

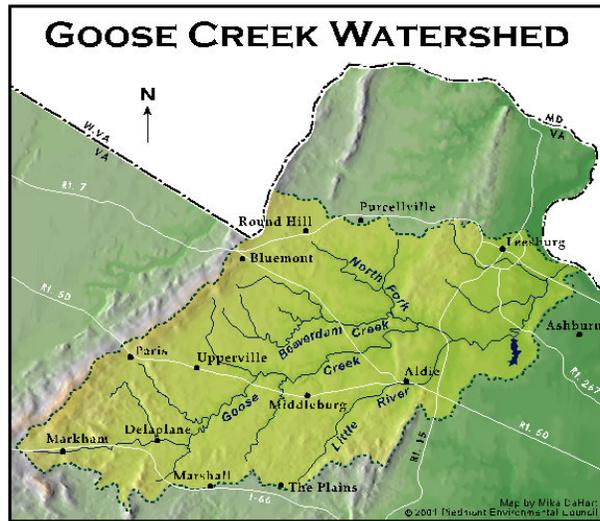


Goose Creek Watershed Assessment Summary October 2003



The Goose Creek Watershed

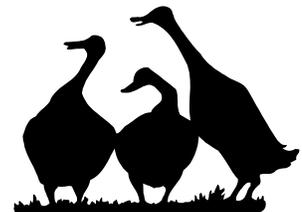
The Goose Creek watershed is 385 square miles, covering nearly half of Loudoun County and one-quarter of Fauquier County in the northern Virginia Piedmont. It is a designated state Scenic River as well as a major water source, providing drinking water to the City of Fairfax and half of suburban Loudoun County. Current impervious cover (surfaces such as roads and buildings) is estimated to be less than 5% of the watershed, and forest area is estimated to be 41%. Significantly, over 20% of the watershed is permanently protected from development by conservation easements and, based on current zoning, future impervious cover over the entire watershed is not expected to exceed 7%. Water quality surveys performed in the early 1990's showed it to be one of the cleanest waterways on the Atlantic seaboard, and scientists studying the creek have reported that it harbors one of the highest levels of biodiversity of small stream invertebrates worldwide. However, impacts from development, inadequate stream buffers, and failing septic systems threaten this important watershed, and there are now seven designated impaired stream segments totaling 36 miles. In several urbanizing subwatersheds, impervious cover will soon exceed 10%, negatively impacting stream quality.



Overview of Watershed Assessment Process

In January 2002, the Piedmont Environmental Council, in partnership with the Goose Creek Association, contracted with the Center for Watershed Protection to perform a "Rapid Watershed Assessment" of the Goose Creek Watershed and its 40 subwatersheds. The 18-month process included the following tasks:

1. Holding two **stakeholder meetings** to engage landowners and representatives from local non-profits, government agencies, and businesses;
2. Producing a watershed "**vulnerability analysis**" based on current and projected future impervious cover;
3. Completing a "**program review**" that assessed current county programs, regulations, & ordinances pertaining to watershed protection;
4. Conducting a comprehensive **assessment of stream conditions and priority conservation areas** in three selected subwatersheds; and
5. Creating detailed "**demonstration subwatershed management plans**" to provide baseline information about the three selected subwatersheds and recommend priorities for conservation and restoration. These plans are based on information gathered in tasks 1-4 and were compiled in a final report, completed in July 2003.



Goose Creek Demonstration Subwatershed Plans

The *Goose Creek Demonstration Subwatershed Plans* report includes over 140 recommendations in three areas: **1) watershed-wide**; **2) countywide** in separate sections for Loudoun and Fauquier; and **3) subwatershed level** for three selected subwatersheds: a) "Goose Headwaters 105" in Fauquier County between Markham and Linden; b) "North Fork 102" in Loudoun County around the town of Round Hill; and c) "North Fork Upper Direct Drainage," adjacent and downstream of North Fork 102. The report also included detailed findings from stream field studies in these 3 subwatersheds.

Overall Watershed Goals

The objective and recommendations contained in the *Goose Creek Demonstration Subwatershed Plans* report support the following nine overall watershed goals:

1. **Increase** the diversity and abundance of fish and macroinvertebrates
2. **Protect** critical habitat and natural resources throughout the watershed
3. **Maximize** the effectiveness of watershed and citizen groups within the watershed through coordination of their efforts
4. **Preserve & enhance** the riparian corridor and in-stream habitat
5. **Foster** stewardship among all residents
6. **Sustain** the rural and scenic character of the watershed
7. **Minimize** impacts of new development
8. **Protect** water quality by reducing the inputs of nutrients and bacteria
9. **Continue** to better understand and monitor changes throughout the watershed

Watershed-wide Recommendations

Watershed-wide recommendations in the report deal with large-scale watershed issues and considerations for implementing other recommendations in the report. They include:

1. Develop an **Implementation Committee** to establish responsibility for and begin implementation of the projects and recommendations included in the report
2. **Revise local codes** to more explicitly protect streams & natural resources from new development
3. **Minimize sewage flows** to the Goose Creek through improved septic system regulations and inspection, and improved detection and removal of illicit discharges
4. **Target lands** with significant natural resources when purchasing easements
5. Establish a “**Mountainside Initiative**” partnership to preserve land along the Appalachian Trail
6. Continue **subwatershed planning** throughout Goose Creek
7. Conduct further **monitoring** in the three demonstration subwatersheds
8. Designate a group to coordinate watershed-wide **education** efforts
9. Disseminate information on funding sources for **agricultural practices**



Countywide Recommendations

The “program review” of county codes and ordinances resulted in over 50 specific recommendations for Loudoun and Fauquier County governments. The following list includes those recommendations deemed to be “high priority” (to be implemented within 2 years):

Loudoun County

- Strengthen Overlay District regulations to protect water recharge areas & reservoir watersheds
- Add conservation provisions (e.g. buffers) to open space requirements
- Strengthen Plant & Wildlife Habitat Policies to require protection of critical habitat
- Strengthen protection of headwater streams with buffer requirements
- Eliminate some existing stormwater waivers for discharges to an “adequate channel”

Fauquier County

- Establish stream buffer requirements
- Encourage non-staff (e.g. citizen) Erosion & Sediment Control (ESC) inspections
- Improve ESC enforcement & penalties
- Establish regular maintenance & inspections of on-site disposal systems (septic tanks)



For Both Counties

- Educate landowners about stream buffers
- Conduct targeted education campaigns about various watershed health issues
- Conduct stream buffer plantings
- Create a website to encourage stewardship
- Establish wetland buffer requirements
- Strengthen the PDR Programs’ protection of critical environmental features

Subwatershed Recommendations

Goose Headwater 105

Introduction

Goose Headwater 105 is located in the westernmost portion of the Goose Creek Watershed and lies entirely within Fauquier County, between Linden and Markham. The in-office vulnerability analysis classified this subwatershed as “High Quality” and predicted that it will remain in this category in the near term. The high quality of the streams is due in large part to significant tracts of contiguous forest present in the subwatershed, including a portion of the G. Richard Thompson Wildlife Management Area. At the same time, field assessments revealed negative impacts caused by Interstate 66, the Norfolk Southern Railroad, inadequate streamside buffers, and other site-specific problems.

<i>Area</i>	8,479 acres	<i>Perennial stream miles</i>	21.9 (21.7 assessed)
<i>Number of catchments</i>	6	<i>Stream habitat quality</i>	5 excellent, 12 good, 2 fair & 2 poor sites
<i>Classification</i>	High quality	<i>Inadequate buffer</i>	37%
<i>Current impervious cover</i>	6%	<i>Cattle/horse access</i>	12%
<i>Future impervious cover</i>	7%	<i>Stream erosion</i>	2%
<i>Conservation easements</i>	0 acres	<i>Contiguous forest</i>	3,779 acres in 3 areas
<i>Estimated forest cover</i>	6,389 acres (75%)		

Subwatershed Objectives

1. Achieve forested buffer along 75% of the stream length.
2. Achieve a “good” to “excellent” habitat quality at all of the sites analyzed.
3. Preserve existing forest cover.
4. Preserve the “viewshed” of the Appalachian Trail.
5. Reduce pollutant loads from areas with a high potential for pollutant contribution.
6. Achieve direct involvement and stewardship by watershed residents.

Recommendations

Conservation

- Protect three identified areas of contiguous forest by promoting easements or investigating acquisition on 26 target parcels. Six of these parcels are adjacent to the Appalachian Trail.

Education/Outreach

Thirteen specific outreach initiatives were identified, including:

- Educate agricultural landowners about riparian buffers.
- Perform outreach to the Thompson Wildlife Management Area managers and property owners with land adjacent to significant forest resources.
- Contact five property owners with identified pollutant sources to discuss possible remedies.

Restoration

- Perform fourteen specific restoration projects covering 3.6 miles of stream (thirteen streamside fencing/forestation projects and one sediment clean-up project).

North Fork 102

Introduction

North Fork 102 is located in the northwest corner of the Goose Creek Watershed in Loudoun County. The in-office vulnerability analysis classified this subwatershed as “Rural Impacted” and predicted that it will remain in this category in the near term. Although impervious cover is less than 10% in this watershed, data indicated impacts from a high number of septic systems, a significant number of horses, several dams, and “poor” water quality based on Index of Biological Integrity (IBI). Stream assessment data suggest that the majority of the stream miles are in “good” condition for physical habitat. In addition, the subwatershed had significant areas of contiguous forest tracts, both along the Appalachian Trail and just west of Round Hill. There are, however, isolated areas of severe channel erosion and significant inadequate buffer throughout the subwatershed.

<i>Area</i>	6,821 acres	<i>Perennial stream miles</i>	18.4 (10.5 assessed)
<i>Number of catchments</i>	6	<i>Stream habitat quality</i>	5 good, 2 fair, 1 poor
<i>Classification</i>	Rural impacted	<i>Inadequate buffer</i>	30%
<i>Current impervious cover</i>	5%	<i>Cattle/horse access</i>	8%
<i>Future impervious cover</i>	9%	<i>Stream erosion</i>	4%
<i>Conservation easements</i>	533 acres (8%)	<i>Contiguous forest</i>	1,264 acres in 3 areas
<i>Estimated forest cover</i>	2,888 acres (42%)		

Subwatershed Objectives

1. Achieve forested buffer along 90% of the stream length assessed.
2. Achieve “fair” or “good” habitat quality at all of the sites analyzed.
3. Improve fish IBI from Very Poor to Fair.
4. Preserve forests and other areas of special value.
4. Achieve direct involvement and stewardship by watershed residents.
5. Reduce pollutant loads from urban stormwater.

Recommendations

Conservation

- Protect three identified areas of contiguous forest by promoting easements or investigating acquisition on 22 target parcels.
- Work with developers to minimize clearing on contiguous forest.

Education/Outreach

Nine targeted outreach initiatives were identified, including:

- Educate agricultural landowners about riparian buffers.
- Educate residential landowners about limiting clearing and encroachment around streams.
- Work with developers to preserve critical headwater streams and contiguous forest resources.
- Contact six specific property owners to encourage protection of water resources.

Restoration

- Perform eleven specific restoration projects, including streambank stabilization, streambank fencing, streamside forestation, installation of a fish ladder, and possible dam removal.

North Fork Upper Direct Drainage

Introduction

North Fork Upper Direct Drainage is located in the northwest corner of the Goose Creek Watershed in Loudoun County and receives drainage from the North Fork 102 watershed. The town of Purcellville lies to the north and east of this subwatershed. North Fork Upper Direct Drainage was categorized as “Rural Impacted” during the in-office vulnerability analysis. Because of future residential growth, it is predicted to shift into the “Urban Impacted” (11-25% impervious cover) category. Over 25% of the watershed has already been subdivided, and 30% of the subwatershed is within the town of Purcellville or the Purcellville Joint Land Management Area. Some of the rural impacts include its designation as an impaired water, its discharge into an adjacent impaired water, high septic and horse densities, its designation as a non-point source pollution area, and “fair” to “poor” Index of Biotic Integrity (IBI) scores. The stream assessment revealed that the North Fork Upper Direct Drainage has the highest percentage of inadequate buffer, cattle/horse access, and stream erosion of the three subwatersheds studied.

<i>Area</i>	5,623 acres	<i>Perennial stream miles</i>	16.3 (13.6 assessed)
<i>Number of catchments</i>	5	<i>Stream habitat quality</i>	6 good, 2 fair, 2 poor
<i>Classification</i>	Rural impacted	<i>Inadequate buffer</i>	42%
<i>Future classification</i>	Urban impacted	<i>Cattle/horse access</i>	20%
<i>Current impervious cover</i>	7%	<i>Stream erosion</i>	7%
<i>Future impervious cover</i>	11%	<i>Contiguous forest</i>	none
<i>Conservation easements</i>	443 acres (8%)		
<i>Estimated forest cover</i>	1,208 acres (21%)		

Subwatershed Objectives

1. Achieve forested buffer along 80% of the stream length assessed.
2. Achieve “good” habitat quality at all of the sites analyzed.
3. Reduce the amount of eroded and degraded streams.
4. Reduce pollutant loads from areas with potentially high pollutant concentrations.
5. Achieve direct involvement and stewardship by watershed residents.
6. Minimize the stream degradation typically associated with new development.

Recommendations

Conservation

- Work with developers to minimize impacts to streams.
- Promote conservation easements on larger parcels.
- Promote better site design guidelines.

Education/Outreach

Six targeted outreach initiatives were identified, including:

- Educate agricultural landowners about riparian buffers.
- Educate residential landowners about limiting clearing and encroachment around streams.
- Contact four specific property owners to encourage better protection of water resources.

Restoration

- Perform eleven specific restoration projects, including streamside forestation and livestock management, stream daylighting, in-stream stormwater retrofit, and streambank stabilization.