



Streamlines

Volume 49, Issue 1 Spring 2013

from Green Valleys Watershed Association

Stormwater - Making the Land/Water Connection *Valley Creek Stormwater Basins to Receive Upgrades*

GVA has been awarded a \$200,000 Growing Greener Grant to carry out Stormwater basin retrofits in the Valley Creek Watershed. The three main activities of this project are to 1) install BMPs to reduce stormwater discharge from 12 or more stormwater detention basins in Valley Creek Watershed 2) expand the existing basin database for the Valley Creek Watershed specifically to lay the foundation for basin upgrades beyond this project, and 3) provide education and outreach on the benefits of stormwater basin retrofits. The timeframe for this project is 2012-2016.

The Valley Creek Watershed suffers from the excessive impervious surface and outdated stormwater controls from the past four decades of development. This runoff causes streambank erosion and excess sedimentation as the stream channels adjust to the excess
see "Upgrades", page 10

Choose Your Adventure! *at Summer Nature Camp*

It's that time of the year to start thinking of the warm summer days – and GVA's Summer Nature Day Camps! Another great summer is planned for 2013, with plenty of opportunities for campers to reconnect with the outdoors. Our nature camps engage children ages 4 through 13 in fun and educational, outdoor activities to help them understand the natural world and their connection to nature.

This year's weekly camp themes include new demonstrations, games, and guest presenters, as well as
see "Camps", page 6



*Campers in the Herons group (grades 6 and 7) enjoy canoeing at a local nature sanctuary.
Photo credit: Ed Bacon*

A Quiet Life: Freshwater Mussels

Part two of a three-part series



Elliptio mussel in substrate, French Creek mainstem.

Our streams and ponds were once home to healthy populations of colorful, and colorfully named freshwater mussels. The 1881 publication "The History of Chester County" lists 13 species (see pg. 10 for a full list of mussel species and their conservation ranks). Most of these species have not been found in recent Chester County surveys; indeed, many of these species are imperiled at the state level, while the Dwarf Wedgemussel and the Freshwater Pearl Mussel are federally endangered.

The frequent occurrence of Elliptio relic shells in the French Creek had led to the expectation that we would be finding live Elliptios during
see "Mussels" page 3

GREEN VALLEYS WATERSHED ASSOCIATION at WELKINWEIR

The mission of **Green Valleys Watershed Association (GVA)** is to protect and preserve the quality and quantity of water resources in northern Chester County through stewardship, education and advocacy.

Welkinweir -- Our 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.

Seasonal hours p. 5.

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

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community

French Creek Clean-Up This Spring!

In the last edition of Streamlines you may have seen a notice that asked for input on streams in need of a "spring cleaning" ("Nominate a Stream for Some TLC", page 2). We have found a section of stream needing just that, and this spring GVA is organizing a Stream Clean Up Day!

The candidate stream is the French Creek where it runs through downtown Phoenixville. The site for our clean-up is approximately a half mile long, from the parking lot used for the Phoenixville Farmers Market (behind the Family Dollar store)

downstream to La Hacienda Mexican restaurant at the corner of Ashland and Bridge Streets (opposite the Iron Hill Brewery). The event will be held rain or shine on Saturday, May 4, from 8:00 a.m. to noon. All are invited to come out and help improve the French Creek watershed. More details will be provided before the event. Anyone who is interested in participating in the event may contact Kelsey Stanton at kelsey@greenvalleys.org.

See "Clean-Up", page 9



HSA Annual Herb Sale Thursday, May 9th



The ripe fruit of our native elderberry, Sambucus canadensis, is used to make preserves, jellies, pies, and wine. The fruit is also very attractive to birds and other wildlife.

The Philadelphia Unit of The Herb Society of America will present its 74th Annual Herb Sale on Thursday, May 9th, 2013 from 10 am to 1:00 pm (rain or shine) on the meadow at Historic Yellow Springs, 1685 Art School Road, Chester Springs.

Thousands of herbs, including our Herb of the Year, Elderberry (in photo below), as well as unusual scented geraniums and salvias will be offered. In addition, there will be expanded herbal offerings, including chutneys, jams, vinegars, and homemade baked goods as well as garden gifts and books for sale in our boutique tent. A gourmet herbal brunch may be reserved for \$15. The brunch will be served starting at 10:30 am. Checks should be made payable to HSA Philadelphia Unit. P. O. Box 273, Chester Springs, PA 19425

GVA's Watershed Watch Volunteers Needed

This year GVA will be forming a new group of Watershed Watch volunteers to carry out a variety of tasks. Volunteers are needed who will host gauges at their homes and collect rainfall/temperature data. This data will be essential to improving the accuracy of the fine scale precipitation maps we are currently creating through a GIS process called spatial interpolation. These fine scale maps will be used to interpret wet and dry weather water sampling results, as well as provide inputs into our stormwater models.

Another goal of the program will be to provide a pool of volunteers available to help amphibians cross the roads safely during springs rains. Amphibian populations are declining for a variety of reasons and one thing we can do is make the roads safer for them during heavy spring migrations. Volunteers will be notified ahead of expected crossing events and have an opportunity to sign up for that evening's roster.



Volunteers are also needed who can be available to observe & photograph sites with potential erosion issues during storms. Pictures are often the best way to report sediment pollution to township and county personnel and get these problems collected as early as possible.

GVA members who are interested in
See "Volunteers", page 9

"Freshwater Mussels," from page 1

habitat surveys, and this winter Zach Yodis located several occurrences in the French Creek mainstem. Fresh relic shells are also seen in the South Branch and the Birchrun, where we expect to find additional populations as our surveys continue.

Some relic shells collected at Welkinweir pond have been identified by specialists at the Partnership for the Delaware Estuary (PDE) as belonging to the Eastern Elliptio and the Alewife Floater. Elliptios have a number of hosts and finding them in the pond is not surprising. However, Alewife Floater populations are associated with their host Alewife, a shad-like fish which usually lives in the sea and spawns in fresh water. Alewife fish can also live in landlocked fresh water communities, but have not shown up in the pond, so just how these mussels got into the pond is currently unknown.

The discovery of any surviving mussel populations in Chester County is a rare event, although many streams have yet to be surveyed. **Inventories of known populations and new surveys of creeks and lakes are needed if conservation and restoration objectives are to be met.**

PDE has a program underway which trains volunteers and conservations groups on how to carry out surveys, and PDE is also serving as the (clearinghouse) for survey results. PDE and GVA are also working together to produce a workshop that will teach volunteers about freshwater mussels. The upcoming Got Mussels? workshop on Wednesday, May 8, will include a freshwater mussel survey led by PDE staff.

Got Mussels? Freshwater Mussel Survey Workshop at Welkinweir

Wednesday May 8, 2013 - 9:30 A.M. to Noon

Please RSVP by May 1

Grab your waders and stream clothes to spend a lovely morning at Welkinweir with staff from GVA and Partnership for the Delaware Estuary. A brief classroom session will cover an introduction to freshwater mussels and a safety lesson, then outdoors we will go for a hands-on mussel search in the stream. Please bring a water bottle, and pack a picnic lunch if you are able to stay after the workshop!

Participants who plan to lead future mussel surveys will receive a copy of the newly published *Freshwater Mussels of the Delaware Estuary Guidebook*. A limited number of waders will be available if you do not have a pair. **To register for the "Got Mussels?" workshop, contact Dee Ross at dross@DelawareEstuary.org or 800-445-4935 x106.**

Healthy populations of mussels provide incredible (and free) eco-services by removing tons of sediments while filter-feeding, stabilizing stream beds against erosion, and providing food for other animals. PDE is working to reintroduce mussel species to their native waters. Visit www.DelawareEstuary.org/freshwater-mussel-restoration for restoration program information.

watershed assessment

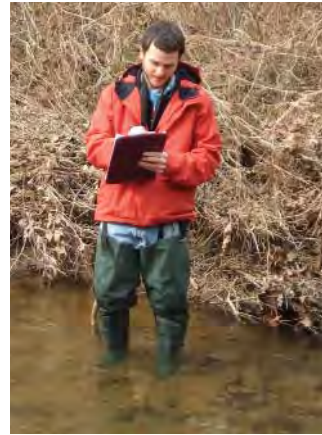
Habitat Assessments in the French and Pickering Creek Watersheds

Habitat assessments (HA) are an important approach in assessing the overall quality of a stream. The easy-to-use procedure identifies twelve interrelated habitat parameters dealing with instream and out of stream elements; such as available cover for fish, sediment deposition, and riparian zone width. The parameters are numerically scored and are then summed to give a total score for that specific reach of stream; the higher the score, the better developed the stream habitat. The data sheet used provides a measuring description to standardize the results.

The importance of HAs is evident in their rapid and descriptive results enable researchers to cover large areas, like the French Creek water-

shed. They give an understanding of how surrounding land use affects stream habitat.

HAs are based on visual observations and therefore there is the potential for subjective interpretation. Results could vary depending on the assessor, time of year, or the method that was used. GVA only uses the DEP's method. We have addressed the subjectivity potential in several ways to ensure that the data is of good quality. This quality control process starts with trained assessors to provide quantified data. In addition, revisiting previously assessed locations to



determine if the data is repeatable is important.

-- Zach Yodis received his BS in Environmental Science from King's College in 2012 where he interned with the Eastern Pennsylvania Coalition for Abandoned Mine Drainage (EPCAMR). At EPCAMR, Zach was trained to carry out habitat assessment and also

performed chemical and macroinvertebrate sampling/analysis. Zach is spending this spring and summer hiking the Appalachian Trail from Springer Mountain, Georgia and hopes to go all the way to Mount Katahdin, Maine—2,180 miles.

Spring 2013 West Chester University Internship

QA/QC for Habitat Assessment

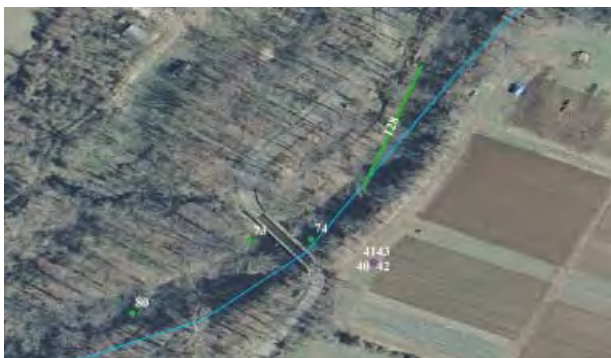
We gathered assessment data from prior habitat assessments (HAs) conducted by GVA, the PA DEP, and the USGS and organized them into a quality control database in order to better understand the quality of the new HA data which GVA is collecting. One concern with HAs is that it is a potentially subjective process; another concern is that a location's score may depend on the method used, time of year and weather conditions. This database will be the foundation for GVA's long term HA program, and also

provide us with information about the precision and accuracy of this data.

HA locations were mapped and areas that were assessed by two or more organizations were identified as "groups." Once groups of HAs are established, statistical analysis may be used to quantify the difference between the scores in the group. The database will continue to grow, but the results of the initial quality control process have been positive. Habitat assessments done by different groups across several years agree very well, indicating HAs are a good method for investigating water quality.

tures of the site have been replicated in the software, the program uses simulated or actual rainfall events to generate results such as total infiltration, total runoff, peak flow rate, and flood volume. Through this modeling, we can also predict the reduction in stormwater flows and associated pollutants resulting from installing Low Impact Development (LID) retrofits at existing Properties.

--Thomas Powell is currently interning with GVA in order to complete his West Chester University course curriculum. He will graduate in May of 2013 with a BS in Environmental Health. The primary objective of an environmental health professional is to understand the relationship between the environment-be it natural, occupational, or residential-and human health. It is a broad field of study and encompasses disciplines such as air; water; and soil quality; food safety; industrial hygiene; hazardous waste operations; emergency management; sewage treatment; and solid waste disposal. Personal interest in water quality assisted Thomas in identifying GVA as a suitable intern site.



Hoffecker Bridge on the French Creek, showing sites of HAs by the USGS, PA DEP, and GVA

Stormwater Modeling

We are using EPA's Storm Water Management Model (SWMM) and Autodesk's Sanitary and Storm Analysis (SSA) to model stormwater at developed properties. Once all the fea-



Signs of Spring

Punxatawney Phil, maple sugaring, snowdrops and crocus, early morning birdsong, trout rising in the streams, spring peepers trilling, springing the clocks ahead – all the signs of spring are here. The sun is suddenly higher in the sky and feels warm despite what the thermometer reads.

Each week brings something new in bloom here at Welkinweir, and the closer we get to May, the more blooms there will be. There have been many birds returning, hunting on the pond or gleaning insects off a tree. Peepers have been calling. Whether you enjoy walking the gardens gathering ideas, birding, or hiking the trails, we invite you to come out and find spring.

We have a new Trail and Habitat Guide, describing the various ecosystems found here highlighting the plant and animal life found within each ecosystem. This foldout brochure is designed to complement our other brochures – the Visitor's Guide (history of the house and garden collections) and Wild Areas Guide. You can pick up all these brochures at our visitors entrance at the new kiosks.

Tribute Tree Program

Need an idea for what to give to someone who has everything? Want to honor a special event such as a wedding, anniversary, birth of a child or memorialize a loved one? Have a Tribute Tree planted at Welkinweir, a beautiful and special place. For more information call the office.



Mother's Day Tea & Azalea Bloom Walk: Saturday, May 12, 2013

Savor an afternoon in the garden at our annual Mother's Day Tea. From the tented terrace overlooking the pond - one of the best views in Chester County - our guests will enjoy assorted tea sandwiches, fruit and pasta salads, cheeses, and dessert. Delight in the brilliant colors and fragrance of spring while wandering the gardens. Proceeds from this event will help to maintain this historic property and provide opportunities for college students to gain real world experience. Event will be held rain or shine.

First Seating: 12:30 to 2 p.m. | **Second Seating:** 2 to 4:30 p.m.

Paid reservation deadline is Monday May 6th.

\$21.50 per person; \$5.50 children 6 to 12 years old; under 6 free

Register online at www.welkinweir.org or call 610.469.7543

National Public Gardens Day

Friday May 10, 2013, National Public Gardens Day is a national day of celebration to raise awareness of America's public gardens and their important role in promoting environmental stewardship and awareness, plant and water conservation, and education in communities nationwide.

What better way to kick off the unofficial start of spring, in America's Garden Capital, at a time when the environment is foremost in the mind of the public. Touring public gardens, like Welkinweir, are a fun activity for families, couples, and enthusiasts, offering a low-cost, entertaining, and beautiful community outing while providing important resources, education and research on environmental stewardship and conservation.

Welkinweir Spring Hours

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

Weekends by advance registration only. Call 610-469-7543 M-F to reserve your weekend visit.

Please respect the privacy of our residents by parking in the Visitor Parking area and observing business hours.

education

“Camps” from page 1

some familiar activities, all guaranteed to excite and educate campers of all ages!



Creating art on rocks during nature's artists week at summer camp 2012.

grandchildren soon so you don't miss out on their favorite camps!

To register your child for GVA's Summer Nature Camp please contact Dawn White at **610-469-8646** or by e-mail at dwhite@greenvalleys.org.

--Dawn White, Nature Education

After-school Club Nurtures a Sense of Environmental Stewardship

For the twelfth year in a row, GVA's after school club at the Phoenixville Middle School is providing customized activities that teach students about the natural environment. The club activities have an underlying theme of personal choice and the consequences of choice. Thirteen 6th and 7th graders submitted written statements explaining why they wanted to join the club. Learning about the natural environment and how to protect it where the number one reason.

This year's club is focusing on watersheds and water resources. The Green Valleys Association is the perfect teacher for this subject matter. The club kicked off with a

demonstration of the Enviroscape Model that shows how point and non-point source pollution can dirty surface and ground water supplies. The model goes further to show best management practices to protect the quality and quantity of water supplies.

Next students took a field trip to the Phoenixville Water Treatment Plant and the Pottstown Waste Water Treatment Plant. During these plant tours students saw how water supplies were treated chemically and biologically to meet state standards for drinking water and stream discharge. Each plant manager personally guided the students around their plant explaining the various water treatment

Camp Open Houses

Thinking about camp for your children but would like more information on what they do and where they explore and play? Visit Welkinweir at one of our Saturday **Camp Open House**, on **June 8** from **9:30-11:00 a.m.** Visit our facilities, walk the grounds, and talk with the Education Director to get your camp questions answered and ease any apprehensions campers may have.

If you wish to explore the grounds on your own, the property is open to the public Monday through Friday, 9:00 a.m. to 4:30 p.m., beginning in April. Weekends are for GVA members by advance reservation only. Please call the office at 610-469-4900 to schedule a weekend visit.



processes in route while sharing the educational requirements for their position and job responsibilities.

Future activities this spring include stream field studies, a service project, crafting an environmental message, and a celebration canoe trip. To prepare the club for the upcoming

See “Club”, p. 9

Environmental Education Internship Available

GVA is currently seeking an energetic, self-motivated college student or graduate interested in delivering programs that engage young children in meaningful, learning experiences in nature. GVA's Summer Environmental Education Internship provides practical work experience that assists the intern in broadening his/her knowledge and skills necessary for a career in an environmental field.

The intern's duties will focus in two main areas:

On-Site Program Educator:

Assist with, and lead stream and pond study programs, including water quality monitoring, for visiting school groups (spring season).

Senior Camp Counselor:

Develop, prepare, and teach age-appropriate, environmental education activities for children attending GVA's 8-week Summer Nature Day Camp, including assisting with marketing and preparations prior to the start of camp. If you or someone you know is interested, please contact Dawn White at **610-469-8646** or dwhite@greenvalleys.org

Support a Child in Our Community

Donate to the Summer Camp Scholarship Fund

Each year, many children have the opportunity to enjoy part of their summer at GVA's Nature Camp. Many other children in our community are not as fortunate. Last year, thanks to many generous donors to GVA's *Summer Camp Scholarship Fund*, nine, underprivileged children from the Pottstown area were able to attend a week of camp of their choice.

This summer, we are requesting members' assistance in providing funds to families who wish to send their children to camp, but simply cannot afford to. This year's **goal is to send at least 12 children to camp** via scholarships.

Please consider making a difference in a child's life by contributing to our *Summer Camp Scholarship Fund*. A donation of \$205 will send one child to camp for one week, but *any* amount is appreciated and will be combined with other donations. Please send your contribution to: *Green Valleys Association, Attn: Summer Camp Scholarship Fund, 1368 Prizer Road, Pottstown, PA 19465.*

GVA NATURE CLASSES FOR CHILDREN

“Little Sprouts” Library Nature Programs

at Henrietta Hankin and Phoenixville Libraries

Little ones and their parents can learn about nature together through stories, interactive demonstrations, animal artifacts, and take-home crafts. For ages 3-6 with caregiver. Advanced registration required. FREE.

Children's Nature Programs at Welkinweir

Children can discover the wonders of nature with their parents during these fun and educational programs. Each class includes a snack and theme-based, age-appropriate activities, including a nature discovery walk, story, and a craft. Non-participating siblings are welcome. Fees for children only: \$8 GVA members, \$10 nonmembers. Advanced registration required.



Collecting pumpkins in the garden, Fall 2012.

Kinder Nature Classes: For ages 3-5 with caregiver.

Little Wonders Nature Classes: For ages 2-3 with caregiver.

calendar

ALL PROGRAMS ARE AT WELKINWEIR unless noted.

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

Green Valleys Watershed Association Community Nature Programs April through July 2013

Community Nature Programs at Welkinweir

Guided Nature Walks

Saturday, 8:00 a.m. FREE

April 20 with Joe Hudson and Dan Sullivan

May 4 with Allen Pallay *botany-themed, this walk starts at **9:00 a.m.**

May 11 with Sarah Neto and Sue Lucas

May 18 with Rick Keyser

Enjoy guided walks with volunteer naturalists to observe a wide variety of plants, and search for resident birds and other wildlife. *Bring binoculars and field guides if you have them. Programs run rain or shine.* Appropriate for ages 6 and up with adult. No registration required.

Night Hike and Campfire

Friday, June 7 8:00-9:30 p.m.

GVA Members \$5 Nonmembers \$7

View nature at night at Welkinweir! Enjoy stories and s'mores at the campfire, then search for signs of nighttime animals, play sensory games, and learn more about nature in summertime. Refreshments provided. Bring bug spray and flashlights. Appropriate for ages 6 and up with adult. Advanced registration required by Thursday, June 6.

Fireflies!

Friday, July 26 7:30-9:00 p.m.

GVA Members \$5; Nonmembers \$7

Discover the amazing lives of "lightning bugs" as we play a game to uncover the mystery of how and why fireflies light up, study the insects themselves, and make a firefly to take home! Refreshments provided. Bring bug spray, a jar for catch and release of fireflies, and flashlights. Appropriate for ages 5 and up with adult. Advanced registration required by Thursday, July 25.

Library Programs: Little Sprouts Nature Classes

At the Henrietta Hankin Library

Mondays from 10:30 to 11:15 a.m.

May 13 – Tadpole to Toad

Advanced, online registration required.

Visit http://www.ccls.org/cwo/Find_a_Library/HH.

At the Phoenixville Public Library

Fridays from 10:00 to 10:45 a.m.

May 10 – Slimy, Scaly Friends

Advanced registration required in the library, or by contacting 610-933-3013 ext. 24.

Children's Nature Programs at Welkinweir

Kinder Nature Classes

Tuesdays from 10:00 to 11:30 a.m.

(All classes are independent of one another.)

April 23 - Creating Art from Nature with Hop Toad Studio

May 7 – Pond Exploration

May 14 - Insect Investigation

Little Wonders Nature Classes

Wednesdays from 10:00 to 11:00 a.m.

(All classes are independent of one another.)

April 24 - Creating Art from Nature

May 8 – Pond Exploration

May 15 – Insect Investigation

GVA Summer Camp Open House

*Saturday,
June 8
9:30-11:00 a.m.*



Kinder Nature Class attendees enjoy a scavenger hunt in the woods, Fall 2012.

Save the Dates

Mark your calendar for these upcoming events:

**French Creek
Clean-Up**

May 4, 2013

**Mother's Day Tea &
Azalea Lane Walk**

May 12, 2013

**Freshwater Mussels
Workshop**

May 8, 2013

**"Science Matters"
GVA Open House**

Jun 22 2013

GVA Supports

"National Take Back Day"

Turn in your unused or expired medications for safe disposal on

Saturday, April 27 from 10 a.m. to 2 p.m.

The collection site is:

CVS Pharmacy, 3425 Bridge Street & Rt. 724, Spring City

Sustainable Landscape Idea Exchange & Pest Walk at Welkinweir

June 20, 2013 10 a.m. to 3 p.m.

Presented in conjunction with the Penn State Cooperative Extension Service. CEU's and Pesticide Update Credits available; Fee charged

"Science Matters" GVA Open House

Saturday, June 22, 9:00 to 11:00 a.m.

Welkinweir, 1368 Prizer Road, Pottstown

"Volunteers" from page 3

learning more about our new "Watershed Watch" volunteer program will have the opportunity to do so at our upcoming "Science Matters" Open House on Saturday June 22nd

The open house will feature the new equipment and technology we are using in the field and here at GVA headquarters. Visitors will have chance to learn about our new water quality monitoring equipment and how we are out in the streams performing habitat assessments and water sampling. We will also be discussing the various opportunities for Watershed Watch volunteers. Your interest and suggestions are most welcome. For more info, please contact Mike Bullard at mikeb@greenvalleys.org

"Club," from page 6

field trips for stream studies, GVA invited the Stroud Water Research Center to teach students about evaluating stream health. Students were given opportunities to sort and identify macroinvertebrates and based on findings predict the stream quality. In another session, Delaware Riverkeeper presented to the club explaining how they work to protect the health of the Delaware River by giving the river a voice.

In addition to these activities, students keep journals and shoot video spots that highlight each club activity. Students will use these resources to create a final presentation which both explains what they have learned during club and will encourage students to participate in the club next year.

--Margot Taylor, Watershed Restoration Coordinator &
Nature Educator

"Clean-Up" from page 2

A staff survey of the site revealed plenty of trash in and around the French Creek. We found tires, cans, plastic bags, and scraps of metal – perhaps left over from the area's previous use as the site of the Phoenix Steel Corporation. We also saw a foraging flock of bluebirds and a freshwater mussel shell, encouraging evidence of nature's resilience in the middle of an urban center. Removing trash from this section of the French Creek will greatly improve the health of the stream as well as the appearance of immediate vicinity, through which the Schuylkill River Trail – a popular and scenic trail that follows the river from Pottstown all the way to Philadelphia – runs. Visitors to the trail, downtown Phoenixville, and the French Creek watershed will all benefit from a cleaner and more beautiful creek. The state of our streams reflects the well-being of our communities, and it is clear that the lower end of French Creek needs our help. Come out on May 4 and support your watershed!

--Kelsey Stanton, Watershed Restoration Specialist

“Upgrades,” from page 1

energy from the runoff. The runoff carries sediments and pollutants which are very harmful to fish spawning, fish food supply, and which overall are degrading this EV watershed. The flooding, especially in the bottom third of the watershed, is well documented and impacts landowners, townships, roads and is threatening the historic Knox covered bridge as well as Washington’s Headquarters.

GVA has mapped about 255 basins in the watershed. Many are decades old and not functioning properly. BMPs which improve basin function are well documented and cost effective; the emphasis now must be to scale up the number of retrofits. In recognition of the large number of basins which will need to be upgraded if water quality goals in the watershed are to be met, this project will utilize a streamlined design and implementation process.

This project is supported by and will benefit from the combined resources and experience of



Historic Knox covered bridge in Valley Forge National Historic Park. This landmark is vulnerable to increasing stormwater flows.

Freshwater Mussel Species, Conservation Codes, *“Mussels,”* from page 3

Freshwater Mussel Species found in Chester County in 1881		
Common Name	Scientific Name	PA Conservation Rank
Yellow Lampmussel	<i>Lampsilis cariosa</i>	S1
Tidewater Mucket	<i>Hydrobia ulter</i>	S1
Green Floater	<i>Lasmigona subviridis</i>	S2
Eastern Pond Mussel	<i>Ligumia nasuta</i>	S1
Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>	S1
Freshwater Pearl Mussel	<i>Margaritifera margaritifera</i>	S1
Triangle Floater	<i>Alasmidonta undulata</i>	S3S4
Elktoe	<i>Alasmidonta marginata</i>	S4
Eastern Elliptio	<i>Elliptio complanata</i>	S5
Alewife Floater	<i>Anodonta implicata</i>	S3S4
Eastern Lampmussel	<i>Lampsilis radiata</i>	S2
Eastern Floater	<i>Pyganodon cataracta</i>	S3S4
Creeper	<i>Strophitus undulatus</i>	S5

State Rank Codes and Definitions ¹	
S1: Critically Imperiled	<i>Extremely rare (often 5 or fewer occurrences) or in very steep decline</i>
S2: Imperiled	<i>Rare due to restricted range, very few populations (often 20 or fewer), or steep declines</i>
S3: Vulnerable	<i>Restricted range, relatively few populations (often 80 or fewer), or recent and widespread declines</i>
S4: Apparently Secure	<i>Uncommon but not rare; some cause for long-term concern due to declines or other factors</i>
S5: Secure	<i>Common, widespread and abundant in the state</i>

¹ PA Natural Heritage Program (PNHP), <http://www.naturalheritage.state.pa.us/RankStatusDef.aspx>

the members, participants and advisers of the Valley Creek Restoration Partnership (VCRP). Total project cost will be \$330,000, not including volunteer hours and in kind donations.

*--Victoria Laubach,
Executive Director*



Please join us...

Thank you for your support of Green Valleys Watershed Association. Our members have always been the heart of GVA and we appreciate your loyalty. We hope you will be an active participant in our mission of education, science, restoration and advocacy for our watersheds, making a real difference for the environment, natural resources and scenic beauty of Chester County. Please consider renewing at a higher level, adding an extra contribution to your membership, or make a supporting contribution to help preserve Welkinweir, home of GVA, where we live and demonstrate our mission.

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

MEMBERSHIP includes tri-annual newsletter subscription, notice of events and programs, and reduced rate to special programs, workshops, and summer environmental camp.

- 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

\$ _____

Tax Deductible Non-Membership Support

Please notify me of GVA volunteer opportunities.

Name _____

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or join online at www.greenvalleys.org.**

Dues and contributions are tax-deductible. Green Valleys Watershed 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.



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