

UPCOMING EVENTS

- SEP. 24 - Water 101: Fundamental Water Resource Challenges
Callicoon, NY, 12:30pm-4:30pm
- OCT. 9 - Star Watch
Bethel, NY, 7:30pm-4:30pm
- OCT. 10 - Fall Hike—Tusten Mountain Trail
Tusten, NY, 10am-12pm
- OCT. 17 - Annual General Meeting
Hawley, PA, 10am-12pm
- DEC. 5 - Eagle Watch Volunteer Training
Lackawaxen, PA, 9:00am-11pm
- JAN. 16 - Eagle Bus Tour-First of the Season!
Lackawaxen, PA, 10am-1pm

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

- INSIDE
- Japanese Barberry and Lyme Disease
- Stewardship Resources for Landowners
- Building Resilience
- Native and Invasive Species Corner

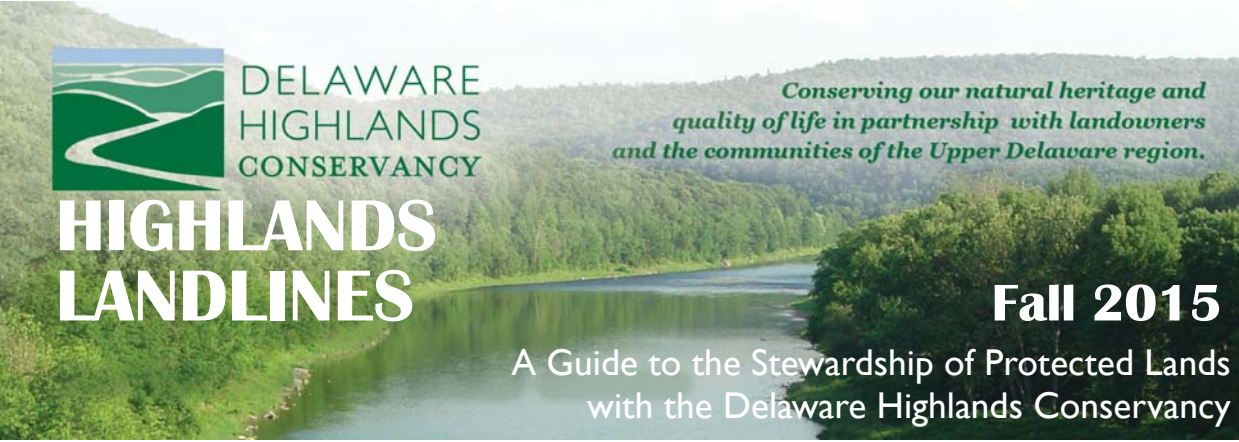


© Roger Gottlieb

Delaware Highlands Conservancy
P.O. Box 218 Hawley, PA 18428-0218

DELaware HIGHLANDS CONSERVANCY

Non-Profit Org.
Hawley, PA
U.S. Postage
PAID
Permit No. 42



DELAWARE
HIGHLANDS
CONSERVANCY
**HIGHLANDS
LANDLINES**

Conserving our natural heritage and
quality of life in partnership with landowners
and the communities of the Upper Delaware region.

Fall 2015

A Guide to the Stewardship of Protected Lands
with the Delaware Highlands Conservancy

More Findings on the Link Between
Japanese Barberry and Lyme Disease

By Debbie Roberts

Recently, I attended a symposium where current research findings on the link between Japanese barberry (*Berberis thunbergii*) and Lyme disease were presented. Over the past few years we've learned that this highly invasive non-native shrub is not only impacting our regional ecosystems, it's also indirectly affecting our public health. While Japanese barberry is considered invasive in at least 20 states and the District of Columbia, it is also still available for sale in many nurseries across the US.

According to recent studies by scientists Jeffrey Ward and Scott Williams at the Connecticut Agriculture and Experiment Station (CAES) **eliminating stands of Japanese barberry from forested areas can reduce the number of Lyme disease-infected ticks on the property by 80%.**

Once established, Japanese barberry tolerates a wide array of site conditions, from full sun to shade and it's not overly picky about soil conditions. It reproduces through seeds, rhizomes or layering and forms dense thickets that choke out native wildflowers and tree saplings.

Berberis thunbergii is a prolific seed producer and its seeds are estimated to have a 90% germination rate. Birds eat the seeds and carry them for a few hundred yards, depositing them in areas where the Japanese barberry can take hold and quickly choke out most other plants.

Ward and Williams' research has shown that **Japanese barberry infested forests have approximately 120 ticks infected with the Lyme disease bacteria per acre. Compare that to approximately 10 infected ticks per acre found in forested areas with native trees and shrubs and no Japanese barberry.**

It seems that stands of Japanese barberry retain humidity. And ticks need an environment with about 80% humidity to



(Continued on page 6)

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.

DIRECTORS

Greg Belcamino
Keith Fitzpatrick
Michael Geitz
Karen Lutz
Jeffery Moore
John Ross
Brenda Ruello
Nicole Slevin
Mary Sue Sweeney Price
Scott VanGorder
Barbara Yeaman

EXECUTIVE DIRECTOR

Sue Currier

LAND PROTECTION

Jennifer Sherwood
Amanda Subjin
Jamie Bartholomew
Carol Smith

OUTREACH

Bethany Keene

ADMINISTRATION

Simon Knox

t: 570-226-3164

t: 845.583.1010

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!



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.

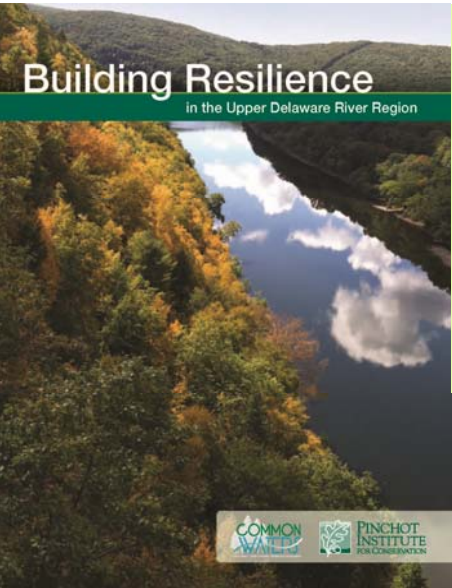
The Delaware River Watershed Initiative

Launched in 2014, the Initiative began with a three-year \$35 million investment from the William Penn Foundation.

The goal is to accelerate conservation in eight "clusters." The Pocono-Kittatinny Cluster is located in our Upper Delaware River region, and encompasses portions of New York's Catskills and Shawangunk Mountains, New Jersey's Kittatinny Ridge, and Pennsylvania's Pocono Mountains.

The funds from this program are helping the Conservancy improve our outreach to the public about the importance of our forests to protecting water quality, to encourage landowners to take action to protect their land, and to work with local government on actions that will safeguard our water resources.

Also, landowners within the Pocono-Kittatinny Cluster may be eligible for funding to protect their lands with a conservation easement. Learn more by contacting Jen Sherwood at protect@delawarehighlands.org, or at 570-226-3164 or 845-583-1010.



Building Resilience in the Upper Delaware River Region

You should have already received your free copy of "Building Resilience," a plan for our region developed by The Common Waters Partnership and Pinchot Institute for Conservation with the input of many local partners.

"Building Resilience," a summary of the regional plan "Adapting to a Changing Climate: Risks and Opportunities for the Upper Delaware River Region," highlights the critical need to build local community resilience against the impacts of climate change, presenting "no regrets" solutions for landowners and communities--they are beneficial regardless of what the future brings, but particularly important in the context of a changing climate.

To learn more or to download a copy of the full climate adaptation plan, visit <http://www.commonwatersfund.org/adaptation-planning>. If you would like additional copies, please contact us at info@delawarehighlands.org.

(Continued from page 1) actively feed, quest and reproduce. By measuring humidity levels above and at ground level under the barberry foliage, Ward and Williams found humidity levels under Japanese barberry dipped below 80% for only one hour per day. In open, sunny areas with no Japanese barberry, the exact opposite is true. The humidity levels rise to 80% for only one hour each day.

White-footed mice, a known apex host for Lyme disease, also thrive under the canopy of Japanese barberry. The combination of mice and a tick population this is active almost all day long appears to be a potent mix that is leading to a public health epidemic in many states. (For more on white-footed mice and tick populations, you may also want to read “The Link Between Lyme Disease and Biodiversity,” at <http://nativeplantwildlifegarden.com/the-link-between-lyme-disease-and-biodiversity/>. As the article explains, “It turns out one of the strongest influencers of mice population is the number of acorns in any given autumn. In years when oak trees, particularly red oaks and black oaks, produce an abundance of acorns, mice populations spike the following spring. This leads to an increase in infected nymphal ticks the following summer. So the risk of Lyme disease is higher two years after a bumper crop of acorns.”)



In addition to creating the ideal environment for ticks, stands of Japanese barberry also tend to increase the levels of nitrogen in the soil. At the same time, the number of earthworms in the nearby soil almost doubles.

In our gardens, earthworms are welcome visitors. But in Japanese barberry infested forests, they are devouring the leaf litter which should act as a protective covering for the soil. Less leaf litter means loose soil, more erosion, less tree regeneration and less wildflowers. Nitrification and low levels of leaf litter also add to storm water runoff, which affects water quality.

The team at CAES worked on 150 acres of land divided into 28 different study areas. They evaluated 56 different treatment and timing combinations for controlling Japanese barberry and found that a fairly simple two-step process is most effective.

First, kill all of the plant that is above ground by cutting it down or applying heat with a propane torch. Next, once the roots begin to push out new growth, treat this growth with heat or a chemical herbicide. If the barberry you’re eliminating is mature, you may need to continue step two a few more times. Ward and Williams also found using a chemical herbicide worked best for controlling plants growing in full sun.

The third step in controlling Japanese barberry is to be ready to re-plant the area with native plants. This is an important step for increasing biodiversity. If you don’t re-plant quickly then it’s quite possible other invasives will move into the area and you will have traded one problem for another. If deer are a problem, plant only deer-resistant natives or fence off the area.

Reprinted and edited for length from Native Plants and Wildlife Gardens; <http://nativeplantwildlifegarden.com/more-findings-on-the-link-between-japanese-barberry-and-lyme-disease/>. Photos copyright Leslie J. Mehrhoff, University of Connecticut.

Invasive Species Corner

Japanese Barberry (*Berberis thunbergii*)

Japanese Barberry is a dense, deciduous shrub introduced from Japan, often used as a hedging plant or barrier. It can invade forests, open woods, and old fields, where it forms dense thickets. It can alter soil pH and nitrogen levels which may increase its competitive advantage. Because it is not palatable to deer, it also increases browse pressure on other plants.

Over 2,000 fruits can be produced on a single plant, which are dispersed by birds and small mammals. In forests invaded by Japanese Barberry, studies have shown that the abundance of Lyme disease-carrying ticks is higher.

In addition, the red barberry frequently sold in nurseries can easily propagate and seed the green barberry that invades forested landscapes.



Native Species Spotlight

Highbush blueberry (*Vaccinium corymbosum*)

An excellent alternative to barberry in landscape plantings, and as an option to re-plant an area once you have removed barberry, Highbush blueberry is a native species that is grown primarily for the edible berries. It makes an excellent landscape plant in the right conditions; i.e., acidic soils in full sun to partial shade. A shallow-rooted species, it should be mulched.

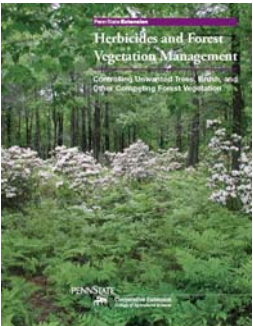
Hardy to zone 3 and slow in growth, the plants develop an upright, spreading form, up to 12’ tall and 6’-8’ wide. This is one of the best plants for wildlife, providing nectar for insects, larval food for butterflies, and fruit for a wide array of mammals—including humans! It has clusters of small, bell-shaped white flowers in the spring and beautiful red and orange fall foliage.

Source: https://extension.unh.edu/resources/files/Resource001358_Rep1815.pdf



Stewardship Resources for Landowners

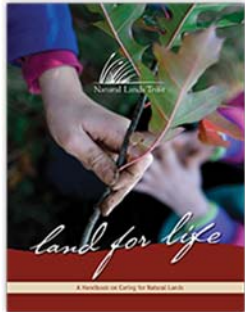
As you search for more in-depth information about managing and stewarding your lands, the following publications may provide guidance in learning more and locating additional helpful resources.



Herbicides and Forest Vegetation Management

From Penn State Cooperative Extension, “Forestry labeled herbicides are a low risk and effective means of controlling undesirable forest vegetation in northern hardwood forestry. They can be used for achieving many objectives including: establishing desirable regeneration, increasing tree growth and timber production, creating and enhancing wildlife habitat, and controlling non-native/invasive plants.”

Download from Penn State Cooperative Extension at <http://extension.psu.edu/publications/uh174>



Land for Life — A Handbook on Caring for Natural Lands

From our partners at Natural Lands Trust, “is a comprehensive resource drawn from Natural Lands Trust’s decades of experience in managing natural resources in southeastern Pennsylvania. Chapters cover major stewardship issues, preparing a stewardship plan, managing deer impacts, controlling invasive plants, restoring forests, establishing native meadows and grasslands, and much more.”

Download from <https://natlands.org/services/for-land-owners/stewardship-handbook/>



Early Detection of Invasive Plants—Principles and Practices

Although primarily designed for natural resource managers, this free report from the USGS provides information on detecting and managing invasive species in parks and natural areas. As the report explains, “early detection, along with rapid response, it is a key strategy for successful management of invasive species. Eradication efforts are most successful on small infestations (that is less than 1 hectare) and become less successful as infestation size increases.”

Download from <http://pubs.usgs.gov/sir/2012/5162/>



Landowner Perspective

This newsletter is YOUR space!

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

Annual Property Visits

Once a property is protected with a conservation easement, the Conservancy is responsible for upholding the landowners’ wishes. Annual monitoring visits give us an opportunity to talk with landowners, offer advice, and provide suggestions.

Monitoring these protected properties went smoothly this year, with the help of our dedicated volunteers (and their families)! In addition to visiting the 14,000 acres of conservation easements held by the Conservancy, this year we also partnered with the Open Space Institute to share the responsibilities for monitoring more than 45 of their protected properties. The partnership gives us insight into alternate techniques and systems.

We're also grateful to have received a Stewardship Capacity grant from the Land Trust Alliance* to help us upgrade and improve our monitoring, making things more efficient.

If you are interested in getting outdoors and helping out with monitoring visits next summer, contact Simon at info@delawarehighlands.org or 570-226-3164 ext. 6.

Thank you to all our volunteers for their assistance!

** The Stewardship Capacity Grant project was supported with funding from the New York State Conservation Partnership Program (NYSCPP) and New York's Environmental Protection Fund. The NYSCPP is administered by the Land Trust Alliance, in coordination with the state Department of Environmental Conservation.*



www.lta.org



www.osiny.org



Keep in touch! Find us at <http://www.facebook.com/DelawareHighlandsConservancy>, www.DelawareHighlands.org, and on Twitter [@DHConservancy](https://twitter.com/DHConservancy).

