Flowing Forward: Evaluating Farmington's Fish Populations for Informed Land and Water Use

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Project Motivation & Goals

Species inventories (recording the presence and abundance of species in an area) in vital ecosystems, such as coldwater streams (Fig. 1), is critically important for municipalities and town leaders to make well-informed land and water use decisions because:

- Certain species can serve as bioindicators of ecosystem health; and
- Relative measures of diversity can help prioritize areas in most need of management.

This project involved **evaluating the ecological status of several streams and rivers within Farmington and reporting my results** to the town in order to aid my community's conservation decision making. Updating their fisheries data will ensure that the town has a comprehensive understanding of Farmington's local aquatic environments, and how the choices they make can impact these valuable rivers and streams.

The **main objectives** of this project were:

- Collect accurate and updated fish population data for three different streams and rivers in Farmington.
- Assess the health of these waterways using a variety of factors.
- Educate my community about the impacts and importance of the conservation of these rivers and streams and their aquatic inhabitants.
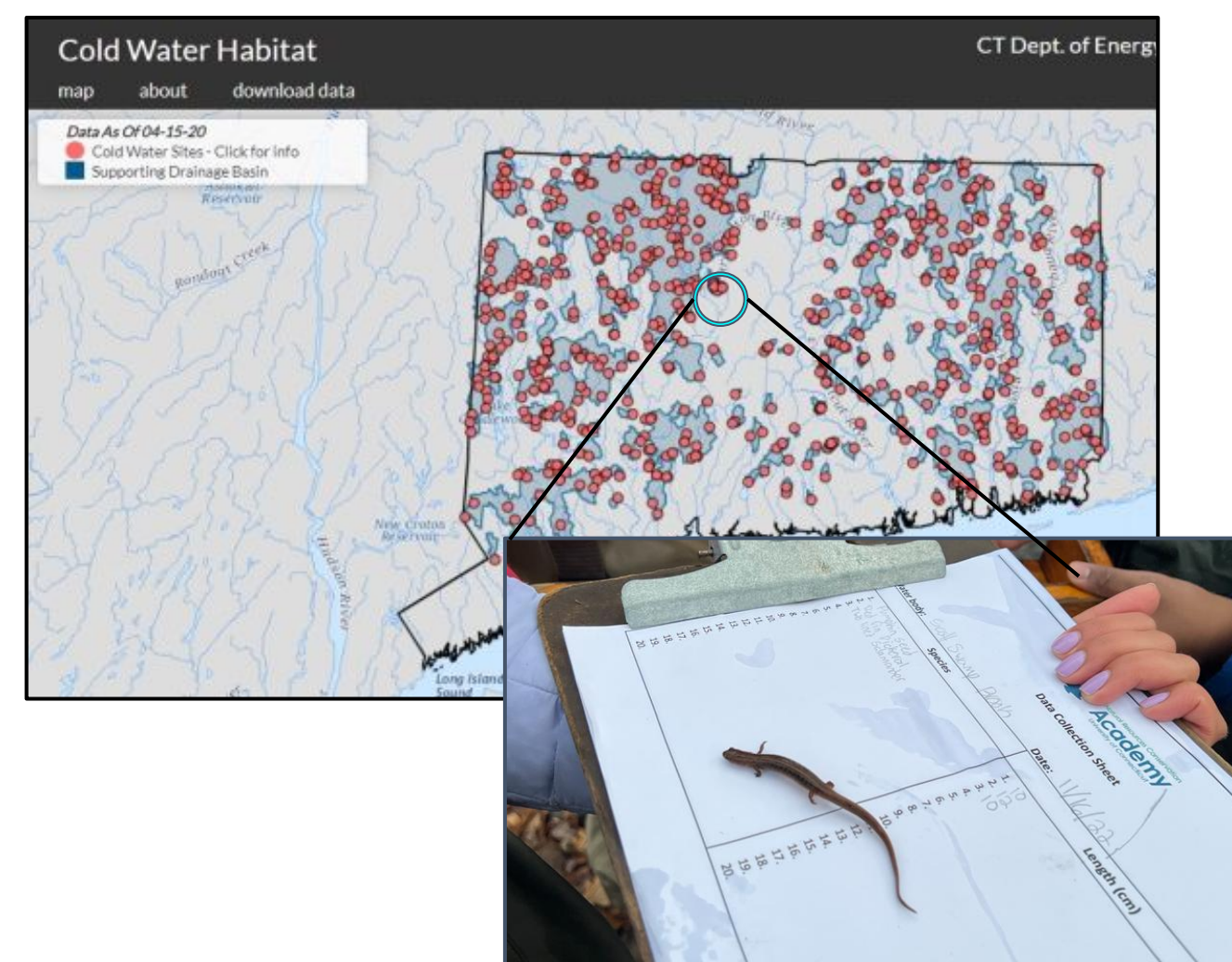- Provide data to Farmington officials to aid in decision-making.

Fig. 1 (Top) Map of coldwater habitats in Connecticut with circle showing survey location. https://portal.ct.gov/DEEP/ (Bottom) Two-lined salamander found while surveying.

Project Outcomes

Key Factors Assessed:

- Species Richness: number of different species
- Origin: native vs. non-native
- Habitat: stream flow and tolerance level

Summary of Observations:

- Population Density: None of the densities are above 1 fish per meter (Fig. 3A)
- Origin: Majority native species in all brooks (Fig. 3B)
- Habitat: Majority fluvial specialists (need flowing water); (Fig. 3C) and mostly intermediate tolerance level species (Fig. 3D)
- Past vs. Current Data: Minor differences in density percentages which shows that the systems are stable *(see presentation to conservation commission: https://tinyurl.com/hkCAP)*
- Unionville brook has parts of the stream that may have non-native species as well as slow moving or still water

Implications for Farmington and Beyond:

- Up-to-date and accurate fish population data and an overall health assessment is necessary to make informed decisions regarding local land and water use and guide the conservation and protection of these important natural resources.
- Healthy waterways and fish populations are indicators of a healthy environment. A healthy environment is important for both human and wildlife populations as it provides essential ecosystem services such as food, habitat, flood control, erosion prevention, aesthetics, and regulating water quality.
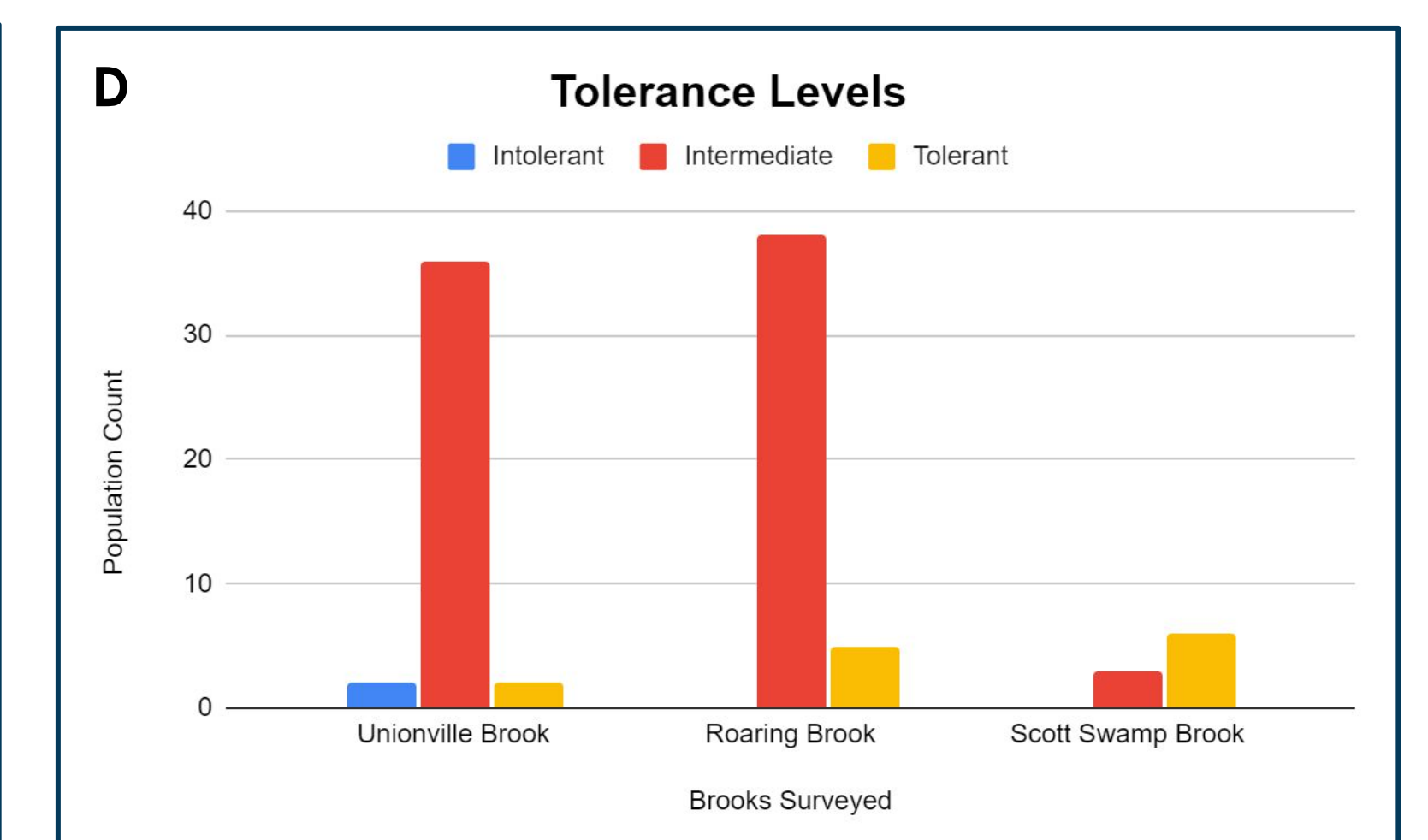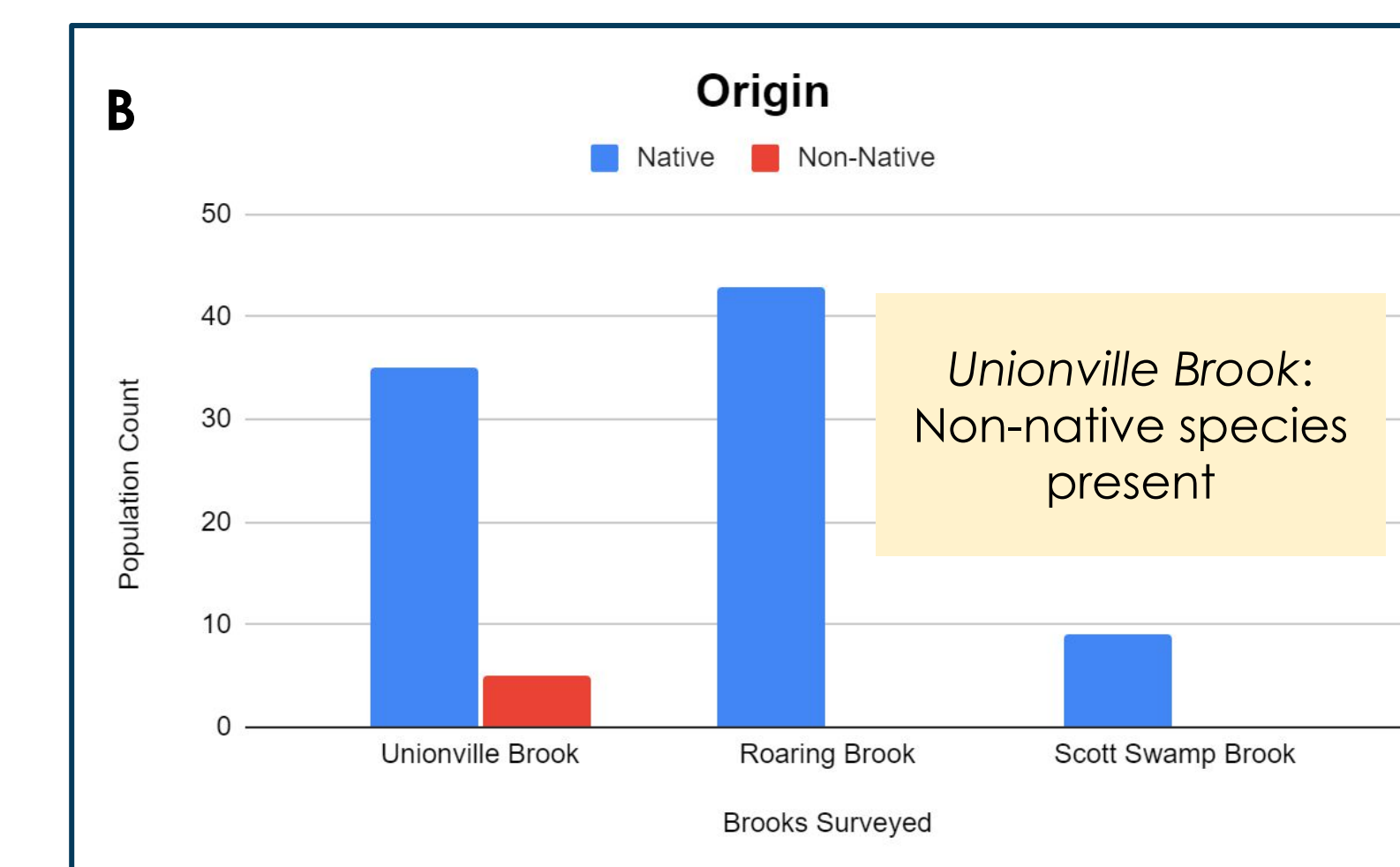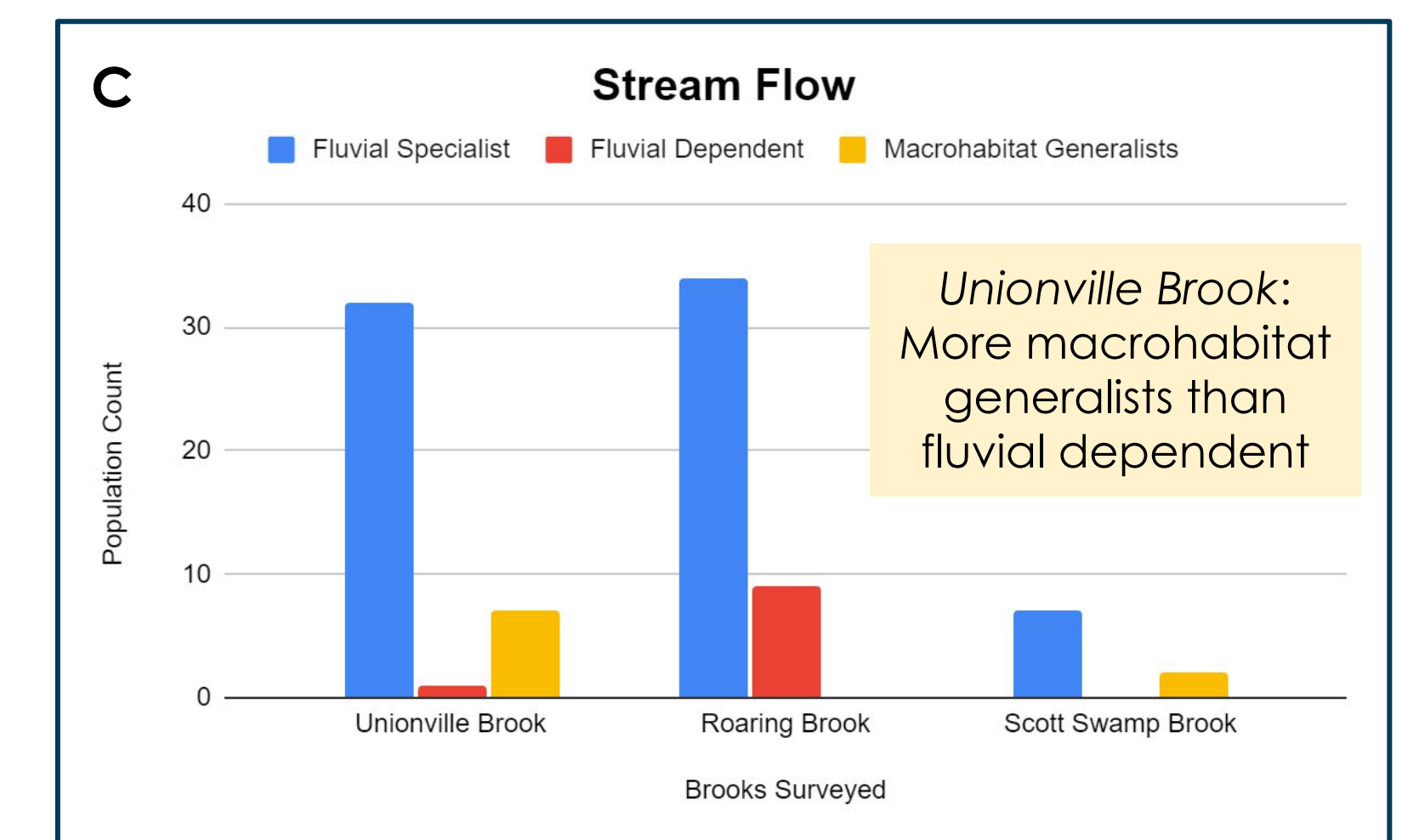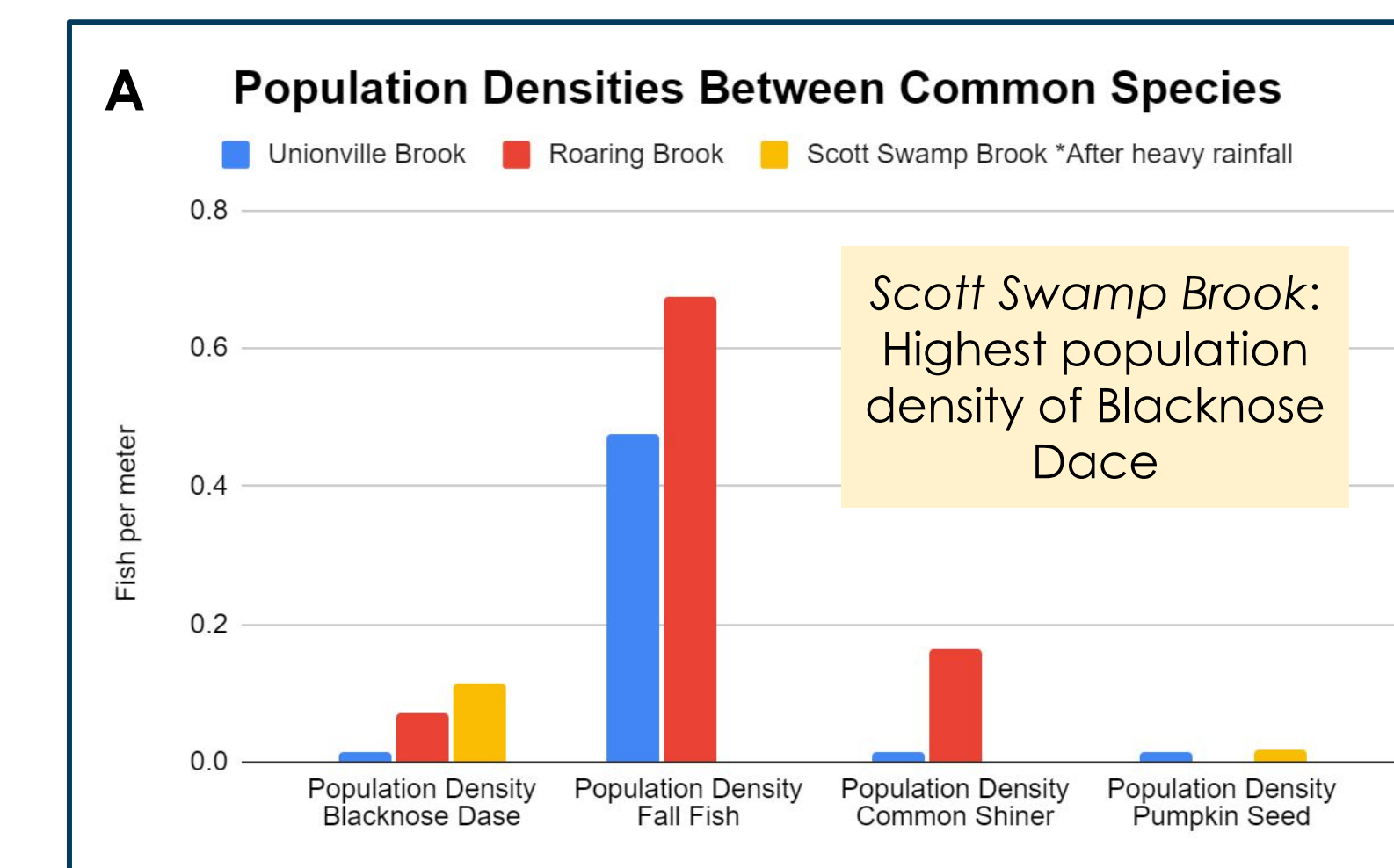

Fig. 3. Graphs A-D above display different fish characteristics from each brook sampled.

Methods

Research and Data Collection:

1. Determined which streams to sample by conducting background research on existing data and local waterways.
2. Sampled 3 streams (Roaring Brook, Unionville Brook, and Scott Swamp Brook) using electrofishing in early November 2022 (Fig. 2).
3. Synthesized and evaluated data to determine implications.

Shared Findings:

1. Reached out to multiple Farmington town committees to find the best fit for who to share data with.
2. Organized data to include the most relevant points.
3. Presented data and answered questions during Farmington Conservation and Inland Wetlands Commission public meeting on March 1st.
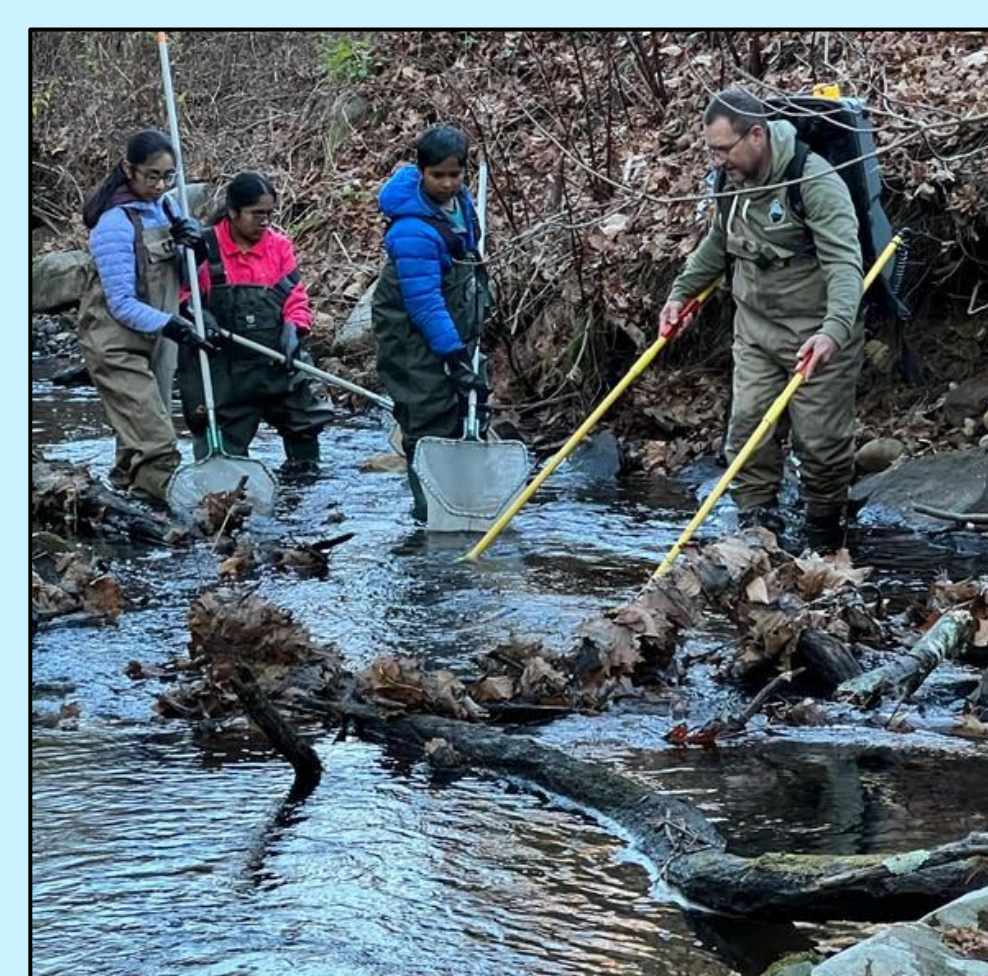

Fig. 2 (Left) Map of Farmington depicting our sampling sites. (Right) Mike and I electrofishing in Unionville Brook.

Community Partnership

I was connected with my community partner, Mike Beauchene, the supervising fisheries biologist at the CT Department of Energy Environmental Protection.

- Mike provided expertise on what factors to look for when choosing what streams to sample.
- While electrofishing, Mike thoroughly explained characteristics about the different types of fish species.
- He also provided great tips for presenting my data to the town.

The data collected is necessary to make informed decisions for land and water use in Farmington, particularly as it relates to the conservation of the town's many streams. I presented the findings above to Farmington Conservation and Inland Wetlands Commission. They responded with interest and got ideas on how to conserve brooks in Farmington.
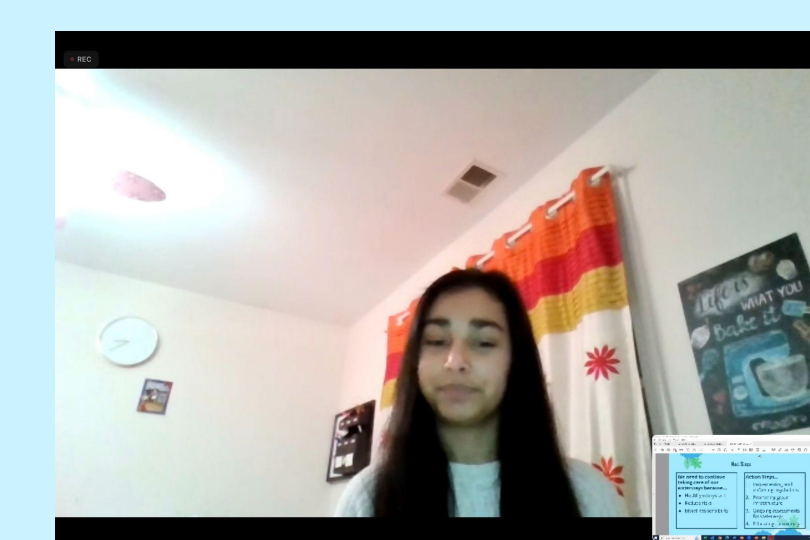
Pictures from my presentation to the Farmington Conservation and Inland Wetlands Commission
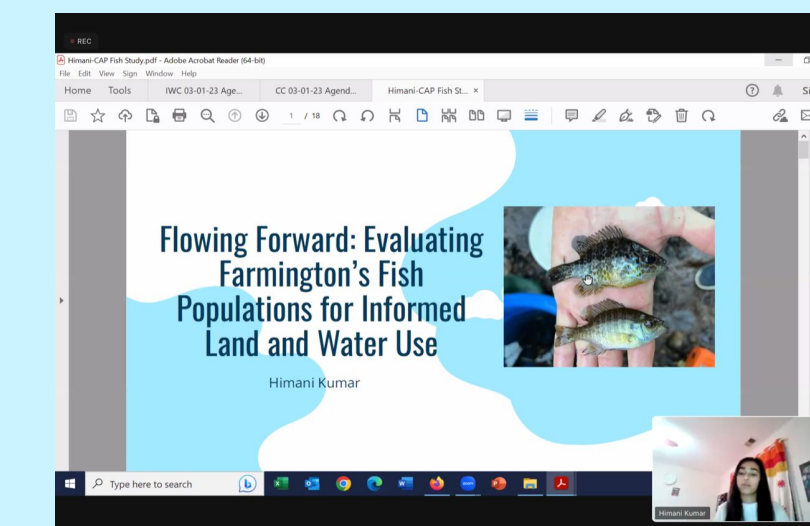
Mike holding a pumpkinseed and a bluegill

Mike and I recording data about the fish collected

A device used to measure the fish's body length

Conclusion and Next Steps

Future Actions:

- Implement and enforce regulations that limit the amount of pollution and development that can occur in or near waterways.
- Promote the use of green infrastructure practices that can help reduce the amount of pollutants improving water quality and habitat conditions for fish and other aquatic species.
- Invest in ongoing monitoring and assessment of these water bodies to track changes and help identify any issues or concerns early on.
- Educate people about the importance of local water bodies and the impacts of individual actions on water quality and conditions.
- Encourage residents to adopt practices that protect and conserve these important resources.

Acknowledgements