Evaluation of Central Southern Management Area (CSMA) Striped Bass Stocks in North Carolina, 2020

DEPARTMENT OF ENVIRONMENTAL QUALITY
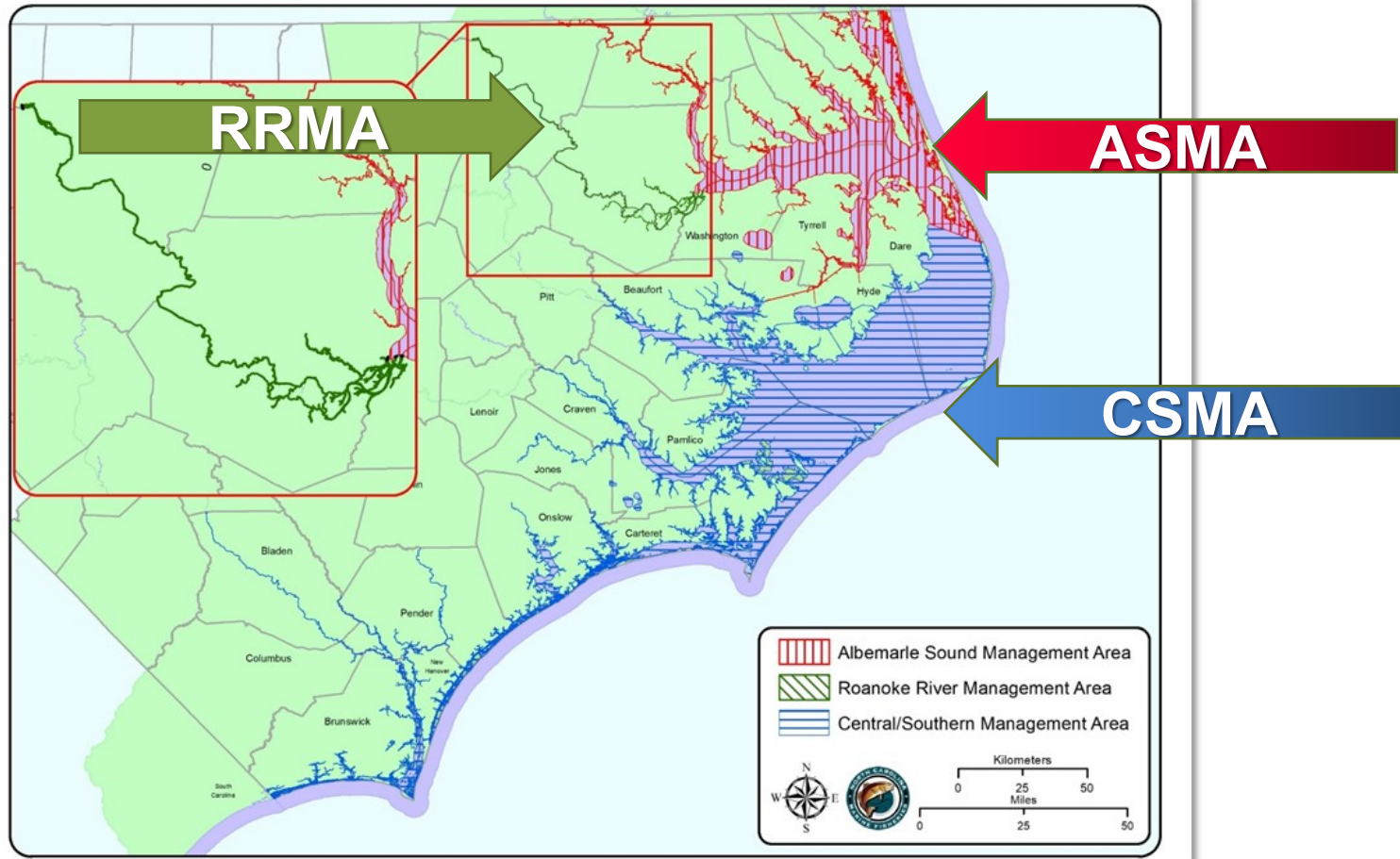
Marine Fisheries

N.C. Marine Fisheries Commission Meeting | Yan Li | November 19-20, 2020

Central Southern Management Area (CSMA)

- Tar-Pamlico River
- Neuse River
- Cape Fear River

Department of Environmental Quality

Evaluation of the CSMA Striped Bass Stocks

- A collaborative effort between the Division and Wildlife Resources Commission (WRC) staff

- Traditional stock assessment models are not appropriate due to:
  - High hatchery contribution
  - Lack of natural recruitment

- To inform management, the team:
  - Evaluated available data (data collection and empirical information)
  - Evaluated available analyses
  - Provided guidance for future research and management
    - Stock status could not be determined.
    - No biological reference points were generated.

Data Collection

Fishery-dependent data

- Commercial landings (Trip Ticket Program 2004 –2018)

- Commercial fish house sampling (2004-2018)

- Commercial gill-net discards (P466 Onboard Observer Monitoring and P467 Alternative Platform Observer Program, 2013-2018)

- Recreational fishery monitoring (angler creel survey, 2004-2018)

Fishery-independent data

- Juvenile Abundance Survey (Program 100, 2017-2018)

- Independent Gill-Net Survey (Program 915, 2004-2018)

- Cape Fear Tagging Program (2011-2018)

- Electrofishing Survey (WRC, Tar-Pamlico1996-2018; Neuse 1994-2018; Cape Fear 2003-2018)

Department of Environmental Quality

Summary of Analyses

Demographic matrix model (all three rivers)

- Stocks are depressed to an extent that sustainability is unlikely at any level of fishing mortality, given the current model assumptions.

- Survival and fertility of younger fish influenced population growth rate more than older fish.

- Older fish contributed more than younger fish to reproduction due to higher fecundity.

- Simulation of stocking and fishing strategies showed the population would likely benefit from stocking more fish.

Tagging model (Cape Fear River)

- Abundance estimates consistently declined from 2012–2018.

- 2018 abundance was reduced to less than 20% of 2012 abundance, even with a total no-possession provision since 2008.

Summary of Analyses

Generalized linear model analysis of fishery data (Neuse River)

- Both commercial and recreational fisheries related factors such as fishing effort and removal (including harvest and discard) could play an important role in driving the relative annual variation in total mortality.

Per-recruit analysis (Neuse River)

- Spawning potential ratio increased with decreasing fishing mortality and increasing minimum size limit.

Age comparison (all three rivers)

- Age determination using otoliths outperformed scales.

Department of Environmental Quality

Research Recommendations

High priority:

- Collect life history information: maturity, fecundity, size and weight at age, egg and larval survival

- Conduct delayed mortality studies for recreational and commercial gear; understand relationships between mortality and salinity, dissolved oxygen, and water temperature

- Develop better estimates of life-history parameters, especially growth; better understand factors influencing natural mortality for all life stages

Medium Priority:

- Determine factors affecting survival of stocked fish

- Implement a random component to Program 100 juvenile sampling

- Conduct a power analysis to determine minimum sample sizes for the representative age structure

Department of Environmental Quality

Next Steps

- Results will inform development of Amendment 2.
- There is no action for the MFC today.

Questions?