

Annual Report
on the
ENVIRONMENT
2003



Fairfax County, Virginia
Environmental Quality Advisory
Council

ANNUAL REPORT
on the
ENVIRONMENT

2003



Fairfax County, Virginia

Environmental Quality Advisory Council

Printed on recycled paper

BOARD OF SUPERVISORS

Katherine K. Hanley, Chairman

Gerald R. Hyland, Vice Chairman
Mount Vernon District

Sharon Bulova
Braddock District

Catherine M. Hudgins
Hunter Mill District

Gerald E. Connolly
Providence District

Dana Kauffman
Lee District

Michael R. Frey
Sully District

Elaine McConnell
Springfield District

Penelope A. Gross
Mason District

Stuart Mendelsohn
Dranesville District

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Robert McLaren, Chairman
Stella M. Koch, Vice Chairman

Frank B. Crandall
John W. Foust
Johna Gagnon
Marcia Johns
George W. Lamb
Gabriel Markisohn

Lyle C. McLaren
Daniel Mendelson
J. Craig Potter
Rachel Rifkind
Sheila M. Roit, R.N.
James A. Roorbach, III

Anthony H. Griffin
County Executive

Robert A. Stalzer
Deputy County Executive

INTRODUCTION

This year's Annual Report on the Environment has been prepared entirely 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: water resources; air quality; ecological resources; wildlife management; solid waste; hazardous materials; noise, light, and visual pollution; and land use and transportation. 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 2002; however, in some cases, activities from early 2003 are also included. This report is meant to serve as an update from the 2002 *Annual Report on the Environment*; the reader is advised to review the 2002 *Annual Report* if more background information about a particular topic is desired.

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 Attorney's Office
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 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 County Water Authority
Fairfax Joint Local Emergency Planning Committee
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)
National Electrical Manufacturers Association
Northern Virginia Conservation Trust
Northern Virginia Regional Commission
Northern Virginia Regional Park Authority
Northern Virginia Soil and Water Conservation District
Occoquan Watershed Monitoring Laboratory
Reston Association
United States Fish and Wildlife Service
United States Geological Survey
Upper Occoquan Sewage Authority
Virginia Department of Conservation and Recreation
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 2002 *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

Madam Chairman and Members of the Board:

EQAC is pleased to present the 2003 Annual Report on the Environment. In this report, we discuss various environmental issues in Fairfax County. We do this in eight chapters – each chapter addressing a different aspect of the environment. Also in each chapter are EQAC's recommendations as to what actions Fairfax County should take to resolve identified problems.

EQAC's top priority recommendations from the 2003 Annual Report on the Environment are in the same area as last years – air quality. EQAC recognizes that the Board of Supervisors and the County staff have undertaken a number of actions in this area. For example, the County's telecommuting program is the best in the region and actions to select lower-emissions vehicles in the County's fleet replacement program are steps in the right direction. However, a number of actions remain to be taken as indicated in our report. Last year EQAC said the following in the Chairman's letter:

A major problem has been lack of staff resources. Unfortunately, EQAC doesn't see any alternative but to increase staff resources in this area.

However, no increase in staff resources occurred. Rather, the Health Department has a reduced number of professionals following air quality issues. As a result, EQAC's ability to assess the status of air quality in Fairfax County has been affected. The annual Air Quality Report was substantially delayed in 2003. Instead of hiring an Air Quality Planner as EQAC recommended, the Board chose to add responsibilities for air quality to the duties of the Environmental Coordinator. Unfortunately, the Environmental Coordinator has no professional staff, so this action increased the workload on a very capable, but already overloaded, individual.

EQAC therefore strongly urges full funding for staff in the Health Department supporting air quality management activities in the County. Furthermore, EQAC urges the County to take a proactive approach to developing a stronger air quality program. Failure in this area can result in severe financial consequences for the County.

EQAC also notes the interrelationship between land use and transportation strategies and air and water quality. As changes to land uses and transportation strategies are contemplated, the impact of air and water quality must be evaluated.

Board of Supervisors
Continued

While EQAC points out in this Annual Report that more needs to be done in the air quality area, the Board of Supervisors can take credit for some very noteworthy actions. The passage of the revised light ordinance satisfies an EQAC recommendation of the past several years. Subsequent to this, the County Staff prepared an outstanding brochure explaining the new ordinance.

The County's progress in the area of water quality continues to address EQAC's past recommendations. The Countywide Stream Protection Plan and Watershed Management Program, the perennial stream mapping project, and the changes to the Chesapeake Bay Ordinance are examples where the County is making good progress. EQAC, of course, continues to remain concerned about a secure funding source for these activities.

Each chapter of this year's Annual Report contains the remainder of our suggestions. We urge your consideration and action on each of these.

This report covers 2002, but also includes significant actions from 2003 that could impact EQAC's comments and recommendations. Unfortunately, the report cannot capture all ongoing actions or the report would never be finished.

As we have done in the past, we would like to commend the outstanding efforts of some groups whose actions enhance the environmental quality in Fairfax County. The Northern Virginia Soil and Water Conservation District (NVSWCD) continues to make their efforts felt in many environmental areas – both as teachers and doers. Their efforts in stream bank restoration are very noteworthy. The Northern Virginia Conservation Trust (NVCT) is pursuing and successfully obtaining easements on privately owned environmentally sensitive land. Volunteers from the Audubon Naturalist Society (and the NVSWCD) 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. EQAC thanks all these hard working groups, as well as many others we haven't mentioned, for their efforts in advancing environmental quality in Fairfax County.

EQAC would also like to commend the County Staff for their outstanding efforts. Of special note are the activities of the Environmental Coordinating Committee (ECC). EQAC has met with the ECC on environmental issues and will continue to do so. ECC's focus on environmental issues is resulting in improvements in County policy dealing with the environment and has greatly improved County actions in environmental areas. EQAC also notes that increased attention is being given to water quality in DPWES – and the results are showing.

Members of EQAC wrote this report; however, we obtained most of the information contained therein from many County agencies. We thank them for their assistance. EQAC would especially like to acknowledge the contributions of two individuals. First, Noel Kaplan of the Environmental and Development Review Branch, Department of Planning and Zoning. Noel provides County staff support to EQAC. This means he sets up every EQAC meeting, attends every EQAC meeting, follows up on actions generated from the meetings, plus coordinates the inputs and publication of the Annual Report. EQAC thanks him for his hard work and long hours in our support. Second, Kambiz Agazi, Environmental Coordinator, Office of the County

Board of Supervisors
Continued

Executive. Kambiz attends every EQAC meeting and provides advice and suggestions. He often follows up after the meetings by providing additional information. His insight and overview of County environmental activities are invaluable. EQAC thanks him for his assistance and valuable contributions.

We would like to commend the Board's actions, as noted in this report, in advancing the environmental quality of the County. Every year the County makes progress. However, much more needs to be done. EQAC remains especially concerned about the impact of the County's financial shortfall on environmental programs. We would like to encourage you not to cut these valuable environmental programs and reverse the gains the County has made.

Your leadership continues to be essential to advancing environmental quality in Fairfax County by preserving and protecting environmentally sensitive areas. We in EQAC will continue to provide recommendations to you on how to achieve this goal. We look forward to working with you and achieving further progress in this area.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert D. McLaren". The signature is written in a cursive style with a large initial "R".

Robert D. McLaren, Chairman
Environmental Quality Advisory Council

TABLE OF CONTENTS

I.	WATER RESOURCES	I-1
A.	OVERVIEW	I-1
1.	Streams	I-1
2.	Watersheds	I-1
3.	Stream Ecosystems and Communities	I-3
4.	Communities	I-3
5.	Oxygen	I-3
6.	Trees, Wetlands, and Buffers	I-3
7.	Nutrients	I-4
8.	Groundwater and the Water Cycle	I-4
B.	POLLUTANTS AND OTHER IMPACTS ON STREAMS	I-4
1.	Point and Nonpoint Source Pollution	I-4
2.	The Effect of Imperviousness on Streams	I-5
C.	STREAM AND WATERSHED ANALYSES	I-5
1.	Countywide Stream Assessments	I-6
2.	Fairfax County Health Department Water Quality Report	I-10
3.	Health Department Volunteer Monitoring Program (Adopt-a-Stream)	I-13
4.	Virginia Department of Environmental Quality (DEQ)	I-13
5.	Special Stream Reports and Programs	I-16
D.	PONDS AND LAKES	I-19
1.	Reston Lakes	I-19
2.	Pohick Watershed Lakes	I-21
3.	Lake Barcroft	I-21
4.	Lake Accotink	I-22
5.	Other Ponds and Lakes	I-22
E.	STORMWATER MANAGEMENT	I-22
1.	Status of Stormwater Utility (Environmental Stormwater Utility) Concept in Fairfax County	I-22
2.	Status of NPDES Requirements	I-23
3.	Regional Stormwater Management Program	I-23
4.	Stormwater Treatment Facilities in Fairfax County	I-24
5.	Infill and Residential Development Study	I-25

I. WATER RESOURCES (continued)

F.	NONPOINT SOURCE POLLUTION PROGRAMS	I-26
1.	Chesapeake Bay Program and Agreements	I-26
2.	The Virginia Chesapeake Bay Preservation Act and Regulations	I-26
3.	Erosion and Sedimentation Control and Enforcement— Fairfax County Department of Public Works and Environmental Services	I-27
4.	Occoquan Basin Nonpoint Pollution Management Program	I-28
5.	Soil and Water Conservation Technical Assistance	I-29
6.	Stream Valley Reforestation	I-30
7.	Stream Bank and Other Stabilization Projects	I-31
8.	Septic Permitting and Repairs	I-32
G.	PERENNIAL STREAM MAPPING PROJECT	I-32
H.	WATERSHED PLANNING AND MANAGEMENT	I-32
1.	Countywide Watershed Planning	I-32
2.	Reston Watershed Plan	I-33
3.	New Millennium Occoquan Watershed Task Force	I-33
I.	GROUNDWATER ASSESSMENT	I-33
J.	DRINKING WATER SUPPLY	I-34
1.	Wells	I-34
2.	Lorton and Corbalis Systems Monitoring Results and Reports	I-35
3.	Source Water Assessments	I-37
4.	Facilities Management	I-37
5.	Regional Cooperative Water Supply Agreements	I-38
K.	NEW LAWS OR REGULATIONS	I-39
1.	Amendments to the Chesapeake Bay Regulations	I-39
2.	Amendments to the Policy Plan	I-39
L.	SUMMARY	I-40
M.	RECOMMENDATIONS	I-41
	LIST OF REFERENCES	I-44

II.	AIR QUALITY	II-1
A.	ISSUES AND OVERVIEW	II-1
1.	Introduction	II-1
2.	Air Quality Status in Northern Virginia	II-5
B.	MAJOR PUBLIC AGENCY RESPONSIBILITIES	II-11
1.	Introduction	II-11
2.	Commonwealth of Virginia	II-11
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)	II-11
4.	County of Fairfax	II-12
C.	PROGRAMS, PROJECTS, AND ANALYSES	II-13
1.	Regional Air Quality Planning	II-13
D.	LEGISLATIVE UPDATE	II-14
1.	Summary of Air Quality Laws Enacted by the Virginia General Assembly	II-14
E.	CONCLUSIONS AND OBSERVATIONS	II-14
F.	RECOMMENDATIONS	II-16
	LIST OF REFERENCES	II-17

III. ECOLOGICAL RESOURCES	III-1
A. ISSUES AND OVERVIEW	III-1
B. PROGRAMS, PROJECTS, AND ANALYSES	III-2
1. Fairfax County Park Authority	III-2
2. Northern Virginia Regional Park Authority	III-6
3. Fairfax ReLeaf	III-7
4. Northern Virginia Conservation Trust	III-7
5. Reston Association	III-9
6. Northern Virginia Soil and Water Conservation District	III-10
7. Fairfax County Wetlands Board	III-11
8. Virginia Department of Forestry	III-12
9. Virginia Department of Transportation	III-13
10. Urban Forestry	III-14
11. Riparian and Other Bioengineering Projects	III-21
12. Gunston Cove Ecological Study	III-23
13. Agricultural and Forestal Districts	III-24
14. South Van Dorn Street Phase III Road Project	III-25
C. RECOMMENDATIONS	III-26
LIST OF REFERENCES	III-28

IV. WILDLIFE AND THE ENVIRONMENT IN FAIRFAX COUNTY	IV-1
IV-1. IMPACTS OF DEER IN FAIRFAX COUNTY	IV-1
A. OVERVIEW	IV-1
B. BACKGROUND	IV-1
1. Are Deer Overabundant in Fairfax County?	IV-1
2. A Description of the Problem	IV-3
C. ISSUES IN ADDRESSING THE PROBLEM	IV-8
1. Understanding Population Dynamics	IV-8
2. Determining Carrying Capacity Goals	IV-10
3. Considering Public Opinion	IV-11
D. METHODS FOR DEER POPULATION MANAGEMENT	IV-11
1. Population Reduction Approaches	IV-11
2. Conflict Mitigation Approaches	IV-13
E. PUBLIC EDUCATION PROGRAM NEEDS	IV-15
F. PUBLIC AGENCY RESPONSIBILITY	IV-16
G. PROGRAM IMPLEMENTATION ACTIVITIES	IV-16
H. CONCLUSIONS	IV-19
I. RECOMMENDATIONS	IV-20
ACKNOWLEDGMENTS	IV-22
LIST OF REFERENCES	IV-23

IV. WILDLIFE AND THE ENVIRONMENT IN FAIRFAX COUNTY (continued)

IV-2. IMPACTS OF GEESE IN FAIRFAX COUNTY	IV-24
A. OVERVIEW	IV-24
B. BACKGROUND	IV-24
1. Origins of the Goose Problem in Fairfax County	IV-24
2. Environmental Impact of Geese	IV-24
C. ISSUES IN ADDRESSING THE PROBLEM	IV-26
1. Goose Population Biology	IV-26
2. Considerations of Public Opinion	IV-27
3. Federal Limitations on Remedial Action	IV-27
D. METHODS FOR POPULATION MANAGEMENT	IV-28
1. Population Stabilization	IV-28
2. Population Exclusion	IV-28
3. Special Foraging Areas	IV-28
4. Landscaping Modifications	IV-28
5. Repellents	IV-29
6. Prohibition of Feeding	IV-29
7. Combined Approaches	IV-29
E. PUBLIC EDUCATION PROGRAM NEEDS	IV-29
F. PUBLIC AGENCY RESPONSIBILITY	IV-29
G. PROGRAM IMPLEMENTATION ACTIVITIES	IV-30
H. CONCLUSIONS	IV-31
I. RECOMMENDATIONS	IV-31
USEFUL REFERENCES	IV-32

**IV. WILDLIFE AND THE ENVIRONMENT
IN FAIRFAX COUNTY (continued)**

**IV-3. WILDLIFE BORNE DISEASES OF CONCERN
IN FAIRFAX COUNTY** IV-33

A. OVERVIEW IV-33

B. BACKGROUND IV-33

 1. West Nile Virus IV-33

 2. Lyme Disease IV-34

 3. Rabies IV-36

 4. Fecal Coliform Bacterial Diseases IV-37

C. PUBLIC EDUCATION PROGRAM NEEDS IV-38

D. PUBLIC AGENCY RESPONSIBILITIES IV-39

E. CONCLUSIONS IV-39

F. RECOMMENDATIONS IV-40

LIST OF REFERENCES IV-40

V. SOLID WASTE V-1

A. ISSUES AND OVERVIEW V-1

 1. Contractual Issues and Landfill Capacity Backup V-1

 2. Solid Waste Management Plan (SWMP) V-2

 3. Solid Waste Disposal Fee V-2

B. PROGRAMS, PROJECTS, AND ANALYSIS V-3

 1. Waste Disposal V-3

 2. Waste Reduction and Recycling Programs V-10

C. LEGISLATIVE AND REGULATORY CHANGES V-19

LIST OF REFERENCES V-19

VI. HAZARDOUS MATERIALS	VI-1
A. ISSUES AND OVERVIEW	VI-1
1. Overview	VI-1
2. Hazardous Materials Incidents	VI-1
3. Hazardous Materials in the Waste Stream	VI-2
4. Pipelines	VI-4
5. Rail Transport of Hazardous Materials	VI-4
B. PROGRAMS, PROJECTS, AND ANALYSES	VI-5
1. Fairfax Joint Local Emergency Planning Committee (FJLEPC)	VI-5
2. Railroad Transportation Plan	VI-5
3. Storm Drain Stenciling Program	VI-6
4. Household Hazardous Waste Program (HHW)	VI-6
5. Commercial Hazardous Wastes	VI-6
C. REPORTING ENVIRONMENTAL CONCERNS AND ISSUES	VI-7
D. LEGISLATIVE UPDATE	VI-9
E. RECOMMENDATIONS	VI-9
REFERENCES	VI-9

VII. NOISE, LIGHT POLLUTION, AND VISUAL POLLUTION	VII-1
VII-1. NOISE	VII-1
A. AIRPORT NOISE	VII-1
1. Operations and Associated Noise Impacts at Ronald Reagan Washington National Airport and Washington Dulles International Airport	VII-1
2. Additions to Washington Dulles International Airport	VII-2
3. Part 150 Noise Compatibility Planning for Ronald Reagan Washington National Airport	VII-2
4. Potomac Consolidated TRACON: Airspace Redesign	VII-3
B. HIGHWAY NOISE	VII-3
1. Background	VII-3
2. State Policy	VII-3
3. Noise Study Submission Requirements	VII-4
4. State Projects in Fairfax County	VII-5
C. RECOMMENDATION	VII-5
VII-2. LIGHT POLLUTION	VII-7
A. OVERVIEW	VII-7
B. ISSUES AND PROBLEMS	VII-7
1. Glare	VII-7
2. Light Trespass	VII-8
3. Security	VII-8
4. Urban Sky Glow	VII-8
5. Energy Usage	VII-9
C. CURRENT COUNTY STANDARDS AND REGULATIONS	VII-9
D. ADDRESSING THE PROBLEM	VII-10
E. PUBLIC AGENCY RESPONSIBILITIES	VII-13
F. PUBLIC EDUCATION AND AWARENESS NEEDS	VII-14
G. CONCLUSIONS	VII-15
H. RECOMMENDATIONS	VII-16
LIST OF REFERENCES	VII-17

VII. NOISE, LIGHT POLLUTION, AND VISUAL POLLUTION (continued)

VII-3. VISUAL POLLUTION AND URBAN BLIGHT	VII-18
A. OVERVIEW	VII-18
B. SIGNS AND BILLBOARDS	VII-18
C. TELECOMMUNICATION TOWERS AND UTILITY TRANSMISSION LINES	VII-19
D. ADDRESSING THE PROBLEM	VII-19
E. PUBLIC AGENCY RESPONSIBILITIES	VII-20
F. RECOMMENDATIONS	VII-21

VIII. LAND USE AND TRANSPORTATION

VIII-1	VIII-1
A. ISSUES AND OVERVIEW	VIII-1
1. Trends and Concepts	VIII-2
2. Macro Considerations	VIII-3
B. LAND USE	VIII-3
1. How is Land Used in Fairfax County?	VIII-3
2. Land Use Planning	VIII-5
3. Land Use Monitoring	VIII-5
4. Land Use History and Buildout Projections	VIII-5
C. TRANSPORTATION	VIII-9
1. How do People and Things Move About Fairfax County?	VIII-9
2. Transportation Decision Making	VIII-14
3. Programs, Projects, and Analyses	VIII-16
D. THE INTERRELATIONSHIP BETWEEN LAND USE AND TRANSPORTATION	VIII-18
1. How are Land Use and Transportation Interrelated?	VIII-18
2. Programs, Projects, and Analyses	VIII-19
E. RECOMMENDATIONS	VIII-22
1. Land Use	VIII-22
2. Teleworking	VIII-23
3. Transportation	VIII-23
LIST OF REFERENCES	VIII-24

APPENDIX A: EQAC RESOLUTIONS AND POSITIONS JANUARY, 2003 THROUGH NOVEMBER, 2003	A-1
APPENDIX B: FAIRFAX COUNTY ENVIRONMENTAL EXCELLENCE AWARDS	B-1
APPENDIX C: ACRONYMS AND ABBREVIATIONS USED WITHIN THE ANNUAL REPORT	C-1

LIST OF FIGURES

Figure No.	Figure Title	Page
I-1	Fairfax County Watershed Map	I-2
I-2	Countywide Site Ratings for IBI	I-7
I-3	Countywide Site Ratings for Habitat	I-7
I-4	Countywide Site Ratings for Fish Abundance	I-7
I-5	Countywide Site Ratings for Drainage Imperviousness	I-7
I-6	IBI vs. Percent Imperviousness	I-8
II-1	Air Quality Trends in Relation to a One-Hour Ozone Standard	II-9
II-2	Air Quality Trends in Relation to an Eight-Hour Ozone Standard	II-10
IV-2-1	Sources of Fecal Coliform Pollution in Accotink Creek	IV-26
V-1	Summary of Initial Performance Data After Retrofits were Implemented	V-6
V-2	Historical Quantities of Refuse Generated in Fairfax County	V-8
V-3	Historical Quantities of Materials Recycled from Fairfax County	V-11
VII-2-1	Effects of Cut-off and Non Cut-off Luminaires	VII-11
VIII-1	Existing Land Use in Fairfax County	VIII-4
VIII-2	Concept Map for Future Development	VIII-6
VIII-3	Average Volume/Capacity V/C Ratios—Existing Peak Hour Conditions (2002)	VIII-12
VIII-4	Average Volume/Capacity V/C Ratios—Future Peak Hour Conditions (2025)	VIII-13

LIST OF TABLES

Table No.	Title	Page
I-1	UOSA Permit Requirements and 2002 Performance	I-14
I-2	NMCPCP Permit Requirements and 2002 Performance	I-16
I-3	Sources of Fairfax County Water Authority Water Supply, 2002	I-34
II-1	Regional Ozone Exceedances, 2002	II-7
II-2	Regional Ozone Exceedances, 2002, Eight Hour Average	II-8
III-1	NVCT Conservation Easements (July 1, 2002 to June 30, 2003)	III-9
III-2	Urban Forestry Division Workload, FY 2001 and 2002	III-15
IV-1-1	Deer Density Surveys	IV-3
IV-1-2	Out of Season Kill Permits Issued For Deer Damage in Fairfax County, Virginia Department of Game and Inland Fisheries	IV-5
IV-1-3	Deer-Vehicle Collisions in Fairfax County	IV-8
IV-3-1	Reported Lyme Disease Cases Meeting Centers for Disease Control (CDC) Case Definition Program, Fairfax County	IV-36
VI-1	How to Report Environmental Crimes	VI-7
VIII-1	Vacant Land in Fairfax County	VIII-8
VIII-2	Existing Land Uses	VIII-8
VIII-3	Planned Land Uses	VIII-9
VIII-4	Where do Residents of Fairfax County Go to Work?	VIII-14
VIII-5	Where do Workers in Fairfax County Come From?	VIII-15

SCORECARD
Progress Report on 2002 Recommendations

I. WATER RESOURCES

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. EQAC strongly recommends implementation of a Comprehensive Countywide Steam Management Program.</p>	<p>Staff agrees with this recommendation. A major aspect of this recommendation is being pursued through the Watershed Management Initiative – under which the staff will develop watershed master plans for the entire County in the next five to seven years. The baseline Stream Protection Strategy (SPS) report released in January, 2001 included broad stream restoration and preservation recommendations. The SPS study is ongoing. The County is updating its base stream map of all stream channels through a perennial stream mapping project. Significant funding will be required to complete the development of the watershed master plans and to implement the recommendations of these plans.</p>	<p>EQAC’s recommendation is on the way to being satisfied – if the County continues with their 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.</p>	<p>In process, with more to be done.</p>
<p>2. EQAC recommends the funding of the Stormwater Utility 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.</p>	<p>Staff is developing a Stormwater Utility implementation strategy. A study, <i>Conceptual Plan for a Comprehensive Stormwater Management Program</i>, was completed in March 2000. DPWES proposes to develop watershed master plans over the next five to seven years. As needs are identified in these plans, DPWES will initiate a public education effort. As public awareness increases, DPWES anticipates citizen understanding and support for a Stormwater Environmental Utility will become strong.</p>	<p>EQAC again reiterates its comments from prior years, with emphasis added. EQAC is concerned about the slowness of the process described by staff, with no clear end in sight. EQAC reiterates its recommendation, strongly urging the Board of Supervisors to <u>speedily</u> adopt a Stormwater Environmental Utility Program. Without this program, EQAC is concerned about the continued availability of funds for a Comprehensive Countywide Steam Management Program.</p>	<p>No.</p>

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. EQAC recommends posting of affected County streams with a health warning for coliform bacteria until such time that the problem of high fecal coliform bacteria in the County's waters is mitigated.	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 is being developed in conjunction with the Northern Virginia Soil and Water Conservation District Office 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 is helpful, it doesn't go far enough. The majority of the County's citizens remain unaware of the problems with fecal coliform. EQAC continues to recommend that the County's streams be posted if testing shows contamination.	No.
4. EQAC recommends selective monitoring on the efficiency of stormwater management ponds, other BMPs, and the effectiveness of required erosion and sediment control procedures and structures and enforcement regimes.	This recommendation is being partially addressed at this time. The Kingstown 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.

II. AIR QUALITY

Air Quality Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. EQAC urges the County to take a pro-active approach in air quality, exercising its leadership capabilities to develop a stronger air quality control program that will ensure compliance with a reasonable margin of safety and to work through the COG to persuade other jurisdictions in the Region to do their fair share as well.</p>	<p>Staff agrees with this recommendation and it is in the process of being addressed. In November 2002, the Deputy County Executive initiated a two-track process for developing a strategy to address issues relating to air quality. In a “Declaration on Air Quality Leadership”, in February 2003, the County Executive tasked each agency director to take appropriate actives to improve air quality consistent with regional efforts.</p>	<p>While the County is taking a more proactive approach, not all of EQAC’s recommendation is being adequately addressed. Interactions, such as joint ECC/EQAC meetings, have begun to look at future air quality planning. However, actions such as losses in County Staff in the Health Department are counter to this recommendation and severely impact the County’s ability to monitor air quality.</p>	<p>Some, but more needs to be done.</p>
<p>2. EQAC renews its recommendation that Fairfax County strengthen its own capability to understand the technical air quality issues, identify and evaluate the impact of alternative approaches to ensuring improved air quality, develop policies and programs that can be applied regionally to accomplish that goal, and persuade other jurisdictions to join in these efforts.</p>	<p>This recommendation is being addressed, although through a different mechanism from EQAC’s proposal to hire an Air Quality Planner.</p>	<p>The County identified a senior staff person to work directly with the Office of the County Executive. However, this tasks an overworked staff member with additional responsibilities rather than the EQAC approach of hiring a person trained in the rigorous technical challenges of air quality management. Furthermore, the cutting back of expertise in the Health Department is hardly consistent with the County strengthening its technical capability in air quality issues.</p>	<p>No.</p>

Air Quality Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>3. EQAC recommends that the Board of Supervisors devote more of its energies to understanding and addressing the difficult issues raised by the Region’s air quality problems, both in its own decisions and in the guidance it provides to the County’s land use and transportation boards and staffs.</p>	<p>The recommendation has already been addressed. The Chairman of the BOS, plus Supervisors Bulova, Kauffman, and Hudgins are active in either the Metropolitan Washington Air Quality Committee or the Metropolitan Transportation Planning Board. Supervisor Bulova is active in Clean Air Partners. The BOS is also active in sending letters to state and federal representative in support of air quality initiatives.</p>	<p>EQAC recognizes that the BOS has been active in activities addressing regional air quality. However, the loss of personnel in the Health Department and the failure to hire an Air Quality Planner means that the required institutional awareness that should be supporting the BOS is not fully there. Considering that the BOS does change, such institutional awareness is necessary for the BOS to understand and address air quality issues.</p>	<p>Somewhat, however more needs to be done in the area of supporting institutional awareness.</p>
<p>4. EQAC recommends that the County set a deadline of June 30, 2003 for the adoption of a new Air Quality Attainment Strategy – a public document adopted by the Board that sets out the policies and priorities that Fairfax County intends to pursue within the County and through COG to ensure the achievement of the necessary levels of air quality with a reasonable margin of safety.</p>	<p>This recommendation is in the process of being addressed. Staff concurs with the general concept behind this recommendation; however, staff does not support the time frame recommended by EQAC or the hiring of new staff.</p>	<p>EQAC notes that June 30, 2003 has come and gone without the public document recommended by EQAC. EQAC’s recommended timeline was based on concerns about the likelihood of ongoing ozone non-attainment in the County and EQAC’s fears regarding what we see on the horizon concerning potential ramifications under the Clean Air Act. EQAC believes that the County should develop a timely public document that establishes policies and priorities. The Spring of 2004 will be critical for the management of air quality in this County.</p>	<p>No.</p>

III. ECOLOGICAL RESOURCES

Ecological Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>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.</p>	<p>Staff concurs with EQAC’s recommendation. The Fairfax County Park Authority (FCPA) completed development of a modeling tool to identify significant natural and cultural resources in the County. FCPA, using the County’s geographic information system (GIS), produced a Countywide “Green Infrastructure” model and resultant map. The natural resource inventory effort continued this year and included the development of a limited database linked to the County GIS system.</p>	<p>This is a long-standing EQAC recommendation. As noted in earlier Annual Reports on the Environment, EQAC commends the Park Authority and fully supports its efforts. EQAC also notes that efforts are underway that support EQAC’s recommendation. Additionally, FCPA is in the process of creating a Natural Management Plan for parklands. However, unless increased staff and resources are allocated to these efforts, and an overall programmatic strategy is developed, EQAC’s recommendation will not be satisfied. EQAC reiterates its recommendation.</p>	<p>Some progress, but more needs to be done.</p>
<p>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.</p>	<p>The Department of Planning and Zoning (DPZ) concurs with the recommendation since the NVCT partnership has been an important tool for supporting the open space and environmental preservation goals of the BOS. The recommendation to extend the MOU with NVCT is not currently being addressed since the current MOU extends through FY 2004. DPZ should make a recommendation to the BOS on the renewal of the MOU in early FY2004.</p>	<p>EQAC commends the BOS for creating the public-private partnership with NVCT. EQAC encourages the BOS to provide the required annual funding and to extend the MOU past three years.</p>	<p>Yes.</p>
<p>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.</p>	<p>The BOS did support such action; however, the proposed changes did not become law and the Senate Bill was not carried to the 2003 session. County staff worked to develop tree conservation language for the 2003 session; however, the resulting proposal was not patronized by any of the local Virginia State representatives and was therefore not introduced into the 2003 Legislative Assembly.</p>	<p>EQAC is extremely disappointed that none of the Fairfax County’s elected representatives to the Legislature would support this action. EQAC continues to recommend that the BOS continue to pursue legislation that would allow a tree preservation ordinance.</p>	<p>No.</p>

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.	Indicators support the belief that Bull Run Regional Park and Upper Potomac Regional Park have attained the desired herd density of 15-10 deer per square mile. Meadowlark Gardens density is zero since the park is encompassed by a deer-proof fence. During the growing season of 2002, a marked improvement was noted in the understory at Bull Run Regional Park. While it will take years for the habitat to rebound, these signs are encouraging. The Park Authority concurs with this recommendation and has been following the management principals referenced by EQAC.	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 change at Bull Run Regional Park is 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.	The Deer Management Committee meets to review and comment on the results of management efforts and on staff recommendations. The County web page devoted to deer management issues continues to be updated. Presentations about deer issues and the County’s plan of response are routinely provided to citizens at various meetings such as community association meetings, Police Department Citizen Advisory Committee meetings, and Police Department Citizen’s Police Academy sessions.	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.	Fairfax County Park Authority has been a full partner in developing the County’s deer management program. The FCPA and Animal Services should continue to partner in a comprehensive deer management program.	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. Animal Services and FCPA continue to provide outreach with private landowners who control property adjacent to public lands to develop and coordinate deer management programs.	While the staff response outlines some options available to small private property owners, more needs to be done. EQAC recognizes the 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; (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. Fairfax County continues to monitor developments and progress of non-lethal methods of deer herd control. The Wildlife Biologist is working in cooperation with other agencies to identify additional means of data collection to address ecosystem health and biodiversity issues.	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 recommends the Board of Supervisors continue to provide for a vigorous and enhanced program of public education.	Educational efforts have been underway since the start of the Deer Management Program. Additional measures are now being considered, including better use of the County's cable TV and updating of publications in the County Library system. (The staff response goes on to list a large number of educational efforts done in the last year.)	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 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.	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 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. In 2002, the Office of Public Affairs sent a news release to the media announcing the geese stabilization program.	EQAC recommends continuation of public education efforts.	In process.
4. EQAC recommends enhanced public outreach to acquaint Fairfax residents with the destructive role excessive goose populations play in our marshland habitats.	The Animal Services Division will be working 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. The Health Department should continue the Stream Monitoring Program and post advisories on currently polluted waters.	The Health Department and DPWES are working to implement a comprehensive Countywide Stream Management Program that will consolidate all monitoring efforts into a single program. The new program will decide the most effective method of posting advisories on polluted waters.	EQAC continues to support this recommendation, encouraging the BOS to provide active support to the reorganized Stream Monitoring Program.	In process.
2. The Health Department should continue and enhance its excellent public education programs.	The Health Department will continue to develop and enhance public education information dealing with public health issues. Presently, educational emphasis is on mosquito control and West Nile virus.	As stated, EQAC believes the Health Department's efforts are creating excellent public education programs.	Yes.
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 webpage. A new program will soon begin whereby Animal Control Officers will canvass neighborhoods near areas with a high number of positive rabies cases. They will check for rabies vaccinations and inform residents of efforts to control rabies. The Wildlife Biologist established an email group for rapid conveyance of wildlife disease information.	EQAC supports the current efforts by the Animal Services Division, the Health Department, and the Wildlife Biologist/	Yes.
4. The potential need for Countywide mosquito abatement programs as a means of suppressing West Nile Virus and malaria should be vigorously evaluated.	The Health Department, through the County's Environmental Coordination Committee, established a multi-agency committee, the Mosquito Surveillance and Management Subcommittee, to vigorously evaluate and develop recommendations for a county-wide mosquito abatement program. The Health Department is working with the newly formed Emerging Mosquito Pathogen Subcommittee of the COG Health Officials Committee to review and update a regional coordinated response to mosquito pathogens.	EQAC endorses these efforts and recommends full support by the BOS.	In process.

V. SOLID WASTE

Solid Waste Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. The County could benefit from applying a thorough “Future Analysis” or “Risk Analysis” of the overall program to look for additional potential weaknesses and develop action plans for any identified weaknesses.</p>	<p>In January 2003, the Solid Waste Management Program started work on the new Solid Waste Management Plan for the County. As part of this Plan, the County will be looking at strategic issues and potential weaknesses in the system that may need support.</p>	<p>EQAC supports this effort currently underway.</p>	<p>In process.</p>
<p>2. EQAC continues to be concerned with the economics of waste disposal in Fairfax County. EQAC feels that business process re-engineering could yield options to consider in a cost benefit analysis.</p>	<p>The Solid Waste Management Program performs an Activity Based Cost Analysis on the various program activities and work to reduce cost to each program element. Further analysis of the economics of the overall solid waste program will be conducted as part of the solid waste management planning effort.</p>	<p>EQAC support the efforts of the Solid Waste Management Program and will continue to interact with senior members of the Program.</p>	<p>Yes.</p>
<p>3. EQAC remains opposed to any action to subsidize tipping fees, and we do not support any proposal that would reduce the effectiveness of recycling programs by redirecting waste paper products to the Energy/Resource Recovery Facility (E/RRF).</p>	<p>Staff recognizes EQAC’s concerns with regard to subsidized tipping fees. Staff analysis of the Citizen’s Disposal Facility indicated a need to raise fees, which is proposed for FY 2004. The County has never considered redirecting waste paper products to the E/RRF. In fact, the County has taken steps to expand the paper collection/recycling activities in the County waste collection areas.</p>	<p>EQAC will continue to interact with the Solid Waste Management Program staff in regard to tipping fees.</p>	<p>Yes.</p>

VI. HAZARDOUS MATERIALS

Hazardous Materials Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. EQAC recommends an aggressive public education campaign on how to properly dispose of household/residential, commercial, and industrial hazardous waste. A “How to chart that can be easily read and kept for continued reference is suggested. Partnering with groups and businesses to provide the money and much of the work is suggested.</p>	<p>DPWES cited information dissemination on this subject being done through their current literature, telephone message, and web site. They also cited work with businesses and Homeowner Associations as well as their electronic collections throughout the year and a Fairfax Fair exhibit. Funding for a more expansive outreach is not planned at this time.</p>	<p>EQAC recognizes outreach and educational efforts made by Staff for hazardous materials disposal. These efforts have reached many people and businesses and should be continued. However, EQAC believes more homeowners and home businesses need to be educated about hazardous materials in homes and home offices. Many people do not think to call or look on the web page and are not part of formal homeowner associations. EQAC believes creative partnering may be able to accomplish this with little cost to the County.</p>	<p>Partially completed.</p>
<p>2. The reporting of PERC releases is limited to those incidents where the business, usually dry cleaners, is currently operating. Ground contamination from businesses no longer in operation is only reported if the chemical has reached a water source or affects another property. EQAC recommends the reporting of all ground contamination that requires environmental cleanup prior to land use applications.</p>	<p>Fire & Rescue noted that the scope of spilled or leaked chemicals is much broader than PERC. DPZ recommends an applicant commit to the performance of site investigations for properties where potential for contamination is suspected. Staff does not feel it is essential for this information to be provided prior to action on individual zoning cases as long as there is a proffer or development condition that insures the issue will be dealt with prior to site development. There are at least two different ways site contamination issues have been dealt with successfully through proffers or development conditions. DPZ recognized through this recommendation that staff is not always aware of the full history of each site that is subject to zoning review. Planned enhancements of current databases used for DPWES permitting process, Fire Prevention Code Permits, and HMIS would improve the availability of information.</p>	<p>EQAC is optimistic that the ISIS database program currently under review and soon to be under vendor contact will provide a more complete coordinated sharing of information.</p>	<p>In progress.</p>

Hazardous Materials Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>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 newsletter, press release story to the media, and age appropriate material sent home through the schools.</p>	<p>Fire & Rescue, DPWES, and OPA currently have an educational campaign that includes displays at County events and information to responsible parties of hazmat incidents. They are currently using the FJLECP's brochure on how to report spills, leaks, or releases of hazardous materials. Staff concurs that an increased awareness creates an informed public and listed five actions to pursue that will have minimal fiscal impacts.</p>	<p>EQAC agrees with the Staff's actions to pursue and thinks this will help educate the citizens. EQAC suggests two additional venues for citizen education: The Police Academy for citizens active with Neighborhood Watch and the Police Citizen Advisory Councils; and the Community College programs being offered through some District Councils. EQAC is concerned that the FJLEPC brochure on spills, leaks, and releases may be written for businesses and not average citizens.</p>	<p>Some progress, but more needs to be done</p>

VII-1. NOISE

Noise Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. EQAC recommends the County Executive and his staff continue to monitor the EIS for the FAA TRACON project.</p>	<p>In January 2003, DPZ received a copy of the Final Environmental Impact Statement for the Potomac Consolidated TRACON Airspace Redesign. DPZ will review the document and comment to the FAA as appropriate.</p>	<p>Staff should continue to monitor this issue.</p>	<p>In process.</p>
<p>2. EQAC recommends that the Fairfax County Executive and his staff should continue to monitor the MWAA quarterly reports and statistics to monitor trends associated with complaints, violations, and civil penalties.</p>	<p>While there is no formal review process for the quarterly monitoring reports from the Metropolitan Washington Airports Authority (MWAA), staff reviews these reports and coordinates with MWAA on an informal basis when questions arise. Data regarding complaints and violations are provided by MWA annually.</p>	<p>The current staff approach should continue.</p>	<p>Yes.</p>

VII-2. LIGHT POLLUTION

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. EQAC recommends that the Board of Supervisors direct DPZ to immediately correct the deficiencies in the draft revised ordinance to address lighting standards and practices in the County and the problems of light pollution.</p>	<p>Staff prepared and circulated a draft proposal in September 2002. As a result of received comments, staff revised the proposal and circulated a second draft in November 2002. After this, staff received additional comments and is considering additional changes.</p>	<p>The staff did incorporate additional changes that satisfied EQAC's concern and the Board of Supervisors did pass the revised ordinance.</p>	<p>Yes.</p>
<p>2. EQAC recommends that the Board of Supervisors direct that future lighting fixtures installed in the County follow the recommendation of the Illuminating Society of North America (light be directed down).</p>	<p>The Board of Supervisors, on January 24, 2000, approved changes to the Citizen Petition Street Light Program Policy to reduce light pollution from County streetlights. Under the changed policy, new streetlights will use "cutoff" optics that totally directs light downward. Efforts are continuing to amend the PFM to formalize the requirement that new streetlight installations have cutoff optics. Semi-cutoff cobra head fixtures may be used where cutoff installations are not economically practical to need lighting standards. However, since January 2000, it has not been necessary to install any new semi-cutoff cobra head fixtures. Based on this experience, DPWES will standardize all new cobra head streetlight installations with the cutoff optic system. A PFM amendment is in the approval process to formalize the requirements that all new cobra head streetlight installations be cutoff.</p>	<p>EQAC is pleased that the recommendations of the Illuminating Society of North American will be followed.</p>	<p>Yes.</p>

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>3. EQAC recommends that the Board of Supervisors direct that all older lighting fixtures under County control that do not meet the above standard be replaced on a phased basis.</p>	<p>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).</p>	<p>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.</p>	<p>No.</p>
<p>4. EQAC recommends that the Board of Supervisors work with VDOT and elected officials to replace existing roadway lighting fixtures (under the control of VDOT) with those in recommendation #3.</p>	<p>No response received from VDOT.</p>	<p>EQAC reiterates this recommendation.</p>	<p>No.</p>

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>5. EQAC recommends that the BOS direct the County Attorney to evaluate the feasibility of seeking a legal determination at the Virginia Supreme Court level of whether VDOT can be required to consider a County outdoor lighting ordinance in planning and implementing roadway lighting within the County.</p>	<p>The Environmental Coordinating Committee does not concur with this recommendation. The Supreme Court of Virginia will not give an advisory opinion on a matter when there is no case before it. However, Staff recommends that VDOT be requested to consider the County’s lighting ordinance in the planning and implementing roadway lighting within the County.</p>	<p>Since EQAC’s recommendation is not feasible, EQAC supports the staff recommendation in that VDOT be requested to consider the County’s lightening ordinance.</p>	<p>No further action needed.</p>
<p>6. EQAC recommends that the Board of Supervisors direct County staff to prepare brochures and information on a web site to promote public awareness of light issues. EQAC also recommends a brochure be prepared to help educate architects, contractors, electricians, and builders to what the County permits in the field of illumination.</p>	<p>Staff concurs with this recommendation and believes that public education of any new regulations is extremely critical. However, staff believes that development of such materials prior to adoption of new regulations in this area would be an inefficient use of staff’s time and resources.</p>	<p>After the staff response was prepared, the BOS passed the revised lightening ordinance. Staff followed up and prepared an outstanding brochure that covered both of EQAC’s recommended topics.</p>	<p>Yes.</p>

VII-3. VISUAL POLLUTION

Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. EQAC supports the recommendations made by the Fairfax County Task Force and recommends that the Board of Supervisors implement these recommendations.</p>	<p>The Sign Task Force report contained nine recommendations; four of which involved requests to amend the Virginia Code. The first recommendation concerned requesting an amendment to Va. Code Sec. 33.1-375.1 to modify the terms of an agreement that the County could enter into with the Commonwealth Transportation Commissioner to allow the County to enforce the limitations on illegal signs in the right-of-way. The BOS concurred with this recommendation and a bill was introduced into the General Assembly to make this modification. The other three recommendations to amendments to the Virginia Code were not supported by the BOS. The remaining recommendations are currently under staff review.</p>	<p>EQAC reiterates its support of the general premises underpinning the Task Force recommendations.</p>	<p>No.</p>

LAND USE AND TRANSPORTATION

Land Use and Transportation Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. Fairfax County has recognized the interrelationship of land use and transportation. This interrelationship should continue to be part of the planning and development process. Note should be taken here, however, to the concerns of EQAC with respect to air quality and water quality as they relate to this planning and development process.</p>	<p>This recommendation is in the process of being addressed through Comprehensive Plan implementation activities. However, additional actions can improve the Comprehensive Plan's implementation. Some examples are:</p> <ul style="list-style-type: none"> • To improve Transportation Demand Management efforts in order to reduce vehicle miles traveled per capita; • To improve coordination of development with the provision of additional regulatory tools such as adequate public facilities, impact fees, and transfer of development rights; • To significantly increase funding for transportation facilities through increased State support and other new sources of funding. 	<p>EQAC has again revised the Land Use and Transportation chapter in the 2003 Annual Report to reflect EQAC's continuing study in land use and transportation. The County needs to continue to look at land use practices and transportation strategies with the goal of reducing the current negative impacts we are seeing in air quality, water quality, and the increasing congestion on County roadways.</p>	<p>No, but the process has started.</p>
<p>2. EQAC recommends the County implement Comprehensive Plan guidance for the Tysons Corner Urban Center, the Reston-Herndon Area Suburban Center and Transit Station Areas, and the Merrifield Suburban Center.</p>	<p>Staff concurs with this recommendation and notes that this recommendation is in the process of being addressed through Comprehensive Plan implementation activities.</p>	<p>EQAC continues to recommend the implementation of the Comprehensive Plan guidance.</p>	<p>In process.</p>
<p>3. EQAC recommends that the Dulles Rapid Transit Project be implemented with an option that brings rail to Tysons Corner and rail to the Dulles Corridor as soon as possible.</p>	<p>This recommendation is being addressed. In October 2002, the BOS endorsed Option T6 as the Locally Preferred Alternative. This option brings Metrorail through Tysons Corner and the Dulles Corridor. In November 2002 WMATA approved this option, followed by approval in December 2002 by the Commonwealth Transportation Board. The County is working with the state to obtain necessary approvals and to construct this rail line as quickly as possible.</p>	<p>EQAC supports the County's efforts and notes that rail is essential to the implementation of the Tysons Corner Urban Center.</p>	<p>In process.</p>

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER I

WATER RESOURCES

I. 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, around 5,000 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 over 900 miles of perennial streams within Fairfax County fed by smaller intermittent headwater streams.

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 I-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 I-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) invertebrates (back-boneless) animals eat this organic matter. These include snails, clams, aquatic worms and crustaceans such as crayfish, but the most ecologically important are the aquatic insects 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. But an overabundance of either 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 uses 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 non-point 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 get deposited on 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

All major non-tidal 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 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 four components and a numeric ranking for overall quality was assigned (See Figures I-2 through I-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, stream morphology; and
- 4) Calculations of the overall percent impervious cover within each watershed based on upon available Fairfax County GIS data.

The County will continue long term monitoring of streams with a 5-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.)

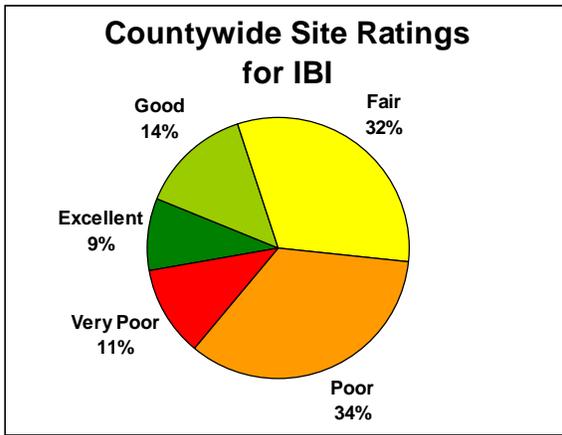


Figure I-2. Percentage of SPS monitoring sites scoring in each of the five IBI quality categories.

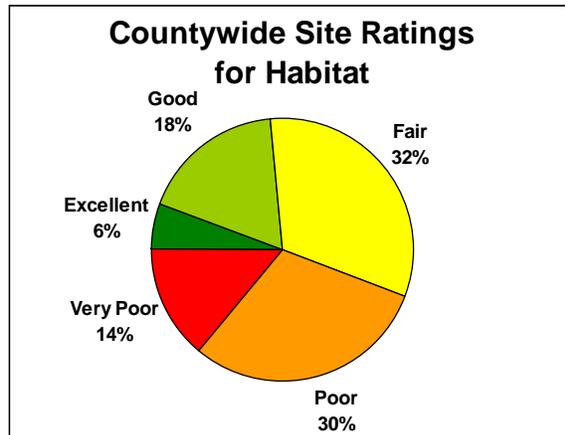


Figure I-3. Percentage of SPS monitoring sites scoring in each of the five Habitat quality categories.

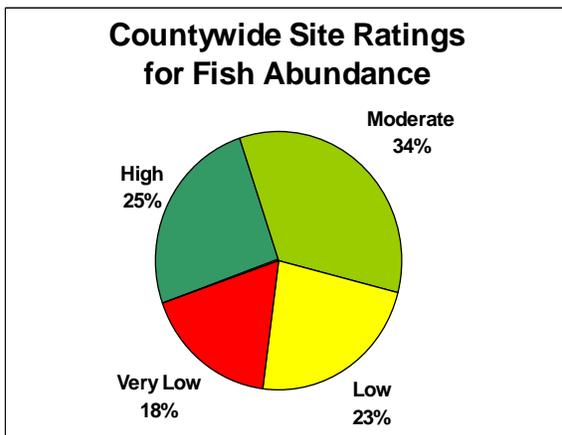


Figure I-4. Percentage of SPS monitoring sites scoring in each of the four Fish abundance categories.

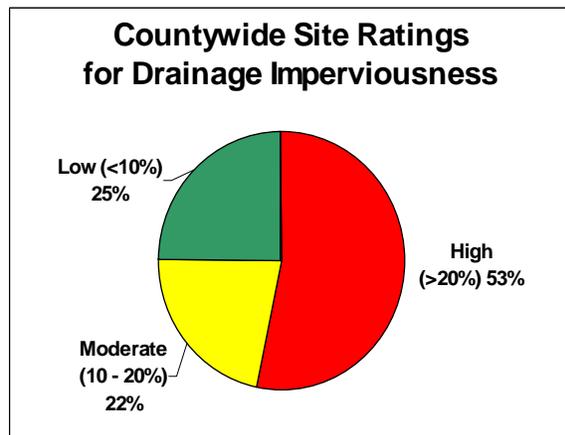


Figure I-5. Distribution of Imperviousness at SPS monitoring sites.

Source of Figures I-2 through I-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 I-6).

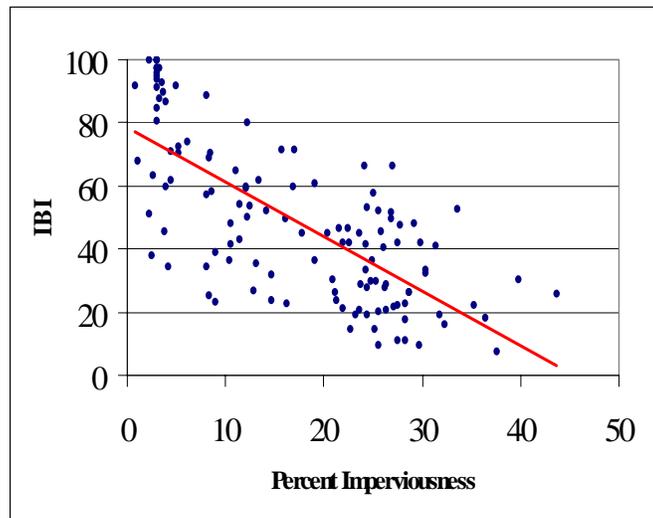


Figure I-6. Trend line indicating that Biological integrity, as measured by an Index of Biotic Integrity (IBI) for benthic macroinvertebrates, generally decreases with increasing percent imperviousness. Source: Fairfax County Department of Public Works and Environmental Services, *Fairfax County Stream 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.co.fairfax.va.us/gov/dpw/spss/homepage.htm>

v. 2001 Update on Countywide Stream Assessment

During 2002, the Stream Protection Strategy (SPS) program completed sampling at 43 randomly selected sites chosen from among the 125 monitoring locations established during the 1999 baseline study. The 11 reference sites within Prince William Forest Park have been, and will continue to be, monitored on an annual basis.

The report for 2002 should be available on line as data analysis is completed at:

http://www.co.fairfax.va.us/gov/DPWES/environmental/SPS_Main.htm.

Sample processing will be completed after the perennial stream mapping project is completed.

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 2002, 39 sites reported winter data, 38 reported in the spring, 63 in the summer, and 43 in the fall.

ii. Audubon Naturalist Society (ANS)

ANS also manages a volunteer water quality monitoring program in the region that currently includes 30 monitors in Fairfax, with an average of four monitors for each of the eight 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

Staff at several Park sites has worked with citizens on stream monitoring projects. Three nature centers and Lake Accotink Park are working to collect long term data at established monitoring points. The Park Authority has also recruited a volunteer to act as a Stream Cleanup Coordinator. This individual will work to organize stream clean-up events in non-staffed stream valley parks.

2. Fairfax County Health Department Water Quality Report

The Division of Environmental Health in the County Health Department produces the other comprehensive review of Fairfax County streams. In 2001, data were collected from 84 sampling sites throughout 25 of 30 watersheds in Fairfax County. A total of 1,434 stream samples were collected for analysis.

Nine site visits were made by the Health Department to investigate seven (7) stream complaints in 2002. Two (2) complaint dealt with dumping and trash in streams, two (2) dealt with possible sewer line breaks, two (2) with fish kills, and one (1) was related to a broken water main in the stream bed. The complaints were initially investigated by the Fairfax County Health Department and referred to the proper agency or resolved utilizing Health Department procedures and local ordinances.

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.co.fairfax.va.us/service/hd/strannualrpt.htm>.

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 I-16.

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 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° F (32° C).

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

f. Heavy Metal and Toxins

The presence of heavy metals in stream water indicates 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 recreation 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 is approaching and surpasses 1000 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 is 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. At present, 95 individuals and groups, representing more than 500 people, participate in the program. DPWES uses information from the Adopt-A-Stream program to help identify pollution sources.

4. Virginia Department of Environmental Quality (DEQ)

There are presently nineteen (19) sites in Fairfax County currently scheduled for inclusion in the Virginia Department of Environmental Quality monitoring, beginning July of 2003. Of these 19 stations, 13 are trend stations that will entail long term continued monitoring and six are watershed stations will be sampled for a two-year duration. There is one trend station located in each of the state-defined hydraulic units

in the County as well as tidal trend stations located in Potomac Embayment waters. 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 lies between 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 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)

UOSA is located in Centerville, VA 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 is 32 million gallons a day (mgd) and is being expanded to a capacity of 54 mgd. Completion of expansion is expected by late 2003. UOSA operates under a Virginia Pollutant Discharge Elimination System (VPDES) Permit. The permit limits and 2002 plant performance are listed in Table I-1.

Table I-1. UOSA Permit Requirements and 2002 Performance		
Parameter	Limit	Performance
Flow	32 mgd	24.5 mgd
Chemical oxygen demand	10.0 mg/l	3.6 mg/l
Turbidity	0.5 NTU	0.05 NTU
Total Suspended Solids	1.0 mg/l	0.05 mg/l
Total Phosphorus	0.1 mg/l	0.03 mg/l
Surfactants	0.1 mg/l	0.022 mg/l
Total Kjeldahl Nitrogen	1.0 mg/l	0.37 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 2002, both the plant maximum 30-day average flow and the annual average daily flows were below the design flow of 32 mgd. The maximum daily flow day during the months of April, August, and October through December, 2002

exceeded the plant capacity. The excess flows were diverted to the Equalization Retention Ponds and subsequently treated during days of lower flows. 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 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 the Fairfax County Water Authority 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 “health of the watershed in terms of nutrients, metals, pH, dissolved oxygen and temperature remains the same as previous years.” 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 their 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 3 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 2002.

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 I-2 presents the facility's performance and current effluent monthly limitations.

Table I-2. NMCPCP Permit Requirements and 2002 Performance		
Parameter	Limit	Performance
Flow	54 mgd	38.67 mgd
CBOD ₅	5 mg/l	< 2 mg/l
Suspended Solids	6 mg/l	1.4 mg/l
Total Phosphorus	0.18 mg/l	0.09 mg/l
Chlorine Residual	Non Detect	Non Detect
Dissolved Oxygen	6.0 mg/l (minimum)	8.7 mg/l
pH	6.0-9.0 (range)	7.0-7.4
Fecal Coliform Bacteria	200/100ml	< 1.40/100ml
Total Nitrogen	No Limit	< 17.5 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 2003. This includes process upgrades to remove ammonia to less than 1 mg/l and total nitrogen to less than 8 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 2002, 58,493 wet tons of sludge were generated and burned and 42 wet tons were sent off-site to the I-95 incinerator (in October).

5. Special Stream Reports and Programs

a. TMDLs (Total Maximum Daily Loads)

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 4 of this report, with Figure IV-2-1 (see page IV-26) 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.

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, 18% 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. A TMDL is a highly structured watershed-specific plan for bringing an impaired waterbody into compliance with the Clean Water Act goals. The implementation plan must be developed within two years of the EPA acceptance date and will focus on the reductions of fecal coliform bacteria from human and canine sources by 98 percent. A draft plan is expected by December, 2003 for review.

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.

iv. Licking Run and Cedar Run TMDL

The Virginia Department of Environmental and the Northern Virginia Regional Commission entered into agreement to develop TMDLs for bacteria in the Occoquan subsheds of Licking Run and Cedar Run by May 1, 2004.

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 2002, 15 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. Therefore, no stop work orders were issued to the developer during 2001. 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 the Fairfax County 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, white perch has remained dominant at steady levels over the period, suggesting a supportive environment. Bay anchovy and blueback herring composed 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 increase 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.

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. An additional chemical treatment was conducted on Lake Audubon to control hydrilla growth.

In addition, waterfowl management initiatives are on-going in an effort to curb the large Canada Goose population on the Reston lakes. In spring, 2002, goose nests were located and mapped and 127 eggs were added.

Lakes Audubon, Thoreau, and Newport were dredged in April-June, 2002. This contributed to increased sedimentation and lack of water clarity during the monitoring season.

Several shoreline and stream bank stabilization projects using biologs, erosion cloth, and plantings were conducted in 2002. Reston Association staff also installed several wetland meadows and areas of submerged aquatic vegetation to enhance fisheries habitat, improve water quality, and reestablish native vegetation in the lakes.

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 2002 monitoring was conducted six times (April through September) during the year by Aquatic Environment Consultants. Weather conditions for the 2002 season were dry and hot compared to the 2001 season. The relatively dry conditions throughout the latter months of summer are thought to have contributed to stagnant conditions and therefore increased algal blooms on some of the lakes. 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 of Lake Anne was not as affected by ambient temperatures as it has been in the past. The average lake temperature for 2001 was 23.1° C which is 3.8° C above the long term average of 19.3° C. The whole-lake pH levels were below the long-term mean. Blooms of green and blue-green algae occurred throughout the season. Reduced water clarity resulted. The largest green algal bloom ever sampled

occurred in September of 2002. These blooms resulted in high biomass (evidence of unicellular organisms present in the water) readings throughout the summer.

ii. Lake Audubon

The temperature/dissolved oxygen profile for Lake Audubon showed stratification after April (different “layers” of water had different DO and temperature readings). Water temperatures were similar to long-term averages. The pH levels were similar to previous averages. The green algae dominated the cooler waters in spring and dropped in numbers to be replaced by blue-green algae as water temperature rose. There was the largest blue-green algae bloom ever recorded in August.

iii. Lake Thoreau

Dissolved oxygen levels in certain “layers” of the lake decreased during summer months as early as May, 2002. The numbers of algae present were the lowest of any of the lakes in Reston. Blue-green algae and green algae were most prevalent from July and August and fell in September. Overall algal presence and biomass was the second lowest ever reported.

iv. Lake Newport

Water temperatures were similar to the 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 was the highest of any of the Reston lakes and was the second highest for this lake behind last year’s record. Blue-green and green algae were the most abundant types. There was an extremely large blue-green algae bloom in August. The populations of all algal groups, especially the blue-greens, contributed in 2001 to the highest density and second highest biomass since 1992. Seasonal density and biomass continued to exceed the long term averages.

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.

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. There are other significantly sized lakes within the County. Many are centered within developments and have dwellings built along the banks of the lakes.

5. Other Ponds and Lakes

There are 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 and 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 2002, the County continued to evaluate BMPs (best management practices), undertook several stream restoration projects, continued with the monitoring of dry weather outfalls, and inspected 1546 stormwater control facilities.

The 2002 Annual MS4 (Municipal Separate Storm Sewer System) Report was submitted 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. 18 potential facilities are in the final

design phase either as County managed projects or via developers through rezoning. 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 is presently in the implementation planning stage. 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.

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. This program has resulted in the planting of 30 ponds, with additional 10-15 pond plantings for 2002.

d. Stormwater Pond Retrofit to Shallow Marsh Wetlands

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.

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 1,049 stormwater management facilities. 939 on-site ponds, 33 regional ponds, 47 underground chambers, 29 percolation trenches, and one bioretention area. In 2002, the County inspected each facility at least once, mowed 802 dam embankments, and performed 228 maintenance work orders at 178 facilities.

There are 1,870 privately maintained facilities in the County: 223 wet ponds, 406 dry ponds, 75 sand filters, 38 manufactured BMPs, 321 percolation trenches, 320 roof top detention areas, 59 parking lot detention areas and 428 underground detention facilities. These facilities are inspected once every five years. A total of 497 such facilities were inspected in 2002.

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, 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
- 8) Enhanced education programs for citizens, staff and industry regarding E&S control.

Actions in 2002 to fulfill the recommendations include:

- 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 1-year storm was started in January, 2002.

F. NONPOINT SOURCE POLLUTION PROGRAMS

1. Chesapeake Bay Program and Agreements

The Chesapeake Bay Program (CBP) is a cooperative arrangement between 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 non-point 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 of the Chesapeake Bay Preservation Act and Regulations. The County has until December 31, 2003 to address the four consistency recommendations: 1) map of the County's Chesapeake Bay Preservation Area components-to be completed November 2003 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) develop 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 2002, 32 soil and water quality conservation plans were developed for 265 acres and included 5,475 linear feet of vegetated buffers in RPAs. Cumulatively, 8,859 acres and 234,288 linear feet of RPAs are covered by conservation plans 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 2002, the EFID recorded 1,530 Erosion and Sediment (E&S) control inspections per month. They also issued 17.5 Notices of Violation (NOVs) per month for violations of Chapter 104 of the *Fairfax County Code*. This represents a 43% decrease over last year's NOV rate. It is hypothesized that the extremely dry weather may have helped to lower the number of violations in 2002.

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.

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. These reviews are to have occurred in the summer and fall of 2003.

ii. Complaints

DCR received 12 complaints in Fairfax County since July 1, 2002, with all but three 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 for drinking water for much of Northern Virginia. With the release of the 2000 Census data, staff determined that there 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.

5. Soil and Water Conservation Technical Assistance

In calendar year 2002, NVSWCD:

- Reviewed and commented to DPWES on the erosion and sediment controls, water quality protection, and stormwater management aspects of 57 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 206 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 155 consultants, engineers, developers, realtors, and citizens.
- Provided land management assistance to individual homeowners and homeowner associations via 525 phone calls, e-mail or office visits, and 98 site visits. Solutions were recommended for drainage, erosion, and other natural resource problems.
- Provided technical advice to 35 pond owners.
- Provided design and installation expertise for a stream stabilization project at Accotink Creek, done in partnership with DPWES, FCPA, and the Virginia Department of Forestry (VDOF). This site is above a site stabilized the previous year, and included imbedding several large root wads, which were donated by a developer from a construction site.

- Designed three SWM pond retrofits for DPWES to provide extended detention, greater water quality improvement, and a more aesthetically pleasing and ecologically balanced environment.
- The *Enviroscape* watershed model was demonstrated ten times to 957 people who learned about watersheds and how man's activities on the land directly affect water quality in nearby lakes and streams.
- NVSWCD coordinated four community outreach programs that educated 3,127 homes 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 2002, NVSWCD distributed 4,176 brochures.

6. Stream Valley Reforestation

In 2002, the Virginia Department of Forestry partnered with volunteers from various organizations such as the Difficult Run Conservancy, the Potomac Conservancy, Timberline Corporation, George Mason University students, and NVSWCD to plant approximately 1,000 seedlings in riparian zones located in stream valleys throughout Fairfax County. Sites planted were at Lake Royal, Green Spring Village Retirement Community, Wolf Trap Run Stream Valley Park, and Difficult Run Stream Valley Park. A total of 110 volunteers helped with the plantings, which added about 500 feet of riparian buffer reforestation.

In partnership with the Potomac Conservancy, 200 live stakes were cut and installed along on 150 linear feet of riverbank on the Potomac River in Fairfax County.

7. Stream Bank and other Stabilization Projects

a. Accotink 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 for Accotink Watershed.

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 have been adversely affected and 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.

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.

8. Septic 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. Approximately 300 new septic systems were constructed in 2002. There were 744 Septic Tank Repair Permits issues in 2002. Repairs ranged from total replacement of the system to minor repairs such as broken piping. There were 661 Septic Repair Permit Approval in 2001. Areas of marginal or highly variable soil remain a concern for future failing septic systems. Fairfax County currently has no enforced septic system inspection requirements.

G. PERENNIAL STREAM MAPPING PROJECT

A perennial stream project to field identify perennial streams was initiated in September of 2001 in response to Fairfax County Board of Supervisor's direction as a result of an Environmental Quality Advisory Council (EQAC) resolution relating to the mapping and protection of additional stream segments under the Chesapeake Bay Ordinance within the County. 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 will be completed by November 2003 and will serve as the basis for delineating perennial stream segments for buffers as required by the Chesapeake Bay Preservation Act Ordinance requirements.

H. WATERSHED 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. A review of the Watershed Planning Process was presented with time for citizen input and group discussions at the end. Those comments were considered as the County began its Watershed Planning.

The field work to assess 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.

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. The Fairfax County Water Authority (FCWA) 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.

With the exception of some wells, prior to use the water must be treated. The Authority's water intake increased to 52.61 billion gallons in 2002.

<u>Sources</u>	<u>Gallons (in billions)</u>
Occoquan Reservoir (Lorton/Occoquan)	21.28
Potomac (Corbalis)	31.04
Wells	0.03
Purchased	0.05
Untreated	0.22
TOTAL	52.61

Source: Fairfax County Water Authority

1. Wells

a. Fairfax County Water Authority and Public Wells

In 2002, FCWA maintained five (5) wells and their two (2) distribution systems that 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 2001, three of the wells exceeded the Secondary Maximum Contaminant Level (SMCL) for odor, one exceeded the SMCL for pH, and two wells for color. These are non-enforceable limits relating to the aesthetic quality of drinking water.

Three of the five wells were taken out of service when water mains from the surface distribution system were put into service.

During quarterly monitoring in 2001, two (2) wells showed trace levels of VOCs. The monitoring results on wells met the Virginia Department of Health Water Works Regulations.

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.

b. Private Wells

There are approximately 12,000 single family residences that are served by individual well water supplies in Fairfax County. In 2002, 153 New Well Permits were issued for single family residences and 75 for non-community well water supplies. There were 344 wells closed in 2002.

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 2002 distribution system running quarterly averages were below the Maximum Contaminant Levels (MCL) for total trihalomethanes (TTHM) of 100 µg/L. The 2002 running quarterly averages for TTHMs were 23 µg/L and 44 µg/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 (HAA) will be regulated a level of 60 µg/L. Preliminary testing indicates that the FCWA will be able to meet these guidelines. The rule also sets a Maximum Residual Disinfectant Level (MRDL) for chlorine of 4 µg/L. FCWA is presently testing for these chemicals in the water treatment systems. To obtain lower TTHM (total THM) concentrations, the new facilities for ozonation are being constructed at the Corbalis and Lorton facility.

Stage 2 (Long Term) is scheduled by EPA to be finalized by July 2003 and will regulate THM and HAAs based on locational running average; monitoring and compliance requirements and enhanced coagulation.

d. Heavy Metals

FCWA 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 continue to be below their MCL or SMCL. “The concentration levels for the unregulated metals were within an expected range.”

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 first 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.

f. Other Monitoring Programs

The Water Authority monitored 3,297 distribution taps for total coliform bacteria in 2001. Each month’s compliance report was within the regulatory limits for the Virginia Department of Health and the EPA’s Total Coliform Rule.

During 2002, the FCWA 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). In some parts of the U.S., MtBE has been detectable in high amounts in source waters. In 2002, monitoring of the FCWA well systems has resulted in non-detectable levels, and surface system monitoring has shown only trace amounts in the raw and unfinished 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)

During 2002, FCWA 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.

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. Residuals generated at Corbalis are presently being applied by contract to agricultural lands in Maryland and Virginia. The FCWA 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. FCWA customers received their first annual CCR in the summer of 1999. The 2002 Water Quality Report is available for review on the FCWA Web site at <http://www.fcwa.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, which supply public tap water, inventory contaminants, and assess water system susceptibility to contamination. The Water Authority, 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.fcwa.org>.

4. Facilities Management

a. New Treatment Plant in Lorton

The FCWA 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 77% completed as of June, 2003. The plant is scheduled for completion in January, 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 the Fairfax County Water Authority, 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.

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 County Water Authority 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. There were significant releases of water from upstream storage facilities for drinking water purposes during the drought of 2002, and the river level reached a recorded low at the Little Falls gauging station of 167 mgd, after the upstream water withdrawals.

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 sections 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 has until December, 2003 to submit its revised Chesapeake Bay Protection Ordinance to CBLAB. As noted earlier in this chapter, the Board of Supervisors adopted a revised Ordinance on July 7, 2003.

2. Amendments to the Policy Plan

In September, 2002, the Board of Supervisors adopted a Plan Amendment to revise criteria that are used to evaluate residential development proposals. This amendment includes a heightened emphasis on environmental protection, including stormwater management. The following text was added:

WATER QUALITY: 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.

DRAINAGE: 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.

L. SUMMARY

Fairfax County streams and watersheds continue to be impacted by four basic problems. First is the failure of comprehensive land use planning and site design over time to adequately incorporate watershed and stream protection requirements into their decisions and to consider the cumulative effects of land use decisions on Fairfax County's streams.

Secondly, at times, high levels of fecal coliform bacteria occur in specific streams throughout the County.

Thirdly, stormwater runoff and erosion continue to be the largest problems within Fairfax County streams. 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 those in E. C. Lawrence Park, remain undisturbed and excellent examples of healthy streams in Fairfax County.

Lastly, there is no one component of the Fairfax County government responsible for the management and protection of the County's streams or environment. County stream assessment and protection have been parceled out to various agencies. Conflicting results have occurred as stormwater management strategies and policies have conflicted with waivers granted by other departments, often resulting in degraded stream habitat. 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.

Some very positive steps have been taken in the past two years to address these chronic long-term problems:

- 1) 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 move towards more coordinated efforts.
- 2) The Fairfax Stream Protection Strategy Baseline Assessment in 2000, the amendment to the Policy Plan to address stream protection, passed in October 2000, and the recommendations of the Infill Report on Stormwater Management in 2000 are significant first steps in addressing many of these issues.
- 3) The initiation and funding of the Watershed Management Planning efforts and the Perennial Stream Mapping Project in the Stormwater Planning Division are important and necessary first steps in good watershed protection and management.

All of these efforts indicate a significant change in County policy and practice towards the protection and restoration of County streams.

M. RECOMMENDATIONS

1. 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) develop a method 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.

2. 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 and ongoing assessments of existing watersheds, to include point and non-point sources, including amounts of impervious surface and vegetative cover;
 - b) Maintenance of inspection and maintenance 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).
3. EQAC continues to recommend the funding of the Stormwater Utility Program/Watershed Protection and Restoration Program.

This program should include the following conditions:

- 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 used in the County.
4. EQAC continues to recommends 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”*.

5. 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 structure and requirements are effective and working well in what conditions in Fairfax County. The continued granting of stormwater waivers would appear to further degrade streams in spite of claims to the contrary. However there are no data to support either side of the argument other than the fact that streams continue to be degraded. Data should be collected.

6. In addition to collecting data on the effectiveness of stormwater management structures, EQAC recommends that increased emphasis be placed on monitoring and enforcement of predevelopment stormwater management controls.

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 to 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.

LIST OF REFERENCES

2002 Stream Water Quality Report, Division of Environmental Health, Fairfax County Health Department

2002 Annual MS4 (Multiple Separate Storm Sewer System) Report for Fairfax County

Audubon Naturalist Society Water Quality Monitoring Brochure

Audubon Naturalist Society Water Quality Monitoring Program Report, Cliff Fairweather, ANS Water Quality Coordinator, October 15, 2002

Bacteria Source Tracking and TMDL Development in Accotink Creek, Douglas Moyer & Kenneth Hyer, U.S. Geological Survey, Richmond, VA

Biology (Fifth Edition), Helena Curtis, 1989, Worth Publishers, Inc.

Department of Environmental Programs, Metropolitan Council of Governments, response to EQAC request for information, Jim Shell, Principal Water Resources Planner, June 30, 2003

Ecological Study of Gunston Cove, Departments of Environmental Science and Policy, and Biology, George Mason University, R. Christian Jones and Donald P. Kelso, Final Report, April 30, 2003.

Estimating Nonpoint Fecal Coliform Sources in Northern Virginia's Four Mile Run Watershed. George Simmons, Donald Way, Sue Herbein, Sharon Myers and Ellen Walker

Fairfax County Agency Responses to the EQAC Recommendations Contained in the 2002 Annual Report on the Environment, Anthony Griffin, County Executive, March 27, 2003

Fairfax County Coordinating Committee Report, February 4, 2002, *Status of Total Maximum Daily Load (TMDL) for Accotink Creek.*

Fairfax County Environmental Coordinating Committee, Regional Pond Subcommittee Report, March 2003

Fairfax County Department of Health, Division of Environmental Health, Gloria Addo-Ayensu, Acting Director, memo, June 12, 2003

Fairfax County Department of Public Works and Environmental Services, Stormwater Planning Division, Fred Rose, Chief, Perennial Streams Mapping Project Report, 2003

Fairfax County. Department of Planning and Zoning, Input to EQAC 2003 Report, 2003

Fairfax County Department of Public Works and Environmental Services, Stormwater Planning Division, Input to EQAC 2003 Report, August 2003

Fairfax County Department of Public Works and Environmental Services, Wastewater Planning and Monitoring Division, Elaine Schaeffer, Director, Report on Noman M. Cole Plant, 2002

Fairfax County Department of Public Works and Environmental Health, Maintenance and Stormwater Management Division, response to EQAC Request for information, Scott St. Clair, Director, July 18, 2003

Fairfax County Department of Public Works and Environmental Services, Environmental and Facilities Inspections Division (EFID) information regarding Erosion and Sedimentation Control Enforcement, August, 2003

Fairfax County Park Authority, Response to Request for information, Michael Kane, Director, June 20, 2003

Fairfax County Stream Protection Strategy Program Reports, December, 2000 and January 2001

Fairfax County Water Authority Report, Charlie Crowder, General Manager, June 20, 2003

Infill & Residential Development Study, 2000, Department of Planning and Zoning, Department of Public Works and Environmental Services, Department of Transportation

Interstate Commission on the Potomac River Basin, Eric Hagen, CO-OP Operations Manager, Memo, July 3, 2003

Metropolitan Washington Water Supply and Drought Awareness Response Plan: Potomac River System, Washington Council of Governments Board Task Force on Regional Water Supply, Updated May 2, 2001

Metropolitan Washington Council of Governments documents: Regional Wise Water Use Campaign, Water Resources Technical Committee Reports, Chesapeake Bay Policy Committee, Potomac River Submerged aquatic vegetation, Jim Shell, Principal Water Resources Planner, June 30, 2003

Northern Virginia Regional Commission Report, *Fecal Coliform TMDL (Total Maximum Daily Load) Development for Four Mile Run, Virginia*, Northern Virginia Regional Commission, February 15, 2002

Fulfilling the Promise: The Occoquan Watershed in the New Millennium (Task Force Recommendations), January 27, 2003

Northern Virginia Regional Commission 2003 Update, Northern Virginia Regional Commission, 2003

Northern Virginia Regional Park Authority, EQAC Update, Gary N. Fenton, Executive Director, June 25, 2003

Northern Virginia Soil and Water Conservation District Response to Information Request for EQAC 2003 Annual Report, Diane Hoffman, Executive Director, October 20, 2003

Reston Association EQAC Water Resources Update, Diana Saccone, Watershed Manager, Reston Association and *2003 Reston Lakes Monitoring Synopsis*, Bill Kirkpatrick and Kevin Laite, Aquatic Environment Consultants.

U.S. Geological Survey Office of Groundwater, US Department of the Interior

Upper Occoquan Sewage Authority (UOSA) Report, James Bennet, Director, June 19, 2003

Virginia Department of Conservation and Recreation, Division of Soil and Water, Information for the 2003 Annual Report

Virginia Department of Environmental Quality email, Chesapeake Bay Program, John Kennedy

Virginia Department of Environmental Quality, Northern Virginia Regional Office, John Bowden, Director, Response to request, June 18, 2003

Virginia Department of Forestry Contribution to the Fairfax County Annual 2002 Report on the Environment, Judy Okay

Wetland Habitats, Dave Brown and John Coleman, Maintenance and Stormwater Management Division, Department of Public Works and Environmental Services.

OTHER DATA

Data from the US Geological Survey Report on Aquatic Vegetation in the Potomac 2000, Nancy Rybicki, and the 2000 Potomac Aquatic Plant Control Program Summary Report, (Potomac Aquatic Plant Management Committee, Washington Council of Governments, June 25, 2001) will be incorporated into a new Potomac section in the 2004 Annual Report on the Environment).

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER II

AIR

QUALITY

II. AIR QUALITY

A. ISSUES AND OVERVIEW

1. Introduction

After more than three years of expressing increasingly focused concern about air quality management in Fairfax County, the past year saw 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 is encouraged by this progress but 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 not yet sufficiently capable of addressing the issues that need to be addressed. More importantly, 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.

During the past year, we have noted for the first time that the Annual Air Quality Report produced by the Health Department was not generated in a timely manner, complicating our efforts to generate this annual report. 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 (“MWCOCG” 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. NO_x SIP Call

The so-called NO_x SIP Call continues to move forward, consistent with our descriptions over the past three years in previous Annual Reports. The implementation dates apparently remain the same for this year as for last although we have not been able to absolutely verify that.¹ 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 NO_x for Fairfax County as a result. These NO_x reductions will be absolutely vital to our ability to demonstrate SIP-Planning that is acceptable to the Environmental Protection Agency (“EPA”). More important, actual reductions in the metropolitan area along with reductions of transported NO_x will be critical to attaining the standard during the next three ozone seasons.

A primary concern that we have with the NO_x 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 NO_x in this area as a result of decisions to purchase emission reduction allowances outside of the Washington Metropolitan air shed.² A particular concern for the Washington area is the Potomac River Generating Plant in Alexandria. We are generally aware that concerns about this plant have apparently already been expressed, but we remain concerned that the situation appears to be unresolved.³ While we do not possess detailed information on the Potomac River Generating Plant, we strongly suggest a close look be taken at the effects of that plant as they relate to the production of NO_x in the Washington Metropolitan Area.

Although it should not theoretically have any direct impact on the overall effect of the NO_x 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 NO_x at some coal burning facilities in the future.⁴

¹ The 2002 ARE referenced implementation dates of 2003 for Northern Virginia, as well as the Washington Metropolitan Area, and 2004 for the rest of Virginia.

² Three of these plants are in Maryland (Morgentown, Chalk Point, and Dickerson) and one is in Virginia (the Potomac River Generating Plant in Alexandria).

³ The sharing of correspondence, concerns, or factual information on this issue is encouraged. We understand that options may be limited, but this is precisely the type of issue where coordination and communication are essential in first of all identifying a problem and secondly in dealing with it. At this stage of the game, any major source of emissions affecting the formation of ozone in the metropolitan area should be on the table for discussion, particularly if it resides in Northern Virginia.

⁴ NSR notwithstanding, the NO_x SIP Call mandates the achievement of fixed statewide NO_x 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 this 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. The focus of current SIP-Planning on attainment of the one-hour standard and the absorption of most the energies of the County and the COG on that subject, as we have stated before, is literally just the tip of the iceberg. 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.

A concern that we have not expressed before, but one that we also have, has to do with the Particulate Matter National Ambient Air Quality Standard (“PM NAAQS” or “NAAQS”). In August of 2003, EPA released a Staff Paper and Risk Assessment addressing the new PM_{2.5} standard and establishing ranges, that if enacted, would clearly put the County into non-attainment of this NAAQS, as well as the ozone NAAQS.⁵

Meanwhile, as if to underscore all of this, the County in 2002 once again had exceedances of both the one-hour and the eight-hour standard⁶, in both cases substantially exceeding those in 2001. Admittedly, 2002 was a bad ozone season, but 2003, which should not have been a particularly bad season, saw violations similar to those in 2001.⁷ 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

Although they theoretically still exist, the Phase II Attainment Plan activities have largely been overtaken by Severe Area SIP planning, which became necessary as a result of the Earth Justice Legal Defense Fund (Sierra Club) lawsuit. Conditional approval of the Metropolitan Washington Area SIP was granted by EPA on April 17, 2003. That conditional approval is dependent upon the completion of a series of activities and commitments, including the adoption of Virginia state regulations necessary to meet Clean Air Act (“CAA”) § 182(d) requirements for severe non-attainment areas, the revision and submission of an updated attainment

⁵ We have further concerns with the release on November 5, 2003 of an EPA proposed rule describing transportation conformity rule amendments for the new eight-hour ozone and PM_{2.5} NAAQS. These concerns are discussed in the Conformity section, below, but they are also consistent with our previous observations and expressions of concern about the changing regulatory landscape that affects all of these issues and specifically whether the County has positioned itself to stay on top of all of this.

⁶ 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.

⁷ The number of exceedances in 2003 (3) actually exceeded the number in 2001 (1). For details on the violations, see section 2 (c), below.

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.

In developing this SIP, the Metropolitan Washington Air Quality Committee (“MWAQC”) has 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 by November 15, 2005.⁸ These control measures are dependent upon the successful completion of a series of regulatory activities, including the regulation of point sources (including transported NO_x), area sources, mobile sources, consumer products, and a complex series of other reductions that experience tells us are bound to be resisted by certain manufacturers and others affected by the rules.⁹ Timing is now super-critical for the development of these regulations and yet we have been told that in some cases we may not have the VOC reductions necessary to comply with the requirements of the Clean Air Act.¹⁰

We do understand that Fairfax County has stepped forward to make helpful suggestions that should result in further VOC reductions and we commend the County for their involvement in this exercise. We should note, however, that if the County had listened more intently to our recommendations beginning more than three years ago, they would be in a much better position than they are today to address these problems.

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. When EPA reclassified the Washington Metropolitan area to “severe” non-attainment status for ozone on January 24, 2003, that determination overtook the conformity planning activities that had until then been associated with Phase II Attainment Planning.

⁸ The details of this SIP, such as they are can be reviewed on the COG Web site at www.mwcog.org/environment/air.

⁹ As they are structured at the writing of this report, these requirements are broken into four categories, including point source measures, area source measures, on-road measures and non-road measures, with all categories addressing the production of both NO_x and VOCs.

¹⁰ There are several examples that could be cited here. EQAC is particularly concerned about the assumptions associated with the NO_x RACT and Regional NO_x Transport reductions (280 tons/day in 2005), the various Ozone Transport Commission (“OTC”) rule reductions, the issue of open burning and whether it can be regulated and the mobile source reductions (for which numbers have not even yet been established!) Readers interested in this issue are encouraged to visit the COG Web site and make note of these evolving nature of the measures that have been identified.

Our conformity status has now been subsumed in the Severe Area SIP planning exercise mandating that all of the requirements of the conditional approval be met by April 17, 2004. As discussed above, those requirements include the submission of all severe non-attainment area SIP requirements missing from the 2005 attainment demonstration as well as the necessary amendments to the 1996-1999 rate of progress (“ROP”) Plan that EPA conditionally approved on April 17, 2003 (68 FR 19106). We understand that the state of Virginia has committed to fulfill all of the requirements of the conditionally approved SIP by the April 17, 2004 deadline, including revising the attainment demonstration motor vehicle emissions budgets using the EPA MOBILE6 Model. The State of Virginia has also submitted revisions to the SIP containing new MOBILE6-based 2005 attainment motor vehicle emissions budgets on August 19, 2003 and has also submitted ROP Plans for 2002 and 2005, and EPA is currently taking comments on the adequacy of all of these budgets. Nevertheless, consistent with our comments above, we remain extremely concerned about all of the inter-dependent activities that these planning assumptions are built on.

As if to complicate this situation further, the EPA has just proposed a rule to amend the transportation conformity rule to include criteria and procedures for the new eight-hour ozone and fine particulate matter (PM_{2.5}) NAAQS. This proposal provides guidance for the application of conformity in areas that will be designated as non-attainment for these two standards and as things stand now, we can expect that Fairfax County will be in non-compliance for both standards.

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 ozone. 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 µg/m³ and, although compliance 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 2001

Attainment of the ozone standard in the Metropolitan Washington, D.C. area will require three years with no ozone exceedances. An exceedant day (for the one-hour standard) occurs when an ozone-monitoring site exceeds the NAAQS of 0.12 ppm for at least one hour. In 2002 there were eight ozone exceedant days of the one-hour standard in the metropolitan air quality region and five exceedant days in

Fairfax County.¹¹ On the five days of exceedances in Fairfax, there were a total of 11 monitors that showed those exceedances in five different locations.¹²

With respect to the eight-hour standard, the County Health Department has shared preliminary data with us reflecting 230 monitored violations over a total of 38 days during the 2002 ozone season. Although we've not seen any data, we've been told that there were 19 violations of the eight-hour standard in Fairfax County during 2002. The State of Virginia, on the other hand, reflects 73 violations in Fairfax County at the same five monitors as for the one-hour standard.

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 three exceedances at two different sites, which is serious cause for concern given what many considered to be a much easier ozone season. Again, the state data disclose other violations at other monitors not accounted for by the County. In 2002, there were 12 Code Red days (Unhealthy for all citizens) and three Code Orange days (unhealthy for sensitive groups). To summarize, 2001 data showed a reversal of the downward trend in unhealthful days for the first time in several years, and 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. All

¹¹ 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.

¹² We are unable to provide references to the actual data this year, since it has yet not been made available "officially". If you discount the Franconia station, as the County apparently does, there were four days of violations with a total of 7 monitored incidents at four different locations. We are unable to cross-reference the state data in a consistent manner, since that data is aggregated by monitoring site without reference to dates. We do know that the state reflected 11 violations at five sites, only one of which overlapped with the County (Mount Vernon). It would therefore appear that if you combined the entire state data set with that of the County, there would be several more violations than in either case alone.

of this gives little cause for comfort in the face of the sanguine attitude of the County that all will be well by November 15, 2005.¹³

Table II-1 Regional Ozone Exceedances, 2002		
Date	Location	Maximum One-Hour Ozone (ppm)
June 10	McMillan, DC	0.125
June 11	McMillan, DC	0.126
June 12	McMillan, DC	0.151
	River Terrace, DC	0.140
	Takoma School, DC	0.138
	Alexandria City, VA	0.143
	Arlington, VA	0.150
	Franconia, VA*	0.126
July 2	McMillan, DC	0.143
	River Terrace, DC	0.151
	Alexandria City, VA	0.145
	Arlington, VA	0.151
	Franconia, VA*	0.137
	Mason Gov't. Center, VA*	0.139
	Mount Vernon, VA*	0.145
August 2	McMillan, DC	0.125
	Alexandria City, VA	0.127
	Cub Run, VA*	0.149
	Franconia, VA*	0.129
	Lewinsville, VA*	0.131
	Mason Gov't. Center, VA*	0.137
August 3	McMillan, DC	0.126
August 12	Arlington, VA	0.131
	Mount Vernon, VA*	0.130
August 13	Greenbelt, MD	0.132
	Franconia, VA*	0.148
	Mount Vernon, VA*	0.153
	Stafford, VA	0.149
September 10	Ashburn, VA	0.132
	Long Park, VA	0.129

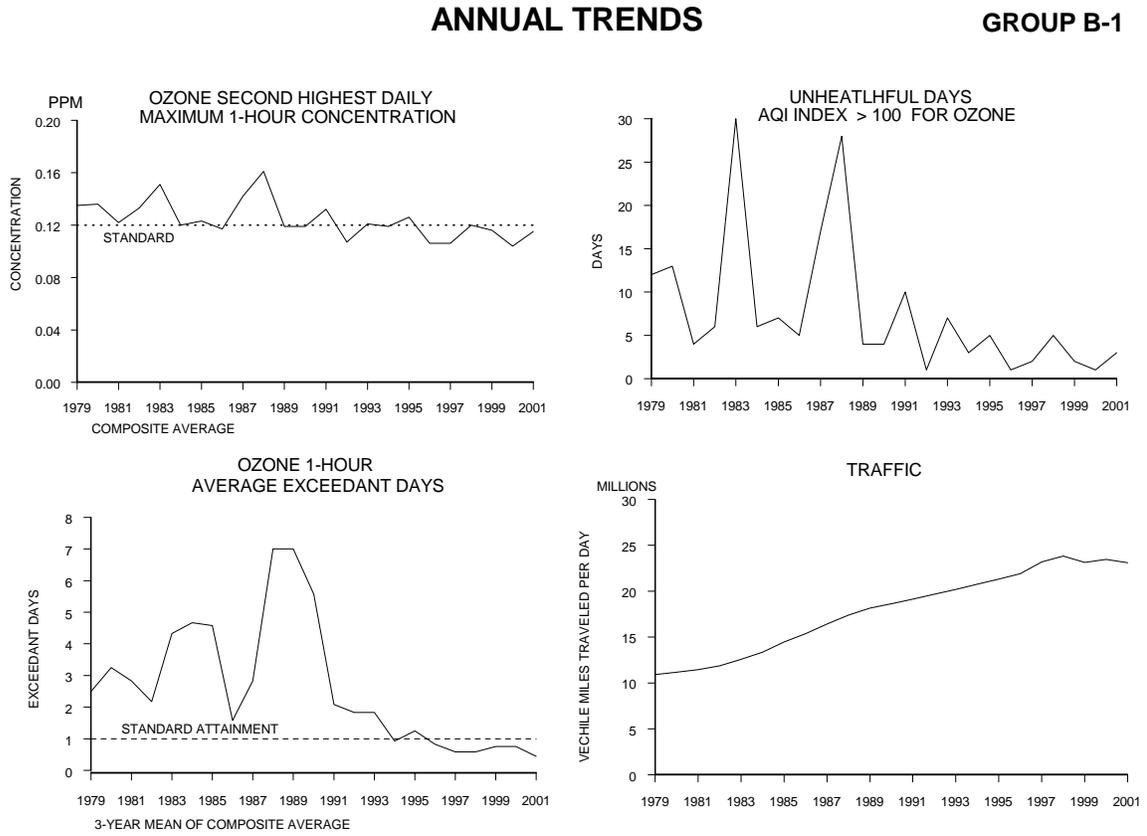
*Fairfax County Monitoring Station
Source: Fairfax County Department of Health

¹³ The Trend Analysis Charts that we've included with this Annual Report are the same as we included last year, since, as mentioned before, the Health Department has not been able to update this information in 2003.

Table II-2 Regional Ozone Exceedances, 2002, Eight Hour Average		
Date	Number of Stations that Exceeded the Standard	Maximum Value in the Metropolitan Statistical Area; Maximum 8-Hour Ozone (ppm)
June 5	1	0.091
June 10	13	0.109
June 11	13	0.100
June 21	2	0.094
June 22	4	0.108
June 24	12	0.111
June 25	13	0.120
June 30	1	0.087
July 1	7	0.100
July 2	15	0.134
July 3	7	0.102
July 4	2	0.089
July 8	3	0.094
July 9	8	0.099
July 12	5	0.095
July 16	3	0.091
July 17	1	0.100
July 18	12	0.100
July 19	2	0.092

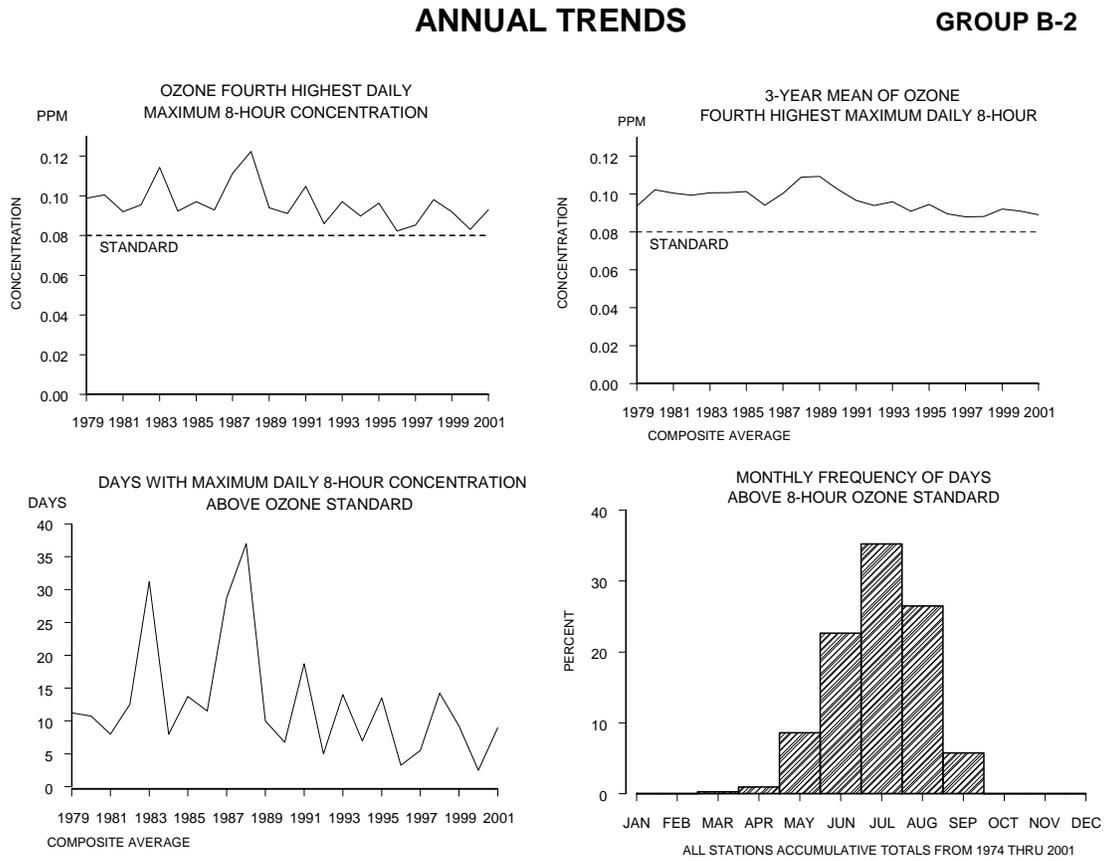
Source: Fairfax County Department of Health

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. Although the MWAQC is technically a different body than the TPB, the members of each body are virtually identical. 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.

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 projects which will contribute to transportation demands, including help in determining if a project will contribute emissions which exceed the region's target volatile organic compounds (VOCs) and nitrogen oxides (NOx).

In the past year, the TPB, which is the designated MPO for the region, has also been actively involved in addressing the conformity issue. The Air Quality Conformity Determination, which was released in October, 2000, is a key document related to conformity analysis that has been produced by the TPB. It is also the TPB that has convened the task force that is attempting to resolve the NOx shortfall that currently plagues the region as well as Fairfax County.

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. This Division also represents the County in its interactions with MWAQC. 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.

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 90s 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

Having failed to attain the federal NAAQS for ozone again in 2002, the County continues to sail uncharted waters in its air quality planning adventures. In response to our recommendation last year 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 planner in the Health Department, as we recommended last year. For the moment, we will defer to the decision of the County and do everything we 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 three years that the complex nature of regional air quality planning needs is

such that the County needs independent, timely, and expert advice 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.

As we indicated was likely to occur last year, Conformity Planning and the Phase II planning activities have all been subsumed by the Severe Area SIP Planning exercise. 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. LEGISLATIVE UPDATE

1. Summary of Air Quality Laws Enacted by the Virginia General Assembly

Given the excessive amount of time that it took to plan for and prepare the Annual Report this year, we were not able to undertake a detailed review of legislation in the 2003 General Assembly bearing directly on the subject of air quality.

E. 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, at about the time that we released our last 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 the County has developed its own approach to air quality, following discussions with MWAQC, that are focused on the development

of an Air Quality Subcommittee designed to develop recommendations for the ECC on local and regional air quality issues.

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) reduction ideas, particularly in the context of ozone action day events. These efforts also seem to be paying some dividends in terms of helping develop 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, until we feel more comfortable with the approach of the County in sidestepping our recommendations on full-time air quality planning capability, we welcome the opportunity to be as interactive as possible with the Air Quality Subcommittee and its activities. We have watched those activities to the extent that we have been allowed to as they have evolved and have several concerns and observations regarding that process.

In general, we have a basic concern that the approach of the County is too lockstep and ponderous and risks being too late in identifying activities and efforts that may truly be able to make a difference. 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. This will inevitably involve some thinking out of the box that is not likely to occur in the context of 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 NO_x SIP call aside, it appears that, based on information we have received in the recent past, that we have our own NO_x 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.

F. 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 rejected our suggested approach to staffing up for air quality management and planning purposes and have decided to pursue their own path on this subject. We are eager to interact with the County in whatever way we can to be most helpful and will remain available to do whenever possible. Until we see how things play out over the next two years, we will focus our recommendations on staffing levels in the Health Department. Meanwhile, we recommend close coordination and communication between EQAC and the County on immediate activities necessary to comply with the ozone standard in 2004 and on into the future.

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, (draft SIP with other relevant information available at the MWCOC 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.

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER III

**ECOLOGICAL
RESOURCES**

III. 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 as a result of development (residential housing and commercial) 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 228,242 acres of land, excluding areas in roads, water, or small areas of land unable to be zoned or developed. Of this total, about 27,200 acres (11.9%) are in parks and recreation as of January, 2002. Another approximately 27,700 acres (12.1%) are vacant or in natural uses. However, this acreage cannot 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 the land that is vacant 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.

EQAC commends Fairfax ReLeaf, and their volunteers, in their reforestation efforts. EQAC also commends the Fairfax County Park Authority staff in their efforts toward a building a Baseline Natural Resource Inventory. EQAC supports the Fairfax County Park Authority in their work toward a Natural Resource

Management Plan (but urges the Park Authority to put a higher priority on finalizing this plan).

EQAC also commends the Northern Virginia Soil and Water Conservation District and the Virginia Department of Forestry for their leadership in a number of activities that will lead to better management of storm water and protection of stream valleys. Additionally, EQAC commends the Northern Virginia Conservation Trust for pursuing and obtaining easements on privately owned environmentally sensitive land.

B. PROGRAMS, PROJECTS, AND ANALYSES

1. 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 environmentally sensitive areas such as forests and stream valley lands.

a. Acquisition of Park Land by FCPA

The FCPA added approximately 1,551 acres in FY 2002. The transfer of open space land from the Board of Supervisors accounted for 1,194 of these acres. Much of the land from the Board of Supervisors was RPA dedications to the County, but also included were the transfer of deeds to several larger parcels such as Scott's Run Nature Preserve. With these 1,551 acres FCPA land holdings now total 21,615 acres at the end of 2002.

In 2003 (to July 2003), FCPA has added an additional 928 acres. These include an 18-acre addition to the Popes Head Estates Assemblage as well as additions to the Accotink Stream Valley Park and the Laurel Hill property.

b. Green Infrastructure/GIS Mapping

The Fairfax County Park Authority staff continues to develop a Natural Resource Inventory for the County's park system. In the past, a partial attempt at building a Countywide Baseline Natural Resource Inventory was done by the Ecological Resources Inventory Committee (ERIC). Unfortunately, sufficient funding was not furnished to compete this task and the partially complete ERIC database languished. Eventually, with changes in computer hardware and software, this database became unusable. Fairfax County, however, did not approve previous budget requests to convert the ERIC data to a GIS-compatible format. The Park Authority believes that it

would be better to generate new inventory data in a GIS-compatible format since the most recent ERIC data is now a decade old. EQAC is unconvinced that throwing out the ERIC data is wise.

However, progress has been made in that the FCPA has developed a modeling tool to identify significant natural and heritage resource areas for the Park Authority's resource protection and management efforts. Using the County's geographic information system (GIS), FCPA has produced a countywide map of "Green Infrastructure" based on a weighted analysis of significant environmental and historic features.

FCPA evaluated hydrology, tree cover, Chesapeake Bay Resource Protection Areas, wetlands, hydric soils, and unusual biological habitat as part of the natural resource analysis. The Park Authority also considered archaeological sites, County historic districts, and historic sites in the heritage resources evaluation. Proximity to existing parkland, other public lands, and open space was also factored into the analysis.

This Countywide Green Infrastructure Map appears to be a basis for the Natural Resource Inventory that EQAC has been recommending. However, it appears that this is more of a general tool rather than an actual resource inventory that includes flora and fauna. EQAC therefore continues to recommend that Fairfax County develop a Countywide Baseline Natural Resource Inventory to provide the detailed information to go along with the Countywide Green Infrastructure Map.

FCPA will use Countywide Green Infrastructure Map for projects such as prioritizing acquisition areas based on relative natural and heritage resource importance, and evaluating impacts of land development proposals. However, EQAC believes that the details mentioned above are needed to best prioritize acquisition areas.

c. 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 (see above) and adopt a unified Natural Resource Conservation Policy.

EQAC's past recommendation on developing a Countywide Natural Resource Management Plan is being partially fulfilled by FCPA. As reported in EQAC's 2002 *Annual Report on the Environment*, the FCPA staff has completed a draft of its Natural Resource Management Plan (NRMP). This plan identifies the countywide and Park Authority programs and data sources related to natural resources and analyzes Park Authority

policies and the Park Comprehensive Plan provisions affecting natural resources. It addresses natural resources management and planning on parklands within the general issues categories of Vegetation, Wildlife, Stormwater Management and Erosion Control, and Human Impact. EQAC continues to recommend that this FCPA effort be expanded Countywide.

Unfortunately, the adoption of this NRMP has not yet taken place. Last year EQAC reported that this draft was undergoing internal Park Authority review and was scheduled to be presented to the Park Authority for adoption in the fall of 2002. However, this did not occur. The draft is still undergoing review and updates and is now scheduled to be presented to the Park Authority Board in the fall of 2003. Since this plan has taken years to get this far, EQAC strongly urges the Park Authority Board to finish this process and adopt the plan.

d. 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 Parks Round Table has 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. Conservation easements have been used successfully by groups such as the Nature Conservancy 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 expanded aggressively through the acquisition of 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.

e. 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. Green Spring Garden Park has developed a draft document intended to guide the park's activities with regard to invasive exotic plants. The guidelines include monitoring for infestations, avoiding the spread of non-native garden plants to natural areas in the park, and cooperating with other horticultural organizations to develop information and programs related to invasive plants.

Huntley Meadows Park has been previously funded for an active management program at Huntley Meadows that provided valuable information for use at other sites around the County. They continue to seek funding sources to continue their invasive control projects.

f. Riparian and Bioengineering Projects

The Fairfax County Park Authority is working on several projects that will affect the biological health of the County's streams.

- Renovation of the old farm pond at Mason District Park started in March, 2003. This project will replace the existing dam, install a new outlet structure, regrade the pond basin and surrounding area, install an overlook at the pond edge, and create a wetland area with boardwalk access. This should control many of the smaller storm events, which are currently causing erosion and degradation of the downstream, reaches of Turkeycock Run.
- The Park Authority is completing negotiations with VDOT to allow bioengineering restoration-stabilization of approximately 1,800 feet of Turkeycock below the Mason District Park farm pond. This will compensate for impacts associated with the Springfield Interchange project. Restoration will likely begin in winter, 2003. (VDOT has indicated that they would welcome more opportunities to partner with County agencies on future bioengineering projects.)
- FCPA is making improvements to retrofit a DPWES storm water management facility upstream from the pond at Hidden Pond Park. This project went out for bid in June, 2003 and will add BMP controls to an

existing peak shaving facility and begin controlling runoff from smaller streams. Benefits from this project include reducing downstream erosion (allowing the stream to regain some biological health). The second phase of this project will include reconstruction of a sediment-filled forebay.

- Huntley Meadows Park has been affected by erosion resulting from increased runoff due to upstream development for several years. Sediments are carried into the park's wetlands, reducing water depth and adversely affecting aquatic life. The Park Authority is working with DPWES on a park bond project in Barnyard Run to use mainly bioengineering stabilization practices to prevent further channel erosion and restore upstream reaches to a healthy condition. The Northern Virginia Soil and Water Conservation District is providing significant assistance in the design of this project.

g. 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. To date, this foundation has raised more the \$480,000 to support County parks and open space. If you are interested, contact them at:

Fairfax County Park Foundation
12055 Government Center Parkway
Fairfax, VA 22035
(703) 324-8581
SupportParks@aol.com
<http://www.FairfaxCountyParkFoundation.com>

2. Northern Virginia Regional Park Authority

The Northern Virginia Regional Park Authority (NVRPA) acquired five acres of new parkland during 2002 – a five-acre addition to Bull Run Regional Park.

NVRPA continues their efforts towards environmentally friendly management of their golf courses, using materials from the Audubon Society's *Cooperative Sanctuary System*, and Virginia Division of Soil and Water Conservation's *Urban Nutrient Management Program for Gold Courses*. Additionally, some areas on their golf courses have been designated as out-of-play and allowed to "return to nature".

NVRPA is active in attempting to mitigate trees lost in Northern Virginia. They planted over 2,000 trees in Fairfax County in their parks during 2002. In Bull

Run Regional Park, they are planning plantings of native vegetation along the shorelines of Bull and Cub Runs as a replacement for the mature trees being lost to flooding and erosion.

In Fairfax County, NVRPA is continuing their efforts to increase bluebird habitat and promote population growth. They have installed (and regularly monitor) boxes at Pohick Bay, Occoquan, Meadowlark, Bull Run, and Upton Regional Parks. They have installed more boxes at the Pohick Bay Golf Course and along the W&OD Trail. These efforts are in cooperation with the Virginia Bluebird Society.

Like Fairfax County Park Authority, Northern Virginia Conservation Trust, and others, NVRPA is devoting many hours to a dedicated effort to eliminate invasive plants. These efforts have taken place at Upton Hill Regional Park, Meadowlark Botanical Gardens, and the Pohick Bay Golf Course.

NVRPA is developing general management plans and natural resource management plans for their parklands in order to protect the important natural and cultural resources located in these parks. These plans include detailed inventories of these resources and suggest parameters for operation and development of the parks.

NVRPA has completed a draft General Management Plan (GMP) for the 1,003-acre Pohick Bay Regional Park. Plans for Bull Run and Hemlock Overlook Regional Parks are in their final stages.

3. 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. If interested, contact them at (703) 324-1409.

4. 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, they changed their name to The Northern Virginia Conservation Trust to better reflect the regional scope of their 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 or easements in Arlington, Fairfax, Loudoun, Prince William, and Stafford Counties.

During Fiscal Year 2003 (July 1, 2002 to June 30, 2003), NVCT recorded nine new conservation easements and two easement amendments as shown in Table III-1.

NVCT also has a public outreach program – Adventures in Conservation – to bring hands-on volunteerism and environmental education opportunities. They had 344 hours in volunteer conservation activities (consisting of invasive plant removal, native seed collection, and tree plantings) and 502 hours in environmental education activities.

EQAC encourages all landowners whose property contains environmentally sensitive land such as wetlands, stream valleys, and forests to consider contacting NVCT and to learn 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 their Web site, <http://www.nvct.org>.

Table III-1 NVCT Conservation Easements (July 1, 2002 to June 30, 2003)	
Name	Comments
Solarz Easement (Dranesville)	Six acres in McLean with significant areas of EQC and forests
Handley Easements I & II (Lee)	Two adjacent properties in Central Springfield area that buffer Calamo Run (a major tributary of Accotink Creek)
Evans/Greenspring Easement (Mason)	A partially forested property buffering Greenspring Garden Park in Annandale
Sloan Easement (Hunter Mill)	An easement conserving the landscape of an historic Victorian house in the Windover Heights Historic District of Vienna
Ruckstuhl Easement Amendment (Providence)	An amendment to NVCT's previous easement on this seven acres in the Falls Church area that further restricted allowable structures on this land
Thompson House Easement (Sully)	This easement protects this Civil War era house that was recently moved to allow for a road expansion of West Ox Road
Clifton Betterment Association Easement (Springfield)	Conserving a property with a historic barn and Popes Head Creek in the Town of Clifton
Laughlin Easements I & II (Mt. Vernon)	Two properties on the Potomac River in the Mt. Vernon area, providing both riparian and scenic conservation of these properties
Cobb Easement Amendment (Dranesville)	An amendment to NVCT's previous easement on this property adding an additional 2.4 acres to make a 14 acre conserved area in Great Falls

Source: *Fiscal Year 2003 Final Report*, Letter From Paul Gilbert, NVCT President, to Mr. Anthony Griffin, Fairfax County Executive, July 15, 2003.

5. Reston Association

The Reston Association has been making a concerted effort to remove the most aggressive of the invasive exotic plant species on the Reston Association's natural areas. They have initiated a monthly volunteer work force of "Weed Warriors" that meet on the fourth Saturday of every month. They have worked on removing Oriental Bittersweet, Chinese Privet, Bamboo, and Autumn Olive. They received a \$3,000 matching grant from the Virginia Department of Forestry to fund tools and the printing of an informational brochure that will go to Reston homeowners explaining concerns about non-native invasive plants.

The Reston Association entered into a Memorandum of Understanding with the United States Geological Survey and the John W. Powell National Center to establish cooperation regarding the issue of invasive species. The John W. Powell Center is one of the largest tracts of forest remaining in Reston, and much of the property is undisturbed forest.

For more information on the Reston Association's activities, visit their Web site at <http://www.reston.org>.

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. An example of this is in the Accotink Creek Streambank Stabilization Project, a partnership among NVSWCD, the Fairfax County Park Authority, Virginia Department of Forestry (VDOF), and the Fairfax County Department of Public Works. Like many streams in Fairfax County, Accotink Creek has serious erosion.

Below the dam of Lake Accotink, VDOF and NVSWCD demonstrated stream bank stabilization techniques to 40 participants at the end of an intensive three-day workshop. The group was shown several bioengineering techniques to protect the banks and improve habitat, including biodegradable logs and erosion control matting, shrubs and live stakes, and cedar revetments.

NVSWCD also participated in a number of special projects:

- Laurel Hill – The Laurel Hill development is located on 280 acres previously part of the D.C. Department of Corrections prison site in the Lorton area. The development includes residential housing, roads, and schools. Fairfax County has required the developer to provide a comprehensive pre- and post-construction monitoring plan to determine the impact on the site's streams and wetlands. NVSWCD is assisting the Department of Public Works and Environmental Services in reviewing and supervising the outcome of the monitoring.
- Government Center Stormwater Management Dry Ponds Retrofit – NVSWCD's proposal for retrofitting an existing stormwater management pond was implemented in fall, 2001. NVSWCD staff prepared the design and helped in planting the pond following construction.
- Huntley Meadows – NVSWCD assisted the Fairfax County Park Authority in developing a plan to decrease the amount of sediment from

two streams (Barnyard Run and Dogue Creek) flowing into Huntley Meadows wetlands.

- Lake Martin – NVSWCD reviewed Fairfax County’s proposal for retrofitting two existing stormwater management ponds and stabilizing the streams above Lake Martin.

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

The Office of Public Affairs worked with staff to develop a Wetlands Permitting information piece to explain the County’s Wetland Permitting process. This information piece is now on the County’s Web site at <http://www.fairfaxcounty.gov/gov/ocp/wetlands/wetlands.pdf>.

The Fairfax County Wetlands Board held three public hearings for shoreline erosion control projects during the 2002-2003 fiscal year. One shoreline erosion control project was approved during that time.

Staff reviewed approximately thirty-one (31) Joint Permit Applications to determine if permits were required from the Wetlands Board during 2002-2003.

The Chair of the Wetlands Board has been working with the County Attorney’s Office to investigate the feasibility of adopting a wetlands mitigation policy, which would encourage the minimization of wetland losses and require compensation for those losses. The Wetlands Board has not yet taken official action on this matter.

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

8. Virginia Department of Forestry

The Virginia Department of Forestry (VDOF) has provided forestry related services in Fairfax County for over 30 years. They are also participating in several efforts aimed at improving riparian zones and stream bank stabilization projects.

VDOF partnered with volunteers from the Difficult Run Community Conservancy, Potomac Conservancy, Timberline Corporation, George Mason University Students, the Northern Virginia Soil and Water Conservation District, and Scout troops to plant approximately 1,000 seedlings in Fairfax County in 2002. A total of 110 volunteers helped with the plantings. This added 500 linear feet to the previous riparian buffer reforestation efforts in Fairfax County. Sites for these plantings were:

- Lake Royal;
- Green Spring Village Retirement Community;
- Wolf Trap Run Stream Valley Park; and
- Difficult Run Stream Valley Park.

VDOF participated in the Fairfax County Arbor Day (April 26) at the Northern Virginia Community College. VDOF gave 500 seedlings to citizens for plantings on their property.

VDOF continues to sponsor stream bank stabilization projects in Fairfax County. One 2002 project was a partnership project with the Northern Virginia Soil and Water Conservation District and the Fairfax County Department of Public Works and Environmental Services. The site of the project was Lake Accotink, where 11 root wads were used for stabilization of about 300 linear feet of stream bank. Also, in partnership with the Potomac Conservancy, 200 live stakes were cut and installed on 150 linear feet of riverbank on the Potomac River.

To support the VDOF goal of “Conserving the Forest Baseline,” VDOF worked closely with the Northern Virginia Conservation Trust. VDOF provided baseline studies for four conservation easements in 2002.

VDOF has promoted the concept of bioretention rain gardens for the past eight years. VDOF did plans and surveys for eight potential rain gardens in 2002. Of these sites surveyed, two rain gardens were implemented.

A new program, “Growing Native”, was initiated by the Potomac Watershed Partnership (PWP). VDOF is active in the PWP and participated in the “Growing Native” project to collect acorns. The acorns are given to State Forestry nurseries to plant and grow seedlings for the Commonwealth of Virginia. Fairfax County citizens participated as volunteers (167 manhours), collecting 665 pounds of acorns, black walnuts, and hickory nuts for the VDOF nurseries.

VDOF offers public education programs promoting environmental initiatives. In 2002, VDOF personnel gave 12 presentations about riparian buffers, stream and watershed restoration, forest management, protection and conservation, and the use of rain gardens to promote stream protection.

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 constructing 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.
- In the Braddock District, VDOT has under construction a wetlands project 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. The Corps of Engineers has authorized this project and planting was to have taken place in the summer of 2003.

VDOT works with volunteer groups (such as Fairfax ReLeaf) in their reforestation efforts. Additionally, VDOT has included landscaping in several VDOT construction projects, including:

- Lorton Road Park and Ride;
- Fairfax County Parkway between Fawn Ridge Lane and Walnut Branch Road;
- Springfield Interchange Improvement Project, Phase 4; and

- Ox Road between Burke Lake Road and Davis Drive (scheduled for fall, 2003).

VDOT is now exploring the use of warm season native grasses along the VDOT right-of-way. Native grasses have been seeded or planted in selected loop areas of the Route 28/Route 50 interchange and the Route 123/I-66 interchange.

10. Urban Forestry

a. Urban Forestry Division

In FY 2002, the Urban Forestry Division continued to serve a unique and diverse set of customers. The Urban Forestry Division customer base includes 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 (OCF), and the School Board.

Table III-2 summarizes the workload of UFD based on the requests for assistance that were completed for FY 2000, 2001, and 2002. These figures demonstrate that the number of requests for assistance in FY 2002 was almost identical to 2001. This 2002 workload, however, was accomplished with seven Urban Forester II positions, not the eight Foresters in 2001. The eighth position became open in 2002 and was not filled due to budget constraints.

A significant amount of staff time in 2002, however, was also dedicated to preparation of amendments to the Zoning Ordinance, Subdivision Ordinance, and Public Facilities Manual (PFM) relating to County tree cover requirements, and tree and vegetation preservation and planting. UFD staff provided presentations on the amendments to the Planning Commission and BOS. The amendments package was approved by the Planning Commission on January 30, 2002 and received final approval by the BOS on February 11, 2002.

UFD staff provided training to Virginia Tech forestry, urban forestry, and landscape students as invited class instructors. Staff continued to provide training to new inspectors in EFID on County Code requirements for vegetation preservation and planting.

Table III-2 Urban Forestry Division Workload FY 2001 and 2002		
Type of Assignment	Number of Completed Requests	
<i>Fiscal Year</i>	<i>2001</i>	<i>2002</i>
Waivers	64	70
Zoning Cases	208	187
EFRD Requests: Plan Review	786	723
EFRD Requests: Site Inspections	725	743
Other (BOS, FCPA, Other County Agencies, etc.)	559	611
Hazardous Trees	25	27
Total	2,367	2,361

In 2002, the Urban Forestry Division continued to work on strategic planning activities. A Leadership Team comprised on every member of the Urban Forestry and Forest Pest Management Sections was formed. In late 2002, the Leadership Team released a Division Mission Statement and a draft Vision as follows:

“The mission of the Fairfax County Urban Forestry Division is to enhance the quality of life in our community by ensuring the vitality of the urban forest, its management, and the preservation of the natural environment. We promote compatibility between the developed and natural communities through science, education, shared knowledge and strong partnerships.”

“Our Vision is to cultivate a healthy and functional urban forest and to educate and inspire the community to value, conserve and enhance this essential resource.”

It is anticipated that the Mission Statement and Vision will be used to navigate a strategic planning process that will continue into 2003, that will eventually generate a 5-year Strategic Plan and Countywide Urban Forestry Management Plan.

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 thuringiensis* (Bt) on high infestations.
- **Educational:** the self-help program and lectures to civic associations and other groups.

In calendar year 2002, gypsy moth caterpillar populations decreased significantly compared to previous years. It is impossible to determine whether this decrease is a sign that populations will remain low for the next few years or if they will increase to moderate levels. The gypsy moth staff will continue to monitor populations in the fall of 2003, and treatment is probable in 2004.

Egg mass surveys conducted by staff in the fall of 2002 indicated that 1,400 acres in four areas of the County had gypsy moth infestations that warranted aerial treatment in the spring of 2003. All of the treatment areas were located in the Mason Neck area of the County. In addition to the aerial treatment areas, there were 50 acres in isolated areas that warranted ground treatment. The pesticide used for these treatments was *Bacillus thuringiensis* (Bt), a material registered with the Environmental Protection Agency for use against the gypsy moth caterpillar in forested, residential communities.

Gypsy moth populations have increased in Virginia and the northeast. There was no detected defoliation by the gypsy moth in Fairfax County last year.

Experts agree that the reason for the current population decrease is due to the fungus *Entomophaga maimaiga*. This fungus was introduced from Japan and can now be found throughout the generally infested areas of the gypsy moth. After a period of heavy rain, caterpillars come in contact with the spores of this fungus and are quickly infected. Record high rainfall amounts for the spring of 2003 probably had an effect on decreasing gypsy moth populations. Information concerning the biology of this fungus can be found in previous Annual Reports on the Environment or by contacting the Forest Pest Program office.

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 District. 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 has monitored for adult female moths throughout the Mount Vernon and Lee Districts in January of 2001, 2002, and 2003. The results of the winter, 2002 – 2003 monitoring effort indicated that the 2,100 acres of the Mason Neck area required aerial treatment in the spring of 2003. The pesticide used for these treatments was Bacillus thuringiensis (Bt), a material registered with the Environmental Protection Agency for use against the fall cankerworm caterpillar in forested, residential communities. During the spring of 2003, County staff supervised contracted staff in ground spraying approximately 61 acres.

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. Tree Preservation Task Force

The Tree Preservation Task Force met once on July 10, 2002 to conduct an annual review of the status of its recommendations and to discuss the status of HB 484, which is proposed legislation submitted by Fairfax County to the 2002 Virginia General Assembly to amend Code of Virginia §15.2-961. During that meeting, HB 484 was discussed by representatives of the building industry and State Senator Janet Howell, who was the patron of the legislation. In order to maximize chances for adoption of HB 484, a plan was formulated to communicate the intent and purpose of the legislation to the building industry. As a consequence, County staff met with local representatives of the building industry and local environmental groups to discuss issues relevant to the legislation. As a result, new language was generated to address the concerns of both groups and is anticipated to be used in any tree preservation legislation that is forwarded in future legislative programs.

The Tree Preservation Task Force activities for the year 2002 primarily focused on County staff completing recommendation #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."

On September 9, 2002, the Board of Supervisors adopted new Residential Density Criteria. A separate criterion (#4) for tree preservation and tree cover requirements was added with the following text:

"All rezoning applications for residential developments, regardless of the proposed density, should be designed to take advantage of the existing quality tree cover. If quality tree cover exists on site as determined by the County, it is highly desirable that developments meet most if not all of their tree cover requirements by preserving and, where feasible and appropriate, transplanting existing trees.

Tree cover in excess of ordinance requirements is highly desirable. Proposed utilities, including stormwater management and outfall facilities and sanitary lines should be located to avoid conflict with tree preservation and planting areas."

In 2002, The Urban Forestry Division actively worked on Tree Preservation Task Force Recommendation #37 to "conduct periodic tree and forest cover analysis." This recommendation was addressed by a grant for satellite mapping of the County's tree cover and analysis of tree cover data, and will be covered in detail later in this section.

The Tree Preservation Task Force will continue to meet to review the progress and effectiveness of the 37 recommendations that the task force forwarded to the Board of Supervisors in 1999. A major subject that is likely to be examined in 2003 and beyond is the perceived need for state enabling tree preservation legislation.

e. Tree Commission Activities and Issues in 2002

Several vacant Tree Commissioner positions were filled so that each of the County's magisterial districts was represented. Representatives from the Virginia Department of Forestry and the non-profit organization Fairfax ReLeaf were also appointed.

In response to the tragedy of September 11, 2001, the Commission launched an effort to plan and construct the 9-11 Memorial Garden. The Memorial consists of a formal landscaped garden on the grounds of the Fairfax County Government Center. Residents of Fairfax County that perished on September 11, 2001 were honored by the Board of Supervisors at the Memorial groundbreaking ceremony in September, 2002. The 9-11 Memorial Garden was dedicated after its completion in the fall of 2003.

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 2002, 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. The Urban Forestry Division 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.

f. Summary of Proposed/Anticipated Changes to Tree Preservation Enabling Legislation

The proposal that Fairfax County prepared to send as part of its 2002 Legislative program to amend § 15.2-961 was continued to the 2003 Virginia Legislative Assembly, where it lost its active status in early 2003. However, components of the proposed language survived in other legislative proposals and were adopted by the Virginia General Assembly in 2003. These amendments allow localities to regulate trees species that are planted for tree cover credits, and require jurisdictions to grant additional tree cover incentives for preserving trees. Although the newly adopted language is not entirely what Fairfax County proposed, it should be considered as a measure of progress in the attempt to acquire local authority to require tree preservation during land development.

Although the existing language of § 15.2-961 provides that "Existing trees which are to be preserved may be included to meet all or part of the canopy requirements," ordinances based on this language are focused primarily on tree replacement. Local tree canopy ordinances allow the requirements to be met exclusively through the planting of nursery-grown trees if pre-development tree canopy is non-existent, or the development of the allowed use necessitates the removal of the pre-development tree canopy.

Any future proposals to amend § 15.2-961 should:

- Provide localities with a mechanism to quantify tree preservation expectations based on pre-development tree cover. For example, if a proposed development site is covered 30 percent with trees, then a locality could expect that 30 percent of the ten-year tree cover requirement will be provided by preserving existing tree canopy.

- Preserve trees in higher percentages than currently realized, yet provide a flexible modification system that acknowledges land development realities and constraints.
- Target land uses that result in high tree cover loss by changing the existing requirement for low-density residential from 20 to 30 percent.
- Provide implicit incentive language allowing localities to grant additional tree cover credits for the preservation of trees that realize environmental, ecological, historic or cultural objectives.

The proposal should enlarge the nature of current Code of Virginia § 15.2-961, which is focused primarily on tree replacement, by placing greater emphasis on the preservation of existing trees. The proposal should also support recommendations by the New Millennium Occoquan Watershed Task Force and Tree Preservation Task Force that call for increasing tree preservation levels during the development process.

It will be imperative that future proposals for tree preservation authority address concerns expressed by the local building industry and environmental groups to the extent possible without compromising the core intent of increasing tree preservation.

g. Status of Grant Proposal for Satellite Mapping of the County's Tree Cover and Analysis of Tree Cover Data

In 2002, the Urban Forestry Division 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). This classification system was originally developed by the Nature Conservancy and has been adapted by the United States Federal Standard Geographic Data Committee as the Federal Government Standard FGDC-STD-005, 1997.

This classification system will be used to map the entire County into areas that are currently populated with native tree, shrub, and herbaceous plant species, as these species group into larger associations, or plant communities. These communities usually coincide with distinct environmental gradients and are dependent on the presence of specific abiotic factors, such as elevation, climate, geologic substrate, and soil and hydraulic regimes.

In 2002, the Urban Forestry Division accomplished the following goals towards the mapping and identification of natural vegetation communities

that exist in Northern Virginia using the National Vegetation Classification System:

- Partnered with Fairfax County GIS Office in order to coordinate use of GIS/GPS software and computer equipment.
- Identified ground truthing areas needed for entire study area in order to establish initial database of reflective values.
- Met with Fairfax County Park Authority staff and Prince William County to devise data collection methodology.
- Finalized data collection methodology and generated needed forms and databases to record data.
- Completed training of Urban Forestry Division Staff, Park Authority Naturalist Staff, Huntley Meadows Park Volunteers, and Prince William County Arborist in data collection methodology.
- Completed data collection and GPS location of 165 of 210 data collection points.
- Worked with Fairfax County Department of Purchasing and Supply Management to develop sole source contract with DigitalGlobe Service, Inc. to purchase satellite imagery.
- Acquired 450 km² (covers Eastern Fairfax County, Arlington County and City Of Alexandria) of the total 2,106 km² of needed 2.6-meter multispectral satellite imagery.
- Contracted with DigitalGlobe, Inc. to acquire remaining 1,656 km² of satellite imagery by summer/fall of 2004.

Once the entire landmass of 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 Countywide vegetation and ecosystem management policies. It is anticipated that Urban Forestry Division will need to continue this mapping effort into 2003 and early 2004.

11. Riparian and Other Bioengineering Projects

Stream bank erosion is a natural process, which begins with water movement from uplands. In areas of urban development, impervious (watertight) surfaces replace vegetative soil coverings, resulting in less water soaking into the ground. As a result, more runoff flowing over land surfaces enters streams, causing excessive stream bank erosion.

Serious undercutting and sloughing of stream banks can occur when stream banks are not adequately protected by riparian vegetation. This stream bank erosion impacts water quality, causing serious problems for fish and wildlife as well as downstream landowners and communities. Thus, water quality and the flora and fauna associated with a healthy stream are closely linked. (See

Chapter I, *Water Resources*, for more comments on water quality and stormwater management.)

Many methods exist to stabilize a stream bank. Traditionally, hard structures such as concrete and stone have been the quick fix. These methods may slow down the erosion process but are costly, unattractive, and environmentally objectionable. Today, many engineers and contractors rely on *bioengineering* techniques that involve the use of living plant materials to stabilize and rebuild soils and vegetation.

Some bioengineering techniques include:

Vegetation -- The stability of a stream bank depends on the establishment of permanent vegetation that can withstand water inundation as well as dry conditions. Live cuttings from willows, dogwoods, and other species that root quickly are incorporated into the soil. Root mass keeps soil in place, and the flexible leaves and branches slow down the flow of water.

Tree revetments -- Large whole trees anchored lengthwise along eroding banks with their bottom ends upstream and overlapping one another may provide continuous protection to the bank.

Biologs -- Biodegradable logs made of processed coconut husk fiber called "coir" can hold soils and plants in place. A biolog is generally eight to ten feet long and about one foot in diameter. The material is tough, flexible, and absorbent. By the time the "log" biodegrades in seven or eight years, a root network of plants has been established through and behind it.

With such innovative bioengineering techniques and proper planning and design, we can restore stream banks, reduce the amount of pollutants and sediment going into streams, improve animal and fish habitat, and create a more aesthetically pleasing environment.

A number of agencies are participating in projects using bioengineering techniques to protect and restore stream valleys. These include: the Fairfax County Park Authority; the Northern Virginia Soil and Water Conservation District; the Virginia Department of Transportation; the Virginia Department of Forestry; and the Fairfax County Department of Public Works and Environmental Services. Their actions in this area are mentioned above.

The Maintenance and Stormwater Management Division (MSMD) of the Fairfax County Department of Public Works and Environmental Services currently performs inspections on six privately maintained rain gardens once every five years. In addition, MSMD has the maintenance responsibility for five County owned rain gardens of which three are located at the MSMD maintenance complex and two at other County complexes.

In support of the 1999 *Interim Policy Regarding Tree Preservation and Planting in and Around Stormwater Management Ponds*, MSMD changed its pond-mowing practices during the summer of 2000 to take advantage of its economic and environmental benefits. The *interim policy* has allowed MSMD to reduce the scope of work for contract mowing in-and-around stormwater management facilities. The mowing of dam embankments, access roads, and emergency spillways continues. However, pond floors, side slopes, and other non-critical areas are no longer mowed. This has resulted in an average decrease in mowed areas of 60% per pond and has allowed the emergence of wet meadow pond floors at more than 500 sites in Fairfax County. This natural process allows for improved functionality by enhancing sediment removal and nutrient uptake rates. MSMD continues to work extensively with numerous homeowners' associations, property owners, Boy Scout groups, etc. to have many of the County's ponds planted with trees, shrubs, and herbaceous wet meadow and wetland plants. To date, over 45 ponds have been planted with ten to fifteen more slated for this year.

12. Gunston Cove Ecological Study

Gunston Cove is a tidal freshwater embayment of the Potomac River located approximately 20 miles south of Washington, D.C. The Cove is formed by the juncture of Pohick Bay and Accotink Bay, through which the waters of Pohick Creek and Accotink Creek flow to the Potomac River.

An ecological study of Gunston Cove, conducted by the Department of Environmental Science and Policy and Department of Biology at George Mason University, and supported by the Department of Public Works, continued during 2002. This study is a continuation of work originated in 1984 at the request of the County's Environmental Quality Advisory Council and the Department of Public Works. This ongoing monitoring program was established to determine impacts from local point sources and nonpoint sources and evaluate the status of the Gunston Cove ecosystem. Information from this study is intended to form the basis for well-grounded management strategies for maintenance and improvement of water quality and biotic resources in the tidal Potomac.

The executive summary of the 2002 report by Jones and Kelso summarizes details from their report and covers water quality, phytoplankton biomass, zooplankton, fish larvae and fish, and benthic organisms. The following is extracted from this summary.

Long-term trends were examined for a wide range of water quality and biological parameters. Linear regressions were conducted to allow detection of long-term linear trends. In the cove, chlorophyll *a*, photosynthetic rate, BOD, total phosphorus, and organic nitrogen had significant negative coefficients indicating a net decrease over the study period (1983/4-2001). These results are consistent with a significant decline in phytoplankton biomass over the study

period. Of the dissolved nutrients, only nitrate exhibited a significant linear regression coefficient over the period and it has declined greatly.

In the river, there have been some signs of an increase in phytoplankton. While Chlorophyll *a* did not show a significant change, three trends were consistent with increased phytoplankton: photosynthetic rate was significantly higher, dissolved oxygen exhibited a positive regression coefficient, and light extinction coefficient was more negative. The river exhibited significant declines in all forms of dissolved nitrogen as well as in nitrogen:phosphorus ratio. From last year's report (summarized in the *2002 Annual Report on the Environment*), Jones and Kelso noted that phosphorus loading from the Noman M. Cole, Jr. Pollution Control Plant was greatly curtailed in the early 1980s. The observed pattern in phytoplankton biomass in the cove can be tied directly to the management action to decrease phosphorus loadings if we assume temporary storage of phosphorus during the pre-decrease period, which continued to be released in significant amounts for several subsequent years until largely exhausted or covered by 1989.

All zooplankton taxa have exhibited significant linear increases since 1990. Those with particularly high rates of increase include the rotifer *Keratella* and the chydorid crustacea. These increases may be related to decreases in planktivorous fish, which have generally occurred during the 1990s. In 2001, there was an increased presence of these fish and the dominant large cladoceran (a prime food source) was lower than in recent years.

The annual reports by George Mason University are proving to be very useful in tracking changes in Gunston Cove as a result of changes at the Pollution Control Plant. These changes at the plant have benefited the Cove. The studies should continue so as to get a better idea of long-term trends (as thus see the impact of changes at the Pollution Control Plant and other changes that may impact the Cove such as changes in land use in the watershed).

13. 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 forest lands for the production of food and other agricultural and forest products. It is also Fairfax County policy to conserve and protect agricultural and forest lands 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.

In 2002, there was a loss of two Local A&F Districts, but there was no loss of Statewide A&F Districts. There are now 40 Local Districts and four Statewide Districts. The two losses were:

- Dranesville: loss of 27.37 acres through the withdrawal of the Leggett District (AF 99-D-001); and
- Springfield: loss of 37 acres through the expiration of the Briarfield Manor District.

Therefore, the total acreage of all districts has gone from 4,095.15 acres in 2001 to 4,030.76 in 2002.

14. 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 as well as 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. Completion of the roadway will most likely be delayed until 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 is also preparing a Natural Resources Plan for management of the County's parks. This long delayed plan, schedule for completion in the fall of 2002 as of last year's EQAC annual report, is now scheduled for completion in the fall of 2003. EQAC fully supports these efforts, urging that they culminate in a Countywide Resource Management 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 commends 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 from development interests. 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.

LIST OF REFERENCES

Fairfax County Land Use Information – Existing Land Use: Methodology, <http://www.co.fairfax.va.us/comm/demogrph/Lusebut.htm>.

Michael A. Kane, *Environmental Quality Advisory Council's Annual Report on the Environment: Information Request for the 2003 Report*, Letter to James P. Zook, Director, Department of Planning and Zoning, Fairfax County, Virginia, June 20, 2003 (containing input and updates concerning the Fairfax County Park Authority for the EQAC annual report).

Fairfax County Park Authority, *Strategic Plan 2002-2006: A Summary of Opportunity Areas and Strategies for the Future, Revised for 2003*.

Fairfax County Park Authority, *Creating the Blueprint for Tomorrow: Annual Report Fiscal Year 2002*.

Gary Fenton, Letter to Noel Kaplan, Department of Planning and Zoning, Fairfax County, Virginia, June 25, 2003 (containing input and updates concerning the Northern Virginia Regional Park Authority for the EQAC Annual Report).

Paul Gilbert, *Fiscal Year 2003 Final Report*, Letter to Mr. Anthony Griffin, Fairfax County Executive, July 15, 2003 (containing a report on activities of Northern Virginia Conservation Trust).

Claudia Thompson-Deahl, email to Noel Kaplan, Department of Planning and Zoning, Fairfax County, Virginia, June 10, 2003 (containing input concerning the Reston Association for the EQAC Annual Report).

Volunteers and Partners: Northern Virginia Soil and Water Conservation District Annual Report, FY 2002, Northern Virginia Soil and Water Conservation District, Fairfax, Virginia.

Fairfax County Wetlands Board – 2002-2003.

Virginia Department of Forestry Contribution to Fairfax County Annual Report on the Environment 2003.

John C. Muse, Letter to James P. Zook, Director, Department of Planning and Zoning, Fairfax County, Virginia, June 20, 2003 (containing input and updates concerning the Virginia Department of Transportation for the EQAC Annual Report).

Scott St. Clair, *Environmental Quality Advisory Council's Annual Report on the Environment: Information Requests for the 2003 Report*, Memorandum to John Wesley White, Director, Department of Public Works and Environmental Services, Fairfax County, Virginia, July 18, 2003.

R. Christian Jones and Donald P. Kelso, *An Ecological Study of Gunston Cove, 2001-2002, Final Report*, George Mason University, Fairfax, Virginia, April 30, 2003.

Fairfax County 2002 Agricultural & Forestal District Annual Statistical Report, Zoning Evaluation Division, Department of Planning and Zoning, Fairfax County, Virginia, August 1, 2003.

Annual Report on the Environment 2002, Environmental Quality Advisory Council, Fairfax County, Virginia, 2002

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER IV

**WILDLIFE
AND THE
ENVIRONMENT
IN FAIRFAX
COUNTY**

IV-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 IV-1-1).

Table IV-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 399 square miles of the County. Of this 399 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 IV-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 IV-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

(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.

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 ecological carrying capacity (see page 10) 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 IV-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 secular variation.

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 IV-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 IV-3 below in this chapter for a discussion of Lyme Disease.

Table IV-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

(Source: Report prepared by Michael Uram, Fairfax County Police Department.)

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.

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.

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, 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 IV-3 of this report).
 - 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 Control Division.
 - Nature Centers.
 - Health Departments.
 - State agencies, particularly Virginia Department of Game and Inland Fisheries and the Virginia Department of Transportation.
 - 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.
 - 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.

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.

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 to actively participate in the deer management program in order to exercise the necessary stewardship of the ecological well-being of the County's parkland, which constitutes 8.7 percent of the land area of the County.

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 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 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.
3. 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.
4. EQAC feels that, while some progress has been made, 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 to legally 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.
5. EQAC feels 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.
6. 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 Web site.

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.

W. Dan Lovelace, Wildlife Biologist, Virginia Department of Game and Inland Fisheries.

Mark Pritt, Wildlife Biologist, Virginia Department of Game and Inland Fisheries.

Jerry Sims, Wildlife Biologist, Virginia Department of Game and Inland Fisheries.

Michael Uram, Analyst, Operations Support Bureau, Fairfax County Police Department.

Allan Rutberg, Ph.D., Senior Scientist, Humane Society of the United States.

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.

Harriet Calloway, R.N., Epidemiologist, Fairfax County Health Department.

Linda Smith, Fairfax County Health Department.

Todd Bolton, Natural Resources Manager, Fairfax County Park Authority.

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.

Caughly, G. 1981. Overpopulation. In: Jewell, P. A. & Holt, S. (Eds.). Problems in management of locally abundant wild mammals. pp. 7-20. Academic Press, New York.

Cypher, B. L. & Cypher, E. A. 1988. Ecology and management of white-tailed deer in northeastern coastal habitats. Biological Report 88 (15) U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC 20240.

DeCalesta, D. S. 1998. Effective diversity carrying capacity: An expanded concept for deer management. U.S. Forest Service Report, U. S. Department of Agriculture (Northeastern Forest Experiment Station, P.O. Box 928, Warren, PA).

Animal Services Division, Fairfax County Police Department. Fairfax County Deer Management Report to the Board of Supervisors, September, 2001.

Ellingwood, M. R. & Spignesi, E. 1986. Management of an urban deer herd and the concept of cultural carrying capacity. Transactions of the Northeast Deer Technical Committee 22: 42-45.

Flyger, V., Leedy, L. & Franklin, T. M. 1983. Wildlife damage control in eastern cities and suburbs. Proceedings of the Eastern Wildlife Damage Control Conference, 1: 27-32.

McShea, W. J., Underwood, H. B. & Rappole, J. H. (Eds.) 1997. The science of overabundance: Deer ecology and population management. Smithsonian Institution Press, Washington and London. [400+ pages, 23 peer-reviewed papers presented at a symposium organized by the Smithsonian Institution Conservation and Research Center, available in the book section of the National Museum of Natural History gift shop.]

Natural Resource Consultants, Inc. Fort Hill, PA. December, 1997. Deer Management Recommendations for Fairfax County, Virginia.

Warren, R. J. (Ed.) 1997. Deer Overabundance. Wildlife Society Bulletin 25 (2) (Special Edition) pp. 213-577. [60 peer-reviewed papers presented at a special symposium organized by the Wildlife Society. Available from the Wildlife Society, Washington, D.C.]

IV-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 upsurge. 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

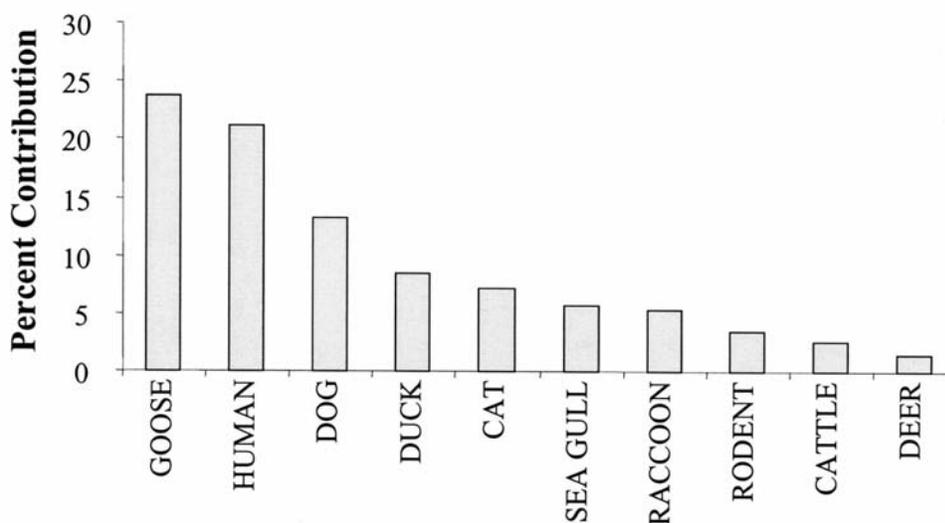
A primary impact of geese is environmental pollution, particularly pollution of streams, ponds, and lakes with fecal coliform bacteria from their wastes. The magnitude of the problem is illustrated in two examples below.

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 IV-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 IV-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 means such as hunting is not an option. 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

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, 3 years.
 - b. Pinecrest Community - population stabilization and nuisance abatement, 2 years.
 - c. Pinecrest Golf Course - population stabilization and nuisance abatement, 2 years.
2. Centreville
 - a. Franklin Farms - population stabilization, 3 years.
 - b. Westfields - population stabilization, 2 years.
3. Fairfax County
 - a. Lake Barcroft - population stabilization and nuisance abatement, 4 years.
 - b. Fairfax County Parks - population stabilization, 4 years.
 - c. Copeland Pond - population stabilization and nuisance abatement, 3 years.
 - d. Brook Hills - population stabilization and nuisance abatement, 3 years.
 - e. Waters Edge - population stabilization and nuisance abatement, 2 years.
4. Oakton
 - a. Fox Lake - population stabilization, 2 years.

5. Reston
 - a. Reston Community - population stabilization, 3, years.
6. Vienna
 - a. Trinity School - population stabilization, 3 years.
 - b. Champion Lake - population stabilization, 2 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 added under the County permit and approximately 1,200 under the separate Fairfax County Park Authority 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.
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.

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>

IV-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. 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. Last year in our report, we noted that CDC had confirmed 161 cases, including 18 deaths, since 1999. This past year saw a jump for the year to 4,156 reported cases and 284 deaths. This year's current outbreak has already resulted in 2,000 cases in Colorado, 1000 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 IV-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 IV-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.

(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 are raccoons, foxes, 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.

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, and foxes and domestic dogs and cats are also significant sources (see Figure IV-2-1 on page IV-26). 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 that 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. 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 upsurge 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 IV-20 and IV-32, 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 and malaria. EQAC further recommends that the Board of Supervisors monitor this program through periodic reports to its Environment Committee by County staff.

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.

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER V

SOLID WASTE

V. SOLID WASTE

A. ISSUES AND OVERVIEW

Fairfax County's solid waste program operated well during FY 2003. The County exceeded its contractual obligations to the Covanta Energy Resource Recovery Facility (E/RRF), processing the second highest amount of waste ever disposed of at the waste-to-energy facility. The Transfer Station celebrated 20 years of service to the community in consolidating smaller loads of waste into larger trailers, thereby reducing traffic congestion and air pollution. A new program was initiated to help identify commercial waste disposed of by companies that use the Citizens' Disposal Facilities. Special recycling collection programs for computer electronics were developed in partnership with ServiceSource, a non-profit organization providing employment and training to persons with disabilities, and Computer Donation Management, Inc. ServiceSource labor is used to disassemble computers and Computer Donation Management Inc. sells valuable components retrieved. This partnership helps to provide employment to persons with disabilities while reducing the quantity of potentially-hazardous materials managed in the County.

There are two solid waste divisions within the County government, the Division of Solid Waste Collection and Recycling (DSWCR) and the Division of Solid Waste Disposal and Resource Recovery (DSWDRR). These two Divisions form a single Business Area, the Solid Waste Management Program. The Program has been functioning under the High Performing Organization model for over a year. During this year, as part of the County Executive's Framework for Excellence, the Program reviewed its Mission, Vision, and Values. In preparation for developing a Strategic Plan for the next five years, staff completed an Environmental Scan, identifying the strengths, weaknesses, threats and opportunities for the Program. The Strategic Plan will form the basis for enhancing existing performance measures that will demonstrate how the Program is performing on a family of measures ranging from simple output to qualitative measures. The Program has focused its efforts in supporting Fairfax County's vision elements of:

- maintaining safe and caring communities;
- creating a culture of engagement with the community;
- maintaining healthy economies;
- exercising Corporate responsibility for County resources and results; and
- practicing environmental stewardship.

1. Contractual Issues and Landfill Capacity Backup

Although Covanta Fairfax, Inc. had declared Chapter 11 bankruptcy on April 1, 2002, Covanta continued to operate the E/RRF with minimal problems during the year. All payments to the County are current and maintenance has continued as scheduled.

The County had formalized agreements with other Virginia landfills for backup/emergency disposal capacity last year, because a combination of events

necessitated using landfills to bypass excess waste that could not be accommodated at the E/RRF. The increase in waste generated, coupled with regularly scheduled outages and several days of unplanned outages at the Facility, resulted in the County bypassing over 54,000 tons to landfills outside the County in FY 2003. This was slightly less tonnage than the bypassed amount for FY 2002, which was approximately 57,000 tons.

2. Solid Waste Management Plan (SWMP)

The development of a new SWMP for Fairfax County began in FY 2003. The Virginia Department of Environmental Quality (VDEQ) requires jurisdictions or planning areas to develop a plan describing how and where waste and recyclables will be managed during the next 20 years. The plan requires significant community input, so efforts have been made to engage citizens and businesses in the Plan development. To provide for that input, County staff has contacted each magisterial district office to obtain information about community groups to contact for plan input. County staff has made many presentations to the suggested groups and staff intends to make the same presentation to any other County organization that is interested in plan development. Details about the plan and opportunities for public input are available on the County's Web site at <http://www.fairfaxcounty.gov/dpwes>. To support the presentations, brochures have been developed to educate interested parties about the requirements and process. A survey is available to County residents, on the County's Web site and via printed media, to help obtain public opinion about various solid waste issues. County staff will continue to attend community meetings and events during FY 2003 and throughout FY 2004 to obtain public input for the plan development. The plan will be submitted to VDEQ by July 1, 2004, after a Public Hearing process is completed and the Plan is approved by the Board of Supervisors.

3. Solid Waste Disposal Fee

The contract waste disposal rate, offered to companies that sign agreements with Fairfax County, was raised to \$39.95 per ton in FY 2003, and will remain at that rate through FY 2004. The contract disposal fee covers transportation and disposal of waste, but does not fully cover all community benefit programs initiated by the Solid Waste Management Program. The County has been able to maintain participation from local hauling companies at this rate. The spot market rate varied during the year as the County needed to attract more or less waste depending upon Facility availability.

The associated waste disposal fee charged by Covanta to Fairfax County rose by \$2 per ton for FY 2003, necessitating the increased contract fee for collection companies. The E/RRF's fee increased due to:

- the equipment added for the Clean Air Act retrofits that makes the facility one of the cleanest processes for waste disposal and electrical energy production in the area;
- increased chemical and remediation costs for ash management;
- reduced interest and miscellaneous revenues, and
- increased cost of operations and maintenance of the Facility.

The E/RRF continued to produce up to 80 megawatts of electricity that is sold to Dominion Virginia Power. This is enough electricity to power nearly 70,000 homes. The revenue from electrical generation is used to keep the tip fees as low as possible.

The tip fee traditionally has covered the cost of community benefit programs such as household hazardous waste, recycling education and awareness, and community cleanups. While the tip fee does not cover all the costs, the amount required to support these programs from the General Fund decreased this year. 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 samples continue to be collected twice a year for analyses, typically in March and September. Results from groundwater monitoring events in 2002 and early 2003 exceeded the Groundwater Protection Standards (GPS) established for the facility in several wells, and pursuant to the landfill's permit, VDEQ was notified. These wells, located very close to the actual buried waste, were anticipated to trigger the notification requirement. Exceeding the GPS limits required that the County perform an Assessment of Corrective Measures (ACM) in August, 2002 to measure the impact of the groundwater to potential receptors, measure the delineation of contamination, and hold a public meeting to discuss the remedy to the problem. The County has been very active in delineating the nature and extent of the contamination detected and drilled eleven additional groundwater monitoring wells. The semi-annual results continue to be analyzed by hydrogeological professionals hired by the County. Initial reports indicate that the contaminants of concern are located near the actual waste depository and have not migrated away from the facility. The ACM dictated that a Presumptive Remedy needed to be implemented as the next step in the groundwater evaluation process specified by VDEQ regulations. As a result, the County has begun to cap the upper reaches of the landfill with a clay liner. This cap will prevent surface water from infiltrating into the landfill and moving off-site. Additionally, no residents use groundwater as their potable water supply, consistent with the Risk Assessment prepared for the facility.

The engineering equipment installed at the landfill remains a critical link in maintaining good environmental control at the facility. Actions such as landfill closure and landfill gas extraction have worked to reduce groundwater impacts.

The groundwater monitoring program will continue to follow the assessment monitoring requirements of VDEQ, where 216 compounds are monitored. The County will continue to monitor groundwater and identify potential impacts of landfill operations outside the boundaries of the landfill site.

ii. Landfill Gas Systems

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 250 extraction wells installed specifically for the purpose of collecting methane gas for power production. The collected landfill gas is distributed to a variety of utilization 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.

iii. Energy/Resource Recovery Facility

As previously stated, the Energy/Resource Recovery Facility (E/RRF) owned by Covanta Fairfax, Inc., has operated well since the bankruptcy filing on April 1, 2002. Daily operations at the plant have been unaffected as the company works through the bankruptcy process. All payments due to the County are current and no further financial impact to the County is anticipated at this time. Covanta employees have indicated that the company's reorganization plan should be completed by December, 2003, and that the company would emerge from bankruptcy shortly thereafter.

Several visual and functional improvements have been undertaken at the E/RRF this year:

- the chimney is in the process of being repainted;
- tip floor walls and guardrails have been painted to improve visibility;
- the ash conveyor upgrade has been completed, covering the conveyor area and allowing for easier maintenance access;
- grounds have been hydroseeded;

- fire hydrants have been replaced or refurbished; and
- siding has been replaced in several areas, improving the appearance of the facility.

Operational items that were improved this year include:

- Covanta worked to establish seven-day outage periods for scheduled maintenance and met the schedules;
- County staff conducted monthly inspections of the facility along with an independent engineering firm, Dvirka and Bartilucci, to ensure that Covanta is operating the facility using best industry practices;
- cranes are being retooled and enhanced;
- an unburned carbon test was performed to demonstrate compliance with VDEQ air quality permit limits; and
- County and Covanta sponsored meetings between their staffs to discuss and resolve operational issues about the facility.

A review of the Supplemental Waste program is underway by VDEQ to determine if legislative changes in 1999 have had an effect on the types of supplemental materials that can be combusted. Until such time as a final determination is made, supplemental waste being processed through the facility is limited to document destruction materials only.

Fairfax County staff was able to broker a settlement to a longstanding dispute between Covanta Fairfax, Inc. and Dominion Virginia Power for the payment of gross receipts tax. The agreement provides for Dominion Virginia Power to retain the money already held and to receive payment for power recently used by Covanta Fairfax Inc. Fairfax County had to return power payments to Dominion Virginia Power that had already been received from Covanta. Final accounting of the settlement occurred in January, 2003.

iv. Air Quality

The I-95 E/RRF monitors flue-gas emissions from the facility on a daily and annual basis. The results of this comprehensive air quality monitoring program are reported annually to VDEQ.

The almost \$7.75 million in capital improvements required by the Clean Air Act Amendments of 1990 have resulted in significant changes in the quality of the air emissions from the facility. While the facility already had many emission controls installed during its construction, the retrofit processes have resulted in significant improvements in the quality of air emissions for the E/RRF. Figure V-1 shows the preliminary reductions in the emissions from the E/RRF:

Summary of Initial Performance Data After Retrofits were Implemented

I-95 Resource Recovery Facility ...

- 94.5% Removal of SO₂
- 98.2% Removal of HCl
- 93.4% Removal of Mercury
- 45% Reduction in NO_x
- Very Low Dioxin Emissions

Figure V-1 - Prepared by HDR Engineering

The NO_x emissions were well below the air permit mass emission limit during FY 2003.

The independent engineering firm of HDR Engineering is currently conducting a further review of the air emissions from the facility. As that information becomes available, County staff will provide it to EQAC. The preliminary results of this new analysis demonstrates the continued reductions in emissions produced by the Facility. The HDR study also compares the air emissions from the production of electricity from waste-to-energy facilities to the air emissions from the production of electricity from coal-fired power plants and facilities using other fuel sources. Waste-to-energy is proving to be a much cleaner overall way to produce electricity with the side benefit of reducing the amount of waste that must be landfilled.

v. Ash Characterization

Ash resulting from the combustion process reduces the volume of refuse to only 10% and its weight to about 25% of the original quantity of refuse. Ash generated by the E/RRF is disposed of 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 uncombusted waste. Ash produced was analyzed by an independent lab and found to be well within permit limits for all constituents, including arsenic, chromium, lead, mercury, selenium, and silver. One analyte, cadmium, while below the regulatory threshold, has shown an increase over a previous year's analysis. Staff believes this increase is due to the increasing number of

nickel-cadmium (NiCd) batteries being used and subsequently disposed of in the County. County staff is exploring ways to remove these batteries from the waste stream before combustion, and this is discussed further in the recycling section.

vi. Wastewater Discharge

Quarterly wastewater discharge testing was conducted throughout FY 2003 and consistently demonstrates compliance with permit requirements. There were no exceedances of permitted wastewater flow rate limits or other constituents regulated by the permit.

County staff continues to work with Covanta to build a cooling water discharge system to dechlorinate water used in the cooling process before it is discharged. Increasing amounts of water are required for the cooling process because of the increasing conductivity of the water supplied by the Fairfax County Water Authority. Covanta has also obtained a permit to discharge the clean water into Mills Branch rather than into the wastewater system, preserving capacity at the wastewater treatment plant.

vii. Quantity of Waste Managed

The Guaranteed Annual Tonnage (GAT) requirement for the E/RRF is 930,750 tons per year and remains fixed until February 2011 when the contract between the County and Covanta terminates. The amount of waste delivered to the Facility in FY 2003 was almost 1,094,000 tons.

During FY 2003, the County shipped over 54,000 tons of solid waste to landfills when the capacity (or availability) of the E/RRF could not accommodate the waste generated. Staff has worked to maintain the E/RRF at full capacity, therefore maximizing energy production and decreasing costs. The following efforts have been undertaken to continue to meet or exceed the GAT commitment:

- Continuation of the waste agreement with Prince William County ;
- Continuation of an agreement with the District of Columbia's solid waste contractor to deliver waste to the E/RRF;
- Entrance into contracts with haulers operating in Fairfax County to deliver all waste collected in the County in exchange for a reduced disposal price; and,
- Continuation of the spot market program to attract out of County waste to the facility.

Staff is carefully analyzing solid waste tonnage projections for the preparation of the Solid Waste Management Plan. Accurate waste quantities and estimated projections of quantities to be generated in the future are necessary to develop strategies to ensure that there is sufficient disposal and recycling capacity for the County's increasing waste management needs.

Figure V-2 shows the recent total amounts of waste generated in Fairfax County.

TOTAL FAIRFAX COUNTY WASTE



Figure V-2- Historical Quantities of Refuse Generated in Fairfax County

viii. I-66 Transfer Station, Landfill & Citizens Recycling & Disposal Facility

The Transfer Station celebrated its 20th year of operation during FY 2003. The Transfer Stations continues to operate for the purpose of consolidating loads of refuse and recyclables to assist in reducing truck traffic and air emissions associated the operation of a fleet of transportation vehicles.

VDEQ inspected the Transfer Station several times during 2003 for compliance with state environmental regulations. VDEQ did not note any deficiencies during these inspections.

Staff continues to work with an outside contractor to assist with transport of waste to the various disposal locations. The outside contractor serves to add trucks when peak demand requires waste transport while the County fleet maintains a stable base. The County fleet is somewhat less expensive to operate than that managed by the outside contractor; however, the flexibility to optimize transportation during peak times is advantageous to the County and serves to lower overall costs.

Additionally during FY 2002, the County leased seven tractor units instead of purchasing them outright; the County continues to analyze this utilization methodology for further consideration. This is another strategy to reduce overall operating expenses.

The Transfer Station consolidates smaller waste loads into tractor trailers, reducing the number of smaller trucks that need to travel County roads to dispose of refuse at the I-95 complex. It is estimated that each trailer holds waste from two to three smaller trucks. Approximately 125 trailer loads of waste move from the Transfer Station to the I-95 complex daily, reducing by two-thirds the number of trucks traveling to the I-95 complex.

County drivers had driven over 7.4 million miles before they sustained one chargeable accident in February, 2003. This low vehicle accident rate is truly noteworthy, especially given the traffic congestion in the area and conditions of the roads traveled from the I-66 Transfer Station to the I-95 Landfill complex.

A study is underway to determine if ultra low sulfur fuels can be efficiently used in the County's diesel truck fleet. Again the purpose is to reduce air emissions resulting from the operation of diesel equipment in as many ways as practicable.

A new program began at both the I-66 and I-95 locations to better distinguish commercial waste from citizens' waste because a different payment scale is applied to the different sources of waste. The Commercial Cash program for businesses operating in Fairfax County was such a successful pilot program during FY 2003 that it will be integrated into the full service waste management activities available at both locations. The Commercial Cash program is designed for smaller businesses that generate waste while conducting their business. They may obtain a permit, without providing a bond, and pay cash to dispose of waste at either facility. More than 2,500 companies now have the permits.

ix. Household Hazardous Waste (HHW) Program

The County continues to operate two household hazardous waste collection centers: one at the I-66 Transfer Station and the other at the I-95 Landfill. Both locations are open three days each week. However, in early FY 2003, staff added a pilot program to begin opening the HHW facility at the I-66 Transfer Station on Sundays, adding a fourth day of operation each week. This was done using a combination of outside contract personnel and County staff altering their hours to work each Sunday.

There were a total of 16,149 customers that used the HHW service at either of the two Citizen's Disposal Facilities located at the I-66 or I-95 complexes. The total quantity of hazardous waste managed at the two facilities in FY 2002 was 359,840 pounds of HHW.

Staff has reestablished the Conditionally Exempt Small Quantity Generator (CESQG) service as a portion of the HHW program. Use, however, remains limited and minimal. Solid Waste Management Program staff continued outreach during FY 2003 to the Fire Marshall's Office and the Industrial Waste Section to have their staffs inform potential customers about the program.

x. Program Enforcement

Solid Waste Management Program staff continues to respond to ordinance complaints related to solid waste issues. In FY 2003, complaints continued to rise slightly, with complaints mostly focusing on solid waste collection haulers and private long-haul trucking companies parking loaded vehicles around the County.

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 DSWCR by the end of February of each year. These reports are evaluated and compiled to calculate the Countywide recycling rate, which for calendar year 2002 was 32%. The following chart (Figure V-3) depicts the historical rates of recyclables generated in the County since the recycling program's inception in 1988.

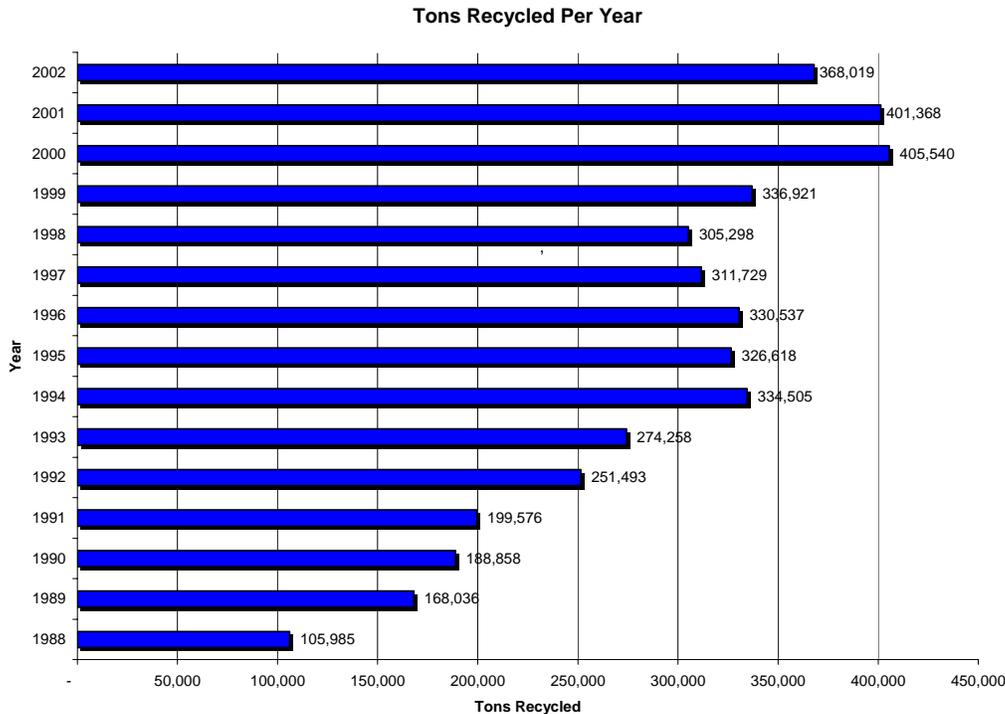


Figure V-3 - Historical Quantities of Materials Recycled from Fairfax County

The recycling rate of 32% is less than the rate calculated for calendar year 2001, which was reported as 34%. The reasons for this are twofold: first, the quantity of paper collected for recycling in the County was reduced by approximately 16,000 tons and yard debris was reduced by almost 6,000 tons; and secondly, the Fairfax County MSW generation rate increased by more than 47,000 tons. The cumulative effect of these actions caused a 2% reduction in the 2002 recycling rate. Because the recycling rate is directly linked to the quantity of refuse generated in the County, anytime the quantity of refuse generated in the County is increased, it has a negative effect on the recycling rate. However, Fairfax County still 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 mandated 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 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.

The thresholds of recycling requirements are being re-evaluated as part of the new Solid Waste Management Plan for Fairfax County; this may result in thresholds being modified for greater mandatory participation.

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 40,000 residences primarily on the east side of the County;
- Collection of refuse and recyclables from the County agency buildings;
- Vacuum leaf collection for 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.

The Solid Waste Reduction and Recycling Centers (SWRRCs, or Park Outs) were eliminated at the end of June, 2003 due to significant drops in the participation level in the program. The reduction in participants resulted in a shortfall in covering the costs of the program, and in April, 2003, the Board of Supervisors voted to eliminate the program. Residents who used the SWRRCs can choose to have curbside collection of trash and recyclables or self-transport their refuse and recyclables to either the I-66 or the I-95 complexes. Two private solid waste collection companies have also started to offer park out collection services at these locations.

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. 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 in 2000 to expand curbside residential recyclables collection by including mixed paper (magazines, newspaper inserts, paperboard, cardboard, office paper etc.) and plastic bottles. This recyclables collection expansion in the County Sanitary Districts has resulted in a documented increase of 20% by weight of the quantity of recyclables collected from approximately 40,000 customers who get their refuse and recyclables collection services from the County. As stated previously, privately-owned refuse and recyclables collection companies are not required by Chapter 109 to collect these additional types of recyclables.

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, 2003. The amendments require that, in any new construction of multifamily residential complexes with more than 100 units, a space must be designated 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.

The collection and recycling staff of the Solid Waste Management Program for Fairfax County provides refuse and recyclables collection for approximately 40,000 single family homes and 1,200 public housing units. The balance of the County's residential single family homes or townhomes receive trash and recyclables collection services from approximately 30 private haulers that must be permitted by the County.

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 40,000 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 to be 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 topdressing 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 2002, Fairfax County recycled 106,768 tons of yard debris. Yard debris decreased by approximately 6,000 tons in FY 2003 due to the very dry summer period, resulting in less vegetative growth.

During 2002, County staff was made 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. 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 will evaluate this situation for the long-term waste management program currently under development.

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 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 Haulers

For areas of the County where refuse and recyclables services provided by County employees 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 material 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/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 FY 2003, the consolidation of collection companies continued. Fewer and fewer choices are available for residents since the largest residential collection company now collects from about 65% of individual homes in the County.

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 offices 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 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 their particular locations. In calendar year 2002, County agency locations recycled approximately 824 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

Public education and outreach form the basis of any county's public outreach effort. 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 partnerships with County agencies, Fairfax County Public Schools, commercial businesses, and private haulers. Outreach programs consist of attendance at County events, 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 Program'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 FY 2002, the Solid Waste Program won the Best of Show Award at the Celebrate Fairfax event in June with an interactive display of equipment and programs. In FY 2003, the Solid Waste Management Program also won a blue ribbon for content for the Celebrate Fairfax event.

The Solid Waste Management Program is also a financial sponsor of the annual Earth Day/Arbor Day event promoted by Clean Fairfax Council. This year, the Solid Waste Management Program was a financial sponsor of the Johnnie Forte Jr. Environmental Scholarship, which awarded six \$500 scholarships to applicants from the Fairfax County Public Schools. This award program 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 to 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 by:

- Developing opportunities for students to learn about recycling and other environmental issues;
- Providing support for school recycling activities to assist in 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.

The Solid Waste Program also promotes an annual Clean Your Files Day geared to County Agency staff to remind staff of the benefits of recycling of office paper and America Recycles Day (November 15), when recycled products purchasing is emphasized.

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) 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 the County's Web site. Information about involvement in community events as well as new information about solid waste matters is constantly 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 will continue through FY 2004.

Program staff is 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. The Solid Waste Management 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 citizen access to recycling opportunity information.

The Solid Waste Management Program staff is also using the Web to collect information from citizens as well as the regulated community as a service to customers to aid in the provision of information back to the County. The forms developed by the Solid Waste Management Program to collect data from recyclers in the County used to calculate the recycling rate are on the Web site in

a format which automatically totals the tonnages of recyclables collected. More opportunities to use the internet will avail themselves as technology advances.

C. LEGISLATIVE AND REGULATORY CHANGES

The 2003 session of the Virginia General Assembly addressed only a few pieces of legislation associated with solid waste management issues. There were several specific pieces of legislation introduced regarding solid waste and recycling. The successful pieces of legislation, effective July 1, 2003, are listed below:

- **Cathode Ray Tube Recycling Program.** Requires the Virginia Waste Management Board to adopt regulations to encourage cathode ray tube and electronics recycling. The bill also authorizes localities to prohibit the disposal of cathode ray tubes in any privately operated landfill within its jurisdiction, so long as the locality has implemented a recycling program that is capable of handling all cathode ray tubes generated within the jurisdiction.
- **Waste Tire and Tire Recycling Fee.** Strengthens the VDEQ's ability to clean up the remaining tire piles throughout the State. The civil and criminal liability provisions of the bill are conformed to the penalties of other environmental statutes. The bill authorizes the establishment of tire convenience centers, which are collection points for the temporary storage of tires. To be classified as a convenience center, the collection point cannot receive waste tires from collection vehicles that have collected waste from more than one property owner. The bill exempts Department of Motor Vehicle licensed salvage yards that are holding fewer than 300 tires and convenience centers having up to 1,500 tires from having to obtain a permit from VDEQ. The bill also establishes a strict liability standard for damages incurred by neighboring property owners when a tire pile burns. To expedite the cleanup of tires piles, a three-year increase in the tire recycling fee from \$0.50 per new tire sold to \$1.00 is proposed. The revenue generated by the increased fee is required to be used solely for the removal of tire piles.

LIST OF REFERENCES

2003 General Assembly Final Report, Memorandum from Sue Rowland, Legislative Liaison, to Members, Northern Virginia Waste Management Board, April 21, 2003.

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.

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER VI

**HAZARDOUS
MATERIALS**

VI. 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 2002 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 2002, Staff was involved with 476 complaints. Fifty-nine complaints were petroleum product releases and 35 complaints were various types of other product releases that had the potential to discharge materials into storm drains or surface waters. Many of these occurrences were the result of motor vehicle accidents that involved damaged fuel tanks and other automotive type fluid releases. In addition, 36 reports of improper disposal of various hazardous materials and solid waste were addressed. (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 primary unit became fully staffed in 2002 to assist with the increasing number of responses.

The Hazardous Materials Response Team responded to more than 750 incidents in CY 2002. 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.

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 to 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 wastes 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 representative 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.

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 2002, two newsletters were mailed to over 1,600 homeowner associations, members represented the Committee at various County and neighborhood functions including Fall for Fairfax, and work was started on updating the Web site and brochures. 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; it 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 permanent HHW collection centers as a part of its recycling program for residents of Fairfax County. 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.co.fairfax.va.us. This information can be found under Public Works and Utilities and under Environment.

Participation in the HHW collection program has resulted in many items being disposed of at the centers that are not hazardous waste. In addition to the confusion of what should be recycled as HHW, the inconvenience of not having collection sites located throughout the County may be affecting the participation.

In FY 2002, there were 16,272 participants disposing of 368,060 pounds of HHW. This included 5,955 gallons of antifreeze, 76,007 gallons of motor oil, 6,197 lead acid battery cores, and 59,980 gallons (or 150 tons) of latex paint. This is a slight increase from FY 2001, when there were 15,312 participants disposing of 356,275 pounds of HHW. That included 6,250 gallons of antifreeze, 59,868 gallons of motor oil, and 57,375 gallons of latex paint. FY 2001’s totals are approximately the same as the totals for the three preceding years. (6) Considering the population and business growth in the County during this five-year period, HHW recycling does not seem to be keeping pace.

5. Commercial Hazardous Wastes

The Conditionally Exempt Small Quantity Generator (CESQG) program has been reestablished on a limited basis. 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)

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 VI-1 below.

Table VI-1	
HOW TO REPORT ENVIRONMENTAL CRIMES	
<u>Type of Incident</u>	<u>Phone Number</u>
<p><u>ANY ACTIVE RELEASE OF MATERIALS INTO THE ENVIRONMENT</u></p> <p>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.</p>	911
<p><u>HAZARDOUS MATERIALS-DANGEROUS</u></p> <p>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.</p>	911

Table VI-1 (continued)	
HOW TO REPORT ENVIRONMENTAL CRIMES	
<u>Type of Incident</u>	<u>Phone Number</u>
<p><u>HAZARDOUS MATERIALS-NO IMMEDIATE DANGER</u></p> <p>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.</p>	<p>During working hours, call: 703-246-4386</p> <p>After hours, call: 703-691-2131</p>
<p><u>RELEASE OF ANY MATERIAL INTO THE ENVIRONMENT</u></p> <p>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 this number. If the release is an active one, call 911.</p>	<p>703-583-3800</p>
<p><u>EROSION AND SEDIMENTATION</u></p> <p>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 this number. 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.</p>	<p>703-324-1937</p>
<p><u>HEALTH HAZARDS</u></p> <p>In addition to the above contacts, if a health hazard is suspected, contact the Environmental Health Administration at this 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.</p>	<p>703-246-2205</p>

D. LEGISLATIVE UPDATE

During 2002, there were no legislative issues and/or hazardous materials changes with regard to hazardous materials.

The U.S. Department of Transportation was involved with reviewing hazardous materials regulations pertaining to the commercial driver license qualifications and in-transit security for hazardous material cargo as a result of the terrorists' attacks on September 11, 2001. Some rule changes from those reviews can be expected to be finalized in 2003. (1)

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. Initially, the "Household Hazardous Waste Disposal Program" flyer that is now available at the West Ox Road and the I-95 Facilities can be used. It is suggested the County pursue partnering with the Northern Virginia Board of Realtors and request they participate by distributing the flyer to all new residents they work with. New residents would be anybody buying or renting a house, townhouse condominium.
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 and Rescue, FJLEPC, and the Emergency Management Coordinator.
3. Environmental crimes require citizens' 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.

REFERENCES

1. Fairfax County Fire & Rescue, Chief Michael P. Neuhard, June 19, 2003 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 Recover, HHW Disposal Program, Cliff Taylor, June 30, 2002 memo
7. Fairfax County Web site:
www.co.fairfax.va.us/dpwes/trash/disposal%Fhazcommer.htm
8. Previous EQAC authors of this chapter and material

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER VII

**NOISE, LIGHT
POLLUTION, AND
VISUAL POLLUTION**

VII-1. NOISE

A. 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. An average of eight million passengers traveled through National and Dulles each quarter in 2002 on approximately 130,000 commercial flights. This number is still well below the pre-September 2001 level, but has been slowly climbing. While the return of commercial air traffic is a welcome event to the local economy, it still has adverse impacts on the quality of life for those living around the airfields.

Dulles sees approximately 34,000 flights each month, still below the 9-11-01 levels. This breaks down to 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, still below the 9-11-01 levels. This breaks down to more than 600 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) 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. In 2002, the Airports Authority's noise complaint centers at National and Dulles reported receiving 369 noise complaints from 155 different callers. National reported 298 complaints from 110 callers. Dulles reported 71 complaints from 45 callers.

National has one of the strictest noise regulations in place at any major airport in the United States. All aircraft operating between 11:00 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 fourteen violations during the year 2002. Civil penalties were sought for seven violations and seven letters of warning were issued. A total of \$11,500 was received from four 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

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

The following discussion has been excerpted and modified slightly from the Web site of the Metropolitan Washington Council of Governments:

MWAA is initiating 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, is designed to forecast future noise contours at Reagan National and to propose abatement and mitigation actions to reduce community noise impacts.

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) is partnering with MWAA throughout the process. A Part 150 Study Advisory Committee (Advisory Committee) has been established to assist and advise the Airport Authority in this study. The Part 150 update process is expected to take about 18 months. At the conclusion of this study, an 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). Of the three “action” alternatives that were presented in the Draft EIS, Alternative 2 presented the least change from existing practices and was therefore viewed by FAA as a “low-risk” concept from the standpoint of implementation.

B. HIGHWAY NOISE

1. Background

Traffic in the Washington metropolitan area, including Fairfax County, continues to grow with intense residential development in Loudoun and Prince William Counties. 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 on 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 01-02:

- Four barriers were approved and completed on Fairfax County Parkway between Sunset Hills Road and Barron Cameron Avenue.
- Four barriers were approved and constructed this year with widening of Ox Road between Burke Lake Road and Lee Chapel Road.

The following barriers have been approved for the following highway construction projects underway in FY 03-04:

- Four barriers for Ox Road between Davis Drive and Lee Chapel Road; widening project underway.
- Two barriers for Ox Road between North Davis Drive and the Prince William County line.
- Two barriers (Fairfax County portion) for Route 1 interchange improvements associated with the Woodrow Wilson Bridge Project; advertisement was scheduled for July, 2003.
- Two barriers approved for Richmond Highway (Route 1) widening between Lorton Road and Telegraph Road; advertisement is scheduled for October, 2003.
- One barrier approved for VDOT Project 0495-029-137,C501; advertisement is scheduled for January, 2004.

C. RECOMMENDATION

1. **NOISE SUPPRESSION/ABATEMENT GUIDANCE:** The Federal Aviation Administration (FAA) does not specify aircraft noise exposure limits for communities near airports. Instead, the FAA sets limits on noise emissions from individual types of aircraft and sets deadlines for permitted operation of aircraft at U.S. airports that do not conform to these limits. Aircraft noise emission limits are important to communities around airports, but they are also important to airport planners who need to evaluate the noise impact of changes in airport operations produced by changes in facilities and normal growth in air traffic. Most airports, even smaller general aviation airports, maintain an airport master plan. An airport master plan is a written document that outlines all aircraft operations, assesses environmental effects including noise, and forecasts future airport growth.

EQAC recommends the following:

- A. Support the use of runways with least impact, especially during sleep hours (11 P.M. – 7 A.M.);
- B. Work with local, state, and federal groups to encourage airlines to restrict use of noisy aircraft during the above time frames; and
- C. Encourage the design and construction of new runways and taxiways to make best use of compatible land and water.

VII-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. Fairfax County had some regulations regarding exterior lighting, but they were minimal and out of date. A major effort was undertaken last fall 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 community as being one of the best such ordinances in the mid-Atlantic region.

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.
- b. Discomfort glare – Discomfort glare does 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. Glare and excessive illumination 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 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 occurs in the normal field of view.

Both of these forms may be present in a given situation.

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 discouraging 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 (Ungren, 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 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 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 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)) and represent a continuing source of glare and light pollution. Installations that were noncompliant at the time of adoption of the new Ordinance under State law are allowed to continue until such time as the fixture requires replacement. Additionally, the combined effects of glare into residential neighborhoods from sources such as nearby park lights and lights on nearby commercial buildings 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 Zoning Ordinance lists glare standards. Specifically, it requires that illumination shall not produce glare in residential districts in excess of 0.5 foot candles and that flickering or bright sources of light shall avoid being a nuisance in residential districts.

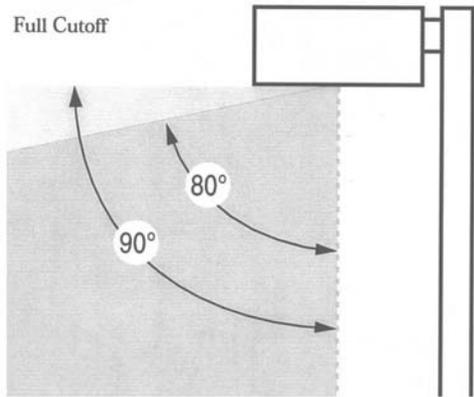
D. ADDRESSING THE PROBLEM

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. The new Virginia law and policy henceforth to use only fully shielded fixtures will eventually mitigate these problems as older fixtures are replaced.

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.

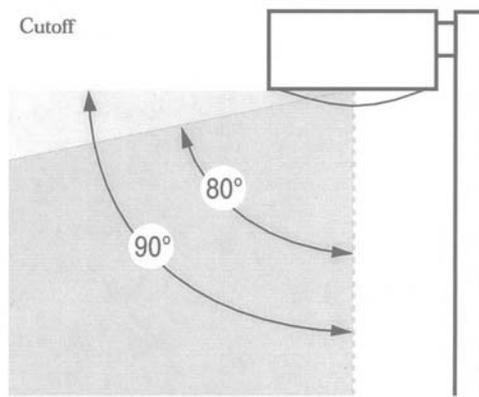
By redirecting this wasted energy, lower wattage lights provide the same amount of illumination in the areas where it is needed. These fixtures have reflective backing and full cut-off shielding to direct all light below the horizontal plane, with 90 percent of the light directed below an angle of 20 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 VII-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.

Figure VII-2-1
Effects of Cut-off and Non Cut-off Luminaires



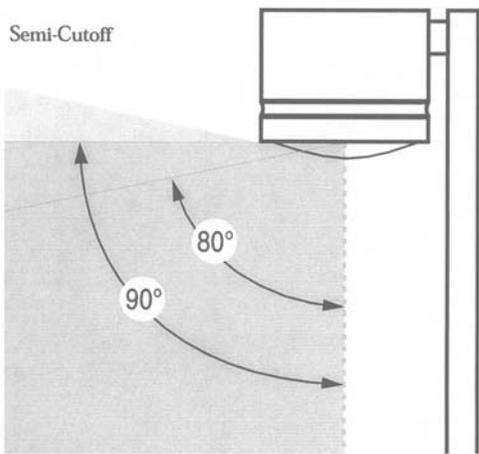
ALLOWS:

- No light at 90 degrees
- 100 cd per 1000 Lamp Lumens at 80 degrees



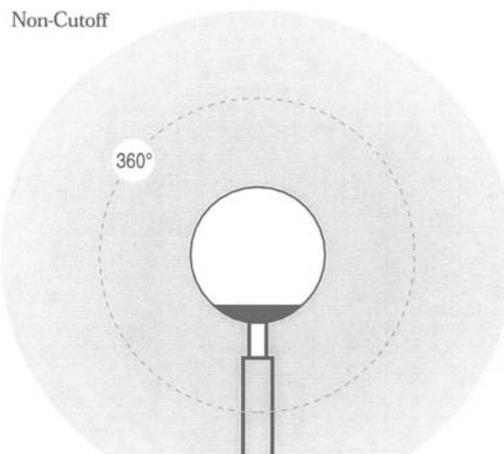
ALLOWS:

- 25 cd per 1000 Lamp Lumens at 90 degrees
- 100 cd per 1000 Lamp Lumens at 80 degrees



ALLOWS:

- 50 cd per 1000 Lamp Lumens at 90 degrees
- 200 cd per 1000 Lamp Lumens at 80 degrees



ALLOWS:

- Unrestricted distribution of light at any angle

(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.)

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 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, motion detector controls can limit the harsh light to only a minute or two when it is really needed.

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.

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 Office of Site Development Services 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 Office of Site Development Services 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 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 implementations 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 to be made aware of the sources and problems of light pollution and of the methods by which these can be best addressed. This can be done in two ways. First, an excellent and informative 16 page booklet has been prepared by County staff to explain the new Outdoor Lighting Ordinance. It can be made available to individuals, homeowners groups, and community associations directly through appropriate County offices and also through the district offices of the members of the Board of Supervisors. Second, this information will soon be available through the County’s Web site, which has become an exemplary vehicle for distributing the latest information relating to all aspects of County governance and services. 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.

A few jurisdictions in other areas have prepared technical brochures and bulletins to familiarize architects, contractors, and electricians with their lighting codes and to specifically describe what their jurisdictions do not permit (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 they recommend. Our County’s 16 page booklet provides much of the

information that these persons need. Thus, the development, contractor, and building management communities 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, 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 gains experience with application of the new Ordinance there will no doubt be discovered some areas 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 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 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.
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.
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 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.
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 and consistently follow the recommendations of the Illuminating Engineering Society of North America.
5. 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 3 above.
6. EQAC recommends that the Board of Supervisors fully support County staff efforts to disseminate its new booklet and provide information on the County Web site to promote public awareness of issues, problems, and solutions connected with illumination and light pollution. EQAC further 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.

LIST OF REFERENCES

Fairfax County Department of Planning and Zoning, *A guide to Fairfax County's Outdoor Lighting Standards*, 16 pp.

Arthur R. Upgren, *Night Blindness*, *The Amicus Journal*, Winter 1996, page 22-25.

Examples of Good and Bad Lighting Fixtures, Information Sheet Number 122, International Dark-Sky Association, Tucson, Arizona, May 1997.

Douglas Paulin, *Full Cutoff Lighting: The Benefits*, (corrected version), Illuminating Engineering Society of North America Web site, <http://www.iesna.org/>.

Shaflik, Carl, *Environmental Effects of Roadway Lighting*, Information Sheet Number 125, International Dark-Sky Association, Tucson, Arizona, August 1997.

Some Lighting Myths, Information Sheet Number 42, International Dark-Sky Association, Tucson, Arizona, January 1991.

Fairfax County, Virginia, *Policy Plan: The Countywide Policy Element of the Comprehensive Plan*, 2000 Edition.

Fairfax County, Virginia, Zoning Ordinance (Chapter 112 of the *Fairfax County Code*)

Illuminating Engineering Society of North America Web site, <http://www.iesna.org/>.
(There are numerous subsidiary and related Web sites)

International Dark-Sky Association Web site, <http://www.darksky.org/>

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/>.

VII-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 of the chapter focuses on visual blight/pollution issues, including such things as proliferation of signs, billboards, litter, auto 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 video transmission lines, communication towers, intrusive and objectionable advertising signage, and other forms of extraneous visual impairments.

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 little 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. TELECOMMUNICATION 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. Yet new towers, sometimes as high as 300 feet, are rapidly popping up near people's homes, next to historic buildings, or in rural, scenic areas. Towering above trees, neighborhoods, and protruding into the skyline, these towers often have an unappealing visual impact (see the Web site <http://www.scenic.org> for examples). The real loser in such deals is the community that has had the tower foisted upon it because it had no legal way to prevent its construction.

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. Basically, it deals with permitted and non-permitted signage (e.g., what kind of sign needs a permit versus that signage not requiring a permit). For example, the Ordinance states when political or other signage that is temporary in nature must be removed, etc. The Ordinance appears to cover the subject thoroughly, but the fact that impermissible signage is overabundant indicate that enforcement is lacking, or that County staff functions are not organized in a way that could provide cost effective enforcement.

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.

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 who 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. Good citizens attempting to help the County by removing signs themselves are not authorized to do so; therefore, they are inviting a liability action when they do remove signs. The ordinance needs to be changed to empower the citizenry to take action, but this will require State enabling legislation.

At present, about the only way the ordinary citizen can be involved with removing signs without the risk of liability is through the 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 to VDOT right-of-ways. A comparable program is needed with respect to utility poles which are placed within easements.

F. RECOMMENDATIONS

1. 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.

2. 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 any 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 be performed to 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.

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER VIII

LAND USE AND TRANSPORTATION

VIII. 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.

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 growth². This per capita vehicle mile increase 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 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,

¹ Fairfax County Comprehensive Plan, Policy Plan Volume, 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

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.

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 growth that is happening beyond Fairfax County in Loudoun and Prince William. Loudoun County is now the second fastest growing county in the nation, averaging 12.6% growth.

Smart growth is the antithesis of sprawl; it is the planned development of the same land with an overall plan in place. 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

Other concepts that combine land use and transportation provide less dramatic changes to traditional subdivision development. **Clustering** provides residential

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

development that allows several 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 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 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 continue to 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. Conversely, 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?

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:

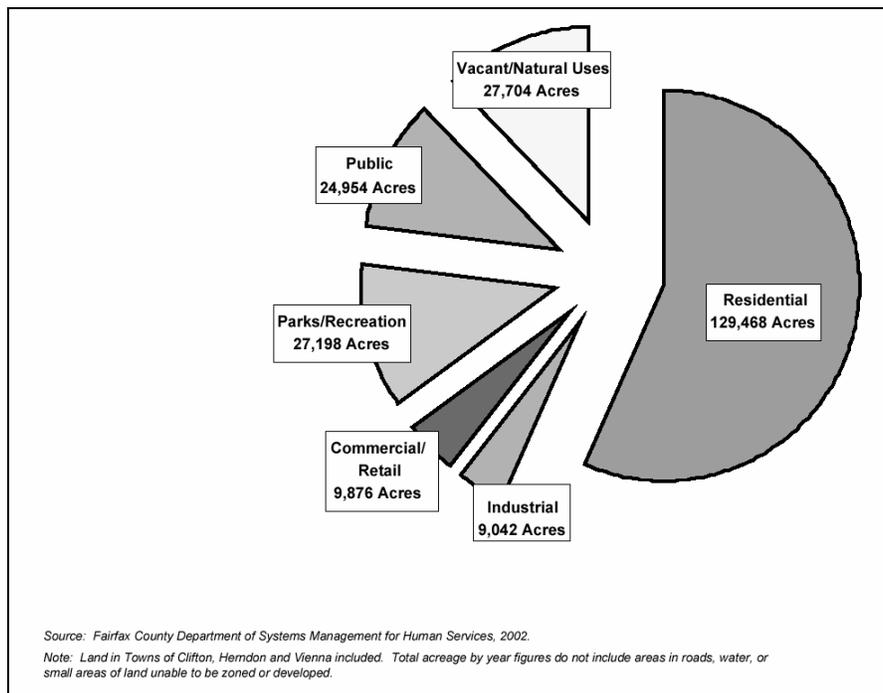
- Residential—acres dedicated to living. Residential acres are measured by the number of dwelling units per acre (DU/AC). For example, a low-density neighborhood has a DU/AC from .1 to .5, a suburban neighborhood ranges from 1-20, and an urban center has a core DU/AC of 35-60.

⁶ U.S. Census Bureau Commuting Patterns

- 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 maximum ratio of gross floor area to the size of lot. For example an FAR of 0.5 means that a single story building can cover half the lot, a 2-story building can cover ¼ the lot, and a 4-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 also measured by looking at 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.

The acreage of land in Fairfax County in each the above uses, as of January, 2002, is illustrated in Figure VIII-1.

Figure VIII-1: Existing Land Uses in Fairfax County



2. Land Use Planning

The Fairfax County Comprehensive Plan is a guide for making land use decisions in Fairfax County. It consists of the Policy Plan plus the Area Plan for each of the four planning areas. The Plan was adopted in 1975 and revised in 1988 around 18 Goals for Fairfax County. The Area Plans are regularly updated, with the next round of the Area Plan Review (APR) process to start in 2004.

In 1990, the County Concept Map for Future Development (Figure VIII-2) was developed that identified 31 mixed-use centers. While the Concept Map was not formally adopted, it is an integral part of the Area Plans.

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.

3. Land Use Monitoring

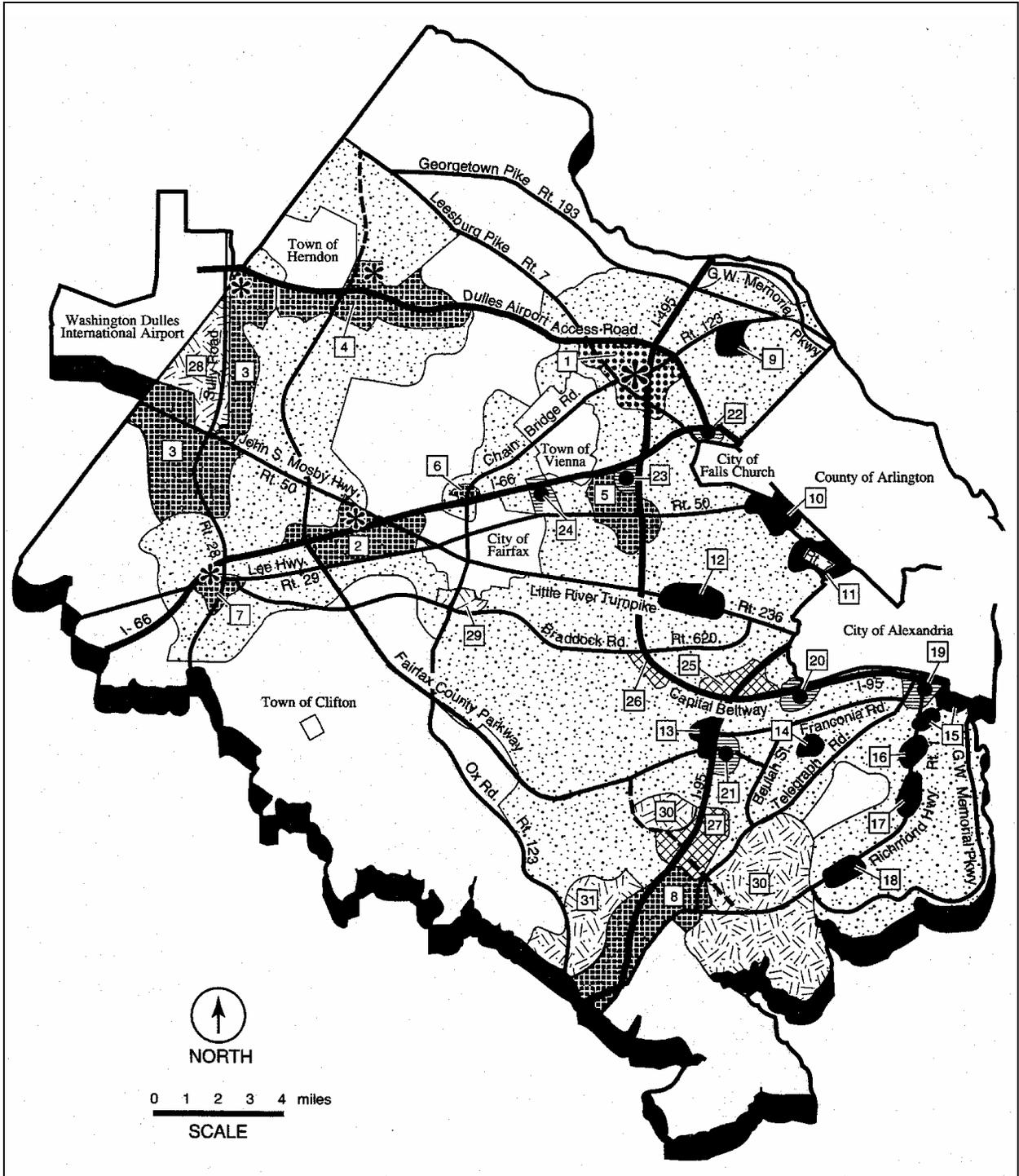
Information on land use is primarily tracked using the Urban Development Information System (UDIS), which was developed in the 1970s. Background information on UDIS from the 1995 State of the Plan explains, “the Comprehensive Plan had detailed guidance for residential development, with a dozen residential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

4. Land Use History and Buildout Projections

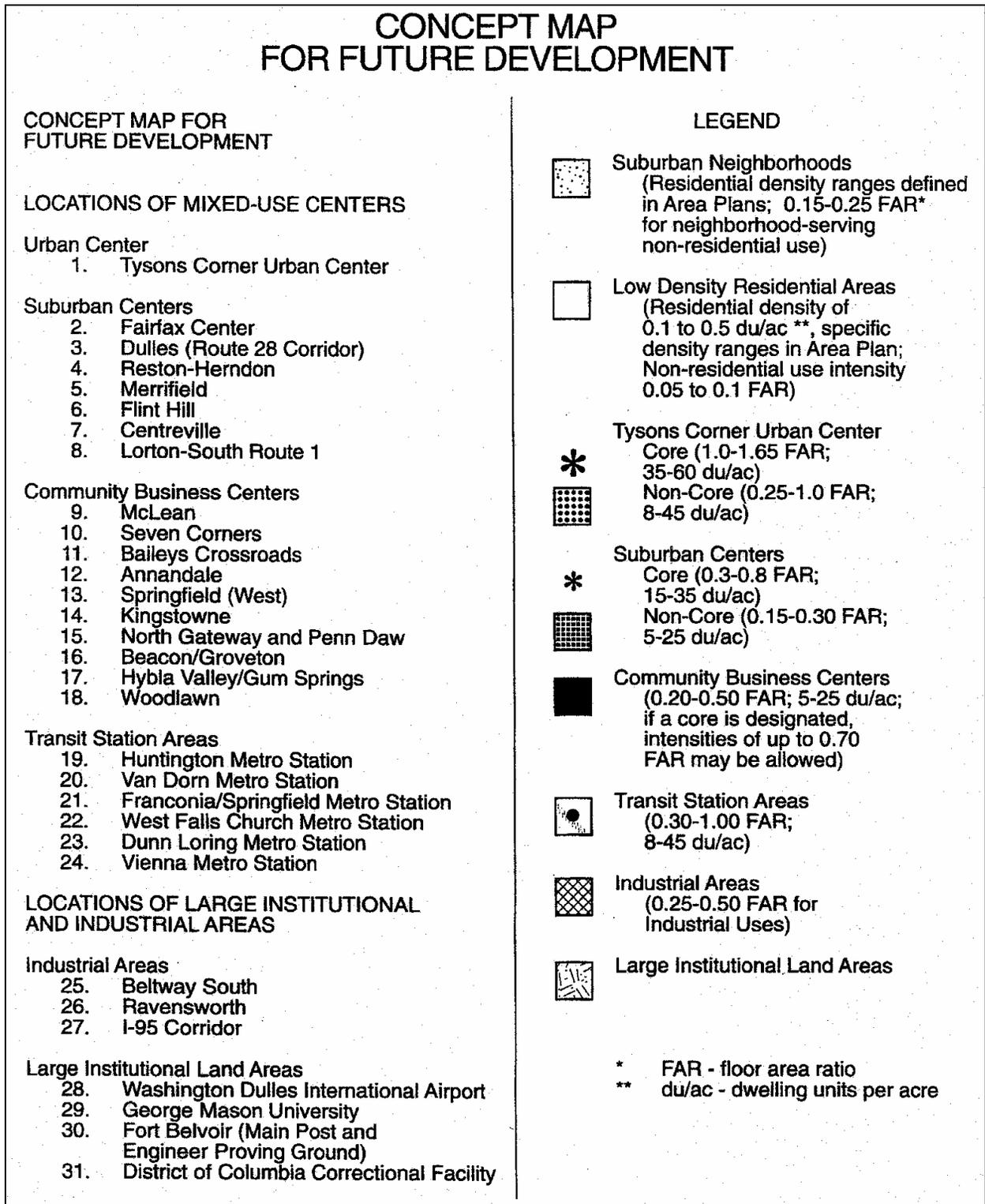
The Comprehensive Plan contains land use recommendations for all of the County’s land. As a practical tool, however, it is most effective when there is significant vacant land to be developed. That vacant land has been steadily decreasing as shown in Table VIII-1.

Figure VIII-2: Concept Map for Future Development



Source: Fairfax County Comprehensive Plan

Figure VIII-2 (continued)



Source: Fairfax County Comprehensive Plan

Table VIII-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 effect existing developed land.

The current land use categories are shown in Table VIII-2.

Table VIII-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 Rec	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 <i>Demographic Reports</i> , 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 VIII-3.

Table VIII-3 Planned Land Uses				
<u>Land Use</u>	<u>Planned Acreage</u>	<u>Percent of Total Land in the County</u>	<u>Vacant/Underutilized Land</u>	<u>Vacant Land as a percentage of Planned Acreage</u>
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 data were taken from the 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

C. TRANSPORTATION

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

a. Transportation Components that Impact the Environment

- 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,

⁷ Fairfax County *Demographic Reports*, 2002

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 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 but, due primarily to budget restraints, 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, both local and inter-county as well as 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 rush hour periods. Many of these buses are old and are a hazard to the environment, again because of the type of fuel they use.
- 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 a leader in this field by establishing the Fairfax County Government Telework Program. It appears to be a very successful program that will be discussed in later in this chapter.

b. Fairfax County Volume to Capacity Maps

Vehicle congestion on roadways is typically measured by volume to capacity (V/C) ratios. The Fairfax County Department of Transportation created maps for this report that show 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. When V/C exceeds 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.

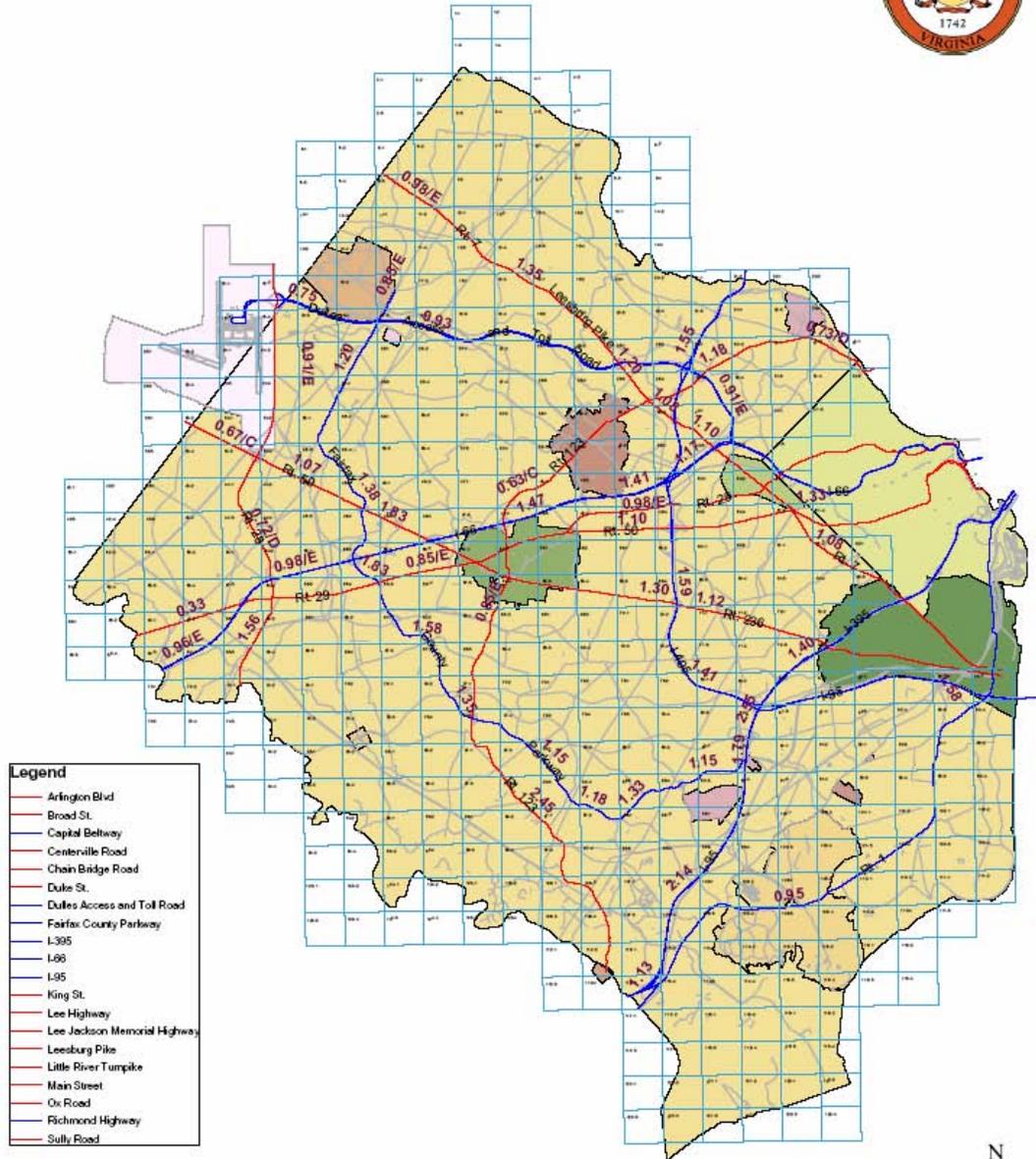
The current V/C ratios are shown in Figure VIII-3. Major portions of the Capital Beltway, I-66, and the Fairfax County Parkway already have a failing LOS. The projected V/C ratios for 2025 are shown in Figure VIII-4. These ratios account for population growth and settlement projections. Comparing the current conditions with future conditions provides many insights into how the transportation infrastructure grows with population. Some observations:

- (i) The Interstate highways that are currently failing will still be failing, with some being much worse and with others actually being better:
 - The portion of I-66 between the Capital Beltway and the City of Fairfax is expected to become less congested, while the portions of I-66 in Fairfax County that are inside the Beltway and that are in the Centreville area will get more congested.
 - The Beltway will become considerably more congested, with V/C ratios increasing from roughly 1.5 to over two. I-95 outside the Beltway is expected to stay the same in some segments and get less congested in others.
- (ii) Major roads are expected to remain basically as congested in 2025 as they are now. This includes Routes 1, 7, 29, 50, and 123. The exception is that portion of Route 123 in southern Fairfax County is expected to become less congested.

The reasons for these changes are many and varied, as are the conclusions that can be drawn. The reason for highlighting this in the EQAC report is to show that transportation changes with land use and other factors, but it is not always a direct correlation.

Figure VIII-3

Average Volume/Capacity V/C Ratios - Existing Peak Hour Conditions (2002)



- Legend**
- Arlington Blvd
 - Broad St
 - Capital Beltway
 - Centerville Road
 - Chain Bridge Road
 - Dulles St
 - Dulles Access and Toll Road
 - Fairfax County Parkway
 - I-395
 - I-66
 - I-95
 - King St
 - Lee Highway
 - Lee Jackson Memorial Highway
 - Leesburg Pike
 - Little River Turnpike
 - Main Street
 - Ox Road
 - Richmond Highway
 - Sully Road

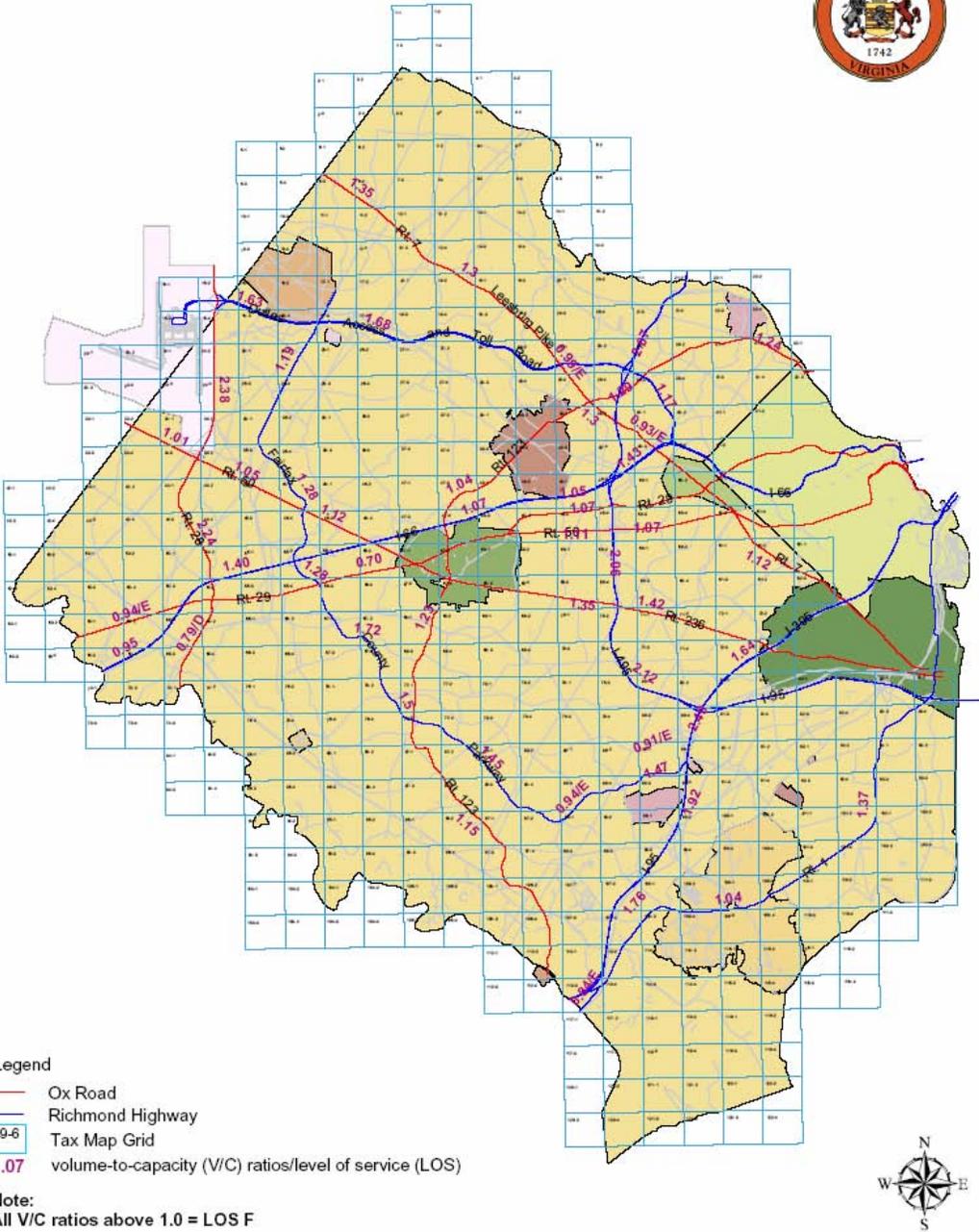
Note:
 0.00/A: volume-to-capacity ratios/level of service
 All V/C ratios above 1.0 = LOS F



Source: Fairfax County Department of Transportation

Figure VIII-4

Average Volume/Capacity V/C Ratios -
Future Peak Hour Conditions (2025)



Source: Fairfax County Department of Transportation

c. Residential Commuting

An interesting statistic on commuter patterns is that over 50% of the residents in Fairfax work in Fairfax, with another 17% working in the District of Columbia (Table VIII-4).

Table VIII-4 Where do Residents of Fairfax County Go to Work?		
Destination	Number of Commuters from Fairfax County	Percent of Total Commuters from Fairfax County
Fairfax County, VA	278,064	52.72%
District of Columbia	88,908	16.86%
Arlington County, VA	48,670	9.23%
Alexandria City, VA	27,641	5.24%
Montgomery County, MD	16,943	3.21%
Loudoun County, VA	16,420	3.11%
Fairfax City, VA	15,741	2.98%
Prince George's County, MD	9,594	1.82%
Prince William County, 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		

Similarly, most of the workers in Fairfax County live in Fairfax County; however over 80,000 workers commute to jobs in Fairfax County from Prince William and Loudoun Counties. Only 12,000 workers commute to the County from the District of Columbia (Table VIII-5).

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.

⁸ <http://www.co.fairfax.va.us/comm/demogrph/publist.htm>

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

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 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.

3. Programs, Projects, and Analyses

a. Walking and Biking Trails

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 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 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 Countywide Trails Plan added on-road bike routes as a new category of trails. They 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 Pedestrian Program Manager.

The Non-Motorized Transportation 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 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.

ESP is funded by a grant from the state Department of Regional Public Transportation (DRPT) that is funneled through the Metropolitan Washington Council of Governments (COG). COG provides the guidelines for the basic mission of ESP, which then reports back to COG, on a monthly basis as to goals and objectives and the achievement of those goals. At the present time, participation by employers is on a volunteer basis and the services are provided to employers with 100 or more employees. Some specific programs and goals of ESP are as follows:

- Regional Commuter Surveys;
- Vanpool Coordination;

- Transportation Information Centers;
- Transportation fairs;
- Metrocheck Benefit/SmartBenefits Programs;
- Guaranteed Ride Home Program; and
- Referrals for Ridematching.

Employer Services Participation is measured on four levels, each of which has numerous functions that can be performed by the employer. The first three levels include basic steps that an employer can take to promote alternatives to mobile commuting. Achieving level four involves the implementation of two or more of the functions included in level three and the active promotion of these programs and alternative commuting. At the present time, seven employers have achieved level four participation and 30 are at level three. The goal established by COG was 40 employers participating in levels three and four, a goal that appears to be well within the reach of ESP.

Any employer (for profit or not for profit) can benefit in a number of ways in addition to assisting Fairfax County and the region in improving the environment and participating in achieving the attainment requirements established by the EPA. One of the major benefits of participating in the program is improvement of employee morale and, most importantly, productivity. Recent surveys conducted in the County, the region, and even nationwide found that, by removing the pressure of commuting alone by car in heavily congested roadways, employee performance improves. Cost implications are minimal, and in some of the components of the program, ESP provides some financial assistance as well. In addition, all expenses incurred by the organizations related to assisting employees in participating in the various components of the program are tax deductible. Finally, there can be some direct financial gains resulting from the possible reduction in workspace created by employees telecommuting and the reduction in parking spaces by virtue of employees' car or van pooling or using other means of commuting.

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 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 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 Board of Supervisors and County 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 Board of Supervisors 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 to twenty percent. We urge that the Board continue funding the program and to increase the goal to a total of 50% of the eligible workforce.
- b. EQAC recommends that the Board of Supervisors take a leadership role in improving the environment through greater use of teleworking by establishing an aggressive program directed at convincing each employer in the County to achieve a minimum "Level 3" Employer Services Participation Program.
- c. EQAC recommends that the Board of Supervisors work with the Federal government to encourage an increase in teleworking. Further, we recommend the Board work closely with the Federal Congressional Delegation to secure resources to establish teleworking sites within the County.

3. Transportation

- a. EQAC recommends that the Board of Supervisors 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 within the County.
- b. EQAC recommends that the Board of Supervisors work with Metro and the Fairfax Connector to increase the number of stops available within communities, to explore a multiple size fleet that could penetrate further into communities, and to increase the number of runs per day on existing routes during peak hours.
- c. 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.

- d. 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.

LIST OF REFERENCES

Chesapeake Bay Foundation and Environmental Defense Fund, *A Network of Livable Communities*, May, 1996

Fairfax Plan Monitoring, State of the Plan, An Evaluation of the Comprehensive Plan Activities between 1990-1995 with an Assessment of Impacts through 2010, May 1996.

Fairfax County, Virginia, Department of Transportation, Average Volume/Capacity Ratio maps (prepared in 2003 for inclusion in this report).

Fairfax County, Virginia, Policy Plan: The Countywide Element of the Comprehensive Plan, 2000 Edition.

Fairfax County, Virginia, Tysons Corner Urban Center Element of the Comprehensive Plan, 2000 Edition.

Fairfax County, Virginia, Upper Potomac Planning District (Reston-Herndon Suburban Center and Transit Station Area) Element of Comprehensive Plan, 2000 Edition, Amendment No. 2000-1 adopted May 21, 2001.

Fairfax County, Virginia, The Merrifield Suburban Center, 2000 Edition, Amendment No. 2000-02 adopted June 11, 2001.

Transportation Coordinating Council of Northern Virginia, Task Force on Land Use and Transportation, "The alternative transportation and land use activity strategies study." March 28, 2001.

Virginia Department of Rail and Public Transportation and Washington Metropolitan Transit Authority, Draft Environmental Impact Statement and Proposed General Plans for the Dulles Corridor Rapid Transit Project, June 2002.

Steven R. Suder, Memorandum to the TCC Technical Committee, Expanded Technical Committee, and Citizen Advisory Committee and attachment regarding Draft Land Use and Transportation Study, January 26, 2001.

McLean Citizens Association, Resolution on the Dulles Corridor DEIS, August 14, 2002. Washington Regional Network for Livable Communities, Making the Most of Metro: Community Building Through Transit, undated.

A Network of Livable Communities, Evaluating Travel Behavior Effects of Alternative Transportation and Community Designs for the National Capital Region; Chesapeake Bay Foundation and Environmental Defense Fund, 1996.

Coalition for Smarter Growth, Better Communities, Less Traffic: Solutions and Choices for Metropolitan Washington, available on the Web at:
www.smartergrowth.net/smartgrowth/alternatives.php.

Texas Transportation Institute, 2003 Urban Mobility Study at
http://mobility.tamu.edu/ums/mobility_data/tables/washington_dc.pdf.

The Washington Metropolitan Area Transit Authority Fact Sheet at
<http://www.wmata.com/about/metromattersfactsheet.pdf>

Others

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

Braddock District workshops:
<http://www.co.fairfax.va.us/gov/bos/bd/commdialogintro.htm>

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

APPENDIX A

EQAC RESOLUTIONS AND POSITIONS JANUARY, 2003 THROUGH NOVEMBER, 2003

CONTENTS

<u>Date</u>	<u>Resolution/Position</u>	<u>Page</u>
January 8, 2003	Resolution on Proposed Revisions to the Chesapeake Bay Preservation Ordinance	A-2
January 8, 2003	Resolution Regarding a Zoning Ordinance Amendment for the R-C District	A-5
May 14, 2003	Resolution Regarding the Chesapeake Bay Preservation Ordinance Revision	A-6
May 14, 2003	Resolution Regarding School Buses	A-7
June 11, 2003	Resolution for Recycling Programs within Fairfax County Public Schools	A-8
June, 2002	Letter regarding the status of revisions to the Chesapeake Bay Preservation Ordinance and Intensely Developed Areas	A-9
August 13, 2003	Resolution on the Advisability of Designating Intensely Developed Areas (IDAs) under the Chesapeake Bay Preservation Ordinance	A-10
November 12, 2003	Testimony Regarding Chesapeake Bay Preservation Area Maps	A-12

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

**RESOLUTION ON THE PROPOSED REVISIONS
TO THE
CHESAPEAKE BAY PRESERVATION ORDINANCE**

January 8, 2003

Whereas, revised State laws known as Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 10-20) became effective March 1, 2002; and

Whereas, local governments throughout Virginia were given until March 1, 2003, to bring their ordinances and regulations into conformity with the new State laws; and

Whereas, Fairfax County has circulated draft revisions to Chapter 101 (the Subdivision Ordinance), Chapter 104 (the Erosion and Sediment Control Ordinance), Chapter 112 (the Zoning Ordinance), and Chapter 118 (the Chesapeake Bay Preservation Ordinance) of the County code and draft revisions to the Public Facilities Manual (PFM) that will be presented to the Planning Commission on January 15, 2003 and to the Board of Supervisors on January 27, 2003; and

Whereas, the draft revisions are extremely thorough and very well conceived except for following points that require further amendment; and

Whereas, in Article 7 an Exception Review Committee is proposed that will, in public hearings, consider applications for exceptions to any provisions of the revised ordinance, with this committee to be comprised of five members of the County staff appointed by the Director of Public Works and Environmental Services, which creates an inherent question of the independence and objectivity of a committee so constituted; and

Whereas, in Article 8, Appeals, item 8 (a) is presently worded so that only an applicant aggrieved by the decision of the Director, Department of Public Works and Environmental Services, the Director, Department of Health, or the Exception Review Committee may appeal to the Board of Supervisors, which does not provide for appeal by any other interested party with legitimate grievance; and

Whereas, the definition of floodplains continues to be based on a drainage area of 360 acres for major floodplains (which have one set of restrictions) and a drainage area of 70 to 360 acres for minor floodplains (which have a lesser set of restrictions), while EQAC has recommended that a drainage area of 50 acres or more define a floodplain and that the restrictions and requirements now applied to major floodplains be applied thereto; and

Whereas, the Infill Development Study has shown that the regulatory requirements for all development within the County needs to be made consistent, explicit language needs to be incorporated in each of the relevant chapters of the County Code to require that all site plans, minor site plans, and any grading plan for each and every parcel of land in the County undergoing development, redevelopment, or other land disturbance clearly delineate the boundaries of the Resource Protection Area (RPA) for any water body with perennial flow located within 100 feet of the site;

Therefore, be it resolved, that Section 118-7-3 (a) be modified as follows, "The Exception Review Committee shall be composed of ~~five (5)~~ seven (7) members who shall ~~be County employees with~~ have demonstrated knowledge of and interest in environmental issues and shall be appointed by the ~~Director~~ Board of Supervisors, with no more than three (3) to be County staff, nominated by the Director of Public Works and Environmental Services, and at least four (4) to be drawn from, or nominated by, the Northern Virginia Soil and Water Conservation District, the Environmental Quality Advisory Council, and the Wetlands Board; and

Be it further resolved, that Section 118-7-3 (b) be modified as follows, "Members shall ~~exempt~~ recuse themselves from voting on any action in which their financial interests or those of their immediate family or employer are directly involved."; and

Be it further resolved, that Section 118-7-4 second paragraph be modified as follows, "The Chairman, Vice-Chairman, and Secretary shall be ~~designated by the Director~~ elected annually by the Committee members."; and

Be it further resolved, that Chapter 118, Article 8 (a) be amended to include the following language shown in italics, "(a) An applicant *or other interested party* aggrieved by any decision of the Director of the Department of Public Works and Environmental Services, Environmental Management or the Director of the Department of Health Services, or the Exception Review Committee in the administration of this Chapter may, within fifteen (15) days of such decision, appeal the decision to the Board of Supervisors. Such appeal shall be filed with the Clerk to the Board of Supervisors and shall state with specificity the provisions of this Chapter which the applicant *or other interested party* alleges to have been violated by the decision and the reasons therefor. A copy of the appeal shall; also be delivered to the Director of the Department of Public Works and Environmental Services ~~Environmental Management~~ within such fifteen (15) day period"; and

Be it further resolved, that Chapter 118, Section 118-1-6, Item (o) be changed to read, ""~~Major~~ Floodplain" means those land areas in and adjacent to streams and watercourses subject to continuous or periodic inundation from flood events with a one (1) percent chance of occurrence in any given year (i.e., the 100-year flood frequency event) and having a drainage area equal to or greater than ~~three hundred and sixty (360)~~ fifty (50) acres and that such areas be governed by the regulations and requirements heretofore applied to major floodplains." and that other chapters of the County Code and sections of the PFM be made consistent with this revised definition; and

Be it also resolved, that explicit language be included in each of the relevant Chapters of the Code and Sections of the PFM requiring that for each and every development site or site where more than 2500 square feet of land disturbance is proposed, a plan must be submitted stating whether there is within 100 feet of any boundary of the site any water body with perennial flow, how this has been determined and, if such is present, clearly delineating on the plan the boundaries of the Resource Protection Area (RPA).

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION REGARDING A ZONING ORDINANCE AMENDMENT FOR THE R-C DISTRICT

January 8, 2003

Whereas, a Zoning Ordinance Amendment has been proposed to allow public/private partnerships to create, through special exception, extensive athletic facilities consisting of fields, associated parking, bleachers, buildings, etc. concentrated in complexes in the R-C District; and

Whereas, the complexes contemplated would cover substantial fractions of the area of such sites with impervious and semi-pervious surfaces, would remove natural vegetation which currently serves to protect water quality and to prevent erosion and would greatly increase stormwater runoff into adjacent streams; and

Whereas, the R-C District was established in order to protect waterways, stream valleys, forest cover, marshes, areas of natural scenic vistas, and aquifer recharge areas; minimize impervious surface and protect the quality of water in public water supply watersheds; and promote open space and agricultural/horticultural uses; and

Whereas, twenty years ago the Board of Supervisors rezoned roughly 41,000 acres of land to the R-C District in order to protect one of the County's major drinking water sources; and

Whereas, the R-C District has the additional benefit of providing habitat for wildlife and plants that need large greenways in which to survive; and

Whereas, this proposed Zoning Ordinance amendment would allow uses that are totally inconsistent with the objectives for the R-C District, threaten substantial harm to waterways, stream valleys, forest cover, and aquifer recharge areas and will contribute to the continued loss of natural open space in Fairfax County;

Therefore, be it resolved that the Environmental Quality Advisory Council strongly opposes any relaxation of the Zoning Ordinance for the R-C District, and strongly opposes the proposed addition of uses incompatible with the original intent of the Ordinance.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION REGARDING THE CHESAPEAKE BAY PRESERVATION ORDINANCE REVISION

May 14, 2003

Whereas, the revisions to the Chesapeake Bay Preservation Ordinance (Chapter 118 of the Fairfax County Code) and related chapters of the County Code and sections of the Public Facilities Manual, after a long and arduous process of refinement, have come to the Board of Supervisors for adoption; and

Whereas, EQAC strongly endorses the revisions, with one exception; and

Whereas, Alternative 2 of the April 10, 2003 version of the revisions provided for a balanced right of appeal in which, "An applicant or any other party aggrieved by any decision of the Director of the Department of Public Works and Environmental Services (DPWES), the Director of the Department of Health, or the Exception Review Committee may, within fifteen (15) days of such decision, appeal the decision to the Board of Supervisors, . . ."; and

Whereas, the Planning Commission's recommended language permits appeal from decisions of the Director of DPWES and the Director of the Department of Health only by an aggrieved applicant but not by any other affected party; and

Whereas, all aggrieved parties should have an equal right to appeal; now therefore

Be it resolved, that EQAC strongly recommends that the Board of Supervisors strike paragraphs (a), (b), and (c) of the new version of Article 8, Appeals, and replace them with the language of Alternative 2 of the April 10, 2003, re-advertised version; and

Be it further resolved, that EQAC strongly endorses the remainder of the Planning Commission's recommended revisions and recommends their prompt adoption.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION REGARDING SCHOOL BUSES

May 14, 2003

WHEREAS, Air Quality is a major environmental issue facing Fairfax County; and

WHEREAS, A major source of air pollution is mobile transportation, and contributing factors include fuel type, traffic congestion, and vehicle miles traveled; and

WHEREAS, It is well known that school buses are contributors to this problem due to the age and condition of the buses, the type of fuel they use, the routes in which they operate and the manner in which they are operated; and

WHEREAS, Buses idling for long periods of time add unnecessary atmospheric pollution and waste fuel; now therefore

BE IT RESOLVED, That EQAC recommends that the Fairfax County Public School System consider the following:

1. Convert all buses currently using regular diesel fuel to using ultra low sulfur diesel or bio (green) diesel fuel and EPA-certified particulate matter filters.
2. Replace buses that, due to their age or condition, cannot be converted.
3. Review the current (and planned) bus routes in an attempt to avoid highly congested thoroughfares, particularly since buses operate during rush hour.
4. Avoid buses idling for long periods of time prior to picking up their passengers. This is of particular concern on the school grounds at the end of the school day.
5. Develop an all inclusive plan to make the Fairfax County School System's transportation program more environmentally friendly.

BE IT FURTHER RESOLVED, That, in recognition that most of these recommendations have significant budgetary ramifications, and in recognition of the time it will take put some of these recommendations into action, EQAC recommends that the School Board place a high priority on these recommendations and include them in its long range budget plan.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL
RESOLUTION FOR RECYCLING PROGRAMS WITHIN
FAIRFAX COUNTY PUBLIC SCHOOLS

June 11, 2003

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, Fairfax County educators stress the importance of recycling to their students; 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 government centers all have recycling opportunities available but the public schools do not; and

WHEREAS, Fairfax County would benefit from a system-wide recycling program in the public schools; now therefore

BE IT RESOLVED, That the Fairfax County Public School system should:

1. k to implement a cost effective recycling program, 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;
2. Involve students in this effort, e.g., ensure that an environmental club or service club manages the recycling program instituted within the school; and
3. Create a volunteer panel of students and teachers to monitor the recycling program.

FAIRFAX COUNTY ENVIRONMENTAL QUALITY ADVISORY COUNCIL

June 23, 2003

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

Dear Madam Chairman and Members of the Board:

We at EQAC have concerns about the present languishing status of the revisions to the Chesapeake Bay Preservation Ordinance. We urge the BOS to adopt the revisions to the Bay Ordinance as recommended by the Planning Commission and to take up the issue of designating Intensely Developed Areas (IDAs) as a subsequent matter.

Subsequent to the Planning Commission's January 15, 2003 public hearing on the proposed revisions to the Ordinance, the Planning Commission referred some of the issues that were raised by various interest groups at the public hearing to the Environment Committee of the Commission. The Environment Committee worked jointly with EQAC, over the course of several meetings that included representatives from the development community and other stakeholders, to review these issues, and the Chairman of the Environment Committee prepared recommendations to the full Planning Commission based on these discussions. The Planning Commission subsequently voted unanimously to recommend approval of the proposed Chesapeake Bay Preservation Ordinance revisions. At the Board of Supervisors' public hearing on May 19, some members of the development community again spoke of their problems with this proposed Ordinance and asked for delay of implementation until December and to consider the possibility of IDA designations. The vote was deferred until Monday, June 2. At its June 2 meeting, the Board of Supervisors again deferred action on the Ordinance revisions and asked staff to provide guidance regarding the IDA designation issue.

At the Board of Supervisors' public hearing on May 19, the Ordinance under discussion did not include designation of IDAs. The Ordinance was not advertised with IDA designations and citizens have not had the opportunity to comment on IDA designation proposals either before the Planning Commission or the Board of Supervisors. Furthermore, the process of designation of an IDA is not a simple task. Up for discussion would be where IDAs would be designated and what the ramifications of those designations would be. The public and EQAC certainly deserve the opportunity to participate in that process.

The entirety of the Chesapeake Bay Preservation Ordinance revisions should not be held up by this latest request. The present Chesapeake Bay Preservation Ordinance allows for the creation of IDAs at a later date. There is no reason to delay passage of the proposed revisions to the Ordinance. These proposed revisions to the Ordinance have the backing of the Planning Commission and EQAC. We again urge the BOS to adopt the revisions to the Ordinance as recommended by the Planning Commission and to take up the issue of IDA designations as a subsequent matter.

I thank you for your attention and consideration.

Sincerely,

(signed by Chairman)

Robert D. McLaren, Chairman
Environmental Quality Advisory Council

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION ON THE ADVISABILITY OF DESIGNATING INTENSELY DEVELOPED AREAS (IDAs) UNDER THE CHESAPEAKE BAY PRESERVATION ORDINANCE

August 13, 2003

Whereas, the Chesapeake Bay Local Assistance Board (CBLAB) issued revised Chesapeake Bay Preservation Area Designation and Management Regulations with an effective date of March 1, 2002; and

Whereas, both the former and present CBLAB Regulations contained a provision allowing, at the discretion of localities, the designation of Intensely Developed Areas (IDAs) under certain formulaic conditions; and

Whereas, the Board of Supervisors in 1991 studied the advisability of incorporating IDAs, and provisions therefore, in Fairfax County's first Chesapeake Bay Preservation Ordinance and decided that the Ordinance as drafted provided ample flexibility and fairness in the exceptions process to eliminate the need for such blanket designations; and

Whereas, Fairfax County brought its ordinances into compliance with the revised CBLAB regulations by enactment on July 7, 2003, of revisions to four chapters of the County Code and the Public Facilities Manual; and

Whereas, Fairfax County took great care to make such revisions comprehensive and to provide thorough exception review processes to ensure the fairness and reasonableness of their application; and

Whereas, the Ordinance revision process included a series of workshops jointly hosted by the Planning Commission and the Environmental Quality Advisory Council at which all "stakeholders" were given the opportunity to fully express concerns over any and all proposed draft revisions; and

Whereas, the matter of IDAs received only minimal expressions of interest and concern in the course of the workshops, even from members of the development community; and

Whereas, on June 2, 2003, while considering the proposed revisions to the Ordinance, the Board of Supervisors asked staff to: (1) investigate whether IDAs should be designated for Tysons Corner and for Revitalization Areas and Districts; and (2) draft such language as might be required for their implementation; and

Whereas, the revised Ordinance, as adopted on July 7, 2003, without inclusion of IDAs, contained even greater flexibility and fairness-of-process than the original Ordinance, including provisions for review of exceptions on a case-by-case basis; and

Whereas, on July 21, 2003, the Board of Supervisors authorized the advertisement of public hearings to consider the addition of text to the Chesapeake Bay Preservation Ordinance regarding IDAs and to consider the designation of an IDA in the Tysons Corner Urban Center; and

Whereas, the Board of Supervisors requested EQAC's review of this matter prior to its consideration by the Planning Commission; and

Whereas, the present CBLAB Regulations (9 VAC 10-20-100) state: "Areas of existing development and infill sites where little of the natural environment remains may be designated as Intensely Developed Areas . . ."; and

Whereas, there is still significant natural environment in the stream valleys of Tysons Corner; now therefore

Be it resolved, that the Environmental Quality Advisory Council strongly supports the revised Chesapeake Bay Preservation Ordinance as adopted on July 7, 2003; and

Be it further resolved, that EQAC particularly supports the provision approved on July 7, 2003 for review of exceptions on a case-by-case basis and further supports the concept of no net loss of RPAs in the stream valleys in Tysons Corner; and

Be it further resolved, that EQAC regards further revision of the Ordinance to provide for designation of IDAs as wholly unnecessary and strongly recommends against such inclusion and designations.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

TESTIMONY REGARDING CHESAPEAKE BAY PRESERVATION AREA MAPS

November 12, 2003

After discussion of the revised Chesapeake Bay Resource Protection Area (RPA) maps that are to be considered by the Board of Supervisors at a public hearing on November 17, 2003, the Council designated member Frank Crandall to testify at the public hearing on behalf of EQAC. The points to be covered in the testimony are:

1. The Stream Remapping Study, which the Board initiated in response to an EQAC resolution, has resulted in a revised set of RPA maps that represent an enormous step forward in stream protection.
2. The staff is to be commended for accomplishing the major phase of this study, resulting in the revised maps before you today, on a very tight time schedule in order to meet the mandate of CBLAD.
3. EQAC recommends the immediate adoption of the revised maps.
4. As with any complex activity of this kind, the Stream Remapping Study has now entered into the "quality control" phase, which the Board very wisely mandated.
5. Already, several instances have been identified where small tributary streams or upper reaches were missed or some reaches of streams were inaccurately characterized as non-perennial due to unusual hydrologic, geologic, and topographic factors. As these cases are resolved, they will require further minor amendments to the maps on a periodic basis.
6. The scientific protocol developed by the County for evaluating streams is generally excellent, but it has been discovered that, in some cases, it leads to mischaracterization of the spring-fed headwaters reaches of small streams. As this problem is resolved it will require a minor amendment to the text of the Ordinance relating to the protocol.
7. EQAC will continue to monitor the quality control efforts and work with the staff to identify any areas needing further evaluation and amendment.

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 2003 Environmental Excellence Awards were:

County Resident Award:	Joseph Chudzik
Organization Award:	Students Against Global Abuse (SAGA)
County Employee Award:	Noel Kaplan

Joseph Chudzik was recognized for his initiative, dedication, and leadership on a number of environmental efforts in the Mason Neck/Lorton area. Students Against Global Abuse was recognized for its leadership in fostering student involvement and activism in support of environmental protection and enhancement in Northern Virginia. Noel Kaplan was recognized for his initiative, dedication, and commitment to public service above and beyond the expectations of his position, in support of EQAC, interagency environmental initiatives, and other environmental efforts. EQAC congratulates all three recipients.

In past years, Environmental Excellence Awards have been awarded to the following people and organizations:

2002

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
APR	Area Plan Review
AQI	Air Quality Index
ARE	Annual Report on the Environment
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
BOS	Board of Supervisors (County)
CAA	Clean Air Act (Federal)
CBLAB	Chesapeake Bay Local Assistance Board (State)
CBLAD	Chesapeake Bay Local Assistance Department (State)
CBP	Chesapeake Bay Program (Regional)
CCR	Consumer Confidence Report
CDC	Centers for Disease Control (Federal)
CDM	Camp, Dresser and McKee
CE	County Executive
CESQG	Conditionally Exempt Small Quantity Generator
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 (Regional)
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)
DCR	Department of Conservation and Recreation (State)
DEQ	Department of Environmental Quality (State)
DIYers	Do-it-yourselfers

DNL	Day-Night sound level (also referred to as "Ldn")
DPWES	Department of Public Works and Environmental Services (County)
DPZ	Department of Planning and Zoning (County)
DRPT	Department of Regional Public Transportation (State)
DSWCR	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)
EFID	Environmental and Facilities Inspection Division (County)
EFRD	Environmental and Facilities Review Division (County)
EHD	Epizootic hemorrhagic disease
EIS	Environmental Impact Statement
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
ERIC	Ecological Resources Inventory Committee (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
FCPS	Fairfax County Public Schools
FCWA	Fairfax County Water Authority
FJLEPC	Fairfax Joint Local Emergency Planning Committee (Regional)
FY	Fiscal Year
GAC	Granular Activated Carbon
GAT	Guaranteed Annual Tonnage
GIS	Geographic Information System
GMP	General Management Plan
GPS	Global Positioning System
GPS	Groundwater Protection Standards
HAA	Haloacetic Acid
HAZMAT	Hazardous Materials

HB	House Bill (State)
HCl	Hydrochloric Acid
HHW	Household Hazardous Waste
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
LCAT	Lorton Citizens Alliance Team
LEPC	Local Emergency Planning Committee
LID	Low Impact Development
LOS	Level of Service
MCL	Maximum Contaminant Level
MCS	Michigan Cogeneration Systems
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
MSMD	Maintenance and Stormwater Management Division (County)
MSW	Municipal Solid Waste
MtBE	Methyl tertiary 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
NiCd	Nickel-Cadmium
NMPCP	Noman M. Cole, Jr. Pollution Control Plant (County)
NOV	Notice of Violation
NO_x	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Sources
NRMP	Natural Resource Management Plan
NSR	New Source Review

NTU	Nephelometric Turbidity Units
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)
NWR	National Wildlife Refuge
OCF	Office of Capital Facilities (County)
OTC	Ozone Transport Commission (Federal)
OWML	Occoquan Watershed Monitoring Laboratory
OWMP	Occoquan Watershed Monitoring Program
PC	Planning Commission (County)
PFM	Public Facilities Manual (County)
PM	Particulate Matter
PM_{2.5}	Particulate Matter less than 2.5 microns in diameter
ppm	parts per million
PRM	Principal Recyclable Material
PWP	Potomac Watershed Partnership
QA/QC	Quality Assurance/Quality Control
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technologies
RDOC	Recycling Drop Off Center
ResWAG	Reston Association Watershed Action Group
ROP	Rate of Progress
RPA	Resource Protection Area
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
SO₂	Sulfur Dioxide
SOCs	Synthetic Organic Compounds
SPS	Stream Protection Strategy
SUAG	Stormwater Utility Advisory Group (County)
SWM	Stormwater Management
SWMP	Solid Waste Management Plan (County)
SWPD	Stormwater Planning Division (County)
SWRRC	Solid Waste Reduction and Recycling Center
TAC	Transportation Advisory Commission (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)
µg/l	Microgram Per Liter
UOSA	Upper Occoquan Sewage Authority
USGS	United States Geological Survey
VA	Virginia
V/C	Volume to Capacity Ratio
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
VPDES	Virginia Pollutant Discharge Elimination System
W&OD	Washington and Old Dominion
WID	Watershed Improvement District
WMATA	Washington Metropolitan Area Transit Authority (Regional)
WWTP	Wastewater Treatment Plant