



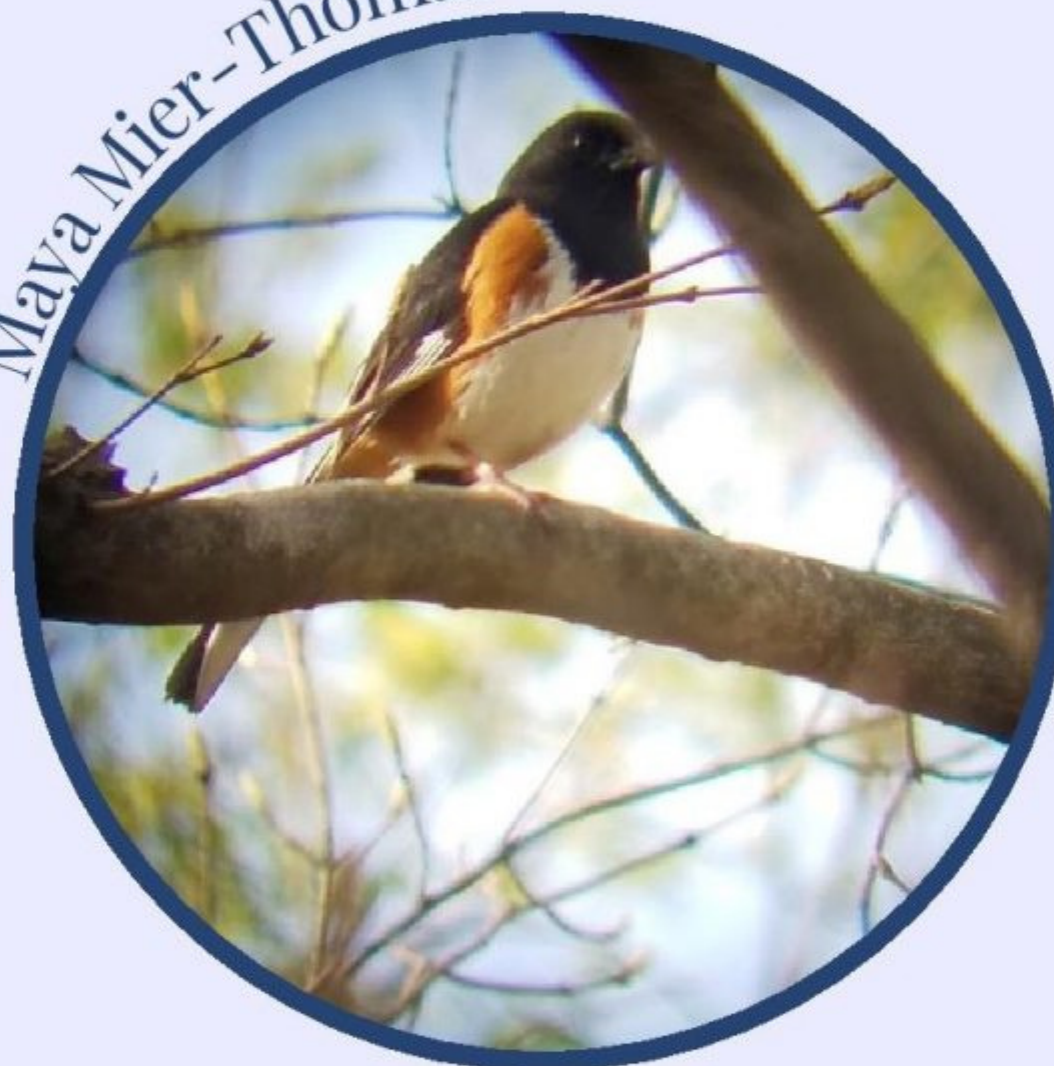
David Smaldone

# Friends of Deckers Creek State of the Creek Report 2021

Adrian Olmstead



Maya Mier-Thomas



Kevin Barr



**Our Mission:** To improve the natural qualities of, increase the public concern for, and promote the enjoyment of the Deckers Creek Watershed.



# Rain Gardens: DIY Water Conservation

by Michaela Collins - Current FODC AmeriCorps

At home water conservation can be notably more rewarding than just turning off the tap while you brush your teeth. Rain gardens are a depressed area in your landscape that collect water from your roof, gutters, driveway, etc., and are planted with native grasses and perennial plants. They are a low maintenance, cost effective, and aesthetically pleasing way to practice water conservation in the community or in your own backyard.

The environmental benefits from planting just one rain garden on your property are numerous. For example, your garden will filter out pollutants and nutrients that would otherwise end up in the creek. The grasses and flowers slow down water runoff, allowing their root systems to soak up the water and nutrients they need, then giving what's left over time to settle and recharge the groundwater supply. Slowing down runoff also means hindering erosion and flooding. Erosion of stream banks leads to increased sedimentation, which not only makes the water look brown and murky, but degrades habitat for the wildlife and plants that live in or rely on the creek. Flooding is an issue that frequently impacts the Morgantown stretches of Deckers Creek watershed due to the city's combined sewage overflow system. Heavy rainfall and subsequent flooding leak water contaminated with nitrates and coliform bacteria directly into the watershed. Rain gardens are incredibly effective at lowering runoff and the multitude of messes it carries into the creek.

Studies have shown that given the average U.S. rooftop size of 1,400ft<sup>2</sup>, a rain garden designed to catch half of the rooftop runoff will capture ~430 gallons of water during one 1" rainstorm. At the cost of \$3 - \$5/ft<sup>2</sup> for self-installation, rain gardens are quickly gaining popularity for being one of the best and most beautiful water conservation systems.

## Interested in creating your own rain garden? Consider the following guidelines:

- 1) Use native plants that are drought tolerant and can withstand wet soils  $\geq$  24 hours. Natives adapt quickly, attract native bees, butterflies, and other helpful critters, and do not need pesticides or fertilizers.
- 2) Depending on soil type, your garden should be at least 20-30% the area of your roof, with a depth of 3-12 inches.
- 3) The best shapes for your garden are kidney and teardrop.
- 4) Purchase plants from a nursery instead of starting with seeds.



RainDogDesigns.com/wordpress



## Native Plant Recommendations

Bee Balm	Bluestem Grass	Cardinal Flower	Joe-Pye Weed	Soloman's Seal	Veronica
Blackeye Susan	Burning Bush	Coreopsis	Mountain Laurel	Spicebush	Virginia Wild Rye
Blue-Eyed Grass	Butterfly Weed	Goldenrod	Rattlesnake Fern	Switchgrass	Windflower

## Check Out FODC's New Kiosks!



Learn about FODC, our treatment sites, and much more as your walk, run, or bike the scenic Deckers Creek Rail Trail! We recently installed two new kiosks - pictured is the Slabcamp Run treatment site kiosk, which you can find near the intersection of the trail and Mckinney Cave Road in Reedsville, WV. Stop here to learn about one of our passive acid mine drainage treatment systems.

The second kiosk is located at the Masontown Trailhead, where you can enjoy the park and read up on the Deckers Creek watershed as a whole: the challenges, the community, and the future!

In partnership with Mon River Trails Conservancy, Preston County Parks & Recreation, WVDEP, and the EPA

# Fish Biodiversity in Deckers Watershed

by Michaela Collins - Current FODC AmeriCorps

Fish. When most people hear that word, fry tends to follow, but fish are so much more than filets and canned goods. At their most basic level, fish are cold-blooded, oftentimes scaled vertebrates with gills. They're the first animals known to develop bones over 500 million years ago, can be found in nearly every type of aquatic environment, and are the most diverse group of vertebrates with 34,300 discovered species. They have inarguable inherent value alongside cultural, economic, recreational, and ecological worth. They represent religious beliefs and star in films, account for \$164 billion in international trade, provide 1/6 of the world's protein, and are an integral piece of both aquatic and terrestrial ecosystems.



Jacob Simpson

Small Mouth Bass

At FODC, fish play a major role in helping us fulfill our mission of remediating the watershed. There are three major components we look at when managing our remediation: 1) Water Chemistry 2) Physical Habitat 3) Biological Composition. Fish fall under the third category, biological composition. As biological indicators, the health and status of their population in a water body can give us insight into the health and status of the ecosystem as a whole. There are a multitude of factors used to evaluate their population and what that means for the health of the watershed, one of which is diversity.

Population diversity is the number of different species present in a community (aka *species richness*) and the *relative abundance* of each of those species. Why is fish biodiversity important? Because it affects the capacity of the entire ecosystem to respond to changes - whether they be on a relatively small scale like the stream channelization near Marilla Park, or large scale like global climate change. Having high diversity can be compared to having a strong foundation for your home: it provides stability. Biodiversity establishes the ability of the ecosystem to function, and provides the "goods and services" that support human interest. Finally, as science is always evolving, there is option value, meaning there are some benefits of diversity that are not yet known, but may be realized in the future.

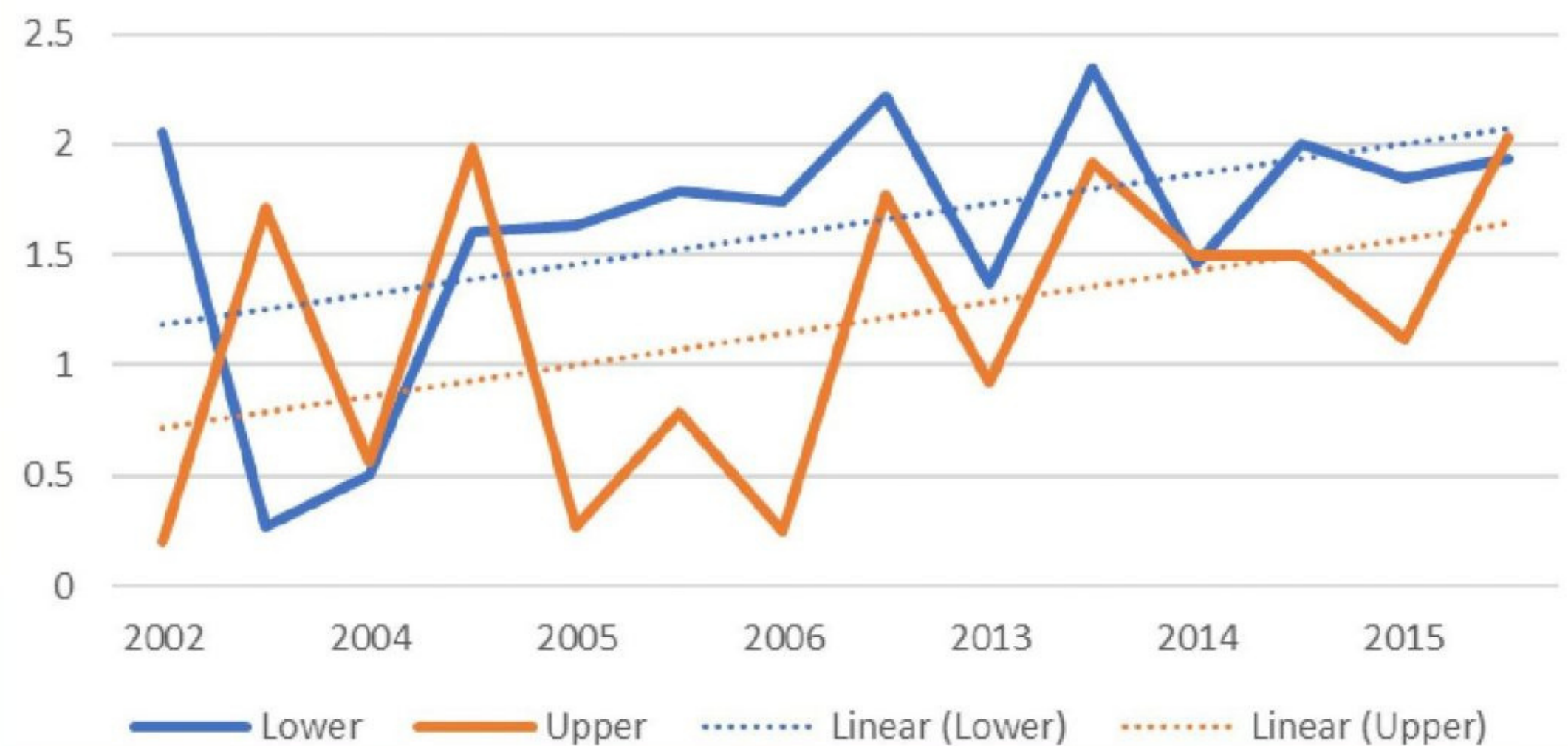
As FODC has been ushering in a "new era" under Executive Director Brian Hurley, we decided to look back at the fisheries data collected by our predecessors, and examine what their measurements could tell us about the fish diversity in both the upper and lower watershed over time. We looked at data sets from the very first collected in 2002, up until the most recent congruent set, and analyzed using the Shannon-Wiener Index of Diversity. The Shannon Index is one of the most widely used metrics in ecological studies, and tells us how diverse the species in a given community are. Interpreting the results is simple: the higher the index (or H value), the higher the diversity of species in the sampled community. The lower the H value, the lower the diversity. If  $H = 0$ , that indicates zero diversity, meaning the community has only one species. While technically there is no upper limit to the index, real-world ecological data typically ranges from 1-4.

The Index Formula:

$$H' = - \sum p_i \ln p_i$$

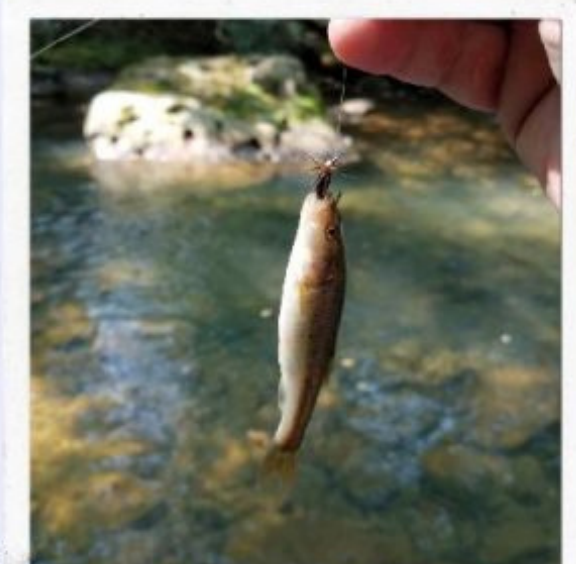
## Fish Population Diversity in Deckers: Upper VS Lower

Using the Shannon-Wiener Diversity Index



Using the Shannon Index, we calculated the H value of multiple upper and lower Deckers Creek watershed sites by year. We then added our H values as data points in the line graph above, giving us a visual representation of the changes in fish diversity over time between the upper and lower sections of the watershed (represented by the solid lines). The dotted lines on our chart are the trendlines, sometimes referred to as lines of best fit, and are an analytic tool used to show the general pattern or direction of the data over time. Observing our graph, it is clear that despite the highs and lows between our individual data points, we can conclude that there is an obvious overall upward trend in the fish biodiversity in both the upper and lower Deckers Creek watershed over the observed period of time. Although this is only one criterion used to evaluate our data, it is affirmative evidence that our remediation efforts have a tangible, positive impact on fish population diversity, and in turn the watershed as a whole.

In conclusion, while the results of our mini fish biodiversity assessment are encouraging, our mission to clean up our watershed and connect with our community is far from over. Looking forward, FODC is working to rekindle a close partnership with WVU Fisheries to help us routinely sample fish on an annual basis. We're also revamping our fish sampling protocol, exploring grant options for expanding our sampling equipment, and continuously keeping up-to-date with the most recent science from around the world so we can best manage our fish and our creeks!



Bret Goddard  
Creek Chub

# Treatment Site Spotlight: Sandy Run

by Jonathan Suite - Operations Manager

As recently as 2011, Kanes Creek, one of Deckers Creek's major tributaries, could be measured to have a pH of 4.6 near the Morgan Mine Road Deckers Creek Rail Trail crossing. Kanes Creek and its tributaries were heavily polluted and largely devoid of life due to the untreated Acid Mine Drainage (AMD) flowing into them. Skipping forward ten years, we've measured huge improvements in the water quality of the Kanes Creek and its tributaries. In fact, last year we conducted an in depth study of the entire Kanes Creek subwatershed, and the results were surprisingly good (check out the Kanes Creek Study at [www.deckerscreek.org/sotc](http://www.deckerscreek.org/sotc) for more details). Why have we seen such a turnaround in Kanes Creek's water quality within the last decade? The largest contributor may be the five AMD treatment sites that FODC has built within it's watershed.

Between the construction of the Upper Deckers Impoundment in the early 1970's (by the office of Abandoned Mine Lands and Reclamation), the first water quality improvement project in the Kanes Creek watershed, and FODC's completion of the Sandy Run Renovation in mid 2021, a lot of intervening work has taken place. Of the 7 AMD treatment sites that FODC currently operates, 5 are located in the Kanes Creek subwatershed. The completion of the Sandy Run renovation can be seen as one of the final pieces in the puzzle of remediating Kanes Creek.



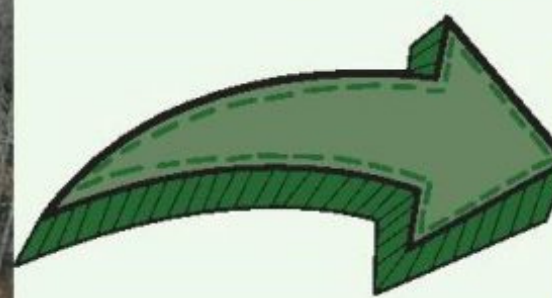
*Aerial view of recently renovated Sandy Run treatment site.*



**Before**



**After**



*Over the course of 2020 and 2021, old limestone was replaced, clogged pipes were cleaned, limestone channels were enlarged, automatic flushing beds were installed, and one settling pond was split into two.*



**Ground-level view of the Satcher Pretreatment Portal**

By early summer 2021, the renovations were complete and the Sandy Run treatment site was brought back online. Mine drainage flows into the site at an average pH of 2.86, and exits at 7.13, but the increase in pH only tells part of the story. Each year, we can expect the Sandy Run site to remove 98% of the AMD load that would otherwise make its way into Kanes, and then into Deckers Creek. That's a total 22,399lbs of acidity, 1,277lbs of dissolved Aluminum, and 2,522lbs of dissolved Iron being kept out of our water every year!

Oh, and about the Morgan Mine Road sampling spot I mentioned in the opening paragraph? Over the past year of monitoring, FODC has found its pH to be between 6.9 and 7.6. Over the past decade we've seen such an improvement in Kanes Creek, but FODC's work is still far from complete; we're currently planning two treatment sites in the Dillan Creek subwatershed, and in a few years we hope to be able to write about a similar remediation success story there.

*The Sandy Run AMD Treatment Site renovation was completed by Friends of Deckers Creek with funding from the WV Department of Environmental Protection, the Environmental Protection Agency, and The Office of Surface, Reclamation, and Enforcement. Aerial photos made possible by The Appalachian Stewardship grants program.*

# A Letter From Our Executive Director:

## My Observations on Climate Change by Brian Hurley

It is my opinion that climate change is real and I believe humans are catalysts for the global impacts. I started out this article intent on doing a review of the recent peer-reviewed scientific journal that “highlights distinct fingerprints of anthropogenic activity in Earth’s changing energy budget” (Kramer et al. 2021). If you have access to peer-reviewed scientific journals, the article is *Observational Evidence of Increasing Global Radiative Forcing* by Kramer et al., published March 25, 2021. I was able to find the summary online but not full text through my available resources. This peer-reviewed journal “serves as direct evidence that anthropogenic activity has affected the Earth’s energy budget in the recent past” (Kramer et al. 2021). When I was trying to track down this particular journal article, search algorithms led me to darker corners of the internet one inevitably finds while searching anything politically charged.

In an effort to outsmart the algorithms I tried numerous variations of: *climate change real* and *climate change hoax*. I was quickly overwhelmed by extreme headlines, such as “Climate change will melt the ice caps entirely by the end of the decade,” and before long, I was deep in internet hysteria. Not all headlines were that radical, and not all articles were very convincing. Convincing arguments or not, I did find myself in darker corners before I remembered *Google scholar*, which searches peer reviewed scientific publications. Once there, my confidence in the articles’ reputability skyrocketed. There, I only found articles that concluded human factors impacted the global climate. Yet I still couldn’t find free access to the article I was looking for. Feeling discouraged about the article, I started reflecting on my personal experience with climate change.

I still wanted to write something about climate change, so I decided to “run with” my personal observations. Growing up, my friends and I were always excited when December rolled around. Back then, we could count on a few snow days each winter to get us out of school. Each winter, we would keep our fingers crossed that school would get cancelled for a week straight, thank you blizzard of 1996! (some things never change) Moreover, we could count on the lake by my house freezing. When it did freeze, a small group of friends and I would play pond hockey and after a few days, the community would come out and join in the fun. Yes, some winters were colder and snowier than others, but we would always have snow days and a few more ice skating days. High school into college, those days were fewer and fewer. Now, the lake hasn’t frozen in years and nor has snow accumulated.



Wisp Resort in February 2017  
Steve Bittner/Times-News

I moved to Morgantown in the mid-2000s and I can recall the best winters off the top of my head, they were 2009-2010 and 2020-2021. Don’t get me wrong, there were a few good snow storms outside of those winters, but in February of 2017 Wisp had to temporarily close for a lack of snow. That same season, Timberline Resort in Canaan Valley had to close during the weekdays to conserve snow for the weekends. These early and weekday closings had never happened before. This isn’t just happening in the mid-Atlantic region, there are countless similar stories out west. One particular example takes us to Alaska. In 2016 there was a dramatic lack of snow during The Iditarod dog sled race. Several train cars were loaded with snow to be transported into Anchorage to provide ground cover for the ceremonial start. Despite trainloads of snow, the eleven mile ceremonial start had to be shortened to three miles and a trail reroute was required. 2015 told a similar story. I remember one particular interview of a local skiing legend in the late 2000s, he talked about Canaan Valley having two poor winters in a row. At the time, that was unprecedented. These days, it is normal to see 4, 5 or 6 poor winters in a row before a good one. Life time residents of Morgantown, throughout Preston County and particularly Terra Alta tell the same story.

Reflecting on my short time on earth of less than 40 years, I have observed a tangible and stark reduction of snow days and warmer temperatures in the mid-Atlantic region. Scientists see it, local residents see it and I see it. 40 years is a very short time, infinitely shorter on a geologic time scale and already I have observed climate change. I have observed an anthropogenic impact on the global climate. What started as a review of a peer reviewed scientific journal, took me to darker corners of the internet, and ended up as a personal reflection on climate change. I don’t know about you, but tomorrow I think I will ride my bicycle to work.



Iditarod 2016 Start  
Bill Roth/Alaska Dispatch



Iditarod 2009 Start  
Jason Parks/Dreamstime.com

# Species Highlight: Least Brook Lamprey

*(Lampetra aepyptera)*



Richard Orf 2009 /

<https://www.flickr.com/people/dragonflyhunter/>

- Common, non-parasitic fish with no jaw, no paired fins & 7 circular gill openings.
- Found in Aarons Creek, a tributary to mainstem Deckers Creek in: 2002, 2005, 2006, 2009, 2010, 2011, 2014, and 2015.
- Habitat: Clear, clean riffles/runs of cold water creeks with mixed gravel substrate.
  - Coal mining, oil/gas development, erosion, timber harvesting, habitat fragmentation, and poor wastewater management can all negatively impact lamprey habitat.

## I'm a Friend of Deckers Creek!

- |            |                                   |
|------------|-----------------------------------|
| ___\$10    | Student                           |
| ___\$25    | Individual                        |
| ___\$50    | Family                            |
| ___\$75    | Establishing                      |
| ___\$100   | Benefactor                        |
| ___\$300   | Clean Creek Program (CCP) Sponsor |
| ___\$500   | Major Donor                       |
| ___\$Other | A Friend is a Friend              |



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*Renew membership online: Visit  
[www.deckerscreek.org](http://www.deckerscreek.org) and click on "Donate"*

**Friends of Deckers Creek**  
**PO Box 877**  
**Dellslow, WV 26531**

- |          |                                   |
|----------|-----------------------------------|
| ___\$60  | Business Member                   |
| ___\$150 | Event Sponsor                     |
| ___\$300 | Clean Creek Program (CCP) Sponsor |
| ___\$500 | Major Business Donor              |

## Other Ways to Support FODC

Volunteering, in-kind donations, and being an advocate are all ways you can help build a healthier watershed and community.

Support while you shop! By using Amazon Smile and/or Kroger Community Rewards, and selecting Friends of Deckers Creek as your charity of choice - you can help clean up the creek in your day-to-day activities.



Shop exclusive FODC merchandise! Visit our online shop by going to [Redbubble.com](http://Redbubble.com) and searching "FriendsofDecker." Browse our products featuring three unique designs!

Follow us on social media to stay connected and share with your friends and family!

Friends of Deckers Creek @fodc\_wv

## THANK YOU for Making Our Mission Possible

WV DEP, EPA, Dr. Thomas & Hope Covey, Joan Gorham, Dr. Darren Tanner, Marc Tanner, George Street, Susan & Don Sauter, Vicky Shears & Dan Doyle, Sarah & Walter Veselka, Rodney Rice, Carol & Ken Means, Francis Mulkeen, and all of our other volunteers, donaters, supporters, and friends of the creek!