

# **Status of an Undescribed Sculpin in the New River Drainage, Virginia**



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Endangered Species Division**

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# Endemic Fishes of the New River



Appalachia Darter (*Percina gymnochepha*)



Candy Darter (*Etheostoma osburni*)



Kanawha Minnow (*Phenacobius teretulus*)



Kanawha Darter (*Etheostoma kanawhae*)



New River Shiner (*Miniellus scabriceps*)



Bigmouth Chub (*Nocomis platyrhynchus*)



Kanawha Sculpin (*Cottus kanawhae*)



Bluestone Sculpin (*Cottus* sp.)



# What the heck is a sculpin?

- Family: Cottidae 70 genera, 250 – 300 species, mostly marine, benthic.

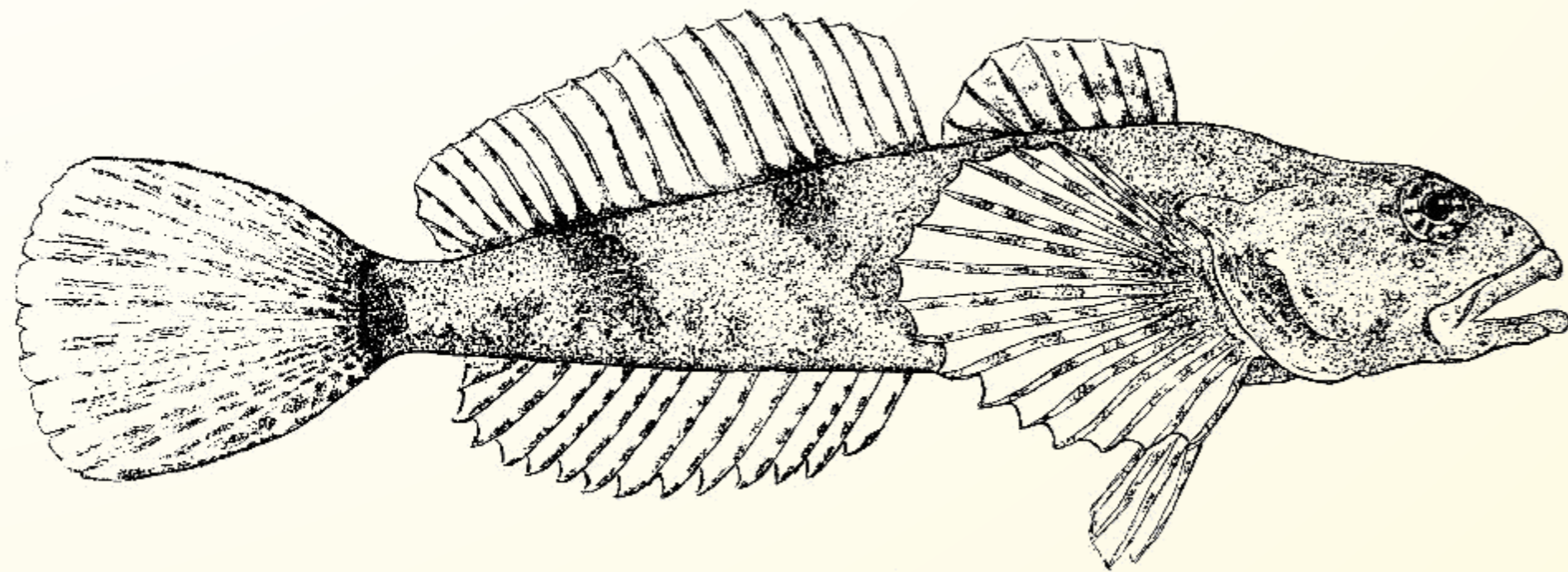
- Genus: *Cottus*



Banded Sculpin  
(*Cottus carolinae*)

- 50 species – All freshwater in North America and Eurasia.
- 33 in North America
- 10 in Virginia (4 undescribed)
- Difficult to identify

- *Cottus* characteristics: Large head, wide mouth, tapering body, scaleless, rounded pectoral fins, and lack swim bladder.



## Diet

Aquatic invertebrates  
to small fish

## VA Size Range

3 ¼" Black Sculpin  
7 ¾" Banded Sculpin



Great Sculpin  
(*Myoxocephalus polyacanthocephalus*)



Cool to cold springs, creeks and streams



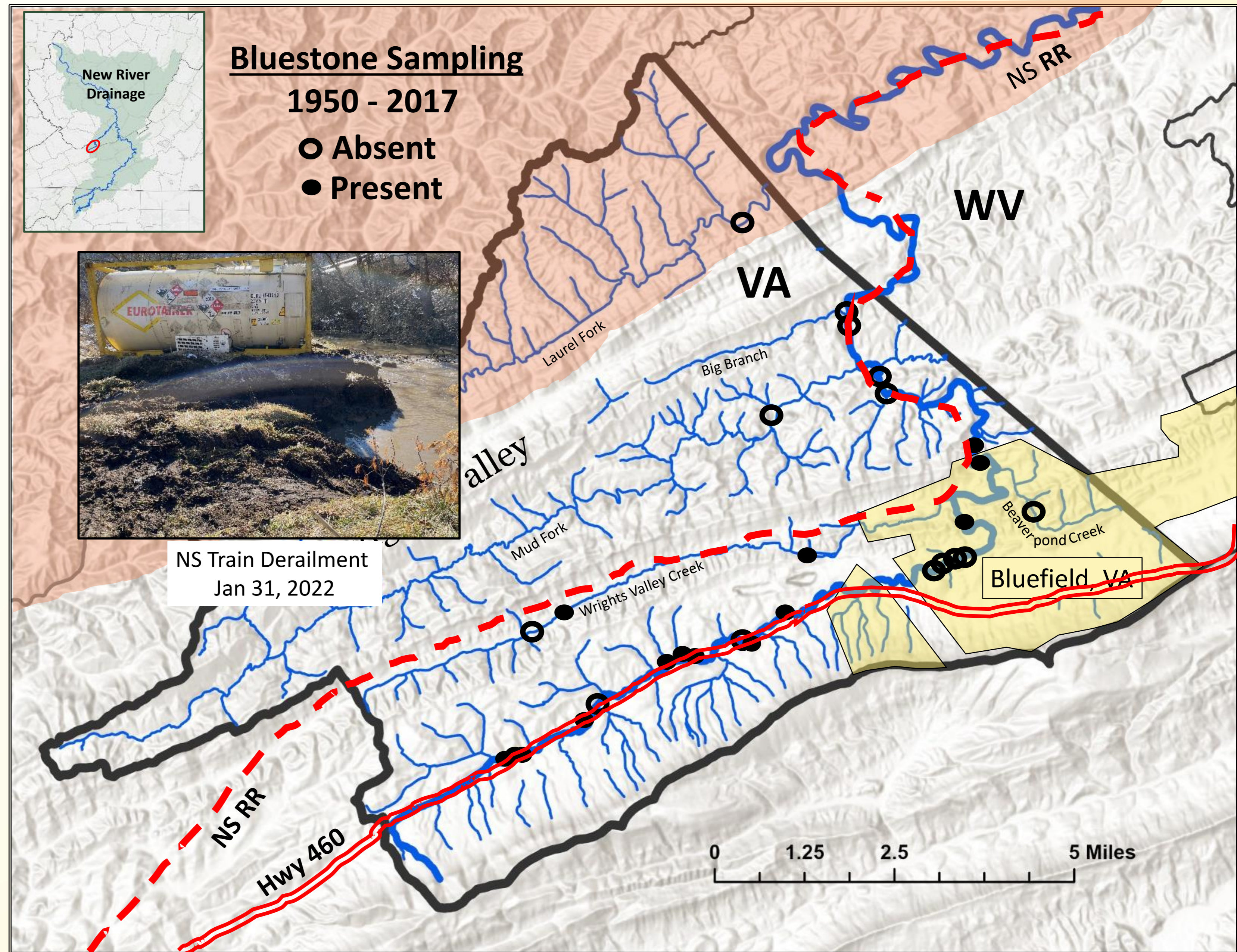
# Bluestone Sculpin (*Cottus* sp.)

- Isolated to the upper Bluestone River in Tazewell Co., Virginia and Mercer Co., West Virginia
- State and Federal Status
  - 2015 Virginia Wildlife Action Plan Tier III Species
  - Under Status Review by the USFWS
- Little published literature available
  - Life History
  - Habitat Use
  - Population Demographics
  - Taxonomy
  - Status and Distribution



## Bluestone Sculpin (*Cottus sp.*)

- Only known in mainstem and one tributary.
- All known sites in the Ridge & Valley.
- Uncommon to abundant, dominating riffles and runs
- Land use:
  - 77.5% Forested
  - 11.2% Agriculture
  - 10.7% Residential/Industrial
- Threats:
  - Water pollution
  - Non-native species
  - Chemical Spills



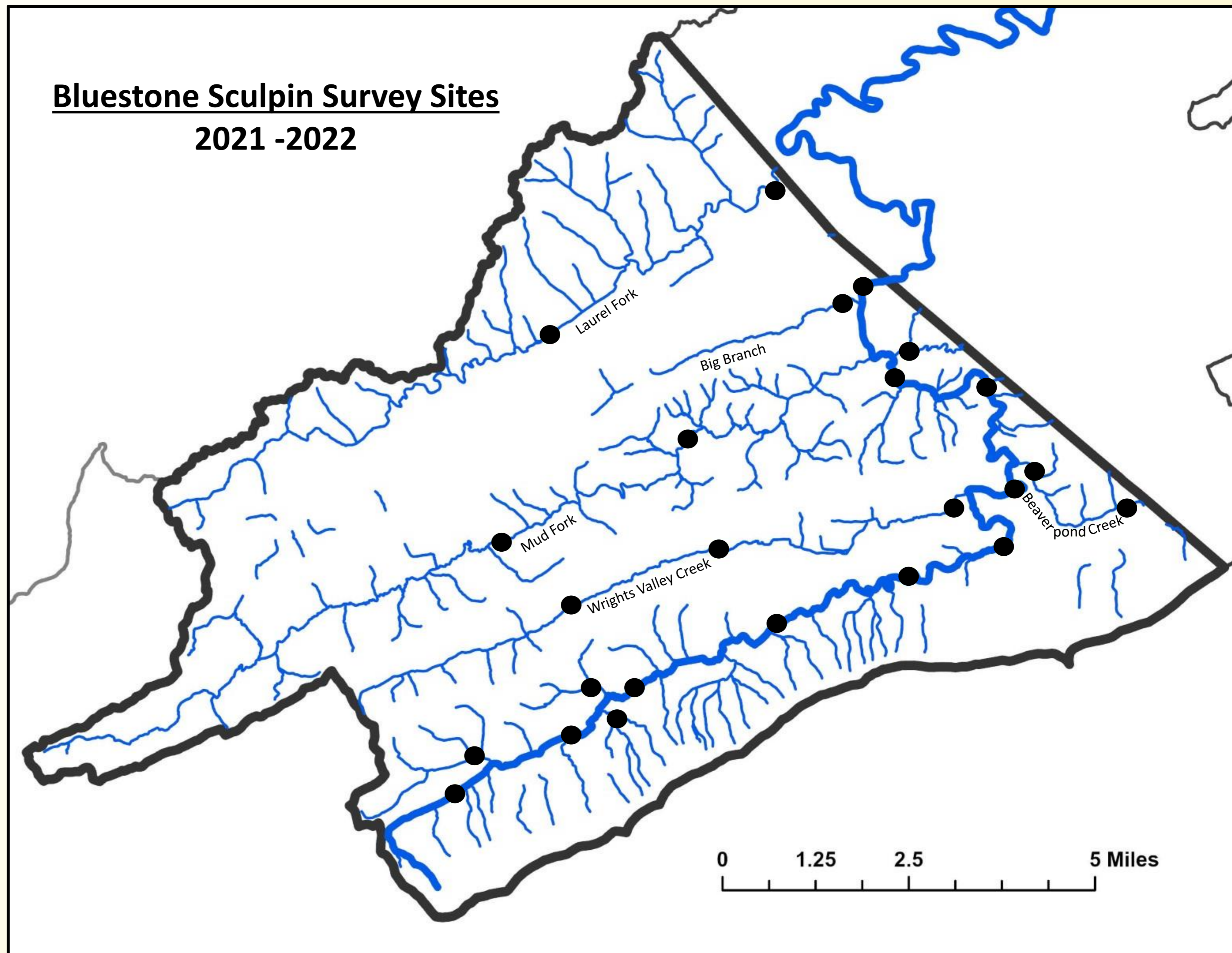
# Study Objectives

1. Determine the status and distribution of the Bluestone Sculpin in Virginia
2. Assess habitat associations
3. Examine population characteristics



## Methods

- 24 sites selected - 10 mainstem & 14 tributaries
- Included historically present, absent and unknown sites.
- Mainstem sites selected systematically with adjustment based on accessibility
- Tributaries sites based on accessibility



# Methods – Distribution and Status

- Late July – September 2021 and 2022
- 20 sampling efforts at each site - equal representation of all mesohabitats (riffle/run/pool)
  - Riffles and runs
    - Backpack electrofishing downstream into a seine
  - Pools
    - Seining or in conjunction with backpack electrofishing.
- All fish were identified to species, counted, and released except for vouchers submitted to the Virginia Institute of Marine Science.
- Total length was measured on all Bluestone Sculpin.



Electrofishing



Seining



Measuring sculpin



## Methods – Distribution and Status

- Stream width: 5 equidistant points along sampling reach
- Water chemistry: pH  
Conductivity ( $\mu\text{S}/\text{cm}$ )  
Turbidity (FNU)  
Temperature ( $^{\circ}\text{C}$ )
- At each sample, habitat type (riffle, pool, run), dominant substrate, and average depth were recorded



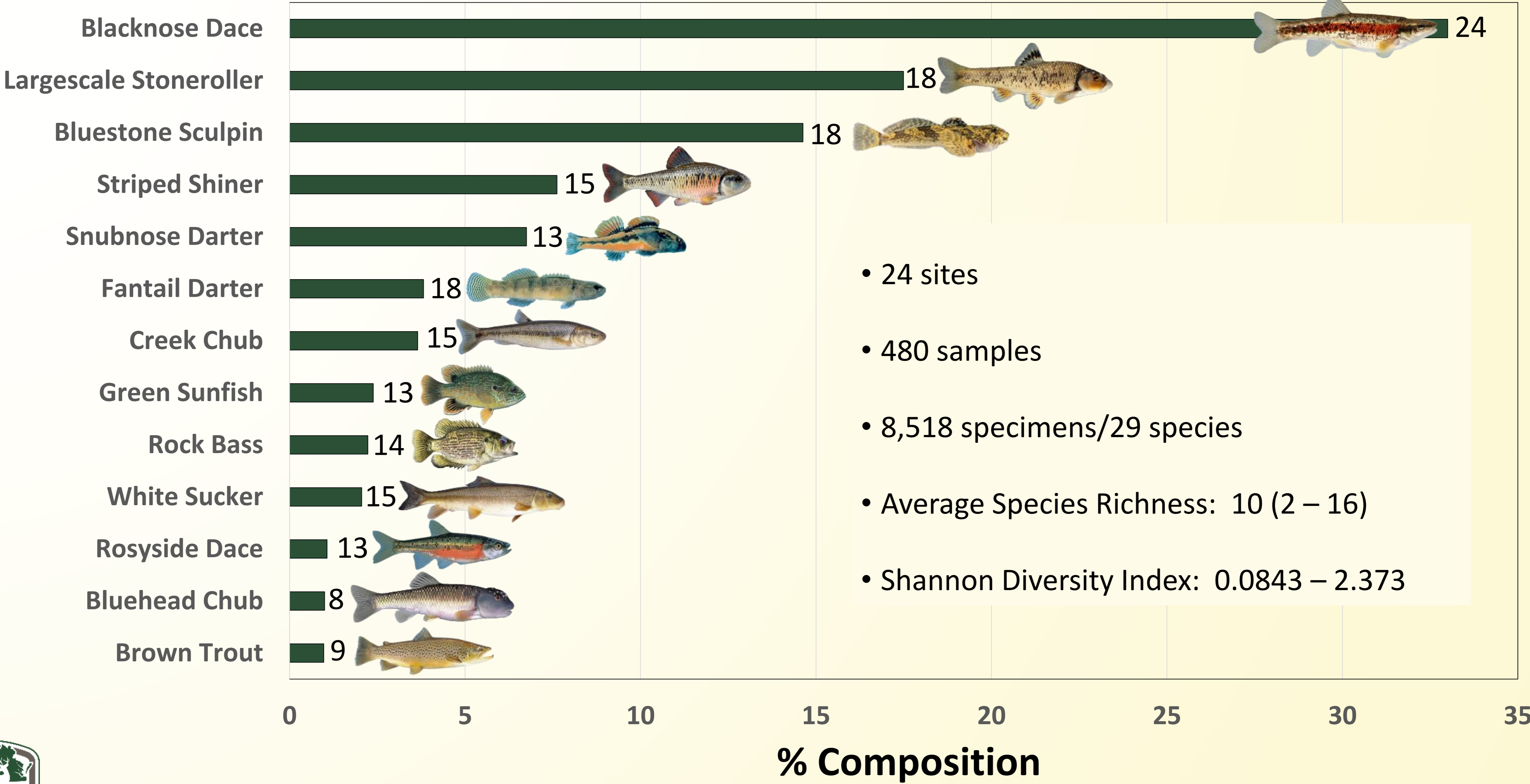
10-m wide mainstem



1-m wide tributary

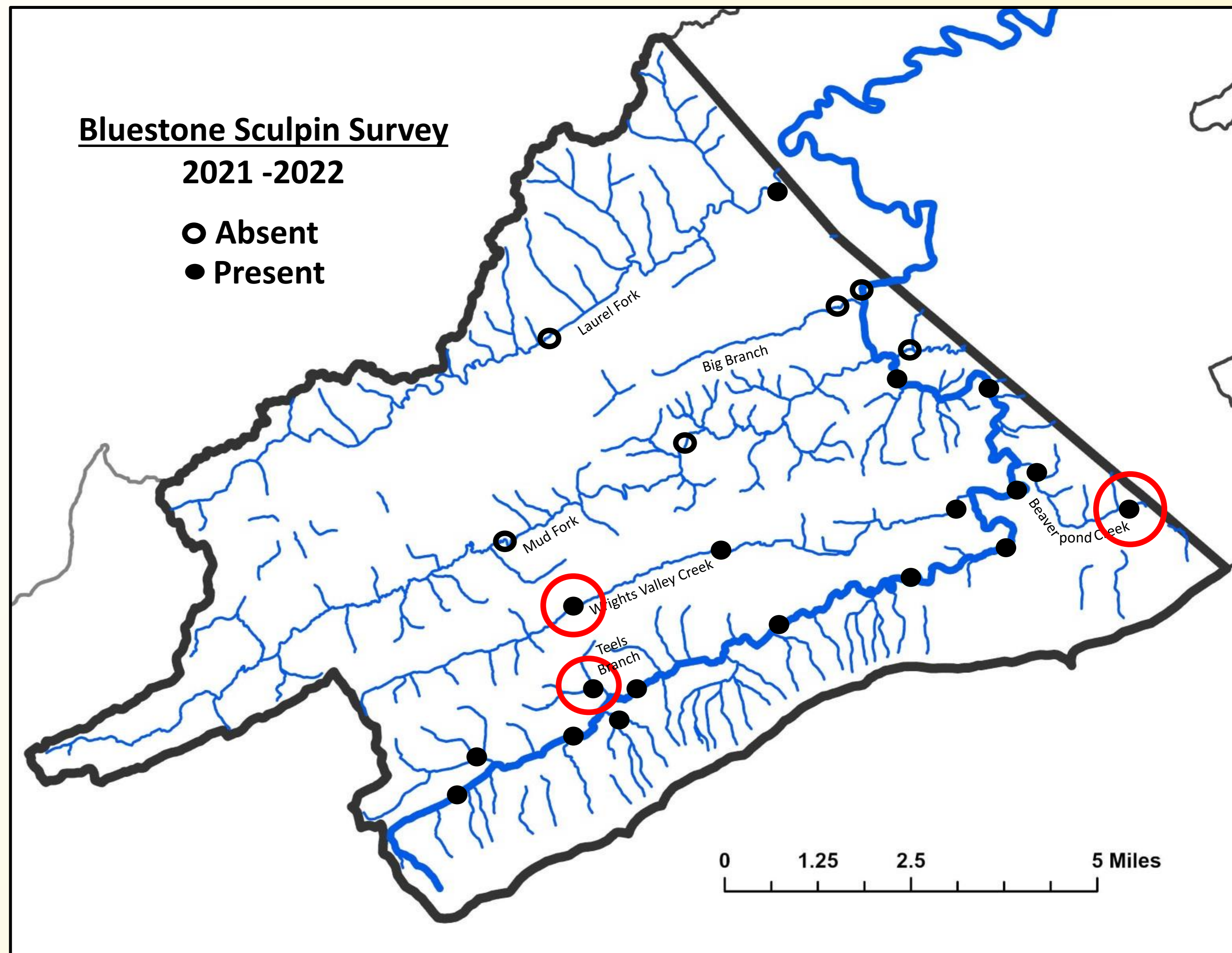


# Results - Bluestone Fish Survey

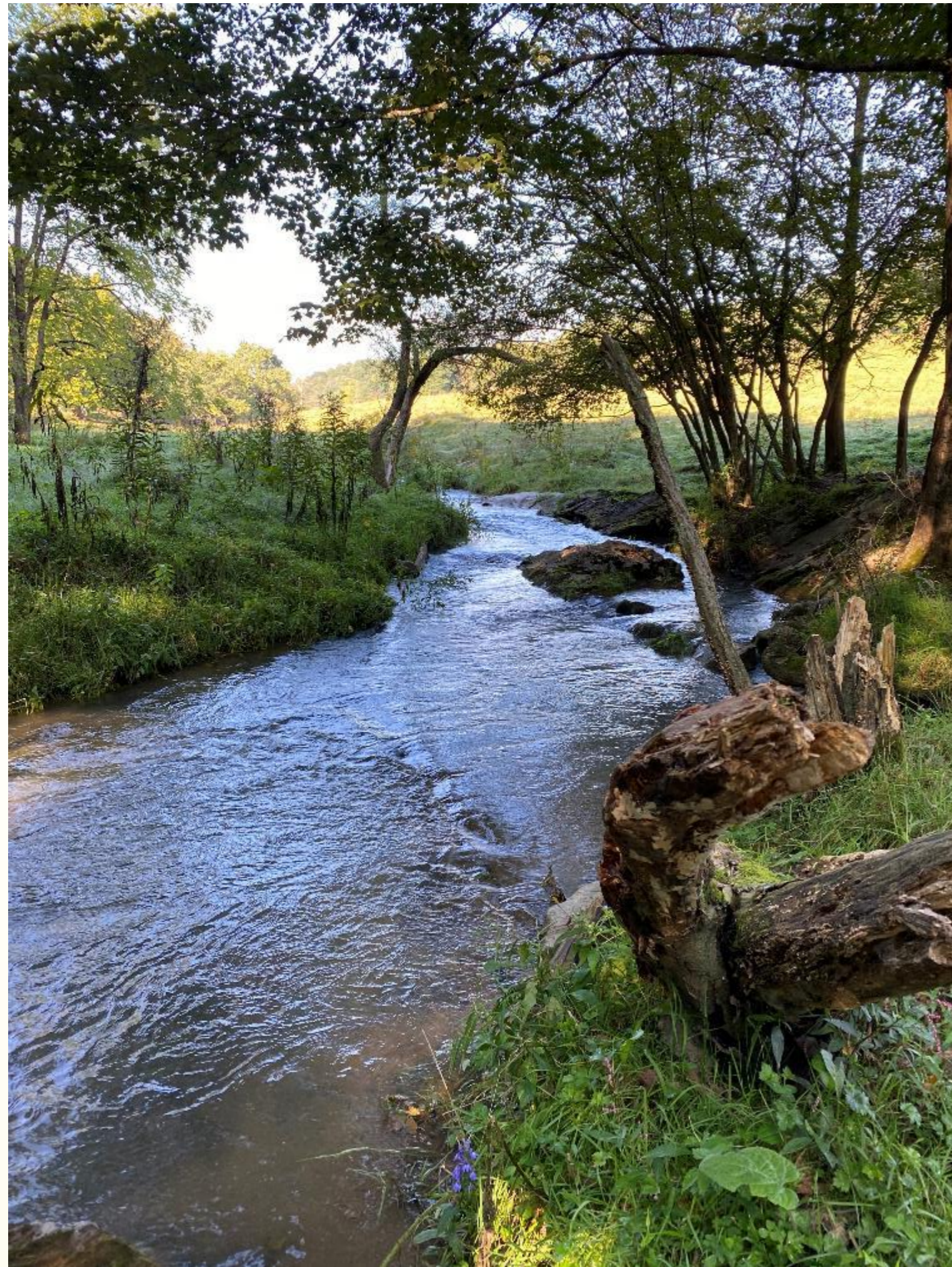


## Results

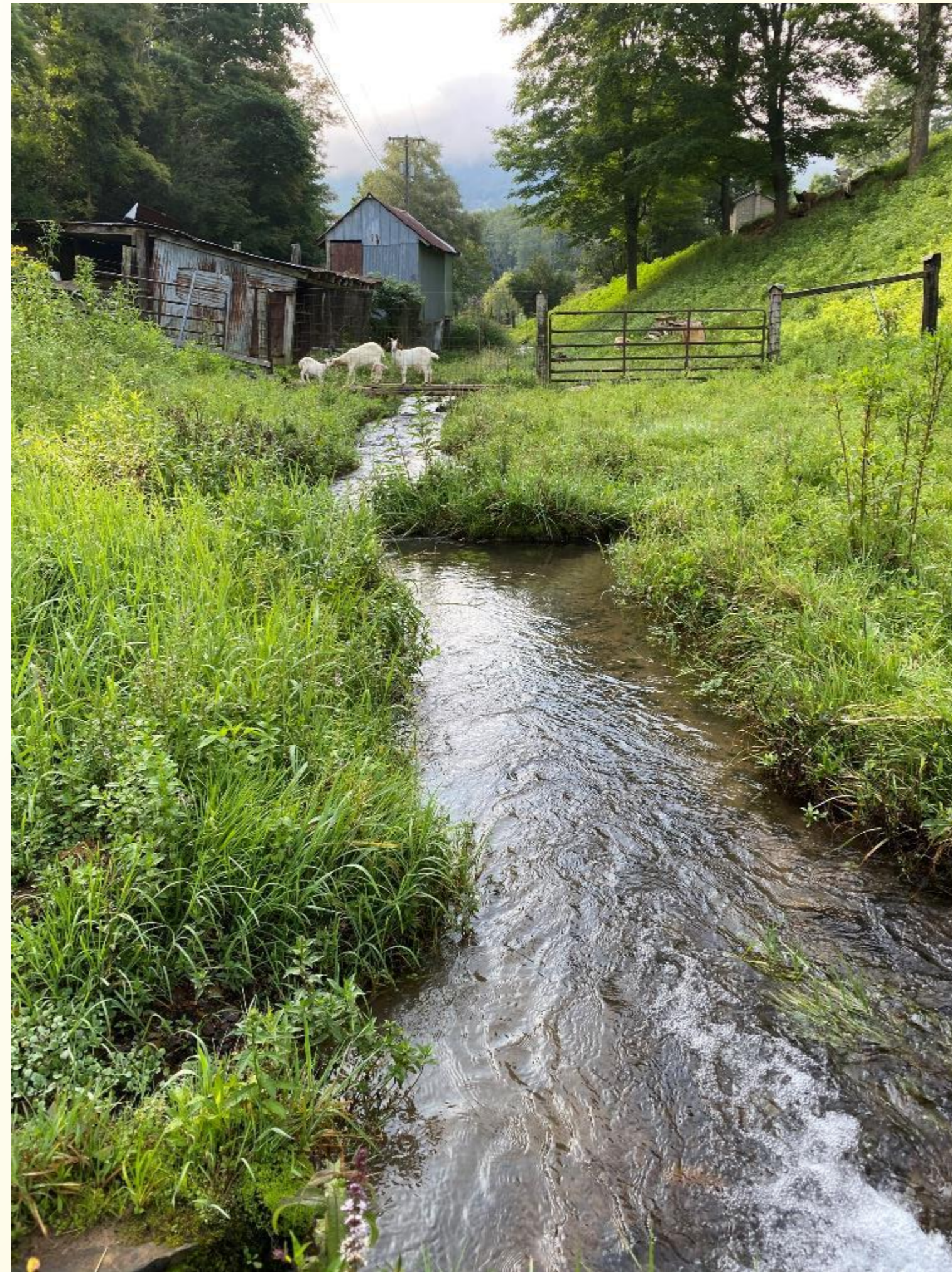
- Present in all but the lower-most mainstem site.
- Present in 6 of 9 tributaries sampled.
- Found in 2 tributaries previously considered absent.
- Nearly ½ of all sculpin collected were found in 3 tributary sites.



# Blue Ribbon Bluestone Sculpin Streams



**Wrights Valley Creek**  
**22%**



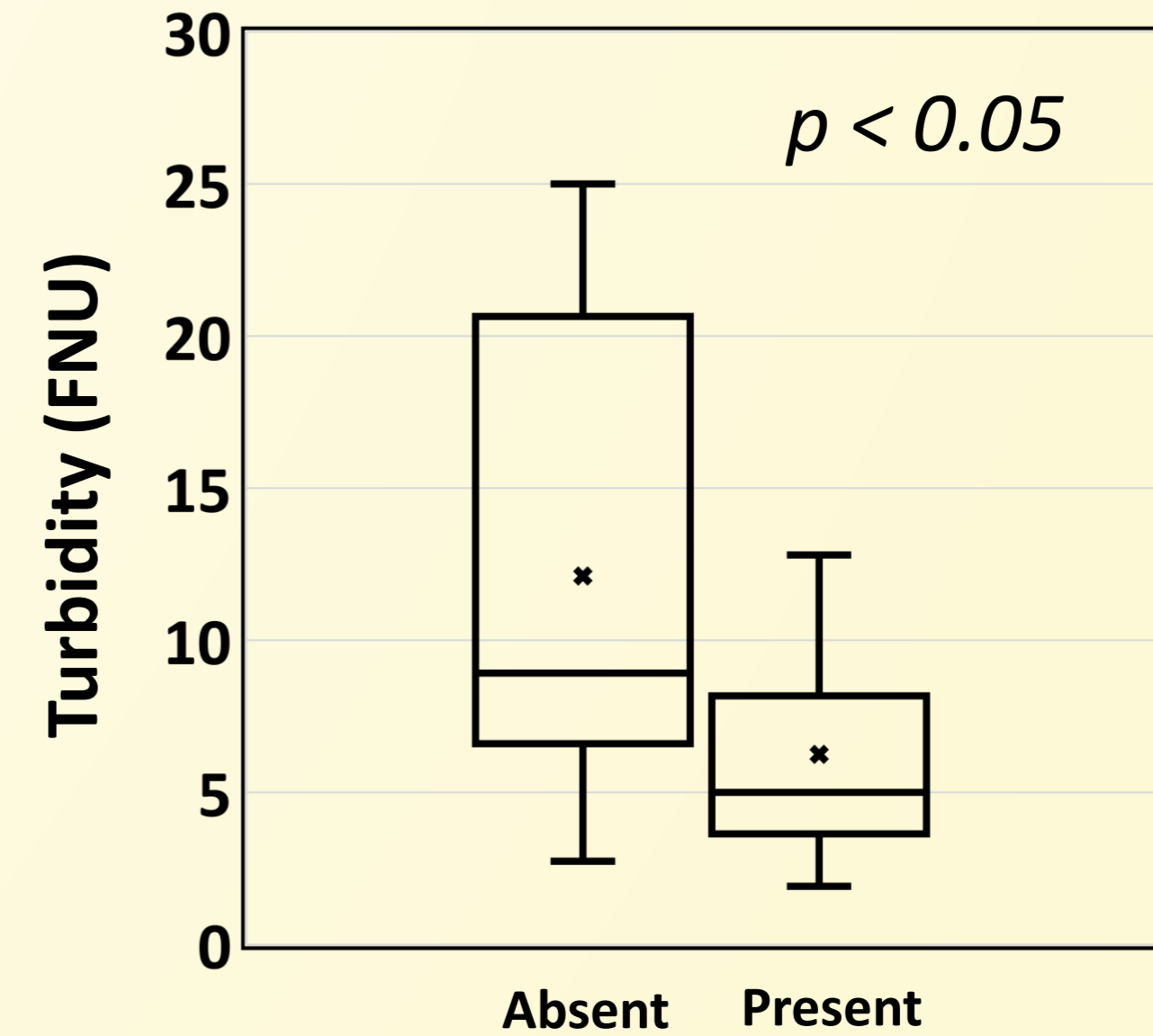
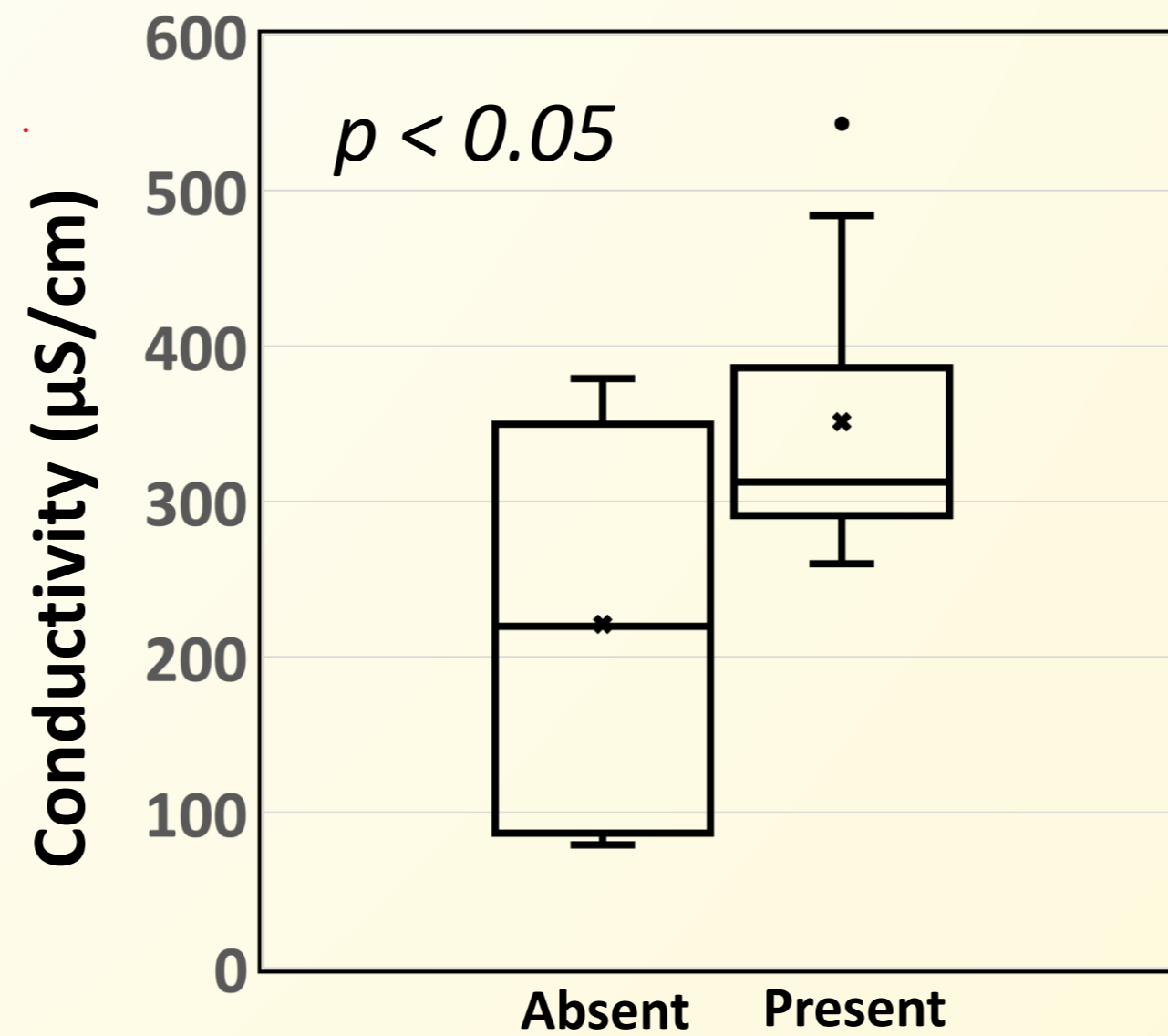
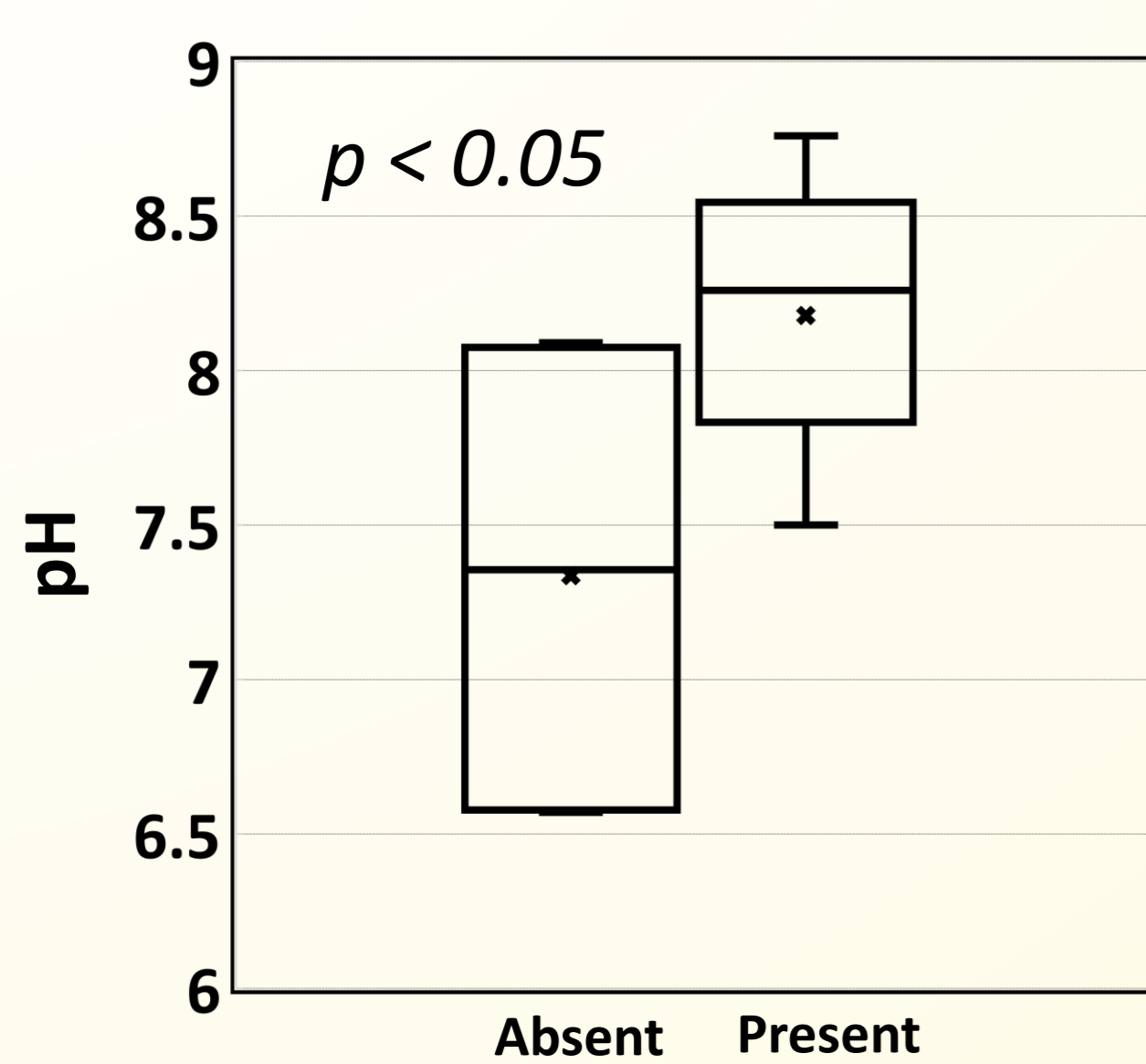
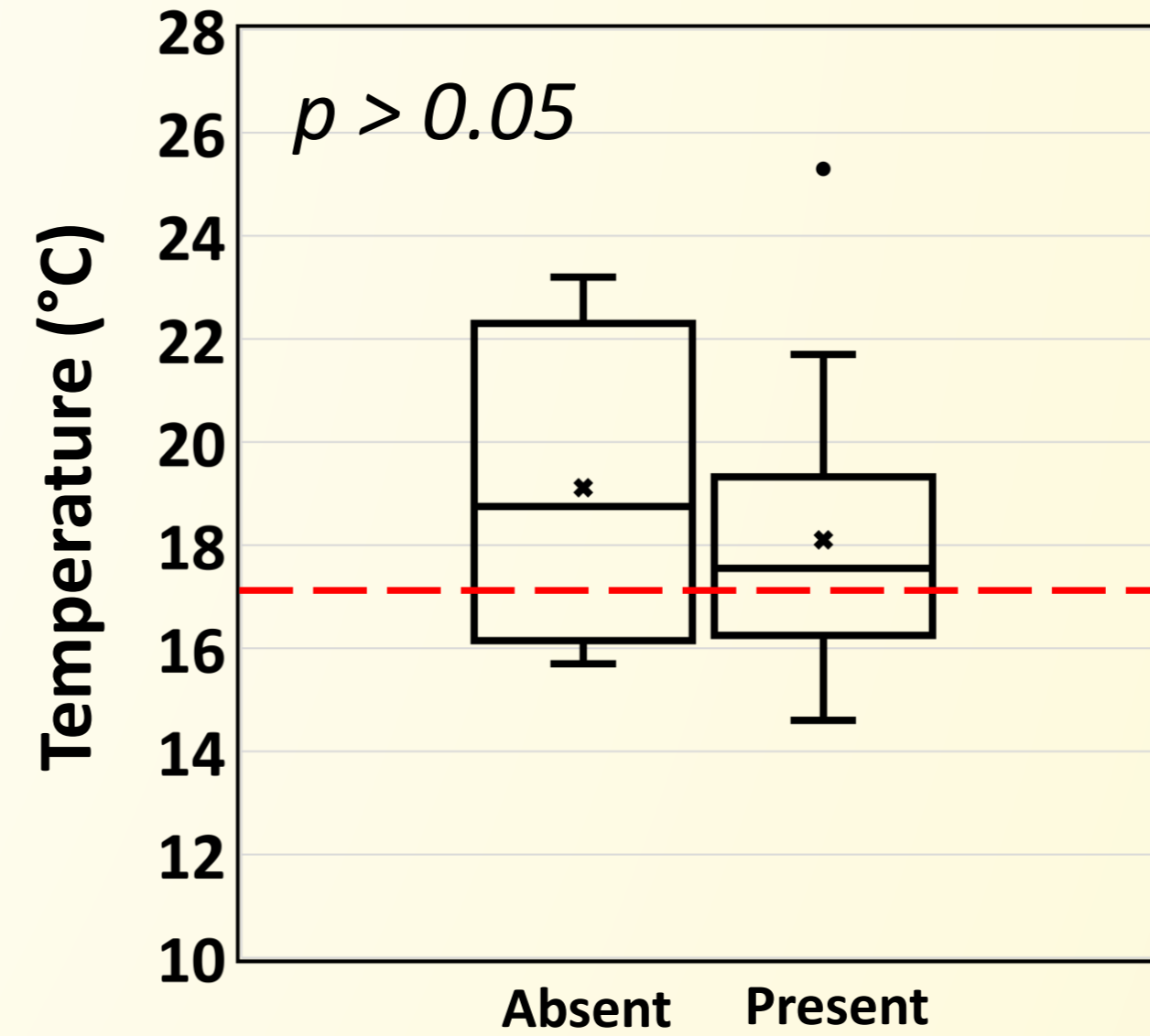
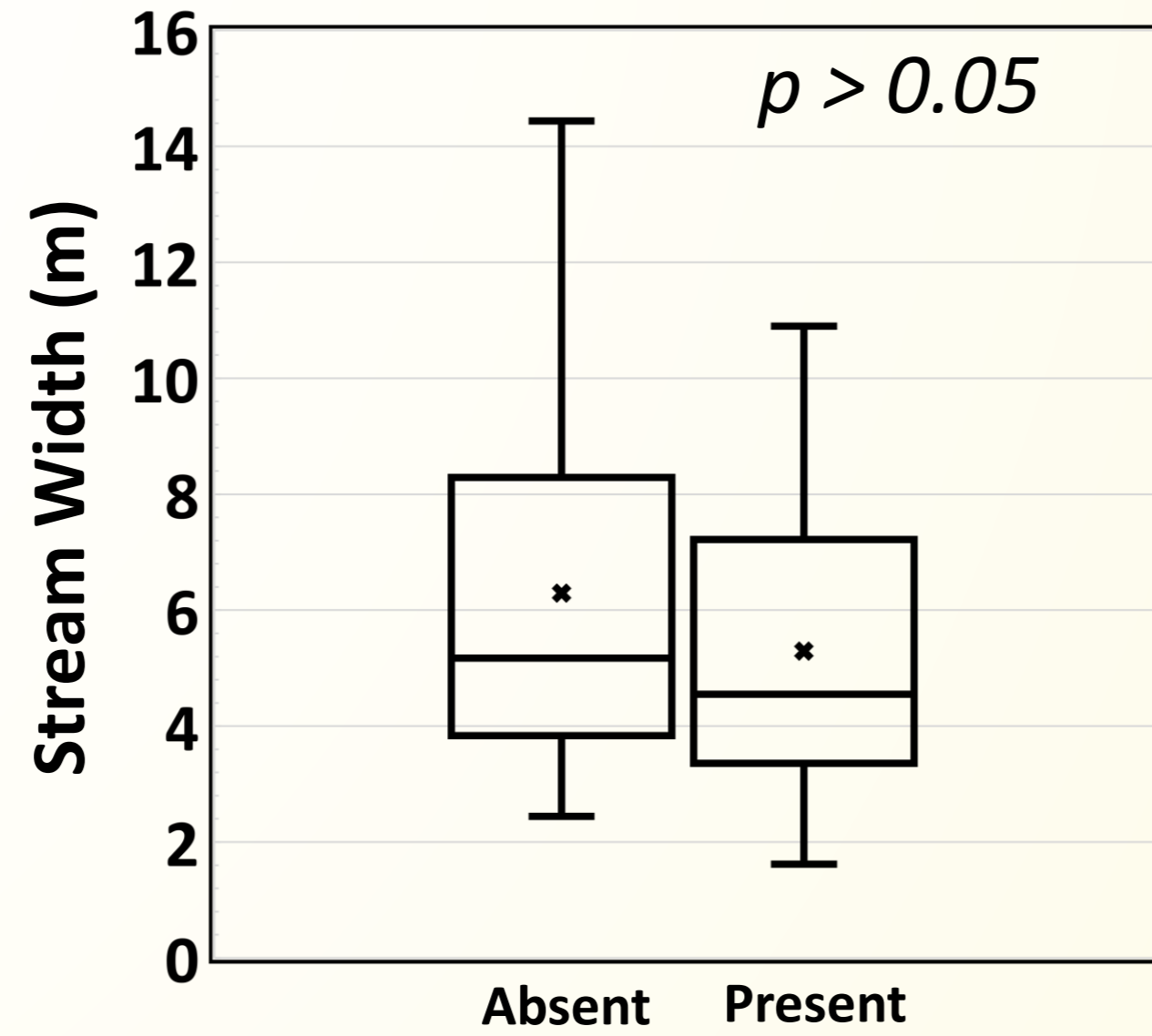
**Teels Branch**  
**12%**



**Beaverpond Creek**  
**9%**

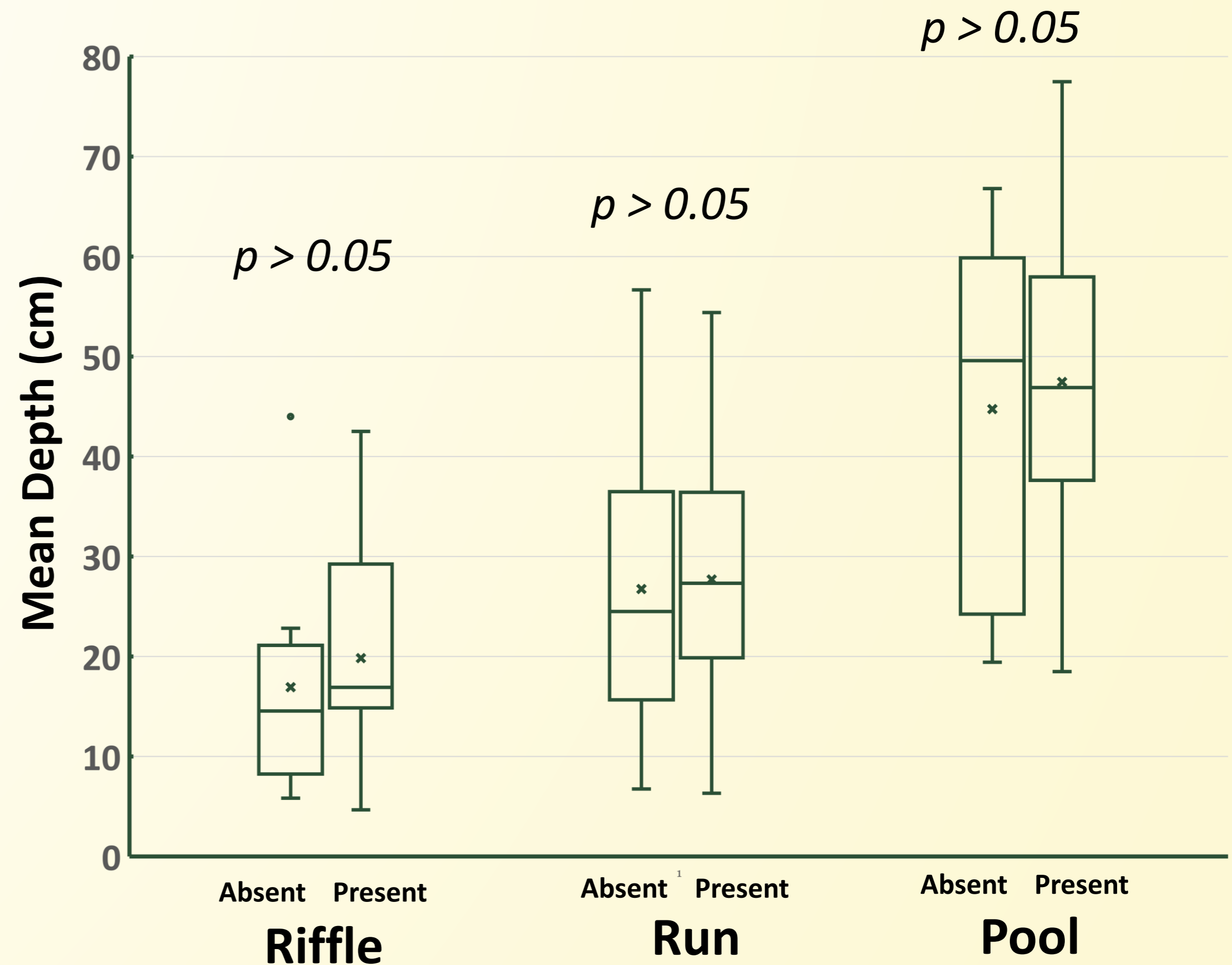


# Presence/Absence Site Comparison

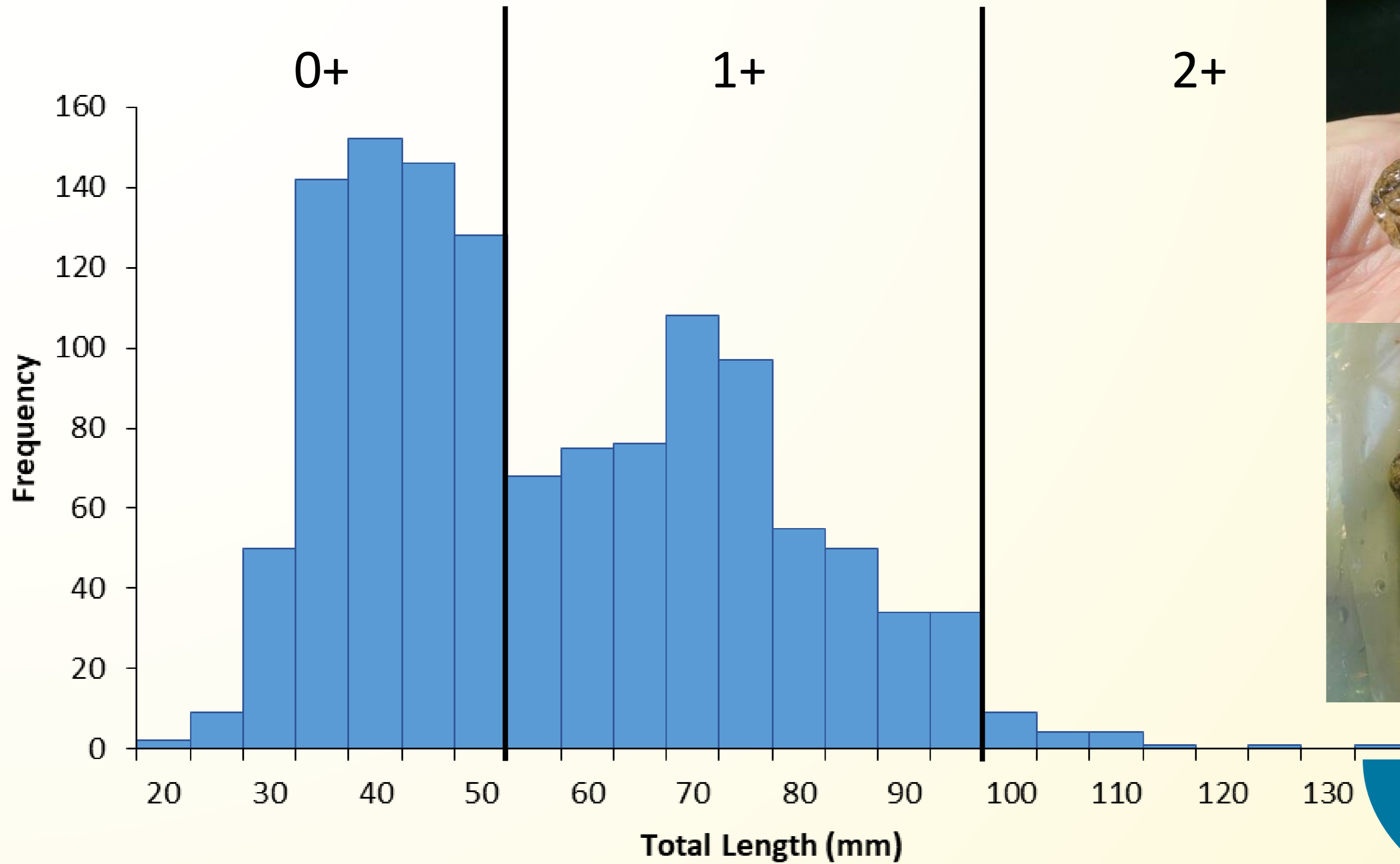


# Mesohabitat Characteristics at Known Sites

- 76% Riffles, 69% Runs, 49% Pools
- No significant difference in substrate types in mesohabitats with and without Bluestone Sculpin.
- Riffles: Cobble > Gravel > Pebble > Bedrock > Boulder
- Runs: Cobble > Gravel > Pebble > Boulder > Bedrock > Sand > Silt
- Pools: Cobble > Gravel > Boulder > Silt > Bedrock > Pebble > Sand



# Bluestone Sculpin Length Frequency

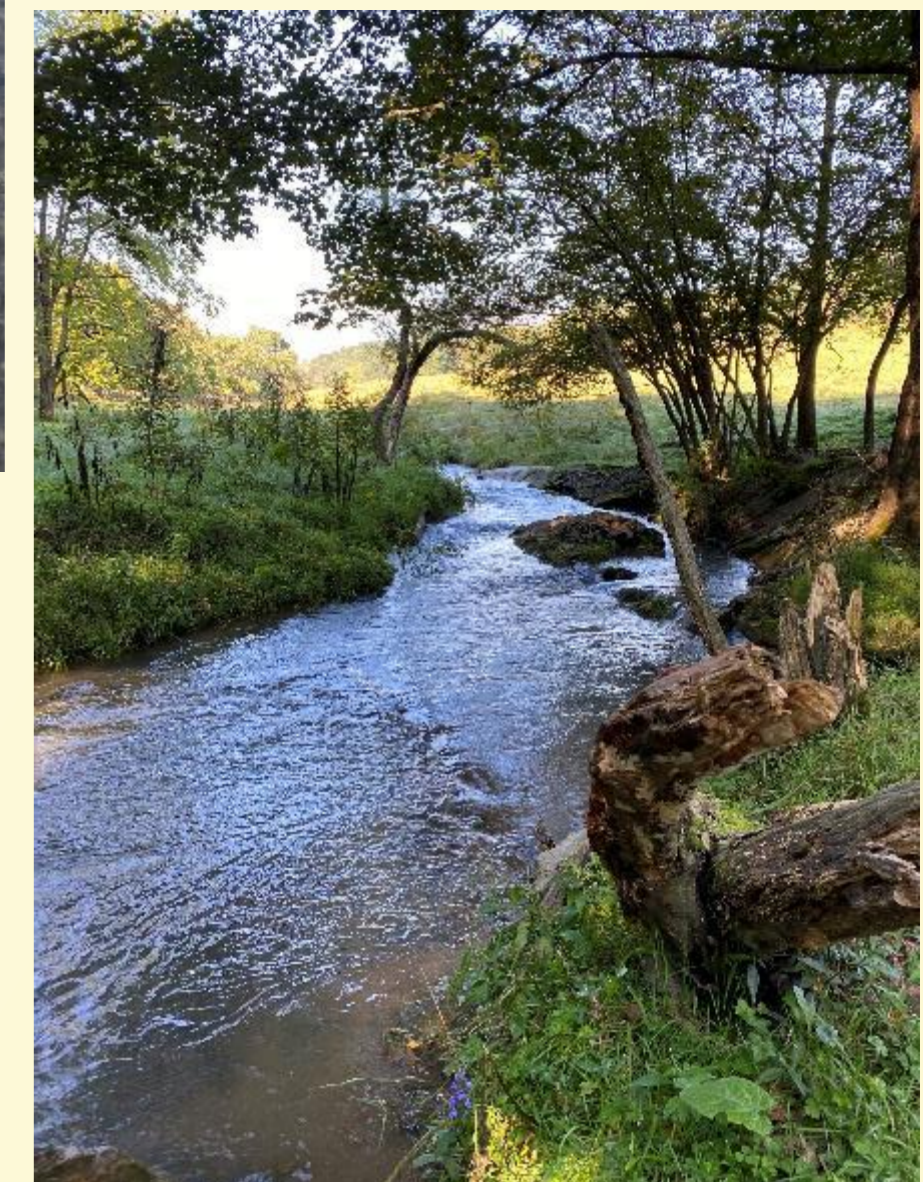


**World Record BSS 133 mm or 5¼ in**



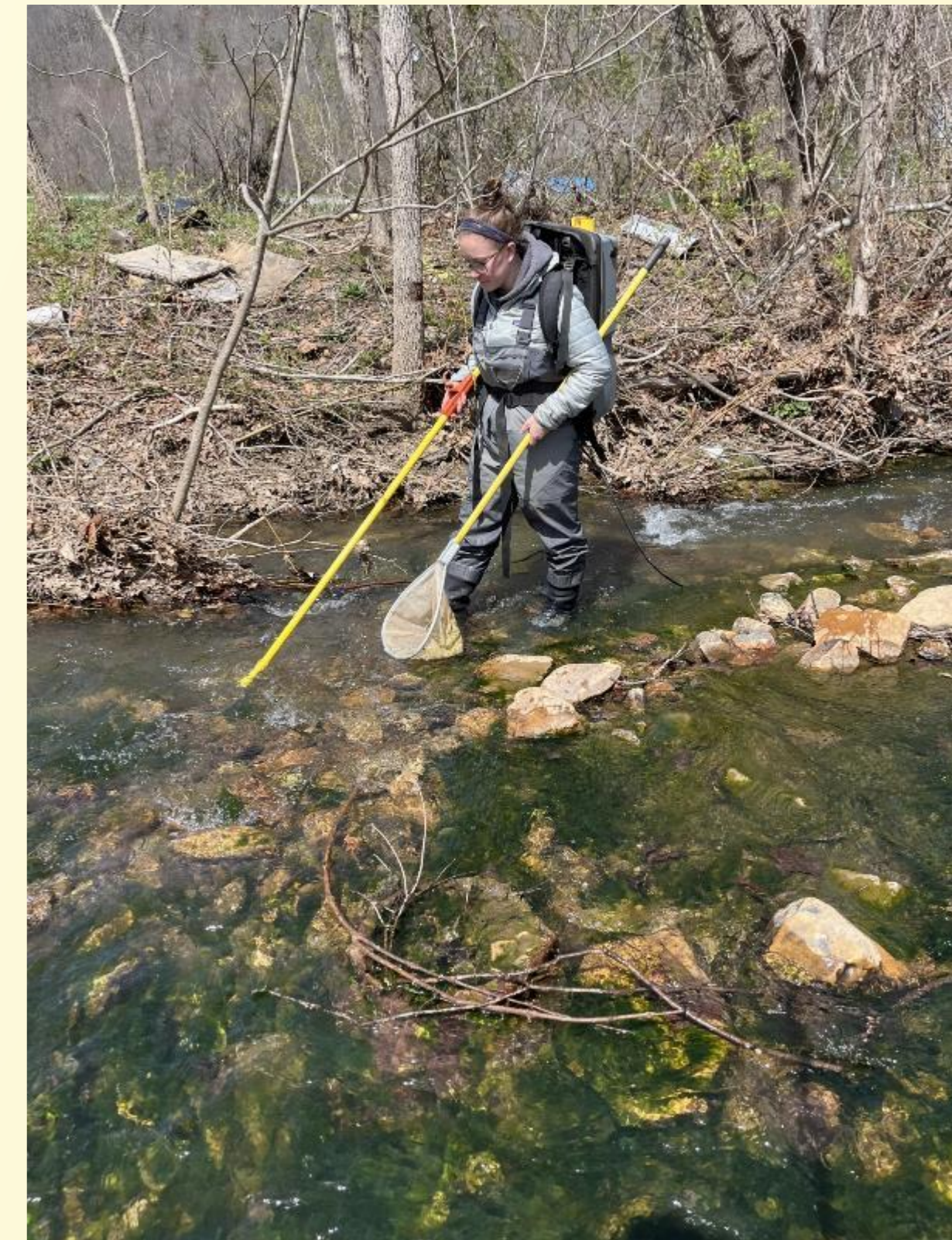
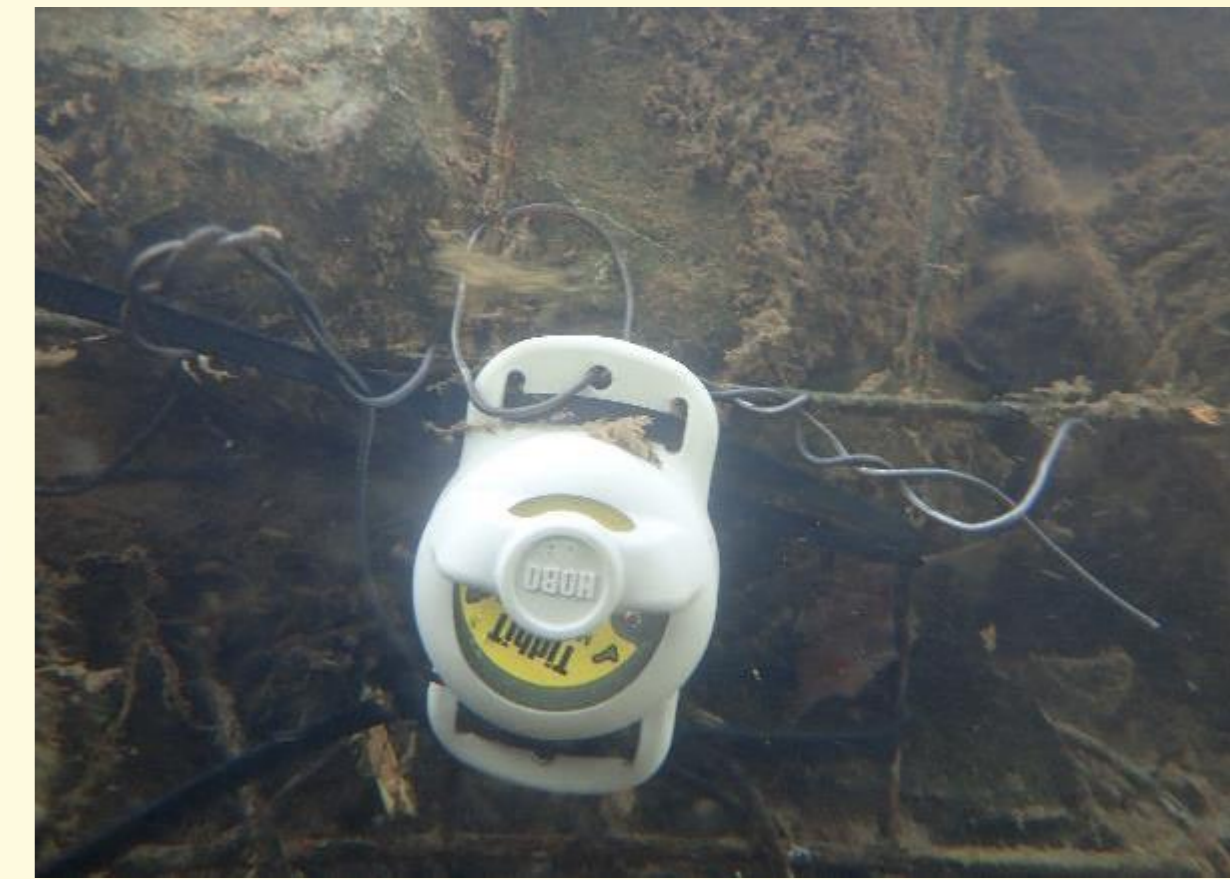
# Summary

- Common and widespread in mainstem to small tributaries in both Appalachian Plateau and Valley and Ridge provinces.
- Occur in clear streams with high pH and conductivity.
- Primarily associated with riffle-run mesohabitat and cobble/gravel substrate.
- Average lifespan of 2 years



## Ongoing and Future Research

- Spawning period, fecundity, sex ratios
- Temperature monitors
- Determine ages using otoliths
- Diet
- Examine genetics
- Status and distribution in WV
- Species Description



# Thanks to the following Sculpin Wranglers

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