



S. Kim

# Aquatic Biodiversity of the Saluda River Basin

Kevin Kubach and Mark Scott

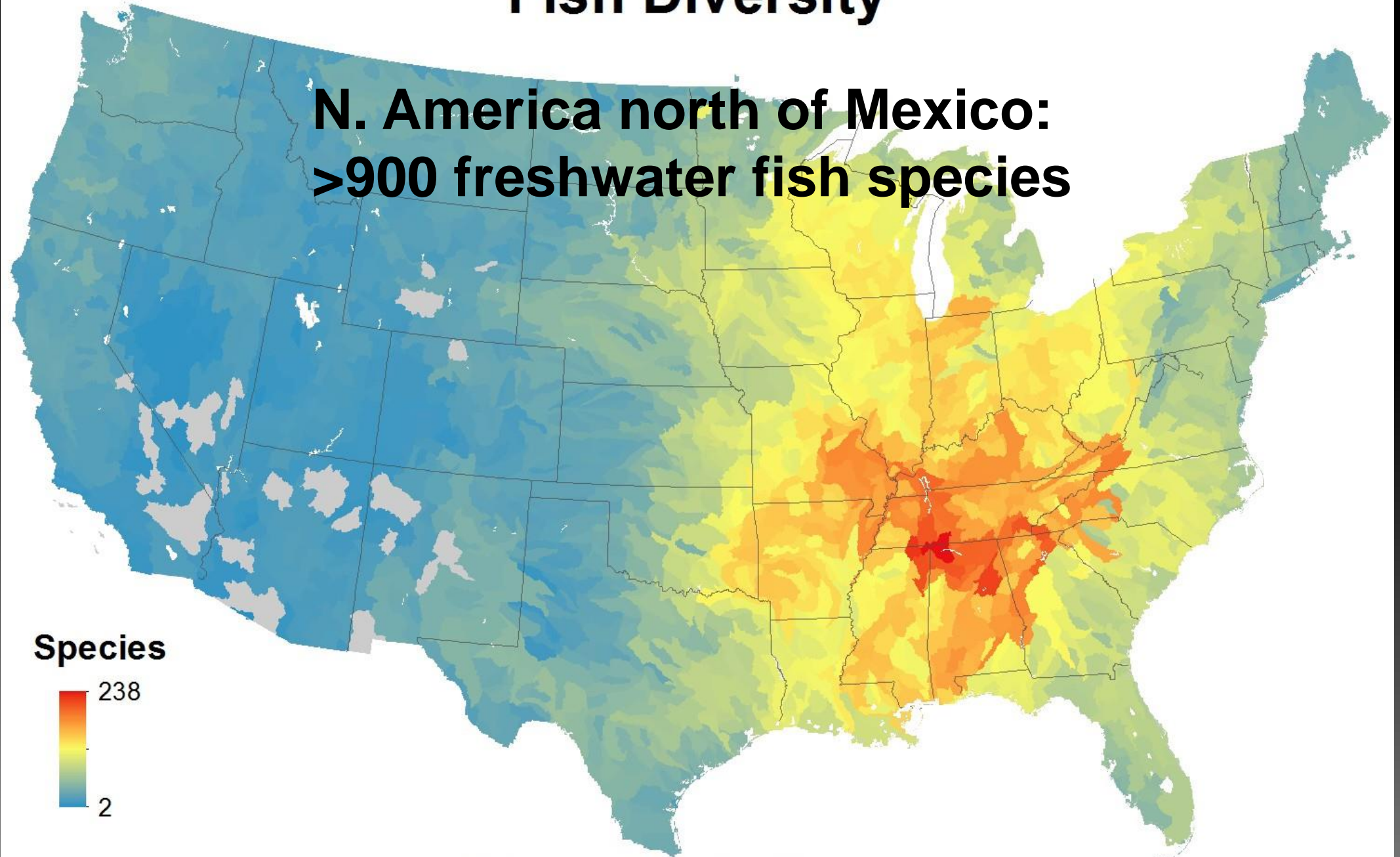
South Carolina Department of Natural Resources

Saluda River Basin Council – 21 June 2023

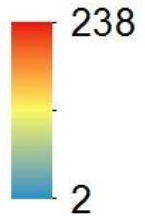


# Fish Diversity

**N. America north of Mexico:  
>900 freshwater fish species**



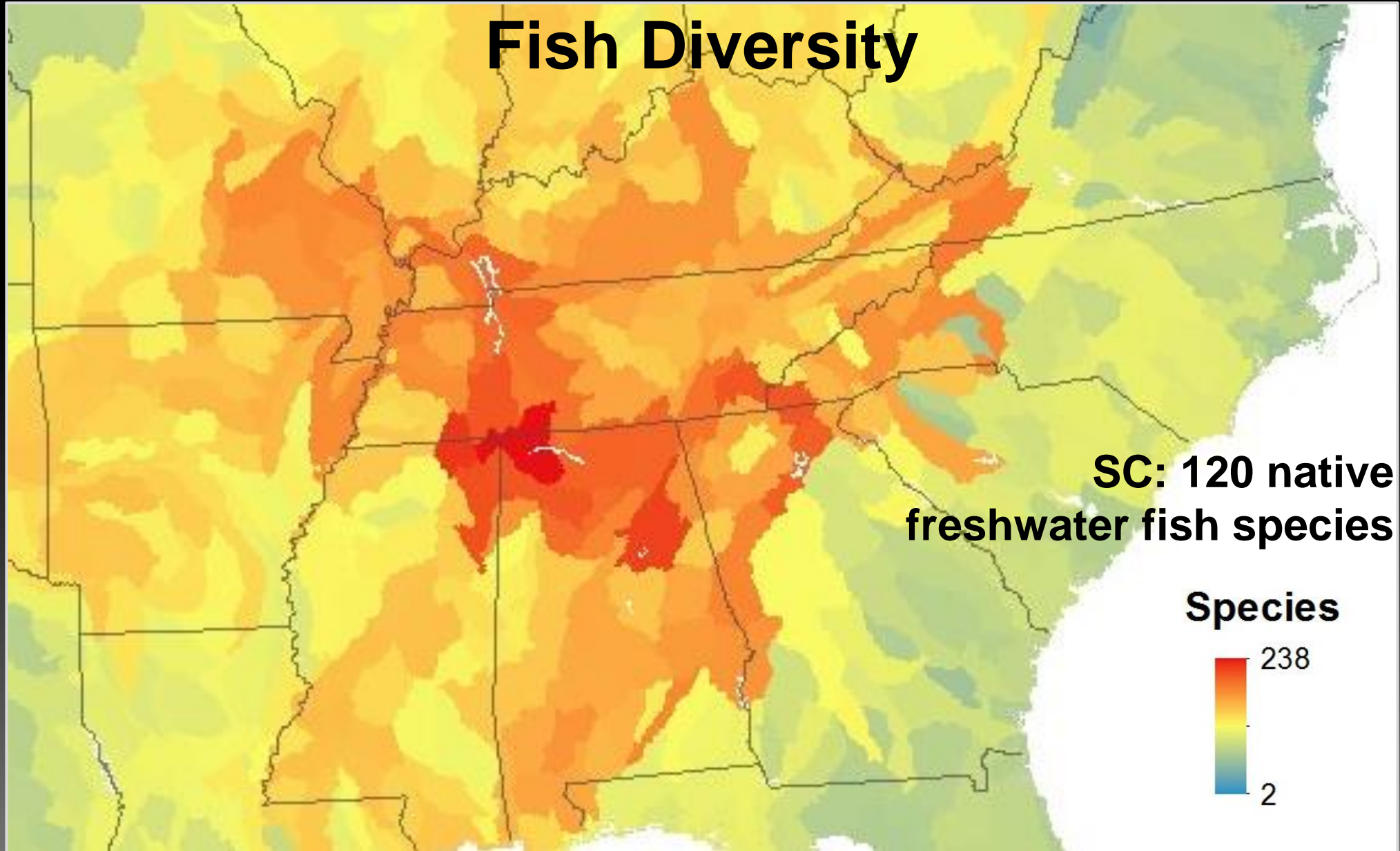
**Species**



Richness of the 863 species with range maps

BiodiversityMapping.org

# Fish Diversity



# Saluda Basin: Disproportionately Diverse

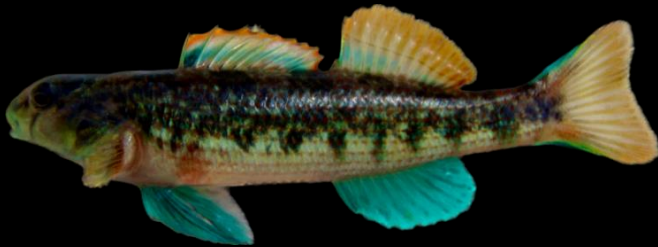
- Saluda basin: 84 fish species (71 native)
- 60% of South Carolina's native freshwater fish diversity in just 8% of the state's area
- 18 Regional Fish Species of Greatest Conservation Need (most of any SC basin)



BROOK TROUT



FIERYBLACK SHINER



SEAGREEN DARTER



PIRATE PERCH



HIGHFIN CARPSUCKER

Photos: NCFishes.com (Rohde and Smith)

**Minnows: 22 species**



**GREENHEAD SHINER**



**ROSYFACE CHUB**



**GREENFIN SHINER**

**Catfishes: 10 species**



**MARGINED MADTOM**



**SNAIL BULLHEAD**

**Suckers: 12 species**



**BRASSY JUMPROCK**



**CAROLINA QUILLBACK**

**11 other families with 1 to 3 species each**



**REDFIN PICKEREL**

**Sunfishes: 15 species**



**REDBREAST SUNFISH**



**LARGEMOUTH BASS**

**Perches: 8 species**



**CAROLINA  
FANTAIL  
DARTER**



**PIEDMONT DARTER**



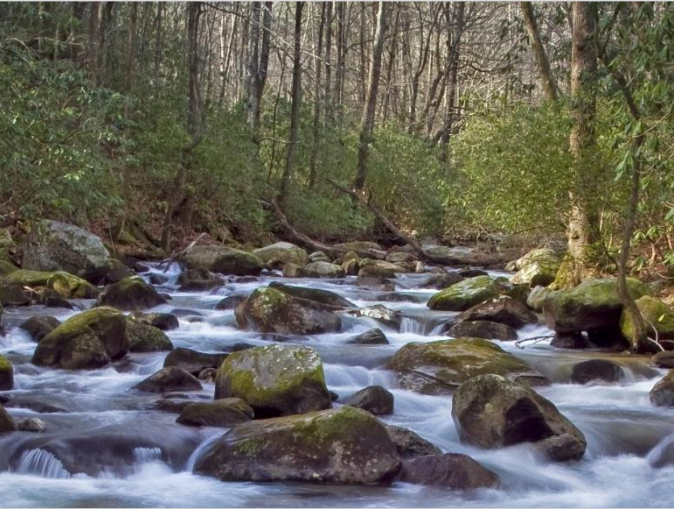
**LONGNOSE GAR**

# Spawning aggregation – Greenhead Shiners

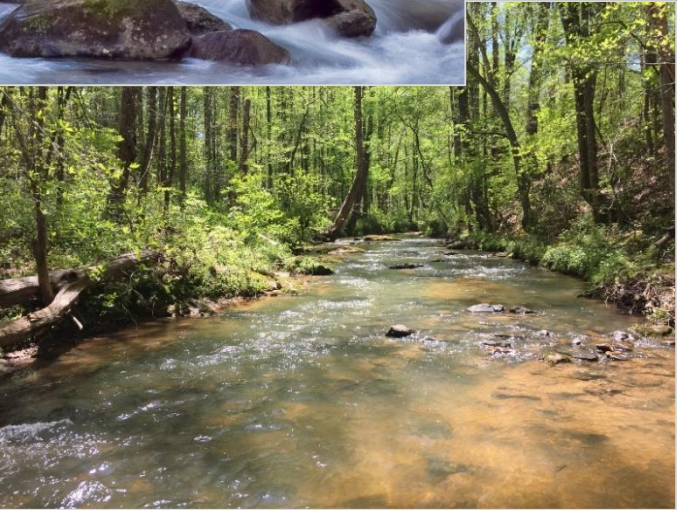
Photo: S. Kim



# Factors Contributing to High Aquatic Biodiversity



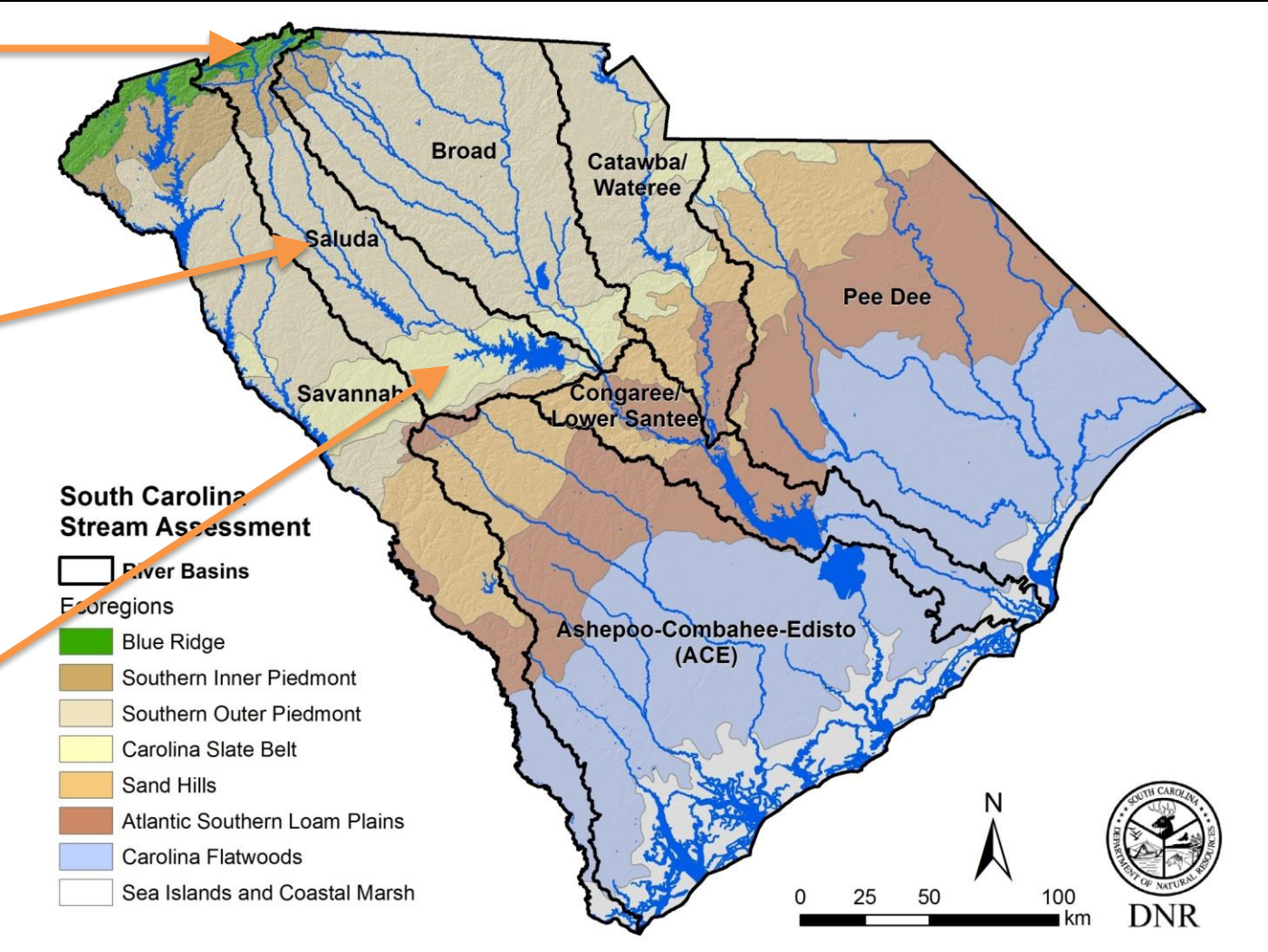
**BLUE RIDGE MOUNTAINS**



**PIEDMONT**



**MIDLANDS**



# Unique species representing each set of conditions

*These species define our “streamscape” and “riverscape”*



**ROYSIDE DACE**



**CAROLINA FANTAIL DARTER**



**SANTEE CHUB**



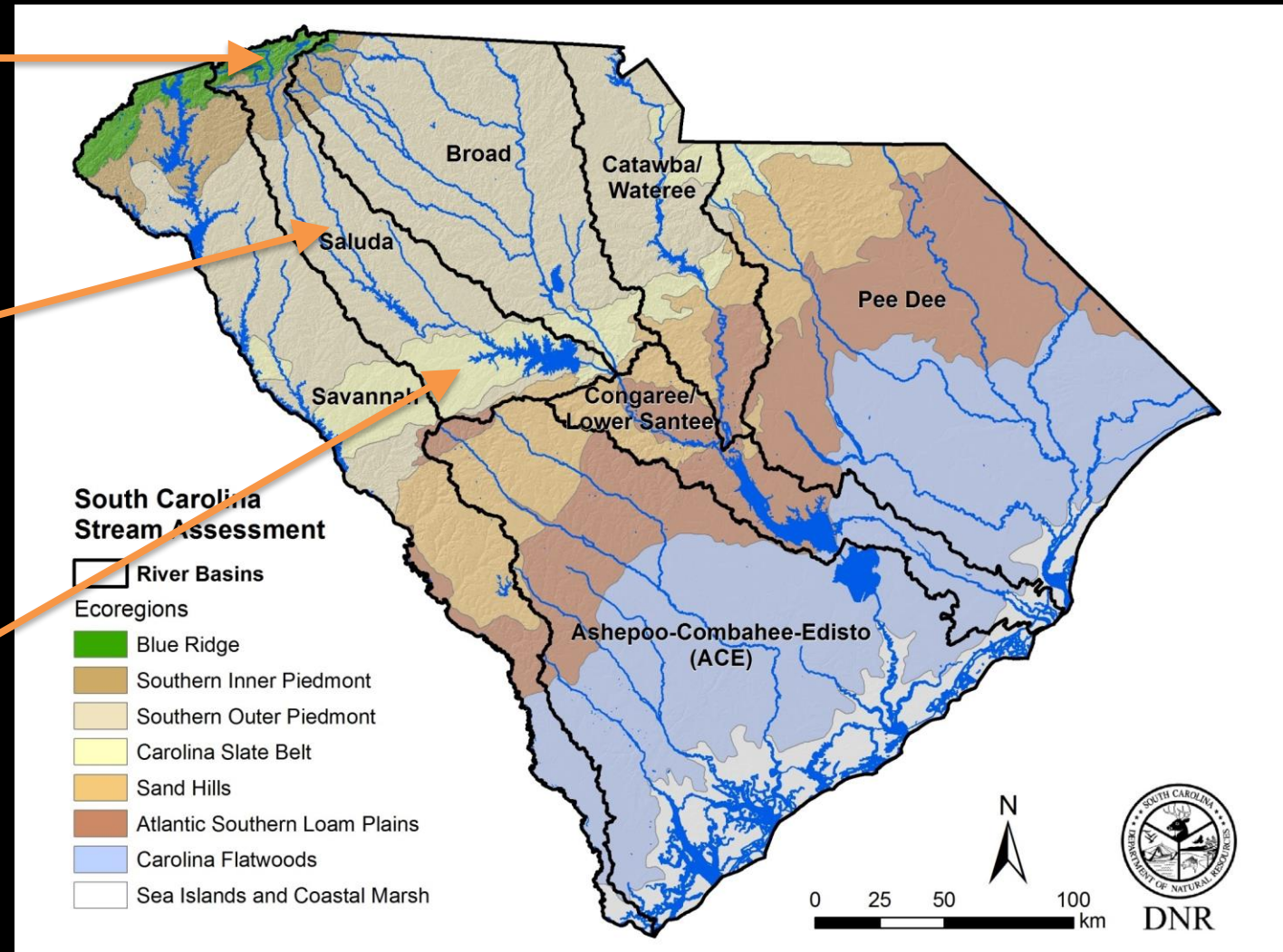
**HIGHBACK CHUB**



**HIGHFIN SHINER**



**CAROLINA DARTER**





# State Wildlife Action Plan Freshwater Fishes of the Saluda Basin

## Conservation Priority Species

- Small range
- Unique habitat requirements
- Specialized biological processes



**SANTEE CHUB**



**V-LIP REDHORSE**



**SEAGREEN DARTER**

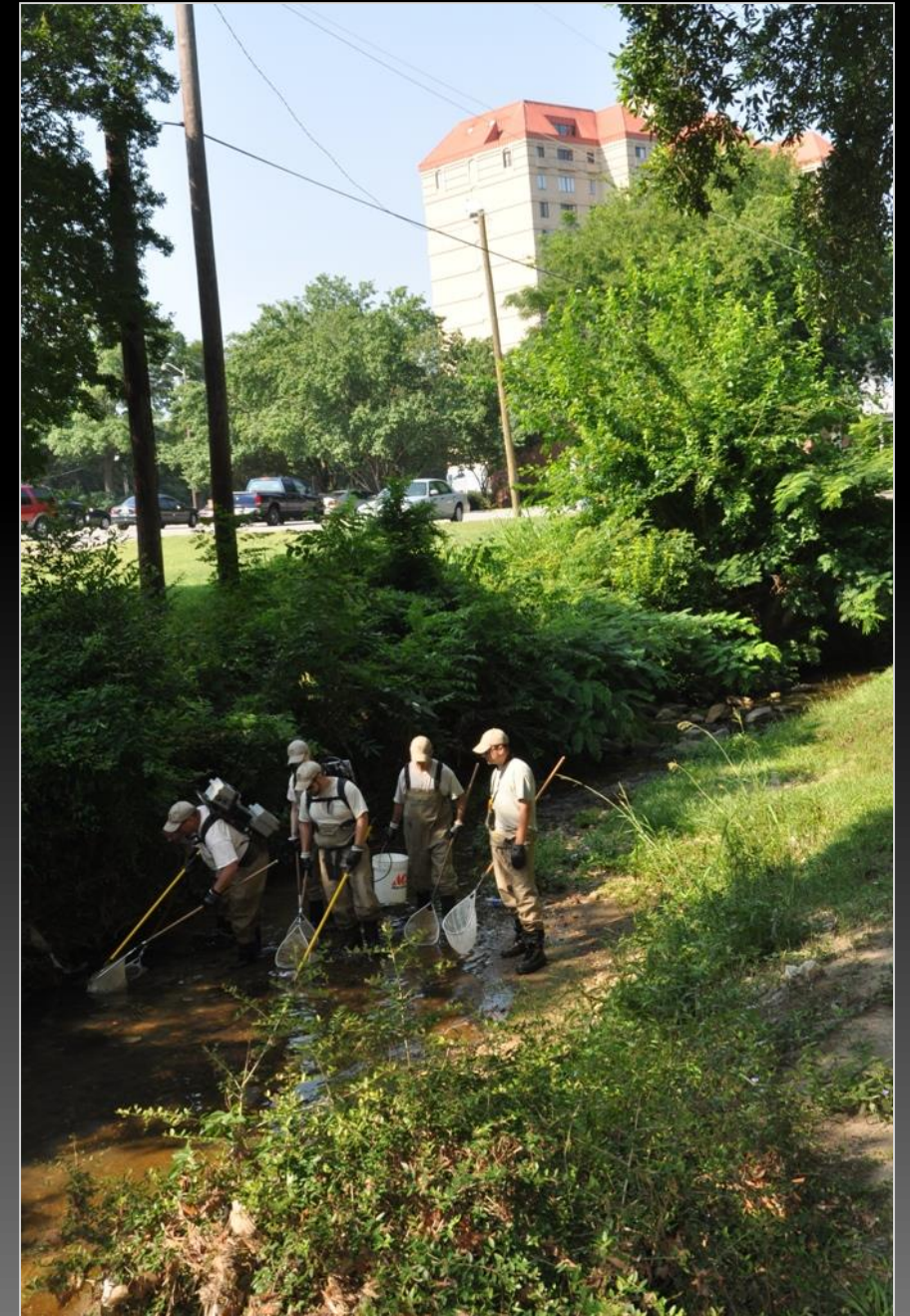
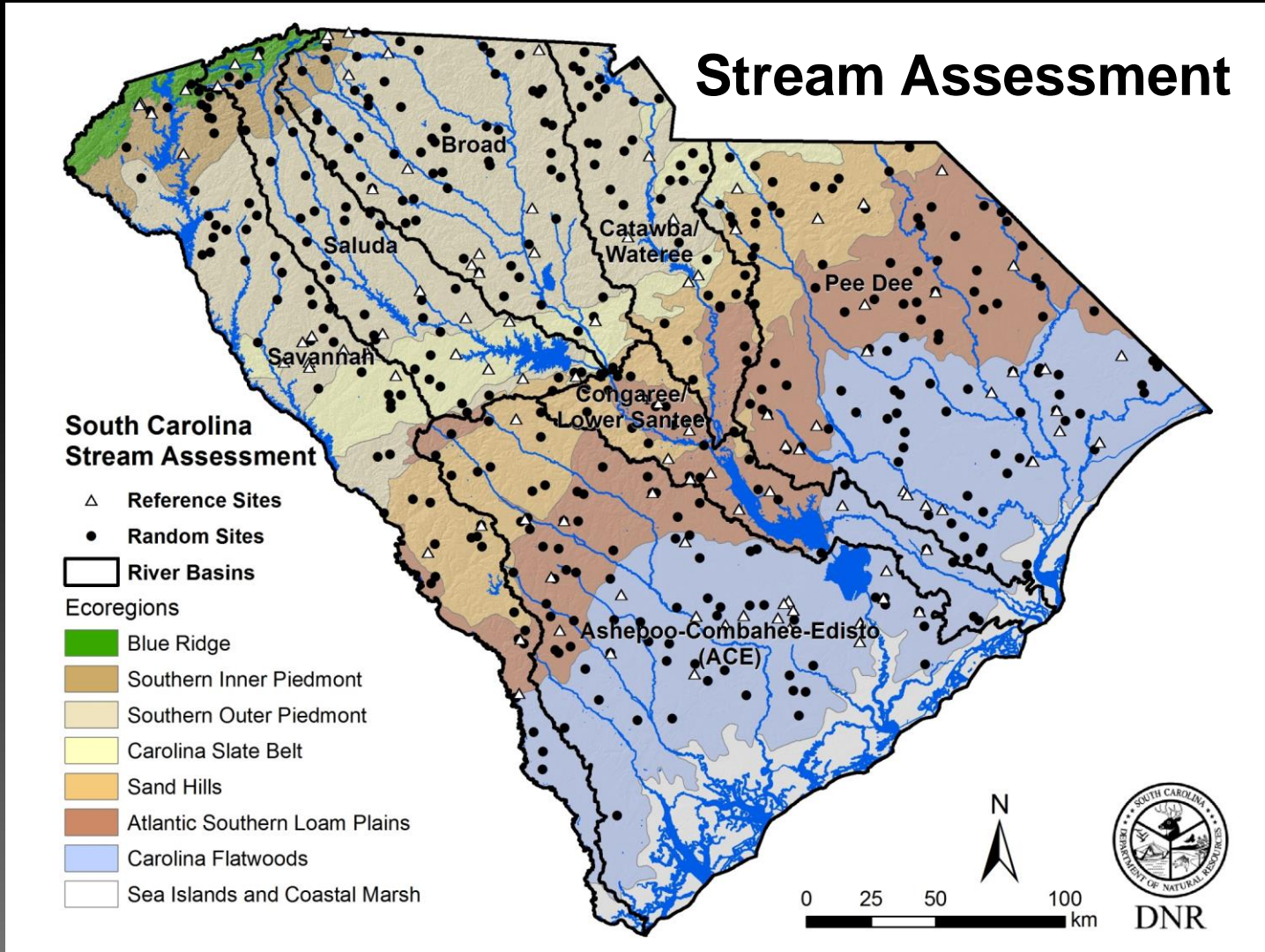
Carolina Quillback	<i>Carpionodes cyprinus</i>
Atlantic Highfin Carpsucker	<i>Carpionodes velifer</i>
Notchlip Redhorse	<i>Moxostoma collapsum</i>
V-Lip Redhorse	<i>Moxostoma pappillosum</i>
Snail Bullhead	<i>Ameiurus brunneus</i>
White Catfish	<i>Ameiurus catus</i>
Flat Bullhead	<i>Ameiurus platycephalus</i>
Stoneroller	<i>Campostoma anomalum</i>
Rosyside Dace	<i>Clinostomus funduloides</i>
Greenfin Shiner	<i>Cyprinella chloristia</i>
Thicklip Chub	<i>Cyprinella labrosa</i>
Fieryblack Shiner	<i>Cyprinella pyrrhomelas</i>
Santee Chub	<i>Cyprinella zanema</i>
Highback Chub	<i>Hybopsis hypsinotus</i>
Rosyface Chub	<i>Hybopsis rubrifrons</i>
Highfin Shiner	<i>Notropis altipinnis</i>
Swallowtail Shiner	<i>Notropis procne</i>
Sandbar Shiner	<i>Notropis szepticus</i>
Lowland Shiner	<i>Pteronotropis stonei</i>
Western Blacknose Dace	<i>Rhinichthys obtusus</i>
Striped Bass	<i>Morone saxatilis</i>
Carolina Fantail Darter	<i>Etheostoma brevispinum</i>
Carolina Darter	<i>Etheostoma collis</i>
Seagreen Darter	<i>Etheostoma thalassinum</i>
Piedmont Darter	<i>Percina crassa</i>
Southern Brook Trout	<i>Salvelinus fontinalis</i>

# Indicator Species

- Being specialized has a cost
  - Specialization = sensitivity to environmental change
  - Habitat alteration affects some species more than others
- = Biological Indicators



# Bio-assessment Studies



Bioassessment data → identify relationships between environmental factors (such as flow) and fish

**MEASURING STREAM  
HABITAT AND FLOW**



**SAMPLING THE WHOLE  
FISH COMMUNITY**



A large group of greenhead shiners swimming in a shallow stream over a rocky bed. The fish are densely packed and moving in various directions. The water is clear, and the rocks are visible on the bottom.

**“Fish prefer water 100% of the time.” –J. Bulak**

**GREENHEAD SHINER  
SPAWNING AGGREGATION**