

# Streamlines

*Spring/Summer 2023*



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# A Sense of Place for All Children



With abundant outdoors available across Chester County, it is worrisome that children (and adults) as a group are not spending nearly enough time outside. There are countless articles that explore this issue, describing the many benefits from spending quality time outdoors, and the host of problems that come from not doing so.

For me the most important part about being outdoors is that it gives children a chance to develop a *sense of place*. *Sense of place* is a broad term describing how we fit ourselves into our local world. It encompasses the emotional connections we make with the natural world and the connections we make with the built environment as well. *Sense of place* includes the attitudes we

have about our local environment, how we view ourselves within this space, and ultimately how strong our commitment to caring for it is. To gain a strong *sense of place*, children need to be outdoors as early in life as possible, and visit frequently.

I have always enjoyed being outside in nature--perhaps because I began at such a young age. My earliest memories are of forested hills, old fields, creeks, simple, unpretentious gardens and of course horses and cows! Many in my generation can relate to time spent outdoors in their youth. Today, these experiences influence where they live and the activities they participate in – hiking, camping, hunting or fishing.

**So much becomes possible once a child is outdoors.** Physical proximity opens up worlds of actions and interactions. Unstructured exploration, guided activities, and vigorous play are all ways that children will grow. Environmental psychologists have emphasized the importance of childhood experiences and have quantified links between exposure to natural environments in childhood and environmental preferences later in life. Learning about surrounding environments during childhood is strongly influenced by the direct experience of playing, as well as through the role of family, culture, and community.



**Gardens are ideal places for young children.** Few things are as magical as a simple garden amongst the vigorous exuberance of nature. How we set out the borders between our gardens and the natural environment varies endlessly--but across these borders comes all manner of wild creatures, each as fascinating as the rest, and so much more so for the youngest among us.

This spring we have experienced a good increase in young visitors and their families exploring Welkinweir! Like most of Chester County, Welkinweir has so much to offer children as they begin their journey through life--yet relatively few are taking advantage of these resources. Let's change that!

*Victoria Janbach*



## Coming Fall 2023--Pandora's Garden

We are excited to announce a new program for toddlers!

Pandora Lorenzi, creator of Pandora's Garden (<https://pandorasgardenblog.com/>) is bringing her program to Welkinweir. Pandora moved to Philadelphia from London, England in 2005 and now lives near French Creek State Park with her husband and three children. With over 30 years' experience in childcare she has seen the calming effects and vital qualities nature provides children.



Pandora's Garden is a nature-based play class for toddlers, designed to create a love of nature and an appreciation of the magical wonders all around. Shared moments of awe and peaceful enjoyment strengthen this bond instilling a feeling of safety and happiness in nature. Young children tend to develop an emotional attachment to what is familiar and comfortable for them. The more personal a child's experiences with nature, the more environmentally concerned and active children are likely to become. If we want children to be environmentally responsible we should first help them to create a love of nature. Passion is more motivating than responsibility.

Classes are structured to explore each nature theme with hands-on experience developing creativity, imagination and intellectual curiosity. The length of the class provides time for unstructured play outdoors. Adults can enjoy a cup of tea in the open air as their children develop independence and free thinking.

In all classes nature themes are reinforced through a combination of songs, stories and nature based play activities. The younger ages will feel comfortable at ease playing with sensory nature tables, older children's curiosity will be ignited with a detailed look at the wonders of nature all around us.

## Welkinweir Organ Video Released

You won't want to miss this fascinating video about Welkinweir's 1928 Skinner Organ and Player (<https://youtu.be/oy1TSZd0Whw>). Filmed at Welkinweir this spring, this is the first of a two part series created by the Organ Media Foundation.

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 FULFILLS ITS PURPOSE OF WATERSHED PROTECTION, ENVIRONMENTAL EDUCATION, AND LAND STEWARDSHIP.

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## Impervious Cover Degrades Water Quality

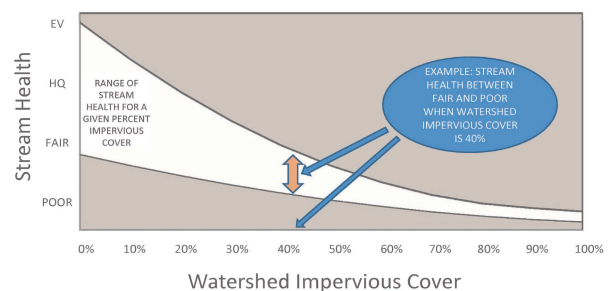
From 2001 to 2019, impervious cover across Chester County increased from 5.8% to 6.8%, a change of 1.0%. During the same time period, impervious cover in the entire Pickering Creek saw a similar increase of 5.1% to 6.7%, with comparable increases in adjacent French Creek. **However, along the Rte. 100 corridor, some watersheds in the headwaters of Pickering Creek and Birch Run (French Creek) underwent increases of 8% to 33%.**

What happens when many land development projects are focused into headwater streams? Impervious surfaces like roofs and roadways increase dramatically and water quality goes down. When these headwater streams are Special Protection Waters, such as the Pickering Creek, there is a stark collision between these accumulations of land development projects and the requirements to protect water quality.

**Special Protection Waters** In Pennsylvania, Special Protection Waters are Exceptional Value (EV) and High Quality (HQ); locally these include the French (EV), Pickering (HQ), Pigeon (HQ), Stony (HQ) and Valley Creek (EV). Special Protection Waters are protected by mandatory Anti-Degradation regulations which are designed to ensure that any new permitted activities do not degrade water quality or impact established uses of those streams, such as fishing or swimming. There are no exceptions to the Anti-Degradation rules for EV streams, and a single exception for HQ streams: the entity seeking approval of a permit that will negatively affect water quality must show that a lower water quality is necessary to accommodate an important economic or social development and that there are no other reasonable alternatives.

**Impervious Cover Total and Directly-Connected** Research that compares stream health with levels of impervious cover looks at both the total amount of impervious area in a watershed (TIA), and also the subset of that which is “directly-connected” (DCIA). DCIA surfaces deliver runoff directly into a waterbody without any treatment. TIA includes DCIA but also many other situations where the runoff does not enter a stream directly, such as when flow from a gutter downspout exits on to a lawn.

**Impacts of Total Impervious Area** This figure summarizes decades of research comparing TIA and stream health. Watersheds with higher levels of TIA and lower levels of natural cover will have more stormwater runoff and more pollutants. There will also be less natural infiltration of precipitation into the local aquifer, leading to decreases in essential baseflow into adjacent streams. Essentially, as impervious cover increases, the supply of clean cold water baseflow to the stream decreases, and stormwater runoff loaded with pollutants increases. The increased stormwater also drives stream bank erosion of legacy sediments, increasing sediment bed loads, smothering aquatic life and creating breeding grounds for microorganisms--including huge numbers of *e. coli* bacteria.



**Permitting** Permitting for new development projects above 1 acre of disturbance are evaluated by PA DEP for conformance with stream protection regulations. PA DEP will apply requirements for riparian buffer preservation, new riparian buffers, number of inches of rain which must be captured on site and so on. What is not required is an analysis of the impact that the increased TIA will have at the watershed scale--whether this is just the impact from the new project taken on its own, or the impact when the new TIA is added to existing TIA.

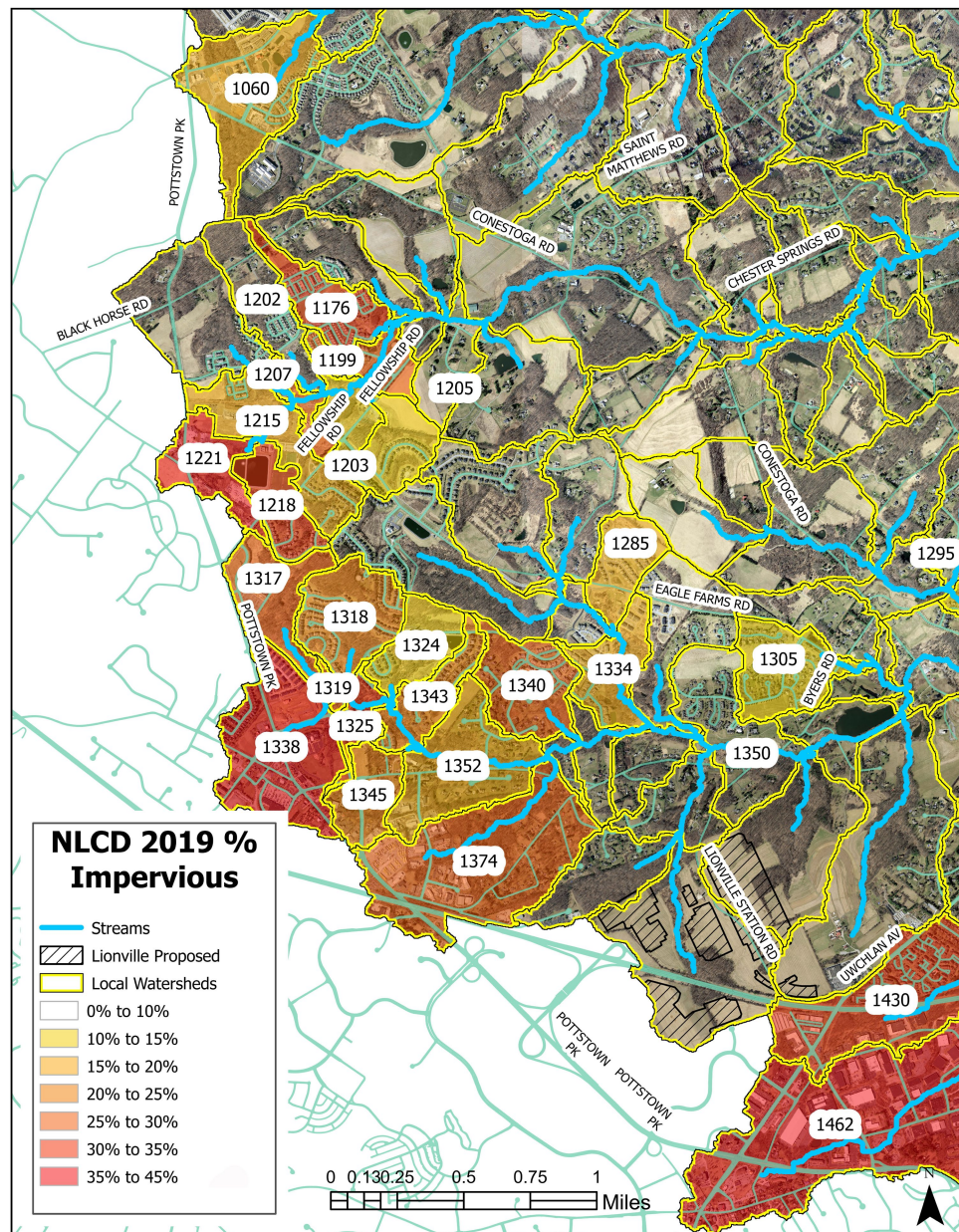


**Mapping NLCD TIA** The National Land Cover Dataset (NLCD) provides “complete, current and consistent” information about the Nation’s land cover. Recent NLCD products include impervious cover products that are directly comparable across years. The process of mapping impervious cover is straightforward and easily accomplished in GIS (Geographical Information Systems). Imperviousness data from the National Land Cover Dataset is summarized for watershed as percent. This gives 2001 data, 2019 data, and the percent change from 2001 to 2019.

**Pickering Headwaters TIA 2001 to 2019** This map shows the headwaters of the Pickering along Rt 100. The blue lines are the local streams, and the yellow/black lines are the borders of the local watersheds. The table shows the 2001 percent TIA, 2019 percent TIA, and the percent increase over that 18 years. Use the Watershed ID number to connect the table data with the mapped watersheds.

*For an online version of this map, click [here](#)*

Watershed ID	% imp 2001	% imp 2019	% change 2001 to 2019
1060	4.3%	18.6%	14.2%
1176	0.2%	33.3%	33.1%
1199	0.9%	25.1%	24.2%
1202	0.5%	9.8%	9.3%
1203	5.5%	14.4%	8.9%
1205	8.0%	13.5%	5.5%
1207	21.6%	26.0%	4.4%
1215	6.1%	18.6%	12.5%
1218	15.9%	34.3%	18.4%
1221	35.2%	38.7%	3.5%
1285	0.9%	19.2%	18.3%
1294	4.5%	12.2%	7.7%
1295	2.1%	14.9%	12.8%
1305	13.2%	13.1%	-0.1%
1317	3.0%	27.2%	24.2%
1318	1.3%	20.7%	19.4%
1319	0.0%	27.1%	27.1%
1324	0.4%	14.0%	13.6%
1325	1.4%	34.4%	33.0%
1334	0.5%	17.4%	16.9%
1338	18.7%	37.2%	18.5%
1340	11.0%	25.2%	14.1%
1343	0.1%	22.2%	22.1%
1345	17.3%	24.7%	7.4%
1350	9.1%	9.6%	0.6%
1352	18.0%	18.0%	0.0%
1374	26.9%	28.8%	1.9%
1430	31.1%	32.6%	1.5%
1462	42.7%	44.6%	1.9%





## Impervious Cover Degrades Water Quality (con't)

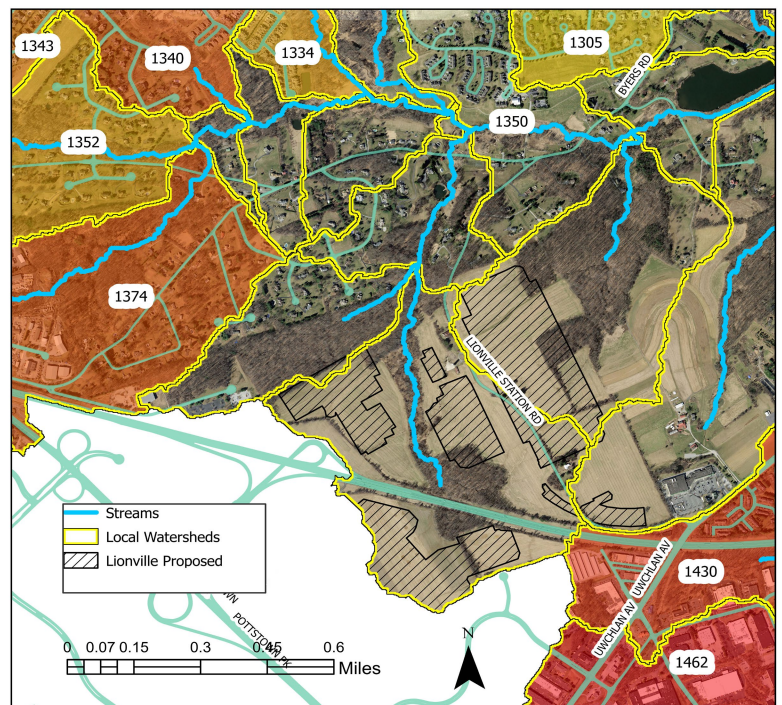
**Eight Million Square Feet of New Impervious Cover Proposed** Two new trucking centers are proposed for the Lionville area. Shown is the approximate footprint of the TIA that would be created by these projects. Two first order watersheds of the Pickering Creek would be permanently impacted by these jumbo-sized facilities. Dramatically increased truck traffic would also introduce a potent new source of non-point source pollution to local roads, as these trucks shed brake dust, tire dust, rust and operating fluids.

**Rte. 100 Corridor is Heavily Impacted** The excessive increases in percentages of impervious cover in first order watersheds along the Rte. 100 corridor during the time frame of 2001 to 2019 are the result of several factors:

- There are currently no watershed-based impervious cover limits being applied to new development plans in Chester County. It is not clear that this simple GIS analysis is even available to plan reviewers.
- Chester County's population grew from 440,000 to 540,000 residents during the 2001--2019 time period, while the county's gross domestic product more than doubled from 22 billion to 46 billion dollars. This population and economic growth are expected to continue in the years ahead, driving construction across the entire county and along Rte. 100 locally.
- Both township zoning and Chester County planning support the range and intensity of development projects that are resulting in high percentages of impervious cover along this section of Rte. 100.
- Green Infrastructure Design to reduce TIA and minimize its impacts are not deployed at the scale needed.
- Some of the impervious cover changes measured by the GIS analysis (page 5) are the result of planning and permitting which took place in the 1990s before there was a broad understanding of the impacts of impervious cover on water quality. That understanding was growing in the 1990s as the shift from mitigating point source pollution to mitigating non-point source pollution was underway.

**Citizen Support is Strong for Protecting These Watersheds!** Numerous public surveys of Chester County residents repeatedly highlight that protecting and restoring environmental health and water quality are top priorities for county residents. We value our quality of life and recognize the intrinsic worth of a healthy environment--every unnecessary loss of environmental quality affects all of us.

*This is the first of several articles reviewing the impacts of concentrated development on our watersheds.*



Proposed Warehouses with 1/4 Square Mile Footprint



## Toxic Compounds in Tire Dust

**Where do our tires go?** Our vehicle tires are constantly wearing away (and needing replacement), and the dust created builds up along roadways and in parking areas. This dust has long been understood to be a major source of microplastics, metals, and other kinds of non-point source pollution. *But recently researchers identified tires as the source of 6PPD-quinone, which is highly toxic to salmon and at least two local fish, rainbow and brook trout.* 6PPD is added to tires during manufacturing and is present in tire dust; 6PPD reacts with ozone to form the deadly 6PPD-quinone compound which is carried into the steam along with other pollution. Both rainbow and brook trout are stocked local species and important game fish in the area. Risk assessments are currently underway in several US states and other countries.



Brook Trout in Pickering Creek

## New Zealand Mudsnails

Pennsylvania has a new Invasive Aquatic Species (IAS)--the New Zealand Mudsnail (NZM). This is a tiny snail can easily be spread by fishing gear, boats and other equipment. NZM has the capability to reproduce rapidly and outcompete native snails and other macroinvertebrates.



New Zealand Mudsnails

Monitoring along the Schuylkill mainstem has identified NZM at several sites. In order to prevent the spread of this IAS, Pa Fish & Boat Commission provides this guidance:

Tips for New Zealand Mudsnails:

- Freezing gear for a minimum of six hours.
- Soaking gear in hot (>120 Fahrenheit) for at least five minutes
- Soaking gear in a 1:1 solution of Formula 409 Degreaser Disinfectant and water (Other typical aquatic invasive species disinfection methods and other 409 brand products are not effective in killing NZM)

Tips for Other IAS:

- When retrieving your boat for the day, check the boat, motor and trailer for weeds and other things “tagging along.”
- Wash your boat’s hull with hot water or with a high-pressure spray.
- Drain livewells, bilges and other compartments.
- Drain all standing water from your boat.
- Don’t dump leftover bait into the water you’re fishing, unless you collected the bait there.



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