

Conservation Currents

Northern Virginia Soil & Water Conservation District
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Enjoying and Restoring Our Streams

Stream Restoration and Fairfax County Watershed Management Plans

by Adele Kuo

Our neighborhood streams and creeks draw people of all ages, especially our children, to play at the water's edge. Exploring a small stream stimulates all the senses: it provides the delightful burbling of water trickling over stones, small pools that twinkle with reflected light, and the melodic chorus of the aquatic life. There are mosaics of natural outcroppings of stones and plants, fresh air mixed with wholesome earthiness, and cooler waters that soothe bare feet. Aquatic vegetation creates hiding places where small critters can be discovered going about their daily activities. Healthy streams provide the priceless simple pleasures of exploring nature and deciphering the surrounding natural environment, even in the midst of our increasingly built-up world.

Across Fairfax County, a pleasant stroll through a typical suburban community passes sidewalks, streets, homes, and well-kept lawns. Though it may not seem so, our neighborhoods are directly connected to those stream ecosystems. The storm drain network, the traditional way of handling rainfall, sends runoff directly to the streams through concrete channels and pipes. This prevents street flooding, but has environmental consequences. In natural systems rain soaks into the soil, recharging groundwater, but when rain falls on impervious surfaces like roads, rooftops, and parking lots, it all turns into runoff.

As a result, when it rains, runoff from the storm drain system overwhelms our streams. The runoff carries eroded soil particles, yard debris, trash, oil, and harmful nutrients and chemicals from lawn care. Water temperature fluctuations impact the ability of



Credit: Christian of "Wandering thru"

Children play in a stream.

Don't Forget: Always wash your hands afterwards; stream water is not drinking water!

fish, amphibians, and insects to survive or reproduce. The increased quantity of water flow causes stream bank erosion and other physical changes. Our urban streams suffer from runoff pollution, erosion, and degradation.

Many residents have witnessed these events occurring in the streams that pass through their backyards and neighborhoods. Virtually everyone living in Fairfax County lives within a half-mile of a stream or creek, and all Fairfax County streams eventually flow into the Potomac River, Chesapeake Bay, and Atlantic Ocean. What happens in your yard and neighborhood, or on any parcel of land, affects the water quality downstream, which in turn affects us all. Habitat is damaged,

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Sunshire Stables, A Clean Water Farm

by Willie Woode, Senior Conservation Specialist

The Northern Virginia Soil and Water Conservation District was pleased to present the 2010 Clean Water Farm Award to Mr. & Mrs. Dean Merrill. The Merrills own and manage an 11-acre 6-horse boarding and riding operation called Sunshire Stables. Their farm is located in the Occoquan River and Reservoir watershed; Sandy Run and a tributary flow through their property, and a farm pond exists on site. Approximately 85% of the property is within Fairfax County's delineated Chesapeake Bay Resource Protection Area (RPA).

Mr. & Mrs. Merrill, being fully aware of the degree of environmental sensitivity that comes with their property, have consistently worked with NVSWCD to do all they can to minimize non-point source pollution contribution from their stable operation. Their cooperation with the district dates back over a decade, and Dean and Debra have always been willing to do the right thing!

They face challenges typical of most horse operations in suburban communities, where large animals are kept on relatively small properties. Their roadmap to success is a Soil and Water Quality Conservation Plan prepared by the district. As a result, they have managed their operation in an exemplary manner.

Manure management: In 2007, at the advice of the district staff, the Merrills made a big move



Dean and Debra Merrill receive the 2010 Clean Water Farm Award from Board Chair Jean Packard

and decided to improve their stable waste management practice. They relocated their permanent manure stacking area - which was closer to their barn but within the RPA - to a more remote area outside the RPA to protect water quality. To help them accomplish this major change, they participated in the VA State Agricultural Best Management Cost Share Program. A four-cell composting facility with a roof and impervious base was constructed. Their stable waste is now successfully composted and incorporated into their nutrient management.

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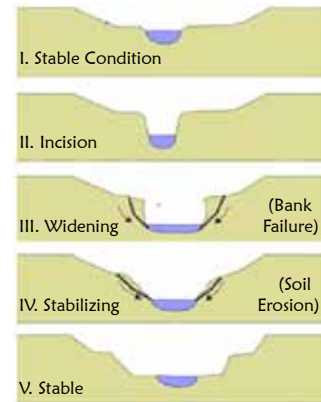
Stream Restoration continued from page 1

What is Stream Restoration?

Stream restoration can take on many forms, and is one of many new technologies and creative planning tools that can be used to protect watersheds. Restoration may include practices such as replanting native vegetation along stream banks, fencing out livestock from the stream channel, or reshaping the channel to create a stable stream using natural channel design.

Natural channel design seeks to restore the disturbed stream to emulate the natural stable channel. Stream bank erosion is a natural process, but can be accelerated by human impacts. When we build roads, buildings, and parking lots, we increase impervious surfaces, and more runoff rushes to streams when it rains instead of soaking into the land. Stream banks are eroded and channels are deepened and widened. Tree roots are exposed and the incising stream channel becomes disconnected from its floodplains. Stream buffer zones are impacted, trees fall and die, and without them soil is left to erode away. Over time, a new deeper and wider channel will form, and the stream vegetation will recover, but not before rain carries away huge amounts of sediment.

A stream restoration that uses natural channel design will imitate nature while preventing soil erosion. The incised stream channel cross section is regraded to a more gentle angle to accommodate plantings, improve bank stability and reconnect a stream to its floodplain. Because redesigning streams often removes trees along the stream edge in order to accommodate the wider channel, stream restoration can sometimes cause controversy. Unfortunately, if the stream is left to restabilize on its own in response to increased runoff flow, the trees will come down regardless, but with much more soil erosion damage to the watershed. Although natural channel design projects can be expensive, conventional approaches of armoring banks with rock rip-rap, berming and concrete channelization can be many times more expensive and negatively impact aquatic habitat and the downstream channel.



Stream channel evolution in response to increased runoff

recreational and aesthetic value is diminished, and more resources are needed to treat drinking water.

In 2003, Fairfax County embarked upon a long-term project to develop comprehensive Watershed Management Plans for each of the county's watersheds. Over one million people live in the county's 400 square miles. This area is drained by 30 major watersheds – such as Accotink Creek, Difficult Run and Bull Run, to name just a few. The 30 watersheds contain 980 miles of streams that are as diverse as the communities that inhabit them, yet they all drain to the Potomac River and Chesapeake Bay. No matter where you live, work or play, you are connected to everyone else through your watershed.

The Fairfax County Watershed Management Plans will serve as tools to identify and address the issues affecting our environment and to manage the protection, conservation, and restoration of the county's stream corridors, wetlands, and other water resources. As of February 2011, all

the Watershed Management Plans have been approved by the Board of Supervisors. The plans are facilitated by the Stormwater Planning Division of the Fairfax County Department of Public Works and Environmental Services (DPWES).

As part of the Watershed Management Plan process, a small tributary of Big Rocky Run was targeted for stream restoration. A successful stream restoration attempts to find a stable equilibrium between the stream's ecological functions and the urbanized landscape that surrounds it. (Read more about stream restoration in the box above and follow the process in photos on page 8.) The primary goals of the project included stabilizing eroding stream banks and re-establishing a vegetated buffer to improve the stormwater drainage from a subdivision across a wide, busy road. To view the Watershed Management Plans that include streams near you or to learn more about your watershed, visit www.fairfaxcounty.gov/dpwes/watersheds/.

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Get Out, Get Wild (Flower)

by Lark Wells

Looking forward to spring? Ready to open the windows for some fresh air and take a walk or bike ride on your favorite local trail? While you're out, take a look at the splashes of color by the trailside and see if you recognize any of the early wildflowers. These spring ephemerals only bloom for a short time every spring. Here are three varieties native to Virginia to watch for on your next excursion.

Spring beauties. These small flowers with five pink or white petals are an important source of nectar for pollinators in the spring. Each individual flower only blooms for a specific number of days, but some species bloom as early as February and others as late as May. Because of the wide range in its blooming schedule, spring beauties are very popular with pollinators including Mason bees and other spring insects.

Historically, Native Americans across the East coast once used this plant as an early food source after harsh winters. The tubers were considered a delicacy and contributed to this plant's nickname—fairy-spud.

Yellow trout lilies. These abundant flowers grow in colonies (some are said to be centuries old!) and form an ephemeral groundcover. Very few yellow trout lily plants in a colony actually produce the yellow speckled flowers for which the plant is named. Whether a particular plant will flower or not is something of a mystery, but it is likely a combination of plant age and health, as well as whether the plant is touching a hard surface or rock underground. It is thought that these plants take four or more years to store up enough energy to bloom!

The yellow trout lily has had a variety of ethnobotanical uses: treating skin diseases caused by tuberculosis, brewing a tea to get rid of hiccups, remedies for ulcers, tumors, and stomach ailments, as well as a fever reducer. The Cherokee would also use it in a ritual to help them catch fish, chewing on it and then spitting it in the water. Iroquois tribes would use the plant as



Yellow Trout Lily. Credit: Dirck Harris

For color photos, see www.fairfaxcounty.gov/nvswcd

a contraceptive as well as a skin treatment. This plant even had a use in Roman times—to cure soldiers' sore feet!

Bloodroot. An interesting spring ephemeral that people often miss, the bloodroot only flowers for a couple days. Once the eight to twelve white petals fall off, the fan-shaped leaf that once coiled around the stem is left over and lives through the summer. The bloodroot's name is particularly revealing since both the plant's root and its sap are red—and toxic. Native Americans would cover themselves with the poisonous sap as an insect repellent and sunscreen. However, the sap dyed the skin of those who used it and may have contributed to the creation of the term "redskin."

While these plants have a history of helping humans, many plants and animals have evolved to help each other, too. Like almost a third of spring ephemerals, bloodroot and yellow trout lilies recruit ants to help spread their seeds. They

Spring Ephemerals continued on page 6

Oh, Deer.

What's the Matter with Deer?

They chomp up our flowers and make us nervous when driving on forested streets at night. Even so, what's the big fuss about a few deer? Can't we coexist with these graceful creatures?

The problem is that there are more than just a few deer out there. Even nature lovers may not be aware that deer are currently a huge threat to the biodiversity of our forests. Deer populations across the east coast have exploded, far surpassing sustainable numbers. Ecosystems are thrown out of balance, and all other wildlife and plant communities living in our forests have been negatively impacted.

As huge numbers of deer eat their way through the forests, native plants disappear from the landscape. Urban Forester Jim McGlone explains, "The forests in Northern Virginia look like they have been mowed. Most of them have been overbrowsed so long they no longer show a browse line; the shrub layer that would normally show where deer are browsing is gone and along with it the nesting habitat for three-fourths of our bird species."

Biodiversity is crucial for ecosystem resilience, healthy populations, and fewer extinctions. Strong plant populations lead to bug biodiversity, bird, frog and toad health, and healthy ecosystems. Migrating birds rely on nutritious native plants and insects to help them live through their long, arduous travels. Native spring wildflowers such as the yellow trout lily pictured at left are vulnerable as well.

We host many beautiful creatures just outside our doors. In order to live among them, we will need to help keep the system in balance. That means participating in invasive plant removals and putting deer-resistant, wildlife-friendly plants in our gardens (see page 7). That means supporting science-based deer management efforts. That means valuing all the creatures who live around us.

Current levels of deer overpopulation are threatening other wildlife's ability to simply survive. While it may be striking to see deer in the forest, we must also know that there are just too many of them. ♣

Humans and Deer, A Historical Perspective

**Charles Smith, Senior Natural Resource Specialist
Fairfax County Park Authority**

The foundation for the issue of deer overpopulation lies with humans. We completely altered the landscape and removed deer and their predators by about 1900. Native plant communities, particularly forests, began significant regeneration from the late 1800s through the mid-20th century as people moved away from agriculture, timber harvests had declined due to severe overharvesting, and there were few invasive plant species and no large herbivores to disrupt native plant life cycles.

Beginning in the mid-20th century, there was widespread development in urban areas, agriculture switched to use of heavy machinery and chemical applications, non-native invasive plant species were being introduced on a large scale, and white-tailed deer were reintroduced for hunting.

The growing human population coupled with the use of machinery and chemicals resulted in massive fragmentation of the landscape; poisoning of air, water and soils; and overall species decline. The non-native invasive plant species benefited greatly from the large scale disturbance of vegetation and soils.

White-tailed deer thrived in the fragmented landscape which greatly increased their preferred habitat: edge habitat, where there is abundant sunlight close to the ground providing large amounts of broad-leaved plant forage. In addition to the expansion of preferred edge habitat with native plant species, human development offered nutritious crops in agricultural areas and fertilized grass and ornamental plants in suburban areas.

With high reproductive rates, lots of available habitat and food, and low hunting pressure, white-tailed deer populations began to explode by the 1980s, fueling current overpopulation levels.

As white-tailed deer populations increase, they have a devastating effect on native flora, particularly in forest communities. First, native species on the forest floor begin to decline. Then the deer eat all of the shrubs, acorns and hickory nuts, and the tree seedlings. The forest floor and understory are stripped bare and non-native invasive species move in, resulting in a low diversity landscape with dozens of fewer species overall.

Clean Farm continued from page 2

Sound pasture management: The Merrills have improved their pasture management with a rotational grazing program. The horses are divided into groups, rotated through the fields and allowed to graze just long enough to prevent overgrazing.

The horses are kept off the pasture on wet weather days to protect the soil from over-compaction and the grass from being dug up by the hooves of the animals. They are also kept off the grazing areas during drought conditions to reduce stress on the grasses. By maintaining a good stand of grass year-round, pasture erosion is kept to a minimum and water quality is protected.

Fences and Vegetation: The Merrills use fences around the pond and along stream buffer areas to keep the horses from having direct access to the open water bodies. Also, saved trees and shrubs within the fenced-off areas of the pond and streams provide a good buffer zone that functions to extract pollutants from runoff through vegetative absorption and soil infiltration.

Nutrient management practices: The Merrills take great pride in implementing their water-friendly nutrient management plan. Composted waste is spread over their fields at recommended times, which contributes slow-release nitrogen and residual phosphorus and potassium. Composting waste at high temperatures also kills weed seeds and harmful bacteria or pathogens.

The compost makes considerable improvement to the tilth of the soil, retains moisture, and encourages the existence of other much needed micro-organisms. All of this makes for increased grass growth, which in turn protects soil from erosion.

Integrated Pest Management: By establishing a threshold of pest tolerance and by responding early to pest emergence, pesticide use has been

kept to a minimum. This reduces the potential for excess pesticides that may degrade water quality and adversely impact other organisms.

Wildlife habitat: Bushes, small densely vegetated patches and wooded areas have been saved to provide shelter and food for a variety of wildlife such as birds, foxes and deer, evidence of which are clearly seen on the property.

Community contribution: The Merrills have conducted a number of educational tours of their operation for the public and conservation professionals. Dean Merrill has also graciously agreed to speak at an upcoming seminar (see below).

Clean Farm Award: We congratulate Dean and Debra Merrill on their outstanding horse farm management and their dedication to protecting water quality. ♦

***** Now Announcing *****

Horse Farm Management Seminar

We invite you to attend the fourth seminar in this popular series on horse farm management, focusing on Sacrifice (Heavy Use) Areas: Location, Design and Construction. Special guest speakers will include Dean Merrill of Sunshire Stables. Stay tuned for more information! Co-sponsored by Sarah Kirk of Great Falls Saddlery.

Date: Tuesday, April 5, 2011

Time: 7:00 – 9:00 p.m.

Location: Great Falls Library at 9803 Georgetown Pike, Great Falls, VA 22066

For more details

visit www.fairfaxcounty.gov/nvswcd or contact Willie Woode at 703-324-1430, TTY 711, or Willie.Woode@fairfaxcounty.gov

Spring Ephemerals continued from page 4

grow a fatty, protien-filled elaiosome on the seed coat to attract ants. Ants will take the elaiosome treat and discard the seed in an area rich with nutrients that help the seed grow. This mutualistic relationship that spring ephemeral plants have with ants is called myrmecochory.

Now that you know how to treat sore feet, fevers, ulcers, and skin diseases (although we don't actually recommend you try these remedies

at home!), you have another great excuse to get out into spring sunshine and explore! ♦

(Many wildflower walks will be held this spring in Northern Virginia. For events and more pictures of spring ephemerals, see this article online at www.fairfaxcounty.gov/nvswcd.)

Lark Wells enjoys riding her bike, studying natural resources management, and would love to know how to do both at the same time.

2011 Native Tree & Shrub Seedling Sale

This year's shrub and small tree package features deer resistance. (Note: These plants are among the least palatable to them, but a hungry deer will eat almost anything!) The tree package includes species ideal for both common areas and individual yards. Trees and shrubs help cleanse water, prevent soil erosion, provide habitat, and clean our air.

Two Packages, Back By Popular Demand! Order now!

Deer Resistant Package, \$15.95
10 Bare-root Shrubs & Small Trees

- 2 Spicebush (*Lindera benzoin*) leaves have a spicy, peppery smell when crushed. Spicebush prefers moist to wet, part sun to shade conditions. Yellow flowers emerge in early spring. 6-12 feet tall.
- 2 Silky Dogwood (*Cornus amomum*). This shrub's blue berries have high wildlife value. Prefers well-drained, moist soil and sunny or part-sun conditions. Good for streambanks. Fast-growing, 6-10 feet tall.
- 2 Red Osier Dogwood (*Cornus sericea*) features multi-stemmed striking red branches and twigs, white berries and flowers, and red or purple fall leaves. This deciduous shrub grows best in full sun to part shade and in moist soil, 6-10 feet tall.
- 2 Serviceberry's (*Amelanchier canadensis*) attractive white flowers are among the first to bloom in early spring. Berry-like summer fruits provide songbirds food. Moist to wet and sun to part-shade conditions. Height 25 to 30 feet, fast-growing shrubby structure.
- 2 Pawpaw (*Asimina triloba*). This small tree has long, broad leaves and the largest fruit native to our continent. It grows best in moist, well-drained areas in part shade. The pawpaw usually reaches 12-20 feet in height. It can form stands from root suckers.

6 Bare-root Trees for \$10.95

- 2 Sycamore (*Platanus occidentalis*). A stately sun-loving tree. The outer bark peels away to create a unique mottled patchwork of tans, whites, grays, greens and sometimes yellows. The feathery seed nutlets provide food for songbirds. Fast-growing.
- 2 American Hornbeam (*Carpinus caroliniana*). This small to medium understory tree is also known as Musclewood because of its sinewy bark. Best in moist soil, but is tolerant of dry sites. Attracts birds and butterflies. Slow-growing, shade-tolerant.
- 2 Black Oak (*Quercus velutina*). A majestic shade tree that is able to thrive in poor or disturbed soils. The plentiful acorns provide a valuable food source for wildlife. Fall foliage consists of vivid yellows, oranges, and reds. Often found on dry upland ridges.

To see images of this year's plants, visit www.fairfaxcounty.gov/nvswcd/seedlingsale.htm

A full, nonrefundable payment must accompany your order by **Monday, April 11, 2011**, or until supplies run out. You will receive a confirmation receipt and a map to the pickup site (in Fairfax County, off of Braddock Road, two miles outside the Beltway). Orders may be picked up on **Friday, April 15, 9:00 a.m.-4:00 p.m., or Saturday, April 16, 9:00 a.m.-noon.**

2011 Seedling Order Form

Name: _____

Address: _____

City/State/Zip: _____

Daytime Phone: _____ Fax (if available): _____

E-mail: _____

Where did you hear/read about our seedling sale? _____

_____ Tree Package(s) @ \$10.95 each _____ Deer Resistant Shrub & Small Tree Package(s) @ \$15.95 each

Total \$ _____ (Sales tax is included in all listed prices)

**Make your check payable to NVSWCD and mail to:
NVSWCD Seedling Sale
12055 Government Center Pkwy,
Suite 905
Fairfax, VA 22035**

Stream Restoration continued from page 3

Over the last decades, the way rainwater is handled has changed. As the Watershed Management Plans emerge and begin to be implemented in Fairfax County, the health, safety, and function of our watersheds will continue to play a larger role in the way we plan and manage our surroundings. We find that stormwater can behave naturally despite imperviousness and other challenges, and that stream restoration projects

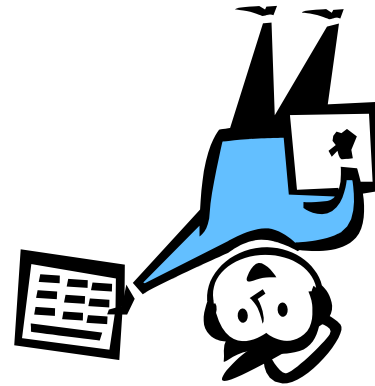
celebrate the rebuilding of a stream to a more stable condition. Improving the overall health and ecological character of streams in the midst of suburban Fairfax County invites residents of all ages to amble down to the water's edge and enjoy their alluring qualities. ♣

Adele Kuo is a graduate student at George Washington University pursuing a degree in Sustainable Landscape Design.



Stream Restoration on Tributary of Big Rocky Run: Before, During and Right After; Stormwater Planning Division, Fairfax County
View color photos at: www.fairfaxcounty.gov/nvswcd/newsletter.htm

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