

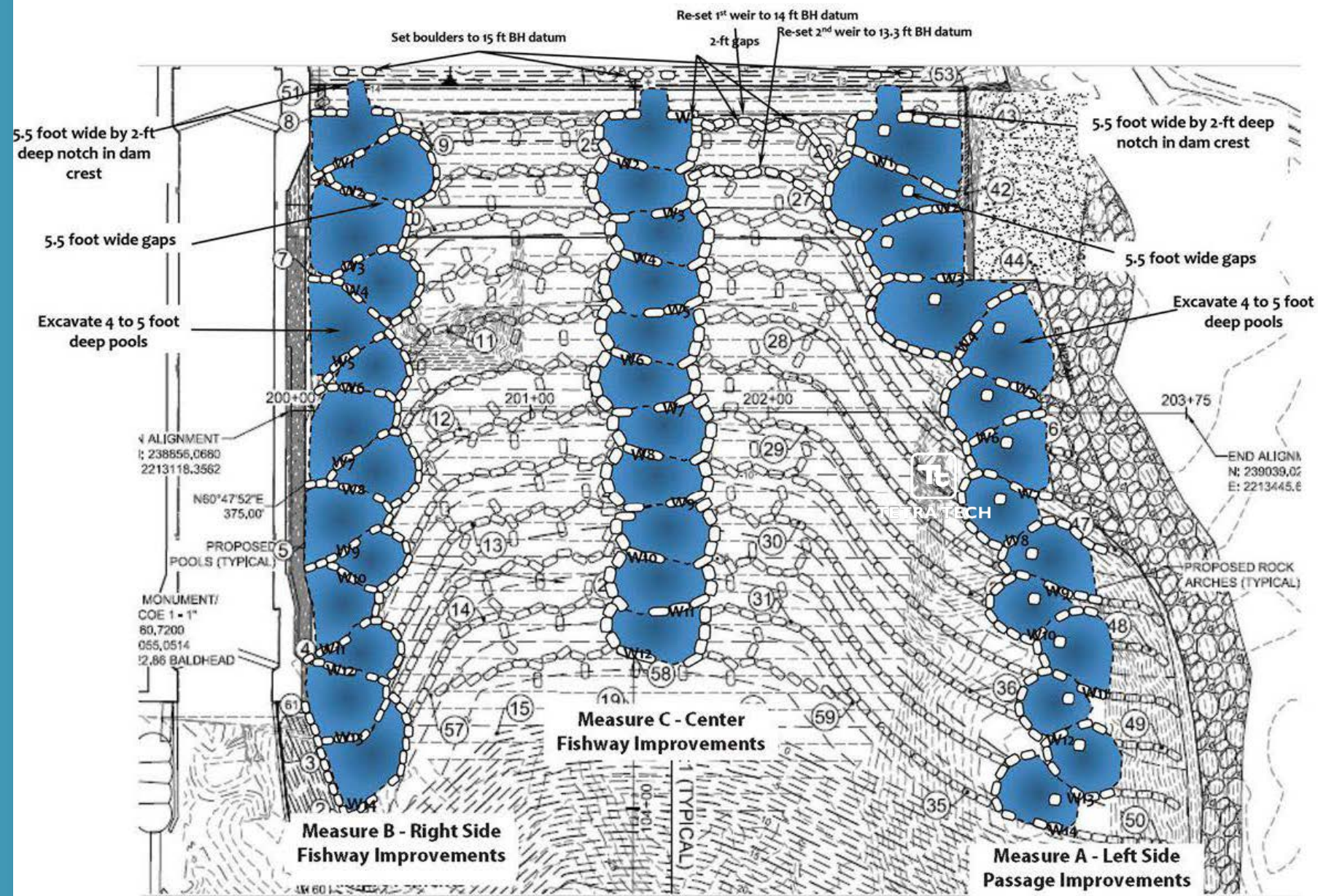
Partnership Spring 2022 Session

Lock and Dam 1; Improving Fish Passage



Fish Passage Basis of Design

The background of the slide features several diagonal stripes in light blue, light orange, and dark blue. On the right side, there is a blurred image of a natural landscape with green foliage and a body of water.



**Alternate 1 – Notched Cres
with 3 Fishway Channels**

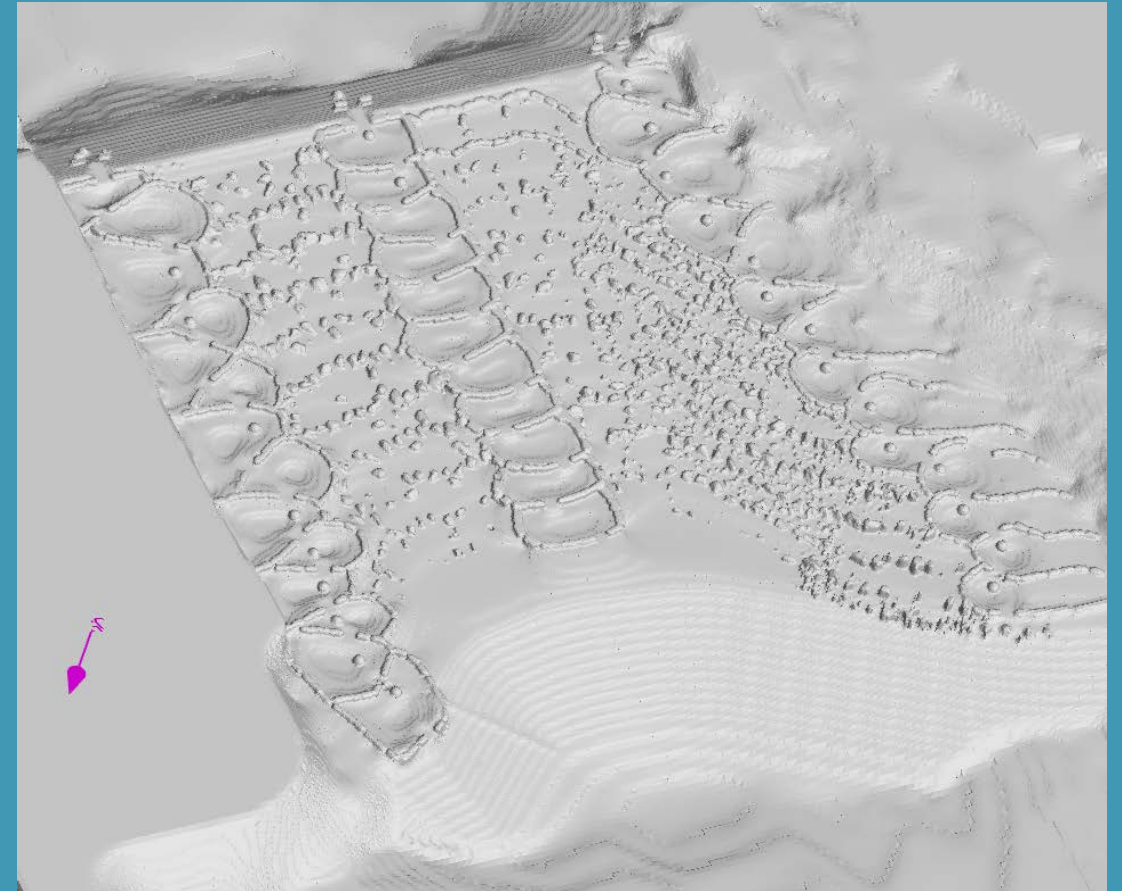
- Upgrade modifications to produce more favorable hydraulic conditions such as reduced flow velocities, wider gaps between weir stones and larger and deeper pools.
- Provide a more gradual and uniform loss of energy along the pathways by reducing the slope of the water surface elevation to approximately 3%.

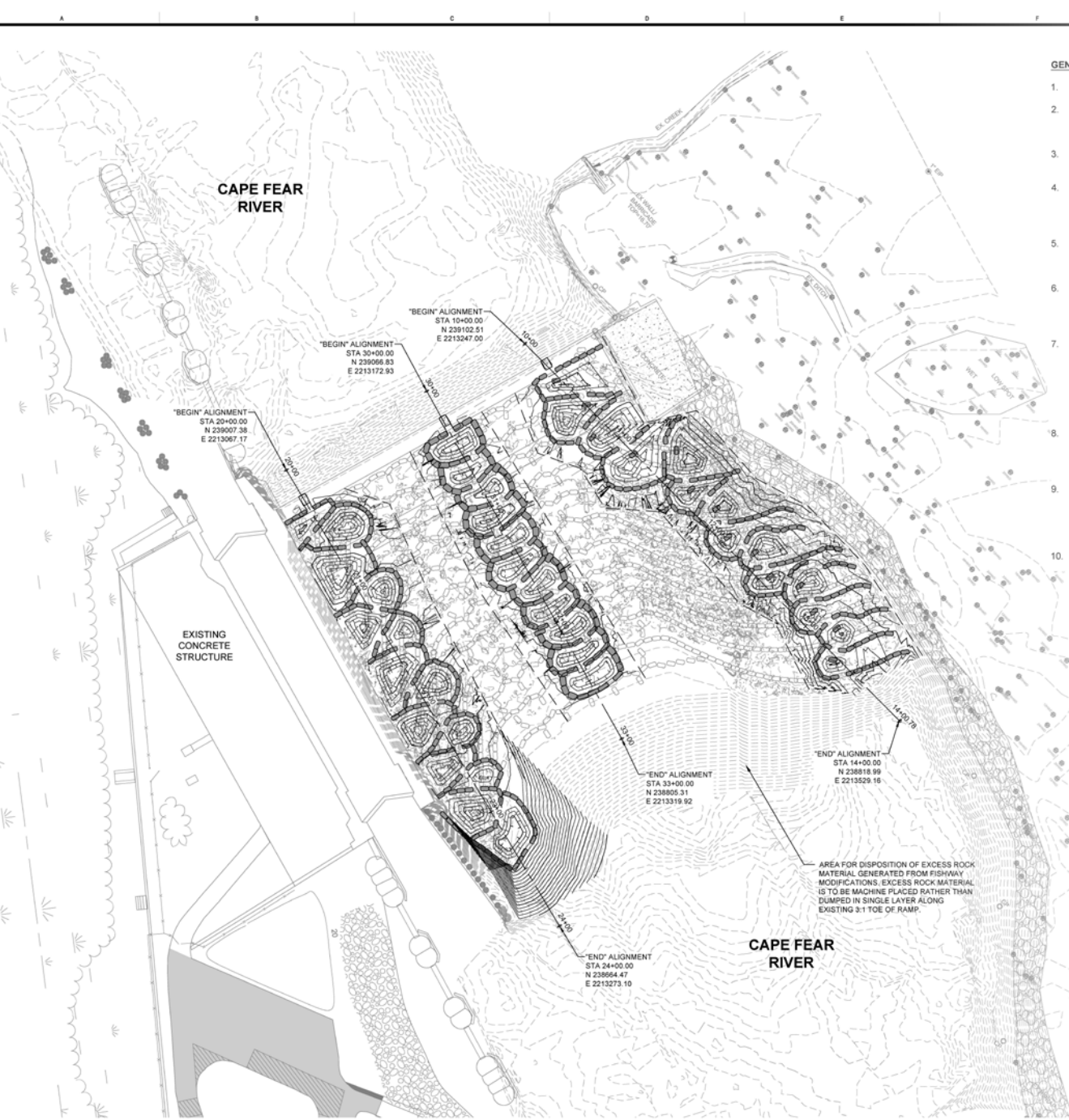
Design Rationale

Core design rationale for nature-like fish passages include:

- › **1)** Nature-like passages should pass the full suite of native fish species.
- › **2)** Fishways should be passable over the range of seasonal flow conditions.
- › **3)** To the degree possible, fishways should be geomorphically similar to reaches of the natural river channel.
- › In the Cape Fear River riffles and rapids are critical habitat for many species.

Flow3D Model





GENERAL CONSTRUCTION NOTES:

1. HORIZONTAL DATUM: NAD 1983
2. TOPOGRAPHY AND SOUNDINGS ARE ELEVATIONS TO POOL LEVELS (DAM CRESTS) ABOVE LOCK AND THAT POINT
3. PROJECT SOUNDINGS WERE SURVEYED 22 JULY 2015 WITH A TRIMBLE 5600 D.G.P.S. HORIZONTAL POSITIONING EQUIPMENT AND 200 KHZ SOUNDING EQUIPMENT
4. TIDE GAGE LOCATED AT: STAFF IN LOWER POOL
TIDE GAGE LOCATED AT: STAFF IN UPPER POOL
+3.0' ON THE LOWER POOL GAGE = LOCK TIDE
+14.0' ON UPPER POOL GAGE = ELEVATION
5. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF THE SURVEY CONDUCTED ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CHARACTER OF THE CONDITIONS AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE.
6. PROPOSED 'SCOUR HOLE REPAIR' FILL MATERIAL IN AREAS NOTED ON USACE PLANS TITLED 'SCOUR HOLE REPAIR' MUST BE REPLACED WITH 'SCOUR HOLE REPAIR' FILL IS BEING PLACED PRIOR TO COMMENCEMENT OF THIS PROJECT.
7. NAVIGATION AIDS LOCATED WITH DISTRICT VESSELS ARE EXPRESSED IN DEGREES DECIMAL MINUTES

DESCRIPTION	EASTING
DANGER BUOY #1	2213308.50
DANGER BUOY #2	2213011.66
DANGER BUOY #3	2212851.57

NORTHING LATITUDE

8. THE CONTRACTOR SHALL PROVIDE ONSHORE DICTATE. IN LOCATING, SECURING AND USING FULLY COMPLY WITH ALL FEDERAL, STATE, AND PAYMENT WILL BE MADE FOR PROVIDING ONE
9. THE CONTRACTOR WILL FURNISH AND INSTALL STONE, AND POOL CHINKING STONE TO PROVIDE GRADING AND SECTIONS SHOWN ON PLATES ALONG THE UPSTREAM CREST OF THE DAM, (RETAINING WALL TO THE EAST SHORELINE AS
10. EXISTING STRUCTURES DAMAGED BY THE CO THE CONTRACTING OFFICER AT NO COST TO

CAPE FEAR RIVER WATCH

Fish Passage Modifications at Lock & Dam No. 1

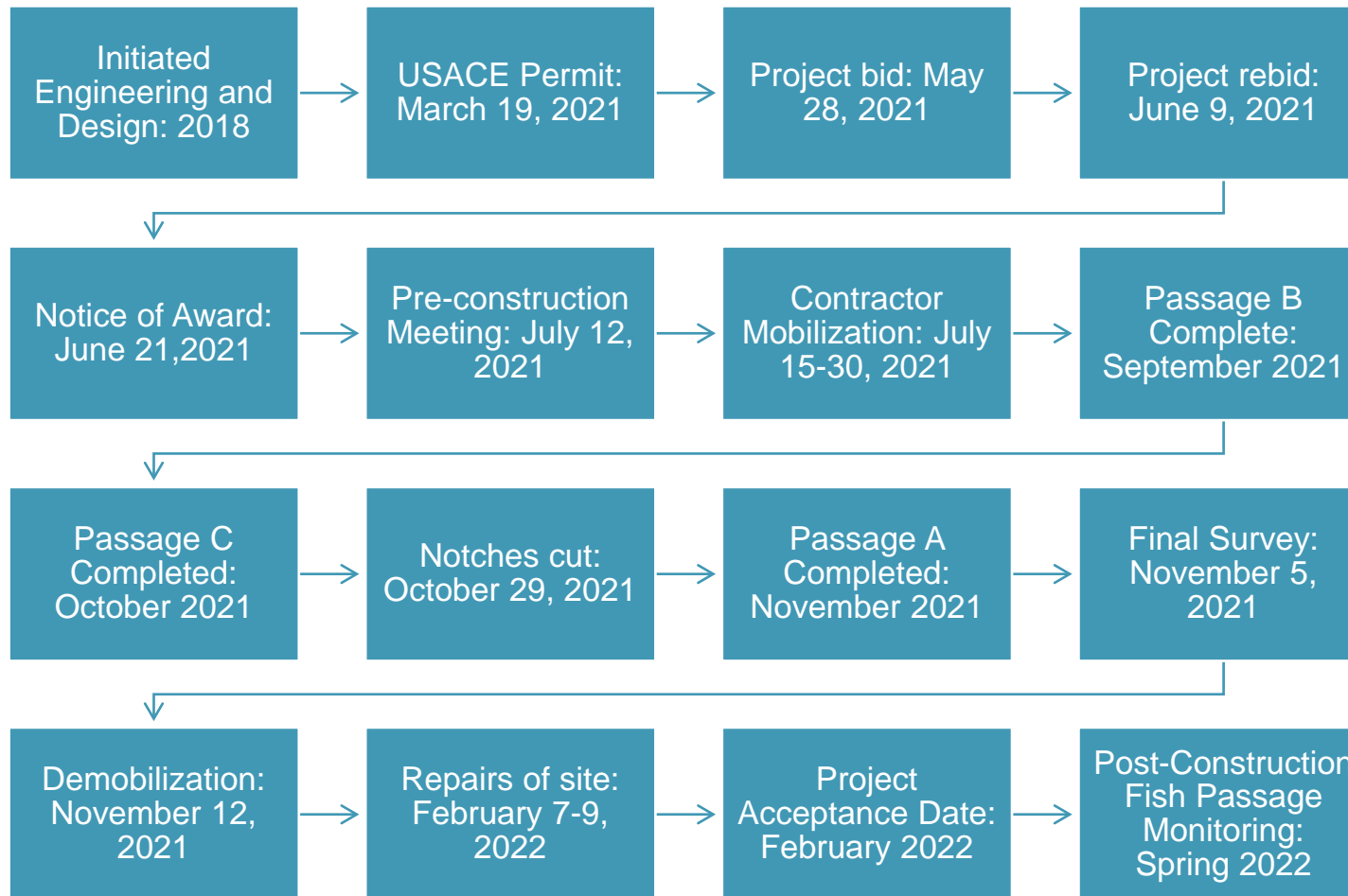
Lock and Dam No. 1
Cape Fear River
Bladen County, North Carolina

PROJECT SPONSOR:
CAPE FEAR RIVER WATCH
617 SURRY LANE
WILMINGTON, NC 28401

CONTRACT SHEET
G-00
8/26/2014

Fish Passage Improvements

(2021)



Project Timeline



Jersey Barrier Installation

8/13/2021



Creating Right Bank Pathway

8/16/2021

Creating Pools

- › Video 1: Creating a bed for the weir stones
- › Video 2: Flows within first pools (8/19/2021)



Notches



- › Three notches for each flow channel
- › Each notch is 2 ft high by 5.5 ft wide
- › Dam crest remnant to stay on-site for education



Notch Cutting



› Wire saw was used with metal wire coated in diamonds

› SCC, Inc. - Sawing & Drilling
(seacoastcc.com)

Cape Fear River Watch – Patrick Connell

- › Project Completed
- › Note three notches
- › All equipment demobilized



November 10, 2021

Sturgeon Monitoring

- › Frank Yelverton – CFRW ED/USACE Biologist
- › Rich Carpenter – NCDMF
- › Bennett Wynne - NCWRC
- › Over 75 years of combined experience in fisheries biology
- › Conducted daily monitoring and reporting during construction
- › Two sturgeon were observed jumping downstream of LD1
- › One sturgeon was observed jumping in the LD1 lock chamber



- › **UNCW tagged 5 Atlantic sturgeon adults but none found near LD1 for fall run**
- › **In 2021, 200 subadult sturgeon were tagged**
 - › **Likely river resident fish**
 - › **Evidence of reproduction in CFR**

Funding

- › N.C. Division of Marine Fisheries - \$372,458
- › National Fish and Wildlife Foundation - \$200,000
- › NC State Port Authority - \$800,000
- › U.S. Fish and Wildlife Service - \$45,000
- › Total - \$1,417,458

- › Funds were used for:
 - › Engineering/Design
 - › Modeling
 - › Permitting
 - › Construction
 - › Construction Administration
 - › Sturgeon Observation
 - › Outreach/Education
 - › Grants Administration

- › **Construction Costs
(\$1,123,908)**



**Thanks to all that made
this project possible!**

Next Steps for Lock and Dams 2 and 3



- › Meeting with USACE Wilmington District and SAD to evaluate feasibility of dam removal
- › Discuss alternatives with Bladen County
- › Schedule stakeholder and agency meeting to review project progress to date
- › Complete studies, alternative analysis and draft environmental documents
- › Submit permit application
- › Section 408 Review

- › **Alternatives to be Evaluated:**
- › **Upstream Fish Passage**
- › **Downstream Fish Passage**
- › **Lock Chamber**
- › **Dam Removal**

Thank you!

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