



# Aquatic Resources of the Broad River

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SCDNR

Yellowfin Shiner



NCFishes.com

Robust Redhorse



NCFishes.com

Seagreen Darter



NCFishes.com

Fiery Black Shiner



NCFishes.com

Bluehead Chub



NCFishes.com

Flat bullhead



NCFishes.com

## Broad River Fishes

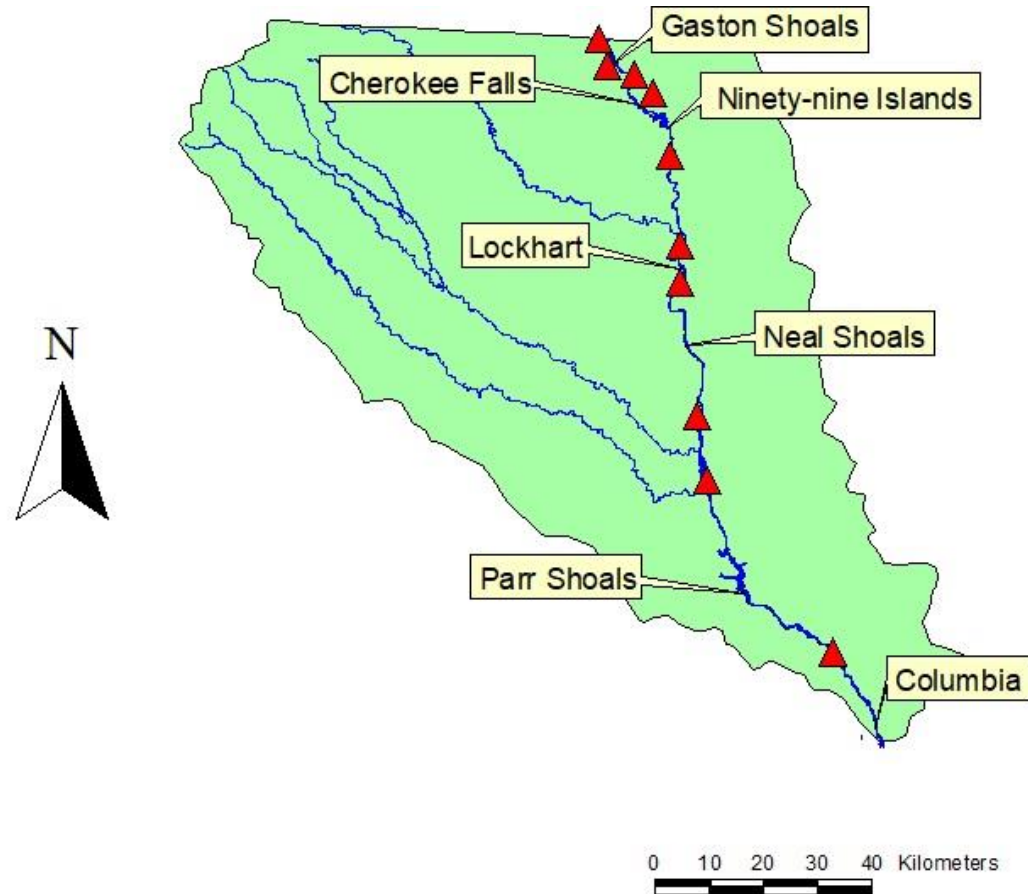
(Images from NCFishes.com)

- Roughly 150 fish species in South Carolina
- Eighty-six species occur in Broad River Drainage
  - 17 non-native species
  - 29 species of conservation concern

• [https://www.youtube.com/watch?v=jCLz54Me23E&ab\\_channel=MommaK](https://www.youtube.com/watch?v=jCLz54Me23E&ab_channel=MommaK)

# Broad River Aquatic Resources Inventory (2003)

- Inventory the aquatic Resources of the Broad River, with emphasis on fish
- Examine health of Largemouth Bass along the length of the river
- Inventory mussel community



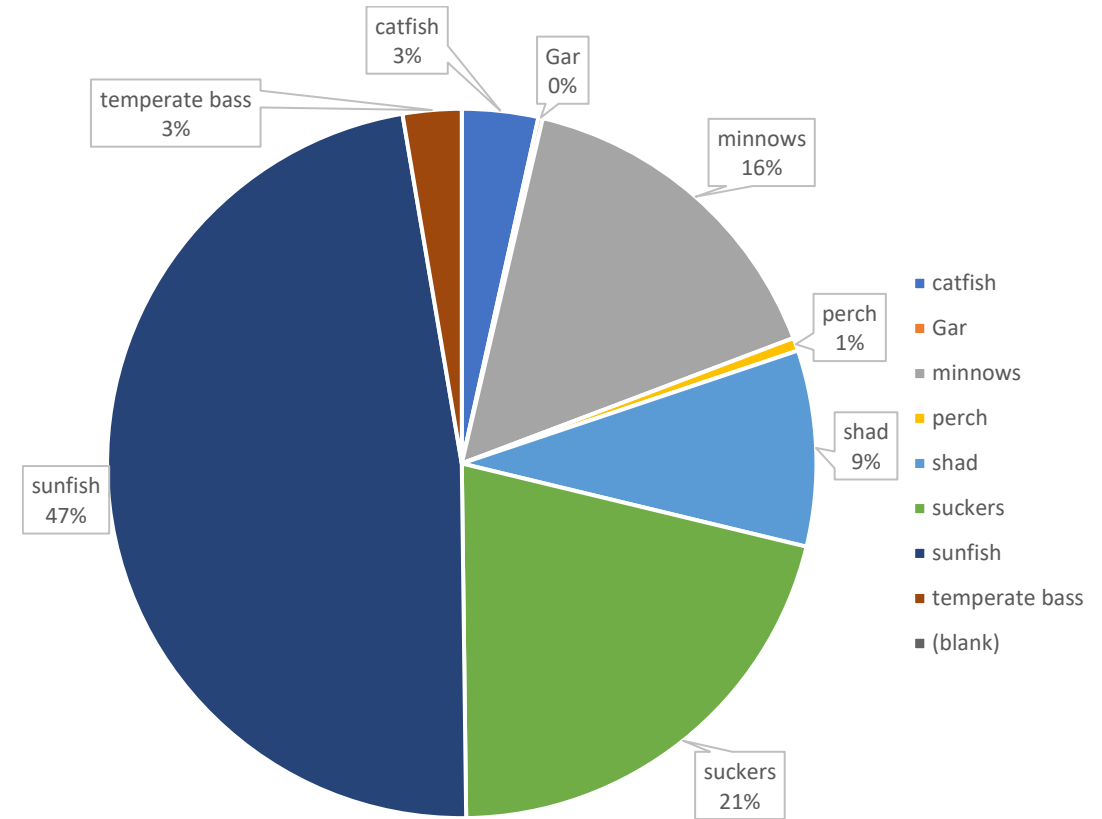
# Mainstem Fish Collections

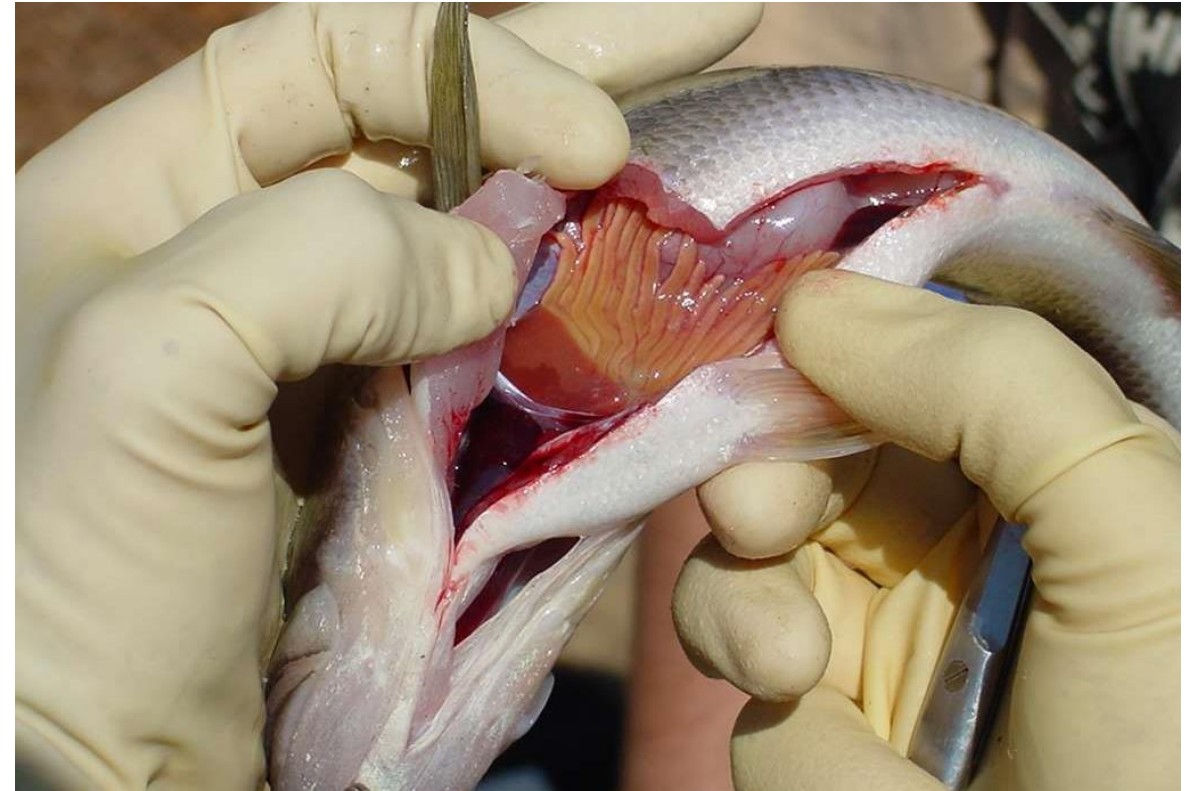
- Sampled 11 sites From North Carolina to Columbia, SC
- Boat electrofishing
  - 204 Collections
- Backpack electrofishing
  - 709 collections



# Boat Electrofishing - Results

- Collected 51 fish species
  - Minnows/shiners – 16 species
  - Suckers/redhorse – 10 species
  - Catfish – 5 species
  - Temperate basses – 3 species
  - Sunfish – 10 species
  - Perch – 5 species
  - Gar – 1 species
  - Live Bearers – 1 species
- Most commonly collected fishes were redbreast sunfish, whitefin shiner and notchlip redhorse
- Species richness and diversity were higher at downstream locations





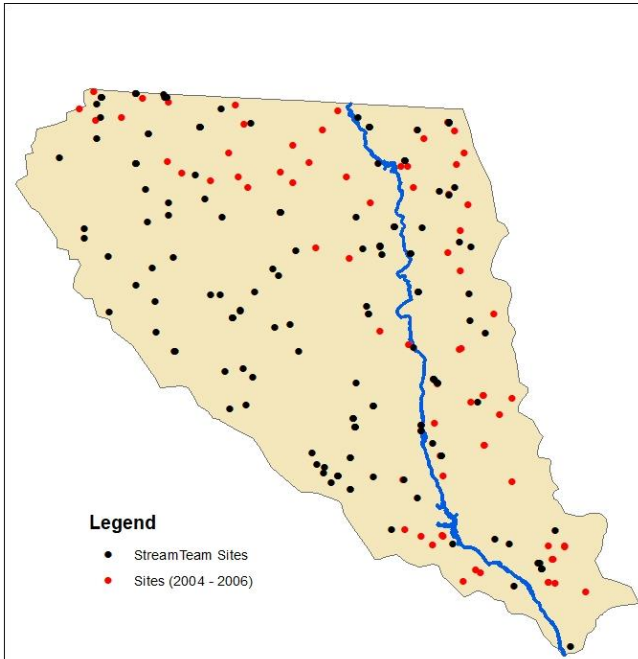
## Largemouth Bass Health Assessment

- Autopsy based procedure where organs, structures and blood parameters are scored based on deviations from normality
- Largemouth Bass Health in Broad River is generally good, but poorer health is observed near industrial effluent



## Mussel Inventory

- “Ecosystem Engineers” – modify aquatic habitat to the benefit of other aquatic organisms
  - Capture organic matter and excrete nutrients
  - Filter phytoplankton, bacteria and fungi
  - Create habitat for aquatic species
- Surveyed mussel community at multiple locations from North Carolina to Columbia
- Identified seven shell forms
- Mussels are abundant in the lower river; however, they are rare in the upper reaches of the river due to poor substrate conditions



**Legend**

- StreamTeam Sites
- Sites (2004 - 2006)



## Broad River Stream survey (2006)

- Comprehensive fish survey of wadeable streams
  - Mean width 15-feet and mean depth 6-inches
- Develop preliminary list of species of greatest conservation need
- Identify opportunities for habitat conservation and restoration activities



Creek Chub



NCFishes.com

Redbreast Sunfish



NCFishes.com

Roseyside Dace



NCFishes.com

Sandbar Shiner



NCFishes.com

Yellowfin Shiner



NCFishes.com

Bluehead Chub



NCFishes.com

# Wadeable Stream Survey - Results

- 45 Streams Sampled
- 45 species collected
- 47% of the streams had “good” habitat conditions
- Number of fish species per stream averaged 14 (Range; 1 – 28)



## Robust Redhorse Restoration



- Large (up to 18-pounds) long-lived (30 years) Sucker species
- Species was lost to science for over 100 years and rediscovered in GA in 1991
- Between 2004 and 2013 DNR stocked 72,000 5-inch fingerlings to reestablish populations in the upper Santee system (up to Neal shoals Dam)
- Spawning adults are now seen in Broad, Wateree and Congaree Rivers, but natural reproduction has not yet been documented
- Cooperative effort between SCDNR, USFWS, SCE&G and Duke Power



# American Shad Restoration

- American Shad - diadromous fish spends adult life in Ocean and spawns in freshwaters
  - Important forage for marine and freshwater fish
  - Commercial fishery in SC
- Fish Passage at Columbia Dam
- American Shad stockings in lower Broad River
  - 53 million stocked since 2008



## Recreational Fisheries

- Historically Largemouth bass, panfish and bullhead river
- Smallmouth Bass stocked in early 80's and an excellent fishery developed
  - Reaches above Parr Shoals are supplementally stocked each year
- Initiating new sampling plan throughout the river to monitor sportfish populations



## Recreational Fisheries – emerging threats



- Flathead Catfish – prey on native catfishes and sunfishes
- Alabama Bass/Spotted Bass – hybridize with Smallmouth Bass and can outcompete Largemouth Bass

# SCDNR Instream Flow Policy

- 1983 General Assembly directed Water Resources Commission to develop minimum flow standards to protect instream uses
  - Navigation, recreation, wastewater assimilation, water quality, fish and wildlife habitat, hydropower and aesthetics
- Policy was drafted in 1988, reviewed and redrafted in 2009

## INSTREAM FLOW STUDY

### PHASE II:

Determination of Minimum Flow Standards to Protect Instream Uses in Priority Stream Segments

A Report to the South Carolina General Assembly

Report Number 163

South Carolina Water Resources Commission  
1201 Main Street, Suite 1100  
Columbia, South Carolina

May 1988



DNR

## INSTREAM FLOWS TO PROTECT AQUATIC RESOURCES IN SOUTH CAROLINA

Minimum Instream-Flow Policy

Determination of General Instream-Flow Recommendations

March 2009

This document is available on the Department of Natural Resources web site at <http://www.dnr.sc.gov/>



## SCDNR Instream Flow Policy – Biological Justification

- Fish and other aquatic life need water
- Riverine aquatic life require sufficient flows to sustain biotic integrity
  - Reduced flows impact spawning migrations and success, decrease habitat availability, negatively effect water quality and increase silt deposition

# SCDNR Instream Flow Policy

- Policy defined the lowest acceptable instream flow necessary to protect and conserve aquatic resources, water quality, recreation, navigation and the prevention of saltwater intrusion.
- Policy does not enhance stream habitats or species, but provides a minimum level of protection for aquatic and recreational resources
- Based on average daily flow within a system
- Flows conform to seasonal variation because aquatic species evolved to spawn in synchrony with the hydrologic cycle

Region	Period	Minimum Recommended Instream-Flow
Coastal Plain	July – November	20% of mean annual daily flow
	January – April	60% of mean annual daily flow
	May, June & December	40% of mean annual daily flow
Piedmont	July – November	20% of mean annual daily flow
	January – April	40% of mean annual daily flow
	May, June & December	30% of mean annual daily flow



