

GOOSE CREEK WATERSHED PROGRAM REVIEW

AN ANALYSIS OF LOUDOUN AND FAUQUIER COUNTIES' CODES, ORDINANCES AND PROGRAMS IN THE CONTEXT OF THE EIGHT TOOLS OF WATERSHED PROTECTION

MAY 2003



Acknowledgements

ACKNOWLEDGEMENTS

The program review is truly a group effort with many organizations and agencies contributing to the assessment. We would like to thank these organizations and agencies listed below:

Loudoun County Department of Planning
Loudoun County Environmental and Historic Resources Program
Loudoun County Department of Building and Development
Loudoun County Health Department
Loudoun County Parks Recreation and Community Services
Loudoun Soil and Water Conservation District
Loudoun County Sanitation Authority
Virginia Cooperative Extension Loudoun County Office

Fauquier County Community Development
Fauquier County Parks and Recreation
John Marshal Soil and Water Conservation District
Virginia Cooperative Extension Fauquier County Office

Piedmont Environmental Council
James M. Rowley Goose Creek Conservation Fund
Goose Creek Association
Loudoun Wildlife Conservancy
Loudoun Watershed Watch
Loudoun County Environmental Indicators Project
Goose Creek Scenic River Advisory Board
Watershed Neighbors Program
Audubon Naturalist Society, Virginia Water Quality Program
Citizens for Fauquier County
Virginia Department of Conservation and Recreation, Division of Natural Heritage

In addition to the organizations listed above, many others were contacted but responses were not received.

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LIST OF ACRONYMS AND ABBREVIATIONS

A&F	Agriculture and Forestal district
ADT	Average Daily Trips
BMP	Best Management Practices
CAFO	Confined Animal Feeding Operations
COW	Codes and Ordinance Worksheet
CREP	Conservation Reserve Enhancement Program
CWP	Center for Watershed Protection
DCR	Virginia Department of Conservation and Recreation
DDA	Development Delineation Area
DEQ	Virginia Department of Environmental Quality
ESC	Erosion and Sediment Control
GCA	Goose Creek Association
HOA	Home Owners Association
ICPRB	Interstate Commission on the Potomac River Basin
IDDE	Illicit Discharge Detection and Elimination
IPM	Integrated Pest Management
LCSA	Loudoun County Sanitation Authority
LOD	Limestone Overlay District
MDOD	Mountainside Development Overlay District
NOVA	Northern Virginia Planning District Commission
NPDES	National Pollutant Discharge Elimination System
OSDS	On-site Sewage Disposal Systems
PDR	Purchase of Development Rights
PEC	Piedmont Environmental Council
POTW	Publicly Owned Treatment Works
RA	Rural Agricultural zoning district
RC	Rural Conservation zoning district
RSCOD	River and Stream Corridor Overlay District
SWCD	Soil and Water Conservation District
TDR	Transfer of Development Rights
VDOT	Virginia Department of Transportation
VESCH	Virginia Erosion and Sediment Control Handbook
VOF	Virginia Outdoors Foundation

1.0 INTRODUCTION

In early 2002, the Center for Watershed Protection (CWP), Piedmont Environmental Council (PEC), and the Goose Creek Association (GCA) embarked on a three-phase project in Goose Creek, including 1) a watershed vulnerability analysis to identify the most vulnerable subwatersheds in the Goose Creek watershed; 2) intensive stream and riparian management assessments within three selected subwatersheds to ground-truth analysis and identify opportunities to protect and restore stream health within each subwatershed and 3) rapid watershed plans for these subwatersheds.

A key element in this third step is to assess current watershed protection capability in Loudoun and Fauquier Counties. The Goose Creek Watershed Program Review was designed to establish a baseline of current strategies and practices within the watershed. By understanding these, strengths and weaknesses can be assessed and future efforts planned. This review is not a critique of past management efforts in the watershed. Instead, it is intended to provide a basis for future efforts in protecting and managing the Goose Creek watershed, utilizing an eight tools approach to watershed protection (see Table 1). A blank copy of the program review is provided in Appendix A.

Table 1. The Eight Tools of Watershed Protection

Watershed Protection Tool	Description
1. Watershed Planning	The application of regulatory measures and/or planning techniques that are designed to maintain or limit future impervious cover, redirect development where appropriate, and protect sensitive areas.
2. Land Conservation	Programs or efforts to conserve undeveloped, sensitive areas or areas of particular historical or cultural value.
3. Aquatic Buffers	The protection, restoration, creation, or reforestation of stream, wetland, and urban lake buffers.
4. Better Site Design	Local ordinances and codes incorporate techniques to reduce impervious cover and/or redirect runoff onto pervious surfaces in the design of new development and redevelopment projects.
5. Erosion and Sediment Control	The use of erosion control, sediment control, and dewatering practices at all new development and redevelopment sites.
6. Stormwater Management	The incorporation of structural practices into new development, redevelopment, or the existing landscape to help mitigate the impacts of stormwater runoff on receiving waters.
7. Non-Stormwater Discharges	Locating, quantifying, and controlling non-stormwater pollutant sources in the watershed. Operation and maintenance practices that prevent or reduce pollutants entering the municipal or natural drainage system. Examples include illicit discharges and confined animal feeding lots.
8. Watershed Stewardship Programs	Stormwater and watershed education or outreach programs targeted towards fostering human behavior that prevents or reduces pollution over a range of land uses and activities.

This document is divided into two main sections. The first section is dedicated to a review of Loudoun County’s programs. The second section is a review of Fauquier County’s programs. Each County’s programs, codes and ordinances are reviewed within the context of the eight tools of watershed protection. Each tool is divided into three sections: 1) a list of relevant regulations and supporting documents, 2) a detailed summary of these relevant regulations and documents and 3) recommendations to enhance existing programs.

2.0 LOUDOUN COUNTY PROGRAM REVIEW

TOOL 1. LAND USE PLANNING

Regulations/Supporting Documents

Loudoun County Revised General Plan
Loudoun County Revised 1993 Zoning Ordinance
Loudoun County, Virginia Purchase of Development Rights Program

Program(s) and Techniques

Among the fastest growing counties in the nation, recent legislation has reflected the Loudoun County's desire to curb this rapid growth and to protect its natural and cultural resources. The County has an extensive network of land use regulations and practices for watershed protection. The intent of the recent changes to the County's Zoning Ordinance and Comprehensive Plan is to direct development to areas of existing infrastructure and direct public services, infrastructure, and resources to areas planned for suburban development and increase protection of environmentally sensitive features such as headwater streams and drinking water reservoirs.

Rural Zoning

Perhaps the most significant change produced by the newly adopted legislation is the rezoning of the western portion of the County from a density of one house per three acres to one house per ten, twenty or fifty acres; depending on location and development type thereby reducing the number of homes that will be built. This legislation zones approximately 45% of the portion of Loudoun County falling within the Goose Creek watershed as AR-2 (one house per fifty acres) with the option to cluster residential lots (up to three acres in size) at the equivalent of one house per twenty acres. A smaller portion of the watershed will also be zoned AR-1 (one house per twenty acres) with the option to cluster residential lots (up to three acres in size) at the equivalent of one house per ten acres.

Another 5% of the watershed is zoned as Transition, with a range of density in sub-areas from 1 house per acres to 1 house per 10 acres. All development within this zone must be clustered.

Purchase of Development Rights (PDR) Program

A PDR program can reduce development in sensitive areas by compensating property owners who voluntarily agree to restrict future use of their land. Objectives of Loudoun County's PDR program include preserving agricultural, natural, historic and scenic resources. For more details on the County's PDR Program, see Tool 2.

Overlay Districts

Overlay zoning imposes additional regulations within specific mapped districts. Loudoun County has implemented this technique to protect key environmental features. Examples of three overlay districts are: the River and Stream Corridor Overlay District (RSCOD), the Mountainside Development Overlay District (MDOD), and the Limestone Conglomerate Overlay District (LOD). Since the RSCOD is most relevant to aquatic buffers, it is addressed in more detail in Tool 3. The MDOD uses land use restrictions and performance standards to minimize the disturbance of these sensitive environmental features. The LOD establishes Karst Feature Buffers measured from the outermost edge of the karst feature to protect the health, safety, and welfare of the public.

Agricultural and Forestal Districts

Agricultural and Forestal Districts are an effective method for protecting agricultural and forestal lands, water supplies and scenic and environmental amenities, inclusion within an Agricultural and Forestal District affords the landowner certain tax benefits (referred to as the Use Value Tax Program) and restrictions on public utilities and governmental action. In exchange, the landowner voluntarily agrees to conditions which limit development of the property during the time in which the land is enrolled in the program.

Recommendations

Develop a Lawn Care Education Program

One unintentional side-effect of rural zoning can be vast expanses of lawns which contribute to non-point source pollution. Develop a program that would educate and encourage homeowners to leave a portion of their property in a natural state and to use Integrated Pest Management (IPM) lawn care practices that would reduce pesticides and nutrient usage. Mediums that should be used in the campaign include radio (public service announcements), the newspaper, cable TV, and schools. Also consider developing a reforestation program that would educate landowners on the benefits of trees versus lawn and provide information on native trees and where to purchase them. As with all education efforts remember to repeat the message. Frequency is important because it determines how well the message will be remembered. See Appendix D for fact sheets on lawn conversion and lawn care.

Strengthen Overlay District Regulations

The current overlay districts are a great addition to Loudoun County's suite of land use planning techniques. However, there are several places where the regulations pertaining to overlay districts could be strengthened to provide better environmental protection:

- Further identify and better protect water recharge areas beyond the existing MDOD language.
- Develop the watershed overlay district and watershed management plans for all public water supply reservoir watersheds in the interest of achieving the water quality goals identified in the Revised General Plan (pages 5 – 12).

Expand Use Value Tax Program

Consider adding criteria to the Use Value Tax Program to create additional incentives for stream protection. The focus of such incentives should include headwater and high quality streams, the reforestation of pastureland adjacent to streams, and the protection of existing forested buffers.

TOOL 2. LAND CONSERVATION

Regulations/Supporting Documents

Loudoun County Revised General Plan
Loudoun County Revised 1993 Zoning Ordinance
Loudoun County Facilities Standards Manual

Program(s) and Techniques

There are multiple avenues for conserving land in Loudoun County. Conservation easements are probably the most widely applied of all of the land conservation techniques. More than 10% of the portion of Loudoun County falling within the Goose Creek watershed is under the protection of a conservation easement. Other land conservation techniques include development ordinances and other policies and programs.

Development Ordinances

- Zoning Ordinance

Open space requirements are one technique local governments frequently use to preserve natural areas and to provide recreation within the community. The open space requirement in Loudoun County's zoning ordinance ranges anywhere from 0 – 80%. The new Transitional Residential zoning categories have high open space requirements to help facilitate the requirement of a 300 foot buffer along Bull Run, Goose Creek, Catoctin Creek, Beaverdam Reservoir and the Potomac River. The 300 foot buffer is a requirement of the RSCOD (see Tool 3 for more information).

- Conservation Design (Zoning Ordinance)

This process requires developers to develop sites with natural and historic features being the focus of the design in the Rural zoning districts, the Transition zoning districts, and the Joint Land Management Areas for towns. Through this process, developers would first delineate primary conservation areas such as the RSCOD. One hundred percent of these areas can be counted towards open space requirements, and development density can be transferred on site outside the protected areas. Next, rural economy conservation lands are delineated, where applicable. The third step is to delineate the remaining open space required in each zoning district if not already achieved with the primary conservation areas. The last step in conservation design is to identify the area in which development will occur (referred to as the Development Delineation Area (DDA)). See Tool 4 for more discussion on Conservation Design.

- Plant and Wildlife Habitat Policies (Revised General Plan)

The Revised General Plan outlines Plant and Wildlife Habitat policies that call for the protection of rare, threatened, and endangered plant and animal habitat as part of open space, passive recreation, or nature preserves. Development applications that have a likely presence of one or more natural heritage resources are required to conduct a species assessment and develop a plan for impact avoidance if the species is identified. The Facilities Standards Manual also requires the identification of areas that support rare plant or animal communities or species as identified by the US Fish and Wildlife Service or by the Virginia Department of Conservation and Recreation's Natural Heritage Program on all existing conditions plats. Lists of rare, threatened, or endangered plant and animal species are available online at: <http://www.dcr.state.va.us/dnh/nhrinfo.htm>

- Forest Management Plan (Revised General Plan and Facilities Standards Manual)

A Forest Management Plan is required by the Revised General Plan and the Facilities Standards Manual for all land development applications. Developers are required to identify a management strategy for the long-term sustainability of designated tree save areas. The Revised General Plan policies also call for the County to develop and adopt a Tree Preservation Ordinance. The Facilities Standards Manual and Revised General Plan provide guidance for prioritizing areas for retention. These include but are not limited to old growth forests, significant tree stands and specimen trees.

PDR Program

This program, also mentioned in Tool 1, is a technique that can be the driving force behind a County's land conservation program. Under most circumstances, the County holds the easement and maintenance of the property falls on the property owner. In the event that the number of properties voluntarily offered exceeds available funds, priority for acquisition is determined using a point based Property Ranking System. Currently, sixty percent of the funds go to agricultural resources and the remaining forty percent is used for the acquisition of non-agricultural resources such as natural, scenic or historic resources or character of urban development.

Land Conservation Fund

This program, which complements the PDR Program, is a special fund created for purchasing conservation easements. This fund is supported entirely by private contributions and provides the community with a means of contributing to the PDR Program if they cannot donate land.

Conservation Easements

Organizations such as PEC and the Virginia Outdoors Foundation (VOF) also provide opportunities for and work towards land conservation. PEC encourages landowners to place conservation easements and undertake land conservation measures. They work in collaboration with public and private organizations to target specific natural resources for conservation efforts. PEC is able to hold conservation easements, but encourages landowners to donate easements to VOF, a state agency established by the General Assembly to hold easement in public trust. According to PEC, state held easements offer a greater level of protection than easements held by private organizations. Most easements in Virginia are donated to VOF. PEC has also established the James M. Rowley Goose Creek Conservation Fund which: a) educates landowners about easements and other land conservation tools; and b) provides funds for the purchase of easements or land.

Recommendations

Specify Open Space Requirements

Currently, many of Loudoun County's zoning categories require a certain percentage of open space. However, for many of them, there are no minimum requirements for how much of the site must actually contain vegetation or the types of vegetation that are allowed, except through the Conservation Design process that has performance standards for the Rural Transition and Joint Land Management zoning districts. Extend these performance standards to all open space requirements.

Encourage the Use of Required Open Space to Provide Additional Stream Buffer Protection

Within existing Conservation Design regulations, required stream buffers are designated as a "Primary Conservation Area." Consider using additional required open space to provide additional stream buffer protection beyond the RSCOD requirements.

Strengthen Plant and Wildlife Habitat Language

The County's current Plant and Wildlife Habitat Policies identify critical habitat and encourage its preservation. However, these policies could be strengthened by changing the current language to make protection of these areas a requirement.

Conduct a Field Inventory of Significant Natural Communities

To improve the on-the ground knowledge of significant natural communities, a field inventory should be conducted within the Goose Creek Watershed. A natural community may be significant for two reasons 1) it represents a rare, naturally restricted community type or 2) it is an outstanding example of a common community type. Identification is the first step for protecting these significant communities. Once these areas are identified, focus resources from the PDR Program to place them under easement. A list of the major community types in Virginia can be downloaded at:

<http://www.dcr.state.va.us/dnh/nhrinfo.htm>

Strengthen the Land Conservation Fund and PDR Program

Implementing the following measures will strengthen the Land Conservation Fund and the PDR Program:

- In its current form, the Loudoun PDR Program includes among its “Non-agricultural criteria,” scoring for a property’s “Proximity to any of the following critical environmental areas: wetlands, major floodplains, steep slopes, woodlands, stream headwaters, and/or mountainside areas.” To strengthen the watershed and environmental benefits of the PDR Program, increase the number of points assigned to properties with these critical environmental features. Some explicit modifications to existing scoring should include:
 - Strengthening the importance of critical and vulnerable headwater streams.
 - Offering additional points for high quality streams, as demonstrated by existing habitat assessments, or fish data.
 - Placing priority on preserving forest that is a portion of large (greater than 200-acre) contiguous forest tract.
 - Offering additional points for areas that drain to a critical resource such as a drinking water reservoir.
- Provisions of easements placed on properties with critical environmental features should ensure the protection of these resources. For example, if the critical environmental area contains a floodplain, the easement should contain strong riparian buffer protection language.
- All easements that are on properties adjacent to streams should try to incorporate strong stream buffer requirements. Ideally this would include fencing of livestock. At the least, it would include restrictions on removing vegetation within 100 feet from the stream. Easements should also include strong forest/tree conservation provisions where appropriate and feasible.

Adopt a Tree Preservation Ordinance

Adopt a Tree Preservation Ordinance, as called for in the Revised General Plan, and ensure that it includes specific forest save and afforestation targets. For an example, see the Forest Conservation Ordinance implemented in Frederick County at:

http://www.stormwatercenter.net/Model%20Ordinances/misc__forest_conservation.htm.

TOOL 3. AQUATIC BUFFERS

Regulations/Supporting Documents

Loudoun County Revised General Plan

Loudoun County Revised 1993 Zoning Ordinance

Program(s) and Techniques

Protection and management of aquatic buffers in Loudoun County relates mainly to the County’s RSCOD.

RSCOD

The RSCOD is an overlay district that contains rivers and streams draining 100 acres or more; associated 100-year floodplains; adjacent steep slope areas (slope 25% or greater, starting with 50 feet of streams and floodplains, extending no farther than 100 feet beyond the originating stream or floodplain); and wetlands, riparian forests, and historic and archaeological sites within the RSCOD. The RSCOD also consists of a flexible 50 foot Management Buffer measured from the edge of the 100-year floodplain or the adjacent steep slope. A 100 foot minimum no-build stream buffer will protect rivers and streams when the 100 year floodplain and adjacent steep slope areas do not extend beyond either bank by 100 feet. The 50 foot Management Buffer will not be added to the 100 foot minimum stream buffer. Specific rivers/streams and water supply reservoirs including Bull Run, Goose Creek, Catocin

Creek, Beaverdam Reservoir and the Potomac River are protected by a 300 foot no build buffer or the RSCOD, whichever is greater. In addition, when 25% or more of the total area of a parcel or lot is subject to RSCOD restrictions (excluding any management buffer), there are no minimum lot size or width requirements. This flexibility allows property owners to achieve the density of the underlying zoning district. The RSCOD will remain largely in private ownership and while there are not any specifications for long-term maintenance or enforcement of the RSCOD area, the Revised General Plan calls for the County to establish a working public and private partnership with property owners.

With the exception of wetlands that fall within the RSCOD, the County currently does not provide protection for wetlands outside of this area. According to the Revised General Plan, the County does have plans for developing a partnership with the Army Corps of Engineers to regulate wetlands outside of the RSCOD and develop a reliable wetlands inventory.

Conservation Reserve Enhancement Program (CREP)

An enhancement of the federal *Conservation Reserve Program*, CREP's goal is to improve Virginia's water and wildlife habitat by offering rental payments to farmers who voluntarily restore riparian buffers, filter strips and wetlands through approved conservation measures. Cost share payments are available to assist in the installation of specific restoration practices. Rental payments for either ten or fifteen years on contracted acres vary according to watershed, restoration practice and soil types.

Recommendations

Develop Wetland Buffer Requirements

Wetlands provide many benefits, including habitat for fish and wildlife; flood protection; and water quality improvement. To preserve these benefits and protect wetlands from the impacts of development, establish no-build, minimum wetland buffer width requirements.

Enhance Stream Buffers

Establishing the RSCOD is the first step in protecting sensitive wetland areas. To enhance the quality of the streams, plant trees within this District, perhaps in concert with a forest conservation ordinance (see Tool 2). Volunteers and watershed groups (see Tool 8) could be used to organize the planting. Utilize seedlings available from the Virginia Department of Forestry and the SWCDs.

Conduct Stream Buffer Education

The future integrity of the buffer system requires a strong education program. The goal of such a program is to make the buffer “visible” to the community. This could be achieved by posting signs during development and securing an agreement during property transfer. Another way to reach this goal is to educate buffer owners/adjacent land owners about the benefits and uses of the buffer with pamphlets, streamwalks and meetings with homeowners associations. Education materials should emphasize the “Three-Zone” buffer, which stresses forest as the target streamside vegetation. As with all education efforts remember to repeat the message. Frequency is important because it determines how well the message will be remembered. More information on stream buffers is available at: http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool3_Buffers/BufferZones.htm.

Additional elements of a stream buffer education campaign should include:

- the education of watershed organizations and other environmental stewardship groups on the provisions of the RSCOD (e.g, a seminar led by county staff). These organizations can then assist the County with awareness and enforcement.
- the creation of stream valley pedestrian trails to enhance public awareness and stewardship. This initiative could be pursued through multiple avenues including development approvals, coordination

with the Bike and Pedestrian Transportation Plan (soon to be adopted by Loudoun County), and through Parks and Recreation public land.

- Continue to work with the Loudoun Soil and Water Conservation District (SWCD) and local environmental organizations on incentive programs and education incentives for landowners.

Increase Stream Restoration Incentives

Increase incentives for stream restoration that are not governed by land disturbing activity regulations in the RSCOD. Also adopt a pro-active county system of monitoring and enforcing stream restoration commitments, both during the construction phase and afterwards.

Protect Headwater Streams

Strengthen existing protections of headwater streams in the MDOD and RSCOD with two provisions by requiring stream buffers on both perennial and intermittent streams with drainages of less than 100 acres.

TOOL 4. BETTER SITE DESIGN

Regulations/Supporting Documents

Loudoun County Facilities Standards Manual

Loudoun County 1993 Zoning Ordinance

Loudoun County Revised 1993 Zoning Ordinance

Loudoun County Subdivision and Development Ordinance

Virginia Department of Transportation Subdivision Street Requirements

Virginia Department of Transportation Road Design Manual

Program(s) and Techniques

Loudoun County conducted a self-evaluation of its codes and ordinances pertaining to Better Site Design about a year ago. The Codes and Ordinances Worksheet (COW) was used to compare development standards and practices to the Model Development Principles in three categories: streets and parking lots, lot development, and conservation of natural areas. Loudoun County allows some of the better site design tools and scored a 63 (out of 100) on the COW. The County identified its biggest weaknesses as parking and street requirements. A copy of Loudoun County's COW is provided in Appendix B. It should be noted that the COW was filled out prior to the recent adoption of the Revised General Plan and new Zoning Ordinance. However, four points were added for the adoption of the RSCOD (COW Score went from a 59 to a 63). The discussion below highlights some of the findings of the COW.

Street Width Requirements

Recommended road widths for streets with fewer than 500 average daily trips (ADTs) range from 18 to 22 feet (CWP, 1998). Based on these standards, current Virginia Department of Transportation (VDOT) width requirements for residential streets with curb and gutter are excessively high, even with approval of reductions (widths range from 22 to 40 feet depending on the number of ADTs). According to the County, private road widths generally are narrower than VDOT requirements. VDOT does not maintain private roads and few jurisdictions are willing to carry the burden, including Loudoun County which allows private roads but does not necessarily encourage their construction.

Parking Requirements

Loudoun County's minimum parking requirements are high compared to the recommendations published by the Institute of Transportation Engineers (1987). For the parking ratio portion of the COW, Loudoun County scored zero points indicating that their parking requirements are excessive for several land uses including professional office space, shopping centers, and single family homes.

Cluster development

A well designed cluster development can have many benefits including minimized impervious cover, pollutant loads, and construction costs; and preservation of natural areas. In Loudoun County, clustering is both an option available to developers in several formats and a requirement in certain zoning districts such as TR-10. Several zoning categories, such as Countryside Residential offer the option of clustering in order to preserve more open space. Loudoun County has used this to target specific resources. For example, the Agricultural Rural District Cluster Option was designed to maintain the contiguity of land for rural economy uses. The required Conservation Design process for Rural, Transition and town Joint Land Management Areas (also mention in Tool 2) allows up to 100% of the density that would be allowed on the gross land area can be located within the DDA (i.e., same number of houses, smaller area). The review process for Conservation Design will be different than that of a standard development site, but the County does not expect that it will take any longer than a normal review process. Also, because the Conservation Design process is relatively new, the County is conducting educational workshops targeted for the staff and design community to encourage the use and understanding of this new process.

Recommendations

Set Maximum Parking Ratios

High minimum parking requirements can lead to the creation of excessive impervious cover which increases the volume of stormwater that must be treated. Placing a maximum on parking requirements can also help to curb needless amounts of impervious cover. Reduce minimum parking requirements and develop maximum parking requirements. Suggested minimum parking ratios are available at: http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool4_Site_Design/GreenParking.htm

Encourage VDOT to Add Flexibility in Street Design

Encourage VDOT to add flexibility in their street design. Help to promote this change by encouraging developers to take the time to get VDOT approval on narrower streets. Because streets can be a large component of impervious cover in the landscape, impervious cover reduction should be a goal.

Encourage the Conservation Design Process for Suburban Zoning Districts

Currently, the Conservation Design process requires developers to develop sites with natural and historic features being the focus of the design in the Rural zoning districts, the Transition zoning districts, and the Joint Land Management Areas for towns. Emphasize and encourage this process for the suburban zoning districts as well.

TOOL 5. EROSION AND SEDIMENT CONTROL

Regulations/Supporting Documents

Loudoun County Facilities Standards Manual

Virginia Erosion and Sediment Control Handbook

Loudoun County Erosion and Sediment Control Program Enforcement Protocols

Loudoun County Erosion and Sediment Control Program Corrective Action Agreement

Program(s) and Techniques

Loudoun's Erosion and Sediment Control Program refers to the Virginia Erosion and Sediment Control Handbook (VESCH) for the guidance and requirements that protect water resources during construction. The erosion and sediment control (ESC) plan must be prepared in accordance with VESCH. The VESCH contains the minimum standards for control of erosion and sedimentation during land disturbing activities in Virginia and is applied to all local programs in the State of Virginia. Sites with land disturbance greater than 10,000 square feet must comply with the ESC requirements. Inspections are periodically conducted to ensure compliance with the approved plan. Inspectors must be certified through the Virginia Department of Conservation and Recreation (DCR). DCR recently completed a review of Loudoun County's ESC program in mid-2002. Notable changes as a result of this review include the addition of at least four additional field inspectors, and the development and implementation of enforcement protocols. According to the Enforcement Protocol the following procedure will be utilized for critical non-compliant land disturbing activities:

- Inspection Report: provides details of the non-compliance issue and required remediation action; corrective action must be complete within five working days.
- Notice to Comply: specifies that the corrective action must be complete within two working days or a Stop Work Order will be invoked.
- Stop Work Order: specifies that corrective action must take place within twenty-four hours or legal action may be taken by County. This includes revoking the grading permit and all other associated County permits will be suspended. When the violation has been corrected, the Stop Work Order is lifted. The responsible party is required to re-apply for a grading permit and pay for the associated fees. Once the new grading permit has been approved, all other suspended permits become effective and development activities can resume.

Recommendations

Limit Clearing

To prevent the unnecessary mass clearing and grading of a site, incorporate numeric specifications on how much clearing is acceptable into Loudoun's ESC Design Standards and include a mechanism to enforce this limit. The enforcement mechanism should specify that first, site plans showing clearing limits that exceed the allowable cleared area will be rejected, and second, if more vegetation is cleared at a site than is shown on the approved site plan, the developer will be required to reforest the illegally cleared areas at a specified ratio. At a minimum, require that, for every site, grading plans show clear delineations of critical areas, such as buffers, wetlands, forests, and habitat areas and that clearing be strictly limited near them. These areas should be clearly flagged on site, as well as in the clearing and grading plan. This can also be achieved by promoting the idea of "phased" construction. This strategy can help minimize mass clearing by requiring that no more than 50 acres of land be exposed at any one time.

Create a Detailed Inspection Schedule

Ensure ESC inspections throughout the construction process by creating a detailed inspection schedule. Inspections are needed at key points during the construction process, including:

- A pre-construction meeting
- After clearing and grading
- During construction of the drainage system
- During house construction
- Close of the construction season

- Close of the project
- Monthly during construction

Encourage Non-Staff Inspections

Two program tools can help meet rigorous inspection schedules outlined above. The first is the use of private inspectors, non-county staff who are trained in erosion and sediment control and submit inspection reports to the County. A second is to expand the existing Soil Watchers Program in which citizen “watch dogs” report violations or concerns at construction sites. Loudoun’s Soil Watchers program needs more sessions, increased publicity and annual review for response time to citizens’ notification to the County of a violation of County or State regulations. A key element of this program is to publish newspaper advertisements, or use a web site to encourage citizens to call in ESC complaints, and also educate them on what to look for.

TOOL 6. STORMWATER MANAGEMENT

Regulations/Supporting Documents

Loudoun County Facilities Standards Manual

Virginia Stormwater Management Handbook

Loudoun County Virginia, NPDES Phase II Minimum Measure Compliance Strategies, Timelines, Conceptual Cost Estimates

Program(s) and Techniques

The Loudoun County Facilities Standards Manual requires that land development activities provide stormwater management. Loudoun County regulations mostly defer to the Virginia Stormwater Management Handbook (the Handbook) which serves as the primary guidance for stormwater programs in most Virginia communities, and also references the Low Impact Design Manual produced by Prince George’s County. The Handbook describes guidelines for basic hydrology and hydraulics, stormwater best management practice design and efficiency, and administrative guidelines to support compliance with state stormwater regulations. Stormwater criteria area listed below:

- | | |
|-------------------------|---|
| Extreme Flood Control: | Safe passage of the 100-year storm. |
| Overbank Flood Control: | Reduce the 10-year post-development peak flow to the pre-development level. |
| Channel Protection: | Reduce the post-development peak flow from the 1-year storm even to be equal to the pre-development level |
| Water Quality Control: | Retain existing phosphorus loads from the site. The Facilities Standards Manual requires that the same methodology be used for both pre-development and post-development loads. |

Stormwater management is required on sites disturbing greater than 10,000 square feet, but waivers from flood and channel protection requirements are in place when “adequate channel” can be demonstrated. Specific conditions for adequate channel are defined in the Facilities Standards Manual.

Dry ponds and wet ponds are currently the most widely applied practices in Loudoun County. Recently, however, Loudoun County has been actively discouraging dry ponds and promoting low-impact design practices such as rain gardens and swales. The most recent version of the Facilities Standards Manual allows for both of nonstructural stormwater practices and structural stormwater facilities to meet water quality goals. These non-structural practices are incorporated in two ways: reference to “stormwater credits” that allow the use of practices such as open space conservation and stream buffers to help meet water quality requirements and reference to “Low Impact Development” as a design option.

Stormwater facilities are inspected during construction and, under most circumstances, Home Owners Associations (HOAs) are responsible for ongoing maintenance of stormwater facilities. Currently, there are no penalties for failure to comply with maintenance agreement nor are there mechanisms for long-term inspections. The eastern part of Loudoun County has been listed by the Environmental Protection Agency and the Commonwealth of Virginia as a community requiring stormwater permits under the National Pollutant Discharge Elimination System (NPDES) Phase II requirements. To meet the requirements of this permit, the County is in the process of implementing several new programs. The programs that fall under Tool 6 include:

- Creation of a stormwater outfall and facility mapping inventory
- Development of a maintenance program that would require a stormwater facility maintenance report from owners and establish operating procedures for stormwater facility remedies and corrective actions.

The County is also considering the implementation of a stormwater utility, a special assessment district set up to generate funding specifically for stormwater management. Users within the district would pay a stormwater fee, and the revenue thus generated directly would directly support maintenance and upgrade of existing stormwater facilities and infrastructure.

Recommendations

Loudoun County’s current stormwater inventory project is a great start to improving its stormwater program. An inventory can provide a community with the ability to track the age and location of facilities. This information can provide the basis for numerous opportunities and projects for better stormwater management. The following recommendations would supplement that initial effort:

Improve Stormwater Maintenance

Maintaining stormwater practices over time helps preserve pollutant removal and aesthetic and habitat values of practices over time. The inventory conducted during the first phases of Loudoun County’s Phase II program can be used to establish a maintenance tracking database that would record inspections, maintenance issues and respective follow-up. In the long-term, practice maintenance should include regular county inspections, and enforcement mechanisms when practices are not maintained. This recommendation is expensive, and we support establishing a stormwater utility to fund stormwater practice maintenance. Information on stormwater maintenance can be found at: http://www.stormwatercenter.net/Manual_Builder/Maintenance_Manual/introduction.htm. An example stormwater utility ordinance is available at: http://www.stormwatercenter.net/Model%20Ordinances/misc_takoma.htm

Establish an Adopt-A-Pond Program

This program could be a helpful component of a stormwater maintenance plan. By engaging Homeowner’s Associations and other volunteers to beautify and maintain their stormwater ponds, they are also helping to keep the embankments stable and improve or maintain the current pollutant removal

capability. Develop an Adopt-a-Pond program that would work with HOAs and other interested individuals and volunteers to conduct basic maintenance for their stormwater ponds. This would include basic inspections (i.e., are there trees on the embankment or significant damage to the riser) trash pick up, mowing, and aquatic vegetation plantings. The stormwater inventory project currently underway offers a unique opportunity for Loudoun County to supplement guidance for HOAs with actual photographs of stormwater practices in place throughout the county. Hillsborough County, Florida has an established Adopt-a-Pond program and materials are available through the Hillsborough County Engineering Division:

<http://www.hillsboroughcounty.org/publicworks/engineering/stormwtr.html>.

Conduct a Stormwater Retrofitting Project

Stormwater retrofits are stormwater facilities inserted into an urban landscape where little or no prior stormwater controls existed. The stormwater inventory can be used to help identify areas that currently are not being treated or are being treated by practices designed under outdated stormwater criteria. A stormwater retrofitting project would help to meet NPDES Phase II criteria. The stormwater retrofitting process is described at: <http://www.stormwatercenter.net/Slideshows/retrofits.htm>.

Simplify Existing Water Quality Requirements

Currently, stormwater guidance in Loudoun County's Facilities Standards Manual provides several options to meet water quality goals. While this flexibility is important, two areas could use some clarification: references to Low Impact Design and load calculations.

As the Facilities Standards Manual currently reads, it appears that designers need to choose between a "Low Impact Design" and a "Structural" design approach. The Manual should be modified to incorporate specific elements of Low Impact Design, such as bioretention, open channel practices, and natural areas conservation as part of an overall treatment train that may include a combination of both structural and non-structural practices.

Loudoun County also requires pre- and post- load calculations to demonstrate that water quality goals have been achieved. A uniform set of assumptions (e.g., loading rates and efficiencies) should be incorporated to ensure a fair and consistent application of this technique.

Modify Channel Protection Criteria

The County should change channel protection criteria to reflect 24-hour detention of the 1-year storm event (as incorporated in Maryland, New York and Vermont), rather than 1-year "post to pre" control. While 1-year "post- to pre-control" is an improvement over 2-year control, this methodology will still retain the "channel-forming" peak flow from the 1-year event over an extended period of time. 24-hour detention of this event, on the other hand, will reduce the peak flow to a non-erosive level.

Revise Waivers for "Adequate Channel" (Chapter 5.230, A.1)

Currently, water quantity (channel protection and overbank flood control) can be waived in several circumstances. Consider eliminating some options for meeting this requirement. In particular, eliminate a waiver for direct discharge to a main channel within a major floodplain which eliminates channel protection requirements on many projects.

Practice Restrictions

Continue to discourage dry ponds, and consider eliminating them as an option to meet water quality requirements, unless the practice incorporates small pools at the inlet and outlet (i.e., a forebay and micropool).

TOOL 7. NON-STORMWATER DISCHARGES

Regulations/Supporting Documents

Loudoun County Streets, Utilities and Public Services Code, Chapter 1066 Private Sewage Disposal Systems

Loudoun County Wastewater Financing Programs, On-site Wastewater Repair Program

General Permit Requirements for Confined Animal Feeding Operations in Virginia

Cost Share & Tax Credit for Virginia Agricultural BMPs

Virginia's Conservation Reserve Enhancement Program

Loudoun County Facilities Standards Manual

Audubon Cooperative Sanctuary Program Local Government Packet

Environmental Principles for Golf Courses in the United States

Loudoun County Virginia, NPDES Phase II Minimum Measure Compliance Strategies, Timelines, Conceptual Cost Estimates

Program(s) and Techniques

Typically this tool looks at how wastewater and other non-stormwater flows are treated and discharged in a watershed. However, for the purposes of this review, Tool 7 has become a catch-all category encompassing not only non-stormwater discharges, but the management practices of agriculture, vineyards and golf courses, as well.

Wastewater Treatment Plants

Properly managed wastewater treatment plants play an important role in protecting community health and water quality. The Interstate Commission on the Potomac River Basin (ICPRB) in a recent study, found that within the Goose Creek watershed, approximately 7,804 households are on sewer (number includes households from both Loudoun and Fauquier Counties) (ICPRB, 2002). The Loudoun County Sanitation Authority (LCSA) currently owns three publicly owned treatment works (POTWs) in the Loudoun County portion of the Goose Creek watershed. The towns of Middleburg, Purcellville, and Round Hill each own one POTW. The LCSA also owns and operates several communal wastewater plants. Communal wastewater plants typically serve 5 to 350+ dwellings and treated effluent is discharged in most cases on-site either through shallow subsurface injection or spray irrigation or, in a few cases, off site to local streams.

On-Site Sewage Disposal Systems (OSDS)

Septic Systems (also known as on-site sewage disposal systems) are used to treat and discharge wastewater from toilets, wash basins, bathtubs, washing machines, and other water consumptive items that can be sources of high pollutant loads. It is estimated that 5,717 households are on septic systems in the Goose Creek watershed (number includes households from both Loudoun and Fauquier Counties) (ICPRB, 2002). In Loudoun County, septic systems are not regulated under NPDES, but are approved by the Health Department. The Department oversees the siting, installation and operation of septic systems. Currently, it is the owner's responsibility to maintain their septic system and failure to do so is a violation of the County Code. Inspections of septic systems are only conducted in the following situations:

- the owner has requested a permit to repair or modify existing system
- the owner has requested that the Health Department evaluate the condition of their system
- the Board of Supervisors requests that the Health Department conduct a community survey to determine the conditions of the systems and water supplies

The County also has an Onsite Wastewater Repair Program that provides opportunity for homeowners who have failing septic systems to obtain low interest loans to repair or replace these systems.

Loudoun County is currently in the process of revising the codes pertaining to onsite sewage disposal systems.

Agricultural Practices

The Goose Creek watershed is a mix of urban and agricultural land uses so it is essential that we also understand the agricultural land management practices advocated and applied within the watershed. Currently, it is estimated that there are over 50,000 livestock in the Goose Creek watershed (this includes cattle, horses, and sheep in both Loudoun and Fauquier Counties) (ICPRB, 2002). Rotational grazing, alternative water sources, and exclusionary fencing are all encouraged by the Loudoun Soil and Water Conservation District (SWCD) and the Virginia Cooperative Extension, Loudoun County Office but are not required. The most popular incentives include cost share programs and tax credits.

- Cost share programs are intended to help farmers mitigate some of the costs of implementing conservation practices to treat animal waste, cropland, pastureland and forest land. State and federal funding is available through the local SWCDs. Some practices are paid for at a straight per acre rate, while others are cost-shared on a percentage basis up to 75 percent. In addition, the Conservation Reserve Enhancement Program (CREP) is intended to help farmers restore riparian buffers, grass filter strips and wetlands through rental and cost share payments. All CREP-enrolled pasture or cropland will be planted with hardwood trees or native warm season grasses.
- The Virginia Agricultural Best Management Practice (BMP) Tax Credit Program supports the voluntary installation of BMPs that address Virginia's nonpoint source pollution water quality objectives. Agricultural producers with an approved conservation plan can take a credit against state income tax of 25% for eligible BMP expenses. A Conservation Equipment Tax Credit Program is also available to farmers for equipment such as a no-till planter. This equipment is also eligible for a 25% tax credit.

Confined Animal Feeding Operations

Confined animal feeding operations (CAFOs) contain a high density of animals (usually livestock) within a small area. Without proper treatment, CAFOs can contaminate streams with bacteria and excess nutrients. According to the Loudoun SWCD, there really are not any CAFOs left in Loudoun County although two dairies remaining in the Loudoun County portion of the Goose Creek watershed. Generally, CAFOs with 300 or more animal units are required to obtain a permit through the State of Virginia. The State strongly recommends that producers meet with personnel from the Virginia Department of Environmental Quality (DEQ), Virginia DCR, as well as the County zoning administrator to make sure they understand all the requirements for a CAFO and to determine whether the planned operation can meet these requirements. Along with the permit, CAFOs are required to submit a nutrient management plan. The main purpose of a nutrient management plan is to assure that no waste or potentially water impacting nutrients from the waste reach either ground or surface water supplies. Once a permit is granted, the nutrient management plan is enforceable by the DEQ.

Vineyard Management

Currently, there are three vineyards within the Loudoun County portion of Goose Creek. The Virginia Cooperative Extension, Loudoun County Office promotes conservation management on vineyards,

including IPM, buffer strips, erosion prevention, fertilizer reduction based on soil tests and petiole analysis. Buffer strips are common practices as is no till. No cost share or incentive programs are available to grape growers.

Golf Course Management

Within the Loudoun County portion of Goose Creek there are seven golf courses. The Virginia DCR permits Nutrient Management Plans with golf courses through the state Division of Soil and Water Conservation. The Facilities Standards Manual also identifies golf courses as hot spots and requires them to meet a number of additional water quality performance standards. Standards include reduction of turf, native landscaping, minimized stream crossings, water reuse strategies, submittal of an IPM and nutrient management plan, and adherence to the “Environmental Principals of Golf Courses in the United States” (Center for Resource Management, 1996).

Illicit Discharge Detection and Elimination (IDDE)

Illicit connections are defined as illegal and/or improper connections to storm drainage systems and receiving waters. IDDE programs are designed to prevent contamination of ground and surface water supplies by monitoring, inspection and removal of these illegal non-stormwater discharges. Loudoun County currently does not have any programs or regulations in place for IDDE. However, as a part of NPDES Phase II compliance, Loudoun County is considering the implementation of such a program and has drafted some elements of an IDDE program that include:

- identification of regulated stormwater outfalls
- initial visual inspection of regulated outfalls
- inspection of regulated outfalls
- follow-up actions regarding illicit discharges

Household Hazardous Waste

Loudoun County sponsors several Household Hazardous Waste Collection Events throughout the year to collect used and unwanted household hazardous materials such as gasoline, household chemicals and electronic equipment. For these events, a special contractor comes to the county to accept and package the waste for shipment to an appropriate processing facility. Events are also held for local businesses.

Recommendations

Conduct Direct Outreach to Golf Courses

Target golf courses within the Goose Creek watershed and work with them to establish stream buffers on their properties, and to develop specific guidance regarding the fraction of the golf course in forest or natural vegetation. As a starting point, encourage golf courses to become certified via the Audubon Cooperative Sanctuary Program. Under this program, golf courses work towards certificates of recognition in six categories: environmental planning, wildlife and habitat management, public awareness, IPM, water conservation, and water quality management. Information on the Audubon Cooperative Sanctuary Program is available at: <http://www.audubonintl.org/programs/acss/golf.htm>.

Conduct Outreach to Vineyards

To minimize nutrient and sediment loadings, educate vineyard owners on the use of environmentally sound practices. This includes integrated pest management, buffer strips, erosion prevention (terracing, no-till cropping, etc.) fertilizer reduction based on petiole analysis and/or soil testing, and stream buffers, where applicable.

Develop an IDDE Program

Actively pursue compliance with NPDES Phase II regulations, including the development of an IDDE Program. Some key “in-office” elements of the program include: an illicit discharge ordinance, staff training, and developing a citizen hotline. The staff training should include “cross-training” of staff that are typically out in the field so that they know what to look for at outfalls and within the watershed and whom to call. The citizen hotline should be publicized in the newspaper and on the County or Goose Creek website (See Tool 8).

The program also needs a field detection component. Although chemical monitoring will most likely be needed eventually, we recommend an initial stream walk in urbanized streams with the goal of marking outfalls with an identification number (to aid the hotline) and also to aid in the outfall mapping process. Any obvious discharges identified during this process should be traced to the source and removed. This simple first phase field work can most likely be conducted with the aid of volunteer monitoring groups that exist throughout Loudoun County.

Minimize the Impact of On-site Sewage Disposal Systems (OSDS)

Since OSDS were identified as the method used by a significant portion of Goose Creek, methods should be developed to minimize the negative impacts OSDS have in the watershed. The primary need is to establish a more rigorous inspection process. Currently inspections only occur when requested by the owner or as part of surveys occasionally conducted by the Board of Supervisors. Inspections of OSDS should be expanded to occur not only by request but also during property transfers. The implementation of a targeted OSDS educational campaign is needed, and various materials can be disseminated to citizens and homeowners who have OSDS. Alternative OSDS, such as recirculating sand filters, can provide a significant reduction in pollutants (nitrogen, bacteria, etc.) (Piluk and Peters, 2000). Consider providing financial incentives to homeowners to encourage the replacement of old OSDS with more advanced OSDS technologies. The brochure developed by the Northern Virginia Planning District Commission (NOVA) is a good starting place for developing a homeowner education campaign: <http://www.novaregion.org/septic.html>. Additional information on alternative OSDS can be found at: <http://www.septic-info.com/doc/display/28.html>.

TOOL 8. WATERSHED STEWARDSHIP

Program(s) and Techniques

There are close to a dozen organizations in the Loudoun County region with an environmental focus and an interest in the Goose Creek watershed. To begin to understand how they act as stewards of the Goose Creek watershed, CWP created an additional survey for these interest groups (see Appendix C).

Groups with a watershed-wide or regional focus participate and implement stewardship activities in both Fauquier and Loudoun Counties (i.e., PEC). For the purposes of this report, these organizations’ survey responses are summarized in the Loudoun County portion of the report.

Watershed Advocacy

Advocacy plays a large role in many of the organizations active in the Goose Creek watershed. Almost all of the organizations surveyed felt that they acted as an advocate for watershed-related matters. These advocates have played a large part in promoting better land management and the preservation of forest and rural lands in Loudoun County by supporting changes to the zoning ordinance and comprehensive plan (for more information see Tool 1). These organizations also usually advocate for the preservation

of stream buffers and natural areas in the form of conservation easements. Public officials and homeowners were the most frequently cited target audience of watershed advocacy.

Watershed Education

Organizations were surveyed in four elements of watershed education: watershed awareness, homeowner stewardship, training, and watershed engagement.

- Raising awareness

Organizations in the Goose Creek watershed raise basic watershed awareness through several avenues. Notably, the Loudoun Wildlife Conservancy and Audubon Naturalist Society conduct streamwalks on a regular basis. Other organizations such as Loudoun Watershed Watch and the GCA have created a watershed map for distribution. In addition, the Goose Creek Scenic River Advisory Board in the past has mailed out a brochure to riparian owners and Loudoun County schools to encourage conservation of the creek and good stewardship. None of the organizations surveyed conduct canoe trips, practice storm drain stenciling or stream buffer and watershed boundary signage.

- Homeowner Stewardship

Homeowner stewardship includes educating residents about the individual role they play in the watershed and communicating specific messages about positive and negative behaviors. From the survey, it appears that very little is being done to encourage good homeowner stewardship. A few organizations promote environmentally sensitive lawn care practices and water conservation. However, none of the organizations surveyed are currently advocating pet waste management, septic system maintenance, or environmentally sensitive car washing or automotive maintenance.

- Training

Providing training opportunities was the most frequently cited of all the watershed education elements. Many organizations including the GCA, Loudoun Watershed Watch, Loudoun County Department of Parks, Recreation and Community Services, Audubon Naturalist Society, and the Watershed Neighbors Program provide opportunities for training on water quality/macroinvertebrate monitoring and conducting stream assessments. In addition, the Loudoun County Department of Parks, Recreation, and Community Services sponsors a Build Your Own Rainbarrel program through Banshee Reeks.

- Engagement

Watershed engagement is providing opportunities for the public to actively engage in watershed protection and restoration. Several organizations, such as Keep Loudoun Beautiful (KLB), do provide several opportunities for the public to participate in such activities. The most common activities include stream clean-ups and stream buffer plantings. In addition, most organizations that provide training for and/or conduct stream monitoring (water quality, macroinvertebrate, habitat, etc.) encourage volunteers to participate.

Pollution Prevention

According to the surveyed organizations, there currently is not any ongoing pollution prevention training or education. Loudoun County does have a mandatory recycling ordinance, and curbside pick-up is provided to many residents. If not available, residents can take their recyclables to County landfills for proper disposal.

Monitoring

In addition to advocacy, monitoring is also another highly cited function of stewardship organizations in Loudoun County. These organizations conduct water quality, macroinvertebrate and stream habitat monitoring on a regular basis (usually four times a year) and encourage volunteer involvement. Loudoun Watershed Watch acts as central organizer for the monitoring data. Loudoun Watershed Watch's main objective in 2002 was to obtain and organize water quality data on streams throughout Loudoun County. This resulted in a report, "State of Loudoun's Streams: 2002" that is available for download off of their website: www.loudounwatershedwatch.org

Maintenance

Watershed maintenance functions include management of conservation areas and buffer networks, and maintenance of stormwater practices and septic systems. With the exception of a few organizations that organize stream clean-ups, there is not much emphasis on watershed maintenance functions.

Restoration

Watershed restoration involves the restoration or rehabilitation of streams that have been degraded by past land uses and/or development. As mentioned previously in the Engagement section above, several organizations participate and organize stream buffer plantings.

Recommendations

Conduct Targeted Educational Campaigns

With so many environmentally active organizations within the Goose Creek watershed, a combined effort educational campaign could be very effective. One organization should act as a central organizer to get these organizations to concentrate on one education campaign at a time. For example, according to ICPRB (2002), there are more than 20,000 dogs in the Goose Creek watershed. To help mitigate potential bacteria impacts associated with pet waste, all the organizations, for a month, could initiate a "Scoop the Poop" campaign that would educate dog owners about the importance of picking up after their pets. Another suggestion is curb and gutter stenciling in urban areas to remind citizens where the water flows. Encouraging homeowner stewardship can take many forms including brochures, newspaper articles, signage, website advertisement, and demonstration projects. Organizations should work with one another to educate homeowners and residents on what they can do to help contribute to the health of the Goose Creek watershed. As with all education efforts remember to repeat the message. Frequency is important because it determines how well the message will be remembered. Fact sheets that can be used in a variety of educational campaigns are available in Appendix D.

Conduct Stream Buffer Plantings

In addition to encouraging citizen participation and awareness, stream buffer plantings have multiple benefits that directly translate to the improvement of the health of the Goose Creek watershed. Since stream buffer plantings are a relatively cheap and easy method of improving watershed health, increase the number of stream buffer plantings in the Goose Creek watershed. A potential funding source is the Chesapeake Bay Restoration Fund.

Develop a Pollution Prevention Program

Develop a pollution prevention campaign to minimize nonpoint source pollution in commercial and industrial areas. A good campaign will also generate watershed awareness and active stewardship. This includes automotive body shops, dumpster management at commercial shopping centers, and illegal dumping. The campaign should target specific behaviors such as the proper handling and recycling of materials (i.e., antifreeze), preventing spills and leaks, and recycling wash water. For additional

information, see the Low Angeles County of Department Works' information kit, "Businesses and Industries for a Clean Environment." This kit includes fact sheets for automotive salvage yards, recycling, food industry, hazardous waste, and landscaping. www.dpw.co.la.ca.us

Create a Website to Encourage Watershed Stewardship

Provide a central location for citizens to access information about their watersheds and streams. A website combined with other education efforts can provide information on watershed basics (i.e., what is a watershed), locator watershed maps (i.e., where do you live in the Goose Creek watershed?), promote practices that citizens can do on an everyday basis to become better watershed stewards, and provide information on how to volunteer or become involved. James City County, Virginia has put together such a website: <http://www.protectedwithpride.org/>

3.0 FAUQUIER COUNTY PROGRAM REVIEW

TOOL 1. LAND USE PLANNING

Regulations/Supporting Documents

Fauquier County Zoning Ordinance

Fauquier County Purchase of Development Rights Program Resolution

Fauquier County Comprehensive Plan Amendments

Program(s) and Techniques

Fauquier County has employed several land use planning techniques, recognizing the need to balance the preservation of the region's natural beauty with inevitable growth. The most notable of these techniques are the use of agriculture and conservation zoning and the Purchase of Development Rights (PDR) Program.

Sliding Scale Density Zoning

The residential density for the RA (Rural Agriculture) and RC (Rural Conservation) is based on a sliding scale whereby the number of new lots created from a parcel is determined by the acreage of the parent parcel of record as of 1981. If the lot of record has been subdivided subsequent to that date, the determination of the number of new lots that can be created is based on a proportionate share allocation.

Large Lot Development Options

As an alternative to the sliding scale density zoning, any 100-acre (or greater) parcel zoned RA or RC, which was of record as of May 21, 1981, may be divided into lots of no less than 50 acres. No lots of less than 100 acres created by this process may be further subdivided. Lots in excess of 100 acres may be further divided by this method, or in accordance with the sliding scale.

Density Deductions Due to Physical Characteristics

In zoning districts other than RA and RC:

- Only 50% density allowance shall be calculated on that area of a lot made up of floodplain, quarries or existing water bodies.
- Only 30% density allowance shall be calculated on that area of a lot made up of slopes in excess of 25% grade.
- Only 50% density allowance shall be calculated on that area of a lot comprised of slopes in excess of 14% but equal to or less than 25% grade.

Conservation Districts

The County has designated zoning districts with strict regulations on development to conserve sensitive areas. Seventy-four percent of the Fauquier portion of the Goose Creek watershed falls in the Rural Conservation (RC) District where only very low-density development is allowed to minimize the impact on the surrounding environmental resources. Residential development is also limited in the Rural Agricultural (RA) District, in an effort to preserve agricultural lands.

Agricultural and Forestal Districts

Considered the best method within the County for protecting agricultural and forestal lands, water supplies and scenic and environmental amenities, inclusion within an Agricultural and Forestal District affords the landowner certain tax benefits (referred to as the Use Value Tax Program) and restrictions on

public utilities and governmental action. In exchange, the landowner voluntarily agrees to conditions which limit development of the property during the time in which the land is enrolled in the program. Landowners voluntarily initiate the formation of a district and subsequent additions. Each district has a core of not less than 200 acres in one or more contiguous parcels. No lot of less than 50 acres may be subdivided from a parcel within a district with the exception of a family transfer or boundary adjustment.

PDR Program

A PDR program can reduce development in sensitive areas by compensating property owners who voluntarily agree to restrict the future use of their land. To help preserve farmland, the Board of Supervisors recently adopted a PDR program resolution. Since PDRs are most relevant to land conservation, this program will be further discussed in Tool 2.

Recommendations

Develop a Lawn Care Education Program

One side-effect of rural, low-density zoning can be vast expanses of lawns which contribute to non-point source pollution. Develop a program that would educate and encourage homeowners to leave a portion of their property in a natural state and to use Integrated Pest Management (IPM) lawn care practices that would reduce pesticides and nutrient usage. Mediums that should be used in the campaign include radio (public service announcements), the newspaper, cable TV, and schools. Also consider developing a reforestation program that would educate landowners on the benefits of trees versus lawn and provide information on native trees and where to purchase them. As with all education efforts remember to repeat the message. Frequency is important because it determines how well the message will be remembered. See Appendix D for fact sheets on lawn conversion and lawn care.

Expand Use Value Tax Program

Consider adding criteria to the Use Value Tax Program to create additional incentives for stream protection. The focus of such incentives should include headwater and high quality streams, the reforestation of pastureland adjacent to streams, and the protection of existing forested buffers.

TOOL 2. LAND CONSERVATION

Regulations/Supporting Documents

Fauquier County Zoning Ordinance

Fauquier County Purchase of Development Rights Program Resolution

Fauquier County Comprehensive Plan

Program(s) and Techniques

Multiple avenues for conserving land exist in Fauquier County. One of the major ones used is the creation of Agriculture and Forestal (A&F) Districts in the County. More than 30% of the County's rural area is subjected to restricted use, by either being voluntarily placed in an A&F District or being within an open easement space. Currently there are more than a dozen A&F Districts. Other methods of land conservation include the newly adopted PDR Program and the establishment of conservation zoning areas.

Development Ordinances

- **Open Space Requirements**

This is one technique frequently used by local governments to preserve natural areas and to provide recreation within the community. In Fauquier County, as much as 85% of lot area is required to be left in open space. All zoning districts require some degree of open space.

- **Zoning Districts**

The County has established nine service districts, whose infrastructures are capable of handling development. In order to preserve the rural nature of the County and limit the infrastructure needed, development is encouraged in and directed towards these districts. In RA and RC Zoning Districts, proposed developments are subject to site inspections to ensure that they will not potentially harm natural resources including, but not limited to: floodplains, forest lands, steep slopes and areas critical to important types of flora and fauna.

Purchase of Development Rights (PDR) Program

This program, also mentioned in Tool 1, can be the driving force behind a County's land conservation program. The agricultural PDR program was adopted in February 2002 to help protect the economic, agricultural and natural resource values of the vast farmland in Fauquier County. It is a voluntary program that offers landowners the opportunity to sell the development rights of their farms to the County while still continuing to own and farm the land.

Conservation Easements

Organizations such as the Piedmont Environmental Council (PEC) and the Virginia Outdoors Foundation (VOF) provide opportunities for and work towards land conservation. PEC encourages landowners to place conservation easements and undertake land conservation measures. They work in collaboration with public and private organizations to target specific natural resources for conservation efforts. PEC is able to hold conservation easements but usually encourages landowners to donate easements to VOF, a state agency established by the General Assembly to hold easements in public trust. According to PEC, state held easements offer a greater level of protection than easements held by private organizations. Most easements in Fauquier County are held by VOF. PEC has also established the James M. Rowley Goose Creek Conservation Fund which: a) educated landowners about easements and other land conservation tools; and b) provides funds for the purchase of easements or land.

Recommendations

Specify Open Space Requirements

Currently, Fauquier County's zoning categories require a certain percentage of open space. However, for many of them, there are no requirements on how much of the site must actually contain vegetation or the types of vegetation that are allowed. Change the Zoning Ordinance to promote open space by further defining what types of land are allowed to count towards the open space requirement and designate specific types of vegetation needed. Model open space language is available online at: http://www.stormwatercenter.net/Model%20Ordinances/open_space_model_ordinance.htm.

Conduct a Field Inventory of Significant Natural Communities

To improve the on-the ground knowledge of significant natural communities, a field inventory should be conducted within the Goose Creek Watershed. A natural community may be significant for two reasons 1) it represents a rare, naturally restricted community type or 2) it is an outstanding example of a common community type. Identification is the first step for protecting these significant communities.

Once these areas are identified, focus resources from the PDR Program to place them under easement. A list of the major community types in Virginia can be downloaded at:

<http://www.dcr.state.va.us/dnh/nhrinfo.htm>

Expand PDR Program and Provisions

As previously mentioned, the recently adopted PDR Program is designed to protect only agricultural land. Expand the PDR program to include the preservation of other land-use types, specifically stream buffers, contiguous forest and critical habitat. This will not only reduce the impacts of development on streams, but by limiting land-use and development, Fauquier County can preserve its rural and agricultural assets. Specifically the PDR Program should target:

- critical and vulnerable headwater streams;
 - high quality streams, as demonstrated by existing habitat assessments, or fish data;
 - forest that is a portion of large (greater than 200-acre) contiguous forest tract; and
 - areas that drain to a critical resource such as a drinking water reservoir.
- Provisions of easements placed on properties with critical environmental features should ensure the protection of these resources. For example, if the critical environmental area contains a floodplain, the easement should contain strong riparian buffer protection language.
 - All easements that are on properties adjacent to streams should try to incorporate strong stream buffer requirements. Ideally this would include fencing of livestock. At the least, it would include restrictions on removing vegetation within 100 feet from the stream. Easements should also include strong forest/tree conservation provisions where appropriate and feasible.

TOOL 3. AQUATIC BUFFERS

Regulations/Supporting Documents

Fauquier County Comprehensive Plan Amendments

Fauquier County Zoning Ordinance

Program(s) and Techniques

According to the County, there currently are not any stream or wetland buffer requirements. However, there is a Floodplain District that broadly outlines permitted uses within the 100-year floodplain, including agricultural uses, recreational uses (such as golf courses), accessory residential, commercial and industrial uses (lawn, pervious parking), and small private streets. Stream buffers are promoted as a means of meeting stormwater requirements.

Conservation Reserve Enhancement Program (CREP)

An enhancement of the federal *Conservation Reserve Program*, CREP's goal is to improve Virginia's water and wildlife habitat by offering rental payments to farmers who voluntarily restore riparian buffers, filter strips and wetlands through approved conservation measures. Cost share payments are available to assist in the installation of specific restoration practices. Rental payments for either ten or fifteen years on contracted acres vary according to watershed, restoration practice and soil types.

Recommendations

Establish Stream Buffer Requirements

Stream buffers are designed to protect streams and creeks from the impacts and side-effects of adjacent land uses. Establish enforceable regulations that would restrict clearing and development within at least 75 feet of the edge of streambanks and encompass associated environmental features, such as steep

slopes, floodplains, and wetlands. Consider implementing the “Three-Zone” buffer which stresses forest as the target streamside vegetation. For more information see the model stream buffer ordinance developed by CWP:

http://www.stormwatercenter.net/Model%20Ordinances/buffer_model_ordinance.htm

Establish Wetland Buffer Requirements

Wetlands provide habitat for fish and wildlife, flood protection, shoreline erosion control and improve water quality. To preserve these benefits and protect wetlands from the impacts of development, establish a no-build, minimum wetland buffer width requirements.

Conduct Stream Buffer Education

Once buffer requirements are established, it is necessary to make the buffer “visible” to the community. Educate land owners about the benefits and uses of buffers with pamphlets, streamwalks and meetings with homeowners associations. As with all education efforts remember to repeat the message. Frequency is important because it determines how well the message will be remembered. Continue work with the John Marshal SWCD and local environmental organizations on incentive programs and education initiatives for landowners. More information on stream buffers is available at:

http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool3_Buffers/BufferZones.htm.

TOOL 4. BETTER SITE DESIGN

Regulations/Supporting Documents

Fauquier County Zoning Ordinance

Fauquier County Subdivision Ordinance

Program(s) and Techniques

Fauquier County has several zoning ordinances in place that contribute to Better Site Design practices. The County allows by-right cluster development and encourages developers to utilize trails in lieu of sidewalks. The County also allows different driveway configurations that include shared driveways and the use of pervious materials. All of these allowances permit developers to build more environmentally sensitive communities. The discussion below highlights some of the strengths and weaknesses of existing codes and ordinances to promote Better Site Design.

Street Width Requirements

Recommended road widths for streets with fewer than 500 average daily trips (ADTs) range from 18 to 22 feet (CWP, 1998). Based on these standards, current Virginia Department of Transportation (VDOT) width requirements for residential streets with curb and gutter are excessively high, even with approval of reductions (widths range from 22 to 40 feet depending on the number of ADTs). According to the County, private road widths generally are narrower than VDOT requirements. VDOT does not maintain private roads and few jurisdictions are willing to carry the burden, including Fauquier County which actively discourages the use of private roads.

Parking Requirements

Fauquier County’s minimum parking requirements are high compared to the recommendations published by the Institute of Transportation Engineers (1987). For the parking ratio portion of the program review, Fauquier County indicated that minimum parking requirements are excessive for several land uses, including professional office space and shopping centers.

Cluster Development

The benefits of a well-designed cluster community include minimized impervious cover, construction costs, and pollutant loads, and the preservation of natural areas. In Fauquier County, clustering is allowed by-right to developers. On lots of greater than 30 acres in the agricultural (RA and RC) zoning districts, 85% minimum open space is required for both conventional and cluster development. In residential zoning districts, however, the required minimum open space of cluster development is significantly higher than that of conventional development. Where residential zoning districts under conventional development are required to include zero to 30% open space, they must have 50% open space under cluster development rules.

Sidewalk Requirements

The County allows alternate pedestrian networks. It encourages developers to trade off some subdivision sidewalks for trails and is developing an integrated trail system. The County also allows shared driveways and the use of pervious materials in driveway construction. In low-density residential developments with lots of one acre or more, open, vegetated ditches are preferred over the traditional concrete curb and gutter system.

Recommendations

Set Maximum Parking Ratios

High minimum parking requirements can lead to the creation of excessive impervious cover, which increases the volume of stormwater that must be treated. Placing a maximum on parking requirements can also help to curb needless amounts of impervious cover. Reduce minimum parking requirements and develop maximum parking requirements. Suggested minimum parking ratios are available at: http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool4_Site_Design/GreenParking.htm

Encourage VDOT to Add Flexibility in Street Design

Encourage VDOT to add flexibility in their street design. Because streets can be a large component of impervious cover in the landscape, impervious cover reduction should be a goal.

Encourage Right-of-Way Reductions

Currently, all roads in the County must meet VDOT standards for right-of-way widths. According to VDOT's Subdivision Street Standards, some reduction in residential road right-of-way widths may be allowed. Depending on the number of ADTs, a reduction to 30 feet for some roads or as low as 22 feet for others may be allowed if requested in writing and approved by VDOT. Encourage developers to apply for these width reductions during the conceptual stage of the site plan or during site plan review. An incentive for developers to reduce right-of-way widths is the cost savings associated with reduced clearing and grading during construction of these narrow right-of-ways.

TOOL 5. EROSION AND SEDIMENT CONTROL

Regulations/Supporting Documents

Virginia Erosion and Sediment Control Handbook

Program(s) and Techniques

In Virginia, a formal Erosion and Sediment Control (ESC) plan is required for all development activities where more than 10,000 square feet of land is to be disturbed. Fauquier County directs developers to the

Virginia Erosion and Sediment Control Handbook (VESCH) for guidance and requirements for their ESC plans. Once the ESC plan is approved, routine inspections are conducted by the John Marshall Soil and Water Conservation District (SWCD). Each site is assessed individually to determine the percentage of cover removal appropriate at each stage of development. The inspection schedule is as follows:

- Pre-construction conference to review plans.
- On-site meeting prior to land clearing to evaluate plan.
- On-site meeting to evaluate initial clearing, grading and controls.
- Weekly evaluation while grading is on going.
- Every 2 weeks while site/construction is active.
- Once/month until the site is 75%-90% stabilized.
- Quarterly for one year once the site is stabilized.
- A final inspection one year after the completion of the quarterly inspections.

Inspectors must be certified through the Virginia Department of Conservation and Recreation (DCR). In January 2001, the Virginia General Assembly approved a bill allowing for the review of current ESC enforcement policies, showing strong support for strengthening the current weaknesses therein. Currently, those found in violation of the ESC ordinance are subject to penalties, including stop work orders and withholding of building inspections and/or occupancy permits.

Recommendations

Limit Clearing

To prevent the unnecessary mass clearing and grading of a site, incorporate numeric specifications on how much clearing is acceptable at a site into Fauquier's Erosion and Sediment Control Design Standards. Provide more specific guidance on how much of a site can be cleared. Also include a mechanism to enforce this limit. The enforcement mechanism should specify that first, site plans showing clearing limits that exceed the allowable cleared area will be rejected, and second, if more vegetation is cleared at a site than is shown on the approved site plan, the developer will be required to reforest the illegally cleared areas at a specified ratio. At a minimum, the County should require that, for every site, grading plans show clear delineations of critical areas, such as buffers, wetlands, forests, and habitat areas and that clearing be strictly limited near them. These areas should be clearly flagged on site, as well as in the clearing and grading plan. This can also be achieved by promoting the idea of "phased" construction. This strategy can help minimize mass clearing by requiring that no more than 50 acres of land be exposed at any one time.

Encourage Non-Staff Inspections

Two program tools can help meet rigorous inspection schedules outlined above. The first is the use of private inspectors, non-county staff who are trained in erosion and sediment control and submit inspection reports to the County. A second is to encourage citizen "watch dogs" to report violations or concerns at construction sites. A key element of this program is to publish newspaper advertisements, or use a web site to encourage citizens to call in ESC complaints, and also educate them on what to look for.

Improve ESC Enforcement

In order to protect water resources, ESC ordinances are established and should be followed. Upon completion of the enforcement policy review approved by the Virginia General Assembly, stronger enforcement capabilities and penalties should be available to the County. Improve the enforcement and penalties associated with violations of ESC ordinances.

TOOL 6. STORMWATER MANAGEMENT

Regulations/Supporting Documents

Northern Virginia BMP Handbook
Virginia Stormwater Management Handbook
Fauquier County Stormwater Ordinance

Program(s) and Techniques

Stormwater management is required on all lots disturbing greater than 10,000 square feet, with exemptions for large lot (greater than five acres) or very small subdivisions (fewer than three houses). Controls are required to improve water quality, reduce channel erosion, and control flooding. The County’s ordinance references both the Northern Virginia Best Management Practice (BMP) Handbook and the Virginia Stormwater Management Handbook. Stormwater criteria are summarized below:

- | | |
|-------------------------|--|
| Extreme Flood Control: | Fauquier County requires safe passage of the extreme (100-year flood). |
| Overbank Flood Control: | Control for overbank flooding is a 10-year “post- to “pre” control |
| Channel Protection: | Control for channel protection is a 2-year “post- to pre-control”, in which the peak runoff rate for the 2-year storm is reduced to its pre-development levels. |
| Water Quality: | Fauquier County uses the “Occoquan Method” as identified in the Northern Virginia BMP Handbook for practice sizing, which requires 40% reduction in phosphorus on regulated sites. |

While the program allows for a wide range of treatment practices, the most common practices used in Fauquier County are dry ponds, infiltration trenches, and wet ponds. Like all stormwater practices, these (and particularly infiltration trenches) require a significant amount of maintenance over time. In Fauquier County, this maintenance responsibility is placed on the homeowner’s associations (HOAs) with a formal maintenance agreement. Specific penalties are in place if practices are not maintained, but the County does not complete inspections of the practices.

Recommendations

Clarify Manual References

Fauquier County’s stormwater ordinance as it stands references the Northern Virginia BMP Handbook as the overall design guidance for stormwater practices, and then later refers to the more recent Virginia Stormwater Management Manual for specific phosphorus removal rates. Although the Northern Virginia BMP Manual is a valuable reference, the more recent Virginia Stormwater Management Manual incorporates more design features that ensure practice performance over time, such as pretreatment measures.

Develop an Inspection Program

Currently, Fauquier County requires stormwater maintenance covenants, but inspections are completed by the HOA or other private practice operator. Either develop staff to conduct inspections, or consider working with Fauquier County to develop a “certified inspector” program to ensure that reports

completed by HOAs are accurate. Information on stormwater inspections can be found at: http://www.stormwatercenter.net/Manual_Builder/Maintenance_Manual/introduction.htm.

Establish an Adopt-a-Pond Program

The restoration or rehabilitation of stormwater ponds is essential to the health of the Goose Creek watershed. All stormwater ponds should have a maintenance plan in place. By engaging HOAs and other volunteers in the beautification and maintenance of their stormwater ponds, they are also helping to keep the embankments stable and improve or maintain the current pollutant removal capability. Other amenities that a properly designed and maintained pond may have are increased wildlife habitat, recreation areas, aesthetic vistas, and property values. Develop an Adopt-a-Pond program that would work with Homeowner Associations and other interested individuals and volunteers to conduct basic maintenance for their stormwater ponds. This would include basic inspections (i.e., are their trees on the embankment or significant damage to the riser) trash pick up, mowing, and aquatic vegetation plantings. Hillsborough County, Florida has an established Adopt-a-Pond program and materials are available through the Hillsborough County Engineering Division:

<http://www.hillsboroughcounty.org/publicworks/engineering/stormwtr.html>.

Revise Channel Protection Requirements

Change channel protection criteria from 2-year control to 24-hour detention of the 1-year storm event (as incorporated in Maryland, New York and Vermont). Two-year control may actually exacerbate channel erosion by retaining the peak flow of the 20-year event over a longer period of time than uncontrolled runoff. 24-extended detention of the 1-year event results in a larger capacity for stormwater practices to retain storm flows, achieving velocities below the “channel forming” even that can erode the stream bank.

Incorporate “Non-structural” Treatments More Explicitly

Although open space preservation is one component of meeting water quality sizing requirements, consider incorporating a BMP Credit system, which explicitly uses non-structural components to meet water quality standards. Three credits: stream buffers, open space conservation, and impervious cover management, are incorporated in Loudoun County’s guidance.

TOOL 7. NON-STORMWATER DISCHARGES

Regulations/Supporting Documents

Fauquier County Comprehensive Plan
General Permit Requirements for Confined Animal Feeding Operations in Virginia
Cost Share & Tax Credit for Virginia Agricultural BMPs
Virginia’s Conservation Reserve Enhancement Program

Program(s) and Techniques

Typically this tool looks at how wastewater and other non-stormwater flows are treated and discharged in a watershed. However, for the purposes of this review, Tool 7 has become a catch-all category encompassing not only non-stormwater discharges, but the management practices of agriculture and vineyards, as well.

Wastewater Treatment Plants

Properly managed wastewater treatment plants play an important role in protecting community health and water quality. The Interstate Commission on the Potomac River Basin (ICPRB) in a recent study, found that within the Goose Creek watershed, approximately 7,804 households are on sewer (number includes households from both Loudoun and Fauquier Counties) (ICPRB, 2002). Fauquier County's Water and Sewer Authority operates one wastewater treatment plant, the Marshall facility, in the Fauquier County portion of the Goose Creek watershed. According to the County's Comprehensive Plan, a Sanitary Sewer Evaluation Survey should be performed and any necessary repairs made to help restore the current capacity of this facility until an anticipated upgrade can be performed, projected to occur in the next five to ten years.

On-Site Sewage Disposal Systems (OSDS)

Septic Systems (also known as on-site sewage disposal systems) are used to treat and discharge wastewater from toilets, wash basins, bathtubs, washing machines, and other water consumptive items that can be sources of high pollutant loads. It is estimated that 5,717 households are on septic systems in the Goose Creek watershed, which includes households from both Loudoun and Fauquier Counties (ICPRB, 2002). The County Health Department is in charge of permitting septic tanks, but no regular inspection or maintenance guidelines are in effect.

Agricultural Practices

By 1987, 58% of Fauquier County was allocated to agricultural use, according to that year's Agricultural Census, so an understanding of the agricultural land management practices advocated and applied within the County's portion of Goose Creek watershed is critical. Currently, it is estimated that there are over 50,000 livestock in the Goose Creek watershed (this includes cattle, horses, and sheep in both Loudoun and Fauquier Counties) (ICPRB, 2002). The Virginia Cooperative Extension, Fauquier County Office and the John Marshall SWCD encourage farmers to conduct their agricultural practices in such a way as to minimize the impact on local waters. They advocate rotational grazing, exclusionary fencing, and the use of off-stream water sources, which is most effective when combined with exclusionary fencing. Incentives are available state-wide and are administered in Fauquier County by the John Marshall SWCD. Examples of these incentives are as follows:

- Cost share programs that are intended to help farmers mitigate some of the costs of implementing conservation practices to treat animal waste, cropland, pastureland and forest land. State and federal funding is available through the John Marshall SWCD. Some practices are paid for at a straight per acre rate, while others are cost-shared on a percentage basis up to 75 percent. In addition, the Conservation Reserve Enhancement Program (CREP) is intended to help farmers restore riparian buffers, grass filter strips and wetlands through rental and cost share payments. All CREP-enrolled pasture or cropland will be planted to hardwood trees or native warm season grasses.
- The Virginia Agricultural BMP Tax Credit Program that supports the voluntary installation of BMPs that address Virginia's nonpoint source pollution water quality objectives. Agricultural producers with an approved conservation plan can take a credit against state income tax of 25% for eligible BMP expenses. A Conservation Equipment Tax Credit Program is also available to farmers for equipment such as a no-till planter. This equipment is also eligible for a 25% tax credit.

Confined Animal Feeding Operations (CAFOs)

CAFOs contain a high density of animals (usually livestock) within a small area. Without proper treatment, CAFOs can contaminate streams with bacteria and excess nutrients. State-wide regulations require CAFOs with 300 or more animal units to obtain a permit through the State. The State strongly recommends that producers meet with personnel from the Virginia Department of Environmental

Quality (DEQ), Virginia Department of Conservation and Recreation, as well as the county zoning administrator to make sure they understand all the requirements for a CAFO and to determine whether the planned operation can meet these requirements. Along with the permit, CAFOs are required to submit a nutrient management plan. The main purpose of a nutrient management plan is to assure that no waste or potentially water impacting nutrients from the waste reach either ground or surface water supplies. Once a permit is granted, the nutrient management plan is enforceable by law by Virginia's DEQ.

Vineyard Management

Currently, there are three vineyards in the Fauquier County portion of Goose Creek. The John Marshall SWCD promotes conservation management on vineyards, including integrated pest management, buffer strips, erosion prevention, and fertilizer reduction based on soil tests and petiole analysis. No cost share or incentive programs are targeted to grape growers. The Virginia Cooperative Extension, Fauquier County Office also works with vineyard operators to develop pesticide and fertilizer application and management programs.

Golf Course Management

There are currently no golf courses located in the Fauquier County portion of the Goose Creek watershed.

Illicit Discharge Detection and Elimination (IDDE)

There is currently no program to detect or eliminate illicit discharges in Fauquier County.

Household Hazardous Waste

Facilities for collecting various hazardous household wastes are provided at County landfills, during specific time periods. In March 2003, the County began offering additional drop-off opportunities to include the first Saturday of every month and every Tuesday. The Department of Environmental Services includes this information in their newsletter.

Recommendations

Regulate OSDS

Fauquier County's Health Department permits septic tanks, and although they currently have no required maintenance protocol, a maintenance program is in the works. Establish regular maintenance and inspections of all septic tanks in the watershed to ensure that they are properly functioning.

Conduct Outreach to Vineyards

To minimize nutrient and sediment loadings, educate vineyard owners on the use of environmentally sound practices. This includes integrated pest management, buffer strips, erosion prevention (terracing, no-till cropping, etc.) fertilizer reduction based on petiole analysis and/or soil testing, and stream buffers, where applicable.

Initiate an IDDE Program

While not an NPDES Phase II community subjected to the rules and regulations that require an IDDE program, Fauquier County and the Goose Creek watershed would benefit greatly from a slightly scaled-down version of an IDDE program. At a minimum this program would consist of stream walks and an outfall characterization of more urbanized areas to determine if any illicit discharges are occurring. These outfall observations can be made on an "opportunistic" basis in concert with any other ongoing field work. They should also encourage the County to maintain updated storm drain maps with the sizes

and locations of outfalls. Finally, offer and advertise a hotline, perhaps incorporated into the existing Litter and Illegal Dumping Program that residents should call if they suspect illegal dumping into storm drains or illicit discharges into waterways.

TOOL 8. WATERSHED STEWARDSHIP

Program(s) and Techniques

To begin to understand how certain environmental groups act as stewards of the Goose Creek watershed, CWP created an additional survey for three groups whose focus, interest and work revolve around Fauquier County's portion of the Goose Creek watershed (see Appendix C).

Groups with a watershed-wide or regional focus participate and implement stewardship activities in both Fauquier and Loudoun Counties (i.e., PEC). For the purposes of this report, these organizations' survey responses are summarized in the Loudoun County portion of the report.

Advocacy

Advocacy plays a large role in many of the organizations active in the Goose Creek watershed. Each organization surveyed said that it acted as an advocate for watershed-related matters. It is in this capacity that these groups have played a large part in promoting better land management. Individually, these groups also work to preserve forests and rural/agricultural lands, and protect water and land quality overall. Citizens for Fauquier County also advocate Transfer of Development Rights (TDRs) and development restrictions. The target audiences of these groups are public officials, citizens and prominent stakeholders.

Education

Organizations were surveyed about four elements of watershed education: watershed awareness, homeowner stewardship, training, and watershed engagement.

- Raising awareness

Both the John Marshall SWCD and Fauquier County Parks and Recreation Department said that they strive to raise watershed awareness through canoe trips. John Marshall SWCD also offers watershed conferences, waste management workshops, and newsletters and administers a long-term stream monitoring program at two sites using high school students. None of the organizations surveyed conducts streamwalks, practices storm drain stenciling, installs signs at watershed boundaries or stream buffers, or distributes watershed maps.

- Homeowner Stewardship

Homeowner stewardship involves educating residents about the individual roles they play in the watershed and communicating specific messages about positive and negative behaviors. One of the organizations promotes environmentally sensitive lawn care practices. Only John Marshall SWCD addresses the following topics mentioned in the survey: water conservation, pet waste management, septic system maintenance, or environmentally sensitive car washing or automotive maintenance; these are addressed through a series of workshops, newsletters and newspaper articles.

- **Training**

Training opportunities are available from John Marshall SWCD and Fauquier County Parks and Recreation Department. Each provides opportunities for conducting stream assessments, and John Marshall SWCD also offers water quality/macroinvertebrate monitoring.

- **Engagement**

Watershed engagement provides opportunities for the public to actively engage in watershed protection and restoration. John Marshall SWCD offers stream clean-ups and long-term stream monitoring and data collection. Fauquier County Parks and Recreation Department also conducts stream clean-ups and stream buffer plantings.

Pollution Prevention

Pollution prevention can take many forms, including recycling and environmentally-sound waste disposal. Fauquier County offers recycling facilities and hazardous waste disposal facilities at its County landfill sites.

Monitoring

In addition to advocacy, monitoring is another activity frequently cited by each of these stewardship organizations in Fauquier County. Fauquier County Parks and Recreation Department stated that they conduct water quality monitoring throughout the County, though they don't use volunteers. John Marshall SWCD conducts water quality monitoring and macroinvertebrate sampling and recently received a grant to start a macroinvertebrate monitoring program in the upper Goose Creek watershed area. They do use volunteers and recruit them using newspapers, newsletters, word-of-mouth and phone calls. The frequency ranges from monthly for high school student volunteers on Cedar and Marsh Runs to quarterly for the Upper Rappahannock and Goose Creek programs.

Maintenance

Watershed maintenance refers to the continued work involving the conservation areas and buffer networks, and maintenance of stormwater practices and septic systems. Two groups cited stream clean-ups, but Fauquier County Parks and Recreation Department also conducts maintenance work on conservation areas, stream buffers and stormwater facilities.

Restoration

Watershed restoration entails the rehabilitation of streams that have been degraded by past land uses and/or development. Both John Marshall SWCD and Fauquier County Parks and Recreation Department each work to establish stream buffers, and John Marshall SWCD also conducts various projects through Virginia's BMP program to enhance stream quality.

Recommendations

Conduct Targeted Educational Campaigns

Since there are several common interests among the organizations mentioned here, a combined educational campaign effort could be very effective. One organization should act as a central organizer to get these organizations to concentrate on one education campaign at a time. For example, according to ICPRB (2002), there are more than 20,000 dogs in the Goose Creek watershed. To help mitigate potential bacteria impacts associated with pet waste, all the organizations could initiate a one-month "Scoop the Poop" campaign that would educate dog owners about the importance of picking up after their pets. Another suggestion is curb and gutter stenciling in urban areas to remind citizens where the water is going. Encouraging homeowner stewardship can take many forms, including brochures,

newspaper articles, signage, website advertisement, and demonstration projects. Organizations should work with one another to educate homeowners and residents on what they can do to help contribute to the health of the Goose Creek watershed. As with all education efforts remember to repeat the message. Frequency is important because it determines how well the message will be remembered. Fact sheets that can be used in a variety of educational campaigns are available in Appendix D.

Conduct Stream Buffer Plantings

In addition to encouraging citizen participation and awareness, stream buffer plantings have multiple benefits that directly translate to the improvement of the health of the Goose Creek watershed. Since stream buffer plantings are a relatively cheap and easy method of improving watershed health, increase the number of stream buffer plantings in the Goose Creek watershed. A potential funding source is the Chesapeake Bay Restoration Fund.

Enhance Pollution Prevention Programs

While recycling and proper waste disposal are important pollution prevention strategies, develop a pollution prevention campaign that targets commercial and industrial areas. This includes automotive body shops, dumpster management at commercial shopping centers, and illegal dumping. The campaign should target specific behaviors such as the proper handling and recycling of materials (i.e., antifreeze), preventing spills and leaks, and recycling wash water. For additional information, see the Low Angeles County of Department Works' information kit, "Businesses and Industries for a Clean Environment." This kit includes fact sheets for automotive salvage yards, recycling, food industry, hazardous waste, and landscaping. www.dpw.co.la.ca.us.

Create a Website to Encourage Watershed Stewardship

Provide a central location for citizens to access information about their watersheds and streams. A website combined with other education efforts can provide information on watershed basics (i.e., what is a watershed), locator watershed maps (i.e., where do you live in the Goose Creek watershed?), promote practices that citizens can do on an everyday basis to become better watershed stewards, and provide information on how to volunteer or become involved. James City County, Virginia has put together such a website: <http://www.protectedwithpride.org/>.

SECTION 4.0 CONCLUSION

Having recognized the need to protect their environmental resources and natural heritage, Loudoun and Fauquier Counties have already established ordinances and programs designed to contain or reduce development, thereby reducing the subsequent negative impacts on the Goose Creek watershed and its tributaries. While many of those existing techniques, reviewed here, are in accord with the Eight Tools of Watershed Protection, it is possible to enhance and improve them and institute additional ordinances to further the protection of Goose Creek. A summary of these recommendations are provided in Table 2.

This comprehensive report was generated after analyzing zoning ordinances, comprehensive plans and countless other state and county documents, as well as surveys conducted with numerous organizations whose goal is to protect Goose Creek. This document does not directly assign responsibility for implementing its recommendations. Implementation and responsibilities of the recommendations contained within this report should be determined by an Implementation Committee. This Committee is discussed in more detail in the Goose Creek Demonstration Subwatershed Plan report.

Table 2. Summary of Program Review Recommendations

Jurisdiction	Watershed Protection Tool	Recommendation
LOUDOUN COUNTY	1: Land Use Planning	Develop Lawn Care Education Program
		Strengthen Overlay District Regulations
		Expand Use Value Tax Program
	2: Land Conservation	Specify Open Space Requirements
		Encourage Use of Required Open Space to Provide Additional Stream Buffer Protection
		Strengthen Plant and Wildlife Habitat Language
		Conduct Field Inventory of Significant Natural Communities
		Strengthen Land Conservation Fund and PDR Program
		Adopt a Tree Preservation Ordinance
	3: Aquatic Buffers	Develop Wetland Buffer Requirements
		Enhance Stream Buffers
		Conduct Stream Buffer Education
		Increase Stream Restoration Incentives
		Protect Headwater Streams
	4: Better Site Design	Set Maximum Parking Ratio
		Encourage VDOT To Add Flexibility in Street Design
		Encourage Conservation Design Process for Suburban Zoning Districts
	5: Erosion and Sediment Control	Limit Clearing
		Create Detailed Inspection Schedule
		Encourage Non-Staff Inspections
	6: Stormwater Management	Improve Stormwater Maintenance
		Establish Adopt-a-Pond Program
		Conduct Stormwater Retrofitting Project
		Simplify Existing Water Quality Requirements
		Modify Channel Protection Criteria
		Revise Waivers for Adequate Channel
		Practice Restrictions
	7: Non-Stormwater Discharges	Conduct Direct Outreach to Golf Courses
		Conduct Outreach to Vineyards
		Develop IDDE Program
		Minimize Impacts of OSDS
	8: Watershed Stewardship	Conduct Targeted Educational Campaign
Conduct Stream Buffer Plantings		
Develop Pollution Prevention Program		
Create Website to Encourage Stewardship		
FAUQUIER COUNTY	1: Land Use Planning	Develop Lawn Care Education Program
		Expand Use Value Tax Program
	2: Land Conservation	Specify Open Space Requirements
		Conduct Field Inventory of Significant Natural Communities
		Expand PDR Program and Provisions
	3: Aquatic Buffers	Establish Stream Buffer Requirements
		Establish Wetland Buffer Regulations
		Conduct Stream Buffer Education
	4: Better Site Design	Set Maximum Parking Ratios
		Encourage VDOT to Add Flexibility
		Encourage Right-of-Way Reductions
	5: Erosion and Sediment Control	Limit Clearing
		Encourage Non-Staff Inspections
		Improve ESC Enforcement
	6: Stormwater Management	Clarify Manual References

Table 2. Summary of Program Review Recommendations

Jurisdiction	Watershed Protection Tool	Recommendation
		Develop Inspection Program
		Establish Adopt-a-Pond Program
		Revise Channel Protection Regulations
		Incorporate “Non-structural” Treatments More Explicitly
	7: Non-Stormwater Discharges	Regulate OSDS
		Conduct Outreach to Vineyards
		Initiate IDDE Program
	8: Watershed Stewardship	Conduct Targeted Educational Campaigns
		Conduct Stream Buffer Plantings
		Enhance Pollution Prevention Programs
		Create a Website to Encourage Stewardship

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