### Carolina DPS Atlantic Sturgeon

#### North Carolina –

#### Roanoke, Tar-Pamlico, Neuse, and Cape Fear Rivers

#### South Carolina –

#### Pee Dee, Black, Santee, and Cooper Rivers





• Overfishing and habitat loss caused population declines

Atlantic Sturgeon federally listed in 2012

- North Carolina rivers lack comprehensive demographic and genetic information
- Roanoke River documented spawning through egg collection
- High abundance in the Cape Fear River indicates likely spawning population

Adult Demography, Migration, and Spawning Habitat Identification

### Confirm and Identify –

- Presence of migratory adult Atlantic sturgeon
- Potential spawning areas in the Cape Fear River

#### Migration –

- Ingress and egress timing and pathways
- Habitats that support aggregations of adults



# **Evidence to determine extant spawning population**

Spawning population?	Criteria
Confirmed	<ol> <li>Active spawning females w/ milting males in spawning habitat or</li> <li>Presence of eggs</li> </ol>
Near certain	<ol> <li>Presence of river-resident juveniles (&lt; 500mm FL) or</li> <li>Gravid females in spawning habitat</li> </ol>
Possible	Milting males in spawning habitat
Uncertain	Capture of adults (but not in spawning habitat)

Sub-adult and Juvenile Atlantic Sturgeon Habitat Use and Population Dynamics

# Sub-adults

- Monitor movement and habitat use at fine/broad scale
- Extent of mixing across US South Atlantic rivers (SC and GA)

# Juveniles

- Monitor seasonal movements using acoustics
- Estimate abundance using mark-recapture



### **STUDY AREA - METHODS**

Lower Cape Fear River system

3 large tributaries
Capture with short soak gill nets
Acoustic and PIT tagging
Collect tissue samples for aging and genetics













Adult Atlantic sturgeon migration

- Three adult males tagged in spring
   2021 and returned in 2022 and 2023
- Animated tracks illustrate immigration/emigration timing and pathways
  - February entry/departure/re-entry
  - Brief entry into Black River
  - Some staging during immigration
  - Variable residency durations



### 2023 return and residency





2023 return and residency (2022 tags)

### Adult Atlantic sturgeon

- Aggregation areas below LD#I
- 9 adults during Spring 2022

Cape Fear River HR3 Arrays at Lock & Dam 1



1500000

1000000

500000



### Atlantic sturgeon eggs

- Collected below LD#1 during April 2023 egg mat deployment
- USGS genetics laboratory has provided preliminary confirmation that eggs are Atlantic sturgeon
- Represents definitive evidence of a spawning population in the Cape Fear River

## Cape Fear Atlantic Sturgeon Summary

- 20 adults captured/tagged since spring 2021
  - Includes a gravid female
  - Multiple adult males have returned each year
  - High resolution spatial data below LD#1
  - Timing, pathways, and river conditions during immigration/emigration
- ✤ 300+ sub-adults captured
  - Numerous recaptures of UNCW + SC/GA fish
  - Subset of acoustic tagged individuals
- ✤ 50+ resident juveniles captured
  - Presence of natal juveniles = strong evidence of spawning
  - Seasonal movements to estimate mortality risks
- Eggs collected in spring 2023
  - Application of genetic primers to confirm species







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### Future work

- Summer mark-recapture of river-resident juveniles during 2023
- Acoustic tagging to quantify habitats, movements, and emigration of riverresident juveniles (n = 20) in summer 2023
  - Will inform assumption of summer population closure
  - Identify aggregation areas and timing of movements to inform disturbance activities (e.g., dredging)
- Continue to look for evidence of fall spawning in the Cape Fear River
- Examine mixing rates of sub-adults across US South Atlantic rivers (NOAA funded project in collaboration with SCDNR and UGA)

# Questions?