12.0 RECOMMENDED MANAGEMENT PROGRAM AND RESEARCH NEEDS

12.1 GOALS AND OBJECTIVES

The goals of Amendment 1 to the North Carolina Estuarine Striped Bass FMP are to achieve sustainable harvest through science based decision-making processes that conserve adequate spawning stock, provide and maintain a broad age structure, and protect the integrity of critical habitats. The plan will consider biological, social, and economic factors in management of the fisheries. The plan will be adaptive, involving regular reviews and responding to new information regarding any aspect of the plan.

To achieve these goals, the following objectives must be met:

1. Identify and describe population attributes, including age structure, necessary to achieve sustainable harvest.
2. Restore, improve, and protect striped bass habitat and environmental quality consistent with the Coastal Habitat Protection Plan (CHPP) to increase growth, survival and reproduction.
3. Manage the fishery in a manner that considers biological, social, and economic factors.
4. Initiate, enhance, and/or continue programs to collect and analyze biological, social, economic, fishery, habitat, and environmental data needed to effectively monitor and manage the fishery.
5. Initiate, enhance, and/or continue information and education programs to elevate public awareness of the causes and nature of issues in the striped bass stocks, habitat, and fisheries, and explain management programs.
6. Develop management measures, including regulations that consider the needs of all user groups and provide sustainable harvest.
7. Promote practices that minimize bycatch and discard mortality in recreational and commercial fisheries.

The following striped bass management issues and recommendations were developed through the FMP process, by the NCDMF and NCWRC through cooperation with the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), and with advice solicited from the A/R and CSMA Advisory Committees (ACs), the public, the NCMFC's Finfish and Regional ACs, as well as the scientific community. The following list of Issues includes the final Management Recommendation from the NCMFC and NCWRC.

12.2 RECREATIONAL STRIPED BASS HARVEST CLOSURE- OREGON INLET AREA/ATLANTIC OCEAN

MANAGEMENT OPTIONS

1) Status Quo – allow the fishery to continue with catch card survey (May – Oct).

2) Close the Atlantic Ocean to the harvest of striped bass from the time the ASMA recreational season closes in the spring until October 1 of each year.

NCMFC and NCWRC Preferred Management Option:

Status Quo – allow the fishery to continue with catch card survey (May – Oct).

12.3 STRIPED BASS STOCKING IN COASTAL RIVERS

MANAGEMENT OPTIONS

1) Status Quo and research needs – goal of 100,000 Phase II striped bass stocked annually per CSMA system (Tar-Pamlico, Neuse and Cape Fear) with 3,000 stocked fish tagged annually in each system.

2) Further increase the number of fish produced/released - three systems per year, goal of 150,000 Phase II per system.

3) Decrease the number of fish produced/released.

4) Eliminate the stocking programs.

NCMFC and NCWRC Preferred Management Option:

Status quo and research needs– Goal of 100,000 Phase II striped bass stocked annually per CSMA system (Tar-Pamlico, Neuse and Cape Fear) with 3,000 stocked fish tagged annually in each system.

12.4 USE OF SINGLE BARBLESS HOOKS DURING THE STRIPED BASS CLOSED SEASON

MANAGEMENT OPTIONS

1) Status quo – don't require barbless hooks and continue to educate anglers on conservative angling practices for striped bass.

2) Require the use of single barbless hooks state wide during specified timeframe.

3) Require the use of single barbless hooks in specific areas and times where striped bass are known to congregate and when anglers direct effort for striped bass in these locations.

NCMFC and NCWRC Preferred Management Option:

Status quo – don't require barbless hooks and continue to educate anglers on ethical angling practices, with additional recommendation to include mortality statistics associated with various handling techniques when possible.

12.5 STRIPED BASS MANAGEMENT AREA - ALBEMARLE SOUND MANAGEMENT AREA SOUTHERN BOUNDARY LINE ADJUSTMENT

MANAGEMENT OPTIONS

1) Status Quo – do not change the boundary point.

2) Make the necessary rule changes to create a new boundary point.

NCMFC and NCWRC Preferred Management Option:

Support the necessary rule changes to create a new boundary point.

12.6 CASHIE RIVER – CHANGE IN JOINT AND COASTAL WATERS BOUNDARY LINE

MANAGEMENT OPTIONS

1) Status Quo – do not change the boundary point.

2) Make the necessary rule changes to create a new boundary point.

NCMFC and NCWRC Preferred Management Option:

Support the necessary rule change to create a new boundary point.

12.7 DISCARD MORTALITY OF STRIPED BASS FROM COMMERCIAL SET GILL NETS CENTRAL SOUTHERN MANAGEMENT AREA

MANAGEMENT OPTIONS

1) Status Quo – continue the gill net requirement for the tie downs and restricting gill net from within 50 yards of shore by proclamation.

2) Modify DFS or tie-down area.

3) Additional restrictions (attendance, yardage limit).

4) Remove all gear restrictions.

NCMFC and NCWRC Preferred Management Option:

Status Quo – continue the gill net requirement for the tie downs and restricting gill net from within 50 yards of shore by proclamation.

12.8 HOOK AND LINE AS COMMERCIAL GEAR IN ESTUARINE STRIPED BASS FISHERIES

MANAGEMENT OPTIONS

1) Status Quo – do not allow hook and line as commercial gear.

2) Status Quo with adaptive management.

3) Commercial hook and line gear allowed with no bycatch requirements and including adaptive management to account for unforeseen changes in the fishery.

NCMFC and NCWRC Preferred Management Option:

Status Quo – do not allow hook and line as commercial gear with adaptive management.

12.9 CENTRAL SOUTHERN MANAGEMENT AREA STRIPED BASS MANAGEMENT MEASURES

MANAGEMENT OPTIONS

1) Status Quo.

2) Total Allowable Catch (TAC) or Quotas (consider a pay back provision)

3) Season or area closures

4) Trip limits

5) Size restrictions

6) Prohibited take

NCMFC and NCWRC Preferred Management Option:

Status Quo with the addition of instituting a payback provision for the commercial harvest TAC.

Status Quo for CSMA management measures maintain the following:

CSMA Recreational Harvest (Coastal, Joint, and Inland waters)

- Unified season Oct 1 – Apr 30
- 2 fish daily creel limit
- 18 inch TL minimum size limit
- Protective slot (no harvest) 22 – 27 inches TL (joint and inland waters only)
- Harvest moratorium for Cape Fear River and its tributaries

CSMA Commercial Harvest (Coastal and Joint waters)

- TAC of 25,000 lbs and commercial fishery, excluding Pamlico Sound, is not a bycatch fishery
- 18 inch TL minimum size limit
- 10 fish or less trip limit
- Spring season only, anytime between Jan 1 – Apr 30
- Gill net mesh size restrictions and yardage limits
- 18 inch TL minimum size limit
- Discards – maintain existing gill net tie-down and distance from shoreline (DFS) measures implemented by proclamation.
- Harvest moratorium for Cape Fear River and its tributaries

12.10 ALBEMARLE SOUND MANAGEMENT AREA AND ROANOKE RIVER MANAGEMENT AREA STRIPED BASS MANAGEMENT MEASURES

The management measures for the Albemarle Sound and Roanoke River Management Areas were not presented as a formal Issue Paper. The FMP Plan Development Team recommended by consensus continuing with status quo for all current management measures for these two management areas. The following were presented to the Albemarle/Roanoke Advisory Committee as the PDT recommended management measures, which they voted to approve.

Biological Reference Points

- $F_{Target} = 0.25$
- $F_{Threshold} = 0.29$

A/R stock has been managed with a Total Allowable Catch (TAC) since 1990

- Maintain current TAC of 550,000 lbs
- The TAC will continue to be split evenly between commercial and recreational sectors
- ASMA commercial TAC = 275,000 lbs
- ASMA recreational TAC = 137,500 lbs
- RRMA recreational TAC = 137,500 lbs

ASMA Commercial Harvest (TAC = 275,000 lbs)

- 18 inch TL minimum size limit (ASMFC compliance requirement)
- Continue to operate as a bycatch fishery
- Spring season, anytime between Jan 1 – Apr 30
- Fall Season, anytime between Oct 1 – Dec 31
- Daily trip limits for striped bass
- Maintain gill net mesh size and yardage restrictions
- Maintain seasonal and area closures
- Maintain attendance requirements for small mesh nets (mid – May through late November)

ASMA Recreational Harvest (TAC = 137,500 lbs)

- 18 inch TL minimum size limit
- Daily creel limit (can be adjusted as necessary to keep harvest below the TAC)
- Open 7 days a week all season (can be adjusted as necessary to keep harvest below the TAC)
- Spring season, anytime between Jan 1 – Apr 30
- Fall season, anytime between Oct 1 – Dec 31

RRMA Recreational Harvest (TAC = 137,500 lbs)

- 18 inch TL minimum size limit
- Protective slot (no harvest): 22-27 inches TL
- 2 fish daily creel, only one of which can be greater than 27 inches TL
- Harvest season in entire river opens on March 1 and closes on April 30 by rule since 2008
- Single barbless hook regulation from April 1 – June 30 in Inland waters above the US 258 Bridge

Management of TACs for ASMA and RRMA

- Short-term Overages: if the harvest point estimate exceeds the total TAC by 10% in a single year, overage is deducted from the next year and restrictive measures implemented in the responsible fishery (ies)
- Long-term Overages: five-year running average of harvest point estimate exceeds the five-year running average of the total TAC harvest by 2%, the responsible fishery exceeding the harvest limit will be reduced by the amount of the overage for the next five years. Should the target F be exceeded, then restrictive measures will be imposed to reduce F to the target level

NCMFC and NCWRC Preferred Management Option:

Status Quo with current management measures for the ASMA and RRMA.

It should also be noted that under the provisions of this plan Amendment the NCDMF Director and NCWRC Chief of Inland Fisheries will maintain the ability to establish seasons, authorize or restrict fishing methods and gear, limit quantities taken or possessed, and restrict fishing areas as deemed necessary to maintain a sustainable harvest.

12.11 RESEARCH NEEDS AND MANAGEMENT RECOMMENDATIONS FROM THE NC ESTUARINE STRIPED BASS FMP AMENDMENT 1

The Habitat and Water Quality MFC AC voted at their September 12, 2011 meeting to support and implement the following Research and Management Recommendations relative to striped bass from the 2010 Coastal Habitat Protection Plan, as well as the Research and Management Recommendations identified in Section 10, Environmental Status, of the FMP:

Recommendations that should be supported and implemented identified in the 2010 Coastal Habitat Protection Plan:

- There should be continued support and development of SHAs in NC.
- Once the SHAs have been designated there should be continued protection of these areas by the cooperating agencies.
- Work with WRC, DWQ, and others to implement management measures that will enhance water quality in areas used by striped bass.
- Work with American Rivers and other partners to accelerate dam removal in priority areas.
- Agencies should continue to protect NC coastal wetlands through the permit review process. Quantify the density and distribution of striped bass eggs, fry, and juveniles in coastal rivers to estimate potential losses to entrainment and impingement.
- Determine if contaminants are present in striped bass habitats and identify those that are potentially detrimental to various life history stages.
- Evaluate the effects of existing and future water withdrawals on water quality and quantity and fisheries habitat in coastal watersheds.

Recommendations that should be supported and implemented identified in Section 10, Environmental Status, of the NC Estuarine Striped Bass FMP Amendment 1:

- Identify and designate anadromous fish nursery areas and how early juvenile striped bass move and are distributed in NC estuarine waters.
- Identify minimum flow requirements in the Tar/Pamlico, Neuse, and Cape Fear rivers necessary for successful spawning, egg development, and larval transport to nursery grounds.
- Evaluate the impacts/effects of reverse osmosis plants on receiving waters and aquatic resources.
- Verify condition of identified SHAs used by striped bass.
- Investigate abundance and spawning contribution of striped bass in the NC and Virginia portions of the Blackwater, Nottoway and Meherrin rivers.
- Investigate striped bass use in the North Carolina portions of the Waccamaw River during the appropriate season.
- Continue to investigate the potential for passage of striped bass above Roanoke Rapids Dam.

- Support fish passage at Buckhorn Dam and Lock and Dam No.2 and No.3 and investigate anadromous fish utilization of the rock ladder at Lock and Dam No. 1.
- Investigate the feasibility of fish passage at and improved water flows from Rocky Mount Mill Dam and Tar River Reservoir Dam.
- Support the removal of Milburnie Dam in Raleigh.
- Support fish passage above the Yadkin chain of dams in North Carolina.
- 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.
- Identify effective engineering solutions to prevent entrainment and impingement of striped bass eggs, fry, and juveniles.
- NCDMF and NCWRC should work with DWQ and other agencies to determine and establish more stringent water quality standards in Anadromous Fish Spawning Areas.

Other research needs:

Atlantic Ocean Summer Recreational Closure

- Methodology tested to accurately capture Atlantic Ocean striped bass harvest during summer months (May-October)

Striped Bass Stocking In Coastal Rivers

- Increase surveys of stocked systems to determine percent contribution of wild versus stocked fish
- Determine if fish produced from system-specific parentage will increase stocking contribution to spawning populations
- Determine factors impacting survivability of stocked fish in each system

Discard Mortality of Striped Bass From Commercial Set Gill Nets In The CSMA

- More at-sea observations made for the gill net fishery to more accurately assess the discards from this fishery
- Explore improvements to NCDMF programs (Trip Ticket, Fish House sampling, fisherman surveys or logbooks) in order to acquire spatially and temporally accurate gill net gear parameters (e.g. yardage, mesh)
- Investigate the impacts of delayed mortality on striped bass captured in gill nets

North Carolina Coastal Stocks

- Clarify relationships between salinity, DO, temperature and catch and release mortality rates in the ASMA and CSMA
- Year round creel survey in the ASMA
- Expand tagging programs to include high reward tagging
- Conduct new analysis of relationship between JAI in Albemarle Sound and flows in Roanoke River
- More at-sea observations of the gill net fishery to accurately assess discards
- Investigate impacts of delayed mortality on striped bass captured in gill nets.

Research Needs By Section:

Section 6 Status of The Stocks

Research Recommendations from the CSMA stock assessment (2010) (H- High priority, M- Medium priority, and L- Low priority).
Life History

- Determine system of origin of fish on the spawning grounds (H).
- Acquire life history information: maturity, fecundity, size and weight at age, egg and larval survival (short term research projects) (H).
- Conduct a mark-recapture study utilizing conventional tags and telemetry approaches (expanded program) (H).
- Determine if suitable striped bass spawning conditions exist in the Tar/Pamlico, Neuse, and Cape Fear rivers (M).
- Conduct egg abundance and egg viability studies (M).
- Determine contribution of stocked fish to spawning stock (M).
- Determine extent of spawning grounds (L).

Fishery Dependent Surveys - Recreational and Commercial

- Improve discard estimates and discard biological characteristics from commercial fisheries (trip level observer coverage) (M).
- Obtain biological characteristics such as length, weight, age, and sex of recreational harvest (expanded creel surveys) (M).
- Obtain biological characteristics such as length, weight, age, and sex of commercial harvest (increased sampling, age structure collection) (M).
- Improve discard estimates and discard biological characteristics from recreational fisheries (creel survey) (L).
- Conduct delayed mortality studies for recreational and commercial gear (short term research projects) (L).

Fisheries Independent Surveys

- Conduct independent surveys that adequately capture all life stages of striped bass (H).
- Continue tagging striped bass in order to evaluate the possible contribution to the Atlantic Migratory stock and provide data to be used in stock assessment efforts. Develop means to better assess the tag recapture and reporting rate for use in tag-based stock assessments (H).
- Conduct a short term study to determine vulnerability-at-length for survey gears (L).

Section 8 Protected Species

Request funding for state observer program:

- Provides data on interactions, fisheries characterizations, and discard information
- Allows for continued proactive management
- Expensive
- Could be difficult to achieve adequate observer coverage coast wide

Apply for ITP for impacted fisheries:

- Provides a legal means of having interactions
- Provides data on protected species and fisheries characterization
- Allows for continued proactive management
- Expensive
- Could be difficult to achieve adequate observer coverage coast wide

Continue gear development research to minimize species interactions:

- Allows fisheries to continue
- Potentially increased survival of protected species
- Potentially reduces interactions
- Potential for fisheries to close due to protected species interactions while gear is being developed

Implementation of outreach programs to inform state agencies, the public, and the commercial and recreational fishing industries about issues relating to protected species and fishery management:

- Well informed public may be able to reduce interactions
- Proactive way to address the issues
- Additional staff time to develop outreach materials