From Data to Impact: How Loudoun Wildlife Conservancy's Stream Monitoring Program is Making a Difference

2024 Virginia Water Monitoring Council Conference

Who is Loudoun Wildlife Conservancy?

A membership-funded, volunteer-driven nonprofit dedicated to preserving, protecting, and restoring wildlife habitat through:

Stream Monitoring Program Focus Areas:

Benthic Macroinvertebrate Surveys

Salt Watch

Chemical Monitoring

Educational Outreach

Data-driven Advocacy

Stream Monitoring Program Accomplishments

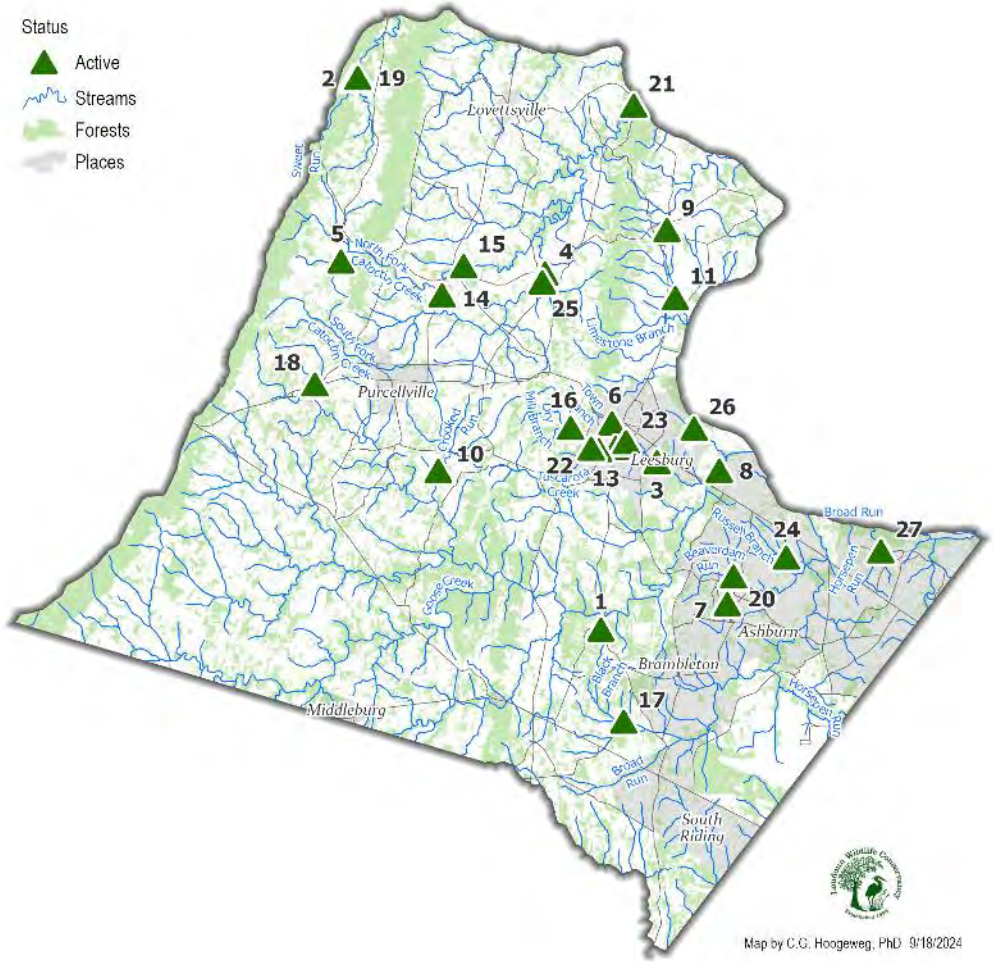
- Conducting monitoring **since 1995**
- **110** volunteers contributed over **1,900** hours to the program in 2024
- **Over 30** non-profit, community, and government partners
- **2023 recipient** of Loudoun County Environmental Excellence Award

Benthic Macroinvertebrate Surveys

Loudoun Wildlife Conservancy
Established 1995

VIRGINIA SAVE OUR STREAMS

Benthic Macroinvertebrate Surveys: What We Do

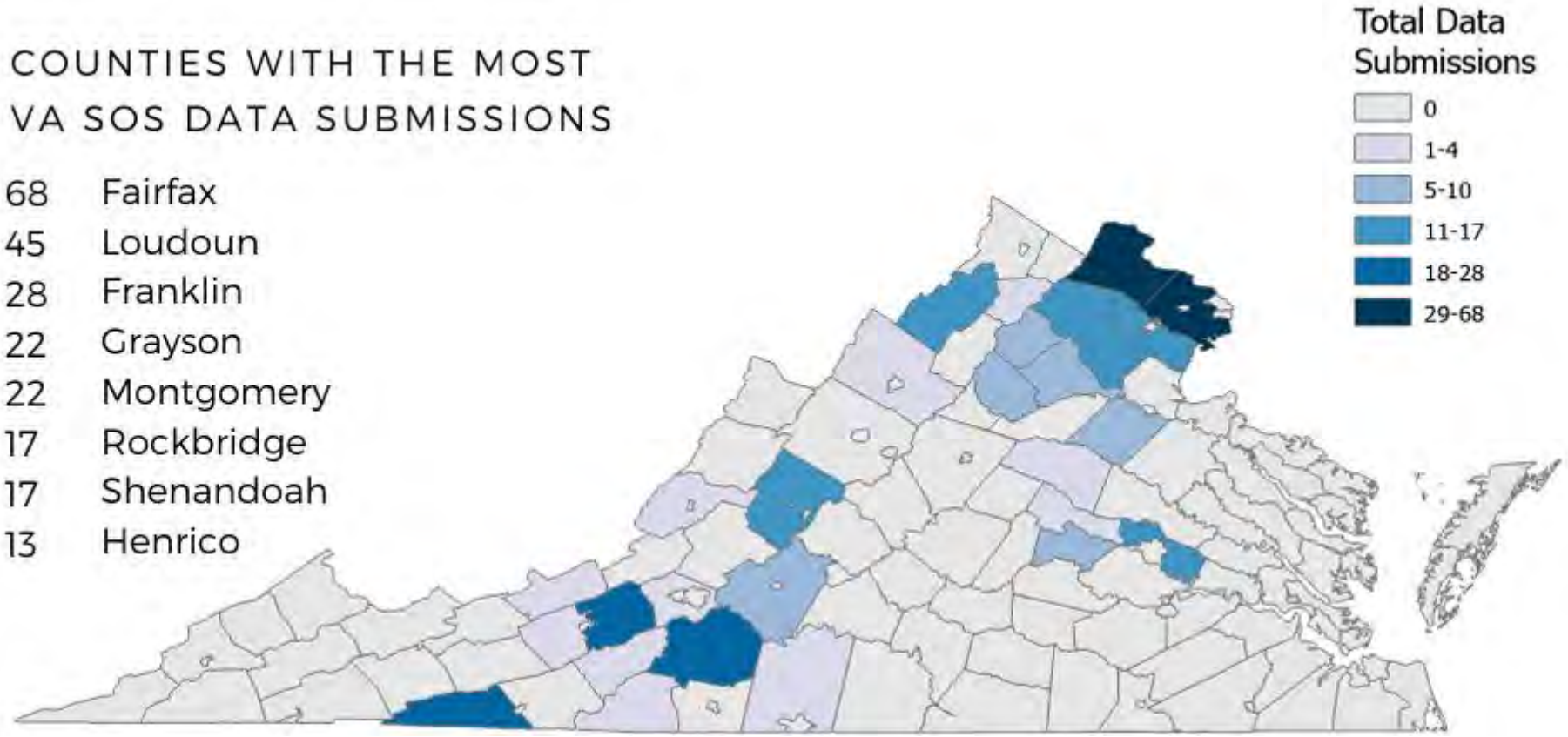


- **28** stream monitoring sites – up from 5 in 2019
- **29** certified monitors – up from 8 in 2019
- All surveys led by certified monitors, but non-certified volunteers participate

2023 Virginia Save Our Streams Data Submissions

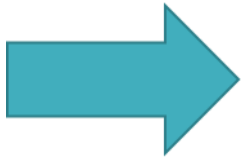
COUNTIES WITH THE MOST
VA SOS DATA SUBMISSIONS

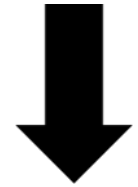
68	Fairfax
45	Loudoun
28	Franklin
22	Grayson
22	Montgomery
17	Rockbridge
17	Shenandoah
13	Henrico



38 of the 45 submissions in Loudoun came from Loudoun Wildlife Conservancy

Benthic Survey Data Distribution





- Posted on our individual site pages
- Writeups in *The Monitor* and on the Loudoun Wildlife webpage

Benthic Macroinvertebrate Surveys: Impact

- **Assess local water quality** around the county and **track changes** over time
- **Identify areas of concern** – future chemical monitoring & DEQ nomination for further study
- **Share data** at local, state, and national levels
- **Engage volunteers**, including students, in hands-on environmental science and **increase environmental awareness**

Salt Watch Program

Loudoun Wildlife Conservancy
Established 1995

SALT WATCH™
IZAAK WALTON LEAGUE OF AMERICA

Salt Watch Program: What We Do

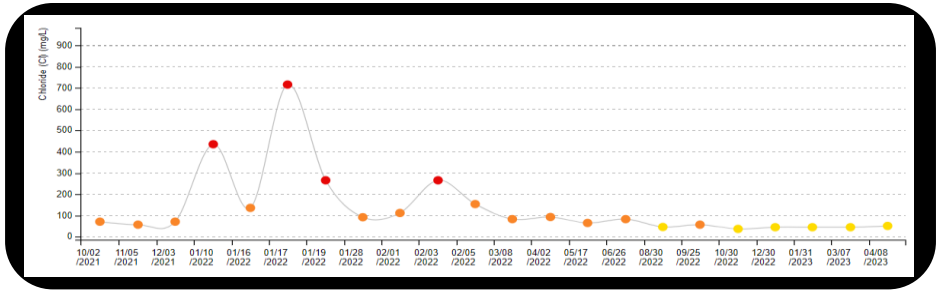
- Season 1 (21-22)
  - 14 sites and 9 volunteers collecting winter weather data from 10 streams
- Season 4 (24-25)
  - 45 sites and 50 volunteers collecting semi-monthly and winter weather data from 17 streams
- YTD 560+ data points – over 14% of the nationwide dataset
- 1,450 data points total

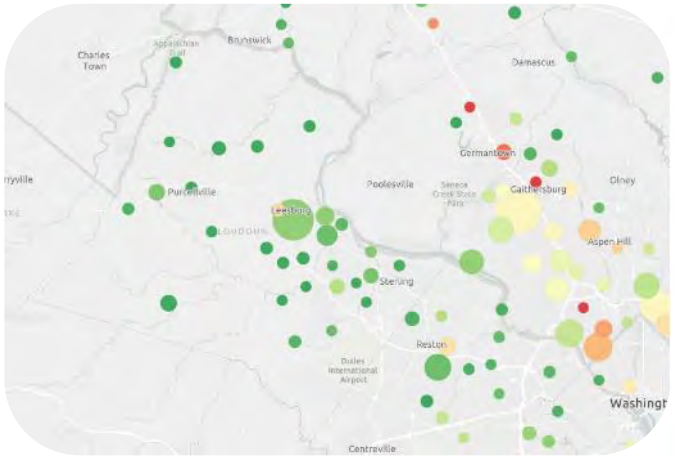
Salt Watch Data Distribution

Loudoun Wildlife Conservancy
Established 1995

CLEAN WATER HUB

SALT WATCH™
IZAAK WALTON LEAGUE OF AMERICA





Shared with Salt Watchers and in *The Monitor*

Used for advocacy and educational outreach efforts

Social Media and Newsletter Outreach

Loudoun Wildlife Conservancy
January 23 ·

You have another chance to be a Smart Salter...get out your brooms tonight or during the day on Wednesday and sweep up and save any salt you see laying about before the rain comes. You'll be keeping the salt out of local waterways and be able to use it again (sparingly) for the next storm - that's a win-win!

80 11 comments 41 shares

Loudoun Wildlife Conservancy
February 13 ·

If you see a salt pile of any size on a road or parking lot, say something!

It not removed, it will end up in the storm drain system after the next rain and directly pollute our local streams. Only 1 teaspoon of salt can pollute 5 gallons of water.

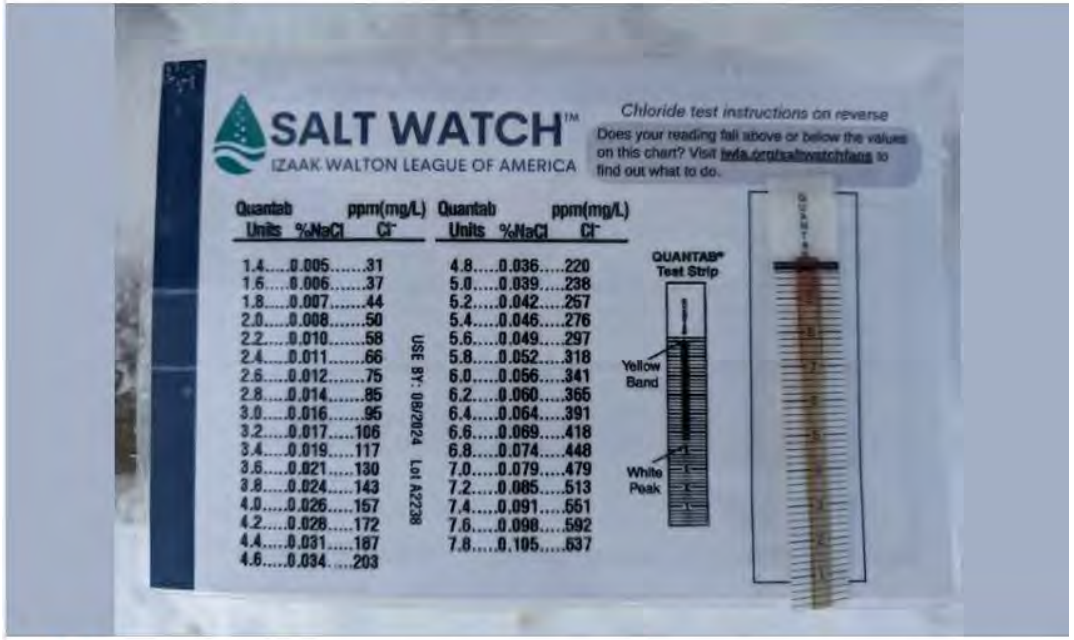
Take a picture of the salt pile (if possible) and get closest street address or intersection for reporting. Then call the following agencies:... **See more**

Brian Magurn, Hannah Gibson and 184 others 19 comments 72 shares

Loudoun Wildlife Conservancy
January 17 ·

Sometimes being a chart topper isn't a good thing.

Our Salt Watchers braved the cold yesterday to test salt pollution concentrations in our local streams. They found concentrations above the highest range of 631 ppm (nearly double the toxic threshold) at four sites on Town Branch and Tuscarora Creek. Not good news for our benthic macroinvertebrates and other aquatic life.

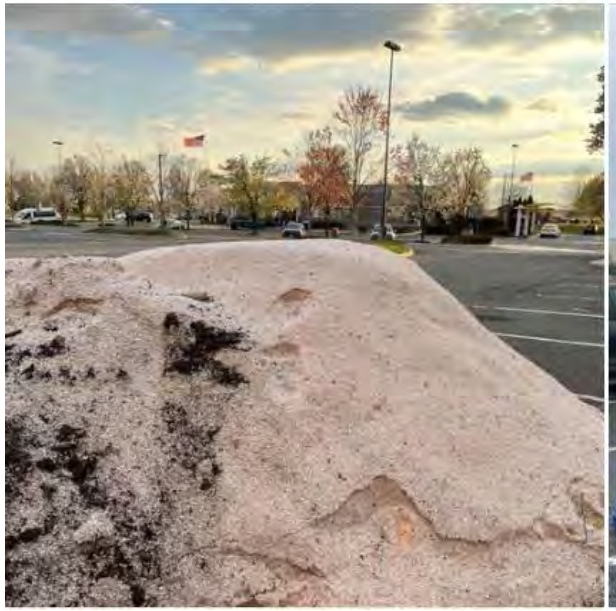


Brian Magurn, Chris Henke and 47 others 9 comments 6 shares

Loudoun Wildlife Conservancy
March 27 ·

Our Salt Watch program doesn't end when winter ends. Our Salt Watchers continue to conduct monthly testing for salt pollution in our local waterways - and report salt piles!

Many thanks to our Salt Watch volunteer Hilary M. for alerting us to this massive salt pile at a parking lot in Sterling, which we reported to the County. Thanks also to the County's Stormwater Management Program for promptly alerting the property owner of the need to properly cover the pile, which was d... **See more**



Salt Watch Program: Impact

- **Identified 15 salt pollution hot spots** on 5 different streams in urban areas
- **13 salt piles** on roads reported for **cleanup**
- **2 enormous salt piles** in parking lots reported for **coverage/removal**
- **120 pounds of salt swept up** in neighborhoods
- **Engaged 65 volunteers**, including high schoolers and families
- **Increased awareness** about the connection between salt and stream health and what actions individuals can take
- **Youth Conservation Leadership Institute projects** shared at Loudoun Student Environmental Action Showcase events

Chemical Monitoring Program

Loudoun Wildlife Conservancy
Established 1995

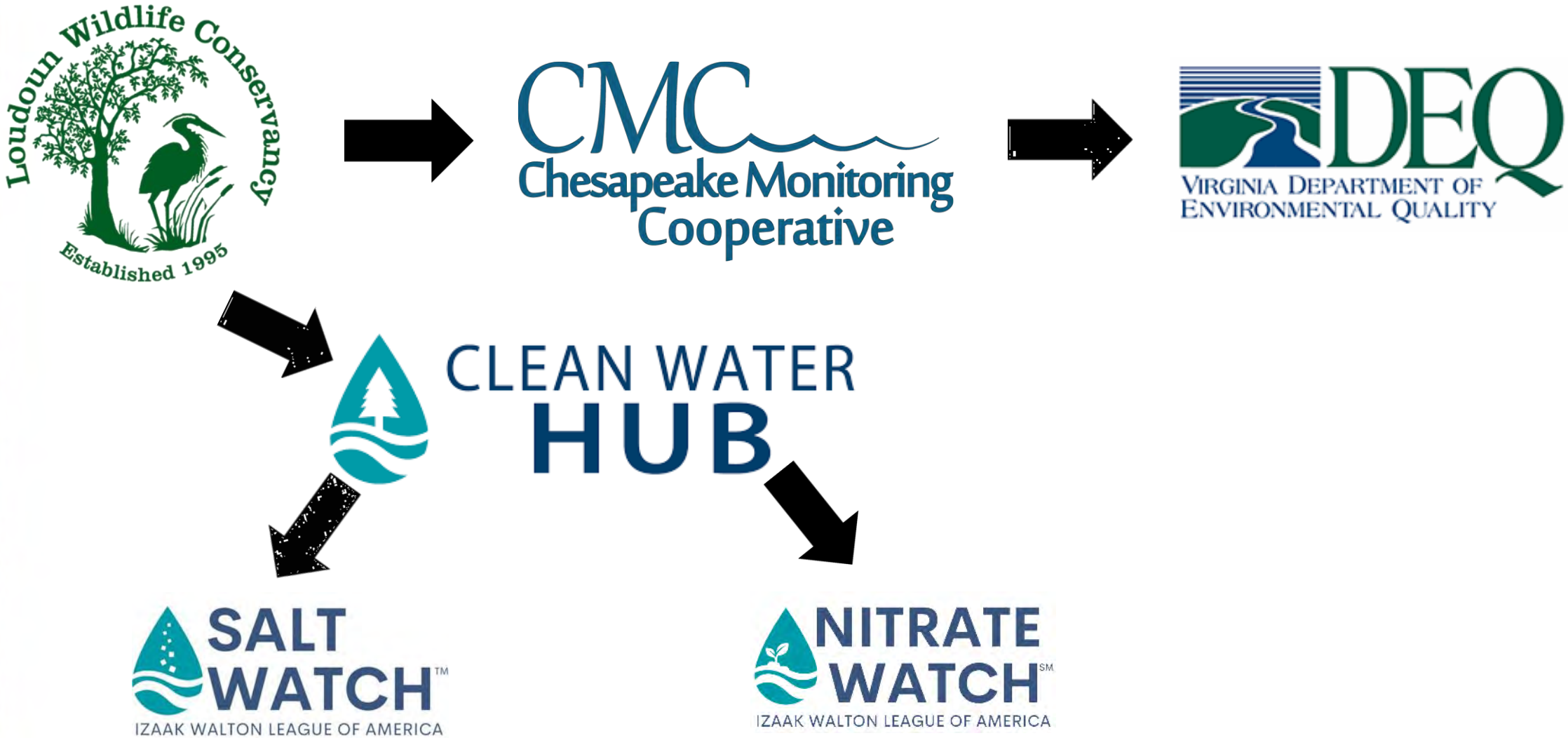
Alliance for the Chesapeake Bay

Chemical Monitoring Program: What We Do

- **6 sites on 2 streams**, all benthic macro sites
- **13 volunteers** (9 certified)

- **Parameters:**
  - **pH** (DEQ Level 3)
  - **Air/water temp** (DEQ Level 3)
  - **DO** (DEQ Level 3)
  - **Water clarity** (DEQ Level 1)
  - **Water depth**
  - **Chloride** (DEQ Level 1)
  - **Nitrate** (DEQ Level 1)
  - **Phosphate** (DEQ Level 1)
  - **Conductivity** (DEQ Level 3)

Chemical Data Distribution



Chemical Monitoring Program: Impact

- Develop more **holistic understanding of stream health** in urban areas to target future advocacy and outreach
- **Provide high quality data to DEQ** and for use in DEQ stream nomination process
- **Engage residents and students** in environmental science
- Use data to create a **stream health report card** to increase awareness of issues and actions individuals and HOAs can take
- **Clean up trash** and partner with Keep Loudoun Beautiful to collect large amounts of trash

Outreach Efforts

Outreach Efforts: What We Do

- Monthly newsletter and FB/IG Macro Feature
- Programming for local middle and high schools
- Mentor Youth Conservation Leadership Institute students for stream-related projects
- Tabling at various events
- Outreach programming
- Founded Loudoun Watershed Roundtable – social media outreach focused on actionable steps individuals can take to reduce stream pollutants

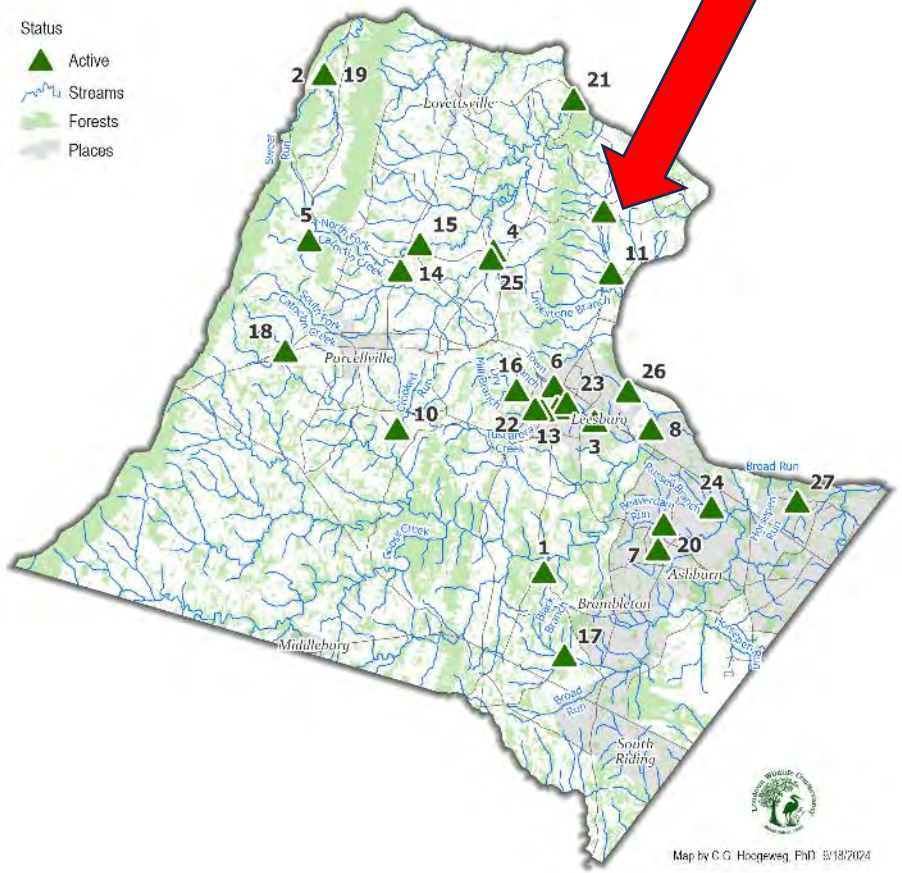
Outreach Efforts: Impact

- Programming **reach of over 1,300 people** of all ages since 2021
- **240 newsletter subscribers** since started in 2020
- **7 high schoolers certified** as benthic monitors
- **Mentored 5 YCLI students** with stream projects
- **Establishing ongoing social media campaign** with Loudoun Watershed Watch in conjunction with county government

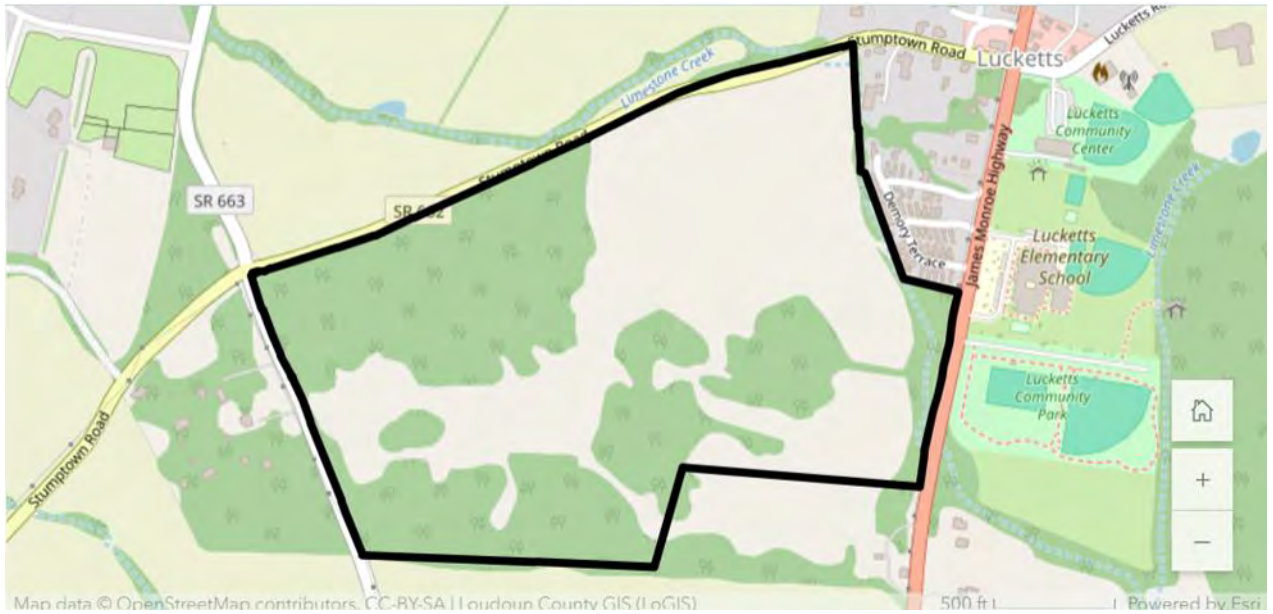
Grant Project:
Securing Clean Drinking Water for Lucketts

Loudoun County

Lucketts



Loudoun Wildlife Conservancy's JK Black Oak Wildlife Sanctuary



Upstream Site: 10 - Acceptable

Downstream Site: 5 - Unacceptable

Hiway Mobile Home WWTF

Permit limit for *E. coli* in discharged effluent:
126 CFU

Initial level of *E. coli* found in discharged effluent:
24,960 CFU

Securing Clean Drinking Water for Lucketts Project

- **$41,432 in grant funding** awarded in January 2022

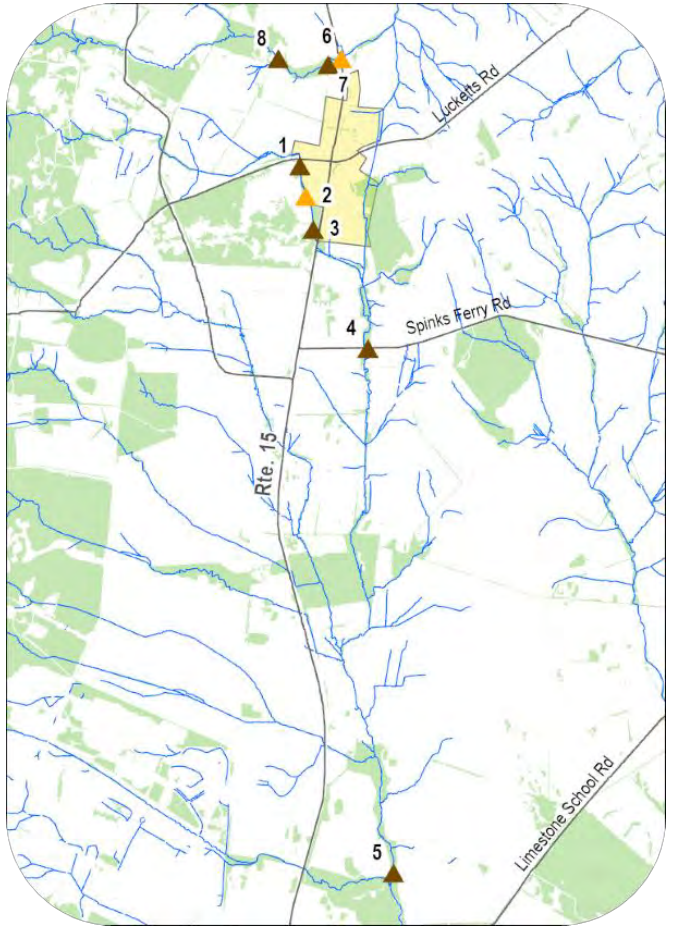
- Project focused on:
  - **Water quality testing** of two Lucketts streams, wastewater effluent, and drinking water
  - Providing **resources to the community** to help them improve their drinking water quality
  - **Educational outreach** about water quality issues

What We Did – Water Quality Testing

- *E. coli* testing
- Benthic macroinvertebrate surveys
- Drinking water testing

E. coli Testing

- **6 stream sites** – 2 on Clark's Run and 4 on UT Limestone Branch
- **2 wastewater treatment discharge pipes** – 1 on Clark's Run and 1 on UT Limestone Branch
- **29 samples** from each location, collected Feb - Dec 2022 (n=174)
- Samples analyzed at an accredited lab

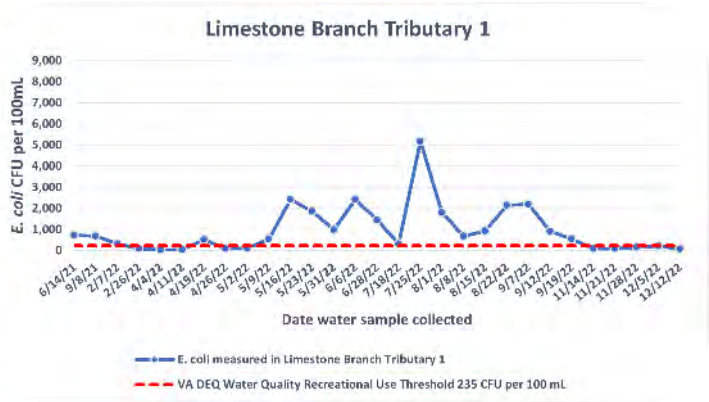


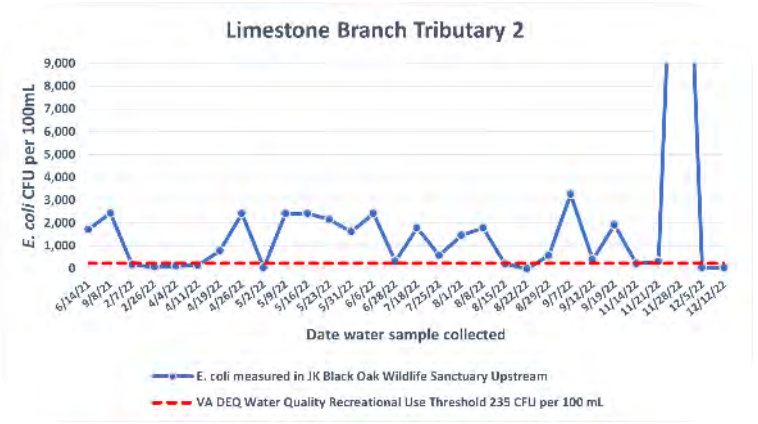
Stream Results for *E. coli* Testing

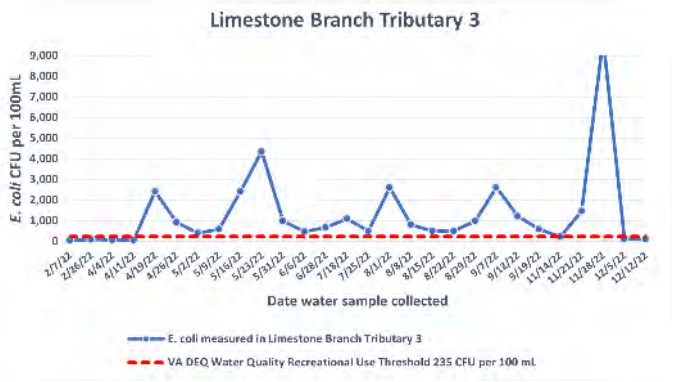
- **70%** of 174 stream samples exceeded single sample recreational use threshold of 235 CFUs
- Concentrations peaked after rainfall
  - Potential sources: failing WWTF/residential septic, livestock, and wildlife

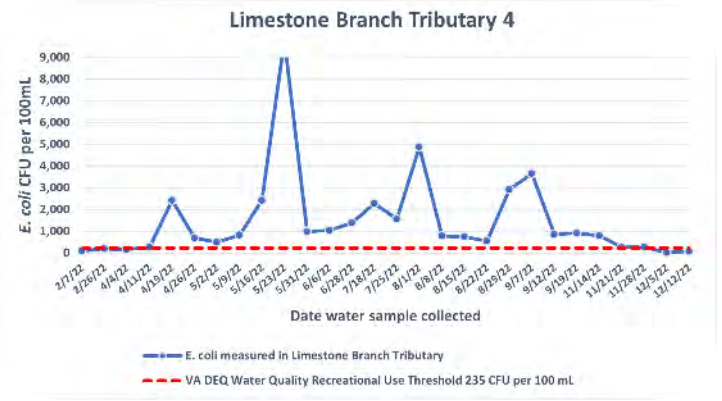
Stream Results for *E. coli* Testing

UT Limestone Branch Tributary

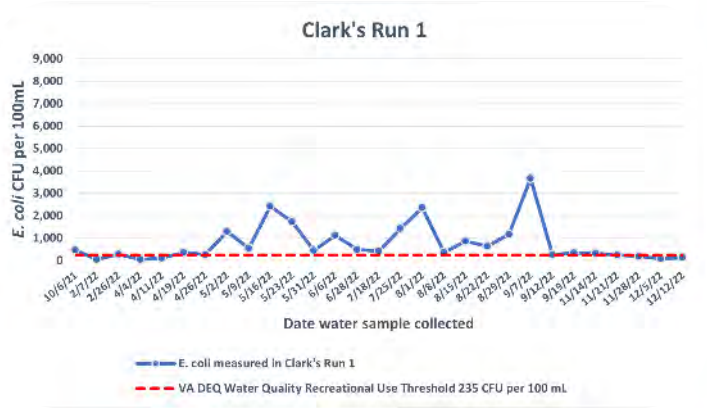


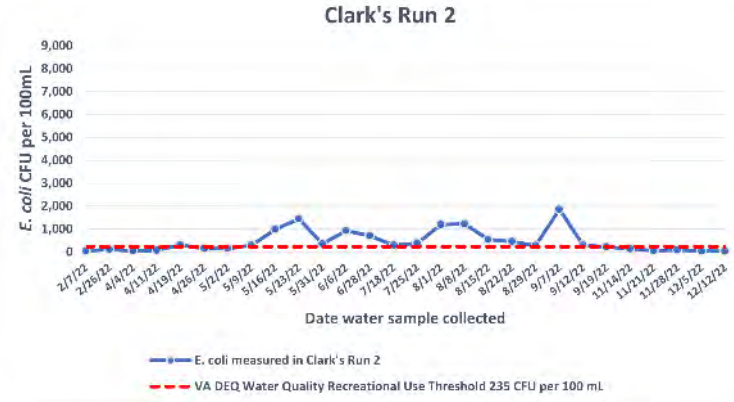






Clark's Run





WWTF Results for *E. coli* Testing

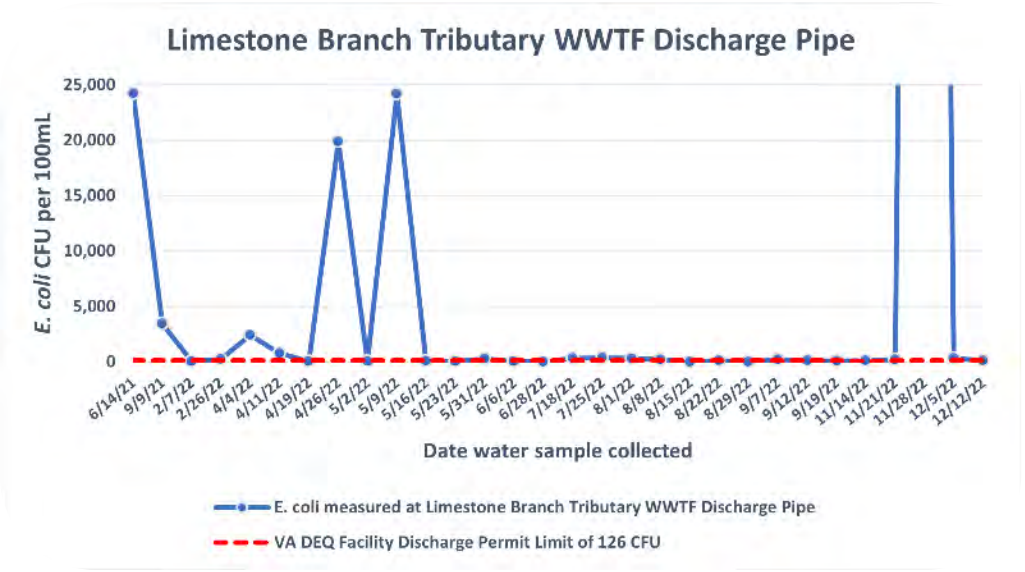
- **WWTF @ UT of Limestone Branch:**
  - **Over 50%** of samples exceeded permit limit
  - Exceedances up to **1,920 times** permit limit

- **WWTF @ Clark's Run:**
  - **10%** of samples exceeded permit limit
  - One exceedance of **192 times** permit limit

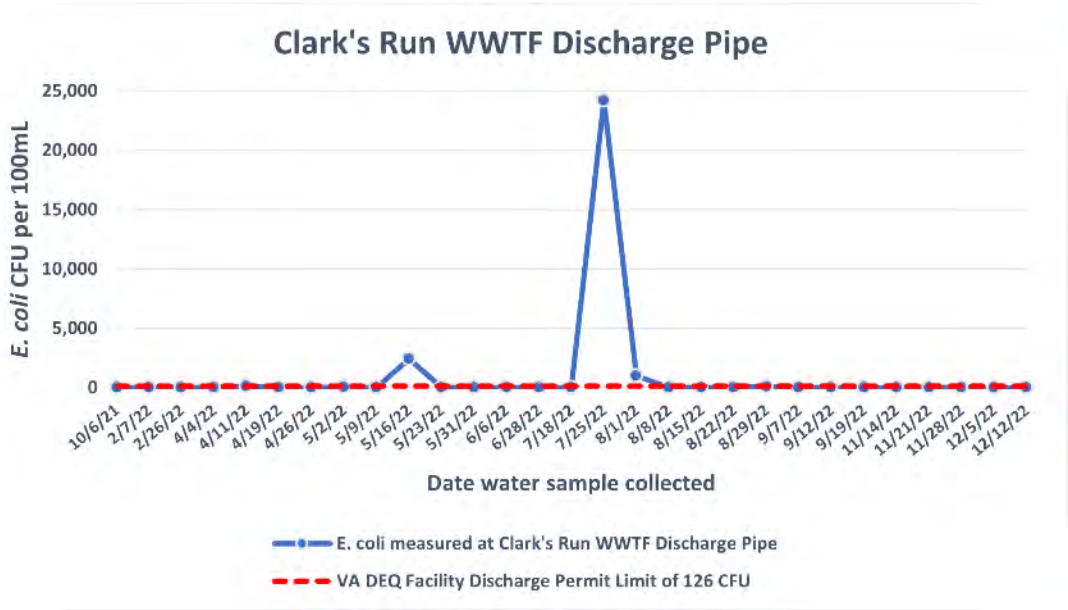
- All exceedances reported to DEQ

WWTF Results for *E. coli* Testing

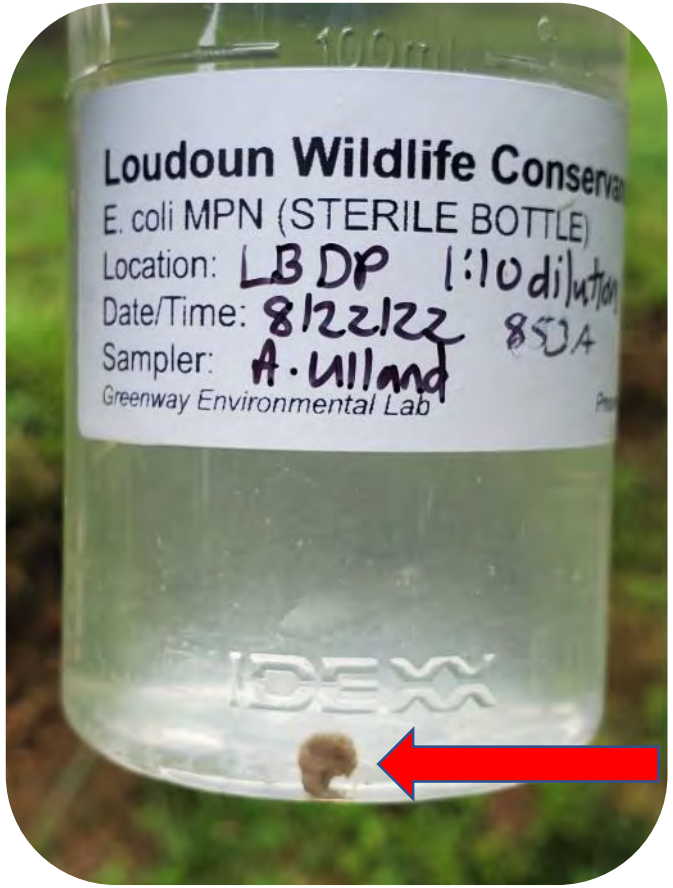
UT Limestone Branch Tributary WWTF



Clark's Run WWTF

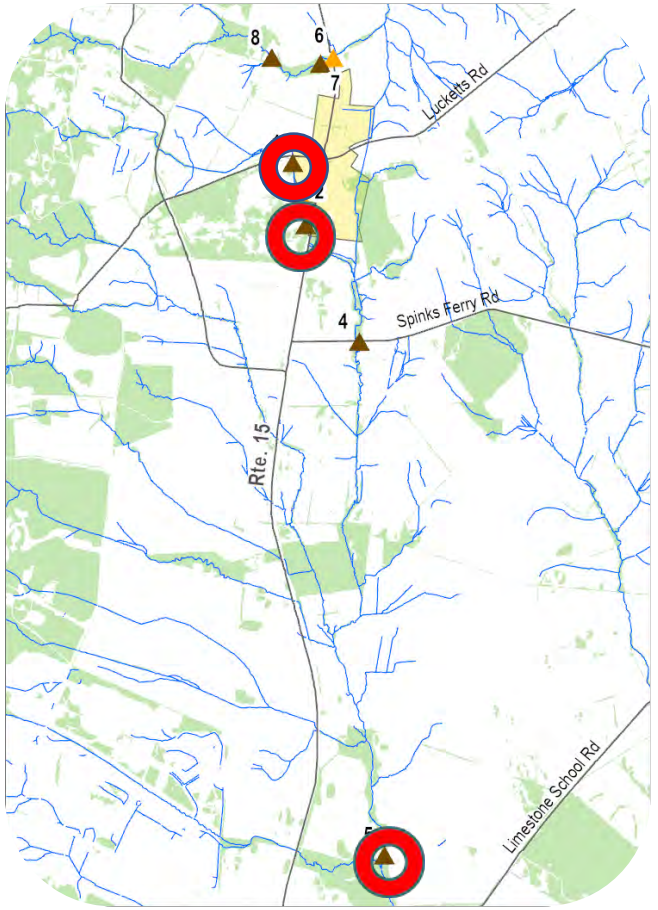


Sewage solids at UT Limestone Branch WWTF



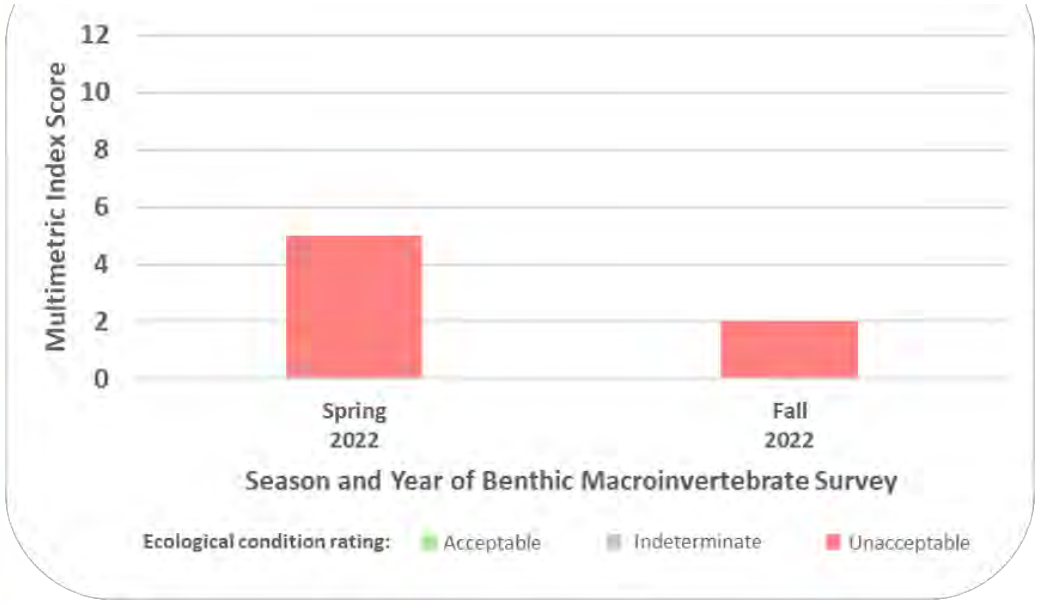
What We Did - Benthic Surveys

- 3 stream sites on UT of Limestone Branch – also *E. coli* testing sites
- Surveys conducted in spring and fall using VA SOS Rocky Bottom Protocol



Benthic Survey Results

UT of Limestone Branch, site downstream of WWTF



UT of Limestone Branch, site furthest downstream

What We Did - Drinking Water Testing

- Drinking water panels tested 11 analytes including *E. coli*, coliform bacteria, lead, and hardness
- Tested water at 23 homes
  - 17 from underserved communities on community wells
  - 6 from area homes on private wells
- All samples analyzed at an accredited lab
- Results and recommendations provided to homeowners

Drinking Water Results – Private Wells

- 4 of 6 homes on private wells had issues with coliform bacteria, lead, and iron
- Resources for treatment options provided to homeowners

Drinking Water Results – Community Wells

- Cultural and community beliefs that water wasn't safe to drink
- Each of the 17 families spending up to **$3,600/ yr** on bottled water
- All 17 homes on community wells passed VDH potable water requirements, but had "very hard" water

What We Did – Community Support

- All 17 families received electronic water descalers and high-quality countertop filtration units with extra carbon filters to address concerns about water taste and quality

What We Did – Community Engagement

- Town Hall meeting about water quality issues, with subject matter experts
- Project webpage with *E. coli* and benthic data
- Articles in local publications
- Distributed publications about well maintenance and testing and septic maintenance

Securing Clean Water for Lucketts: Impact

- WWTF *E. coli* data provided to DEQ and EPA = **EPA mandated construction of new facility** – done!
- **Savings** of $15k/family and **$250k/ community over 4 years**
- Partnership with local farmer to install **exclusion fencing** for livestock
- **Increased community awareness** of stream/drinking water quality and how to reduce *E. coli* in waterways and drinking water

Transforming Volunteer Data into Tangible Change

Loudoun Wildlife Conservancy's Stream Monitoring Program contributes to:

- **Identifying and Addressing Water Quality Issues**
- **Supporting Regulatory Action** to protect and restore stream health
- **Improving Water Quality** through targeted interventions and data-driven decisions
- **Providing Public Health Benefits and Financial Savings** for underserved communities
- **Raising Environmental Awareness** and empowering residents with actionable steps to improve local water quality

Thank You!

- **Izaak Walton League of America**
    - Virginia Save Our Streams
    - Salt Watch
    - Nitrate Watch
- **Alliance for the Chesapeake Bay**
    - RiverTrends
- **Virginia Department of Environmental Quality**
- **Loudoun Soil and Water Conservation District**
- **Friends of the Shenandoah River**
- **Loudoun Wildlife Conservancy's AMAZING Volunteers**

Questions?

Contact Amy at:

aulland@loudounwildlife.org