

Introduction

Background

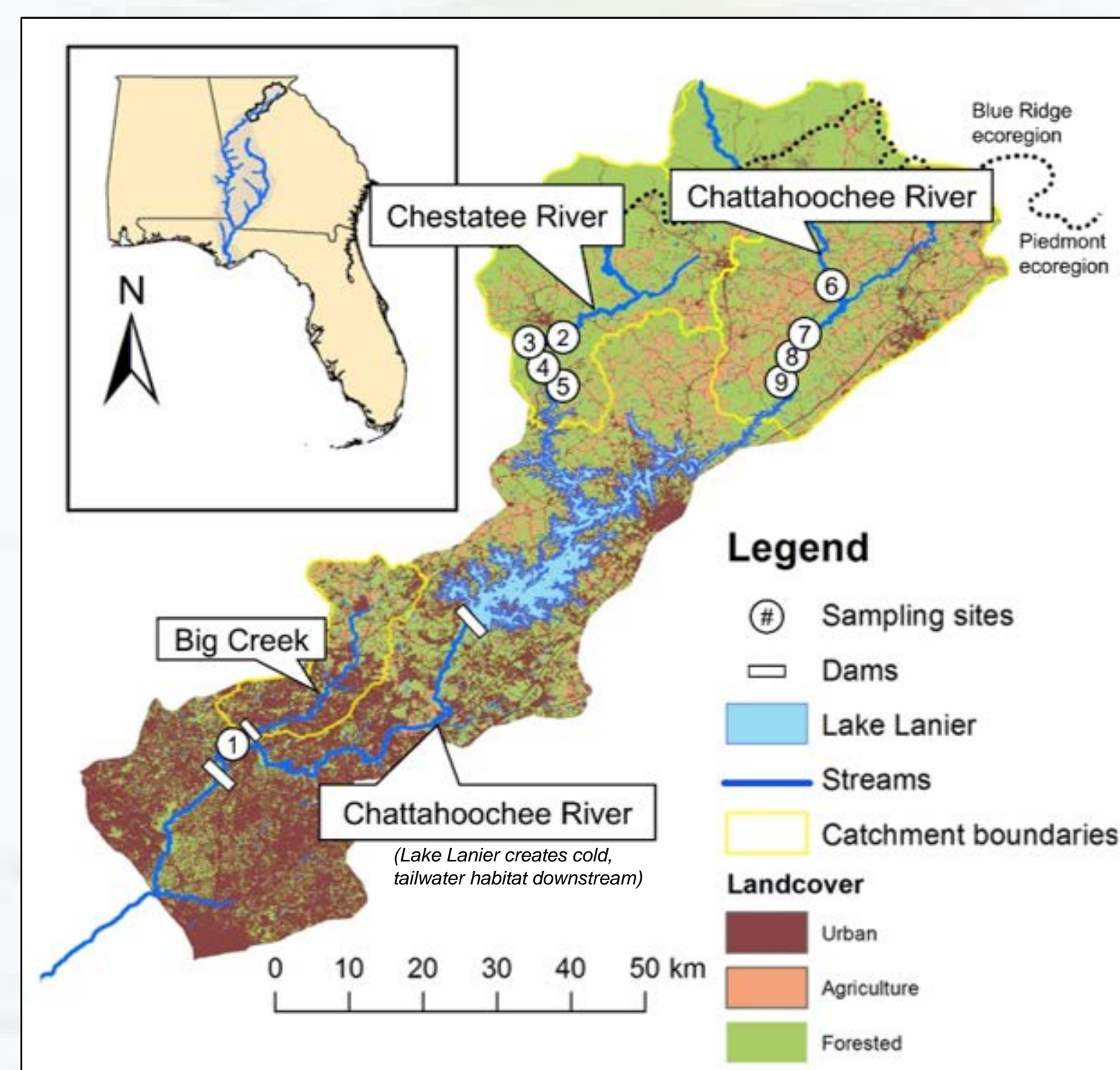


- The Shoal Bass (*Micropterus cataractae*) is a popular sportfish endemic to the Apalachicola-Chattahoochee-Flint Basin of the southeastern US
- Shoal Bass require flowing water and rocky, shoal habitats to complete their life cycle, but extensive damming has led to habitat fragmentation and loss
- Non-native black basses (e.g., Smallmouth Bass) have also been introduced into the area, threatening Shoal Bass via hybridization
- Unfortunately, few population assessments exist to inform management and conservation efforts

Study Area

- We focused on three isolated populations of Shoal Bass in the Upper Chattahoochee River Basin (UCRB), Georgia
 - Big Creek
 - Chestatee River
 - Chattahoochee River (above Lake Lanier)

- Big Creek is the most urbanized, and the population is presumably limited to 2 km between an upstream mill dam and the confluence with the thermally-depressed mainstem



Objectives

For all 3 UCRB populations

1. Assess genetic integrity using 16 microsatellite DNA loci
2. Estimate age and mortality with non-lethal scale samples
3. Examine variables influencing recruitment

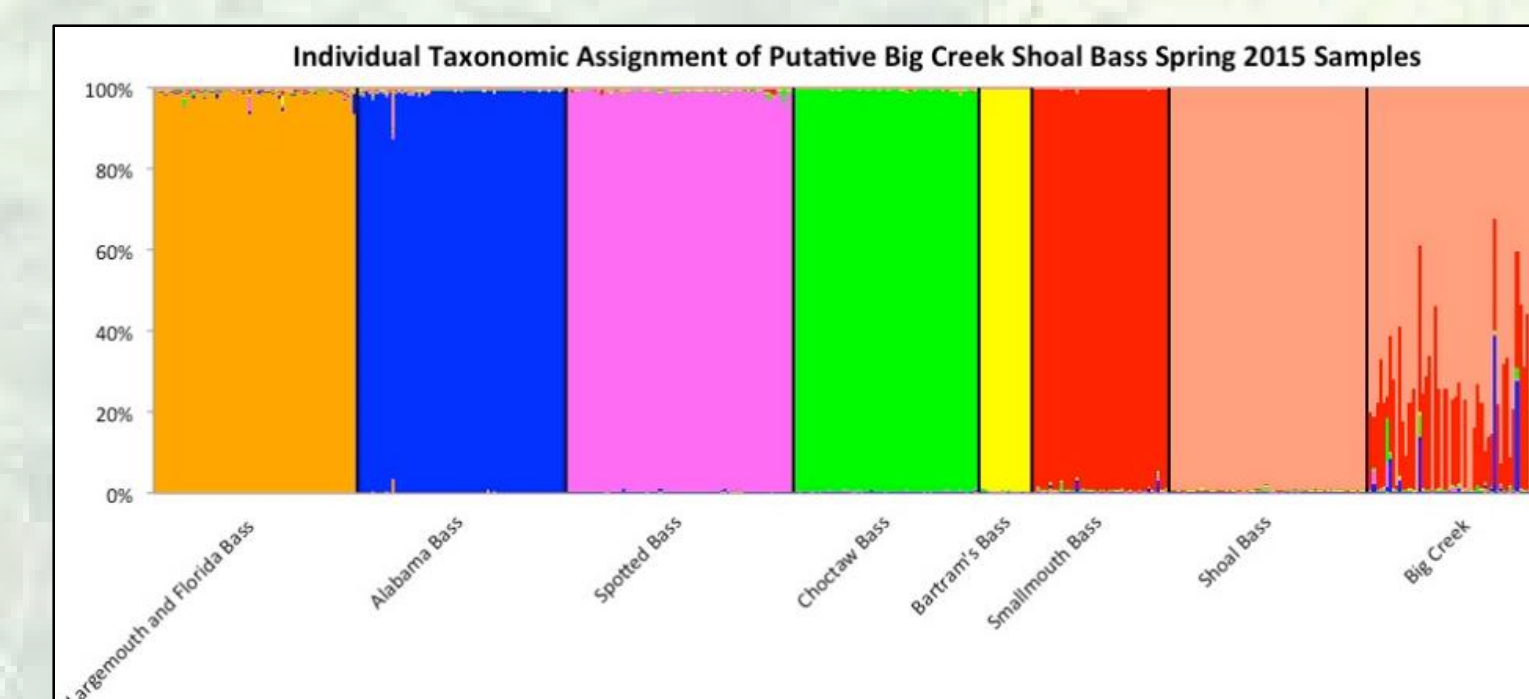
For Big Creek population

1. Estimate population size with mark-recapture surveys
2. Characterize adult movements with ultrasonic telemetry tags and stationary receivers

Results

Genetic Integrity

- 76% of fish in Big Creek were hybrids with non-native Smallmouth Bass
- Few hybrids with non-native Alabama Bass detected in all three populations
- Effective population size estimates for pure Shoal Bass in both rivers (combined) ranged from 94–198, suggesting short-term stability but risk of losing adaptive potential



Age and Mortality

- Fish were aged 1–12 years in all populations
- Annual mortality was estimated at 18–24% in all populations, which is markedly lower than 40–69% estimated in southerly portions of the species' range

Recruitment

- Year class strength was most variable in Big Creek
- Recruitment variability in Big Creek was positively related to variability in summer discharge, suggesting that flashy, sediment-laden streamflows reduced age-0 survival



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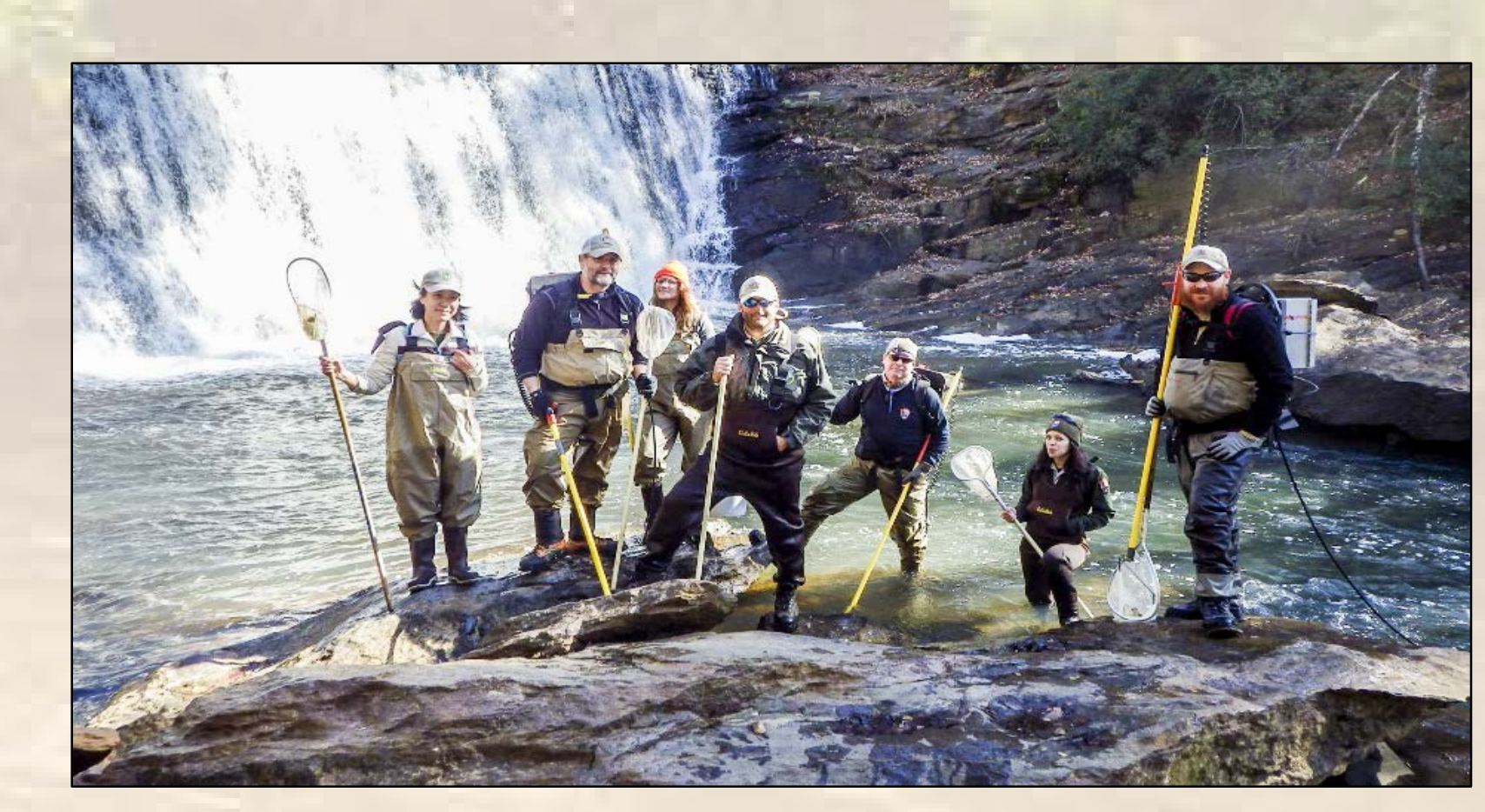
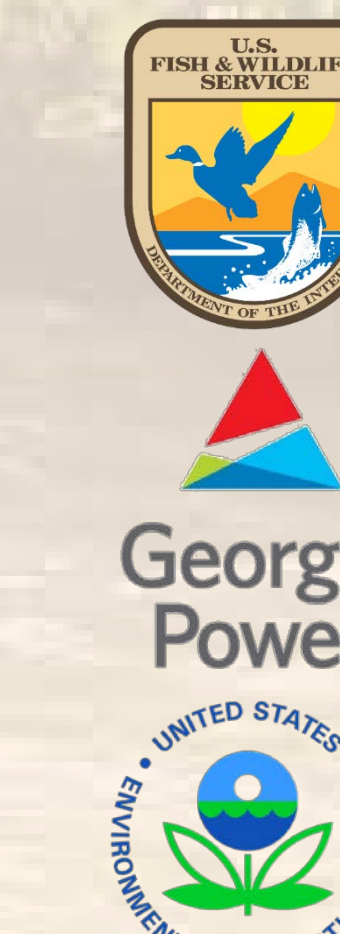
Results (cont.)

Big Creek Population Size

- Phenotypic Shoal Bass abundance varied from 219–348 fish from May 2014 to May 2016
- 78% of tagged fish were aged 0–2 years old, indicating very few reproductive adults

Big Creek Adult Movements

- Adults occupied shoals from May (spawning) through late August, then occupied areas near the river confluence through winter



Multi-agency sampling teams were vital to project success

Discussion

Chestatee and Chattahoochee rivers

Appear to be the last strongholds for Shoal Bass in the UCRB. Monitoring of hybridization is needed.

Big Creek

At risk of extirpation because of introgression, recruitment variability, and low adult abundance. Immediate supplemental stocking and non-native removals could help conserve this population.