.

MWAA reports that National Airport has one of the strictest noise regulations in place at any major airport in the United States. All aircraft operating between 10:00 P.M. and 7:00 A.M. must satisfy the Airport's nighttime noise limits or face monetary fines of $5,000.00 maximum per violation. There were ten violations during the year 2003. Civil penalties were sought for eight violations and two letters of warning were issued. A total of $28,000 was received from six penalties, with the remaining cases pending.

Resources

Metropolitan Washington Airports Authority	
Community Relations and Noise Abatement	703-417-8745
National Airport Noise Complaints	703-417-8020
Dulles International Airport Noise Complaints	703-572-8215
Federal Aviation Administration	
Washington National Airport	703-413-1530
Dulles International Airport	703-471-1270
FAA Noise Ombudsman	202-493-5047
Other Aviation Facilities	
Andrews Air Force Base-(auto information line)	301-981-1110
Baltimore-Wash Int'l Airport (BWI)-complaints	410-859-7021

2. Additions to Washington Dulles International Airport

The Metropolitan Washington Airports Authority (MWAA) has begun the process of preparing an Environmental Impact Statement (EIS) to evaluate the possible addition of two new air carrier runways (one oriented north-south and the other east-west) to Dulles Airport. The scoping process for this EIS took place during the summer of 2002; a draft EIS is anticipated in the fall of 2004. Other recent Dulles Airport projects that have gone through the National Environmental Policy Act (NEPA) process include: the addition of a new midfield concourse and related facilities; the construction of an "Automated People Mover" system to replace the existing Mobile Lounges with an underground rail system; and the construction of a new air traffic control tower.

3. Part 150 Noise Compatibility Planning for Ronald Reagan Washington National Airport

Portions of the following discussion have been excerpted and modified slightly from the Web site of the Metropolitan Washington Council of Governments:

MWAA has prepared a major update of the Noise Compatibility Study for Ronald Reagan Washington National Airport. This study, conducted in accordance with the provisions of the Federal Aviation Administration's "Part 150" process, has been designed to forecast future noise contours at Reagan National and to propose abatement and mitigation actions to reduce community noise impacts. A study report containing a series of recommended noise abatement and mitigation measures was released in September, 2004. Noise abatement recommendations include, among other things, the application of improved technology to keep arriving and departing aircraft over the Potomac River up to their designated turning points, an improved distribution of turning points from the Potomac River between five and ten miles south of the River, and the improvement of the Airport's noise monitoring and flight tracking system. In October, 2004, the Fairfax County Board of Supervisors endorsed staff comments concerning these recommendations; the comments were generally supportive of the noise abatement recommendations but recommended a follow-up assessment of the effectiveness of these measures.

Because of the importance of this issue to the community, the Metropolitan Washington Council of Governments' (MWCOG) Committee on Noise Abatement and Aviation at National and Dulles Airports (CONAANDA) partnered with MWAA throughout the process of development of the noise abatement and mitigation recommendations. A Part 150 Study Advisory Committee (Advisory Committee) was established to assist and advise the Airport Authority in this study; indeed the Advisory Committee's recommendations were incorporated into the Part 150 Study document.

The public comment period for the Part 150 study has closed, and it is anticipated that the updated noise compatibility program for Reagan National Airport will be submitted to FAA for approval.

4. Potomac Consolidated TRACON: Airspace Redesign

The 2002 *Annual Report on the Environment* described the Draft EIS for the proposed redesign of airspace in the Baltimore-Washington metropolitan area in conjunction with the newly consolidated TRACON (Terminal Radar Approach Control) facility that has been established at Vint Hill Farms in Fauquier County, Virginia. In May, 2003, FAA issued a Record of Decision supporting "Alternative 2," which will generally preserve air traffic transfer points along the boundary of the Potomac Consolidated TRACON airspace while changing the airspace structure within the boundary (in order to take advantage of opportunities for improved efficiency and

overall noise reduction offered by the consolidation of four separate TRACON facilities).

C. HIGHWAY NOISE

1. Background

Traffic in the Washington metropolitan area continues to grow, due to ever increasing residential development in and around Fairfax County, especially to the west and north where adjacent counties are allowing almost uncontrolled residential development growth rates which are some of the largest in the country. These increasing rates of residential growth are being allowed with little or no consideration of their impacts on the already over used and limited transportation infrastructure serving the entire metropolitan region. The area's traffic ranks consistently as one of the most congested in the country. As more lanes are added and some new roads are constructed, increased traffic generates more noise that creates demands for noise attenuation or abatement measures, including constructing barriers/walls or berms, providing landscaping/vegetation, or providing acoustical design techniques. Barriers have become the most popular choice. Since 1991 in Fairfax County, barriers constructed by the Virginia Department of Transportation (VDOT) have consisted of a solid wall of absorptive concrete that breaks the line of sight between vehicles and homes. Although noise barriers have a maximum decibel reduction of 20 dBA, most only provide 10-12 decibel reductions.

2. State Policy

Virginia adopted its original noise abatement policy in 1989. The policy established criteria for providing noise protection in conjunction with proposed highway projects in the State. Implementation of the policy has aided in the construction, or construction approval, of more than 100 federally-funded sound barriers. Experience with this policy created considerable feedback from citizens and elected officials. As a result, the Commonwealth Transportation Board decided to evaluate the policy for possible changes. The major source of information used was a survey of 15 state departments of transportation in the eastern U.S. The culmination of this process was the adoption of changes to the State policy in November, 1996, which became effective in January, 1997.

The key changes to the policy were to: 1) raise the cost-effectiveness ceiling from $20,000 per protected receptor to $30,000 per protected residential property based other state practices; 2) clarify that Virginia will not participate in any retrofit project along an existing highway when not in conjunction with an improvement for that highway; and 3) add the possibility for third party funding of the amount above VDOT's $30,000 ceiling if the abatement measure otherwise satisfies the criteria.

3. Noise Study Submission Guidelines

On July 24, 2000, the Board of Supervisors adopted Zoning Ordinance Amendment ZO 00-330, which permits noise barriers in excess of the Zoning Ordinance fence/wall height limitations where needed to reduce adverse impacts of highway noise on properties adjacent to major thoroughfares, or to reduce adverse noise impacts of commercial and industrial uses on adjacent properties. Such barriers may be approved by the Board of Supervisors in conjunction with the approval of a proffered rezoning for any zoning district, including P districts, or in conjunction with the approval of a special exception application, or by the Board of Zoning Appeals as a special permit use. Pursuant to Par. 1 of Sect. 8-919 or Par. 3F of Sect. 10-104 of the Zoning Ordinance, a noise impact study is required to demonstrate the need for the noise barrier and the proposed height and level of mitigation to be achieved by the noise barrier. In conjunction with the adoption of this Zoning Ordinance Amendment, the Planning Commission and Board of Supervisors requested staff to develop standardized noise study submission guidelines, which would be submitted to the Planning Commission for review and comment prior to implementation.

In response to this request, a noise study submission form and guidelines were developed. This form requires the applicant to provide information regarding the assumptions and data used in the noise study, the results of the analysis, and a detailed description of the visual impacts of the noise barrier and its effectiveness in providing noise mitigation. Given that the cost of providing this information may be prohibitive for a noise barrier request on an individual residential lot, a second form has been developed which requires less information for noise barrier requests on individual residential properties.

Staff from the Department of Planning and Zoning, Department of Transportation, and the Virginia Department of Transportation participated in the review and development of these guidelines. In addition, acoustical engineers from several firms that have submitted noise studies to the county in the past were invited to provide written comments on two occasions; participating consultants met with staff to discuss their issues and concerns regarding the proposed noise study submission guidelines. In addition, the Northern Virginia Building Industry Association (NVBIA) and the National Association of Industrial and Office Properties (NAIOP) were provided with the opportunity to comment on these guidelines.

On March 14, 2002, the Planning Commission's Environment Committee reviewed and endorsed the Noise Study Submission Guidelines. On March 20, 2002, the Planning Commission endorsed the guidelines.

On April 29, 2002, the Board of Supervisors accepted the proposed guidelines without change.

4. State Projects in Fairfax County

VDOT's Northern Virginia Office constructed the following sound barriers in FY 03-04:

- Four sound barriers for Ox Road between Davis Drive and Lee Chapel Road;
- Two sound barriers for Ox Road between North Davis Drive and the Prince William County line; and
- One sound barrier along I-495 (Capital Beltway).

The following barriers have been approved for the following highway construction projects underway in FY 04-05:

- Two sound barriers (Fairfax County portion) for U.S. Route 1 (Richmond Highway) interchange improvements associated with the Woodrow Wilson Bridge Project; and.
- Two sound barriers associated with the widening of Richmond Highway (U.S. Route 1) widening between Lorton Road and Telegraph Road.

D. RECOMMENDATIONS

1. Continue to support airport noise compatible land use planning near airports in the county through the implementation of policies and regulations that reference the most current airport noise contour projections for the airports and that are at least as stringent as federal noise compatibility guidelines.

2. Develop and distribute materials to educate the public on airport noise issues, including airport noise contours, noise compatible planning and regulation, noise changes that may result from new construction and changes in flight frequencies, and noise complaint procedures. Incorporate these educational materials into the county's overall environmental educational efforts.

3. Support the addition of new runways at Washington Dulles International Airport as long as aircraft operations at the airport associated with this increased operational capacity do not result in overall net increases in noise exposures to residents of Fairfax County when compared with operations that would occur using existing runways.

4. Encourage the use of opportunities provided by the Virginia Department of Transportation (VDOT) that allow for third party contributions to noise barrier construction when the VDOT cost criteria preclude VDOT's construction of such barriers. Through this VDOT policy, neighborhoods affected by high levels of highway noise can participate in the funding of barriers that would not otherwise be constructed.

5. Encourage the retention and planting of noninvasive vegetation to provide visual shielding of residents from highways. Where possible, support the provision of vegetated areas adjacent to highways that are wide enough and dense enough to provide noise reduction benefits to

residential areas near the highways. Where feasible and appropriate, pursue such approaches in lieu of noise walls.

6. Review all airport and highway studies that require Environmental Assessments or Environmental Impact Statements under the National Environmental Policy Act (NEPA) for consistency with county policies addressing transportation-related noise and mitigation.

VIII-2. LIGHT POLLUTION

A. OVERVIEW

Light pollution is a general term used to describe light output, primarily from exterior (outdoor) sources, in commercial, residential, and roadway settings that is excessive in amount and/or that causes harmful glare to be directed into the path of travel or into residential neighborhoods. Light pollution is thus both a safety issue and a quality of life issue. With the increasing urbanization of Fairfax County, exterior (outdoor) lighting and light pollution in its many forms have become pressing issues to our communities. In the past, Fairfax County had some regulations regarding exterior lighting, but they were minimal and out of date. A major effort was undertaken in 2002 to write a totally new and modern Outdoor Lighting Ordinance that took into account the numerous advances that have been made in lighting technology in recent years. This highly successful effort utilized several workshops, in which EQAC and a number of local experts participated, and came to fruition in the early summer of 2003 with the adoption of the new Ordinance. It is regarded by experts in the outdoor lighting community as being one of the best such ordinances in the mid-Atlantic region. However, there are one or two areas that could not be adequately addressed by the new ordinance, since suitable standards and convenient measurement technology were not available. This report will focus on these areas.

B. ISSUES AND PROBLEMS

The main issues and problems of exterior lighting and light pollution may be summarized as follows:

1. Glare

Glare, as defined by the Illuminating Engineering Society of North America (IESNA), falls into three main categories:

a. Disability glare – Disability glare, also known as veiling luminance, is caused by light sources that shine directly into ones eyes and is dangerous because it is blinding (i.e., it totally overloads the eye's light sensor cells).

b. Discomfort glare – Discomfort glare may not necessarily reduce the ability to see an object, but it produces a sensation of discomfort due to high contrast or non-uniform distribution of light in the field of view.

c. Nuisance or annoyance glare – Nuisance glare is that which causes complaints such as, "The light is shining in my window."

Glare is a significant and pervasive problem that seriously impairs both safety and quality of life. Glare demands attention in that one's eyes are naturally attracted to bright light, and at night this destroys the eye's dark adaptation, which is a serious driving hazard. Obtrusive lighting by commercial establishments to attract attention is a serious problem as is selection of inappropriate fixtures for exterior residential lighting. A major problem is the high intensity lighting of sports facilities, such as ball fields and tennis courts, adjacent to residential neighborhoods. Glare and excessive illumination (which are two separate problems) cast into surrounding residential neighborhoods not only detracts from the quality of life but can make it difficult for pedestrians and homeowners to see their surroundings.

2. Light Trespass

Light trespass is the poor control of outdoor lighting such that it crosses property lines and detracts from the property value and quality of life of those whose property is so invaded. It is particularly common when obtrusive commercial or recreational lighting is immediately adjacent to residential neighborhoods or when a homeowner uses inappropriate fixtures, light levels, and lighting duration, often in the interest of "security." It is generally categorized in two forms:

a. Adjacent property is illuminated by unwanted light.

b. Excessive brightness (often called "glare") occurs in the normal field of view.

Both of these forms may be present in a given situation. Illumination, that is, the amount of light energy falling on a surface, is readily measured by simple hand held instruments and is expressed in foot candles. The new ordinance establishes 0.5 foot candles as the limit of illumination at the property line of the property producing the illumination. Illumination levels above that are regarded as prohibited light trespass.

Glare or excessive brightness is a more complex and difficult-to-measure phenomenon. It is experienced when the light producing source (the bulb) is directly visible, but also depends on the contrast between that source and the surrounding background. For example, even a very bright light source viewed against a noonday sky doesn't seem particularly glaring or objectionable, but the same source viewed against a night sky is very objectionable and seems so bright as to be almost painful. One of the problems in addressing this kind of light trespass, or more properly glare trespass, is that there are not at present good standards for acceptable limits, and instruments to measure this kind of glare are necessarily complex and difficult to operate.

3. Security

Much outdoor lighting is used in the interest of providing security. These safety concerns often result in bad lighting rather than real security. One reason often cited for today's bright lights is that high wattage is needed to deter crime. If light is overly bright with excessive glare it makes it easier for a person to hide in the deep shadows

created by objects in the harsh glaring light. This might actually encourage crime rather than discourage it. The debate as to whether or not additional light provides more safety has been more emotional than factual. The few rigorous studies that have been done reveal no connection between higher lighting levels and lower crime rates. This may be due to people with nefarious intent taking more risks in better lit areas. For example, the National Institute of Law Enforcement and Criminal Justice found no statistically significant evidence that lighting impacts the level of crime (Upgren, 1996). Thus, the supposed correlation between a high level of security lighting and reduced crime appears to be nothing more than a popular myth.

4. Urban Sky Glow

Urban sky glow is brightening of the night sky due to manmade lighting that passes upward with the light rays reflected off of submicroscopic dust and water particles in the atmosphere. Although urban sky glow was first noted as a problem by the astronomical community, it is by no means any longer solely an astronomical issue. With the increasing urbanization of many areas of the U.S., all citizens in those areas are now being affected. In Fairfax County, which is now an urban county, improper lighting has seriously degraded the darkness of our local night skies into a pallid luminescence that many of our citizens find objectionable.

5. Energy Usage

Smart lighting techniques, which direct all of the light generated onto the target area, reduce energy consumption and hence the use of fossil fuels. Several engineering estimates suggest that at least 30 percent of outdoor lighting is being wasted through light energy spilling upward and outward rather than being directed downward onto the target area. Also, many installations are greatly over-illuminated as well as being lighted for unnecessary durations, further compounding the energy wastage. Inefficient lighting incurs both direct financial costs and hidden environmental costs. It has been estimated by national organizations studying light pollution that in excess of $8 billion of electricity is being wasted annually on obtrusive and inefficient outdoor lighting (see data from Virginia Outdoor Lighting Task Force and the International Dark-Sky Association). Since electricity generation in the eastern part of this country is mostly from fossil fuels, every unnecessary kilowatt of electrical energy generated also produces air pollution, unnecessary greenhouse gases and acid rain.

C. CURRENT COUNTY STANDARDS AND REGULATIONS

In EQAC's view, Fairfax County now has an excellent ordinance that prescribes limits for the maximum wattage of light sources and for the amount of illumination and glare in

commercial and residential districts. However, these standards do not cover all roadways (particularly main roadways, which are under the jurisdiction of the Virginia Department of Transportation (VDOT)); therefore, some roadways represent a continuing source of glare and light pollution. Also, installations existing at the time of adoption of the new Ordinance that were noncompliant are allowed under State law to continue until such time as the fixture requires replacement.

An important shortcoming is that the effects of glare into residential neighborhoods from sources such as nearby park lights and lights on nearby commercial buildings and school facilities are not as fully addressed as would be desirable.

Fairfax County's *Policy Plan: The Countywide Policy Element of the Comprehensive Plan* (2000 Edition) recognizes the nuisance of light emissions arising from increasing urbanization and recommends that efforts be made to avoid creating sources of glare that interfere with residents' and/or travelers' visual acuity. To put this into practice, the county's Zoning Ordinance contains standards for illumination limits. Specifically, it requires that illumination shall not exceed 0.5 foot candles at the property line in residential districts and that flickering or bright sources of light shall avoid being a nuisance in residential districts. However, the issue of glare, as opposed to illumination level, needs to be seriously addressed.

D. ADDRESSING THE PROBLEM

While the new Ordinance very adequately addresses new and replacement installations of outdoor lighting and fixtures in commercial and residential districts, much roadway lighting remains a problem because it is prescribed by VDOT, which is not subject to local control. The recently passed Virginia law and policy to use henceforth only fully shielded fixtures will eventually mitigate these problems as older fixtures are replaced. Ensuring that new residential installations meet Code requirements represents a potentially significant compliance problem and will require that both review and inspection personnel will be fully aware of the new Code requirements and diligent in their application and enforcement.

One of the most common street lights in use, the drop-lens, cobra-head fixture, draws 150 watts. A fixture with reflective backing and shielding can direct all light below the horizontal plane with the same illumination of streets and homes and use only 100 watts. The same possibility exists with the popular 175 watt unshielded mercury vapor lamp. Both the 150-watt cobra-head fixture and the 175-watt mercury vapor lamp cast light laterally as well as down. As a result, substantial glare is often cast directly into the eyes of drivers. This glare destroys drivers' dark adaptation, creating potential safety hazards. In many cases the driver is not able to see the roadway any better than he or she would with lower-wattage properly shielded lights, and in many cases his or her vision is much worse.

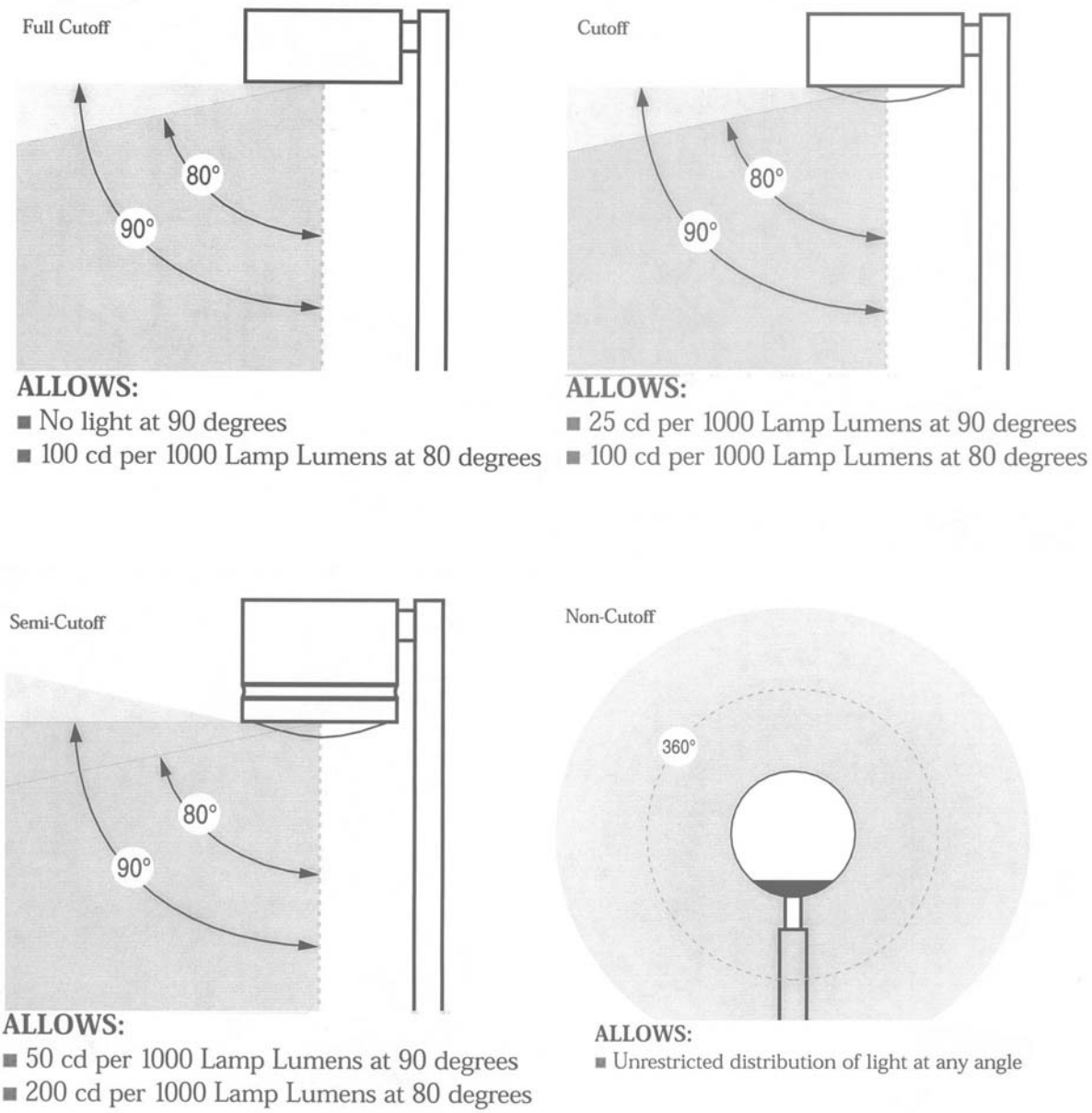
Because they cut down on glare, shielded fixtures not only are safer for drivers, but, according to experts (see references), actually make it easier for pedestrians and home owners to see their surroundings.

By redirecting this wasted energy, lower wattage lights provide the same amount of illumination in the areas where it is needed. These fixtures have reflective backing and full cut-off shielding to direct all light below the horizontal plane, with 90 percent of the light directed below an angle of 20 degrees from the horizontal. For example, a 50-watt metal halide lamp with a reflective shield will provide as much illumination below the horizontal plane as the 150-watt cobra-head fixture or the 175-watt unshielded mercury vapor lamp. These newer types of fixtures, which are recommended by the Illuminating Engineering Society of North America, are widely available and direct all light below the horizontal plane, thereby eliminating lateral glare (see Figure VIII-2-1). It is estimated that it takes only three years of energy savings to recoup the initial investment in these fixtures. The lower wattage fixtures provide energy savings, improved driver safety, better visibility for pedestrians, and an improved ambiance and security for neighborhoods. Several municipalities, such as Tucson, Arizona, San Diego, California, and Sanibel Island, Florida, have adopted street lighting ordinances requiring these newer fixtures.

Most security lighting is overdone, with high wattage lights burning from dusk to dawn. As noted earlier, constant levels of illumination tend to be largely ignored because they are commonplace, and they waste a huge amount of energy. The large amount of glare produced by high intensity sources creates shadows that provide hiding places for intruders. Moreover, the constant glare and light trespass onto adjacent properties is a major source of annoyance to their occupants. On the other hand, lights that are activated by motion within a controlled area attract immediate attention and, at the same time, use very little energy and create intrusion on adjacent properties only when such attention is desired. For example, if one is using 300 watts of security lighting for an average of 10 hours each night and converts to an infrared motion sensor control that turns on the lights only when there is motion in the controlled area, energy cost is reduced to almost nil. In addition, the cost of the added sensor-control hardware itself can be recovered in as little as two months due to the energy saving. At the same time, security is increased rather than decreased, and glare and light trespass onto adjacent properties is virtually eliminated.

Glare is a significant and pervasive problem, but one that is relatively easily solved by installing fully shielded light fixtures, or in some cases using supplementary shielding panels, to prevent light trespass onto adjacent residential properties. Where it is not possible to completely eliminate glare through the use of shielded fixtures, inexpensive motion detector controls can limit the harsh light to only a minute or two when it is really needed.

Figure VIII-2-1
Effects of Cut-off and Non Cut-off Luminaires



(Sources: Paulin, Douglas, *Full Cutoff Lighting: The Benefits*, IESNA Web site, and Shaflik, Carl, *Environmental Effects of Roadway Lighting,* Information Sheet Number 125, International Dark-Sky Association, Tucson, Arizona, August 1997.)

Light trespass is a term of relatively recent origin and denotes (1) glare that is generated by sources on one property that lie within the normal field of view of the occupants of another property, and (2) light that spills over the boundaries of one property onto another, thereby producing unwanted illumination of it. Increasingly, such light intrusions are being regarded as trespass violations every bit as serious as physical trespass of a person onto the property of another. Such problems can now be readily avoided by the selection of proper fixtures, intensity levels, and the use of timers and sensors/controllers. These are areas where our new and comprehensive county ordinance does an excellent job of spelling out acceptable technology.

Sky glow is also readily addressed by the selection of properly designed modern fixtures for new installations and phased retrofit of current inadequate installations. The cost of such retrofits is normally recoverable within a reasonable time period (usually estimated at about three years) through efficiently placing all of the light onto the desired area and the resulting lower energy usage.

Adherence to the following four principles will do much to mitigate or eliminate light pollution.

a. Always illuminate with properly shielded fixtures that prevent the light source itself, and the resultant glare, from being directly visible. This is done by using cutoff fixtures or supplementary shielding that keeps all of the illumination below the horizontal plane and directed onto the target area.

b. Do not over-illuminate. Never use more illumination than needed for the task at hand. Using a 400 watt floodlight to illuminate a small parking area or a flag at night is overkill and wastes a great deal of energy. A properly shielded and adjusted 250 watt luminaire (light source + fixture) can illuminate an area just as effectively as an older style 1,000 watt light source.

c. Always aim lighting downward, keeping all of its distribution within the property lines and below the horizontal plane so that it is not a source of glare. Light trespass onto adjacent properties is unnecessary, inconsiderate, and potentially illegal.

d. Do not burn lighting all night long with the intention of improving security. Using infrared motion sensor-controlled lighting that comes on instantly when there is motion in the designated area is far more effective as a security measure. That rapid change from dark to light draws the immediate attention of everyone in the surrounding area, including security and law enforcement personnel on patrol, and may well be unsettling enough to cause illicit intruders to immediately flee. Lighting that stays on all night draws no special attention and is an enormous waste of energy.

E. PUBLIC AGENCY RESPONSIBILITIES

Compliance with glare standards for residences and other private property is the responsibility of the county's Zoning Enforcement Branch. The county has 18 Zoning Inspectors (two per magisterial district) to oversee all Zoning Ordinance enforcement. Any enforcement activity dealing with light is complaint-driven. Typically, light-related complaints represent about 0.5% of total complaints. The county does not respond to anonymous complaints. Complaints are either filed directly with the Zoning Enforcement Branch or are forwarded by the staff of a member of the Board of Supervisors. The causes of the complaints were usually fast food establishments, security lighting for residences, athletic facilities (e.g., ball fields, driving ranges), or churches. The Zoning Inspectors typically resolve violations with informal enforcement such as a verbal warning that there is a violation and how it may be remedied. A written notice of violation or civil action can be used if needed. Beyond the general glare standards, the county frequently is able to impose additional restrictions through the provisions of the rezoning, special permit, and special exception processes.

The Fairfax County Park Authority and the Fairfax County Public Schools are the two largest users of recreational and sports field lighting in the county. Parks and schools by their very nature are usually located in the midst of residential communities where their outdoor lighting, if inadequately designed, can seriously impact the surrounding residents. Schools, particularly high schools, often have sports practice sessions extending into the early evening hours and games that begin after the dinner hour and run into the later evening hours. In addition, schools of all categories often have "security" lights that burn from dusk to dawn. Our park system, faced with increasing demand for team athletic facilities, will necessarily have to turn to synthetic turf and lighting to enable greater utilization of its existing fields. It is the responsibility of both organizations to utilize better designs and better equipment than employed heretofore in addressing these needs. To do less unnecessarily and unfairly impacts the surrounding neighborhoods and diminishes both property values and quality of life.

One of the most onerous sources of light pollution is the obtrusive lighting of commercial and industrial facilities, particularly commercial retail and service establishments. While their desire to attract attention to themselves is understandable, abusive excesses degrade the overall ambience of our commercial areas and materially degrade the quality of life in adjacent residential neighborhoods. This is of particular concern in the case of "by-right" development, where there are no public hearings (e.g., Planning Commission, Board of Zoning Appeals, Board of Supervisors) at which adjacent property owners and neighborhoods can register their concerns and see approval conditioned on appropriate restrictions. In such "by-right" cases, the initial responsibility would necessarily fall almost entirely upon the Land Development Services function of the Department of Public Works and Environmental Services, which reviews all proposed plans before a building permit is issued and subsequently conducts inspections to ensure that the work is in compliance with regulations. Evaluation of plans for compliance would add a small amount of effort to the review process but would add only a negligible amount to the inspection process.

At this time, the county has no formal policies regarding street lighting. Some neighborhoods within the county prefer to have local streets lighted, while others do not. Whether or not the county provides street lighting is often driven by budget priorities, and, unless there is a demonstrable public safety need, the priority for retrofitting an established community is usually low. More often, street lighting is addressed in the overall planning of new subdivisions. In these cases, the Land Development Services function of DPWES would have responsibilities for both reviewing the plan and inspecting the implementation of it.

Responsibility for the lighting of main roadways is under the jurisdiction of the Virginia Department of Transportation (VDOT). Historically, local communities and neighborhoods have had to deal directly with VDOT over roadway lighting issues. It has proven very difficult to influence VDOT's choice of fixtures and technical standards, even when it can be demonstrated that their proposed implementation will result in unacceptable levels of glare and light trespass in adjacent residential neighborhoods. However, quite recently, encouraging headway has been made in getting VDOT to recognize the severity of the problem and to take some limited first steps to address it.

F. PUBLIC EDUCATION AND AWARENESS NEEDS

The general public needs awareness of the sources and problems of light pollution and of the methods by which these can be best addressed. The county staff has prepared an excellent and very informative 16 page booklet to explain the new Outdoor Lighting Ordinance (available at **http://fairfaxcounty.gov/DPZ/Zoning/lightingbrochure.PDF**). It can also be made available in printed version to individuals, homeowners groups, and community associations directly through appropriate county offices and through the district offices of the members of the Board of Supervisors. The complete Ordinance in convenient form is available on the Fairfax County Web site at **http://fairfaxcounty.gov/DPZ/Zoningordinance/articles/Art14.PDF**. In addition, the International Dark Sky Association and the Illuminating Engineering Society of North America (IESNA) maintain Web sites with a variety of technical information on lighting issues and technology.

Our county's 16 page booklet provides much of the information that architects, contractors, and electricians need to familiarize themselves with our lighting codes and specifically what is not permitted (e.g., unshielded security lights, angle-directed post or building mounted fixtures, wall packs without shielding or baffling, excessive wattage or unshielded floodlights, light-trespass onto other properties, etc.) and what practices are recommended. Our county review and inspection personnel should make sure that members of the development, contractor, and building management communities with whom they deal will be fully aware from the outset of the revised standards in the new Ordinance and how best to address them.

There is an excellent Web site (**http://www.qualityoutdoorlighting.com**) that illustrates many examples of good, bad, and ill-conceived lighting practices right here in our local area. It can play a central role in education of the public.

G. CONCLUSIONS

The principal means to prevent poor exterior lighting practices is a comprehensive code or ordinance, because this provides well thought out standards for, and enforceable and legal restrictions on, specific lighting practices that affect the community and its quality of life. Numerous jurisdictions have adopted codes and ordinances that have proven very effective in reducing light pollution and preventing light trespass. A properly conceived and well written code permits all forms of necessary illumination at reasonable intensities, but requires shielding and other measures to prevent light pollution and light trespass. A good code applies to all forms of outdoor lighting, including streets, highways, and exterior signs, as well as lighting on dwellings, parks, schools, commercial and industrial buildings, parking areas, and construction sites. A good code also provides for reasonable exceptions for special uses within acceptable time periods and subject to effective standards. In EQAC's opinion, Fairfax County's newly adopted Outdoor Lighting Ordinance is an outstanding example of such a code. As the county has gained experience with application of the new Ordinance, some areas have been discovered where small adjustments and fine-tuning will be beneficial, but the solid foundation has been laid and should serve us well into the future.

The Fairfax County Park Authority, because of its need to increase the hours of utilization of existing sports fields by installing lights to illuminate them, bears a special responsibility to ensure that such lighting systems do not adversely impact adjacent residential properties. Experience to-date with a test rectangular field that was outfitted with lights and artificial turf has been very unfortunate. While the illumination at the property line meets the 0.5 foot-candle limit for light spillover, the glare from the fully exposed, high-intensity lamps on 70 foot poles facing a residential neighborhood is disastrously intense. Selection of better-engineered fixtures will be essential if the Park Authority is to expand the use of lighting for fields without creating widespread public outrage. This same concern applies equally to the Fairfax County Schools, which also utilize lighted sports fields.

The county needs to work closely with VDOT to achieve better lighting practices on roadways within Fairfax County that are under VDOT jurisdiction. Current VDOT lighting and proposed new installations are regarded as being very intrusive by adjacent neighborhoods. However, it should be noted that a newly enacted law requiring the Commonwealth to acquire only shielded fixtures should materially improve VDOT practices in this regard on new installations and as old fixtures are replaced.

Much of the security lighting, both residential and commercial, in Fairfax County is poorly conceived, excessive in intensity, and improperly directed and controlled. These deficiencies could be corrected at relatively low initial costs that would be rapidly

recovered through the energy savings realized. This will require considerable public education to familiarize the using public with the issues and the available technology.

Much lighting in residential neighborhoods uses old style fixtures (or new but poorly designed ones) that cause excessive glare and light trespass onto adjacent properties. The new comprehensive Ordinance and an intensive public awareness campaign should be used to address correction of these problems. Single family dwellings especially need to be brought into compliance with the spirit and provisions of the revised Ordinance, for that is where the majority of us live and where our quality of life is most affected by intrusive lighting.

Poor lighting design, particularly in commercial areas, is contributing to excessive and highly objectionable sky glow. The new Ordinance and retrofitting or adjustment of fixtures can eliminate the worst of this effect.

H. RECOMMENDATIONS

1. EQAC recommends that the Board of Supervisors ensure that the Fairfax County Park Authority and the Fairfax County Public Schools fully comply with the new Ordinance and consistently follow the recommendations of the Illuminating Engineering Society of North America. EQAC further strongly recommends that the Board of Supervisors appoint a task force to determine appropriate standards and technology for lighting of athletic fields countywide.

2. EQAC recommends that the Board of Supervisors direct that all exterior lighting fixtures installed on Fairfax County facilities and properties be consistent with the new Ordinance and follow the recommendations of the Illuminating Engineering Society of North America. EQAC further recommends that the Board of Supervisors direct that all older lighting fixtures under county control that do not meet the above standards be replaced on a phased basis with the newer recommended fixtures. EQAC notes that these steps will lead to significantly lower energy costs that will recoup the costs of the changeover within a reasonable period of time.

3. EQAC recommends that the Board of Supervisors work with VDOT and Virginia elected officials to eliminate unnecessary roadway lighting and to achieve replacement of existing poorly designed fixtures (under the control of VDOT) on our roadways with the same type of fixtures specified in Recommendation 2 above.

4. EQAC recommends that the Board of Supervisors continue to monitor and evaluate the effectiveness of the recently enacted Outdoor Lighting Ordinance to determine any areas in which enhancements and modifications may be needed and to ensure that lighting standards and practices and the reduction of light pollution in Fairfax County are comprehensively addressed.

5. EQAC recommends that the Board of Supervisors support county staff efforts to develop any additional technical information that may be needed for the education of architects, contractors, electricians, and builders as to what the county permits and does not permit in the field of illumination and the technology available for compliant installations.

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National Electrical Manufacturers Association Web site, http://www.nema.org/. (Particularly see their White Paper on Outdoor Lighting Code Issues.)

Virginia Outdoor Lighting Taskforce (VOLT) Web site, http://www.volt.org/ .

Quality Outdoor Lighting Web site, http://www.qualityoutdoorlighting.com/ .

VIII-3. VISUAL POLLUTION AND URBAN BLIGHT

A. OVERVIEW

Historically, the term “pollution” has referred primarily to the fouling of air, water, and land by wastes or from the byproducts of human activities. In recent years it has come to signify a wider range of disruptions to environmental quality. Both noise pollution and light pollution issues have been addressed earlier in this chapter. This section focuses on visual blight/pollution issues, including such things as proliferation of signs, billboards, litter, dumps, junkyards, and the like, which are important components of visual pollution.

Simply stated, “blight” is something that impairs or destroys appearance and results in a deteriorated condition. In recent times, urban blight has come to include a wide range of visual pollutants that degrade the ambience of our communities, including such things as trash and litter on roadsides, unkempt properties, above-ground power and communications transmission lines, communication towers, intrusive and objectionable advertising signage, and other forms of visual impairments. Without doubt, signage that is excessive in amount and inappropriate in placement is the most ubiquitous of these “pollutants.”

B. SIGNS AND BILLBOARDS

Unnecessary signs and billboards, almost always placed as some kind of advertising, have been called "visual pollution," "sky trash," "litter on a stick," and "the junk mail of American roadways." Nothing can destroy the distinctive character of our communities and countryside more quickly or thoroughly than uncontrolled signs and billboards.

Imagine your ideal destination. Chances are, the first thing that springs to your mind are charming communities with tree-lined streets, tasteful architecture, and friendly people who are proud of where they live, not a clutter of signs and billboards. Increasingly though, intrusive signage is marring our ideal destinations and making every place look the same. A proliferation of on-premise signs creates visual clutter that detracts from the unique character and beauty of a place. However, appealing signs that are compatible with local character contribute to a neighborhood or downtown, cultivating local pride and inviting travelers to stop.

Signs in the public rights-of-way have been around for as long as there have been public rights-of-way, but the numbers have spiraled out of control in recent years. Between fields of “popsicle-stick” signs for homebuilders and politicians, and signs for weight loss, work-at-home businesses, painting, hauling, and other signs plastered on every available traffic

sign and utility pole, everyone in Fairfax County has something to hate about the proliferation of signs.

Communities can regain control of their visual environment, preserve their distinctive character, and protect natural beauty and the environment by enacting and enforcing ordinances that control signage and billboards. Reducing sign and billboard blight helps communities reclaim local beauty and character. Excellent alternatives to large intrusive signs and billboards, such as wayfinding signs, logo signs, and tourist-oriented directional signs, can help people locate local businesses and are minimal in their visual impact.

C. TELECOMMUNIATION TOWERS AND UTILITY TRANSMISSION LINES

In 1996, Congress passed the landmark Federal Telecommunications Act to encourage the rapid development and growth of new telecommunications technology such as wireless telephones and digital television. However, antenna towers, often of considerable height, have been built near people's homes, next to historic buildings, or in rural, scenic areas. Towering above trees, neighborhoods, and protruding into the skyline, such towers often have a very unappealing visual impact (see the Web site **http://www.scenic.org** for examples). Reconciling the requirements of communications engineering and community aesthetics is a difficult and growing problem but one that must be directly addressed if both needs are to be properly served.

The visual blight associated with above ground utility lines besets both our residential and commercial areas. These lines and poles are particularly objectionable in our local shopping areas where they obstruct the vision of drivers and greatly impair the visual attractiveness of the locale.

D. ADDRESSING THE PROBLEM

Creating sign regulations developed with community input encourages business owners to erect less intrusive signs that reflect an area's spirit, contributing to civic pride and helping to revitalize commercial districts. Regulations should encourage signs that quickly communicate their message, complement their surroundings, and enhance the visual character of the community. Attractive on-premise signs can help encourage citizens and business owners to work together to improve and revitalize local appearance.

The Fairfax County Zoning Ordinance, Article 12, deals with signs and signage regulations. It deals comprehensively and at length with permitted and non-permitted signage and what kind of sign needs a permit versus signage not requiring a permit. The Ordinance appears to cover the subject thoroughly, but the fact that impermissible signage is overabundant indicates that enforcement is lacking, and perhaps that county staff functions are not organized in a way that could provide cost effective enforcement. In

addition, the Ordinance has a significant shortcoming in Article 12, in that there is no explicit provision therein for civil penalties (i.e., fines) for failure to obey it. Rather, it relies on Article 18-903.1.H and I to deal with Infractions and Civil Penalties. However, these two provisions deal only with Sections 12-301 and parts of 12-104. Thus, the entirety of Sections 102, 103, and part of Section 104 are not addressed. This is very important, since adequate civil penalties can readily pay for an effective enforcement program.

The other key component of an effective enforcement program is the requisite political will on the part of the Board of Supervisors. It is a given that the well-organized real estate industry will vigorously resist any real enforcement program that would impose limits, no matter how reasonable, on their current practice of excessive and obtrusive signage. The many small business enterprises that litter the roadsides and telephone poles with illegally placed signs will complain that enforcement will deprive them of livelihoods. Finally, political campaign signage, in which the lawmakers themselves have a vested interest, is a sensitive issue despite recognition of the current abusive practices.

The Board of Supervisors initiated the Fairfax County Sign Task Force in August, 2000. In September, 2001, the Task Force issued its report, *"Illegal Signs in the Right of Way"* which:

- Examined current Fairfax County practices and enforcement procedures regarding signs within and along the roadways;
- Evaluated other jurisdictions' best practices in dealing with illegal signs; and
- Recommended amendments to the county's sign ordinance and suggested new legislative approaches to address this problem.

Thus far the report and its recommendations have met with inaction.

Communities can do much to regulate the height, number, and location of wireless telecommunication towers by enacting strong ordinances. Without good ordinances, communities are at the whim of telecommunication companies that avidly seek sites for towers and property owners who may willingly lease land for a tower. Fairfax County recently prevailed at the Virginia Supreme Court in a decision that required VDOT to reasonably comply with the Fairfax County Zoning Ordinance in siting monopole towers within the VDOT right-of-way.

E. PUBLIC AGENCY RESPONSIBILITIES

The Sign Task Force concluded that there is no one agency within the county government that is devoted to removing impermissible signs or prosecuting persons who erect the signs in violation of the law. The Task Force concluded that cleanup efforts are inadequate unless a county official receives complaints or VDOT receives complaints. Therefore, it appears that what little effort there is to remove signs is responsive rather than proactive. Some neighboring communities assign specific persons to this job, but Fairfax County

does not have such a system. In fact, Zoning Inspectors do have authority delegated to them from VDOT to remove illegal signs. However, on many occasions when county inspectors have removed signs (e.g., on a Friday afternoon), they are back up by Monday morning or sooner.

The ordinance needs to be changed to empower the citizenry to take action, but this would be facilitated by State enabling legislation. Good citizens attempting to help the county by removing signs themselves are not clearly authorized to do so; therefore, they are inviting a liability action when they do remove signs. At present, about the only way the ordinary citizen can be involved with removing signs without some risk of liability action is through the VDOT Adopt-a-Road Program. In this program, a group agrees to become responsible for keeping a stretch of roadside cleaned of debris and litter and is, in effect, deputized with authority to remove impermissibly placed signs along with other litter. However, this program applies only to VDOT rights-of-way. A comparable program is needed with respect to utility poles which are placed within easements.

F. RECOMMENDATIONS

1. EQAC strongly recommends that the lack of an explicit provision in Article 12-300 of the present Ordinance for assessment of civil penalties be rectified at the earliest opportunity. It is recommended that Article 18-903 of the Ordinance be amended by deleting items 1.H and 1.I.. These provisions should be replaced by new, more comprehensive, language added to Article 12 as follows:

PART 4 12-400 VIOLATIONS, INFRACTIONS, AND PENALTIES

12-401 General provisions

1. Any sign erected, placed, or affixed contrary to any of the provisions of this Article or contrary to any provisions of any permit issued under this Article shall be and is hereby declared to be unlawful.

2. Any person (whether owner, officer, lessee, principal, agent, employee or otherwise), corporation, or organization who violates any of the provisions of this Article, or permits such violation, or fails to comply with any of the requirements hereof shall be subject to the enforcement provisions of this Part.

3. Upon becoming aware of any violation of any provision of this Article, the Zoning Administrator shall serve notice of such violation on the person committing or permitting the same, which notice shall require the violation to cease within such reasonable time as is specified in the notice. After such notice is sent and such violation is not ceased within such reasonable time as is specified in the notice, then the Zoning

Administrator may proceed to remedy the violation as provided in Sections 402 or 403 below. The Zoning Administrator may also revoke a residential or non-residential use permit to terminate the violation. Any written notice of the Zoning Administrator shall include a statement informing the recipient that a right to appeal the notice of a zoning violation or a written order within thirty days may exist in accordance with Sect. 15.2-2311 of the Code of Virginia and Part 3 of Article 18 of the Zoning Ordinance, and that the decision shall be final and unappealable if not appealed within thirty days. The appeal period shall not commence until such statement is given.

4. In addition to the remedies provided in Par. 3 above, the Zoning Administrator may initiate injunction, mandamus, or any other appropriate action to prevent, enjoin, abate, or remove such erection, placement, or affixation in violation of any provision of this Article. Such action may also be instituted by any citizen who may be aggrieved or particularly damaged by any violation of any provisions of this Article.

12-402 Infractions and Civil Penalties

1. A violation of the provisions of this Article shall be deemed an infraction and shall be punishable by a civil penalty of $100 for the first violation at a specific location; any subsequent violations at the same location arising from the same set of operative facts shall be punishable by a civil penalty of $250 for each separate offense, except that any violation arising from the same set of operative facts at the same location which persists for sixty (60) days or more may, at the discretion of the Zoning Administrator, thereafter be treated as a criminal misdemeanor.

2. Each day during which any violation of the provisions of this Article is found to have existed at the same location shall constitute a separate offense. However, in no event shall any such violation arising from the same set of operative facts at the same location be charged more frequently than once in any ten day period, nor shall a series of such violations arising from the same set of operative facts at the same location result in civil penalties which exceed a total of $5000.

3. The designation of a particular violation of this Article at a particular location as an infraction pursuant to Par. 1 above shall be in lieu of criminal sanctions, and except for any violation resulting in injury to any person or persons, or any violation arising from the same set of operative facts at the same location persisting for more than sixty (60) days,

such designation shall preclude the prosecution of a violation as a criminal misdemeanor.

4. After having served a notice of violation on any person committing or permitting a violation of the Zoning Ordinance provisions enumerated in this Article and if such violation has not ceased within such reasonable time as is specified in such notice, then, upon the approval of the County Attorney, the Zoning Administrator shall cause two (2) copies of a summons to be served upon such person.

5. Such summons shall contain the following information:

A. The name and address of the person, corporation or organization charged.

B. The nature of the infraction and the Ordinance provision(s) being violated.

C. The location, date, and time that the infraction occurred or was observed.

D. The amount of the civil penalty assessed for the infraction.

E. The manner, location, and time in which the civil penalty may be paid to the County.

F. The right of the recipient of the summons to elect to stand trial for the infraction and the date for such trial.

6. The summons shall provide that any person, corporation, or organization summoned for a violation may elect to pay the civil penalty by making an appearance in person or in writing by mail to the Department of Finance at least seventy-two (72) hours prior to the time and date fixed for the trial and, by such appearance, may enter a waiver of trial, admit liability, and pay the civil penalty established for the offense charged. Such summons shall provide that the signature to an admission of liability shall have the same force and effect as a judgment of court, however, an admission shall not be deemed a criminal conviction for any purpose.

7. If a person, corporation, or organization charged with a violation does not elect to enter a waiver of trial and admit liability, the violation shall be tried in the General District Court in the same manner and with the same

right of appeal as provided by law. A finding of liability shall not be deemed a criminal conviction for any purpose.

8. The remedies provided for in this section are cumulative and not exclusive and shall be in addition to any other remedies provided by law.

12-403 Criminal Violations and Penalties

1. Any violation of the provisions of this Article, other than those set forth in Sect 12-402 above, shall be deemed a misdemeanor and, upon conviction thereof, shall be punishable by a fine of not less than $100 and not more than $1000. Failure to remove or abate a violation within the time period established by the Court shall constitute a separate misdemeanor offense punishable by a fine of not less than $100 and not more than $1000, and any such failure during any succeeding ten day period shall constitute a separate misdemeanor offense for each ten day period punishable by a fine of not less than $100 and not more than $1000.

2. The Fairfax County Sign Task Force made several recommendations. EQAC strongly urges the Board of Supervisors to again consider the Task Force's report and either implement its findings or reconstitute the Task Force to find alternatives that are more palatable to the Board and citizens of the county.

- After holding a public hearing, the Board, pursuant to Virginia Code §33.1-375, should enter into an Agreement with the Commissioner of VDOT to enforce Virginia Code § 33.1-373. The Agreement would provide for sharing civil penalties collected after the county's costs have been recovered. [The Task Force provided a draft Agreement for the Board to consider.]

- The county should fully support the county Sheriff's program of using inmates for removal of roadside litter, including removal of signs illegally posted in a right-of-way.

- The county should implement a pilot project of approximately six months to determine whether additional resources are needed, and if so, develop a list of alternatives for further evaluation and ranking in terms of cost benefit analysis for the Board to use as it decides whether to expand the Agreement or move in a different direction.

- The county should conduct an information and public outreach program regarding restrictions of signs in the public rights-of-way and any new county program to prosecute sign violations.

- The county Executive should send letters to public entities within the county advising them of illegal signs and outcomes of posting same.

- The Board should invite VDOT to consider implementing in Fairfax County additional possible deterrents to minimize illegal signs in the rights-of-way.

- As part of its Legislative Program, the Board should seek an amendment to the Code of Virginia that would declare all signs illegally posted in a right-of-way to be abandoned and, therefore, illicit trash that may be removed by anyone.

- If the above is not successful or possible, then the alternative is to seek an Amendment to the Code of Virginia that would permit individuals, as opposed to organized groups, to participate in the Adopt-A-Highway program to remove or cleanup illegal signs as duly authorized representatives of the Commissioner.

- The county should seek an Amendment to the Code of Virginia placing reasonable limitations on political campaign signs in the right-of-way. The county should offer recommendations for limits on the number, minimum distance between individual signs, and the time frame for posting and then removing the signs.

3. The Environmental Quality Advisory Council supports the general premise underpinning each of the Task Force's recommendations above, but believes that before the county seeks major amendments to the Code or introduces new programs of its own, a study should be performed to determine the impact on existing programs, staffing, and budget, and that a cost benefit analysis determine the extent to which the proposed amendments or additions would contribute to reducing visual pollution in a cost effective manner, having due regard for the possibilities of cost recovery through the rigorous imposition of civil penalties.

NOISE, LIGHT POLLUTION, AND VISUAL POLLUTION: SUMMARY OF RECOMMENDATIONS

Noise

1. Continue to support airport noise compatible land use planning near airports in the county through the implementation of policies and regulations that reference the most current airport noise contour projections for the airports and that are at least as stringent as federal noise compatibility guidelines.

2. Develop and distribute materials to educate the public on airport noise issues, including airport noise contours, noise compatible planning and regulation, noise changes that may result from new construction and changes in flight frequencies, and noise complaint procedures. Incorporate these educational materials into the county's overall environmental educational efforts.

3. Support the addition of new runways at Washington Dulles International Airport as long as aircraft operations at the airport associated with this increased operational capacity do not result in overall net increases in noise exposures to residents of Fairfax County when compared with operations that would occur using existing runways.

4. Encourage the use of opportunities provided by the Virginia Department of Transportation (VDOT) that allow for third party contributions to noise barrier construction when the VDOT cost criteria preclude VDOT's construction of such barriers. Through this VDOT policy, neighborhoods affected by high levels of highway noise can participate in the funding of barriers that would not otherwise be constructed.

5. Encourage the retention and planting of noninvasive vegetation to provide visual shielding of residents from highways. Where possible, support the provision of vegetated areas adjacent to highways that are wide enough and dense enough to provide noise reduction benefits to residential areas near the highways. Where feasible and appropriate, pursue such approaches in lieu of noise walls.

6. Review all airport and highway studies that require Environmental Assessments or Environmental Impact Statements under the National Environmental Policy Act (NEPA) for consistency with county policies addressing transportation-related noise and mitigation.

Light Pollution

1. EQAC recommends that the Board of Supervisors ensure that the Fairfax County Park Authority and the Fairfax County Public Schools fully comply with the new Ordinance and consistently follow the recommendations of the Illuminating Engineering Society of North America. EQAC further strongly recommends that the Board of Supervisors appoint a task force to determine appropriate standards and technology for lighting of athletic fields countywide.

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5. EQAC recommends that the Board of Supervisors support county staff efforts to develop any additional technical information that may be needed for the education of architects, contractors, electricians, and builders as to what the county permits and does not permit in the field of illumination and the technology available for compliant installations.

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3. Upon becoming aware of any violation of any provision of this Article, the Zoning Administrator shall serve notice of such violation on the person committing or permitting the same, which notice shall require the violation to cease within such reasonable time as is specified in the notice. After such notice is sent and such violation is not ceased within such reasonable time as is specified in the notice, then the Zoning Administrator may proceed to remedy the violation as provided in Sections 402 or 403 below. The Zoning Administrator may also revoke a residential or non-residential use permit to terminate the violation. Any written notice of the Zoning Administrator shall include a statement informing the recipient that a right to appeal the notice of a zoning violation or a written order within thirty days may exist in accordance with Sect. 15.2-2311 of the Code of Virginia and Part 3 of Article 18 of the Zoning Ordinance, and that the decision shall be final and unappealable if not appealed within thirty days. The appeal period shall not commence until such statement is given.

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- As part of its Legislative Program, the Board should seek an amendment to the Code of Virginia that would declare all signs illegally posted in a right-of-way to be abandoned and, therefore, illicit trash that may be removed by anyone.

- If the above is not successful or possible, then the alternative is to seek an Amendment to the Code of Virginia that would permit individuals, as opposed to organized groups, to participate in the Adopt-A-Highway program to remove or cleanup illegal signs as duly authorized representatives of the Commissioner.

- The county should seek an Amendment to the Code of Virginia placing reasonable limitations on political campaign signs in the right-of-way. The county should offer recommendations for limits on the number, minimum distance between individual signs, and the time frame for posting and then removing the signs.

3. The Environmental Quality Advisory Council supports the general premise underpinning each of the Task Force's recommendations above, but believes that before the county seeks major amendments to the Code or introduces new programs of its own, a study should be performed to determine the impact on existing programs, staffing, and budget, and that a cost benefit analysis determine the extent to which the proposed amendments or additions would contribute to reducing visual pollution in a cost effective manner, having due regard for the possibilities of cost recovery through the rigorous imposition of civil penalties.

APPENDIX A

EQAC RESOLUTIONS AND POSITIONS DECEMBER, 2003 THROUGH OCTOBER, 2004

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ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Resolution regarding the Fairfax County Park Authority Natural Resource Management Plan

December 2, 2003

Whereas, the Fairfax County Park Authority (FCPA) is charged with the stewardship and management of some 8.7% of the total land area of Fairfax County; and

Whereas, much of this land consists of and/or contains some of our County's most precious and irreplaceable natural resources; and

Whereas, the Fairfax County Park Authority has developed and just announced a Natural Resource Management Plan to guide the stewardship and management of these resources; and

Whereas, EQAC has long advocated creation of such a plan by the Park Authority; and

Whereas, the Plan outlines an approach to deal comprehensively with the full range of natural resources issues and prepare definitive guidance for their assessment and ultimate management and stewardship; and

Whereas, the Plan must have appropriate budgetary funding allocated if it is to be more than mere noble philosophy; and

Whereas, the Plan particularly addresses the 2004-2008 time period, but should become a permanent and integral part of the FCPA planning and management process; now therefore

Be it resolved, that the Fairfax County Environmental Quality Advisory Council (EQAC) finds the Plan to be soundly based and comprehensive and commends both the Plan and the staff who developed it; and

Be it further resolved, EQAC strongly recommends that the plan and the processes that it outlines be promptly implemented and that funding for these purposes be promptly allocated and placed at the top of the list of FCPA budget priorities; and

Be it finally resolved, that EQAC strongly recommends that the plan and periodic updates be adopted as an integral part of the overall FCPA planning and management process.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION REGARDING
LIGHTING ORDINANCE HANDBOOK

December 2, 2003

WHEREAS, in its last Annual Report on the Environment EQAC noted that the new Outdoor Lighting Ordinance was nearing completion and recommended that also needed were a simple brochure for the average homeowner and a more detailed technical brochure for architects and builders; and

WHEREAS, the new Ordinance was adopted on June 17, 2003; and

WHEREAS, staff in the Zoning Administration Division immediately began to develop the recommended guidance materials and were able to combine both versions into a 16 page booklet to serve the needs of both homeownwer and development communities: and

WHEREAS, this booklet was developed with such efficiency that it was released in September, 2003; now therefore

BE IT RESOLVED, that the Environmental Quality Advisory Council commends Jack Reale and Lorrie Kirst of the Zoning Administration Division for their outstanding and highly professional efforts in designing and producing with great dispatch the Guide to Fairfax County's Outdoor Lighting Standards.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

PERENNIALITY OF BURKE'S SPRING BRANCH

March 10, 2004

At its March 10, 2004 meeting, the Fairfax County Environmental Quality Advisory Council discussed a rezoning application along Burke's Spring Branch in McLean and adopted the following position regarding this stream:

"Based on all evidence presented to EQAC to date, this stream is perennial and ought to be protected."

FAIRFAX COUNTY
ENVIRONMENTAL QUALITY ADVISORY COUNCIL

March 31, 2004

Board of Supervisors
County of Fairfax
12000 Government Center Parkway
Fairfax, VA 22035

Dear Chairman Connolly and Members of the Board:

At the March 10, 2004 meeting of the Environmental Quality Advisory Council (EQAC), EQAC authorized me to prepare comments on its behalf regarding potential budget cuts for the FY 2005 budget based on previous positions that EQAC has taken regarding the County's environmental efforts. These comments have been reviewed and endorsed by a majority of EQAC members.

In his February 23, 2004 Memorandum to the Board of Supervisors, the County Executive provided a list of options for potential budget cuts for Board consideration. There are 146 options listed for possible cuts. I note that seven of these possible cuts impact programs that EQAC has recommended to the Board (both in the past and now). In the last two years, in presenting the Annual Report on the Environment, I expressed concern to the Board about the County's budget problems and the possibility that needed environmental programs would be impacted. These options given up for consideration by the County Executive, if enacted by the Board, would indeed set back environmental programs (especially those dealing with water quality) in the County. I would therefore recommend that the Board not adopt the following options for cuts: 38, 39, 105, 110, 111, 140, and 143.

In the paragraphs below, I give abstracts from the County Executive's *Summary of FY 2005 Options* with the option number, the reduction, the money that would be saved by the reduction, and comments contained in the summary. I follow up each abstract with comments that reflect EQAC's past positions.

38 Public Works and Environmental Services Stormwater
Eliminate 1 limited term Senior Engineering Inspector
$42,970
Reduces the quality control, oversight and data collection of the stormwater management programs

Option 38 eliminates an inspector and directly impacts the County's ability to monitor stormwater controls. In past years when the County had budget problems, many inspector positions were eliminated. This led to increasing problems with stormwater controls in the County with increasing silt runoff. Water quality in our streams was degraded. EQAC recommended that the positions for inspectors be increased and this was done. However, EQAC remains concerned about stormwater control measures. Decreasing the number of inspector positions will lower the County's ability to maintain

water quality thereby reducing the County's ability to comply with the Clean Water Act and Virginia's commitments to ChesBay.

39 Public Works and Environmental Services Stormwater
Eliminate 1 Geographic Information Spatial Analyst 1
$44,675
Reduces capability for mapping infrastructure inventory, impacting agency compliance with stormwater quality permit.

Option 39 is similar to Option 38 in impact. The mapping of infrastructure is essential for managing stormwater on a watershed basis and will lead to increases in efficiency. Elimination of this position will therefore lower the County's ability to maintain water quality thereby reducing the County's ability to comply with the Clean Water Act and Virginia's commitments to ChesBay.

105 Contributions
Eliminate funding to Northern VA Conservation Trust
$250,602
Elimination of funding for this contributory, which works to preserve open space in Fairfax County (508 acres to date) would require other County agencies to assume more responsibility for identifying and acquiring open space.

This public-private partnership came into being due to a long-standing EQAC recommendation. EQAC had noted that groups such as The Nature Conservancy used easements on private lands as a tool for environmental preservation on ecologically sensitive lands. EQAC recommended that Fairfax County also pursue such tactics. The Northern Virginia Conservation Trust (NVCT) has protected ecologically sensitive lands through a number of means, including easements. A number of easements have been in stream valleys, therefore protecting against degradation of the stream's waters. Continuation of this program will improve the County's ability to comply with the Clean Water Act and Virginia's commitments to ChesBay. This is an activity that needs to continue.

110 Police
Eliminate Geese Peace Program
$35,140
Eliminates single program in County available to handle geese management.

Resident Canada Geese have become an increasing problem in the County. A major negative impact of their increasing numbers is their contribution to fecal coliform pollution in the waters of Fairfax County's streams. For example, twenty-four percent of the fecal coliform pollution in Accotink Creek (an impaired stream due to excess fecal coliform) is attributed to geese. EQAC has supported the Geese Peace program as an effective means of managing the geese population. Absent this program, I would expect to see more increases in the geese population and increasing loads of fecal coliform

pollution in Fairfax County streams. For the small amount of money involved, eliminating this program does not make sense.

111 Police
Eliminate Deer Management Program
$77,000
Eliminates single program in County to handle deer management.

Overpopulation of deer in Fairfax County has been a major problem leading to increased deer-automobile collisions and destruction of habitat in the County's parks. The deer will eat everything within reach as can be evidenced in the parks. Overpopulation also leads to deaths of deer due to starvation and disease. As a result, other species that rely on the vanished understory have declined and will disappear. The deer management program has started to bring the deer population under control and has been strongly endorsed by EQAC. Without this program, the deer population will rebound, and more environmental damage to the County's parks will occur. Additionally, the number of deer-automobile collisions will increase. Given the injuries and fatalities that will probably occur as a result of these collisions, eliminating this program does not make sense.

140 Capital Projects
Eliminate land acquisition reserve
$1,000,000
Eliminates all FY2005 Advertised Budget Plan capital project funding

EQAC has commended the Board for their foresight in acquiring ecologically sensitive lands with reserves. Environmentally sensitive land that is not developed is becoming scarce in the County. Therefore, as the opportunity arises, such land should be protected by outright purchase or through easements, either directly by the BOS or through NVCT. EQAC recommends that such activities continue to receive full support.

143 Capital Projects
Reduce watershed project funding
$800,000
Reduces FY2005 Advertised Budget Plan capitol funding for VPDES Municipal Separate Storm Sewer System Discharge Permit required by the Clean Water Act. This reduced funding level will delay completion of watershed master planning and implementation of improvements.

EQAC has endorsed the watershed planning project since its inception. Prior to the County starting this project, EQAC had pointed out the need for planning at a watershed level. Due to the large amount of developed land in Fairfax County, and due to the past absence of watershed planning, Fairfax County is now playing catch up in regard to this issue. This is an essential program that should not be reduced.

As you can see, each of these proposed reductions is counter to past EQAC recommendations. I strongly urge the Board not to eliminate or reduce the above

programs. We should not allow the geese and deer populations to increase with their accompanying problems. The other programs above either directly or indirectly impact water quality in the County and the County's ability to comply with the Clean Water Act and Virginia's commitment to ChesBay.

Over the past years, the Board has accepted a number of EQAC's recommendations that have led to improved environmental quality in the County. EQAC has commended the Board for these actions. I hope that you will not reverse some of the progress that the County has made in the environmental area. I'm sure that EQAC would be pleased to consult further with you on these issues.

I thank you for your consideration.

Sincerely,

Robert McLaren
At-Large member of EQAC

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION REGARDING
FAIRFAX COUNTY'S SOLID WASTE MANAGEMENT PLAN

April 14, 2004

WHEREAS, the Virginia Department of Environmental Quality (VDEQ) requires all jurisdictions to prepare a 20 year integrated solid waste management plan by July 1, 2004; and

WHEREAS, Fairfax County has developed a Solid Waste Management Plan with stakeholders from throughout the solid waste system, reviewed current waste activities and programs, projected potential waste generation for the next 20 years and analyzed the gaps between the current system and the future needs; and

WHEREAS, Fairfax County has developed a Solid Waste Management Plan that is in-depth, and incorporates current knowledge regarding solid waste management principles along with future projections of population and business growth;

THEREFORE, BE IT RESOLVED that the Environmental Quality Advisory Council congratulates the staff on their work on this major undertaking; and

BE IT FURTHER RESOLVED that EQAC recommends stronger language on the increased use of recycling in multiunit residences as well as expanding the number of businesses that are required to recycle from those with 200 people or more to those businesses with 50 people or more; finally

BE IT FURTHER RESOLVED that EQAC supports the Solid Waste Management Plan.

FAIRFAX COUNTY
ENVIRONMENTAL QUALITY ADVISORY COUNCIL

May 12, 2004

Staff and Board
Northern Virginia Soil and Water Conservation District
12055 Government Center Parkway
Suite 905
Fairfax, VA 22035

We, the members of the Fairfax County Environmental Quality Advisory Council, wish to congratulate you on receiving "double honors" from the National Association of Conservation Districts by winning a District Outreach Award to recognize the *Conservation Currents* newsletter and your Web site.

We are well aware of and applaud your efforts at community outreach and education. Your *Conservation Currents* newsletter and your Web site are both excellent examples of your outreach efforts, and we share the views of the award judges regarding the "amazing wealth of information" that you provide and regarding the quality of presentation of this information.

Again, congratulations on the award. It is well-deserved.

.

(Signed by Council members)

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION FOR RECYCLING PROGRAMS WITHIN FAIRFAX COUNTY PUBLIC SCHOOLS

June 9, 2004

WHEREAS, The Fairfax County Public School system produces a lot of waste, predominately paper waste; and

WHEREAS, Countless studies have demonstrated that there is a negative impact of waste on the environment, whether from the creation of the products being wasted or from the actual consumption of those products—for example, the production of excess paper products means that an excess of trees were harvested and there is excess paper in trash dumps; and

WHEREAS, Students from some Fairfax County public schools recognize the importance of recycling and show an interest in, with limited success, creating recycling programs within their own schools; and

WHEREAS, Fairfax County would benefit from an effective system-wide recycling program in the public schools; and

WHEREAS, Fairfax County public schools have minimal recycling opportunities available, but have not been effective apart from the efforts made by individual teachers and/or administrators; and

WHEREAS, the actual implementation of the recycling program at the school level needs to be improved to include effective means of collecting and disposing of recyclable materials; now therefore

THEREFORE, BE IT RESOLVED, that EQAC recommends that the Fairfax County Public School system develop a plan to ensure the implementation of a cost effective recycling program at the individual school level, including a system to enforce the recycling procedures;

FURTHERMORE, BE IT RESOLVED that EQAC recommends that this effort involve students to ensure that an environmental club or service club manages the recycling program instituted within the school, so that students can participate in a recycling program and not only learn the importance of recycling first hand but also form healthy habits of recycling, which could expand to their homes; and

FINALLY, BE IT RESOLVED that EQAC recommends that the Fairfax County Schools create, both countywide and at individual schools, a volunteer panel of students, teachers and the maintenance staff to monitor the recycling program and report the overall progress to the school system and to EQAC.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL
RESOLUTION SUPPORTING
THE NORTHERN VIRGINIA CONSERVATION TRUST

September 8, 2004

WHEREAS, Fairfax County and The Northern Virginia Conservation Trust (NVCT) have been working together in a public-private partnership since June 20, 2001, that has facilitated 25 easements and 4 fee simple ownerships totaling 512 acres across Fairfax County; and

WHEREAS, The NVCT has established a sustaining program with dedicated staff working throughout Fairfax County and Northern Virginia; and

WHEREAS, NVCT has a public outreach program that has generated 977 hours of volunteer conservation activities and 1,143 hours of environmental education over the last three years in Fairfax County; and

WHEREAS, NVCT has leveraged the Fairfax County commitment to generate grants in excess of the funds contributed by the County; and

WHEREAS, the Memorandum of Understanding between the NVCT and Fairfax County has recently expired and is being managed as a year-to-year agreement that does not provide a commitment to a long term partnership nor a cost of living adjustment to NVCT staff; and

WHEREAS, It was recommended by the New Millennium Occoquan Watershed Task Force that Fairfax County: "Establish a more proactive easements program that provides for outreach efforts to owners of land in the Occoquan Watershed that contains environmentally sensitive resources, particularly where these resources would not otherwise be protected by regulation;" and

WHEREAS, Creating and maintaining a healthy environment within the Occoquan Watershed is vitally important to the health of the citizens of Fairfax County and consistent with the goals and objectives of the recently adopted plan of the Board of Supervisors entitled "Environmental Excellence for Fairfax County: A 20-year Vision;" and

WHEREAS, The NVCT has a proven record for acquiring easements and has provided a proposal for dedicated resources that will focus on the Occoquan Watershed;

THEREFORE, BE IT RESOLVED, that the Environmental Quality Advisory Council strongly recommends that the Board of Supervisors:

1. Adopt the Memorandum of Understanding (MOU) with the NVCT prepared by the County Attorney's Office for an additional three to five years and review the MOU in like-year increments to provide the NVCT a commitment to continue their excellent work in Fairfax County; and

2. Fund an expansion of this partnership in the FY'06 Budget to provide more resources to focus on conservation and environmental education in the Occoquan Watershed.

FAIRFAX COUNTY
ENVIRONMENTAL QUALITY ADVISORY COUNCIL

September 10, 2004

Board of Supervisors
County of Fairfax
12000 Government Center Parkway
Fairfax, VA 22035

Dear Chairman Connolly and Members of the Board:

It is our understanding that the Board will be considering the allocation of $2,000,000 in additional funds to support environmental initiatives during its FY 2004 Carryover Review on Monday, September 13. At its September 8 meeting, the Environmental Quality Advisory Council, by a unanimous vote of members present, authorized me to write this letter of support for such an allocation of carryover funds. There are projects that are critical to preserving the County's environment and that would support the Board's environmental plan ("Environmental Excellence for Fairfax County: a 20-year Vision"), and the allocation of carryover funds for the purpose of addressing these needs should be strongly supported.

Thank you for your consideration of environmental initiatives during the Carryover Review.

Sincerely,

[Signed]

Stella Koch, Chairman
Environmental Quality Advisory Council

APPENDIX B

FAIRFAX COUNTY
ENVIRONMENTAL EXCELLENCE AWARDS

The Fairfax County Environmental Excellence Awards have been established to recognize County residents, organizations, businesses, and County employees who unselfishly dedicate time, energy, and expertise for the betterment of the environment in support of countywide environmental goals and initiatives. Award recipients are selected by the Environmental Quality Advisory Council, and the awards are presented each fall during a meeting of the Fairfax County Board of Supervisors.

The recipients of the 2004 Environmental Excellence Awards were:

County Resident Award:	Ned Foster
Organization Award:	Reston Association

Ned Foster was recognized for his extraordinary personal dedication, energy, and leadership in environmental stewardship efforts in the Little Rocky Run Watershed, including the establishment and leadership of the Friends of Little Rocky Run. The Reston Association was recognized for its progressive and comprehensive watershed planning, protection, and restoration efforts and associated efforts to educate and involve the community. EQAC congratulates both recipients.

In past years, Environmental Excellence Awards have been awarded to the following people and organizations:

<u>2003</u>

County Resident Award:	Joseph Chudzik
Organization Award:	Students Against Global Abuse (SAGA)
County Employee Award:	Noel Kaplan

<u>2002</u>

County Resident Award:	Charlie Creighton
Organization Award:	Hickory Farms Community Association

2001

County Resident Award:	Chris Koerner
Organization Award:	Bailey's Beautification Alliance

2000

County Resident Award:	Norma Hoffman
Organization Award:	Friends of Sugarland Run
County Government Employee Award:	Gary Roisum

The nomination period for the Environmental Excellence Awards occurs during the spring of each year. EQAC encourages interested individuals, organizations, County employees, and businesses to submit nominations.

APPENDIX C

ACRONYMS AND ABBREVIATIONS USED WITHIN THE ANNUAL REPORT

°C	**Degrees Centigrade**
°F	**Degrees Fahrenheit**
A&F	**Agricultural and Forestal**
ACM	**Assessment of Corrective Measures**
ANS	**Audubon Naturalist Society**
APHIS	**Animal Plant Health Inspection Service (federal)**
APR	**Area Plan Review**
AQS	**Air Quality Subcommittee (county)**
ARD	**America Recycles Day**
ARE	**Annual Report on the Environment**
BMP	**Best Management Practice**
BOS	**Board of Supervisors (county)**
Bt	**Bacillus thurinaiensis**
BWI	**Baltimore-Washington International Airport**
CAA	**Clean Air Act (federal)**
CAP	**Corrective Action Plan**
CBC	**Commercial business center**
CBLAB	**Chesapeake Bay Local Assistance Board (state)**
CBLAD	**Chesapeake Bay Local Assistance Department (state)**
$CBOD_5$	**Chemical and Biological Oxygen Demand (5-day text)**
CBP	**Chesapeake Bay Program (regional)**
CCR	**Consumer Confidence Report**
CCT	**Cross-County Trail**
CDC	**Centers for Disease Control (federal)**
CDD	**Construction/Demolition/Debris**
CDF	**Citizens' Disposal Facility**
CDM	**Camp, Dresser and McKee**
CE	**County Executive**
CEMS	**Continuous Emissions Monitoring System**
CESQG	**Conditionally Exempt Small Quantity Generator**
CFI	**Covanta Fairfax, Inc.**
CIP	**Capital Improvement Program**
CLRP	**Constrained Long Range Plan (regional)**
COG	**Metropolitan Washington Council of Governments (regional-Also cited as MWCOG)**

CONAANDA	**Committee on Noise Abatement and Aviation at National and Dulles Airports (fegional)**
CO-OP	**Cooperative Water Supply Operations**
CTB	**Commonwealth Transportation Board (state)**
CY	**Calendar Year**
D.O./DO	**Dissolved Oxygen**
D/DB-P	**Disinfectant/Disinfection By-products**
dB	**Decibel**
dBA	**Decibel (A-weighted level scale)**
DC	**District of Columbia**
DCR	**Department of Conservation and Recreation (state)**
DEQ	**Department of Environmental Quality (state)**
DEET	**N,N-diethyl-meta-toluamide**
DEIS	**Draft Environmental Impact Statement**
DGIF	**Department of Game and Inland Fisheries (state)**
DIYers	**Do-it-yourselfers**
DNA	**Deoxyribonucleic Acid**
DPWES	**Department of Public Works and Environmental Services (county)**
DPZ	**Department of Planning and Zoning (county)**
dscm	**Dry standard cubic meter**
DSWC&R	**Division of Solid Waste Collection and Recycling (county)**
DSWDRR	**Division of Solid Waste Disposal and Resource Recovery (county)**
DU/AC	**Dwelling Units per Acre**
E&S	**Erosion and Sediment**
E/RRF	**Energy/Resource Recovery Facility**
ECC	**Environmental Coordinating Committee (county)**
EE	**Environmental Enterprise**
EFID	**Environmental and Facilities Inspection Division (county)**
EFRD	**Environmental and Facilities Review Division (county)**
EHD	**Epizootic hemorrhagic disease**
EIS	**Environmental Impact Statement**
EMO	**Emergency Management Office (county)**
EPA	**Environmental Protection Agency (federal)**
EPCRA	**Emergency Planning and Community Right-to-Know Act (federal)**
EQAC	**Environmental Quality Advisory Council (county)**
EQC	**Environmental Quality Corridor**
ERC	**Employee Recycling Committee (county)**
ERICA	**Employee Recycling Committee Recycler of the Year Award (county)**

ESP	**Employer Services Program (county)**
ESWTR	**Enhanced Surface Water Treatment Rule**
FAA	**Federal Aviation Administration**
FAR	**Floor Area Ratio**
F.C.	**Fecal Coliform**
FCDOT	**Fairfax County Department of Transportation**
FCPA	**Fairfax County Park Authority**
FCPD	**Fairfax County Police Department**
FCPS	**Fairfax County Public Schools**
FCS	**Forest Conservation Section (county)**
FCWA	**Fairfax County Water Authority (now Fairfax Water)**
FJLEPC	**Fairfax Joint Local Emergency Planning Committee (regional)**
FPP	**Forest Pest Program (county)**
FPS	**Forest Pest Section (county)**
FTE	**Full time employee**
FW	**Fairfax Water (formerly the Fairfax County Water Authority)**
FY	**Fiscal Year**
GAC	**Granular Activated Carbon**
GAT	**Guaranteed Annual Tonnage**
GIS	**Geographic Information System**
gpd	**Gallons per Day**
GPS	**Global Positioning System**
GPS	**Groundwater Protection Standards**
HAA	**Haloacetic Acid**
HAZMAT	**Hazardous Materials**
HCl	**Hydrochloric Acid**
Hg	**Mercury**
HHW	**Household Hazardous Waste**
HMIS	**Hazardous Materials & Investigative Services Branch (county)**
HOT	**High Occupancy Toll**
HOV	**High Occupancy Vehicle**
IBI	**Index of Biotic Integrity**
ICPRB	**Interstate Commission on the Potomac River Basin (regional)**
IESNA	**Illuminating Engineering Society of North America**
IPM	**Integrated Pest Management**
IT	**Information Technology**
LCAT	**Lorton Citizens Alliance Team**
LDS	**Land Development Services function of the Department of Public Works and Environmental Services (county)**
LEPC	**Local Emergency Planning Committee**

LID	**Low Impact Development**
Li-ion	**Lithium Ion**
LOS	**Level of Service**
MCL	**Maximum Contaminant Level**
MCS	**Michigan Cogeneration Systems**
MD	**Maryland**
mg	**Milligram**
mg/l	**Milligrams per liter**
mgd	**Million gallons per day**
ml	**Milliliter**
MOU	**Memorandum of Understanding**
MPO	**Metropolitan Planning Organization**
MRDL	**Maximum Residual Disinfectant Level**
MRF	**Material Recovery Facility**
MS4	**Municipal Separate Storm Sewer System**
MSW	**Municipal Solid Waste**
MtBE	**Methyl teritary butyl ether**
MWAA	**Metropolitan Washington Airports Authority (regional)**
MWAQC	**Metropolitan Washington Air Quality Committee (regional)**
MWCOG	**Metropolitan Washington Council of Governments (regional – also cited as COG)**
NAAQS	**National Ambient Air Quality Standards**
NAIOP	**National Association of Industrial and Office Properties**
NEPA	**National Environmental Policy Act**
ng	**Nanogram**
NiCad	**Nickel-Cadmium**
NiMH	**Nickel Metal Hydride**
NMCPCP	**Noman M. Cole, Jr. Pollution Control Plant (county)**
NOV	**Notice of Violation**
NOx	**Oxides of Nitrogen**
NPDES	**National Pollutant Discharge Elimination System**
NPS	**Nonpoint Sources**
NRCS	**Natural Resources Conservation Service**
NRMP	**Natural Resource Management Plan**
NSR	**New Source Review**
NTU	**Nephelometric Turbidity Units**
NVAR	**Northern Virginia Association of Realtors**
NVBIA	**Northern Virginia Building Industry Association**
NVCS	**National Vegetation Classification System**
NVCT	**Northern Virginia Conservation Trust**
NVPDC	**Northern Virginia Planning District Commission (now NVRC)**

NVRC	**Northern Virginia Regional Commission (regional—formerly NVPDC)**
NVRPA	**Northern Virginia Regional Park Authority**
NVSWCD	**Northern Virginia Soil and Water Conservation District (regional)**
O&M	**Operation and Maintenance**
OAR	**Opportunities, Alternatives and Resources**
OCA	**Office of the County Attorney**
OWML	**Occoquan Watershed Monitoring Laboratory**
OWMP	**Occoquan Watershed Monitoring Program**
Pb	**Lead**
PD	**Planning Division (county)**
PFM	**Public Facilities Manual (county)**
PM	**Particulate Matter**
$PM_{2.5}$	**Particulate Matter less than 2.5 microns in diameter**
pph	**Pounds per hour**
ppm	**Parts per million**
PRM	**Principal Recyclable Material**
QA/QC	**Quality Assurance/Quality Control**
RACM	**Reasonably Available Control Measures**
RBRC	**Rechargeable Battery Recycling Corporation**
RDOC	**Recycling Drop Off Center**
ResWAG	**Reston Association Watershed Action Group**
ROP	**Rate of Progress**
RPA	**Resource Protection Area**
SAGA	**Students Against Global Abuse**
SARA	**Superfund Amendments and Reauthorization Act of 1986 (federal)**
SCRAP	**Schools/County Recycling Action Partnership**
SDWA	**Safe Drinking Water Act (federal)**
SIP	**State Implementation Plan**
SMCL	**Secondary Maximum Contaminant Level**
S.O.	**Subdivision Ordinance (county)**
SO_2	**Sulfur Dioxide**
SOCs	**Synthetic Organic Compounds**
SPS	**Stream Protection Strategy**
SUAG	**Stormwater Utility Advisory Group (county)**
SWMP	**Solid Waste Management Plan (county)**
SWMPTF	**Solid Waste Management Plan Task Force (county)**
SWPD	**Stormwater Planning Division (county)**
TCC	**Transportation Coordinating Council (regional)**
THM	**Trihalomethanes**
TMDL	**Total Daily Maximum Load**
TPB	**Transportation Planning Board (regional)**

TPTF	**Tree Preservation Task Force (county)**
TRACON	**Terminal Radar Approach Control**
TTHM	**Total Trihalomethanes**
UDIS	**Urban Development Information System**
UFD	**Urban Forestry Division (county)**
UFM	**Urban Forest Management (county)**
µg/l	**Microgram Per Liter**
µg/m^3	**Microgram Per Cubic Meter**
UOSA	**Upper Occoquan Sewage Authority**
USGS	**United States Geological Survey**
VA	**Virginia**
V/C	**Volume to Capacity Ratio**
VDACS	**Virginia Department of Agriculture and Consumer Services**
VDEQ	**Virginia Department of Environmental Quality**
VDGIF	**Virginia Department of Game and Inland Fisheries**
VDH	**Virginia Department of Health**
VDOF	**Virginia Department of Forestry**
VDOT	**Virginia Department of Transportation**
VOC	**Volatile Organic Compound**
VOLT	**Virginia Outdoor Lighting Task Force**
VPDES	**Virginia Pollutant Discharge Elimination System**
VRE	**Virginia Railway Express**
W&OD	**Washington and Old Dominion**
WID	**Watershed Improvement District**
WMATA	**Washington Metropolitan Area Transit Authority (regional)**
WWTP	**Wastewater Treatment Plant**
ZO	**Zoning Ordinance (county)**