



Striped Bass Central Southern Management Area

DEPARTMENT OF ENVIRONMENTAL QUALITY

Marine Fisheries

Marine Fisheries Commission | Charlton Godwin | Aug 18, 2016



OUTLINE

- History of striped bass stocking in the Tar/Pamlico, Neuse, and Cape Fear rivers (Central Southern Management Area)
- Previous method of determining hatchery contribution to the stocks
- Current method of determining hatchery contribution
- Results of hatchery contribution by system
- Moving forward

STRIPED BASS STOCKING HISTORY

- US Fish and Wildlife Service, Edenton National Fish Hatchery, began stocking Phase II striped bass (6-8 inches long) in 1980
- Striped bass were stocked on a rotating basis between rivers
- In 2010 the stocking strategy changed to stocking each river each year
- Current goal of 100,000 fish in each river each year
- Edenton National Fish Hatchery stocks Tar/Pamlico and Neuse; Wildlife Resources Commission – Watha State Fish Hatchery stocks the Cape Fear
- Phase I fish (2-4 inches long) and fry (4-5 days old) have also been stocked through the years

STRIPED BASS STOCKING HISTORY



- Photo courtesy Stephen Jackson, Manager, Edenton National Fish Hatchery

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DETERMINING HATCHERY CONTRIBUTION – PREVIOUS METHOD

- Tag 3,000 Phase II striped bass per system
- Mark the ear bones (otoliths) of fish in the hatchery with a chemical (OTC), then analyze ear bones at a later date to determine percent hatchery contribution
- Results indicated stocked fish contributed minimally to the spawning stock and fisheries in the Central/Southern rivers
- Incorrect results due primarily to problems with chemical mark retention



Photo: Matthew D. Taylor, PhD
University of New South Wales



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DETERMINING HATCHERY CONTRIBUTION – CURRENT METHOD



- Genetic “tags” starting in 2010
- Genotype the parents in the hatchery
- All offspring can be identified back to the individual parents

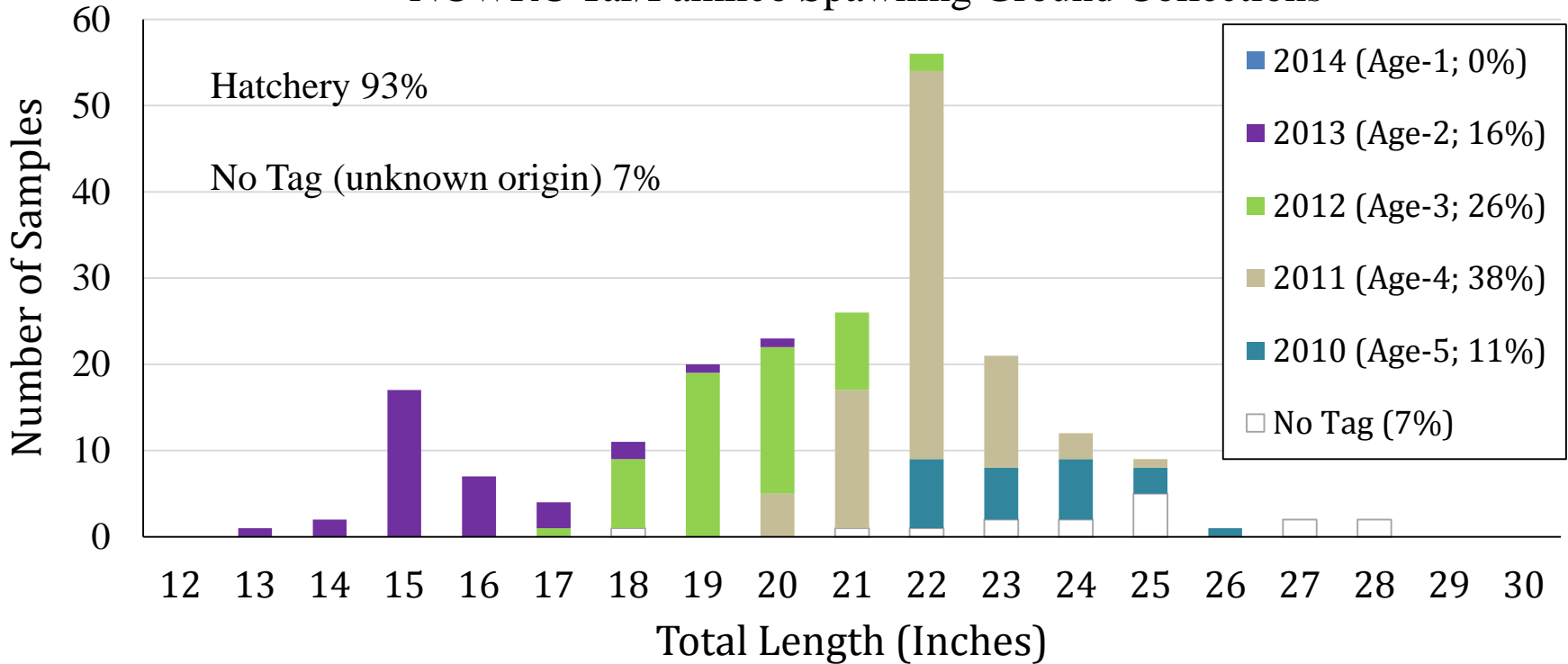
- 99.99 percent accurate
- Non-lethal, uses a fin clip
- Can sample many more fish



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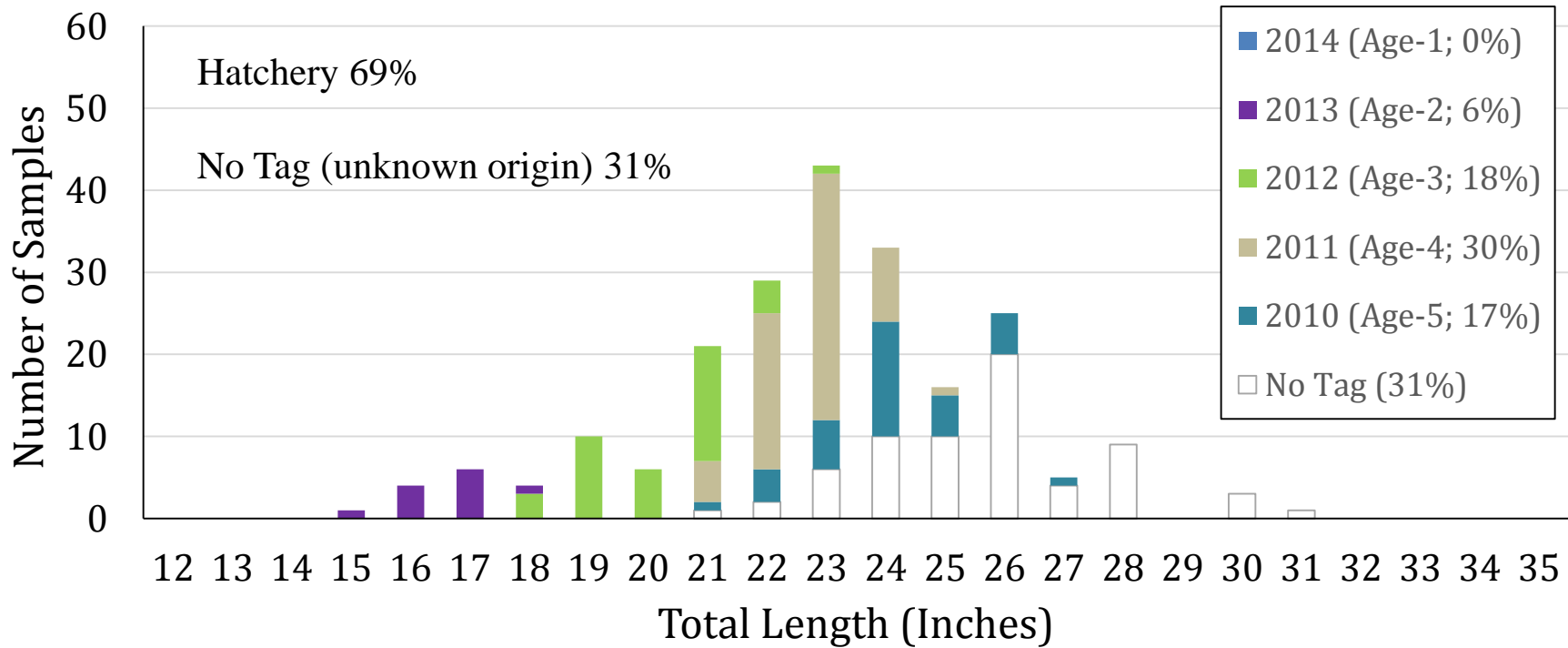
HATCHERY CONTRIBUTION BY SYSTEM

2015 Striped Bass Fin Clips (n = 214)
NCWRC Tar/Pamlico Spawning Ground Collections



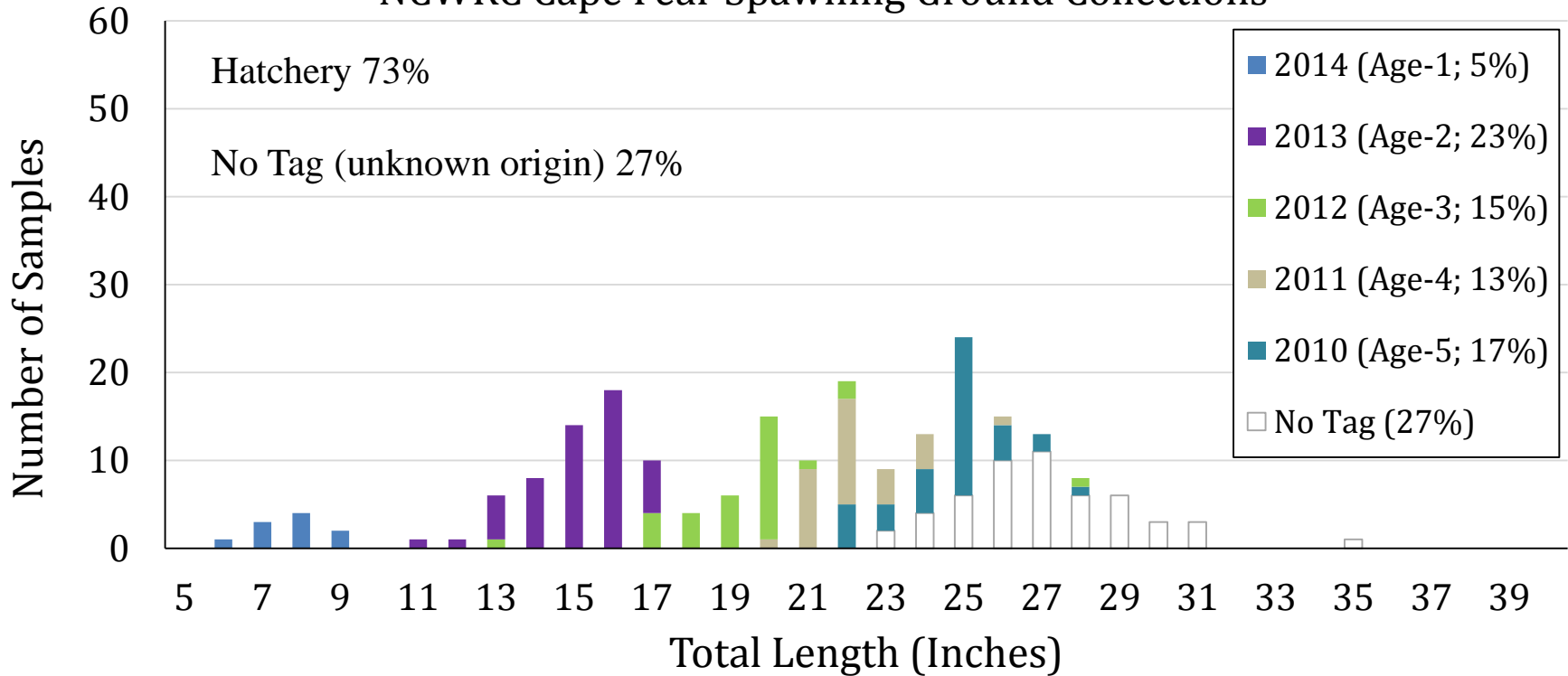
HATCHERY CONTRIBUTION BY SYSTEM

2015 Striped Bass Fin Clips (n = 216)
 NCWRC Neuse Spawning Ground Collections



HATCHERY CONTRIBUTION BY SYSTEM

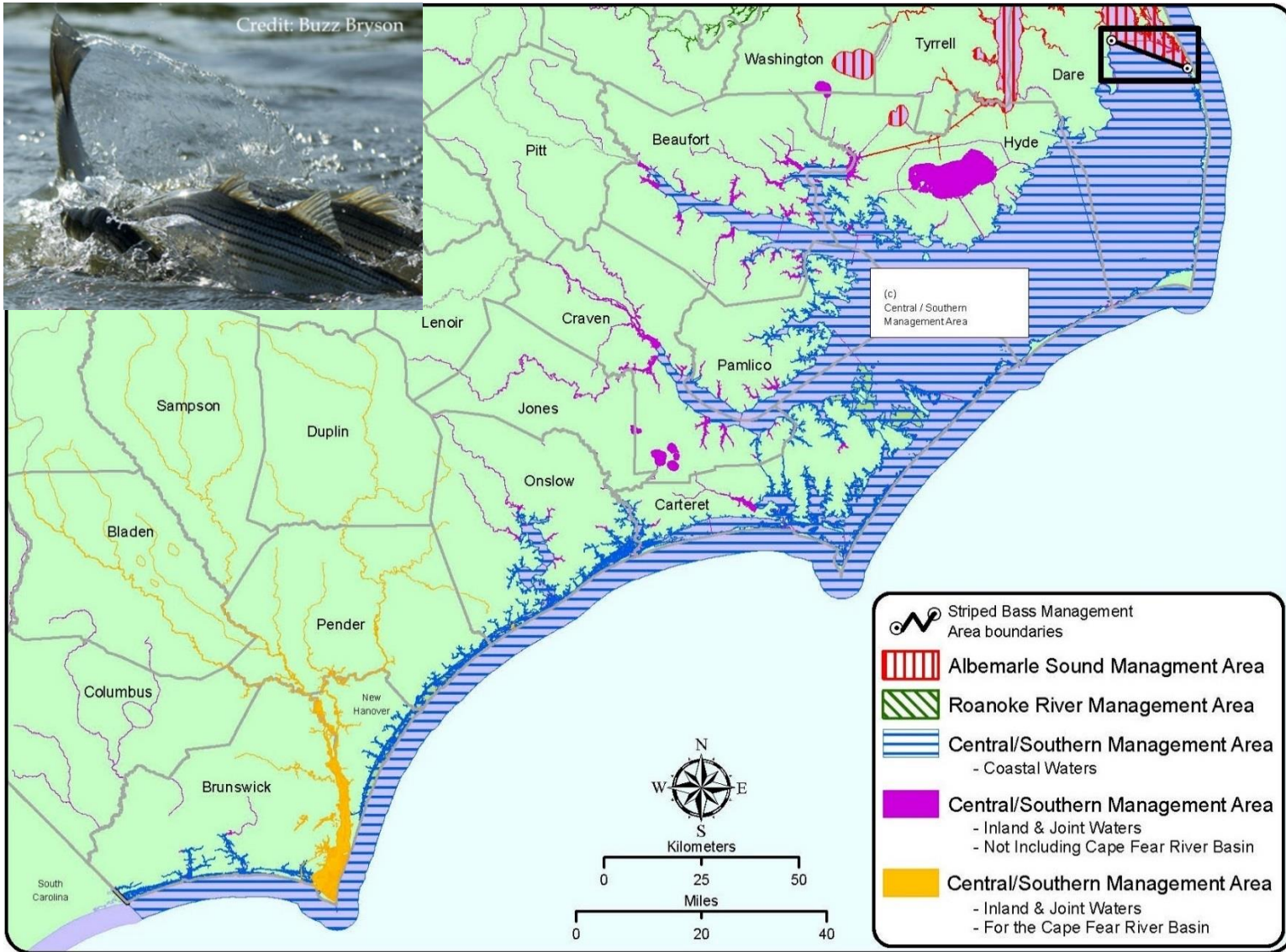
2015 Striped Bass Fin Clips (n = 217)
NCWRC Cape Fear Spawning Ground Collections



HATCHERY CONTRIBUTION BY SYSTEM

- Majority of current samples have come only from spawning grounds or the middle river in each system
- Need to expand genetic sampling to locations other than spawning grounds
- In the spring of 2016 the division collected genetic samples from fish harvested in the recreational and commercial sectors, and division independent sampling in the lower portions of the Tar/Pamlico, Neuse, and Cape Fear rivers
- The 384 samples have been sent to South Carolina genetics lab for analysis
- The lab has indicated the genetic results should be available for review at the November 2016 commission meeting

HATCHERY CONTRIBUTION BY SYSTEM



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MOVING FORWARD

- Based on these recent genetic findings, and a request by the commission, the division and wildlife staffs met on June 22, 2016 to discuss management options
- Due to the potential for significant management changes the group determined that a full review of the plan with input from all user groups is warranted
- Therefore the group recommends, with the support of the directors of both agencies, that the commission adjust the Draft Fishery Management Plan Review Schedule to start the full review of the striped bass plan in July of 2017 instead of July 2018

MOVING FORWARD

- If the schedule change is approved by the commission, a joint workgroup of division and wildlife staffs will convene in September 2016 to develop a list of specific actions to continue working on, in order to be fully prepared to start the plan review process in July 2017
 - Consider potential stock assessment options in light of new genetics information (data used will be through 2016)
 - Develop draft revisions to the fishery management plan Goals and Objectives
 - Develop draft revisions to the stocking program objectives and strategies
 - Continue to collaborate with academia to identify and implement research projects to address the lack of natural recruitment of striped bass in the Central Southern Management Area

MOVING FORWARD

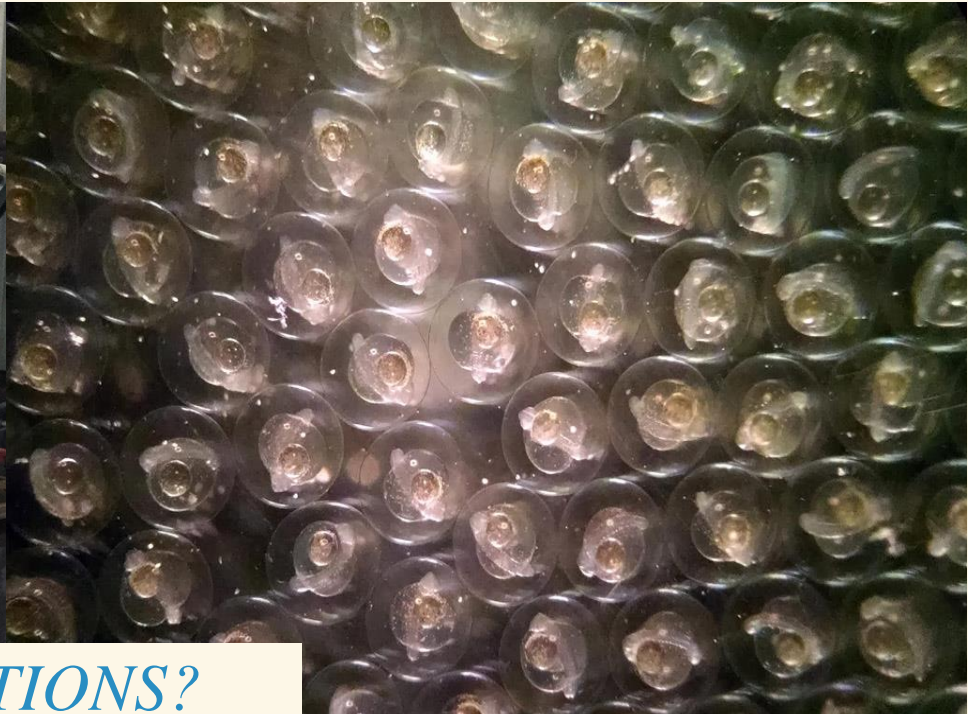
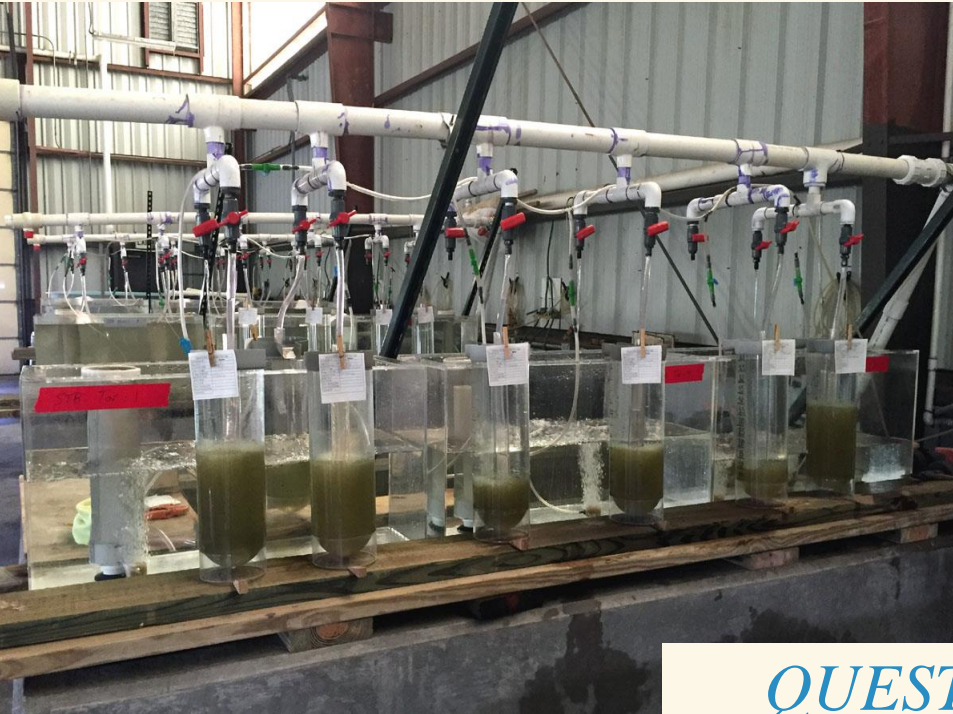
- The question we have to answer now is why is there very little successful natural reproduction?
 - Too few spawning females in the population?
 - Side effect of stocking fish from the Roanoke River in these systems from 1980-2010.
 - Is there enough springtime flow to keep the eggs afloat?
 - Water quality could be an issue.
 - Is there access to enough suitable spawning grounds habitat due to dams in all systems, especially the Cape Fear?
 - Combination of all factors?

RESEARCH PRIORITIES AND PROGRESS

Management Strategy	Outcome
Identify and designate anadromous fish nursery areas and how early juvenile striped bass move and are distributed in NC estuarine waters.	<ol style="list-style-type: none"> 1) Recently finished research by Dr. Jim Rice in the Neuse-NCSU. 2) Proposed sampling by DMF to initiate juvenile sampling in the Tar/Pamlico, Neuse, and Cape Fear rivers spring 2017.
Data on the density and distribution of striped bass eggs, fry, and juveniles in coastal rivers are needed so that potential losses to entrainment and impingement can be estimated.	<ol style="list-style-type: none"> 1) Sampling in the Neuse in 2016-WRC. 2) Sampling in the Cape Fear in 2015 and 2016-DMF, WRC, NOAA Fisheries, Cape Fear River Watch. 3) CRFL proposal recently submitted for potential sampling in the Tar/Pamlico and Roanoke-ECU
Determine if fish on the spawning grounds are stocked.	Ongoing through genetics study-WRC & DMF
Acquire life history information: maturity, fecundity, size and weight at age, egg and larval survival.	Ongoing through CRFL funded projects. See Knight (2015) for recent publication on maturation and fecundity in the Neuse and Tar/Pamlico rivers-ECU
Conduct a mark-recapture study utilizing conventional tags and telemetry approaches.	Ongoing through CRFL funded projects-DMF
Determine extent of spawning grounds.	Ongoing through CRFL funded grant acoustic tagging grant-DMF

RESEARCH PRIORITIES AND PROGRESS

Management Strategy	Outcome
Improve discard estimates and discard biological characteristics from commercial fisheries.	Ongoing through statewide observer coverage. See Rock et al. (2016) for recent report on improving discard estimates through creel survey and expanded observer program-DMF
Conduct independent surveys that adequately capture all life stages of striped bass.	Proposed sampling to initiate juvenile sampling in the Tar/Pamlico, Neuse, and Cape Fear rivers spring 2017-DMF
Continue gear development research to minimize species interactions.	Ongoing-DMF
Increase surveys of stocked systems to determine percent contribution of wild versus stocked fish.	Ongoing through genetics study- WRC & DMF
Determine if fish produced from system-specific parentage will increase stocking contribution to spawning populations.	Ongoing through genetics study- WRC & DMF
Determine factors impacting survivability of stocked fish in each system.	Recently finished research by Dr. Jim Rice in the Neuse-NCSU
More at-sea observations made for the gill net fishery to more accurately assess the discards from this fishery.	Ongoing through Observer Program-DMF
Expand tagging programs to include high reward tagging.	Ongoing through CRFL funded grant-DMF



QUESTIONS?

Photographs courtesy Stephen Jackson

