



Streamlines

Volume 47, Issue 3
Summer 2012

from Green Valleys Association at Welkinweir

Stormy Waters for Freshwater Mussels

Part 1 of a 3-part Series

Freshwater mussels were once so numerous that in places they lined the bottoms of streams and rivers like cobblestones. This made mussels an important part of the aquatic food chain, but as “filter feeders” they also played an active role in maintaining streamwater quality. In continuously filtering out small particles of food from its watery habitat, a single mussel can process many gallons of per day, leaving the water cleaner in the process.

Conservation Status

Of the 15 species of freshwater mussels known to inhabit the waters of Chester County in 1881, only 7 have been found recently. Of the 63 species originally found statewide, 54 species are either extirpated, endangered, threatened (US or PA status), or of special concern. For North America, which is home to 300 species (the

greatest number globally), 21 species are extinct, 77 species are endangered, 43 species are threatened and 72 species are of special concern. For North America, and likely the world, mussels are silently undergoing an extinction crisis unequalled by any other group.

What happened to these once plentiful mollusks? Mussels are at home partially or completely embedded in the *substrate*—sand, gravels and fine sediments — and stay in the same area of a stream for their adult lives, unable to swim away from habitat destruction and pollution. Changes in land use which increase stormwater flows damage this substrate, scouring it away in some places and smothering it in sediment in others. Dams and other structural changes interfere with dispersal of juveniles (see life cycle). Pollutants cause mortality by depleting oxygen, disrupting food chains, or through direct toxicity.

Three factors make mussels an excellent indicator of the stability of long term water quality:

- 1 - Many mussel species are long-lived; some can exceed 100 years.
- 2 - Mussels require good to excellent water quality, and are particularly sensitive to some pollutants. This also suggests the reason why most streams in southeast PA have lost all species—at some point in the past most streams have seen considerable habitat destruction and pollution.
- 3 - Mussels rely on specific fish hosts as part of their unique reproductive strategy, further increasing their reliance on a stable and diverse stream ecosystem.



As part of GVA’s water monitoring program, the stream banks at sampling points are being examined for mussel shells. Pictured here are empty *Elliptio* shells from French Creek (top) and Birch Run (bottom), where live individuals have also been found.

10th Annual Run for Green Valleys

Sponsored by PECO

Save the Date –

September 8, 2012

Registration is now open for this family-oriented and pet-friendly event.

Our Run and Walk road courses – accurately measured by the Chester County Run Store – begin and end at Welkinweir. The scenic routes through the rolling hills of Northern Chester County will lead you over clear-flowing streams, beneath canopies of changing leaves, and past neighboring farms and country homes. Join us in celebrating the 10th anniversary of this event, which raises awareness and support of GVA’s

Details on page 2



Juvenile mussel from Welkinweir Pond, approx. 1/32" (1 mm) with foot extended. See Life Cycle, p.3

Recent surveys in Southeastern PA by the Partnership for the Delaware Estuary (PDE) and the Academy of Natural Sciences (ANS) show a dramatic decline of freshwater mussels¹. Of more than 70

See “Mussels,” page 3

**GREEN VALLEYS ASSOCIATION at
WELKINWEIR**

Green Valleys Association's mission is to protect and preserve the quality and quantity of water resources in northern Chester County through advocacy and education.

Welkinweir

Our Welkinweir headquarters in East Nantmeal Township, Chester County, is a spectacular property which showcases GVA's Mission. Originally home of GVA founding members Everett and Grace Rodebaugh, the 197-acres of permanently preserved land features a 55-acre arboretum, ecologically diverse wetlands, forested riparian buffers, meadows, and forest habitats. The property hosts our many environmental education programs and features an ever-growing collection of projects that demonstrate sustainable practices. See hours p. 4.

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Streamlines, our quarterly newsletter, highlights local and regional activities focusing on water resource conservation and preservation. Available through membership or online at our website.

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community

“Annual Run for Green Valleys,” from p.1

work to protect our natural resources. We thank the Martin Foundation for their support of the very first walk in 2002. Compete for cash and prizes in age categories as well as for the top overall male and female finishers. We have something for everyone – so chose a distance that is right for you and bring out the whole family!

Thanks to our sponsors:

**PECO • Kimberton Whole Foods • CertaPro Painters
Chester County Running Store • OJR Fit For Life**

Date: Saturday, September 8, 2012

Events: 5K Walk, 5K Run, 10K Run and our newest addition, a Kid's Fun Run – a 100-yard dash!

Start Times: Children's Fun Run 8:45 a.m.
5K Walk, 5K Run and 10K Run 9:00 a.m.

Start/Finish: Welkinweir, 1368 Prizer Road, Pottstown, PA

Race Entrance Fees: \$20 — Pre-registration for 5K Run or Walk
\$25 — Pre-registration for 10K Run
\$ 5— Entry for Kids Fun Run

(On Race Day, prices for adults increase by \$5. Pre-registration is encouraged.)

**Register now at www.greenvalleys.org
Or contact Chris at 610-469-4900 or christine@greenvalleys.org.**

Volunteers Needed! Please call or email Chris.

We'll Miss You!

A sincere thank you to recent GVA President, David Zelinger. Dave volunteered for the organization before joining the board. He served as Secretary and was elected President in 2010, a position he held until his retirement in July. Dave was instrumental in moving the organization toward more science education and financially supported projects to improve our infrastructure and communications. We wish Dave and his wife Cherie the best as they enjoy retirement in their home state of Wisconsin.

Family Fun Barbeque

*Sunday, September 9, 2012
4 to 7:00 p.m.*

Come and enjoy great backyard **BBQ fare** – chicken, ribs, burgers, hotdogs, side salads and dessert, served with beer, wine, and lemonade – all overlooking the **pond** with the sounds of summer, old time lawn **games** and **music** by Agent Armadillo.

RSVP to gva@greenvalleys.org or online at www.greenvalleys.org.

Cost is \$15 pp, \$5 for kids 6 to 12, under 6 are free

Event will be held rain or shine.

Annual Celebration Fundraiser at Welkinweir

Save the date:

**Wednesday October 10, 2012
from 5:30 to 8:30 p.m.**

Enjoy great food, friends, and views while supporting an even better cause

Tree Tenders' Basic Training Comes to Welkinweir

The PA Horticultural Society's *Tree Tenders* training course empowers residents to make dramatic strides toward restoring their local tree populations. Green Valleys Association will host the nine-hour course on three consecutive Tuesdays – September 11, 18 and 25 – from 6 to 9:00 p.m. at its Welkinweir headquarters at 1368 Prizer Road, Pottstown, PA.

The Tree Tenders program is a vital element of the new PHS initiative, *Plant One Million*. The goal of the multi-state campaign is to replenish the tree population of 13 counties in the Greater Philadelphia region, southern New Jersey and Delaware—a region that has lost millions of trees to development in recent decades. The regional initiative is multi-layered, involving local governments, corporate sponsors, organizations, schools, civic groups and residents in reaching the goal of a 30 percent tree canopy throughout the area.

The hands-on course offers tree care training for residents, including:

- tree biology
- urban stresses on trees
- tree identification
- tree planting
- community organizing
- tree pruning
- root care

The training is intensive, and is not appropriate for children under age 16.

A community can form a Tree Tenders group by having three or more people graduate from the course. Benefits include tree grants and volunteer tree planting opportunities.

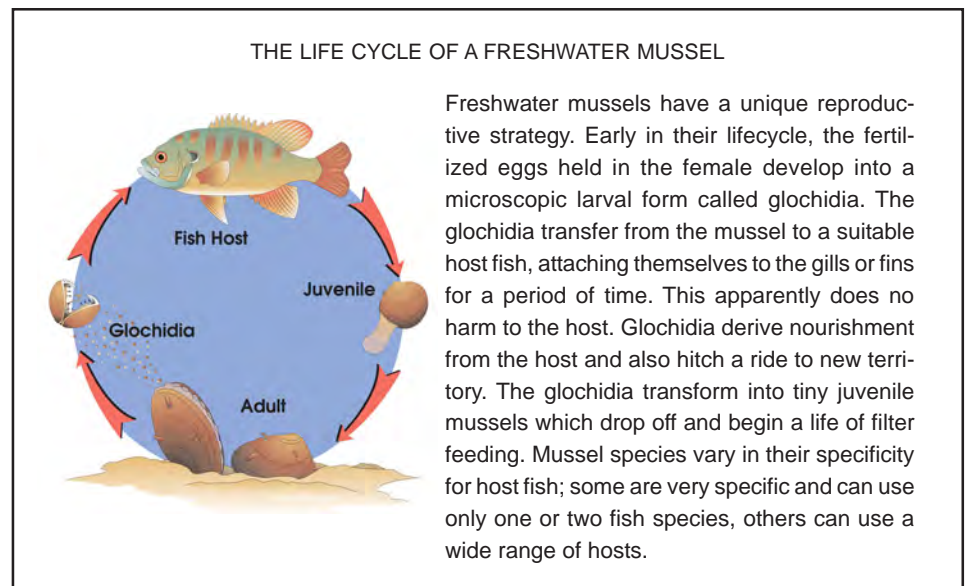
Fee for the course is \$25. Pre-registration is required. Please register online at www.phsonline.org. For more information, contact Barley Van Clief, bvanclief@pennhort.org, 215-988-8793

“Mussels,” from p.1

streams surveyed, living mussels were found in just four. Where mussels *are* found, they are usually isolated populations of *Elliptio complanata*, a hardy eastern U.S. species. And the evidence being gathered indicates that these *Elliptio* mussels are old populations which are not reproducing.

What is the long-term outlook? Specialists in the field believe that mussel restoration is a practical goal and one which will have a great benefit for water quality where accomplished.

¹ *Partnership for the Delaware Estuary. 2012. Technical Report for the Delaware Estuary and Basin. PDE Report No. 12-01. 255*



Welcome Kelsey Stanton

GVA is pleased to announce that Kelsey Stanton has joined our staff as Watershed Restoration Specialist. Kelsey will be using her skills in AutoCAD, ArcGIS, and Adobe Creative Suite to prepare maps and other documents. Kelsey will also be assuming other duties including maintaining the membership database, assisting with the watershed science education program, and will continue in her role in natural lands management.

Kelsey is a recent graduate of Temple University, with a BS in Landscape Architecture and certification in environmental sustainability. Kelsey's landscape design experience includes selection and installation of native plants, with a specific interest in naturalistic designs such as meadows and rain gardens that support wildlife.

Caught On “Castor Cam”

One of Welkinweir's resident beavers becomes a research assistant



Castor works on the dam. See article on page 5.

Dramatic Hydrangeas In Bloom At Welkinweir

As you stroll through the grounds at Welkinweir during the summer, you'll see shades of blue, purple — even a hint of pink. You may encounter mop heads of white and lace caps of blue. While these descriptions could apply to the hairstyles and wardrobe choices of some of our garden visitors, I am actually referring to an exceptional group of species - Hydrangeas.

When it comes to hydrangeas, the more blooms the better. These magnificent plants come in many varieties and add dynamic colors to your garden and landscape. At Welkinweir, there are cultivars of *Hydrangea quercifolia* (oak leaf hydrangea), *H. paniculata* (panicked hydrangea), *Schizophragma hydrangeoides* ('Moonlight' climbing hydrangea) and *H. macrophylla*, also known as big leaf, mophead, or lace cap hydrangea.

Hydrangea quercifolia is native to the southeastern U.S., where it grows as an understory shrub in forests. It also grows along streams, spreading by stolons (underground stems) that help to hold streambanks together and prevent



Oak Leaf Hydrangea

erosion. Oak leaf hydrangea is a multi-season plant with cone-shaped panicles of white flowers that fade to pink through burgundy before turning brown. Its fall leaf color is burgundy and the bark of its cinnamon-colored stems peels attractively, lending interesting texture to the

winter landscape. There are many cultivars from dwarf to full size; look for mass plantings of the straight species throughout the Welkinweir gardens, as well as the dwarf variety 'Little Honey' in the Barn Ruins, where the gold foliage brightens a shady corner.



H. macrophylla,
"Endless Summer"

Hydrangea macrophylla is a very popular hydrangea, with true blue flowers that can also bloom pink. Blue flowers occur at lower pH (acid) and will

turn pink in high pH (lime) soil, making *H. macrophylla* a good indicator of your soil's pH. (More on how to manipulate the color can be found online.) Older *H. macrophylla* varieties bloomed on old wood and buds could be damaged by cold temperatures. New introductions (of which there are many) bloom on new wood, guaranteeing success. The 'Endless Summer' series is one of the most popular introductions and makes a long-blooming display you can see here at Welkinweir.

Hydrangea paniculata is known for its massive displays of large white cone-shaped flowers in mid to late summer. There have been many new introductions and you can find one of them, 'Lime-light', planted at Welkinweir. The desirable trait of all *H. paniculata* is their tolerance for pruning because they bloom on new wood and regular pruning keeps this plant from becoming overgrown and out of scale in the landscape. Thin and/or cut back the previous season's growth in late winter or early spring, since flower clusters occur on newly developing branches.

Schizophragma hydrangeoides is a desirable mid-summer flowering woody vine that attaches itself by aerial roots to brick, masonry, or wood. It requires little or no pruning. If certain shoots have grown out of bounds, reduce their length

in late July. Look for this hydrangea climbing the walls of the Welkinweir garage.

We hope you explore the many varieties of hydrangeas on your next visit to Welkinweir. - Beth Moosman

Saturday a.m. Wildlife Walks

Enjoy guided walks at Welkinweir with volunteer naturalists. See dates and Walk Leaders on Calendar (page 7).

Horticulture Intern

We welcome Mary Mantey, Welkinweir's 2012 Horticulture Intern for the summer. Mary is pursuing her Bachelors of Science in Horticulture and Landscape Design at Temple-Ambler while gaining hours to become a certified arborist. Working at Welkinweir is teaching Mary a great deal about watershed preservation, the importance of trees to water quality, and the garden "best management practices" that protect water resources. Her ultimate goal is a career in Public Horticulture. Mary lives in Manayunk with her two dogs and enjoys walking, biking and running in the Wissahickon Park in her free time.

Welkinweir Summer/Fall Hours

Welkinweir's arboretum and surrounding natural lands are open M-F, 9:00 a.m. to 4:30 p.m.

Open early (8:00 a.m.) on Wednesdays for birders.

Weekends by advance registration only. Call 610-469-7543.

Please respect the privacy of our residents by parking away from the house and observing business hours.

www.welkinweir.org

“Castor Cam” from p. 3

This spring and summer there hasn't been much physical evidence of beaver activity at Welkinweir. They have been spotted a few times in the main pond at dusk, happily munching their way through the water lilies. But the trails they were using last fall and winter have grown over and there are no fresh signs of chewed wood.

However, just a few weeks ago one of the beavers — Castor, as we've dubbed him — began redesigning the outlet of the main dam. Apparently the pond is not deep enough. To improve the situation, Castor has been busy weaving together branches and trunks up to 4" in diameter and packing the structure with rocks and mud brought up from the pond bottom.

This presented a perfect opportunity to start getting pictures of Castor at work. We set up a motion-activated camera and have been regularly removing some of the branches and mud to encourage Castor to make repairs so we can document his activity. (See photo on page 3.)



One of the live freshwater mussels brought up by Castor's activity.

Most of the wood Castor has been using is completely waterlogged, so it is probably from last winter's food caches stored on the bottom of the pond. Interestingly, the mud Castor is bringing up is revealing what else is down there: hundreds of empty mussel shells from at least two species, some obviously old, and some quite fresh. In the mud there are also many healthy, living *Pyganodon cataracta* mussels, ranging in size from 3 to 7 inches.

- GVA Science Staff

Flowers and Pollen and Insects — Oh My!

Welkinweir's Children's Garden Provides Learning Opportunities

The Children's Garden was designed and planted in 2000, making it one of the newest gardens at Welkinweir. The design is based on the traditional Pennsylvania Dutch “four-square” garden. Paths radiate from a central birdbath leading to four themed gardens.

Thanks to the hard work of interns and volunteers, the Children's Garden is in lovely condition this summer.



The Children's Garden in full bloom.



Summersweet (Clethra alnifolia) and honeybee.

It's a great place for kids to explore and view a variety of flowering plants up close. Kids can also observe the many different birds and insects which come for the nectar and pollen.

Science Education at Welkinweir

Students from 6th through 12th grades visited Welkinweir this spring to gain hands-on knowledge of the insects and other critters that live in our streams and ponds, how they are indicators of water quality, and how they are affected by water chemistry. Students learned about the food chain, searched for macro-invertebrates and brought samples back for closer examination under the microscope; demonstrations were given for a number of water quality analyses from pH and dissolved oxygen to bacteria testing.



At left: sixth grade students use microscopes to examine the macroinvertebrates they found. (Photo by Ed Bacon) At right: Bill Richardson's Environmental Science students look for aquatic life in the pond.

education

Phoenixville EAC Club Members Learn By Doing

For 10 years, the Environmental Awareness Club at Phoenixville Middle School has engaged 6th and 7th grade students in a wide-ranging variety of current environmental topics.

This year's club members enjoyed guest speakers, field trips and service-learning projects, each selected to increase students' knowledge about natural resources, careers in conservation, and building environmental awareness in their school and community.

Naturalists and wildlife service professionals shared details about Pennsylvania wildlife and natural resources. Presentations from the PA Game Commission, live birds from Great Valley Nature Center, and "All About Deer" with Valley Forge National Park naturalists, introduced students to PA wildlife and their habitat needs.

Field trips provided direct experiences with nature on the land. At Mill Grove students focused on birds, their habitats, and the life work of John James Audubon; at Welkinweir the connection between forest and water resources health. A highlight was sighting one of the beavers and witnessing its activity.

Two service-learning activities were incorporated into the club program to teach by doing and learn the value of giving back. Club members planted native shrubs on a steep slope at the Schuylkill Elementary School, to create valuable wildlife habitat for birds and small mammals.

A second project was to plant twelve flowering containers and to install two bird boxes built by the students for residents of the Golden Living Center, in Phoenixville.

The club culminated with a presentation to funders, school officials, and parents recapping each week of the program. Students shared their experiences through skits, narratives, and student-created videos. As one club member remarked, "This is the one of the best clubs ever ... all these people right here are the coolest group I've been in ever."

- Margot Taylor



EAC Club members plant containers at Golden Living Center.



Sixth grade teacher Catherine Renzulli assists students in identifying a tree in the interior courtyard during an Adaptations program delivered by GVA staff.

Connecting with Nature Hands-on

Green Valleys Association offers many ways for children, youth, and adults to connect with nature. Our Nature Explorers Clubs expanded this year to all five of the elementary schools in the Owen J. Roberts School District, thanks to funding from the district. Offered after school, these clubs get students exploring nature on the school grounds.

A sincere thank you to: Nancy Simpson-Dorward, Harriet Stone, and Caryl Ann Cooper for volunteer teaching assistance with the students this spring.



Students in French Creek Elementary's Nature Club search in leaves and pine needles for bugs, slugs and other animals.

Nature Education Funding Received

Pottstown Health & Wellness Foundation \$1,500 for a pilot nature education program at Barth Elementary School

Kate Svitek Memorial Foundation \$1,300 for guest speakers at Summer Nature Camp; and **Ron Graham, John Funk, Ben Campbell, Debbie Eddinger**, and the **Brigandi Family** for providing scholarships to send 10 underprivileged children to Summer Nature Camp

Penn Liberty Bank \$400 in support of Community Nature Programs

Many thanks to these organizations and individuals for their generous support of our educational programs.

ALL PROGRAMS ARE AT WELKINWEIR unless noted.

For all program information and registration, please contact Dawn at 610-469-8646, or dwhite@greenvalleys.org.

Wildlife Walks at Welkinweir

Saturdays, at 8:00 a.m.

Appropriate for ages 6 and up with adult. FREE. No registration required. *Bring binoculars and field guides if you have them.* Rain or shine.

- September 8 with Sue Lucas
- September 15 with Rick Keyser
- September 22 with Sue Lucas
- October 13 with Sarah Neto
- October 20 with Rick Keyser
- October 27 with Joe Hudson and Dan Sullivan
- November 10 with Sarah Neto

Other Programs

Monday, October 8

Young Naturalist Day 8:30 a.m.-3:00 p.m.

On their day off from school, students can enjoy discovering what Welkinweir has to offer through nature hikes, exploration, and various nature activities. For children in 2nd through 6th grades.

Fees: \$65 GVA members, \$75 nonmembers. Advanced registration required.

Friday, October 12

Boy Scouts' Night Hike and Campfire 7:00-9:00 p.m.

Join us for a night of fun and educational programming. Enjoy stories and s'mores around the campfire, followed by a night hike in search of nocturnal animals. For Boy Scouts ages 6 and up with adults.

Fees for children and adults: \$8 GVA members, \$10 nonmembers. Advanced registration required.

Friday, November 9

Owl Prowl 7:00-9:00 p.m.

Sponsored by *Penn Liberty Bank*

Get up close and personal with live owls and learn more about these amazing hunters. Touch feathers and talons, take part in various activities, and go on a nature walk in search of our local wild owls. Refreshments provided. For ages 6-Adult only.

Fees: GVA Members \$3 per child, \$5 per adult; Nonmembers \$5 per child, \$7 per adult. Advanced registration required.

Little Sprouts at the Henrietta Hankin Library

Mondays from 11:15 to 12:00 p.m.

Little ones and their parents can learn about nature together through an interactive nature story, animal artifacts, and a take-home craft. For ages 3-5 with adult.

FREE. Advanced, online registration required. Contact the library at 610-321-1724.

- September 10—*Animal Coats and Coverings*
- October 15—*Super Senses*
- November 12—*Life in the Leaves*

Kinder Nature Class at Welkinweir

Tuesdays from 12:30 to 1:45 p.m.

Children ages 3-5 can discover the wonders of nature with their parents during these fun and educational programs. Each class includes age-appropriate activities based on the theme, including a nature discovery walk, story, craft, and other activities. A snack is also included.

Fees for children only: \$6 GVA members, \$8 nonmembers. Advanced registration required.

- October 2—Nature Detectives
- October 9—Creature Coats and Coverings
- October 16—Forest Friends
- October 23—Pick a Pumpkin, Plant a Seed
- October 30—Animals of Halloween
- November 6—Animal tales

Little Wonders Class at Welkinweir

Wednesdays from 12:30 to 1:30 p.m.

Youngsters ages 2-3 can discover the wonders of nature with their parents during these fun and educational programs. Each class includes age-appropriate activities based on the theme, including a short nature discovery walk, story and craft. A snack is also included. Fees for children only: \$6 GVA members, \$8 nonmembers. Advanced registration required.

- October 3—Nature Detectives
- October 10—Creature Coats and Coverings
- October 17—Forest Friends
- October 24—Pick a Pumpkin, Plant a Seed
- October 31—Animals of Halloween
- November 7—Animal Tales

Please join us...

Join GVA or Renew Your Membership Today! *ONLINE MEMBERSHIP now available!

Name _____

Address _____

City _____ State _____

ZIP _____ Phone _____

Township _____

Watershed _____

Email _____

I would like to volunteer time to GVA.

Dues and contributions are tax-deductible. Green Valleys Association is a registered charitable organization. A copy of the registration and financial information is available by calling 1-800-732-0999. Registration does not imply endorsement.

**Make checks payable to Green Valleys Association and mail with Membership Form to
1368 Prizer Road, Pottstown, PA 19465.
Visa/MasterCard accepted—please call office.**

MEMBERSHIP includes quarterly newsletter, notice of events and programs, access to Welkinweir grounds, reduced rate to special programs (including summer environmental camp) and fishing with a GVA permit.

- Individual** \$45.00
- Supporter** \$60.00
- Naturalist** \$100.00
- Environmentalist** \$250.00
- Protector** \$500.00
- Preservationist** \$750.00
- Steward** \$1,000.00

I am a **Renewing Member** **New Member**

BECOME A "FRIEND" BY ADDING AN ADDITIONAL CONTRIBUTION

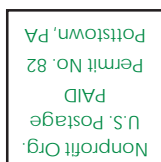
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Summer 2012

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