



# The Health of the Shenandoah River

Seneca Valley Trout Unlimited  
14 September 2020

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[mark@shenandoahriverkeeper.org](mailto:mark@shenandoahriverkeeper.org)



# WHAT'S HURTING OUR RIVER?



BACTERIAL POLLUTION  
SEDIMENT POLLUTION  
LEGACY TOXINS  
CLIMATE CHANGE  
NUTRIENT POLLUTION  
THREATS TO PUBLIC ACCESS



# Agenda

- Atlantic Coast Pipeline
- River Herd Campaign
- EPA Lawsuit
- Mid-Atlantic Smallmouth Bass Health Assessment
- Potomac River SMB Supplemental Stocking
- Shenandoah Watershed Compact
- Respect the Shenandoah Campaign

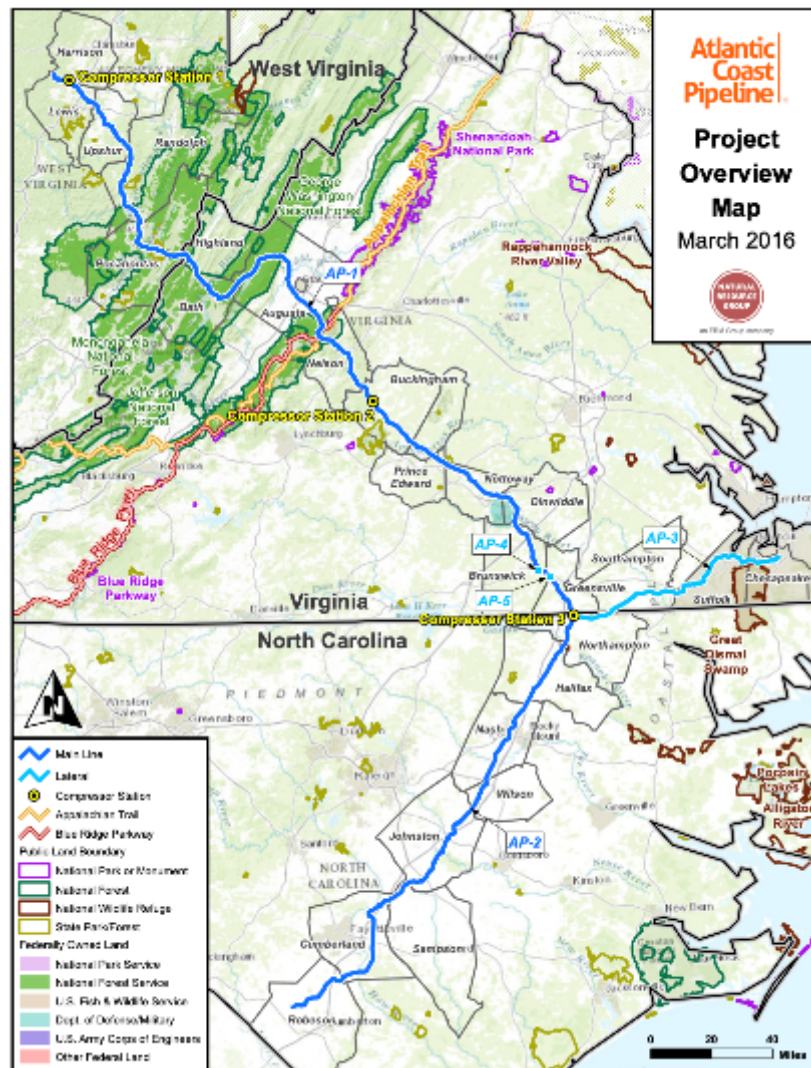


# Atlantic Coast Pipeline





# ACP Map





# Atlantic Coast Pipeline

- Proposed 600-mile natural gas pipeline; cuts across the headwaters of the Shenandoah
- A 42" pipe, requiring excavation of an 8 to 12-foot-deep trench and a 125-foot-wide construction corridor
- Major legal challenges
  - FERC Certificate
  - Forest Service Permit
  - Fish & Wildlife
  - National Park Service Permit
  - Buckingham County Compressor Station Air Permit



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*Our mission is to protect and restore water quality in the Potomac River and its tributaries through community action and enforcement.*







River Herd Campaign





# Where are we?



First Cattle Census	76
Herds no longer accessing the river	<u>27</u>
Herds w/pending cost share programs	<u>49</u>
Filed ASA Complaints	<u>25</u>
Remaining Herds	24
	<u>20</u>
	~ 4



# Major Legislative Victory

- HB1422/SB704
- Sets 31 Dec 2025 as voluntary deadline
- If not met, will require the use of nutrient management plans and livestock stream exclusionary fencing

Devil is in the details...and  
there is more to be done

# Do We Really Need Improved NMPs?



# Visiting With Owners Of Problem Feedlots



Getting Them Fixed!!





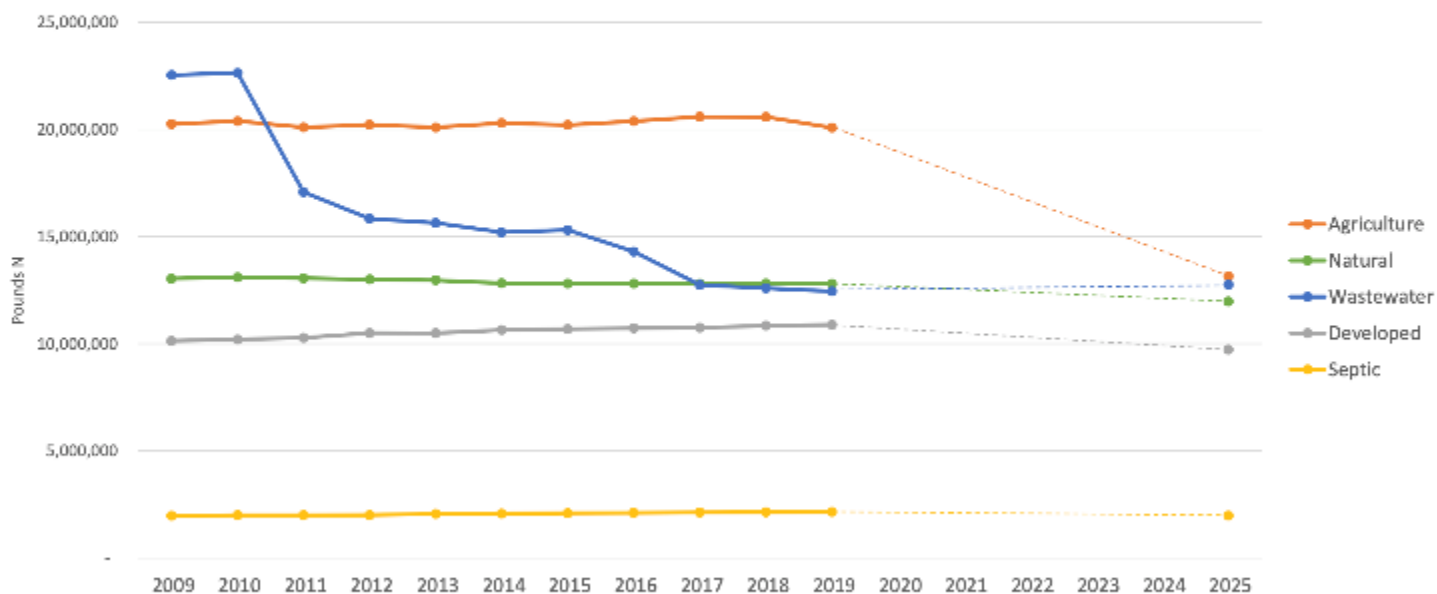
## SRK EPA Lawsuit

- Filed lawsuit on 30 May 2017, DC District Court
- Challenged EPA's decision to approve Virginia's List of Impaired Waters
- Algae blooms 'impaired' the river for recreational use – swimming and boating.
- Lost in District Court and then this past March lost in Federal Appeals Court





## Virginia Nitrogen Loads (CAST2019, Delivered)

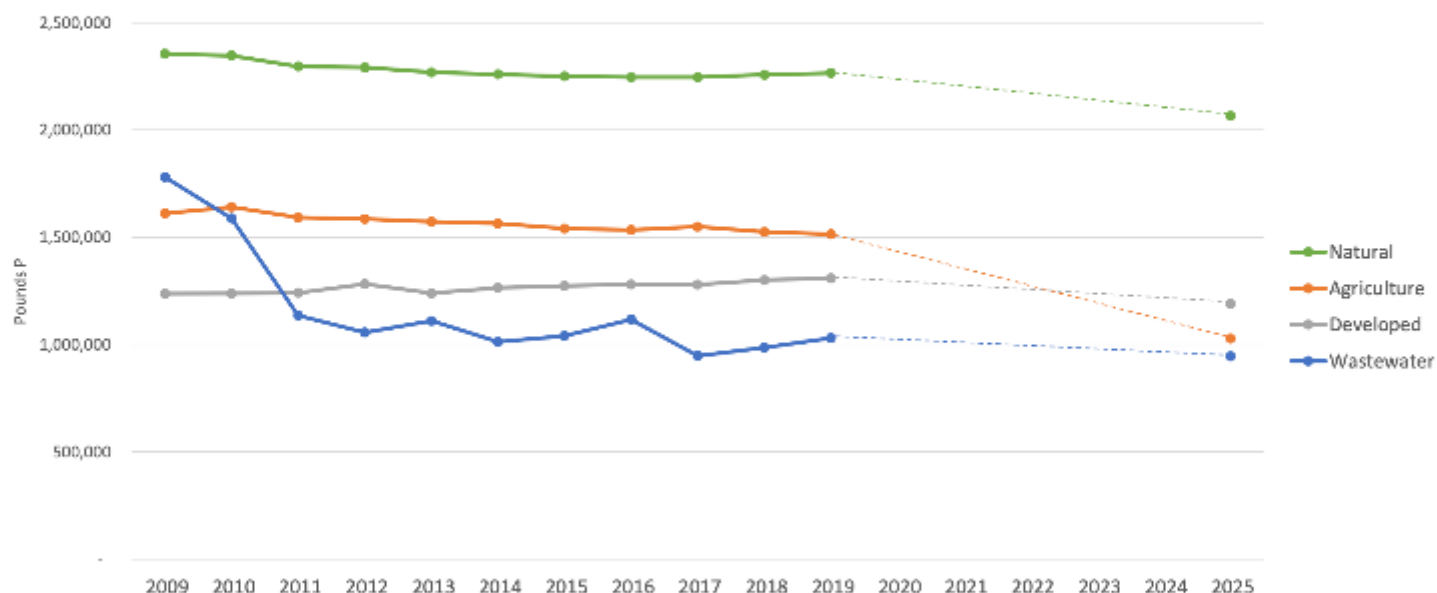


Virginia Department of Environmental Quality





## Virginia Phosphorus Loads (CAST2019, Delivered)



# Isolating Algae Sources – Making Them Public









# Blue Green Algae





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# Mid-Atlantic SMB Health Assessment



- <https://www.potomacriverkeepernetwork.org/executive-review-2019-mid-atlantic-smallmouth-bass-health-assessment>

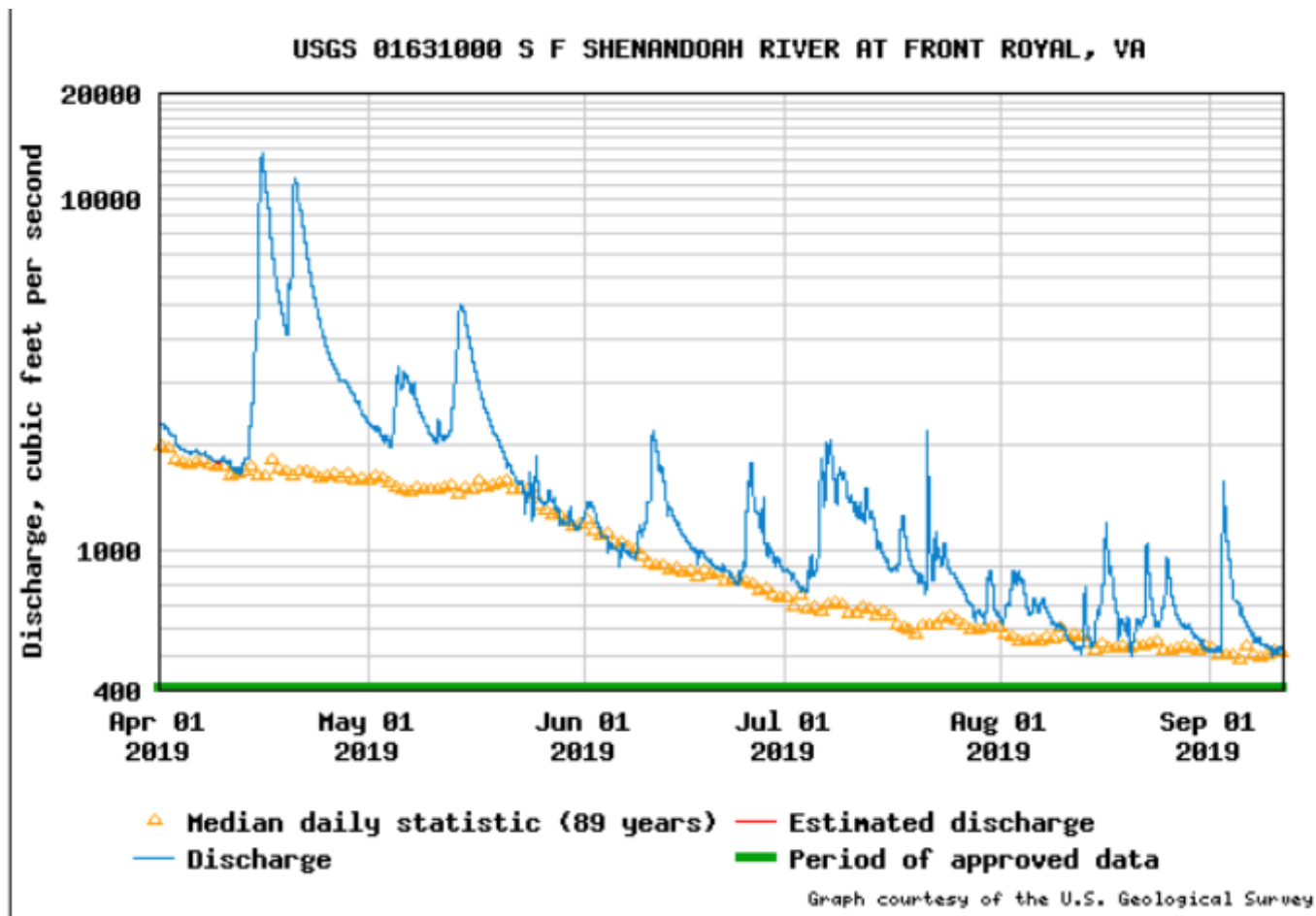


# Health Assessment Findings

- Six of the highest top May flows over the last 100 years have occurred in the last 10 years.
- Dramatically impacting the spawn
- Disappearance of one to two year old SMB
- Not just climate change, however

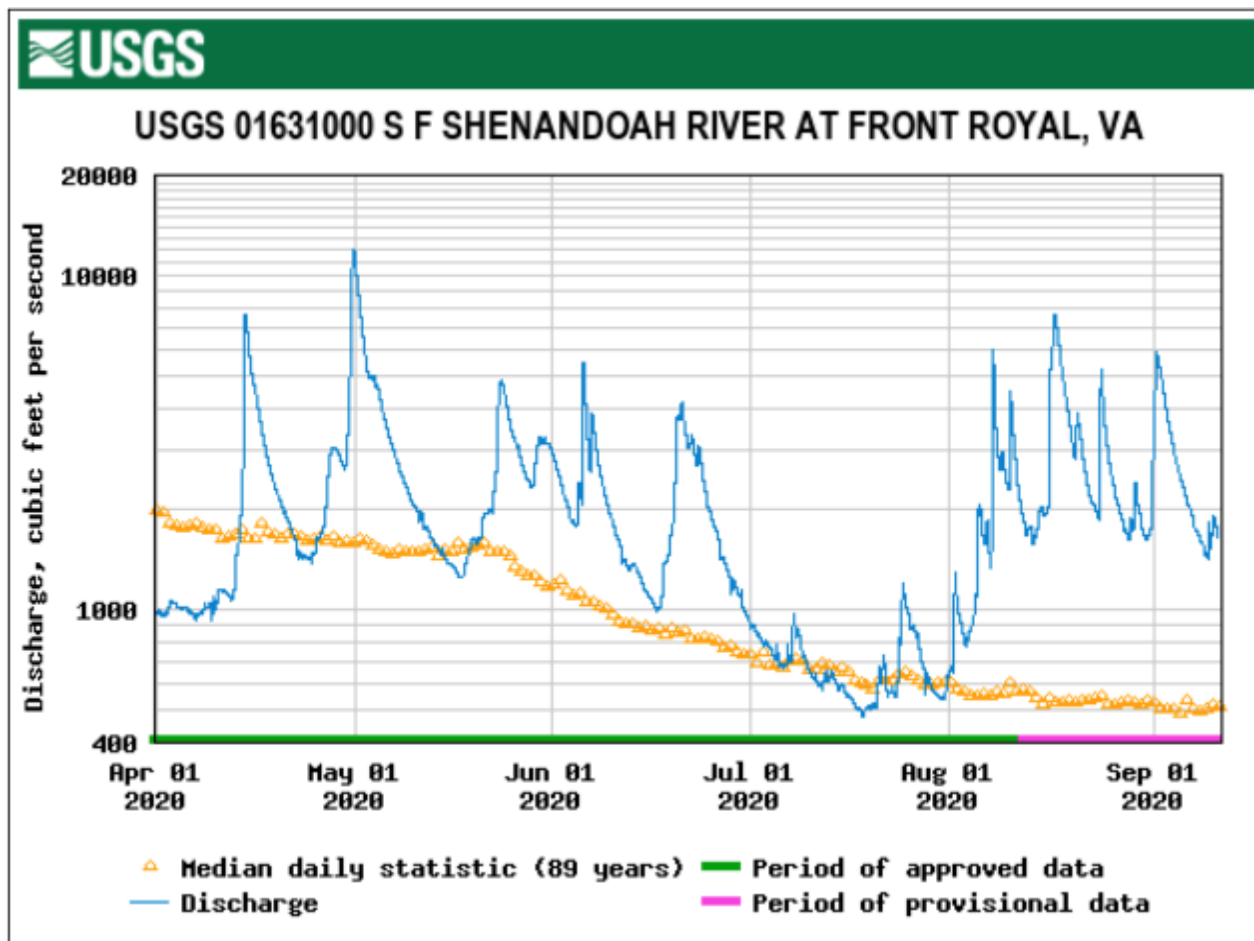


# Front Royal Gauge 2019



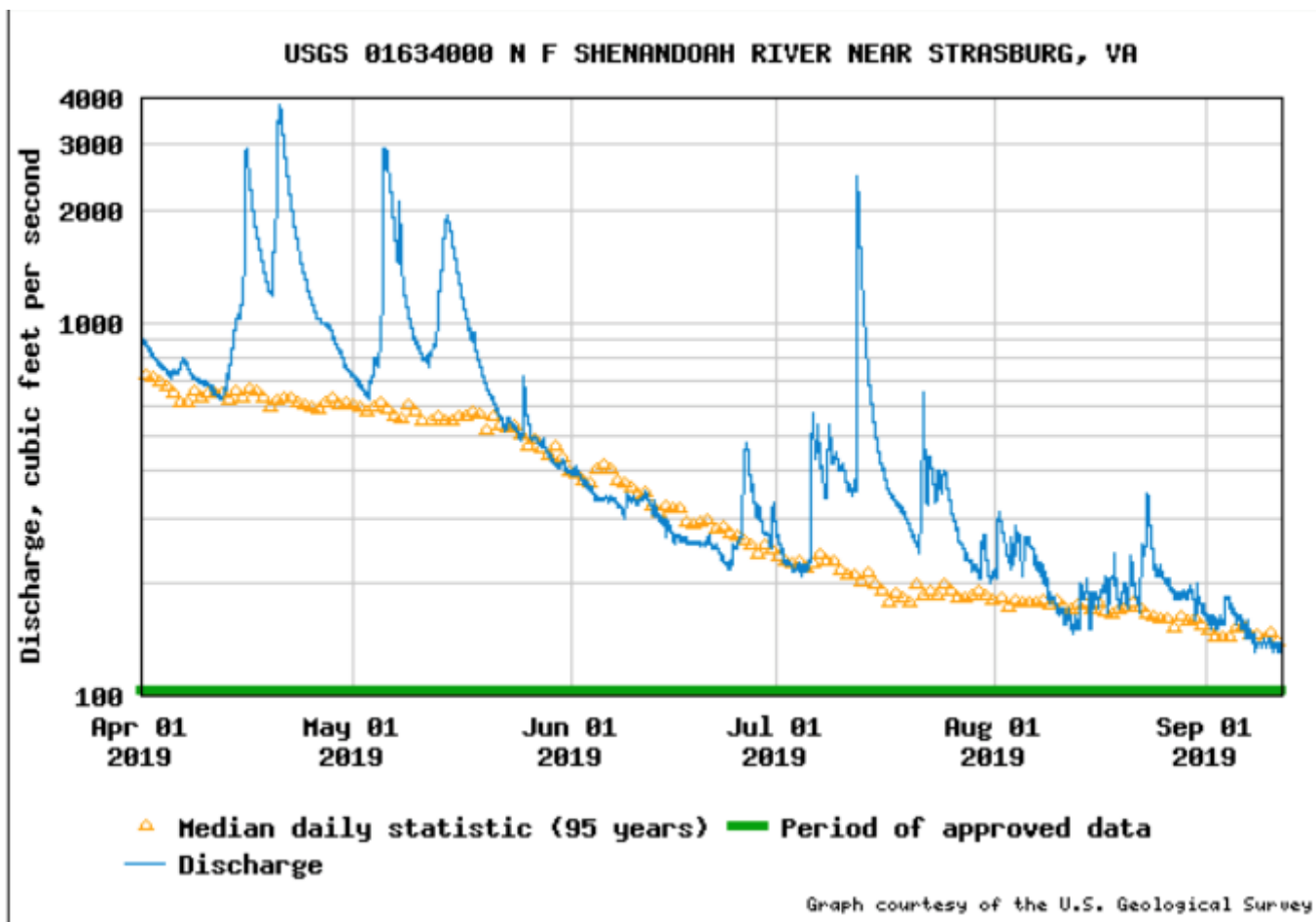


# Front Royal Gauge 2020





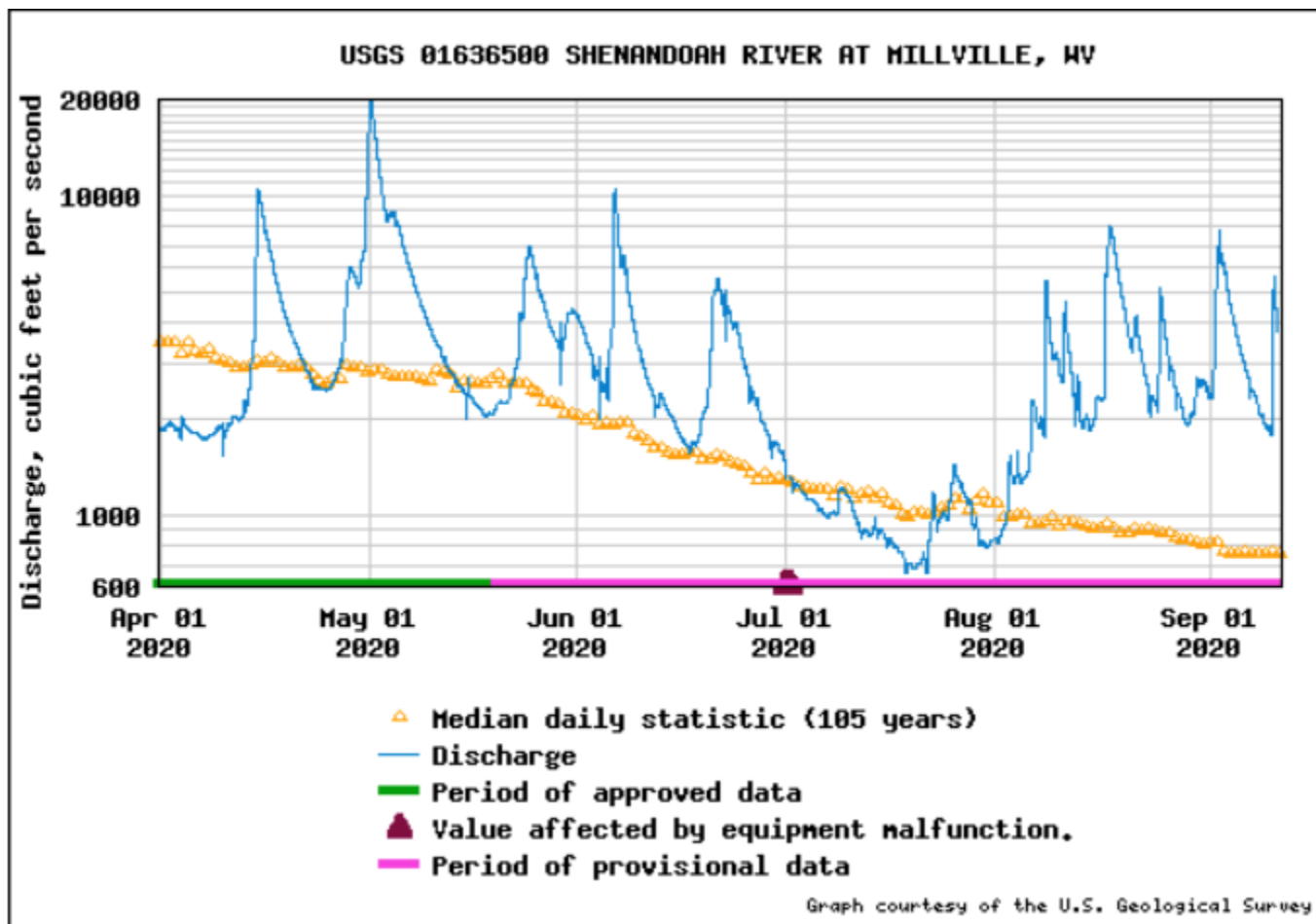
# Strasburg Gauge 2019





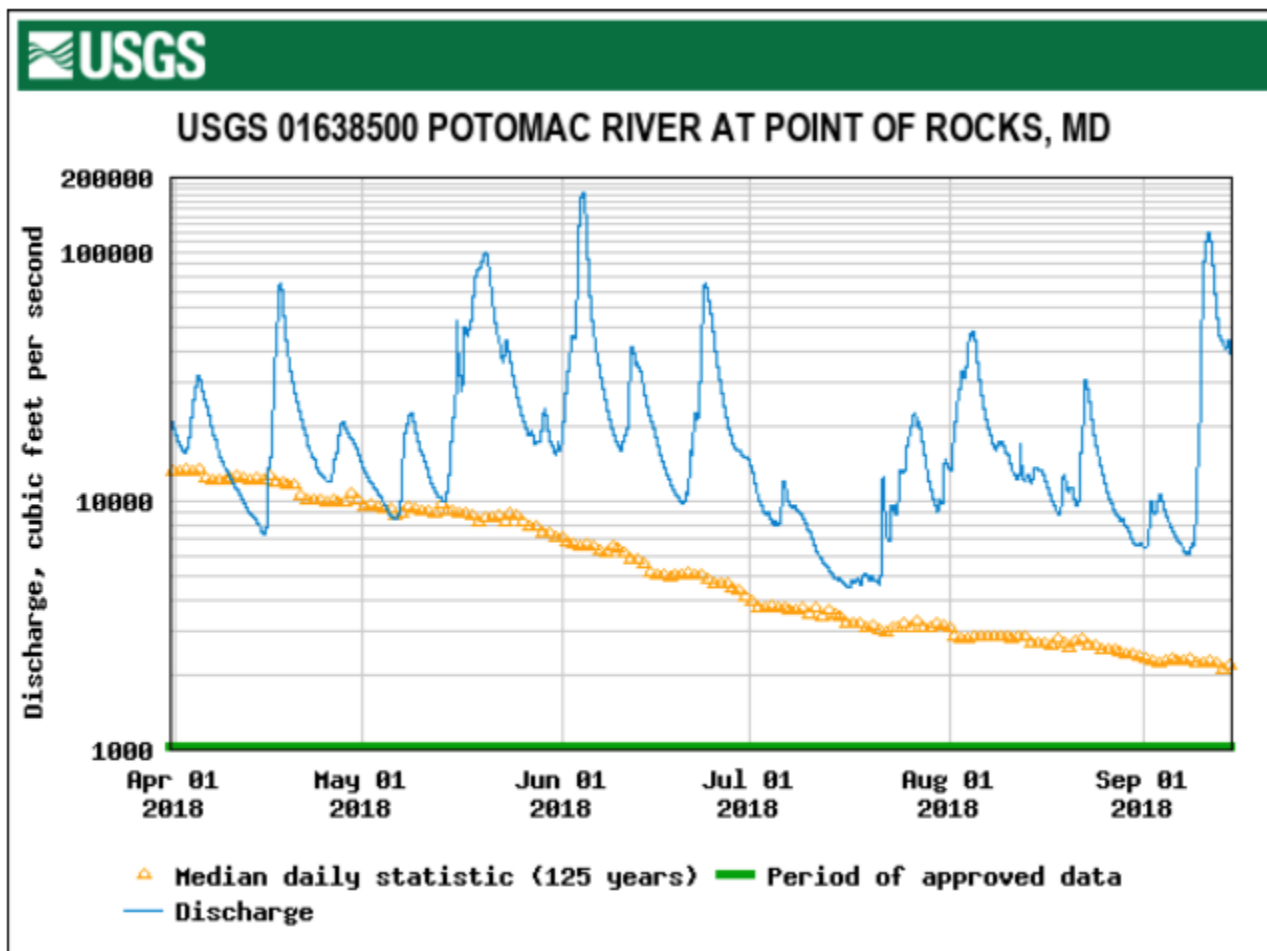


# Millville Gauge 2020



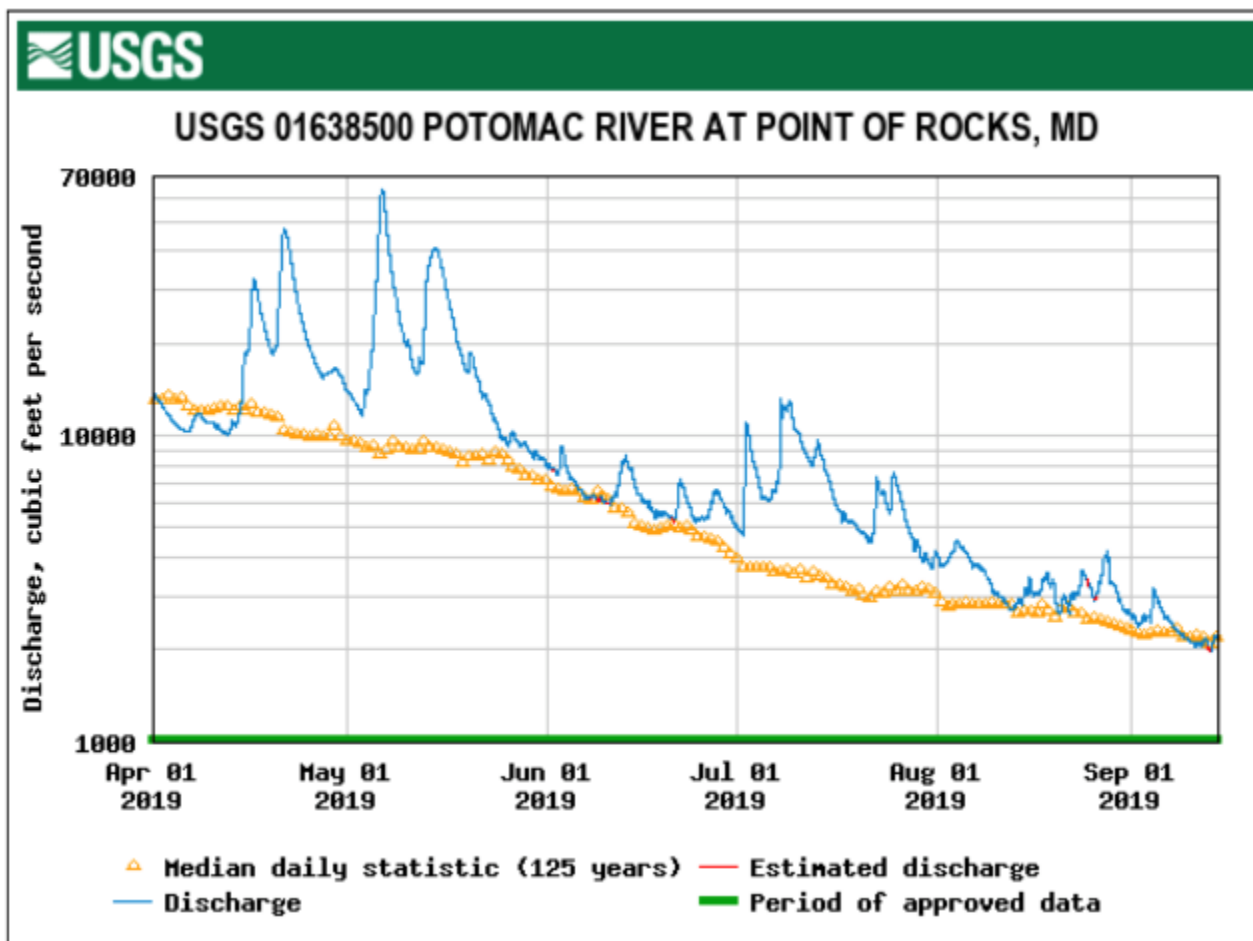


# Point of Rocks Gauge 2018



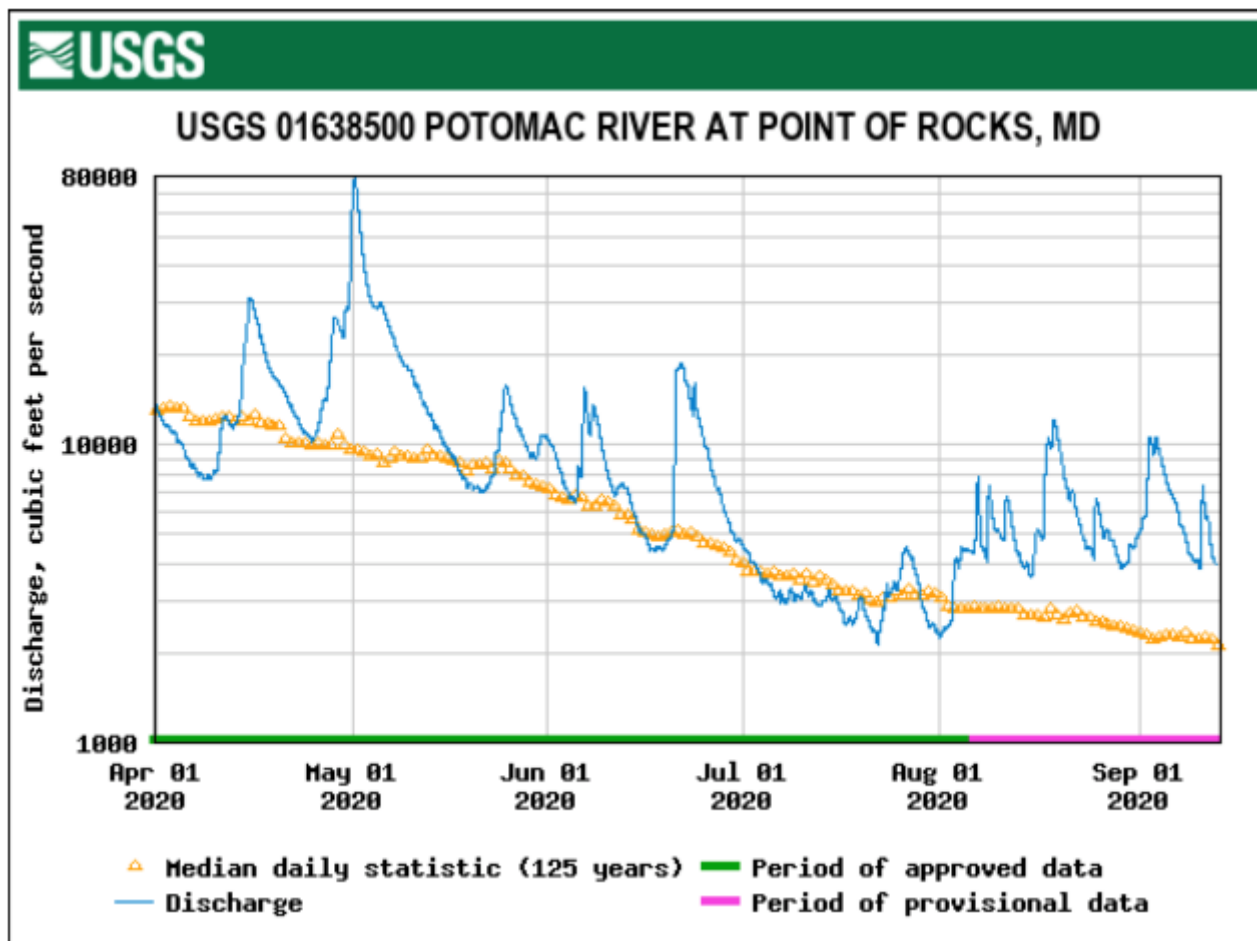


# Point of Rocks Gauge 2019





# Point of Rocks Gauge 2020





# Shenandoah River Findings

- Significant fish kills began in 2000
- When 30 percent of population has lesions, a fish kill is underway
- Shenandoah has experienced five years of below average spawns; four years of average spawn and just one exceptional year (2014)
- Challenge to get good data on North Fork

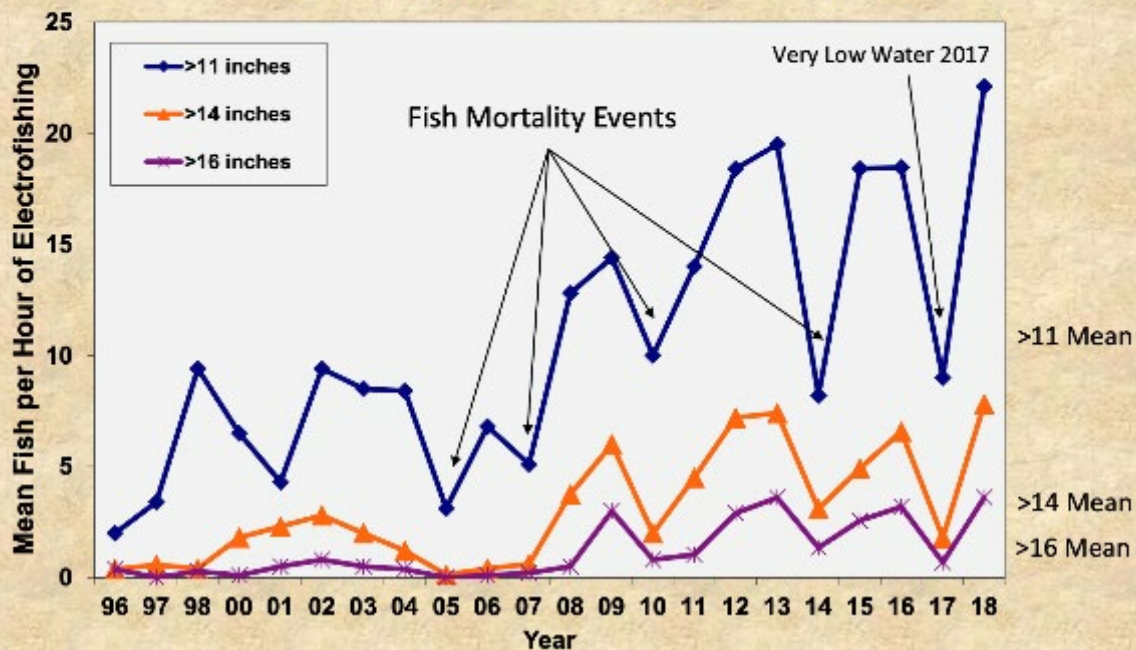
Virginia imposing 14"-17" slot limit



# Shenandoah River

## Fish Mortality Events

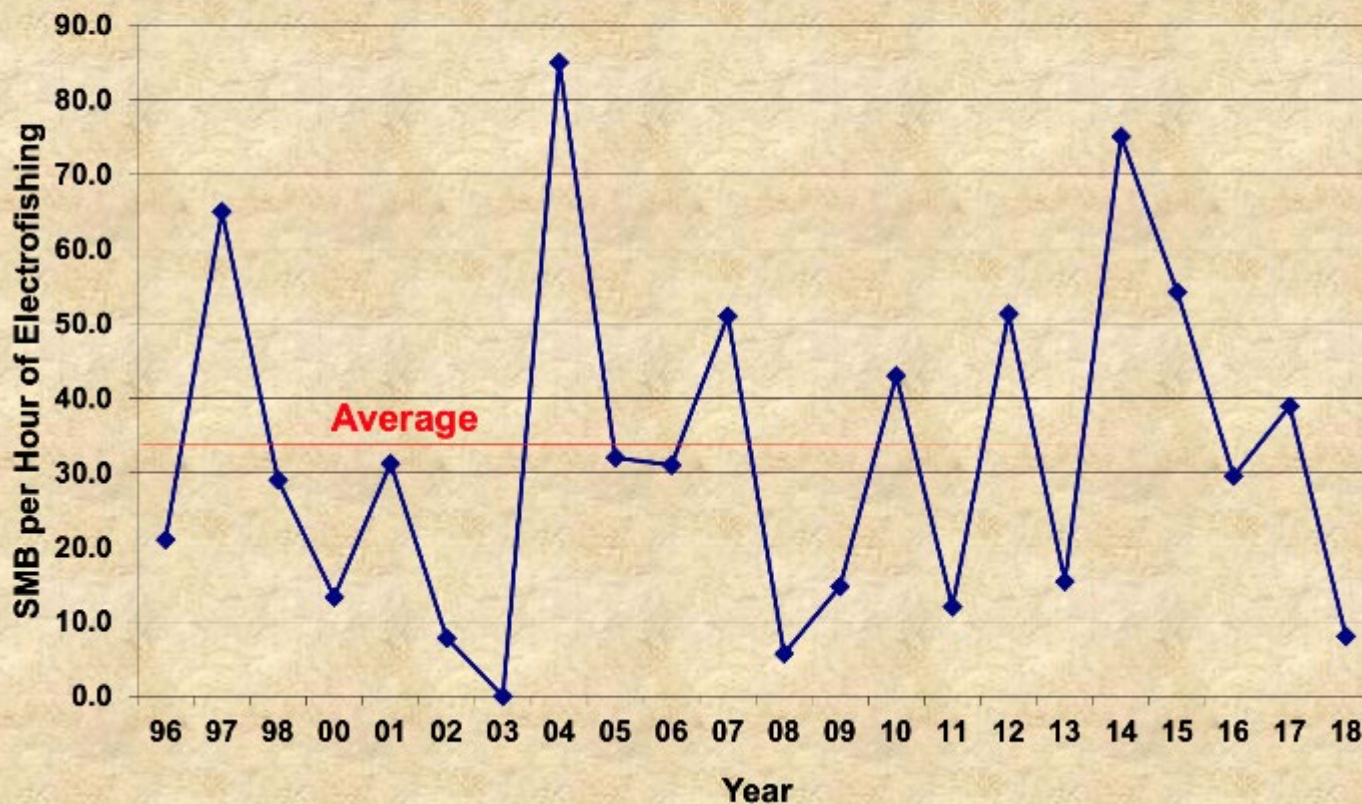
South Fork Shenandoah River Smallmouth Bass  
Electrofishing Catch Rate and Population Rebound





## SMB Spawning Success

South Fork Shenandoah River SMB Spawning Success





# NRDA Fund Allocations

Categories	Compensation
Improve Water Quality and Fish Habitat	\$10M
Freshwater Mussel Restoration	\$4M
Neotropical Migratory Songbird Full Life Cycle Restoration	\$2.5M
Land protection, property acquisition, and recreational and wildlife enhancements	\$18.2M
Willets Tract addition and forest restoration	\$1.3M
Recreational Fishing Improvement Projects	\$2.5M
Front Royal Fish Hatchery	DuPont





# Front Royal Fish Hatchery

- Needs major reconstruction
  - Pond, raceway and building upgrades
  - Work is just getting underway
- Provide consistent production of smallmouth bass to supplement during years with poor natural reproduction
- 35,000 smallmouth bass per year
  - DuPont paying directly – up to \$10M



# Potomac River Findings

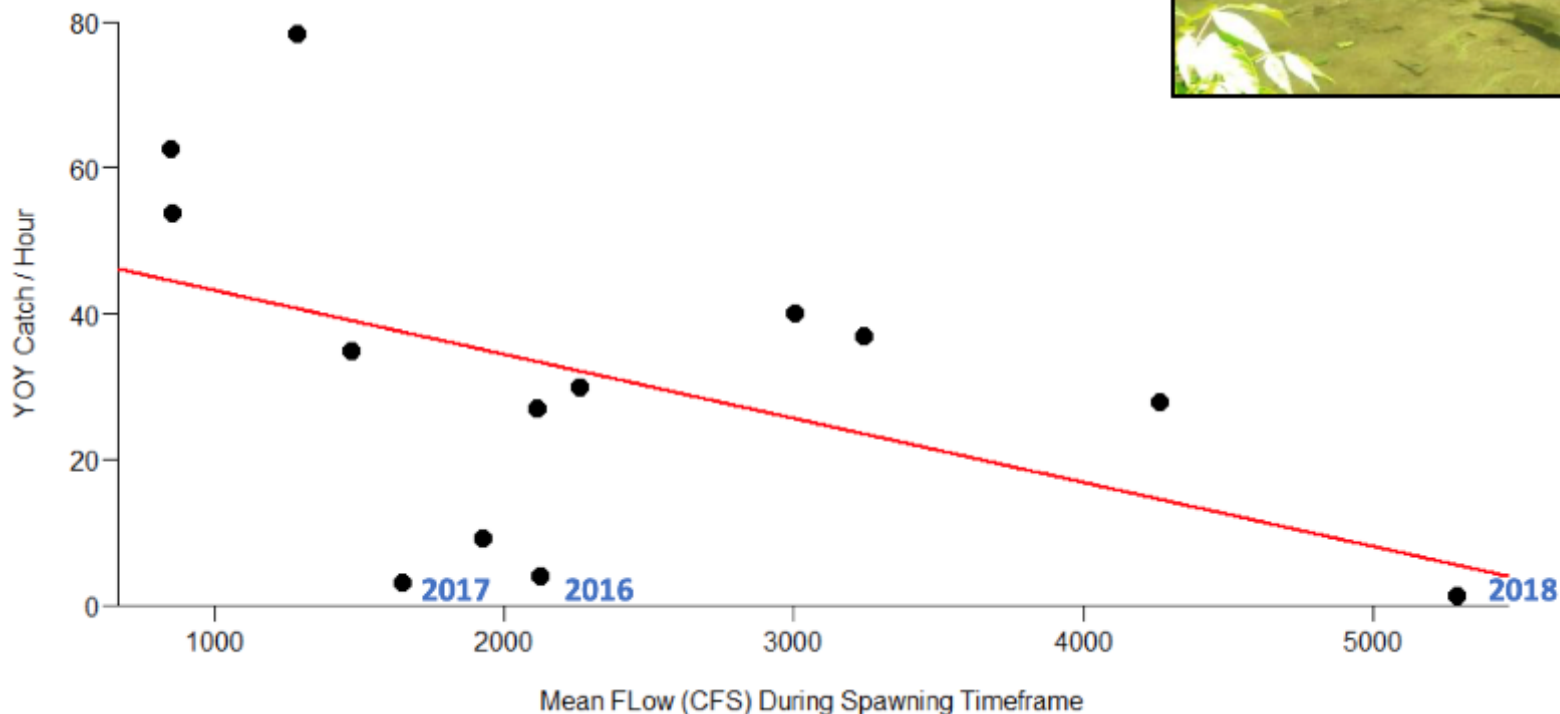
- Almost ten years of poor spawn classes
- Attempted supplemental stocking in 2019
- Adult SMB had decent numbers in 2019
- Fish composition changing – far fewer minnows and bait fish; flathead catfish
- Black fly spraying
- Algae playing a role but difficult to quantify



# South Branch of the Potomac

## Abundance - Young of Year:

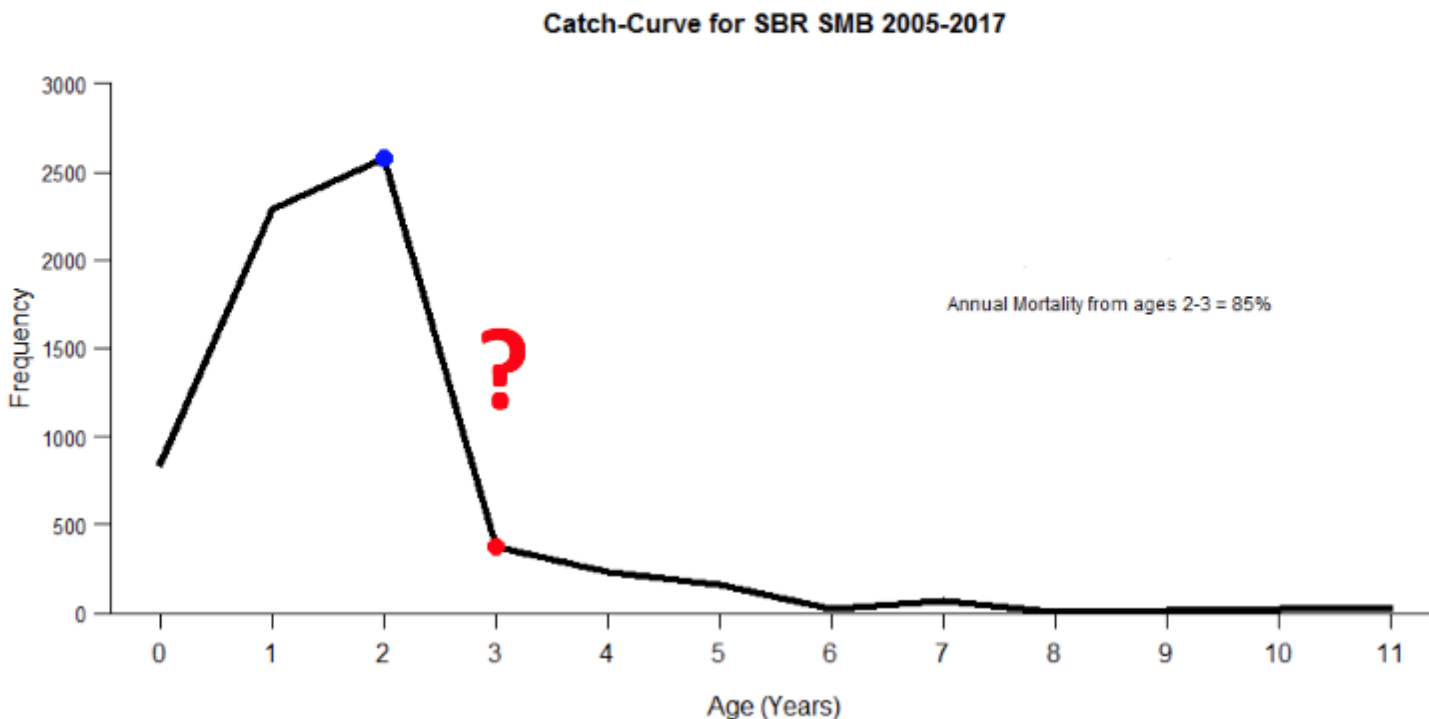
FLOW, and the role that it plays in recruitment success





# South Branch of the Potomac

## Mortality Trends ('05 – '17)





# Maryland Upper Potomac

Management Goal – maintain a productive smallmouth bass fishery for anglers in the upper Potomac River

## 2019 Objectives

- Maintain a mean electrofishing catch rate  $\geq 28$  quality-size bass ( $> 11$  inches) per hour (25<sup>th</sup> percentile of 2008 – 2017 mean catch rate for entire river)
- Supplement natural reproduction to improve smallmouth bass yearclass strength and to reduce annual recruitment variability



## Smallmouth Bass



- Problems with juvenile recruitment
  - Poor year-classes (2008-2018)
  - Average seine index score = 0.67 fish/haul (1975-2007 = 1.8)
  - No dominant year-class
  - High spring flows (May-June)



Dam 5 - June 4, 2018



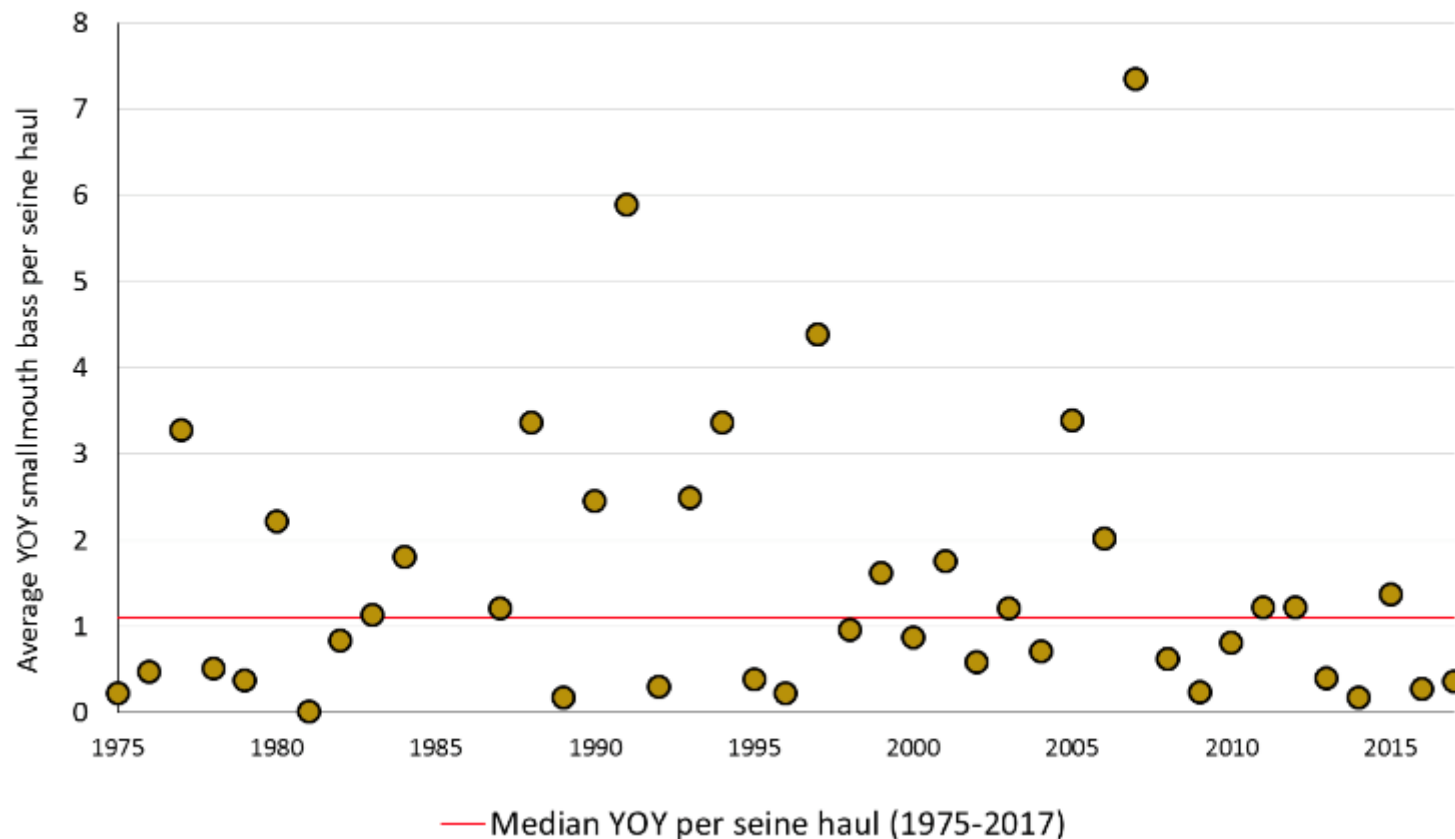
Shepherdstown - June 4, 2018





# Maryland Upper Potomac

## Summer SMB young-of-year seine survey catch rates





# Susquehanna River Findings

- Seeing more mortality in juveniles as opposed to adults in other rivers
- Mid-2000s saw significant mortality due to disease; 2005-2012 experienced high mortality of adults SMB coupled with low recruitment
- Trying to strengthen/relax fishing regs based on monitoring data



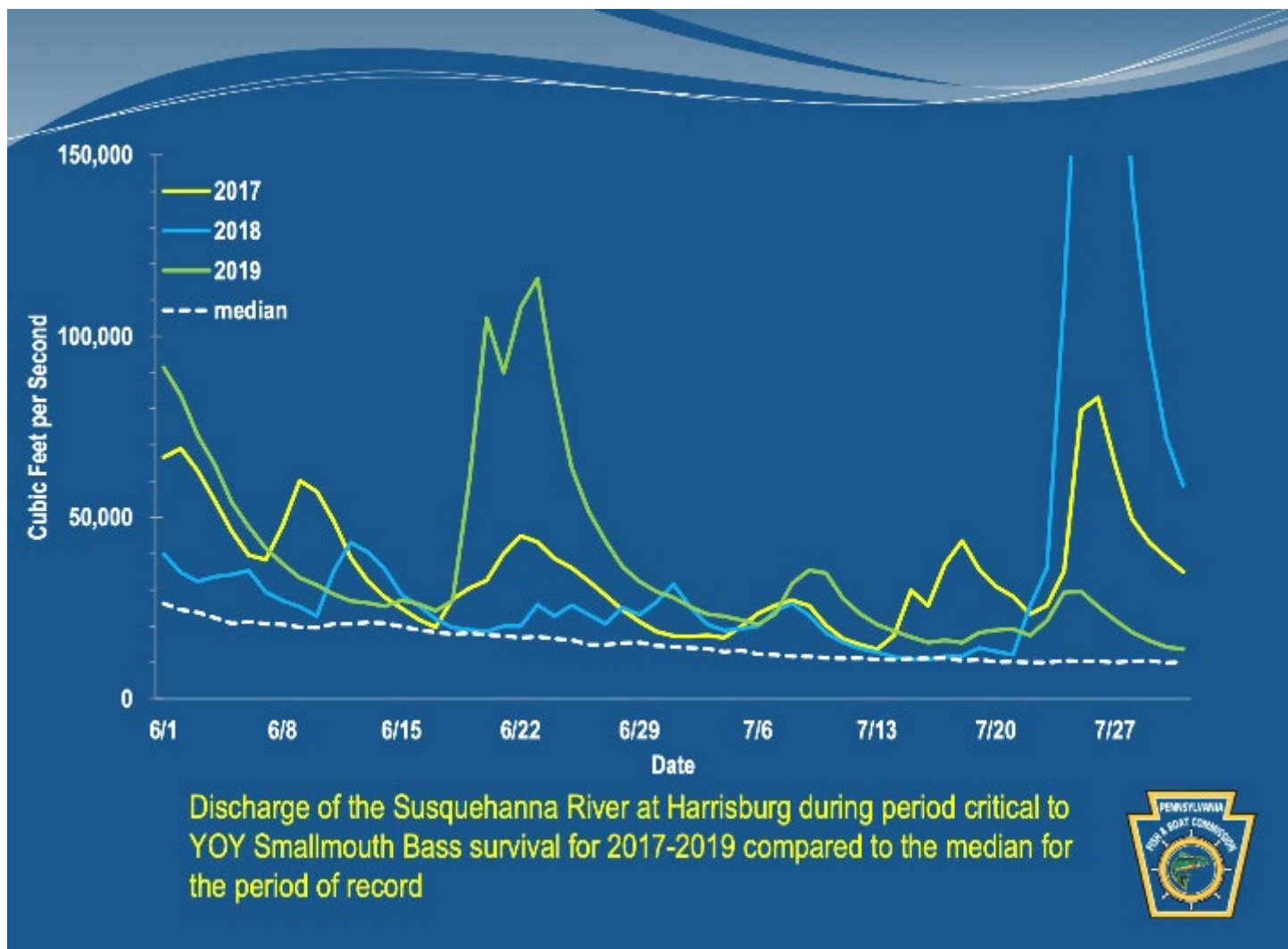


# Susquehanna River Findings (cont)

- In 2018, Middle Susquehanna SMB exhibiting lesions on ~ 2 percent of fish, while
- Lower Susquehanna River SMB had lesions on ~23 percent of fish



# 2017-2019 CFS for June/July





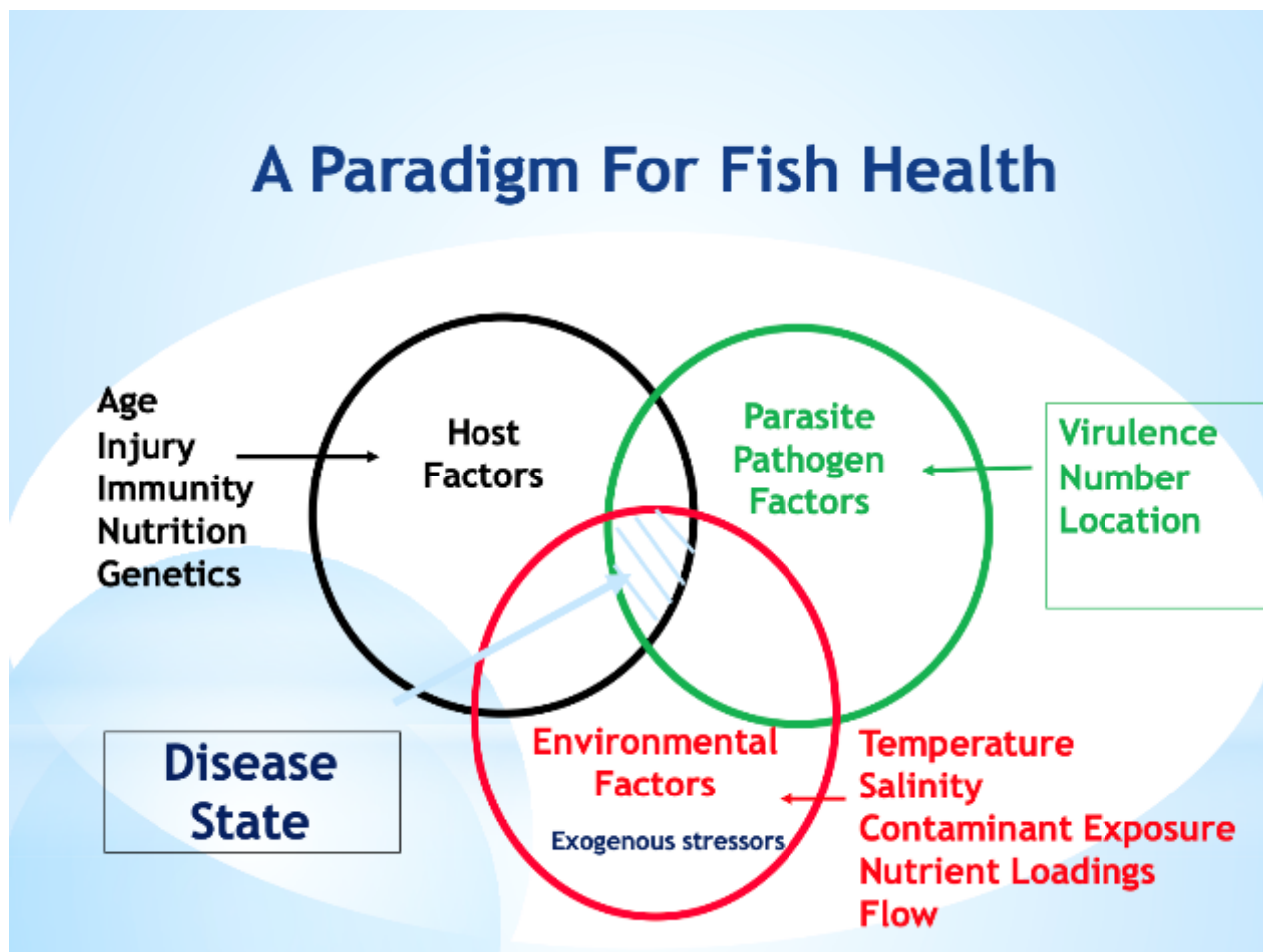
# USGS Fisheries Lab Findings

- Role of water quality and chemicals present in the system
  - Endocrine disruptors, neonicotinoids
- Throw in stressors such as nutrients, water temps, turbidity further complicate picture
- No smoking gun but perfect storm of multiple bacteria and other agents that collectively weakening immunosuppression



# USGS Fisheries Lab

## A Paradigm For Fish Health





# USGS Fisheries Lessons Learned

- All fish are not created equal; they respond differently
- Fish confronted with complex mixtures of chemicals in addition to environmental stressors
- Multiple chemicals can have similar effects
- Many effects such as intersex fish may occur early in life and not be seen until maturity



# Potomac SMB Supplemental Stocking

## Management Action

- Smallmouth bass stocking
  - Supplement juvenile recruitment with hatchery raised fingerlings
  - Adult smallmouth bass broodstock collected by anglers from UPR (12-15 pairs)
  - Spawned at a state hatchery (Manning)
  - Broodstock returned to UPR
  - Fingerlings chemically marked to identify hatchery origin
  - Stocked in the UPR at prioritized locations



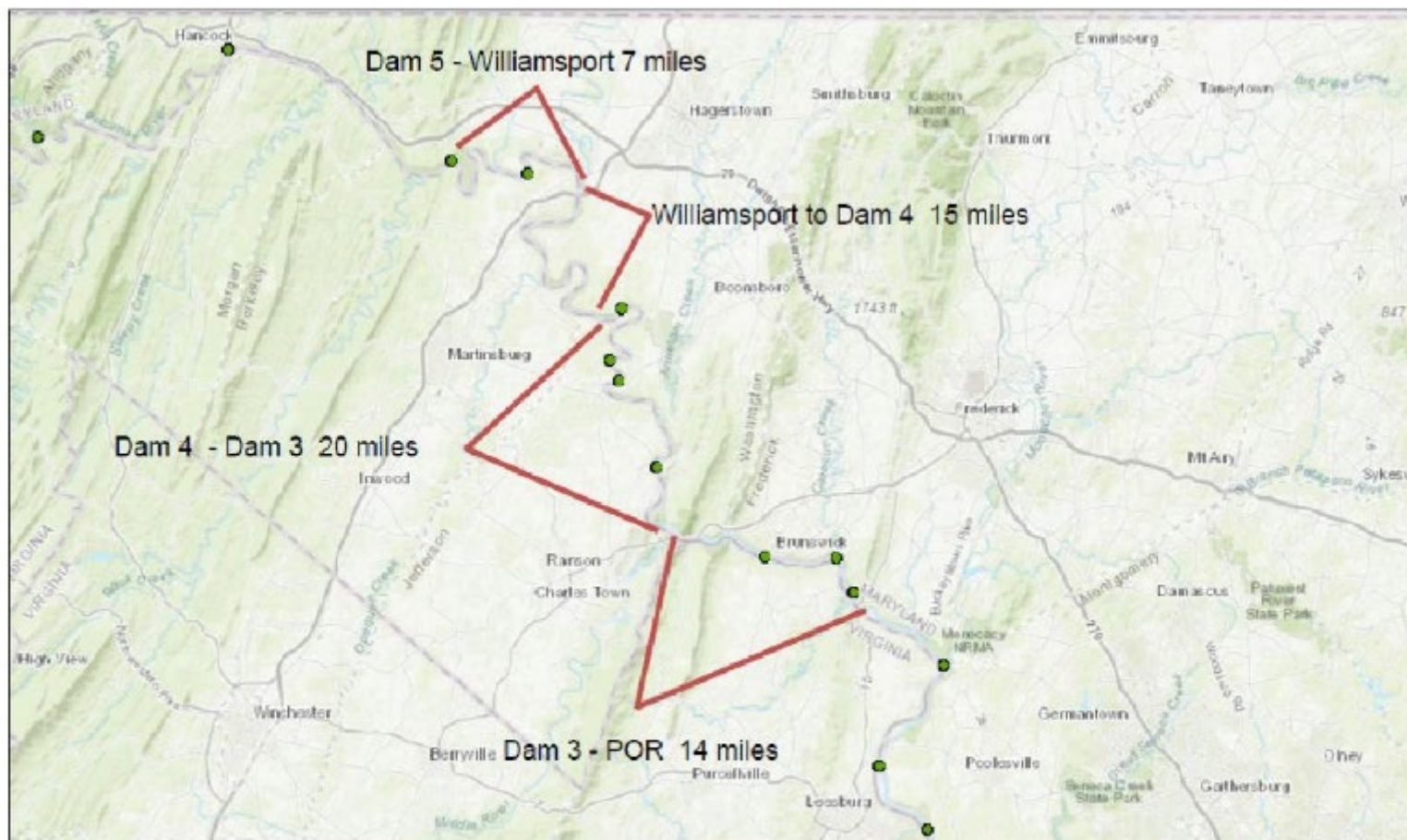


# 2020 Supplemental Stocking

- Mid-July 30,000 fingerling smallmouth bass stocked from Taylors Landing downstream to Edwards Ferry.
- Adult smallmouth bass from the Potomac collected in April served as hatchery brood.
- 2" – 3" An additional 5,000 fingerling smallmouth were generously provided by the West Virginia Division of Natural Resources



# 2020 SMB Stocking Area



11/9/2016, 11:15:32 AM

● Potomac\_Surveys

1:577,791  
0 3.75 7.5 15 mi  
0 5 10 20 km  
NOAA Fisheries Staff. Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, © OpenStreetMap contributors, and the GIS User Community







# July 2020



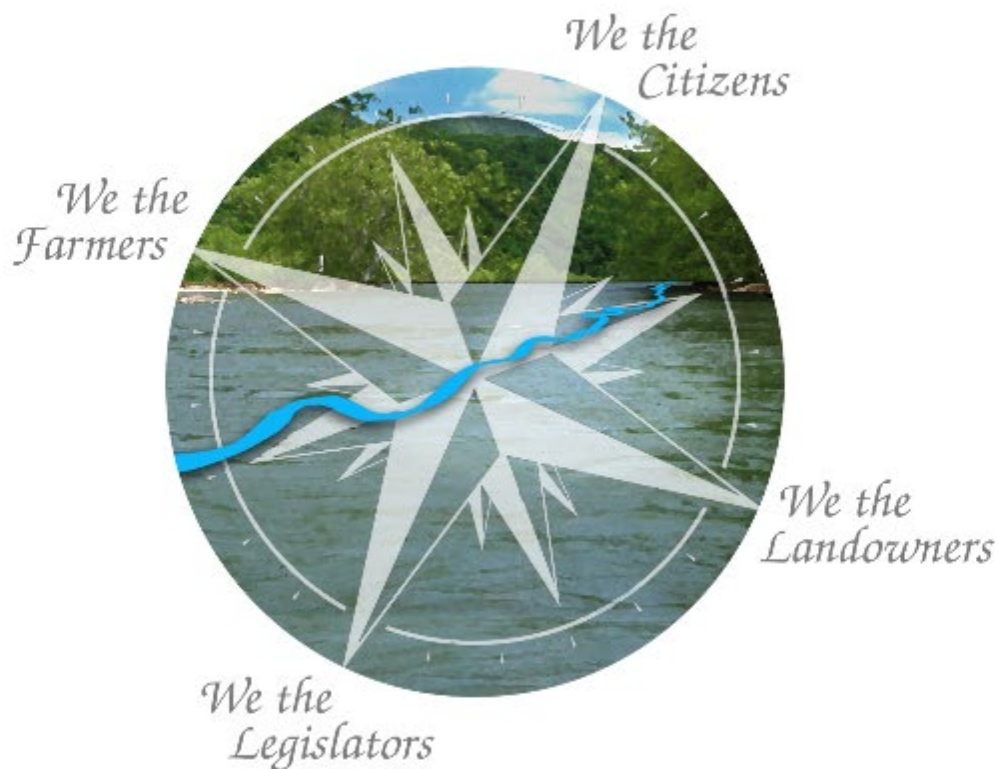


# PPE Protocol in Effect





# Shenandoah Watershed Compact



*Charting a Course to a Healthy and Prosperous Future*



## Who Can Help Realize the Vision for the Shenandoah River Watershed?

- *We the People* of the Shenandoah River watershed understand our relationship and responsibilities as stewards of the natural resources in our care. Taking initiative to educate ourselves and our communities, we actively protect our commonly held resource from damage inflicted by social, economic, and natural causes.
- *We the Farmers* make up a thriving agricultural community that provides leadership in achieving water quality restoration. As stewards of the Shenandoah River watershed, we model best management practices that define our region as a conservation zone recognized and respected for an ethos grounded in education, advocacy, and action. Working together, all citizens and businesses demonstrate by word and deed their understanding and appreciation of the river as a shared resource whose health and resilience requires an equally shared responsibility.
- *We the Landowners* whose property bounds the river strive to create and support clean drinking water and a healthy ecosystem by preserving and creating riparian buffers that prevent erosion while filtering debris and pollutants. As a community, we are engaged and aware of our vital role in maintaining a healthy physical environment for all river inhabitants, including flora and fauna.
- *We the Legislators* commit to public education, incentives, legislation, and enforcement that ensure stewardship for a healthy watershed in perpetuity, protecting our natural resources for future generations. We support decisions that aid residents in understanding their interrelationship with and impact on the watershed through citizen forums, access to government, and opportunities for direct river use and education.



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RESPECT THE  
SHENANDOAH



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WATERKEEPER ALLIANCE



## *Respect the Shenandoah Goals*

- Reduce harmful algal outbreaks
- Raise public awareness
- Fence out all cattle herds by end of 2025
- Establish new regulations and improve old ones
- Develop body of evidence that more needs to be done



## Current Situation

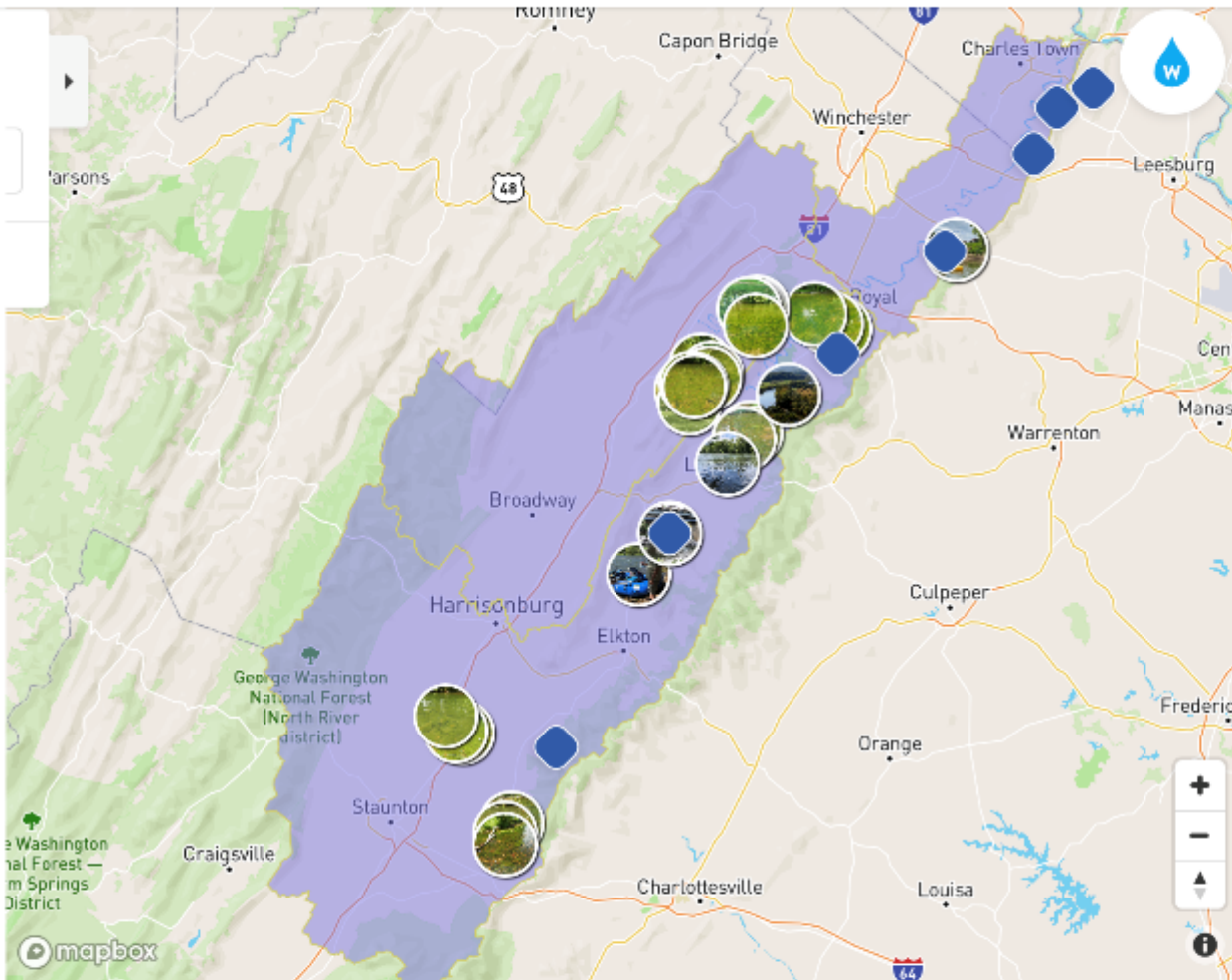
- Lost our EPA lawsuit federal appeal
- Submitted over 60 algal complaints last year (could have been 360)
- Major win in Richmond regarding cattle herds
- Poultry production continues to rise as does the spread of manure and litter



## *Respect the Shenandoah Approach*

- Creation of a SRK *Respect the Shenandoah* webpage
- Create a Water Reporter map identifying algal locations
- Constant drumbeat of grassroots pressure
  - Social media
  - Print Media
- Build body of evidence to compel DEQ to address algal blooms





Whenever you're out on the river and you see a disturbing algae outbreak or bloom, just log it on the map.

This helps your fellow river users and it helps us by providing data to demonstrate to authorities how widespread the problem is.

## LEARN MORE

[Cattle Exclusion](#)

[Poultry Litter Problem](#)

[Nutrient Management Plans](#)

[Algal Outbreaks In the Shenandoah](#)

[Shenandoah Watershed Compact](#)

**The goal is to return the Shenandoah River to the condition of health and beauty that many of us remember from days gone by when there were healthy fish populations and clear, clean water for paddling and swimming.**

This is not just a dream. There are solutions that can be put in place by people of goodwill throughout the Valley that will enable the Valley to prosper economically as well as environmentally. Through the **Shenandoah Watershed Compact** process, Mark was able to bring

*Our mission is to protect and restore water quality in the Potomac River and its tributaries through community action and enforcement.*



He is the face of Orvis fly fishing. - mark@potomacriverkeeper.org - PRK Mail

ABOUT US ▾

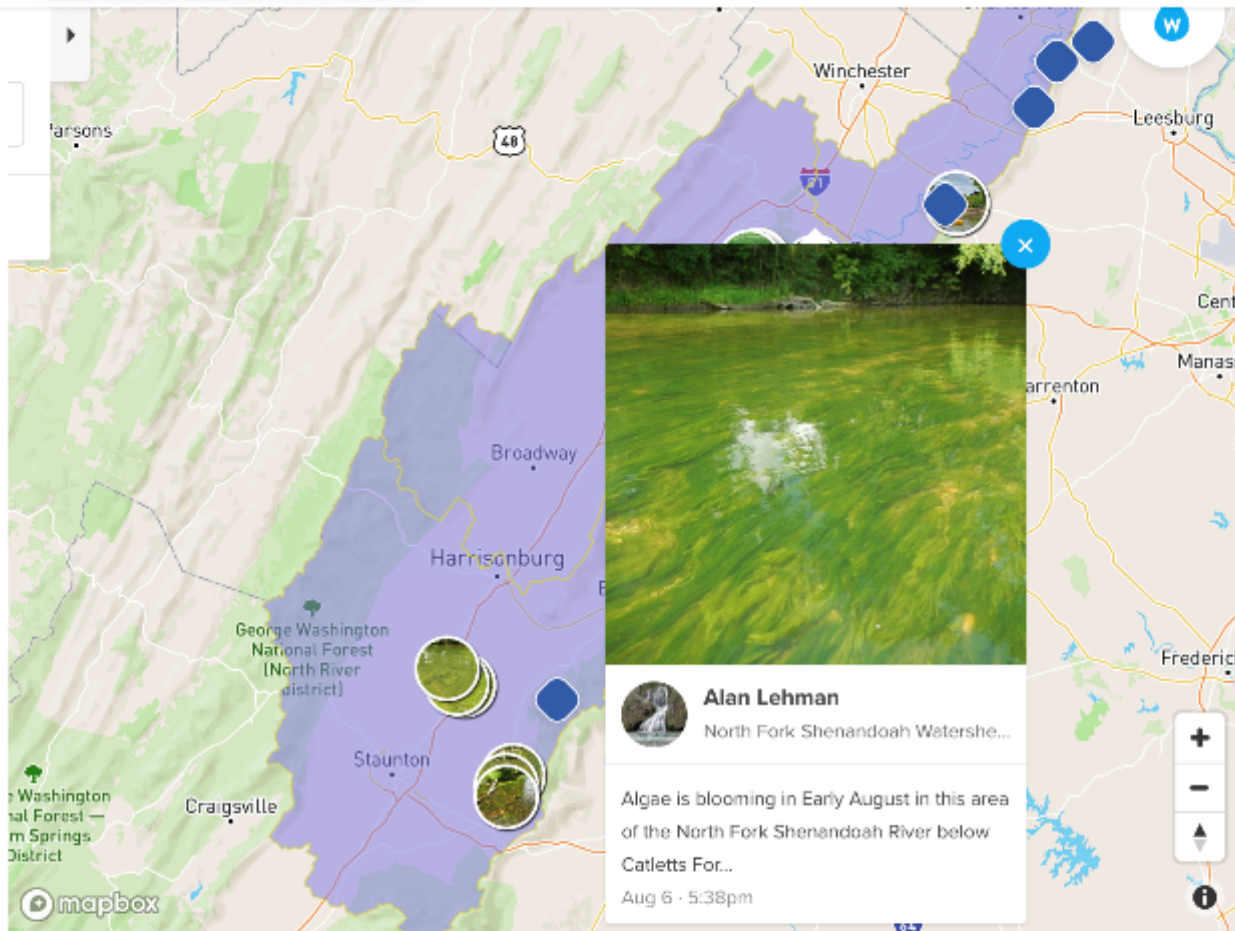
OUR WORK ▾

OUR RIVERS ▾

MEDIA ▾

GET INVOLVED ▾

CONTACT ▾



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### LEARN MORE

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[Compact](#)

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Support the Shenandoah and report algae blooms using the Water Reporter™ smartphone app.



## Get Started

- Download Water Reporter to your smart phone.
- Create your personal account.
- Join the Potomac Riverkeeper® Network



## Submit Reports



Open your Water Reporter App



Click on "Start a new post"



Add the photo of algae and confirm location



Share observations with the hashtag **#respecttheshenandoah**

## Important Tips

- Select/Share with the **Potomac Riverkeeper® Network** on your post before sending
- Show the algae clearly in the photo
- Use the hashtag **#respecttheshenandoah**

For support, click the Help section in the application menu or visit <https://help.waterreporter.org>





IN ORDER TO DO  
*OUR WORK*  
WE NEED *YOU.*

# HOW TO GET INVOLVED



## TO START:

- I. DOWNLOAD the Water Reporter App on your iPhone
- II. FOLLOW US on Facebook, Twitter, LinkedIn, and Instagram.

## WANT TO TAKE IT TO THE NEXT LEVEL?

- I. BECOME A MEMBER. Visit our website.
- II. VOLUNTEER OR ATTEND AN EVENT.

