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Hemlock Woolly Adelgid
 Credit: Nicholas A. Tonelli

Spring / Summer 2019

Providing Insight into the Benefits and Uses of the Pennsylvania iMapInvasives Database

Tracking Invasive Species with Pennsylvania iMapInvasives

Park Stewards Battle Invasives in Allegheny County

A brand new program in Allegheny County’s North Park inspires locals to become park stewards by raising awareness of the harm caused by invasive species and taking active steps to remove problematic species within the park.

Story written by Joanne Foerster, CountyStat Manager for the Allegheny County Courthouse and [Master Naturalist](#)-in-training

Allegheny County, located in southwestern Pennsylvania and home to the city of Pittsburgh, is also home to a 12,000-acre, largely forested park system. Each of the nine county parks that comprise the system are bordered by suburban cul-de-sacs, shopping centers and business parks developed over the past 50 or more years. Despite adjacent streets named for native flowers and trees (e.g., Chestnut Ridge Road, Azalea Drive, Hemlock Circle), many suburban neighbors—residents and businesses alike—have landscaped their yards with the likes of Japanese barberry and Callery pear trees. Over the years, with a little help from birds, other pollinators and the wind, the spread of these species into the parks is now growing at an alarming rate.



Joanne Foerster

The Western Pennsylvania Conservancy, in its ecological assessment of South Park conducted for the Allegheny County Parks Foundation, states that “the density of exotic shrubs and vines (in South Park) may prevent mature forest cover of any kind from regenerating.” In each of the four assessments performed for the park system to-date, the Conservancy has identified invasive species control as a priority project for the county parks to pursue. It was no surprise that when asked what kind of volunteer project could be helpful to the county parks, the County Parks Director’s immediate response was a stewardship program to help tackle the invasive species problem.



Clay Kusbach, Allegheny County Park Ranger, demonstrates to park stewards how to remove invasive Japanese barberry from a wooded location in North Park.

(Story continued on page 2.)

Park Stewards Battle Invasives in Allegheny County (story cont.) >>>



Volunteer park stewards removing various terrestrial invasive species from North Park.

(Story continued from page 1.)

With some coordinating assistance from a volunteer Pennsylvania Master Naturalist-in-training (the writer of this story), the Allegheny County Park Rangers launched a new Park Steward volunteer program. Training was held at North Park on March 30, teaching a corps of volunteers about the importance of invasive removal, how to identify certain invasives that are common in the county park system, how to lead a team of volunteers, and how to use several different tools for invasive species removal.

The training also included a segment on how to use the iMapInvasives app for those stewards that are interested in participating as citizen scientists.

The day concluded with some practice in the field, identifying and removing invasives from a corner of the park where a young white pine forest has a strong chance of succeeding with a little stewardship assistance.

The formal launch of the Park Steward program on April 27 attracted an energetic and enthusiastic group of 24 volunteers that worked for three hours to assist that same white pine forest. The volunteers hailed from all over Allegheny County and even neighboring Butler County and included a contingent from the local chapter of the Society of Women Environmental Professionals.

The next steps for the new Park Stewards will be for each of them to adopt a section of a county park and volunteer 24 hours each year in stewardship activities.

Anyone interested in learning about the Allegheny County program and future training opportunities can find more information at

[https://
www.alleghenycounty.us/
parks/rangers/park-
stewards-program.aspx](https://www.alleghenycounty.us/parks/rangers/park-stewards-program.aspx).



Allegheny County Park Ranger Sam Shephard provides a safety demonstration to volunteer park stewards in North Park.



Hemlock woolly adelgid (Adelges tsugae)
Credit: USDA Forest Service

Search for Hemlock Woolly Adelgid Yields Significant Results in PA and NY

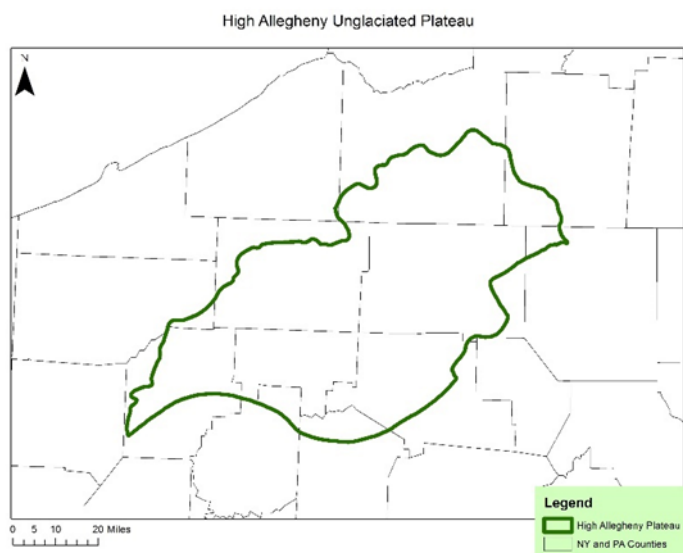
A collaborative group known as the High Allegheny Hemlock Conservation Partnership is spearheading an effort to search for an invasive insect known as Hemlock Woolly Adelgid (HWA). From the group's efforts, thousands of hemlock trees have been checked and many priority stands of hemlocks have undergone treatment to preserve the health of the trees.

Story written by Elyse Henshaw with the [Roger Tory Peterson Institute of Natural History](#)

Beginning in 2012, The Nature Conservancy (TNC) and the U.S. Forest Service (USFS) sought collaboration

across the High Allegheny Unglaciaded Plateau for the purpose of protecting eastern hemlock trees from the impacts of an invasive insect known as Hemlock Woolly Adelgid (HWA). To do this, over 50 landowners, land managers, non-profit organizations, academic institutions, a tribal government, and other interested groups were brought together to form the High Allegheny Hemlock Conservation Partnership (HAHCP).

Through collaborative workshops, the partnership prioritized hemlock stands across state boundaries and ownerships in Pennsylvania and New York. These priority stands, known as Hemlock Conservation Areas (HCAs), were established in order to focus monitoring and treatment efforts across the entire plateau. In addition to establishing HCAs, the partnership worked to form a volunteer monitoring program. Training sessions were offered to the public by TNC and USFS to encourage adoption and annual monitoring of the prioritized sites.



Staff from the Roger Tory Peterson Institute show map of HWA survey area to volunteers.

Since the induction of the project, many volunteers have served as early detection surveyors, reporting any suspicious sightings of HWA on their designated sites. Due to the diligent work of these volunteers, HWA has been identified in a number of areas within the High Allegheny Plateau at low infestation levels. Several HWA positive areas, including sites within the Allegheny State Park and Allegheny National Forest, have been chemically treated. Within neighboring sites, some preventative chemical treatments or preemptive cuttings have occurred in order to prevent further spread of this invasive pest.

In previous years of the program, volunteers were encouraged to report their survey results by emailing

(Story continued on page 4.)

Search for Hemlock Woolly Adelgid in PA and NY (story cont.) >>>

(Story continued from page 3.)

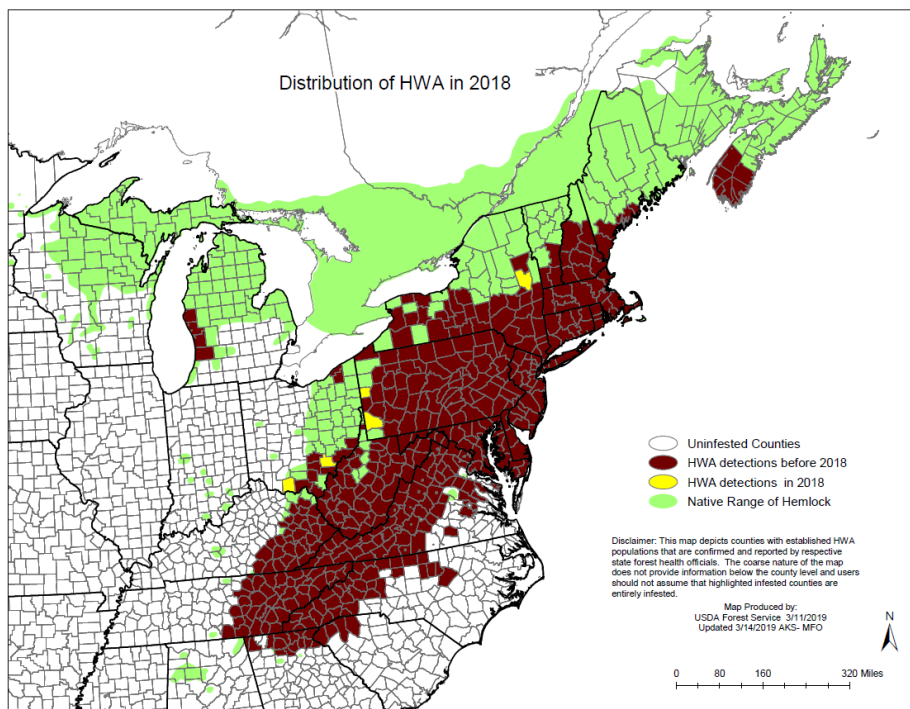
members of the HAHCP. More recently, the iMapInvasives database was introduced to training attendees as an additional method to report survey results. Existing volunteers were also made aware of the database as a reporting method in hopes of better streamlining incoming observation reports in the coming years.

Between 2017-2018, changes occurred within the HAHCP and resulted in a need for additional collaboration. In 2018, the Roger Tory Peterson Institute of Natural History (RTPI) was identified as a new partner for the HAHCP project. RTPI was formally tasked with coordinating the Hemlock Woolly Adelgid Volunteer Monitoring Program, conducting volunteer trainings, developing and producing educational outreach materials, and tracking volunteer activities and monitoring results.

Throughout the 2018-2019 HWA survey season, two formal training sessions were offered to the public, one at the Allegheny National Forest Marienville District Office and the other at the University of Pittsburgh at Bradford campus. Presenters from the PA Department of Conservation & Natural Resources, Penn State Extension, RTPI, and the USFS covered a wide range of topics to the combined 30 attendees. Additionally, several programs and trainings reaching an additional 60 individuals were held including RTPI's annual HWA Citizen Scientist Training where the HAHCP was highlighted as an avenue that volunteers could get involved in HWA monitoring. The HAHCP hosted two HWA survey sessions where the public could join, and provided on-site training. The group also presented to students at Houghton College and surveyed their campus woodlot for HWA. Lastly, the HAHCP provided a brief HWA survey training to Watershed



Roger Tory Peterson Institute of Natural History, located in Jamestown, NY.



Distribution map from 2018 depicting Hemlock woolly adelgid in northeastern United States. Source: USDA Forest Service, 2019.

2,700 reported trees were checked for HWA and more than 100 hours were spent by volunteers. No new HWA infestations were found!

To learn more about the HAHCP or to volunteer your time to assist the partnership, please contact Andrea Hille, Forest Silviculturist with the U.S. Forest Service, at andrea.hille@usda.gov or 814-728-6161.

Snapshot volunteers collecting water samples in the Allegheny National Forest.

Throughout the academic spring semester, RTPI oversaw two Jamestown Community College interns as they assisted with various aspects of the project, including creating educational resources for the HAHCP and the general public. Some of those resources included pocket-sized cards featuring basic HWA identification and reporting information, designed and printed by the HAHCP. Additionally, the interns produced a “how-to” video showcasing survey methods for HWA and how to report positive and negative HWA findings. The video can be viewed on line at <https://youtu.be/fMxzzwLJ4tg>.

Approximately 30 sites were adopted for the 2018-2019 survey season, and about 22 of those sites were monitored. Over



Credit: Nicholas A. Tonelli

Invasive Species Profile >>>

Hemlock Woolly Adelgid (*Adelges tsugae*)

Species at a Glance: Hemlock woolly adelgid (HWA) is a fluid-feeding insect that feeds on hemlock trees throughout eastern North America, including Pennsylvania. The egg sacs of these insects look like the tips of cotton swabs clinging to the undersides of hemlock branches.

Identification: HWA are very small (1.5 mm) and often hard to see, but they can be easily identified by the white woolly masses they form on the underside of branches and at the base of needles on hemlock trees. These masses or ovisacs can contain up to 200 eggs and remain present throughout the year. Once hatched, juvenile HWA, known as crawlers, search for suitable sites on their host tree, usually at the base of the needles. They insert their long mouthparts and begin feeding on the tree's stored starches. HWA remain in the same spot for the rest of their lives, continually feeding and developing into adults.

Habitat: HWA populations feed exclusively on North American hemlocks. Upon examination of an infested tree, HWA are usually found near the bark at the base of the host tree's needles.

Spread: HWA has spread along the East Coast from Georgia to Maine and now occupies nearly half the eastern range of native hemlocks.

Distribution: HWA was introduced from Asia into the Pacific Northwest in 1924. It was probably introduced into the northeastern U.S. in the 1950's, and it was first discovered in Pennsylvania in 1967. This insect has been damaging hemlock trees ever since and is spreading. To date, 49 counties in the eastern two-thirds of Pennsylvania have been infested with this insect.

Environmental Impacts: Feeding from HWA severely damages the canopy of an infested hemlock tree by disrupting the flow of nutrients to its twigs and needles. Tree health declines, and mortality usually occurs within 4-10 years. All species of hemlock are vulnerable to attack, but severe damage and death typically occurs in eastern (*Tsuga canadensis*) and Carolina (*Tsuga caroliniana*) hemlocks only. Hemlocks are ecologically important due to the unique environmental conditions they create under their dense canopies. These cooler, darker and sheltered environments are critical to the survival of a variety of species that rely on them for food, protection, and ideal growing conditions. Well suited for growing on steep slopes where not many other species can grow, hemlocks stabilize shallow soils and provide erosion control. In addition, they are often found along streams where their shade helps moderate water temperatures, maintaining a suitable environment for cold-water species such as trout.

This species profile comes from the PA DCNR's "Forest Health Fact Sheet: Hemlock Woolly Adelgid" and the New York Division of Lands and Forests "Hemlock Woolly Adelgid" fact sheet.



Credit: M. J. Raupp



HWA Crawler
Credit: Kelly Oten,
North Carolina Forest
Service, Bugwood.org

Invasive Water Chestnut Population Discovered in Mercer County

Water chestnut is an aquatic invasive plant capable of growing densely, overtaking an entire waterbody and causing severe environmental and economic damage. Management efforts began in 2018 on an infested impoundment in Mercer County and are continuing into 2019 in order to suppress this problematic population.



Water chestnut (Trapa natans)
Credit: Petroglyph



Nick Trivelli

Story written by Nick Trivelli, Agricultural Resource Conservationist with the [Mercer County Conservation District](#)

In summer 2018, staff with the Mercer County Conservation District (MCCD) identified a population of European water chestnut (*Trapa natans*) on an impoundment located in Fairview Township, Mercer County, PA. This aquatic invasive species (AIS) is native to Eurasia and had previously only been documented in Pennsylvania in Warren County and several counties in southeastern Pennsylvania. European water chestnut prefers slow-moving, shallow waters, where it forms dense monocultures and displaces native vegetation. Boating through an established infestation is nearly impossible. The risk of spread is great; the aquatic plant has a sharply four-pointed nut that can attach and be transported via waterfowl or downstream by flowing waters.

Upon confirmed identification on June 26, 2018, a rapid response protocol was initiated. The observance was recorded in iMapInvasives, an interview on a local news station was conducted, and a hand-pulling control effort was organized on July 11 consisting of public volunteers, Pymatuning State Park (DCNR) staff, and MCCD staff. However, it quickly became apparent that the infestation was too large to be removed through hand-pulling. Proper permits were obtained and a

certified applicator was contracted for a late summer foliar herbicide application in order to help control the population. The MCCD applied for and was awarded a PA Lake Management Society (PALMS) mini-grant to help cover the costs of spring (pre-emergence) and summer (post-emergence) control efforts on the impoundment in 2019.

Through coordination and correspondence with individuals and entities experienced with



Population of water chestnut (Trapa natans) infesting an impoundment located in Fairview Township, Mercer County.

the attempt to eradicate water chestnut infestations, MCCD has become aware that a long-term action plan approach needs to be implemented. Education, outreach, and monitoring efforts remain ongoing. MCCD staff are engaging the general public, landowners, technical service providers, government agencies, and park managers on the importance of properly identifying and promptly removing this aquatic invasive species. Considering that numerous public and private lakes, which provide various water-related recreational opportunities are located within a 10-mile radius of the impoundment, education and identification are paramount.

To date, it is unknown how this plant ended up establishing a population in central Mercer County.



Volunteers and staff from DCNR and MCCD hand pull water chestnut from the infested impoundment in Fairview Township.

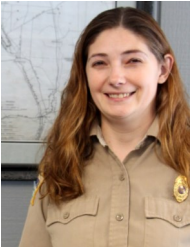
Hydrilla Control in Pymatuning Reservoir

First discovered in Crawford County's Pymatuning Reservoir in 2010, hydrilla continues to be a problematic invasive species for park staff to manage. However, with a treatment plan in motion, progress is being made as the hydrilla population slowly dwindles and more boating enthusiasts are made aware of the harm caused by aquatic invasive species.



Hydrilla (Hydrilla verticillata)

Story written by Stacie Hall, Assistant Manager at [Pymatuning State Park](#) (DCNR)



Stacie Hall

When an aggressive aquatic invasive species (AIS) was found in Pymatuning Reservoir, the largest lake in Pennsylvania, the ecological impacts to the waterbody and scale of management operations required to control it were unknown. Hydrilla was discovered during a routine plant survey at the southern end of Pymatuning Reservoir in 2010. Staff and partners watched as the infestation began spreading north along the shallow shorelines of the lake. With the assistance of the Crawford County Conservation District, U.S. Army Corps of Engineers, University of Florida, Ohio DNR, and the Pennsylvania Department of Agriculture, a massive effort was put together in 2015 to perform a lake-wide aquatic vegetation survey across Pymatuning's 17,088 acres. At that time, hydrilla was found at a 10.9% frequency across the sample points south of the causeway, a roadway which separates the deeper south end from the shallow northern section.

Planning efforts were well underway based on these surveys which allowed for treatment of 58 acres testing effectiveness of Sonar H4C (fluridone) and Aquathol K (endothall) in 2016. During 2017, staff worked through permitting issues and evaluated concerns of flow and wind impacts on product effectiveness, treating 29 acres with Aquathol K and performing additional dye testing. The stars aligned in 2018 with permitting and funding allowing for the treatment of 795 acres using Sonar One/Sonar H4C, Aquathol K, and Diquat/Cutrine Ultra. Along with the three Sonar applications, water samples were taken from 12 locations over eight dates throughout the season to monitor concentration levels.

The herbicide, monitoring, equipment, and labor in 2018 cost a total of \$466,000. Funding for the project was made possible through the Pennsylvania DCNR, Ohio DNR, Growing Greener funding through a Crawford County Conservation District Award, and a PA Lake Management Society mini-grant.



Invasive species check station for watercraft at Pymatuning Reservoir, Crawford County.

Initial response efforts are far from over as the annual vegetation surveys have shown hydrilla continues to spread north of the causeway. Treatment areas in 2018 showed a 24% reduction in hydrilla frequency while areas outside the treatment zone showed a 16% increase. A Great Lakes Restoration Initiative grant was received through the assistance of Pennsylvania Sea Grant to continue treatments in 2019.

Along with continuing survey and treatment endeavors, efforts to increase public education and awareness began in 2015. Staff at Pymatuning Reservoir are now entering their 4th season of setting up invasive species check stations at Pymatuning's boat launches in an effort to slow the spread of invasive species from launch to launch and inform boating enthusiasts of the harm caused by AIS.

Additionally, each boat being checked provides a positive step towards preventing AIS from entering into other waterbodies being visited by recreationists in the Mid-Atlantic region and Canada.

Supported by the Crawford County Conservation District, Pennsylvania Sea Grant, and the Mid-Atlantic Panel on Aquatic Invasive Species, the boat launch check station program continues to expand to other lakes within PA's state park system.

Watershed Conservation Plan Developed for Indian Creek in Fayette County

The preservation of Indian Creek and its watershed is a key goal of the Mountain Watershed Association. By utilizing iMapInvasives as a tool to learn what invasive species are present, management considerations are being made to better protect the health and vitality of the watershed's native species and its ecosystems.



*Wild plants growing near a natural seep.
Credit: Tom Fitzpatrick*

Story written by Peter Kester, AmeriCorps Member with the [Mountain Watershed Association](#)



Originally developed in 2001, the Indian Creek River Conservation Plan was one of the earlier River Conservation Plans completed, and since that time, these plans have evolved to cover more issues. Since its creation 18 years ago, many concerns within the watershed have been addressed through the implementation of management recommendations in the original plan along with other studies conducted in the Indian Creek watershed. However, as time evolves, new technologies become available, and new issues arise.

Much of the original plan focused on the restoration of Indian Creek from the abandoned mine discharges that were prevalent in the area. Indian Creek is no longer a dead creek and has much aquatic life flourishing again, thanks to the six mine-drainage treatment systems and a land-liming project that has been installed. Mountain Watershed Association (MWA) continues to address future conservation efforts, and updating the Indian Creek Watershed Conservation Plan is just one way the organization stays on top of these issues.



*Wild grasses found in Roaring Run Natural Area.
Credit: Tom Fitzpatrick*

As previously mentioned, River Conservation Plans themselves have evolved to include issues that previously were unknown or have recently come about such as invasive species, natural gas development, and a new active deep mine that opened in the Indian Creek watershed. Many of the invasive species present in the watershed present new challenges to protect the sensitive water quality. Some of these species are damaging important native species and ecosystem processes vitally important to the health of the watershed.

(Story continued on page 9.)

Watershed Conservation Plan for Indian Creek (story cont.) >>>



Eastern hemlock defoliation. Credit: Peter Kester

(Story continued from page 8.)

The Pennsylvania Natural Heritage Program, a partnership of the Western Pennsylvania Conservancy and several state agencies, administers the iMapInvasives program which is beneficial in helping to identify new invasive species and impacted ecologically sensitive areas. With the invasive species data that the iMapInvasives program affords, the MWA and other local organizations are able to identify the ecologically sensitive areas that need immediate attention. By including this data in the updated River Conservation Plan, the MWA can educate stakeholders and develop

management recommendations including practices outlined by the PA Game Commission, PA Fish and Boat Commission, and the PA Department of Agriculture to extensively combat the invasive species. Also, the MWA will use best management practices to prevent the spread of invasive species into and out of the Indian Creek watershed.

Currently, Hemlock Woolly Adelgid (HWA) is an invasive species attacking the eastern hemlock, a species vital to the health of the headwater and tributaries of Indian Creek. There are a few exceptional value streams, tributaries, and native trout-producing cold water fisheries within the watershed that are in danger of being destroyed from the HWA. Because of the information provided through iMapInvasives, treatment through different management practices can be used to save a very important foundation species, the eastern hemlock. A task force and future management of invasive species will become key aspects of conserving the Indian Creek watershed. Once the updated Indian Creek River Conservation Plan is completed, work to remove and manage the new threat of invasive species will be a high priority for the watershed.



Hemlock woolly adelgid. Credit: Entomology at the University of Kentucky

ENCOURAGING WORDS >>>



Katrina Stanley, Environmental Science Student at the University of Pittsburgh (recently graduated in Spring 2019)

“iMapInvasives has taught me the importance of reporting sightings of invasive species. As an inexperienced student working with the program, I found it easy to understand and navigate and I learned that observations can be vital to the role of mitigation by natural resource managers. It is a tool I will continue to use and refer to in the future.”

The MWA, home of the Youghiogheny Riverkeeper, works to protect, preserve, and restore the Indian Creek and greater Youghiogheny River watersheds. The MWA has a unique approach of pursuing on-the-ground restoration of past environmental damages while also advocating on local issues—primarily coal and shale gas extraction—as well as regional and national issues that have a local impact. To learn more about the MWA, please visit their website at www.mtwatershed.com.