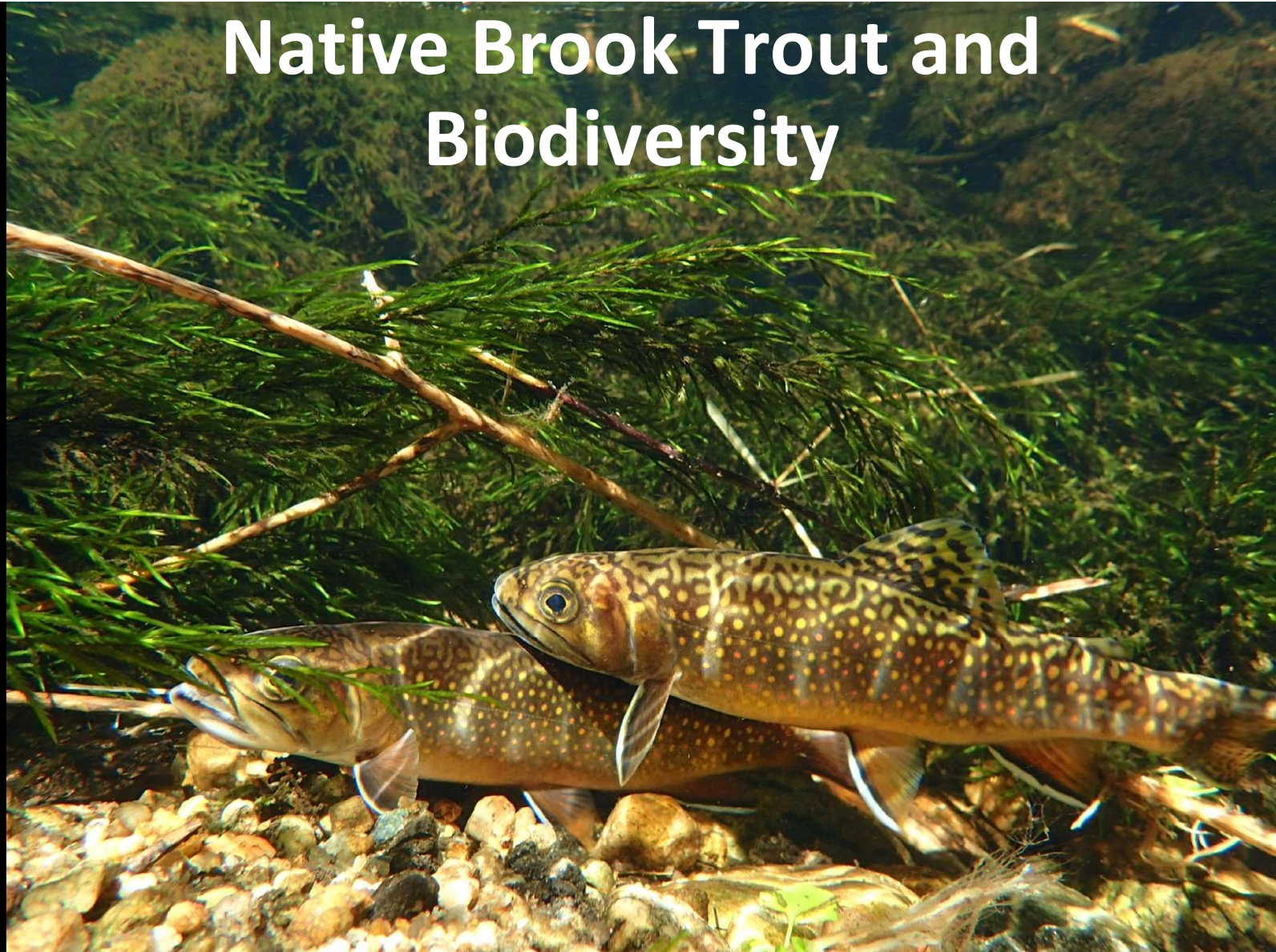


*WILD THINGS in the
Narragansett Bay Region*

Corey Pelletier
Fisheries Biologist
RIDEM Fish and Wildlife
corey.pelletier@dem.ri.gov



Native Brook Trout and Biodiversity

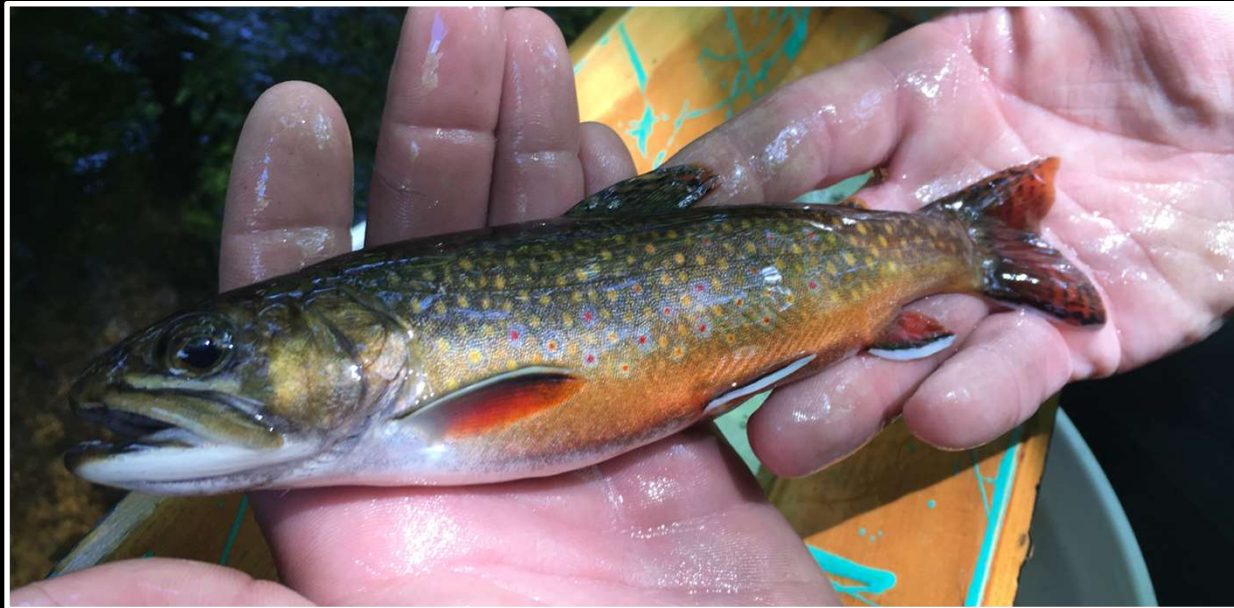


What ecosystems do Brook Trout represent and how do we conserve these into future?

We will cover:

- Brook Trout and their habitat
- Eastern Pearlshell mussel
- Freshwater macroinvertebrates
- Threats to coldwater resources
- Improving resiliency

Eastern Brook Trout (*Salvelinus fontinalis*)



- Native to Rhode Island
- Iconic
- Declining across native range (Hudy et al., 2008)
- State and Regional Species of Greatest Conservation Need (SGCN)
- Considered an indicator species for coldwater ecosystems

Brook Trout Habitat Requirements



- Preferred temperatures 12-18 °C (53-65 °F)
- High dissolved oxygen content (>6 mg/L)
- Physical cover
- Forage
- Other life history traits

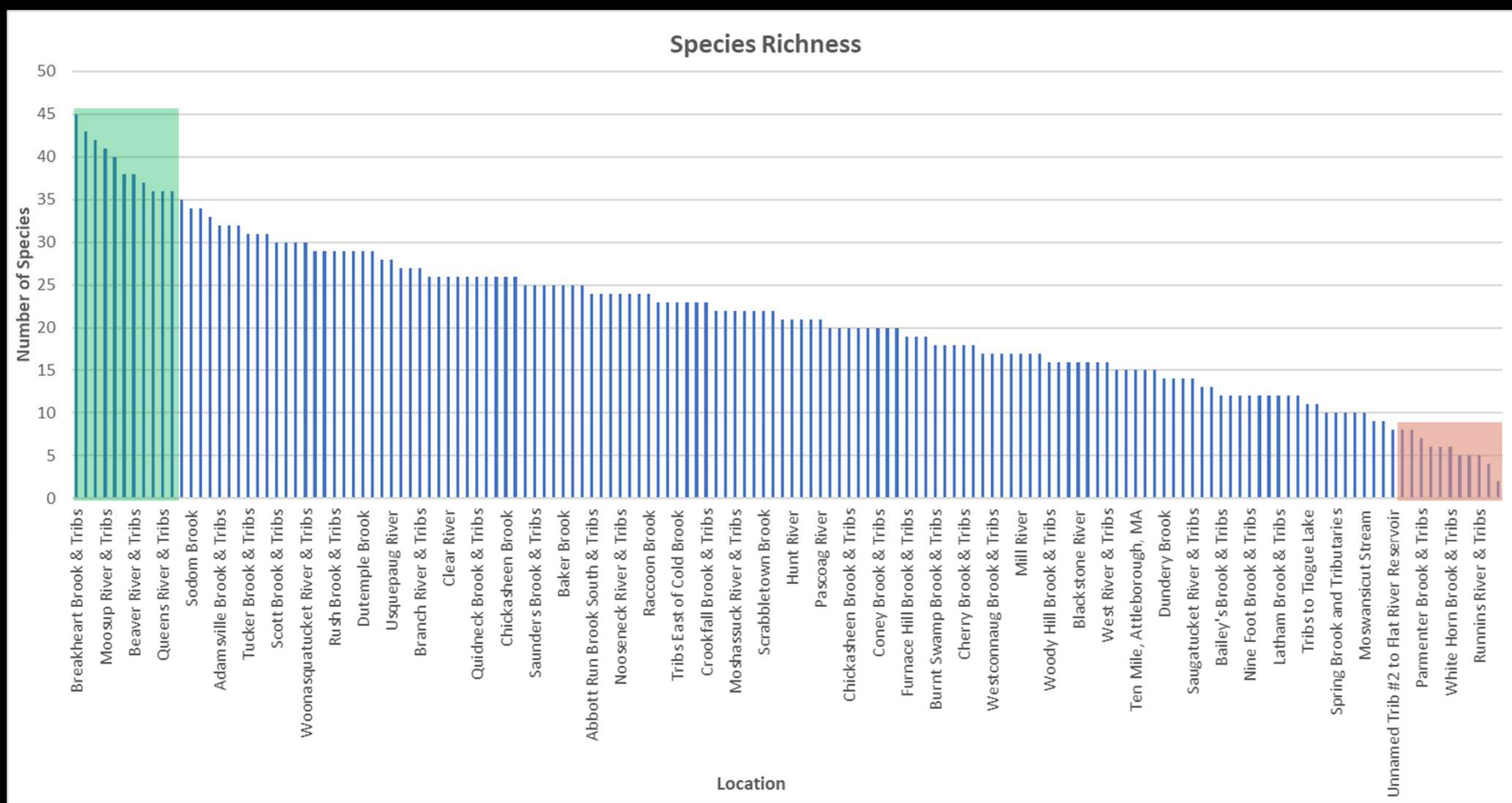


Eastern Pearlshell Mussel (*Margaritifera margaritifera*)

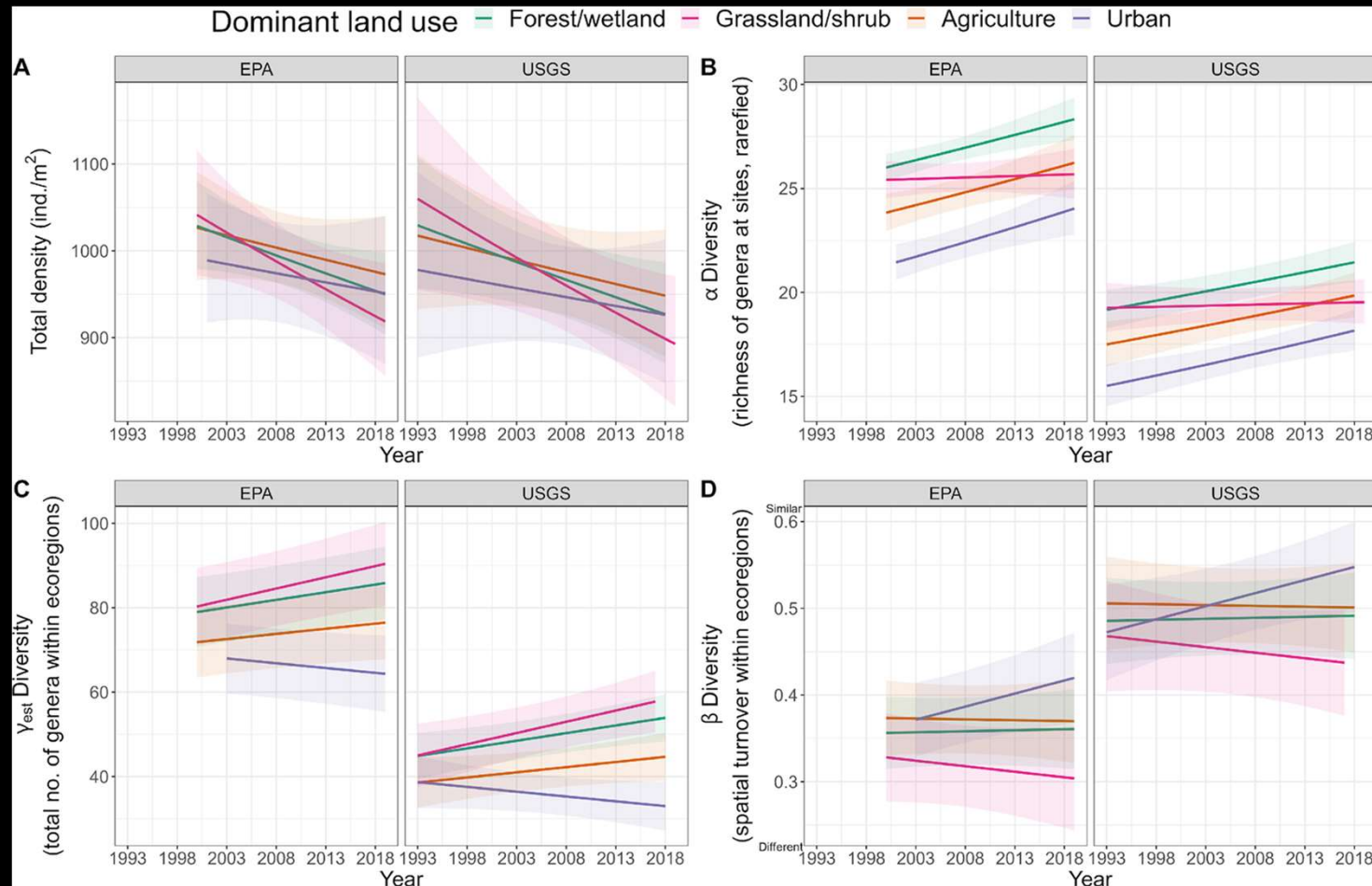
- Ecosystem function = water filtration
- Dependent on salmonids for reproduction and dispersal
- State and Regional SGCN
- Limited distribution in RI and found in conjunction with Brook Trout



Freshwater Macroinvertebrates in Rhode Island



Freshwater Macroinvertebrates Status Nationwide



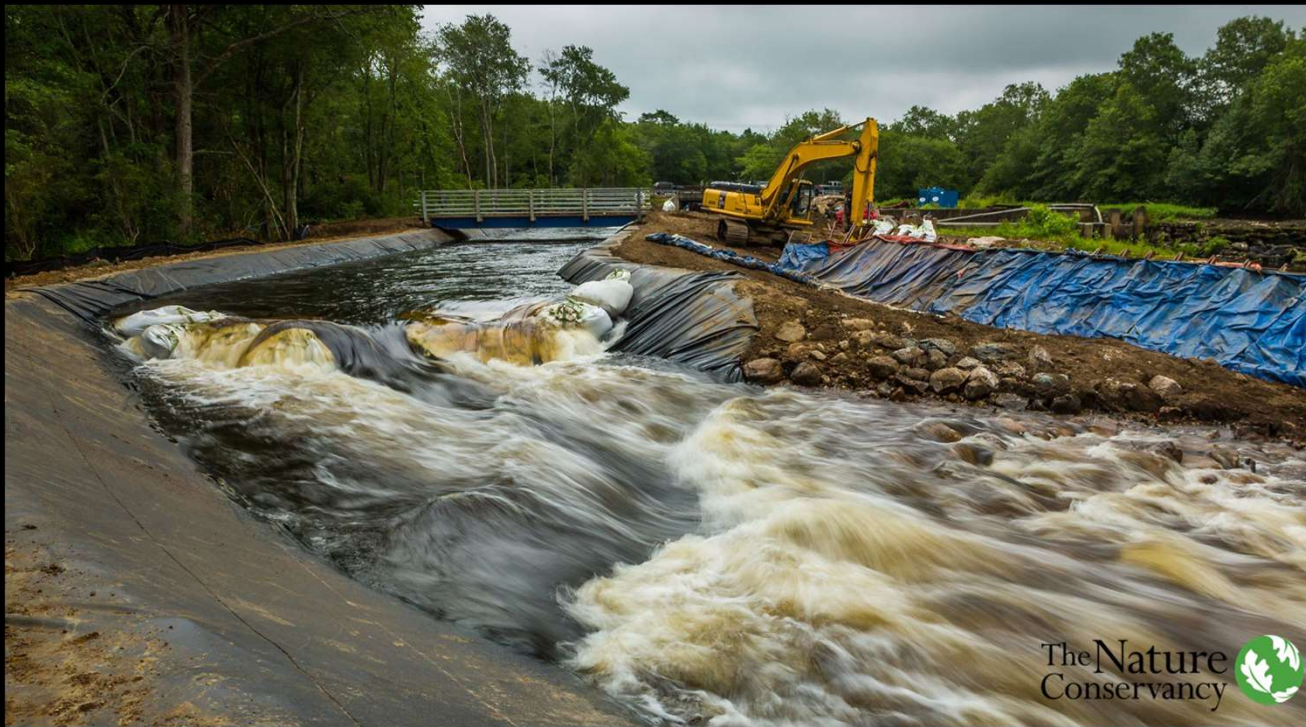
(Rumschlag et al., 2023)

Threats to Coldwater Resources

- Coldwater habitats contain the most at-risk species to climate change
- Water temperatures are on the rise
- More variable flow conditions
- Development

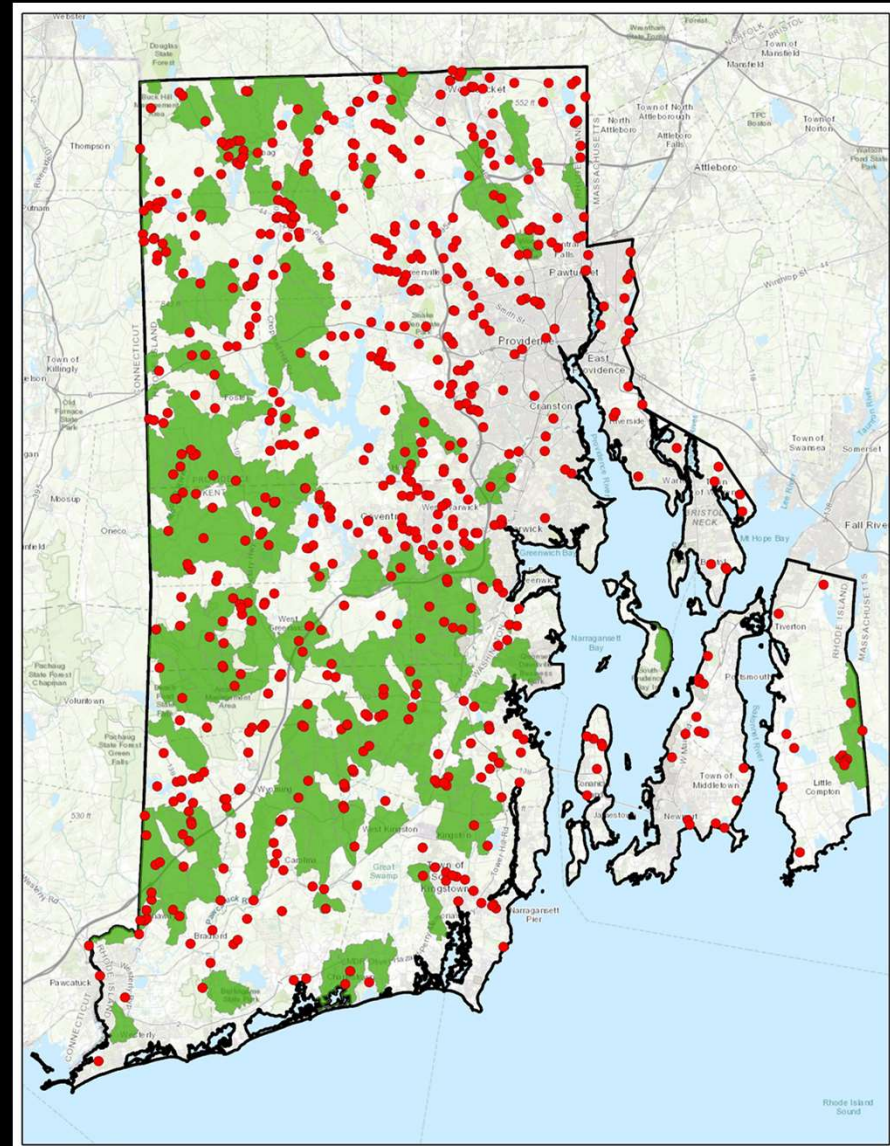


Resiliency Through Restoring Connectivity



Barriers to Aquatic Organism Passage

Dams



Perched or
Poorly
Functioning
Culverts



Impacts of Barriers on Aquatic Ecosystems

- Fragmentation by dams and perched culverts- reduced/no AOP
- Impoundments created by dams increase surface water temperature
- Reduced water quality



Ecosystem Based Restoration

Removing dams will:

- Improve water quality
- Reduce maximum temperatures
- Restore thermal refugia
- Mitigate effects of increased warming

Resiliency

Ecosystem Based Restoration

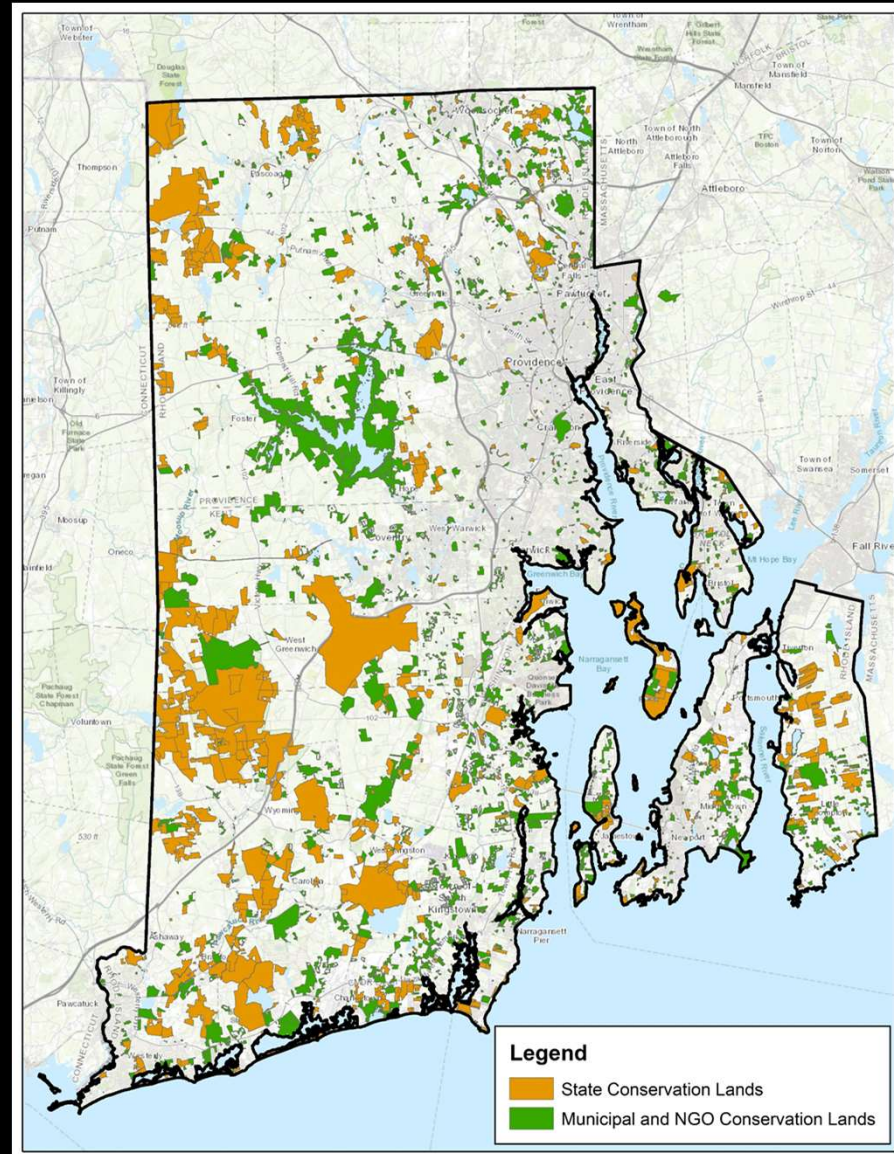
Removing barriers to connectivity in stream networks will:

- Allows species access to a broader range of habitats
- Species dispersal
- Improved gene flow
- Maintain or increase biodiversity

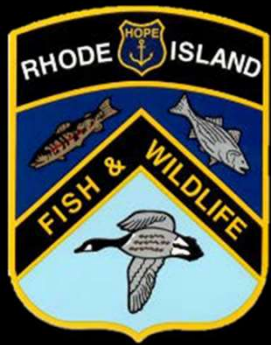
Resiliency

And Lastly...

Land Conservation!



Collaboration is, and will be, key to success in
maintaining biodiversity in Rhode Island



Thanks!



DEM
RHODE ISLAND

References:

- Hudy, Mark, Teresa M. Thieling, Nathaniel Gillespie, and Eric P. Smith. 2008. "Distribution, Status, and Land Use Characteristics of Subwatersheds within the Native Range of Brook Trout in the Eastern United States." *North American Journal of Fisheries Management* 28 (4): 1069–85. <https://doi.org/10.1577/M07-017.1>.
- Rumschlag, Samantha L., Michael B. Mahon, Devin K. Jones, William Battaglin, Jonny Behrens, Emily S. Bernhardt, Paul Bradley, et al. 2023. "Density Declines, Richness Increases, and Composition Shifts in Stream Macroinvertebrates." *Science Advances* 9 (18): eadf4896. <https://doi.org/10.1126/sciadv.adf4896>.