UPCOMING EVENTS

OCT. 22 - Annual General Meeting
Woodloch Springs Clubhouse, 10am-12pm

OCT. 28 - Star Watch
Bethel, NY, 7:30pm-9:30pm

DEC. 3 - Eagle Watch Volunteer Training
Lackawaxen, PA, 9am-1pm

JAN. 7 - Eagle Day
Hawley, PA, 1pm-4pm

JAN 14 - Eagle Watch Bus Tour
Lackawaxen, PA, 10am-1pm

JAN. 28 - Eagle Watch Bus Tour
Lackawaxen, PA, 10am-1pm

Visit www.DelawareHighlands.org, email info@delawarehighlands.org, or call 570-226-3164/845-583-1010 for more information on these events and others, and to register.

DELAWARE HIGHLANDS CONSERVANCY
serving New York and Pennsylvania
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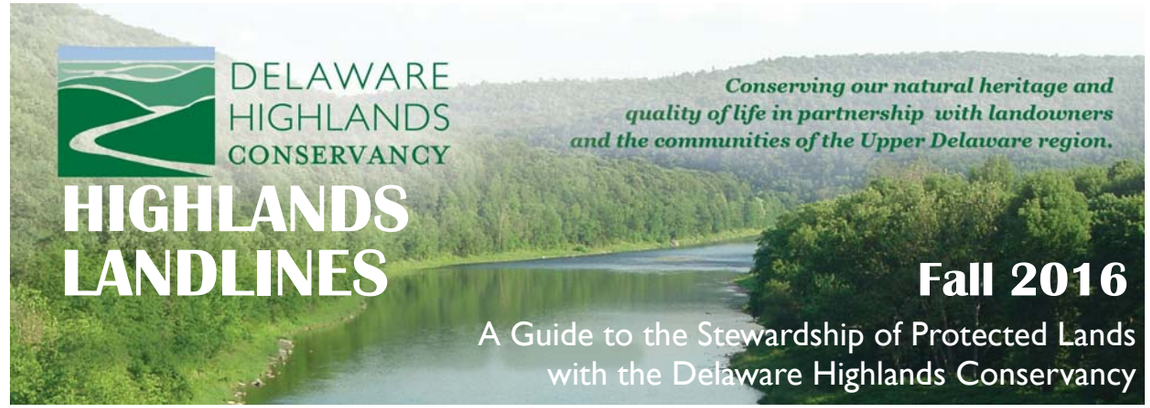

Riparian Buffer Management

Well-managed riparian buffers are areas of trees and shrubs located adjacent to streams, lakes, ponds, and wetlands. These buffer areas provide an extremely important and widely diverse array of benefits to the environment. Certain species established or managed in riparian forest buffers can also provide timber, wood fiber, and horticultural products.

The streamside forest functions as a **FILTER** by removing sediment and other suspended solids from surface runoff. Sediment is probably the most common and most easily recognized of the non-point source pollutants. Sediment suspended in the water can reduce or block the penetration of sunlight, adversely affecting the growth and reproduction of beneficial aquatic plants. When deposited on the stream bottom it can interfere with the feeding and reproduction of bottom dwelling fish and aquatic insects, weakening the food chain. Large deposits of sediment can overfill stream channels and floodplains, greatly increasing the potential for flooding.

Phosphorus is the nutrient which has the greatest negative impact on our waterways. Fortunately, its impacts can be significantly reduced by the filtering action of the streamside forest. The great majority of available phosphorus is bound to soil particles in the riparian zone. Vegetation in the riparian buffer removes about 80% of phosphorus from surface runoff water as it filters this sediment.

The streamside forest functions as a **TRANSFORMER** when chemical and biological processes occurring within it change the chemical composition of compounds. For example, under well oxygenated soil conditions, bacteria and fungi in the streamside forest convert nitrogen in runoff and decaying organic debris into mineral forms. When soil moisture is high enough to create anaerobic conditions in the litter and surface soil layers, denitrifying bacteria convert dissolved nitrogen into various nitrogen gasses, returning it to the atmosphere.

Studies have shown that the amount of nitrogen in runoff and shallow groundwater can be reduced by as much as 80% after passing through a streamside forest.

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The Delaware Highlands Conservancy is a land trust dedicated to conserving our natural heritage and quality of life in partnership with landowners and the communities of the Upper Delaware River region.

t: 570-226-3164
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www.DelawareHighlands.org

Highlands Landlines is a semi-annual newsletter created by the Conservancy for landowners who have a conservation easement with the Conservancy. This publication is also available electronically.

What is Highlands LandLines?

You probably already receive the Delaware Highlands Conservancy's biannual newsletter, *Highlands Journal.* Our newsletter is distributed to all of our landowners, members, and other like-minded folks who are interested in the Conservancy's activities, accomplishments, and conservation goals.

This publication, *Highlands LandLines*, comes to you twice a year and is dedicated to landowners. *LandLines* provides you, the landowner, with useful information and tips for the stewardship of your land and conservation easement.

Participate in LandLines!

We are interested in your ideas for future articles and features, or your comments on the publication in general.

We'd love to know what you think!

DELAWARE HIGHLANDS CONSERVANCY

ACCREDITED LAND TRUST ACCREDITATION COMMISSION

Website for Women Forest Landowners

www.WomenOwningWoodlands.net strives to bring topical, accessible, and current forestry information to women woodland owners and forest practitioners through news articles, blogs, events, resources, and personal stories. We support women in forest leadership, women who manage their own woodlands, and all who facilitate the stewardship of forests.

(Continued from page 5) were relatively untouched by the fire, the smaller outflows were more vulnerable, especially in areas of extremely shallow soil. However, the wet areas that were burned along High Point Carriage Road and some other narrow strips of wetland have begun exhibiting their wetland qualities once again. Sphagnum moss, a characteristic moss genus found in bogs, has returned in some of these areas, while tiny sundews can be seen on both the newly grown moss and the saturated but still blackened soil.

Animal activity was apparent almost immediately. The prairie warblers' ascending trill could be heard throughout the spring in all areas of the preserve. Insect and pollinator activity has been high, especially with the return and subsequent blooms of milkweeds and meadowsweet. Park staff also noticed a number of ruffed grouse, which like forest openings. The remains of chewed up pine cones littering the forest floor are evidence of red squirrels. Eastern towhee activity was also high in the period immediately after the fire. Towhees are a species of bird that feed on pitch pine seeds as they are released from their cones. Amphibians could be spotted burrowing into the moist ground in order to keep cool.

During a fire and the initial period afterward, it is easy to focus on the destruction and negative impacts. However, it's important to remember that fire is a vital ecological process in many environments, especially for the health and longevity of pine barren communities. The Sam's Point Fire offers great opportunities for discovery.

Reprinted and edited for length from Nature Times, August 2, 2016, https://nysparksnaturetimes.com/2016/08/02/rebirth-after-fire/

Useful App for Landowners

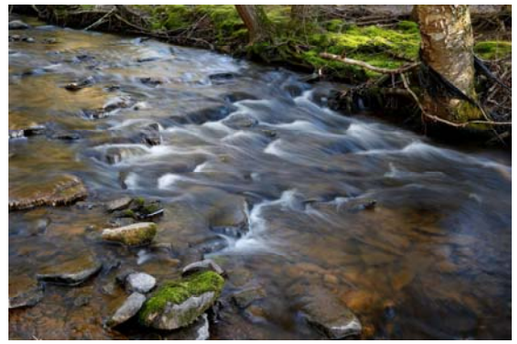
If you want to get to know your property a bit better, you might want to give the app GPS MotionX a try. It can be purchased through the App Store ($0.99 for iPhone, $1.99 for iPad) and will allow you to view aerial and topographic (contours and relief) maps of your property.

The Conservancy can provide the .gpx file for your property boundary, which you can load into the app and use to walk your boundary. You can track your route, create waypoints if you want to indicate something important or memorable (and even snap a photo), and share the tracks you took. It also works just like a GPS—it can navigate you to a point or along a previously recorded track.

If you would like to receive your property boundary to use with the app, email Mary Anne at steward@DelawareHighlands.org

(Continued from page 1)

Toxic chemicals such as pesticides are also transformed to non-toxic forms. Applied pesticides seldom move far off-site. Those picked up by runoff, are converted to non-toxic compounds by microbial decomposition, oxidation, reduction, hydrolysis, solar radiation and other biodegrading forces at work in the soil and litter of the streamside forest.



The streamside forest can function as a **SINK** when nutrients are taken up by plants and sequestered in plant tissue. Some estimates indicate that 25% of the nitrogen removed by the streamside forest is assimilated in tree growth which may be stored for extended periods of time in woody tissue and possibly removed as logs or other forest products.

The streamside forest functions as a **SOURCE** when it provides energy to streams in the form of dissolved carbon compounds and particulate organic detritus. These materials are critical to processes within the stream itself, helping to restore and maintain nature's equilibrium. In small, well shaded upland streams, as much as 75% of the organic food base may be supplied by dissolved organic compounds or detritus such as fruit, limbs, leaves and insects that fall from the forest canopy. Benthic detritivores, the stream bottom bacteria, fungi and invertebrates that feed on the detritus, form the basis of the aquatic food chain. They pass on this energy when they are consumed in turn by larger benthic fauna and eventually by fish. Thus the streamside forest functions as an important energy source for the entire aquatic food chain from headwaters to estuary.

Plant establishment is an important part of most riparian buffer restoration initiatives. Detailed standards and specifications that describe planting techniques and establishment procedures should be developed with the help of a local expert. Native species should be used where possible to achieve the restoration goals. Vegetation can be established by seeding; planting vegetative cuttings; or using nursery-grown bare-rooted, potted, and burlap-wrapped specimens.

Source: You and Your Forest: Letter 3, CORNELL COOPERATIVE EXTENSION OF COLUMBIA AND GREENE COUNTIES AGROFORESTRY RESOURCE CENTER & THE WATERSHED FORESTRY PROGRAM OF THE WATERSHED AGRICULTURAL COUNCIL.

Discover Activities to Care For and Enjoy Your Woods

Visit www.MyWoodlot.com for outdoor activity ideas, advice on landownership, and opportunities to connect with other landowners through discussion forums. You'll find extensive resources on woodlands from both landowners and professionals, and the site developers have given them context through projects landowners like you can actually do.

All the resources on MyWoodlot are available for free.

Invasive Species Corner

Mile-a-Minute *(Persicaria perfoliata)*

Mile-a-minute weed, also called Asiatic tearthumb, is fast-growing invasive plant that can quickly smother other native plants and even ascend into the tree canopy where it becomes very dense. As it grows, it forms thick mats that damage native plants and prevent sunlight from reaching them.

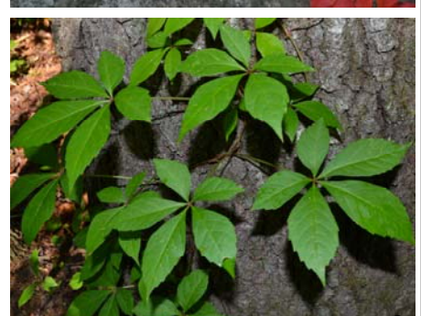
To identify it, look for a vine with alternate, triangular, light green leaves that are barbed on the underside, with round leaf-like structures surrounding the stem. Mile-a-minute often colonizes disturbed and open areas, such as along the edges of woods, streams, wetlands, field, and roads.

The plant can be controlled early (before it fruits) by hand-pulling, so landowners throughout the Upper Delaware River region should remain vigilant in identifying and removing mile-a-minute weed on their properties. It is also possible to use herbicide to control mile-a-minute, but it can be very challenging because it is usually growing up and over more desirable vegetation which should not be treated with herbicide.

Source: http://nyis.info/index.php?action=invasive_detail&id=31

Native Species Spotlight

Virginia Creeper *(Parthenocissus quinquefolia)*



Virginia Creeper, also called Victoria creeper, five-leaved ivy, or five-finger, is a flowering vine in the grape family. A deciduous perennial vine with a woody stem, Virginia Creeper blooms in the summer. It is easy to grow and is both fast-growing and hardy, whether in sun or shade, and turns a dark shade of red in the fall.

Virginia Creeper will easily climb structures, reaching as high as 40 feet. The tendrils of the plant have adhesive-like tips that allows it to climb walls without support, and since it doesn't penetrate the wall, it is less likely to cause damage to a building than other types of ivy. It can also be used as a ground cover.

It can be identified easily by its leaves, which typically have five toothed leaflets with a pointed tip radiating from the center, up to 7 inches long.

Source: http://www.wildflower.org/plants/result.php?id_plant=PAQU2

Invasive earthworms threaten growth of new North American trees

by Bob Holmes

An invading horde is spreading across the northern forests of North America, gobbling seeds and altering forest ecosystems as it goes. Who are these marauding horrors? Humble earthworms.

Despite their reputation as a gardener's friend and contributor to soil fertility, these earthworms aren't natives. The native earthworms were wiped out by glaciers during the last ice age, so the northern part of the US and Canada has probably been earthworm free for tens of thousands of years and every earthworm now living there is in fact an invader, usually from Europe.

The worms can cause dramatic changes to ecosystems by altering soils, reducing leaf litter and disrupting microbial interactions, which reduces biodiversity. Now it seems they are also eating plant seeds in the wild, potentially altering the make-up of forest communities.

Ecologists Colin Cassin and Peter Kotanen of the University of Toronto in Mississauga, Canada, caged single earthworms with fine-mesh screen in 54 test plots in a mixed forest in Ontario, then sowed 15 seeds – marked with UV-fluorescent ink – into each plot. Two weeks later, they collected the soil in each plot and searched for seeds.

More than half the seeds of small-seeded species, but less than 15 per cent of those of larger-seeded plants, disappeared in worm cages. Because less than 2 per cent of seeds vanished from control cages that contained no worms, the missing seeds must have been eaten by the worms.

Cassin and Kotanen also used fiberglass-mesh screens to exclude either underground worms or above-ground rodents, or both, from forest plots with a natural store of seeds in the soil. After four weeks, plots with worms but without rodents had lost 47 per cent of their seeds, with small-seeded species again suffering the steepest losses.

"They eat a lot more seeds than we think," says Cassin, now at the Ontario Invasive Plant Council in Canada.

The study shows another way that earthworms can alter forest ecosystems, particularly for small-seeded species such as birch, says Lee Frelich, an ecologist at the University of Minnesota in St Paul.

"We've always blamed lack of birch regeneration on other factors," he says. "Now maybe we need to look at earthworms."

Once earthworms have invaded a habitat, they are almost impossible to eradicate, says Erin Bayne, of the University of Alberta in Canada. Conservationists must instead work to keep worms out of pristine habitats, he says, for example by restricting the use of worms as fishing bait and by controlling accidental transport of contaminated soil.

Journal reference: Biological Invasions, DOI: 10.1007/s10530-016-1101-x Reprinted from https://www.newscientist.com/article/2083338-invasive-earthworms-threaten-growth-of-new-north-american-trees/.

Landowner Perspective

This newsletter is YOUR space!

Share your connections to the land with other LandLines newsletter readers. Send an email to conserve@delawarehighlands.org with your photos, journal entries, drawings, other artwork, or stories, and we'll share it here.

Rebirth After Fire

Article and Photos by Lindsey Feinberg

Located within Minnewaska State Park Preserve is Sam's Point, an area of unique ecological significance encompassing roughly 5,000 acres in the Shawangunk Mountains of southern New York. Toward the end of April, during a particularly dry and windy week, a fire broke out along the Verkeerderkill Falls Trail and engulfed over 2,000 acres of pitch pine and oak woodlands. While this may seem like a devastating event, one of the factors that make the globally rare dwarf pine ridge ecological community of Sam's Point so unique is that it is a fire dependent ecosystem.

Since progressing into the deep summer months, Sam's Point has experienced an explosion of new growth. Toward the end of the fire there was an extended period of cold rainy weather that continued for a week after the fire was out. Soon afterward , bracken fern fiddleheads began springing forth through the burned earth and painted trilliums flowered near the Ice Caves trail in an area of low intensity burn. A number of pink lady slippers also popped up along the Loop Road and the Verkeerderkill Falls Trail.

Sam's Point was fully closed until Memorial Day Weekend, when it was reopened to limited capacity with only the Loop Road and Ice Caves Trail available to the public. Park staff members were positioned at the Verkeerderkill Falls Trail with a table of educational materials in order to encourage park patrons to obey the closures and help them understand the importance of staying out of affected areas. The main concern is the potential for rapid spread of non-native invasive plant species by seeds hitchhiking in the boots and backpacks of visitors. Without competition from established plants and with the increased availability of nutrients that follows fire, invasive species have the potential to quickly establish.

Fortunately, the closures seem to be working and few invasive plants and many native species have been seen in those areas. Blueberries and huckleberries have been quick to return, along with chokeberries, serviceberry, wild raisin and sheep laurel, which have repopulated the understory in a carpet of vibrant green. Rhodora, a small, showy rhododendron that is threatened in New York State, has been proliferating in high numbers in some of the wetter areas of Sam's Point. Even bunchberry, a wildflower more typical of cool, moist woodlands and uncommon in southern New York, is coming back near the Indian Rock Trail.

Many of the pitch pine trees that were blackened and scorched, all of which looked ostensibly dead, have exhibited new growth occurring at the base, epicormically (along the trunk), and from the top of the tree. Walking along the loop road, hints of long bristly shoots resembling bright green porcupines are apparent on a number of blackened trees. The majority of pitch pine stumps that were cut for fire control purposes have also begun re-sprouting.

Sam's Point has a number of unique, highly acidic wetlands too. While the larger pockets

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