

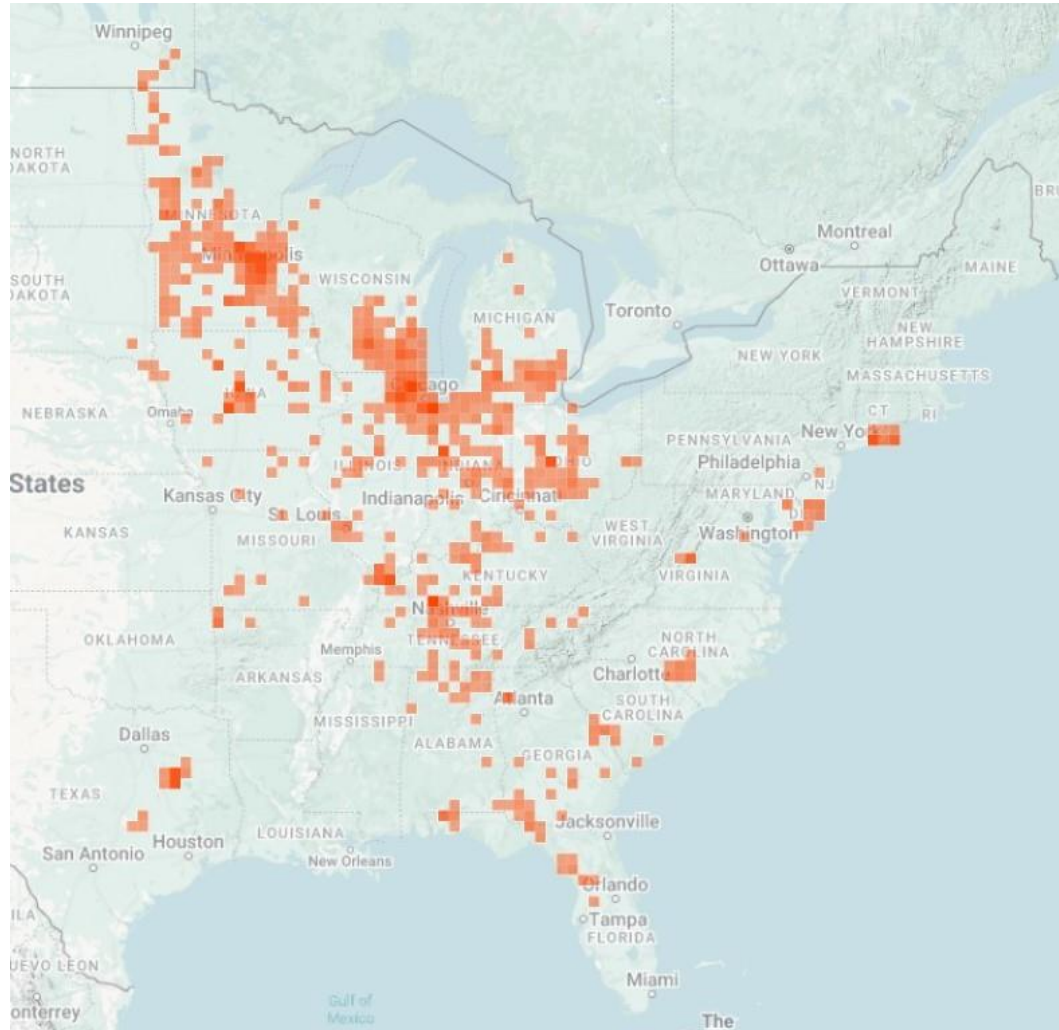
Using eDNA technology to detect E. Tiger Salamander



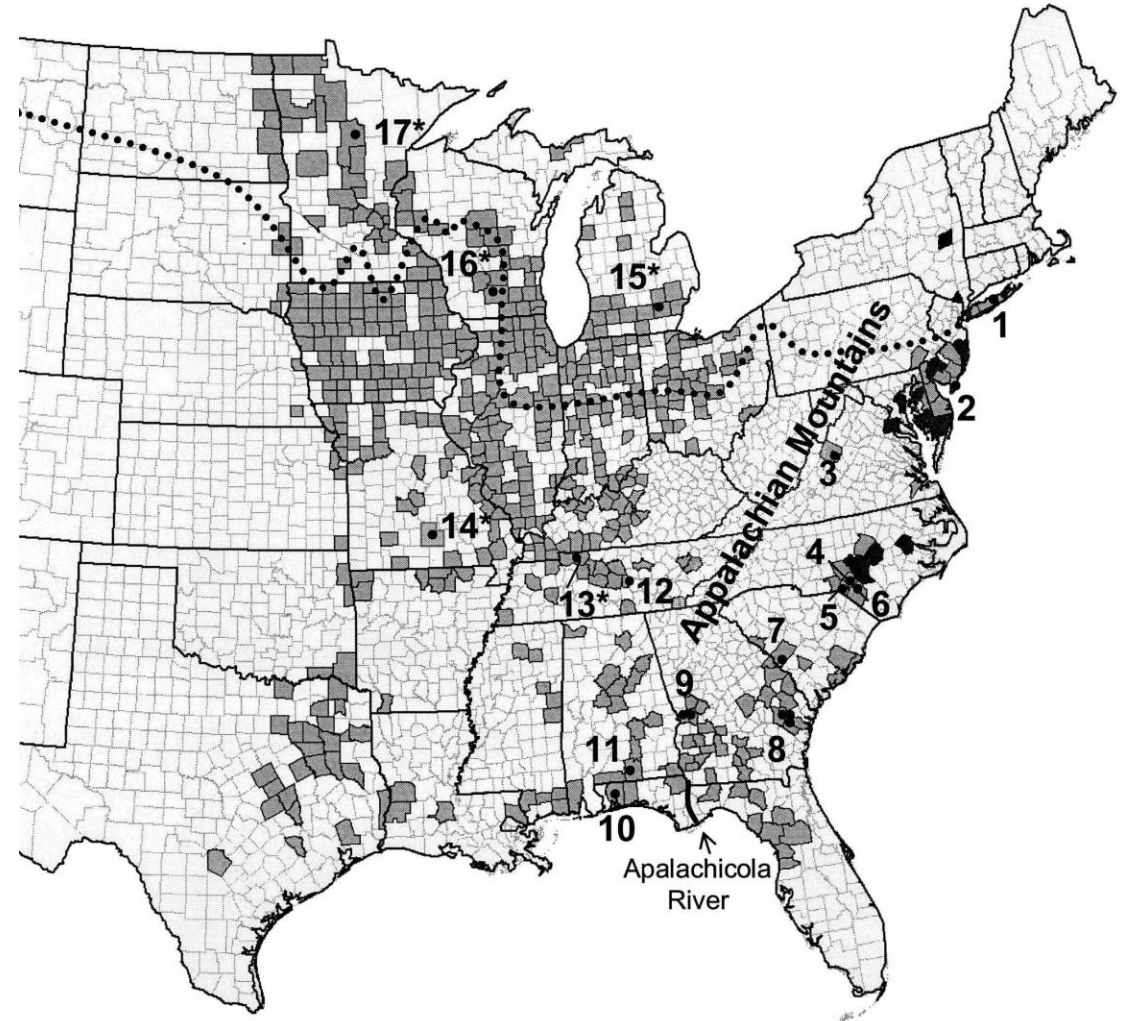
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NJDEP Fish & Wildlife

Endangered & Nongame Species Program

Ambystoma tigrinum US Range

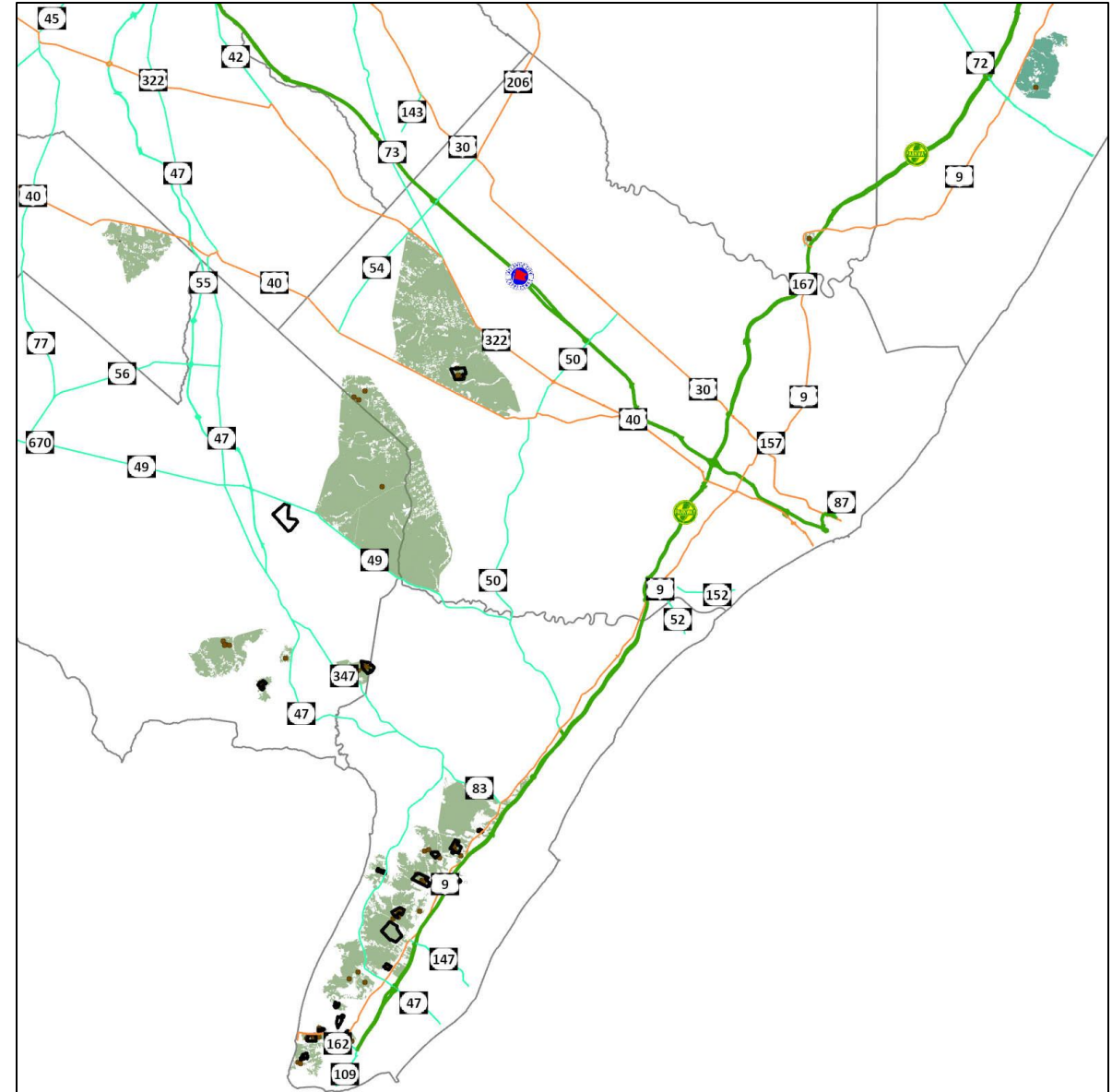


iNaturalist observation data

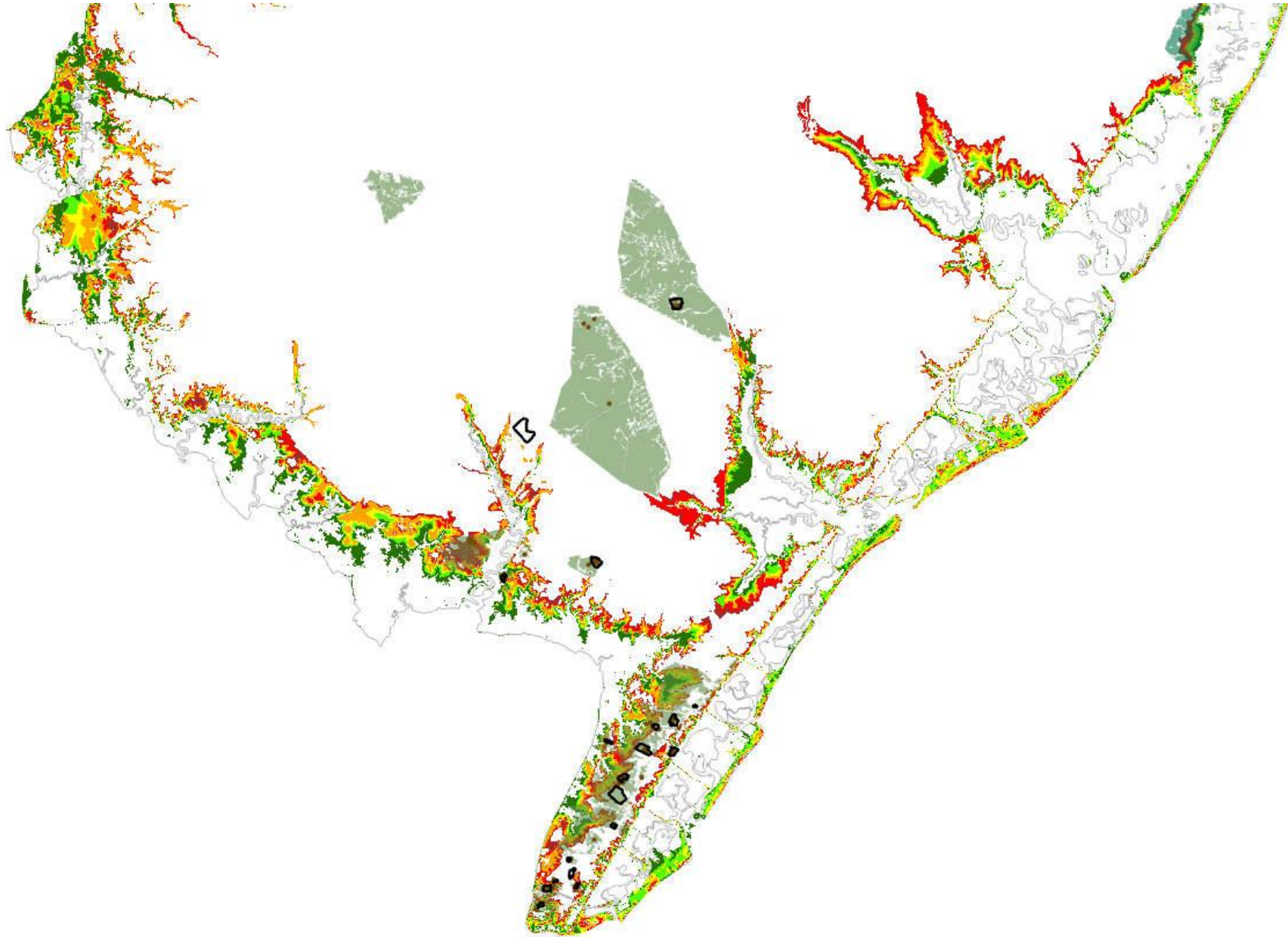


Church et. al, 2003

Ambystoma tigrinum NJ Distribution



Ambystoma tigrinum Habitat Connection





Challenges

- Sea level rise
- Annual / seasonal hydrologic variability
- Paedomorphic adults / predation
- Emergent diseases
- Several changes in project leadership
- Nonstandard data collection
- Inconsistency of partners
- Difficulty surveying large geographic areas + scouting new sites

Previous Tiger Salamander Work



- 1981–85: Pool creation, egg translocation, and monitoring at created site in lower Cape May County
- 2009–14: Pool creation, headstarting with Cape May Zoo, and monitoring at extant site in Central Cape May County
- Genetics and water quality
- Monitoring (ENSP/CWF staff, USFWS, volunteers)

Current Tiger Salamander Work



- Egg translocation in Cumberland Co. since 2020
- Predation control used in 2023-24
- Monitoring (ENSP staff, USFWS, volunteers)





Project Goals

- Better Informed Management Strategy for current populations
- Strategies for discovering additional populations &
- Habitat Guidance for translocation and vernal pool creation
- Maximizing expenditure of conservation dollars

Steps to achieve goals

- Standardize Physical Survey Methods + eDNA surveys
- Determine Abiotic factors to measure for habitat model assessment for T. Salamander P/A + Breeding density (egg mass)
- Understanding eDNA signature in vernal pools





Standardization of Physical Surveys

- Compare yearly + regional data set
 - Compare within the same data
- Ease of collaborations
- Have a method to hand to individuals interested in volunteering, assisting in effort
- Include CPUE equivalent to allow data to be compared to eDNA capture compare between methods
 - Compare between different data sets
 - Capture per unit effort

eDNA

Understanding eDNA signatures in vernal pool habitats

1. Presence / Absence

- True Negative
- True Positive

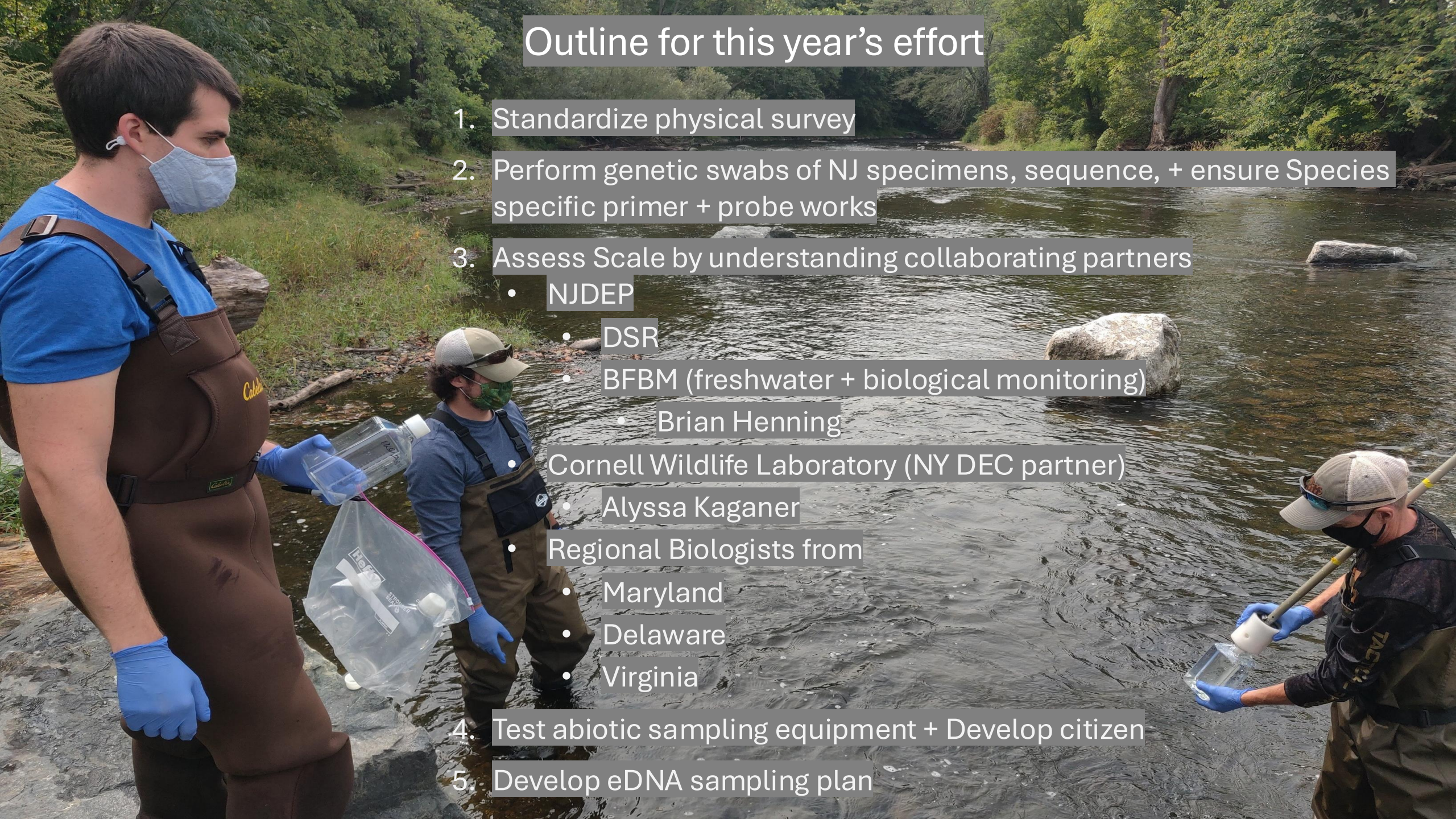
2. Relative DNA signature increase / decrease

- Baseline DNA signature
- Weekly sampling during breeding season – coinciding with physical surveys
- Inhibition



Outline for this year's effort

1. Standardize physical survey
2. Perform genetic swabs of NJ specimens, sequence, + ensure Species specific primer + probe works
3. Assess Scale by understanding collaborating partners
 - NJDEP
 - DSR
 - BFBM (freshwater + biological monitoring)
 - Brian Henning
 - Cornell Wildlife Laboratory (NY DEC partner)
 - Alyssa Kaganer
 - Regional Biologists from
 - Maryland
 - Delaware
 - Virginia
4. Test abiotic sampling equipment + Develop citizen
5. Develop eDNA sampling plan



Questions?

