Streamlines

Fall 2024

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Working with Farms to Protect Our Streams

With our current grant funding for assisting farmers and landowners with best management practices (BMPs) wrapping up, we thought this would be a good time to highlight our most recent projects at Ryerrs Farm and Nokota Preserve.

Ryerss Farm, a 501c3 nonprofit dedicated to providing retirement for horses, continues to make improvements to the pastures for their equine residents. Phase one which was covered in the Fall 2022 Streamlines, included the installation of a manure stacking pad, a crossing, and earthwork to address runoff from the hillside fields, which is working great according to farm manager Cory Mowrer. The manure stacking pad has been particularly successful!

Now, the second phase of work includes a stream crossing below the historic springhouse, installing a catch basin on the north side of the farm road to capture water runoff and piping this runoff into a buffer area, which will have an additional 200 trees planted this fall. The results of this work will give the resident horses a more level, drier pasture.

Stormwater Erosion Feature Before (2019 aerial)

and After Restoration

Our other current project is at the Nokota Preserve, a 501c3 nonprofit with a mission to preserve the American Nokota horse breed, the last descendants of Sitting Bull's revered pony. The farm was one of the parcels of a much larger farm that was subdivided with a dozen new large homes built uphill from the Preserve, affecting water flow onto the farm. Initially, the landowner worked with the Chester County Conservation District using PennVest funding to create a heavy use area / walkway, adding diversions and grassed waterways, and installing underground outlets, to do the right thing for the environment as well as the health of the horses. Unfortunately, the funding ran short to complete the work after those initial improvements resulting in pipes ending in the pastures, adding to the water issues being experienced at the farm.

Nokota Horses, The Preserve, Chester Springs

Looking to continue environmental improvements that also improve farm operations, we began to work with the Preserve in 2018, looking at the west side of the farm with the pond and pastures. The pond, likely installed in the 1940s or 50s, was silting in becoming shallow, attracted flocks of geese, and during summer turns completely green from excess nutrients, heating up, then send this warm algae water into the Exceptional Value Birch Run. The pastures were suffering from the heavy rain storms, uphill development, and changes to the adjacent road and road drainage.

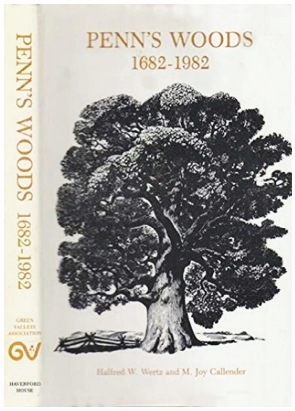
The project started with the removal of the spring-fed pond, then restoring the stream channel, and adding a gravel animal walkway that will give watering access to the horses. Wetland plants, similar to what exists onsite currently will be added along the stream channel, along with some shrubs and a few trees. The remaining work will extend the best management practices work begun on the east side of the farm, managing the water runoff and stabilizing the pastures.

Penn's Woods Celebrated

Artist Margot Taylor, inspired by the book Penn's Woods 1682 – 1982, by Green Valleys first executive director, Halfred Wertz, and M. Joy Callender, wondered how many of the documented trees were still alive, starting a multi-year search for the remaining trees. Her journey has resulted in this show she describes as:

"A visual homage to the trees that were alive in Pennsylvania, Maryland, New Jersey, and Delaware in 1682, when William Penn claimed his territory in Pennsylvania."

Working in ceramics and mixed media sculptures, Margot will be joined by photographer Carlos Alejandro, and mixed media artist Leah Well.



Sunday, October 20, 2024
from 2 to 4 p.m.
Welkinweir, 1368 Prizer Road, Pottstown, PA 19465
RSVP by October 14: welkinweir@greenvalleys.org

Community Nature Walks at Welkinweir

Welkinweir's diverse habitats – gardens, forests, meadows, ponds and stream – offer a home for wildlife. Join us on one of planned nature walks to learn about the flora and fauna that make this 224-acre property home. Walks are led by knowledgeable volunteers. Open to all ages (children must be accompanied by an adult).

Sunday, October 6, 8:30 a.m. – Walk in Penn's Woods
Friday, November 8, 7 p.m., Owl Prowl – Indian Run EE; Fee charged and registration is required.
Saturday, December 14, 8 a.m. - Bird Walk with Valley Forge Audubon Society.

Welkinweir Update

Building and grounds have been recieving some must needed TLC over the past 6 months. The main dam spillway and wing walls have been rebuilt again after weathering 25 years of storms since our previous rebuild. We have also finished transitioning to a new septic system for the estate house at considerable expense. Many thanks to the diligent work of GVWA's Welkinweir Committee in managing the Rodebaugh Trust that provides funding for this work.

After many years of staff mowing the dangerously steep hill below the Estate House, we hired (bought!) an electric robotic mower. This hill is now trimmed constantly--all without gasoline engine noise. Over the past several years we have steadily replaced many of our smaller gasoline powered tools with quality electrics--and we could not be happier with the reliability, power, quietness, light weight and safety.

Green Valleys Watershed Association mission is to protect, preserve, and restore the natural waterways of northern Chester County. We inspire, educate, and involve our community to make a difference for this generation and for generations to come.

Our headquarters is located in the French Creek watershed in East Nantmeal Township at Welkinweir, the former home of founding members Everett & Grace Rodebaugh. It is from here that the organization fulfils its purpose of watershed protection, environmental education, and land stewardship.

Open for visiting Monday to Friday 9 a.m. to 4:30 p.m.

1368 Prizer Road
Pottstown, PA 19465
Phone (610) 469-4900
Email gva@greenvalleys.org
Web www.greenvalleys.org

Cover Image:
Tiger Swallowtail on butterfly weed *Asclepia tuberosa*

Monarch Fall Migration--An Incredible Journey --Liz Willow

In Southeast Pennsylvania, late August into early September is the time monarch caterpillars are fattening themselves up in final preparation for their butterfly selves to migrate south to Mexico. Munching on their only food source, milkweed, this final generation of the summer becomes the migrating generation that will make their first and only trip south. On longer wings and larger bodies, the butterflies coast high above on air currents, conserving energy, and traveling up to 100 miles a day of the 2,000 plus mile trip. Living eight to nine months, instead of the summer adult lifespan of three to five weeks, they will not mate or lay eggs until the return trip to the United States, starting in Texas, next spring.

In Cape May, New Jersey, the Monarch Monitoring Project counts and tags traveling monarchs beginning September first through the end of October. The importance of having both milkweed as a food source for the caterpillars and fall flowers for the nectaring butterflies is paramount. The American Littoral Society, also headquartered in New Jersey, noted in their Underwater Naturalist publication article by author Rick Cech, "Monarchy in Distress, Disturbing Trends in the Viability of Monarch Migration", that not only butterflies, but all North American migrants, from songbirds and hummingbirds to bats and dragonflies, the destruction of traditional stop-over habitats by human developers continues to be a source of increased population stress.

If you see a tagged monarch, please take a picture or note the code on the last line of the tag and email it to tag@ku.edu or call 1-888-TAGGING. ch Egg

Monarch Egg

Monarch Second Instar

Campers Hear Monarchs Munching

Meanwhile, migration continues as they take off from multiple North American areas from southern Canada, east of the Rocky Mountains to just north of the Great Lakes, the northern limit of milkweed growth. Thousands are tagged each year as they pause in the stop-over habitat provided at the Cape May Bird Observatory. The excitement builds as the gathering monarch clouds begin to funnel over Texas, often detected by weather radar. By the end of October, they begin arriving at the wintering grounds in the moist, cool, but not freezing, mountainous portions of central Mexico. This is home to the Oyamel fir trees, where the butterflies cluster, conserving their energy, clinging to the branches and pine needles. On warmer, sunny days they will fly to nearby water where they drink. Sadly, although much of the monarchs' wintering grounds are preserved, the unique area is threatened by illegal logging and pressure from profitable Avocado farming. The area also becomes politically unstable and dangerous due to drug cartels.

The arrival of the monarchs to their winter home coincides with the joyful Mexican celebration, Dia de los Muertos, or Day of the Dead, in early November. The local indigenous people of the area, since before the Spanish arrival, have been annually honoring their traditional belief that the monarchs are the souls of their ancestors, who are returning to visit their relatives still on earth. Modern memorial celebrations include orange and black monarch themed parades, parties, traditional recipes and family ancestor stories.

Next March, the monarchs will leave their Mexican roosts, fly north and east looking for milkweed plants to lay their eggs on. The future of the entire population depends entirely on this migrating generation. Over the summer, there will be up to four generations, depending on the growing season, spread throughout the land. Before summer ends, there will once again be millions of monarchs all over the United States and southern Canada.

Monarch Chrysalis

Monarch Chrysalis

Monarch Adult

Campers at GVWA ECO Camp this year enjoyed a daily dose of monarch life from egg, to caterpillar, with all the instars in between, to chrysalis, and finally, the beautiful butterfly. Monarch rearing has also become a popular family activity and has evolved into cherished family traditions. The Xerces Society for Invertebrate Conservation, a champion of Monarch butterflies, credits these families and the public with providing needed information. "A lot of what we know came from community science. For decades, community members have been counting, tracking, and documenting through photos, tagging and other support. This is how we know how much monarch populations have dramatically declined since the 1980s".

Protecting Monarch Habitat

There is so much that all of us can do to accommodate the needs of Monarchs and other pollinators. First, simply learn about our native plants and let them grow wherever you can. Butterflies need both caterpillar (host) plants – the leaves that provide food to caterpillars as well as nectar sources, the flowers, that provide food for the adult butterflies (and hummingbirds as well as other pollinators).

Second, caring for your garden and habitat in a manner that is beneficial to monarchs and other pollinators. Don't use pesticides! Don't be super tidy – many butterfly caterpillars overwinter in leaf debris, so leave the leaves in garden beds and around trees. If you manage a meadow for pollinators, don't mow until after the first frost in the fall or before plant growth begins in late winter / early spring. Milkweed, with its strong underground root system, grow in clumps and can easily be mowed around once you learn to identify the plant.

Common Milkweed

About Liz: I have been raising monarchs every summer for 20 years. I am also a certified PA Master Naturalist with a background in journalism and environmentalism. My history with GVWA goes way back to the 1980s when I served on the Board and volunteered to edit GVWA's "Scene" newsletter. Over the last few years, I have brought caterpillars of monarch and black swallowtail butterflies, luna and sphinx moths to share with GVWA campers.

"I'm confident, because monarchs are resilient, with our help, they will save themselves."

Regulations Lag Legacy Sediment Science

Water quality impairments from sediments in our streams are a primary concern-but where does this sediment come from? The answer to this simple question has changed in recent years, and now includes a new source, Legacy Sediments (LS).

Institutional Knowledge For most of the past 40 years it is understood that when we see muddy streams we are seeing sediments from stormwater runoff. During stormwater events, water flows over exposed soils and carries the material into the streams. This view is reinforced every time we see sediment-laden runoff from a field or construction site. In the 1980s and 90s, as the Clean Water Act (CWA) is driving numerous programs to clean up non-point source pollution like sediments, this understanding is central to how these programs develop; over time, this understanding becomes ***institutional knowledge***.

Legacy Sediments Delivery to Stream

Legacy Sediment (LS) Recognized as Major Source of Sediments More recently, new studies have shown that eroding LS deposits are major sources of stream sediments--and thus stream impairments. LS deposits along streams are a potent source of heavy fine silts and clays which smother stream bottoms, support bacterial growth, increase unwanted nutrients, and impair fish and macroinvertebrates. To learn where LS came from, we must look back in time to when agriculture was the primary land use in our watersheds, when soil conservation practices were minimal or non-existent, and soil erosion extreme.

From the 1937 USDA Yearbook of Agriculture "*Erosion has practically destroyed for American agriculture more than 21,000,000 acres of land formerly in cultivation. Gullying is the visible evidence of the destructive effect of unrestrained rain wash. But the impoverishing effects of sheet erosion are far greater than those of gullying. This slow process, which carries away a part of the soil during every heavy rain, is gradually diminishing the productive capacity of 75 per cent of the crop land in the United States. All the crops grown in the United States annually remove about 6,000,000,000 pounds of plant food from the soil. Erosion annually removes about 21 times as much. Some 500,000,000 tons of suspended material are discharged into the sea by rivers every year. What reaches the sea is the finest, most minute material. The heavier sand, pebbles, and rocks are stranded somewhere along the way to form sand bars, new river bottoms, or new banks.* ***For every ton of sediment that reaches the sea, at least 2 tons are stranded along the way. At a conservative estimate, 1,500,000,000 tons of eroded material get into our river channels every year.***

Historical Erosion of Agricultural Soils Over the past 200 years there has been severe erosion of many tilled fields across Chester County. The arrival of powered tractors in the early 1900s increased erosion. By the 1920s, the issue of soil loss was well understood and in 1935 the Soil Conservation Service (SCS) was established and began collecting good quality aerial imagery across the nation's farmlands as part of a monitoring program. Erosion has declined in recent decades due to modern practices, depletion of highly erodible soils, and a marked decline in tilled acreage on steep slopes--but previously erosion in our watersheds was extreme, delivering massive sediment loads into our streams.

Mill Dams and Floodplains Store LS One result of these massive sediment loads is the accumulation of LS along stream corridors and behind mill dams. Soils that washed off the fields many decades ago builds up year after year as flat terraces, forming the LS deposits that are prominent features today. The 1937 aerial imagery taken by the SCS shows important features: extensive tilled agriculture and sediment choked stream corridors. To view the 1937 SCS aerials, GVWA has prepared a mapping application for the Pickering Creek Watershed[1]. Other online watersheds maps featuring this imagery are currently in production.

Rapid LS Erosion Today, streams are cutting away at these deposits, and the soils that left farms long ago are now returning to the streams after many decades of storage.

Failure to Adapt Today, there are numerous agencies involved in identifying on-land source of sediments and working to reduce these sediments with a wide array of BMPs. This regulatory structure includes watershed modelling of impairments, water quality assessment procedures manuals, impairment listings of water quality, BMP manuals, funding programs for restoration, and so on. Despite abundant evidence of LS delivering large loads of sediments into some streams, various agencies have not adapted their workflow to include LS. As one example of many, the *2024 Pennsylvania Integrated Water Quality Report* (1567 pages) is a key biennial report to the EPA containing exhaustive information about the condition, diagnosis, and restoration planning for every section of every stream in Pennsylvania, yet the term Legacy Sediment is absent, and eroding stream banks given only a cursory mention.

1. https://arcg.is/1mb1qP0

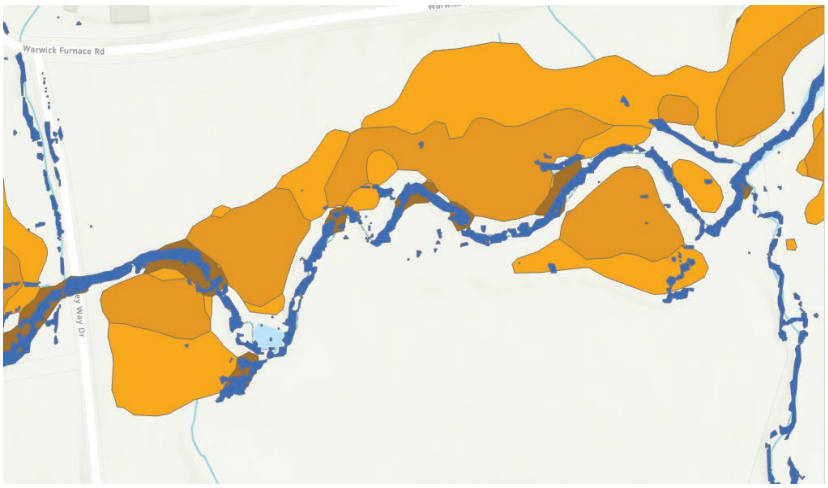
LS Impact Varies by Watershed The relative prevalence of LS deposits will vary greatly by stream reach due to both the features of the watershed and how much soil erosion has occurred in the past. Similarly, the rate at which LS is now eroding will also vary, based on stream channel features and peak flow velocities. But it is possible to quantify LS delivery to streams. For example, detailed analysis in the nearby Conestoga River indicates half of observed stream sediment is from erosion of LS--not agriculture[1]. For our local watersheds, we need good mapping of both the locations of LS and the erosion rates.

LS Hotspots GVWA is working on quantifying LS impacts in several local watersheds[2]. One of those watersheds is the South Branch of the French Creek (SBFC). SBFC is an elongated watershed with many stretches of low gradient reaches, abundant floodplains, and historically extensive farming on steep slopes. Due to these conditions, large LS deposits accumulated, which are today eroding extensively. SBFC is one of the watersheds locally where it is likely that LS is the primary sediment source. SBFC is also one of the very few local watersheds were Elliptio mussels are still found; reducing LS impacts here is a priority, as is ensuring any restoration work does not result in new sediment loading in these mussel areas.

South Branch French Creek showing a fine, heavy sediment layer. Elliptio mussels are visible in highlighted areas.

Moving Forward Currently, many agencies are committed to using watershed models to develop restoration priorities, as well as predicting the outcomes of the restoration work once completed. Watersheds are complex systems, and a modelling framework is essential to setting priorities and estimating outcomes. But if these models do not incorporate sediment delivery from LS, in many watersheds the models will be wrong. Incorporating LS into watershed models, watershed assessment manuals, watershed assessment reports, restoration BMP manuals, and restoration funding guidelines is overdue and very much needed in our watersheds.

Geomorphon Analysis for Mapping Legacy Sediments



Geomorphon-Based Legacy Sediment Delineation
South Branch French Creek at Valley Way

GVWA is working to identify and map LS deposits efficiently, not only to delineate local features in our watersheds, but also to provide input for regional analyses of how LS relates to nutrients, bacteria, and other instream parameters. Several Geographical Information Systems (GIS) approaches have been developed over the past decade, using both elevation and soils data. More recently, Geomorphic Analysis tools became available which are giving good preliminary results in terms of fast and accurate LS delineation. For the image at left, high resolution elevation data from 2013 LIDAR is processed to extract flat valleys. This approach scales well, allowing the automated extraction of LS features from elevation data at large geographic scales.

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7376757/
2. https://arcg.is/01nHbX

The health of our watersheds has been our focus for over 50 years.

Green Valleys Watershed Association is located in northern Chester County, Pennsylvania, where our scenic watersheds are comprised primarily of Exceptional Value (EV) and High Quality (HQ) waters. These streams are in the top tier in Pennsylvania. They are a precious resource.

JOIN US!

MEMBERSHIP *includes newsletter subscription, notice of special events and programs, and reduced rate to special programs, workshops, and Summer Nature Day Camp.*

Membership levels:

- ☐ Individual.....$45
- ☐ Family.....$60
- ☐ Naturalist.....$100
- ☐ Environmentalist.....$250
- ☐ Protector.....$500
- ☐ Preservationist.....$750
- ☐ Steward.....$1,000

I am a: ☐ New Member ☐ Renewing Member

☐ I am interested in including GVWA in my legacy planning.

☐ Please notify me of GVWA volunteer opportunities:

Name _____

Address _____

City, State, Zip _____

I would prefer to pay with: ☐ Check (*payable to GVWA*)

☐ Visa ☐ MasterCard ☐ Discover ☐ American Express

Credit Card #_____

Exp___/____CID_____Phone*_____

Email address*_____

**Phone & email needed to process credit card payments. We do not share your information with any other organizations.*

Detach this form and mail with payment to:

Green Valleys Watershed Association
1368 Prizer Road, Pottstown, PA 19465

Online membership also available at
www.greenvalleys.org/support

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