# Issues/Reports

INFORMATION WILL BE PROVIDED AT THE MEETING.

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

**MEMORANDUM**

TO: N.C. Marine Fisheries Commission

FROM: Lee Paramore
Division of Marine Fisheries, NCDENR

DATE: Aug. 6, 2014

SUBJECT: 2014 Stock Status Report

Attached is the N.C. Division of Marine Fisheries 2014 Stock Status Report. This annual report is intended to serve as an overview of the overall health of North Carolina's fisheries resources. The information contained in the stock status report is used to prioritize development of fishery management plans and subsequent plan amendments. Only one stock had a change in status this year, which was Albemarle/Roanoke striped bass. The status of other species remained the same.

Albemarle/Roanoke striped bass changed from "viable" to "concern". Based on the 2010 N.C. Division of Marine Fisheries Albemarle/Roanoke Striped Bass Stock Assessment, the stock is not experiencing overfishing and is producing a sustainable harvest. Striped bass experienced a period of unusually high recruitment from 1994-2001, followed by a period of lower recruitment that attributed to the continued decline in both commercial and recreational landings. A draft of the 2014 N.C. Division of Marine Fisheries' Albemarle/Roanoke Stock Assessment is scheduled to be reviewed at the August commission meeting. Recent trends in landings and survey data have prompted the status change to "concern." Proposed changes in management strategy are likely to be considered for the 2015 season.

"Viable" stocks include bluefish, shrimp and southern flounder. Red drum remains in the "recovering" category with an Atlantic States Marine Fisheries stock assessment to be completed by the end of 2015. Spotted seatrout and southern flounder remain in the "depleted" category and Division of Marine Fisheries stock assessments are scheduled to be completed early 2015 for both species.

# Stock Status Report 2014

| Species and Stock | Status | | | | | |
|---|---|---|---|---|---|---|
| | Viable | Recovering | Concern | Depleted | Unknown | Comments |
| **Bass, Black Sea** | | | | | | |
| North of Hatteras | |  | | | | The 2011 benchmark stock assessment by the National Marine Fisheries Service's Northeast Fisheries Science Center was not accepted by reviewers for use in determining stock status or management . A 2012 stock assessment update used a different model technique and is being used, along with a constant catch approach for determining management. Research is currently underway to resolve uncertainty identified in previous stock assessments in preparation for a new assessment in 2016. However, there are no clear signs that the stock is overfished and it is considered to be recovering. |
| South of Hatteras |  | | | | | The stock is recovered after going through a federally managed rebuilding plan, which went into place in 2006. An updated stock assessment indicated the stock is not overfished and has met the rebuilding plan's target. |
| **Bass, Striped** | | | | | | |
| Albemarle Sound and Roanoke River | | |  | | | The 2010 Albemarle/Roanoke striped bass stock assessment (data through 2008) indicates the resource is not experiencing overfishing and is producing a sustainable harvest. Although the stock is not overfished, landings in all sectors have steadily declined from the peak harvest in 2004. Striped bass experienced a period of unusually strong recruitment (number of age-1 fish entering the population) from 1994-2001, followed by a period of lower recruitment from 2002-2013, thus causing the recent decline in landings. A draft 2014 Albemarle/Roanoke striped bass stock assessment that incorporates data through 2012 is scheduled to be approved in August 2014. Reductions in harvest limits will likely be necessary based on this stock assessment. |
| Atlantic Ocean Migratory Stock |  | | | | | The 2013 Atlantic striped bass benchmark assessment indicates the resource is not overfished or experiencing overfishing relative to the proposed new reference points. Although the stock is not overfished, female spawning stock biomass has continued to decline since 2004, and total fishing mortality has risen. A draft addendum to the Atlantic Migratory fishery management plan is expected in August for public comment on potential harvest reductions. |
| Central/Southern | | |  | | | The lack of adequate data causes the Central Southern Management Area stocks to be quantitatively assessed as unknown and to be listed as "concern." The need for continued conservation management efforts are supported by the truncated size and age distributions, low overall abundance, and the absence of older fish in the spawning ground surveys. Amendment I to the N.C. Estuarine Striped Bass Fishery Management Plan was approved by the Marine Fisheries Commission in February 2013. |

| Species and Stock | Status | | | | | |
|---|---|---|---|---|---|---|
| | Viable | Recovering | Concern | Depleted | Unknown | Comments |
| **Bluefish** |  | | | | | The Atlantic stock of bluefish is not overfished and is not experiencing overfishing. The Atlantic States Marine Fisheries Commission Bluefish Technical Committee continues to work on improving and refining bluefish age data and the bluefish stock assessment. A benchmark stock assessment is scheduled for 2014. |
| **Croaker, Atlantic** | | |  | | | Atlantic croaker is not experiencing overfishing. Estimates of spawning stock biomass were too uncertain to precisely determine overfished stock status. However, given that biomass has been increasing and the age structure of the population has been expanding since the late 1980s, it is unlikely the stock is in trouble. |
| **Dolphin** |  | | | | | The South Atlantic Fishery Management Council's Dolphin Wahoo Fishery Management Plan was approved in 2004. The South Atlantic Fishery Management Council has approved Amendment 5 to the plan. The Amendment will revise acceptable biological catches, annual catch limits, sector allocations, accountability measures, and annual catch targets implemented through the Comprehensive Annual Catch Limit Amendment. A new stock assessment is scheduled for 2016. |
| **Drum, Black** | | | | |  | Concern for the stock has been expressed because fishing effort has increased on the stock since the 1980s and a majority of black drum harvested is young, potentially juvenile fish. It is unknown if the stock is overfished. The Atlantic States Marine Fisheries Commission has developed an Interstate Fishery management Plan and a coastwide stock assessment is to be completed in 2014. |
| **Drum, Red** | |  | | | | Overfishing is not occurring. A stock assessment completed in 2009 by the Atlantic States Marine Fisheries Commission indicates that the population is above the overfishing threshold and likely above or very near the management target. |
| **Eel, American** | | | |  | | The stock was declared depleted by the 2012 Atlantic States Marine Fisheries Commission benchmark stock assessment. Stock status is poorly understood due to non– standard sampling protocols across the species' range. Reliable indexes of abundance of this species are scarce. The Atlantic States Marine Fisheries Commission is currently considering management options for Addendum IV to the American Eel Interjurisdictional Fishery Management Plan. |
| **Flounder, Southern** | | | |  | | Based on the N.C. Division of Marine Fisheries 2009 stock assessment, the southern flounder stock is overfished and overfishing is occurring. The Southern Flounder Fishery Management Plan Amendment 1 was approved in February 2013 and a new stock assessment is scheduled to be completed February 2015. |
| **Flounder, Summer** |  | | | | | The 2013 National Marine Fisheries Service's Northeast Fisheries Science Center stock assessment indicated the stock was not overfished and overfishing did not occur in 2012. The stock was rebuilt in 2010 and is considered to be viable. |
| **Grouper, Gag** | | |  | | | The stock is not overfished but overfishing is occurring, according to a 2014 stock assessment. A federal management plan is restricting harvest to end overfishing. |

| Species and Stock | Status | | | | | |
|---|---|---|---|---|---|---|
| | Viable | Recovering | Concern | Depleted | Unknown | Comments |
| **Herring, River** (A) | | | | | | |
| Albemarle Sound | | | |  | | The N.C. Marine Fisheries Commission implemented a no harvest provision for commercial and recreational fisheries in joint and coastal waters of the state, beginning with the 2007 season. Current research is being conducted by the N.C. Division of Marine Fisheries in the Albemarle Sound area to re-evaluate spawning habitat, expand juvenile sampling, and monitor the Chowan River adult spawning stock. Development of Amendment 2 to the N.C. River Herring Fishery Management Plan has begun, and changes are predicted to take effect in 2015. |
| Other Areas | | | | |  | No current sampling program. |
| **Kingfishes (A)** | | | | |  | A state fishery management plan completed in 2007 indicated a healthy age structure in the stock along with increasing trends in juvenile abundance, but commercial landings dropped in 2013. |
| **Mackerel, King** | | |  | | | Based on the 2008 South Atlantic Fishery Management Council stock assessment, the South Atlantic king mackerel stock is not overfished. It is uncertain whether overfishing is occurring. A new assessment is scheduled to be completed in the fall of 2014. |
| **Mackerel, Spanish** |  | | | | | Based on the 2012 South Atlantic Fishery Management Council stock assessment, the Spanish mackerel stock in the South Atlantic is not overfished and is not undergoing overfishing. |
| **Menhaden, Atlantic** | | |  | | | Based on the 2010 benchmark stock assessment, Atlantic menhaden are experiencing overfishing. It is unknown whether the stock is overfished. The Atlantic States Marine Fisheries Commission Atlantic Menhaden Board approved Amendment 2 to the fishery management plan in December 2012. A new Atlantic States Marine Fisheries Commission benchmark stock assessment is under development. |
| **Monkfish** | |  | | | | The Northeast Fisheries Science Center conducted a monkfish operational stock assessment in 2013 to update the 2010 assessment with additional data from 2010 and 2011. Results from the operational stock assessment indicate that the North and South monkfish stocks are not overfished and overfishing is not occurring. A review panel has recommended a new benchmark assessment not proceed until new information on age, growth, longevity and natural mortality is obtained. |
| **Mullet, Striped** |  | | | | | The stock is not overfished. Landings for 2013 were within management threshold limits established in the 2006 fishery management plan. Historically, the commercial fishery has had sustained landings similar to current levels. |
| **Reef Fish (B)** | | |  | | | Of the 60 species in the South Atlantic Fishery Manage Council unit, some stocks are sustainable but several stocks are considered overfished. The overfished stocks include snowy grouper, speckled hind, red porgy, red snapper, red grouper and Warsaw grouper. |
| **Seatrout, Spotted** | | | |  | | The 2009 N.C. Spotted Seatrout Stock Assessment indicated that the stock in North Carolina and Virginia has been overfished and overfishing has been occurring throughout the entire 18-year time series. A new stock assessment is underway and should be peer reviewed by the beginning of 2015. |

| Species and Stock | Status | | | | | |
|---|---|---|---|---|---|---|
| | Viable | Recovering | Concern | Depleted | Unknown | Comments |
| **Scup** |  | | | | | The 2012 stock assessment update completed by the National Marine Fisheries Service's Northeast Fisheries Science Center indicated the stock was not overfished and overfishing was not occurring in 2011. Recruitment was poor in 2009 and 2010 but the 2011 year class was above average. |
| **Shad, American** | | |  | | | Commercial landings increased in 2013, and were above the 10-year average. The 2007 Atlantic States Marine Fisheries Commission coastwide stock assessment concluded that the Albemarle Sound area stocks were stable, but well below historical levels and the stock status of the other systems in North Carolina were unknown. The assessment also indicated that the majority of stocks along the East Coast are at all-time lows and continue to decline despite current management efforts. In 2013, North Carolina adopted an American Shad Sustainable Fishery Plan to meet Atlantic States Marine Fisheries Commission requirements. |
| **Shad, Hickory** | | | | |  | Commercial landings increased in 2013 and the price per pound is above the 10-year average. Two Amendments to the Shad and River Herring Fishery Management Plan recently approved by the Atlantic States Marine Fisheries Commission do not directly address hickory shad. The N.C. Division of Marine Fisheries has not conducted any directed sampling since 1993. |
| **Sharks** | | |  | | | In North Carolina coastal fishing waters, sharks are included in the Atlantic States Marine Fisheries Commission Interstate Fishery Management Plan for Coastal Sharks implemented in August 2008. The Atlantic States Marine Fisheries Commission plan was implemented to compliment the National Marine Fisheries Service Consolidated Atlantic Highly Migratory Species Fishery Management Plan that includes sharks in federal waters. Recent assessment results indicate great uncertainty about the various shark species. The current status is concern because of the overfished status of sandbar, dusky, blacknose, and porbeagle sharks. |
| **Sheepshead** | | | | |  | The division gained proclamation authority to manage sheepshead in 2013. The recreational and commercial landings were above their 10-year averages in 2013. |
| **Spiny Dogfish** |  | | | | | Spiny dogfish are currently managed under a joint Mid-Atlantic Fishery Management Council and New England Fishery Management Council fishery management plan in federal waters and under the Atlantic States Marine Fisheries Commission Spiny Dogfish Interstate Fishery Management Plan in state waters. The 2013 stock assessment update, conducted by the Northeast Fisheries Science Center, estimates spiny dogfish are not overfished and not experiencing overfishing. Spawning stock biomass has exceeded the target for the past six years and fishing mortality is below the plan's threshold. |
| **Spot** | | |  | | | Recreational and commercial landings increased in 2013 from historical lows in 2012. The juvenile abundance index increased in 2013. In 2011, the Atlantic States Marine Fisheries Commission approved the Omnibus Amendment for spot. Coupled with adaptive management measures, the Omnibus Amendment provides options to efficiently implement management measures should they be needed in the future. |

| Species and Stock | Status | | | | | |
|---|---|---|---|---|---|---|
| | Viable | Recovering | Concern | Depleted | Unknown | Comments |
| **Sturgeon, Atlantic** | | | |  | | The Atlantic States Marine Fisheries Commission is responsible for managing this species and considers the stocks to be depleted along the Atlantic Coast. There is a coastwide prohibition on possession. On April 5, 2012, the National Marine Fisheries Commission listed the Carolina Distinct Population Segment of Atlantic sturgeon as a federally endangered species. A new stock assessment is underway with plans to have peer reviews completed during 2015. |
| **Weakfish** (Gray Trout) | | | |  | | The weakfish stock along the Atlantic coast is at a level of low abundance. Coast- wide landings are near the lowest levels on record. The most recent assessment indicates that the cause is likely due to factors other than fishing mortality. The Atlantic States Marine Fisheries Commission has set strict harvest limits in response to the decline in an effort to aid in stock recovery. |
| **Shellfish and Crustaceans** | | | | | | |
| **Clam, Hard** | | | | |  | Based on the best available indicators, harvest levels in most areas appeared relatively constant in recent years. Amendment 1 of the fishery management plan was completed in 2008. Data limitations prevent conducting a hard clam stock assessment and calculating sustainable harvest. Amendment 2 of the fishery management plan is under development. |
| **Crab, Blue** | | |  | | | The stock status is “concern” due to continued decreases in landings. 2013 landings were more than 5,000 pounds lower than the 10-year average of 22,000 pounds; however, value for blue crab – hard, soft and peelers – increased. The Traffic Light Assessment for 2012 suggests that the N.C. blue crab stock is not overfished. This assessment will be updated in 2014. |
| **Oyster, Eastern** | | |  | | | Based on the best available indicators, harvest levels in most areas appeared relatively constant in recent years. Amendment 1 of the FMP was completed in 2008. Data limitations prevent DMF from conducting a hard clam stock assessment and calculating sustainable harvest. |
| **Scallop, Bay** | | |  | | | High natural mortality from environmental change and predation cause annual variability in abundance. Sampling showed low abundance in all areas except Bogue Sound in 2013. The main harvest season (late January to March) was not opened in 2014 in any region due to abundance levels not meeting the threshold to allow harvest. |
| **Shrimp(C)** |  | | | | | Annual shrimp stock status is determined mainly by environmental and recruitment conditions. Natural mortality far outweighs fishing mortality. Final approval of the Shrimp Fishery Management Plan Amendment 1 is scheduled for February 2015. |
| **Totals** | **10** | **4** | **14** | **5** | **7** | |

**(A)** Catfishes includes 5 species, Kingfishes (Sea Mullet) includes 3 species, and there are two species of river herring.
**(B)**The reef fish group includes about 60 species, while there are more than 40 species of sharks. Within these groups, individual species range from Viable to Overfished. The status indicated is for the group as a whole.
**(C)**Shrimp consists of 3 species — brown, pink, and white.

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Pat McCrory, Governor

John E. Skvarla, III, Secretary

N.C. Department of Environment and Natural Resources

Release: Immediate
Date: July 1, 2014

Contact: Patricia Smith
Phone: 252-726-7021

**Albemarle/Roanoke striped bass stock moved to "concern" in stock status report**

**MOREHEAD CITY –** The N.C. Division of Marine Fisheries' 2014 Stock Status Report reclassifies the Albemarle/Roanoke striped bass stock from "viable" to "concern," due to biological factors associated with a declining population.

The division annually grades the status of important marine finfish, shellfish, shrimp and crabs as viable, recovering, concern, depleted or unknown. The grades serve as a barometer of the overall health of the state's fishery resources, and they are used to prioritize development of fishery management plans.

While a 2010 stock assessment concludes the stock is not overfished, several population trends have prompted concern about the status of striped bass fishery. Since 2002, the number of young fish entering the population has declined, causing a steady decrease in landings from the peak harvest in 2004. A new Albemarle/Roanoke striped bass stock assessment is scheduled to be approved in August, and reductions in harvest limits likely will be necessary.

Striped bass in North Carolina are managed by the N.C. Marine Fisheries Commission and the N.C. Wildlife Resources Commission, and data collected by both agencies are used to assess the status of the stocks. Amendment 1 to the N.C. Estuarine Striped Bass Fishery Management Plan was approved by both commissions in 2013.

Stocks exhibiting declining landings may be classified as "concern" even if they have an approved stock assessment and fishery management plan, as is the case with the Albemarle/Roanoke striped bass stock.

The stock status of all other species remained the same as the 2013 report.

Bluefish, shrimp and summer flounder stocks remained in the "viable" category. A stock is considered "viable" when it exhibits stable or increasing trends in a number of biological factors associated with healthy fish populations.

Spotted seatrout and southern flounder were still in the "depleted" category and are awaiting the completion of state stock assessments that are underway now. A "depleted" stock is one where the population of spawning females or the entire population is too low. Factors that can contribute to this status include overfishing, poor water quality, habitat loss, larvae survival and disease.

Red drum stocks remained in the "recovering" category, and oyster and blue crab stocks remained in the "concern" category. A "recovering" stock shows marked and consistent improvement in the criteria listed for a "viable" stock, but has not yet reached its target.
Full definitions for the stock status grades can be found at: http://portal.ncdenr.org/web/mf/stock-status-categories-and-definitions.

The complete 2014 Stock Status Report can be found at the Division of Marine Fisheries' website at: http://portal.ncdenr.org/web/mf/stock-status-reports.

For more information on the 2014 Stock Status Report, contact Lee Paramore at 252-473-5834, ext. 222 or Lee.Paramore@ncdenr.gov.

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North Carolina Department of Environment and Natural Resources

Pat McCrory
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**MEMORANDUM**

TO: Marine Fisheries Commission

FROM: Jason Rock
Division of Marine Fisheries, NCDENR

DATE: Aug. 21, 2014

SUBJECT: Blue Crab Traffic Light Stock Assessment Update

Amendment 2 to the N.C. Blue Crab Fishery Management Plan adopted by the Marine Fisheries Commission in November 2013 incorporated the use of the traffic light stock assessment method and adaptive management measures for management of the blue crab stock. The current plan requires annual updates to the Blue Crab Traffic Light Stock Assessment be presented to the Marine Fisheries Commission as part of the Division of Marine Fisheries' annual Stock Status Report.

The assessment update is divided into three separate characteristics: 1) adult abundance, 2) recruit abundance, and 3) production. Each characteristic uses data from several division biological surveys and sampling programs to determine the relative abundance of adult and recruit blue crabs in the population and various production indictors for the stock each year. Under the plan, regulations will be implemented in the blue crab fishery if certain biological triggers are met for three consecutive years. The three-year period was chosen to prevent taking management action as a result of annual variability in the blue crab stock and instead have any management response based on the observation of a short but continued declining trend in the population. To trigger management actions, either the adult abundance or production characteristic of the assessment must be above the 50 percent red threshold for three consecutive years to trigger the moderate management actions and must be above the 75 percent red threshold for three consecutive years to trigger the elevated management actions established in the plan (Table 1). The recruit abundance indicator, while not used to trigger initial management action, may be used to supplement any management actions taken if a trigger is activated.

Results of the initial 2010 assessment showed the blue crab stock in North Carolina is not overfished and is producing a sustainable harvest; however, it is unknown if overfishing is occurring. The assessment was updated with data through 2012 prior to the commission's adoption of Amendment 2 and showed the stock status had not changed and no triggers had been activated.

The assessment has been updated with 2013 data for stock status determination (Figure 1). The current assessment update indicates that both the adult and production characteristics exceeded the moderate threshold of 50 percent red for 2013 (adult=70 percent red, production=50 percent red). This serves as the first of the three consecutive years above the 50 percent red threshold, for both the adult and production characteristics, that is required before management action must be taken.

The blue crab stock status is currently listed as "Concern" due to a decline in landings and reduced abundance of adult and young crabs in the population.


Figure 1. Adult abundance, recruit abundance, and production characteristics for the 2014 Blue Crab Traffic Light update. *Amendment 2 was formally adopted in 2013 and is the first year eligible to count toward the three consecutive years needed to activate a management trigger.

Table 1. Moderate and Elevated management responses under the adaptive management framework for the Blue Crab Traffic Light in the Blue Crab Fishery Management Plan Amendment 2.

| Characteristic | Moderate management level | Elevated management level |
|---|---|---|
| Adult abundance | A1. Increase in minimum size limit for male and immature female crabs | A4. Closure of the fishery (season and/or gear) |
| | A2. Reduction in tolerance of sub-legal size blue crabs (to a minimum of 5%) and/or implement gear modifications to reduce sublegal catch | A5. Reduction in tolerance of sub-legal size blue crabs (to a minimum of 1%) and/or implement gear modifications to reduce sublegal catch |
| | A3. Eliminate harvest of v-apron immature hard crab females | A6. Time restrictions |
| Recruit abundance | R1. Establish a seasonal size limit on peeler crabs | R4. Prohibit harvest of sponge crabs (all) and/or require sponge crab excluders in pots in specific areas |
| | R2. Restrict trip level harvest of sponge crabs (tolerance, quantity, sponge color) | R5. Expand existing and/or designate new crab spawning sanctuaries |
| | R3. Close the crab spawning sanctuaries from September 1 to February 28 and may impose further restrictions | R6. Closure of the fishery (season and/or gear) |
| | | R7. Gear modifications in the crab trawl fishery |
| Production | P1. Restrict trip level harvest of sponge crabs (tolerance, quantity, sponge color) | P4. Prohibit harvest of sponge crabs (all) and/or require sponge crab excluders in pots for specific areas |
| | P2. Minimum and/or maximum size limit for mature female crabs | P5. Reduce peeler harvest (no white line peelers and/or peeler size limit) |
| | P3. Close the crab spawning sanctuaries from September 1 to February 28 and may impose further restrictions | P6. Expand existing and/or designate new crab spawning sanctuaries |
| | | P7. Closure of the fishery (season and/or gear) |

# N.C. FISHERY MANAGEMENT PLANS

August 2014

- Administrative steps for the Kingfishes plan review are underway.

**Annual Fishery Management Plan Update**
**N.C. Marine Fisheries Commission Meeting**
**August 21, 2014**

## Authority and Process

The Fisheries Reform Act of 1997 and its 1998, 2001 and 2004 amendments established the requirement to create fishery management plans for all of North Carolina's commercially and recreationally significant species or fisheries. The contents of the plans are specified, advisory committees are required and reviews by the Department of Environment and Natural Resources secretary and the Joint Legislative Commission on Governmental Operations are mandated.

The original 1997 legislation mandated the Blue Crab Fishery Management Plan be completed first and the Marine Fisheries Commission used the Division of Marine Fisheries' annual stock status review to prioritize the order of species that would be addressed in subsequent plans. All initial fishery management plans identified on the priority list have been developed. Fishery management plans normally take about two years to complete and are required to be reviewed at least once every five years. Upon review, amendment of a plan is required when changes to management strategies are necessary. A revision of a plan, which includes changes in factual and background data only, is completed if there are no management changes. The division and the Marine Fisheries Commission adopted an annual rule cycle in 2009 to coincide with rulebook production, increase efficiency in rule making processes and consolidate efforts in the development of fishery management plans and the associated implementing rules.

The division formed a fishery management plan process committee in 2010 that audited the current plan guidelines, procedures, internal processes, and capabilities to determine how to improve and streamline the entire process. Results of that analysis have been completed and continue to be implemented and refined to maximize efficiencies in the process.

## Status of State Fishery Management Plans

Eight of 13 state plans are currently underway. These are a revision to the Interjurisdictional Fishery Management Plan and amendments to the Shrimp, Bay Scallop, River Herring, Striped Mullet, Hard Clam, and Oyster fishery management plans. Review of the Kingfishes Fishery Management Plan has also begun. A table indicating the schedule for the plan reviews is included at the end of the report.

The draft **Interjurisdictional Fishery Management Plan Revision 1** is underway. No change in management strategies is necessary, so the plan is being revised with the most current factual and background data.

The **Shrimp Fishery Management Plan Amendment 1, Bay Scallop Fishery Management Plan Amendment 2, and Division of Marine Fisheries-Wildlife Resources Commission Joint River Herring Fishery Management Plan Amendment 2** are complete. The plans were sent to the Department of Environment and Natural Resources and the Joint Legislative Commission on Governmental Operations for review in March 2014; there were no comments. The proposed implementing rules are scheduled to be presented to the Marine Fisheries Commission at its August 2014 meeting for approval to begin the rulemaking process. Public hearings on the proposed rules are scheduled for the fall.

The **Striped Mullet Fishery Management Plan Amendment 1** began in October 2013. The division, with the assistance of an advisory committee, has developed the amendment. The draft amendment is scheduled to be presented to the Marine Fisheries Commission at its August 2014 meeting for approval to send the plan to public meetings for comment.

The **Hard Clam Fishery Management Plan Amendment 2** and the **Oyster Fishery Management Plan Amendment 4** are also underway. The 2010 supplement to the oyster plan must be addressed in this review as well as any additional management issues for both plans.

Review of the **Kingfishes Fishery Management Plan** has begun. The division is examining the existing plan and it's supporting data and associated studies to determine if changes in management strategies are necessary.

The Marine Fisheries Commission gave final approval of the **Spotted Seatrout Fishery Management Plan** in February 2012. In accordance with G.S. 113-182.1, the plan contains management measures to end overfishing within two years of final adoption of the plan. At the time of plan adoption the fishery was not producing a sustainable harvest. As a result, the Marine Fisheries Commission requested a review of the plan three years after adoption, instead of the usual five. This is reflected in the fishery management plan schedule.

The **Red Drum Fishery Management Plan** review is currently scheduled to begin in July 2015. The red drum stock assessment by the National Oceanic and Atmospheric Administration's Southeast Data, Assessment and Review is scheduled for completion in November 2015. Upon completion of the stock assessment, the division will undertake a review of the plan.

The five-year reviews of the **Southern Flounder** and **Division of Marine Fisheries-Wildlife Resources Commission Joint Estuarine Striped Bass** fishery management plans are scheduled to begin in 2018. The Marine Fisheries Commission gave its final approval of the **Blue Crab Fishery Management Plan Amendment 2** in November 2013 and the implementing rules became effective April 1, 2014. The next review of the blue crab plan is scheduled to begin in 2019.

| FISHERY MANAGEMENT PLAN REVIEW SCHEDULE (July 2014 – June 2019)<br>Revised August 2014 | | | | | |
|---|---|---|---|---|---|
| SPECIES (Last FMP) | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 |
| INTERJURISDICTIONAL (6/08) | | | | | |
| SHRIMP (4/06) | | | | | |
| RIVER HERRING (9/07) | | | | | |
| BAY SCALLOP (11/07) | | | | | |
| STRIPED MULLET (4/06) | | | | | |
| KINGFISHES (11/07) | | | | | |
| HARD CLAM (6/08) | | | | | |
| OYSTER (6/08) | | | | | |
| SPOTTED SEA TROUT (2/12) | | | | | |
| RED DRUM (11/08) | | | | | |
| SOUTHERN FLOUNDER (2/13) | | | | | |
| ESTUARINE STRIPED BASS (2/13) | | | | | |
| BLUE CRAB (11/13) | | | | | |

| TIMELINE FOR OYSTER FISHERY MANAGEMENT PLAN AMENDMENT 4 AND HARD CLAM FISHERY MANAGEMENT PLAN AMENDMENT 2 (June 2, 2014) | | | |
|---|---|---|---|
| **MILESTONES** | **INTERNAL GUIDELINES** | **TABLES 1&2 STEP** | **PROJECTED COMPLETION DATE** |
| 1. Orient AC and Discuss Issues, Goal and Objectives | III. B. | 9/5 | June 2014 |
| 2. Present Timeline and Goal and Objectives to MFC; Solicit MFC Input on Issues | III. D. | 11/7 | August 2014 |
| 3. Issue News Release to Solicit Public Input on Issues | III. D. | 12-15/8-11 | September 2014 |
| 4. Draft/Revise and Review Informational Sections and Issue Papers in the FMP and Establish DMF/AC Positions | III. D - F | 16-19/12-14 | September 2014-July 2015 |
| 5. Obtain MFC Approval for Review of FMP | III. F. | 20/15 | August 2015 |
| 6. Public and Committee Review of FMP | III. F. | 21-24/16-18 | September-October 2015 |
| 7. Present Revised FMP to MFC for Selection of Preferred Management Options | IV. A. | 25/20 | November 2015 |
| 8. Review of FMP by DENR and JLCGO | IV. A. | 26-29/21-24 | January, February or March 2016 |
| 9. Procedural Approval of FMP; Approval of Notice of Text for Rules by MFC | IV. A. | 30-32/25-27 | May 2016 |
| 10. Direct Rules through APA Process | IV. B. | 33/28 | August-October 2016 |
| 11. Final FMP and Rule Approval by MFC | IV. C. | 34-35/29-30 | November 2016 |
| 12. Selected Management Measures Effective Date | N/A | N/A | 48 Hours if proclamation; April 1, 2017 if rule |

Initial approval by DMF Director: Signature: _____ Date: 6/2/14

Presented to MFC: Date: _____

Revision approved by DMF Director: Signature: _____ Date: _____

Presented to MFC: Date: _____

Revision(s) and reason(s): _____

July 21, 2014

**Potential Hard Clam and Oyster Fishery Management Plan Issues 2014**

Clam specific:

- Investigate the use of pot haulers to pull rakes
- Management of mechanical clam harvest

Oyster specific:

- Adopt the management provisions of Supplement A into the Oyster FMP or they expire when the revised plan is approved
- Adopt the 10 bushel per operation limit for all hand harvest areas
- Open the areas closed to mechanical harvest in the 2001 Oyster FMP

Shellfish Sanitation

- Relay permit vs. closed season certification form for the same lease

Leases

- Using GPS instead of surveys to define lease boundaries
- Defining adverse impacts to SAV from leases
- Movement of cultured seed shellfish from polluted waters
- Relaying from closed areas and closure of the entire lease
- Combining multiple permits for shellfish aquaculture operations
- Modify shellfish lease provisions i.e.: (lease term, acreage limits, land survey requirements, and production requirements)
- Redefine off bottom culture
- Modify penalties of lease theft
- Core Sound and Brunswick County lease moratoriums
- Sale and resale of shellfish seed

June 16, 2014

# DRAFT OYSTER FMP GOAL AND OBJECTIVES

The goal of the N.C. Oyster FMP is to manage the state's oyster population so that it achieves sustainable harvest and maximizes its role in providing ecological benefits to North Carolina's estuaries. To achieve this goal, it is recommended that the following objectives be met:

1. Identify, restore, and protect oyster populations as important estuarine habitat.
2. Manage and restore oyster populations to levels capable of maintaining sustained production through judicious use of natural oyster resources, enhancement of oyster habitats, and development and improvement of oyster production on shellfish leases and franchises.
3. Minimize the impacts of oyster parasites and other biological stressors through better understanding of oyster disease, better utilization of affected stocks, and use of disease resistant and biological stress resistant oysters.
4. Consider the socioeconomic concerns of all oyster resource user groups, including market factors.
5. Recommend improvements to coastal water quality to reduce bacteriological-based harvest closures and to limit other pollutants to provide a suitable environment for healthy oyster populations.
6. Identify and encourage research to improve understanding of oyster population ecology and dynamics, habitat restoration needs, and oyster aquaculture practices.
7. Identify, develop, and promote efficient oyster harvesting practices that minimize damage to the habitat.
8. Initiate, enhance, and continue studies to collect and analyze economic, social, and fisheries data needed to effectively monitor and manage the oyster resource.
9. Promote public awareness regarding the ecological value of oysters and encourage public involvement in management and enhancement activities.

June 16, 2014 – Approved by Advisory Committee

# DRAFT HARD CLAM GOALS AND OBJECTIVES

The goal of N. C. Hard Clam FMP is to manage hard clam stocks in a manner that achieves sustainable harvest and protects its ecological value. To achieve this goal, it is recommended that the following objectives be met:

1. Protect the hard clam stock from overfishing, while maintaining levels of harvest at sustained production, providing sufficient opportunity for both recreational and commercial hard clamming, and aquaculture.

2. Identify, develop, and promote research to improve the understanding of hard clam biology, ecology, population dynamics, and aquaculture practices.

3. Initiate, enhance, and continue studies to collect and analyze economic, social, and fisheries data needed to effectively monitor and manage the hard clam fishery.

4. Identify, develop and promote efficient hard clam harvesting practices while protecting habitat.

5. Promote the protection, restoration, and enhancement of habitats and water quality so that the production of hard clams is optimized.

6. Consider the socioeconomic concerns of all hard clam resource user groups, including market factors.

7. Promote public awareness regarding the status and management of the North Carolina hard clam stock.

**Overview of the Preliminary NCDMF and Advisory Committee Management and Research Recommendations for the Draft Amendment 1 of the Striped Mullet FMP**

Table 1. Draft Striped Mullet/Finfish Advisory Committee (AC) and NCDMF management recommendations for Amendment 1 of the Striped Mullet Fishery Management Plan, June 17, 2014. Underline indicates differences in recommendations between the NCDMF and AC.

| Issue | AC | NCDMF |
|---|---|---|
| 10.1 Newport River Trawl Nets Prohibited Area small mesh gill net attendance and the existence of a Special Secondary Nursery Area within a Trawls Nets Prohibited Area | Same as NCDMF | The PDT recommends removing the Newport River Trawl Nets Prohibited Area [Rule 15A NCAC 03R .0106 (7)] from Marine Fisheries Rule 03R .0112 (b) (1), but leave it subject to 03R .0112 (b) (5), which requires attendance from May 1 through September 30. This would bring current regulations in line with enforcement actions for this area and remove the unintended consequences of the Trawl Nets Prohibited Area designation on the striped mullet and other small mesh gill net fisheries. |
| | Same as NCDMF | The removal of the Special Secondary Nursery Area designation for waters contained in the Trawls Nets Prohibited Area in the Newport River should be examined further as part of the proposed Shrimp Fishery Management Plan Amendment 1 review of Special Secondary Nursery Areas by the Habitat and Water Quality Advisory Committee. |
| 10.2 User Conflicts in Striped Mullet Runaround Gill Net Fishery | Status Quo (handle conflicts on a case-by-case basis using the mediation process if necessary) | Modify Rule 15A NCAC 03J .0103 to make it unlawful for runaround, drift, or other non-stationary gill nets to block more than two-thirds of a waterway or interfere with navigation (similar to current rule for stationary gill nets). |
| 10.3 Striped Mullet Management Measures | The AC did not come to a consensus on this issue. The first vote in support of the PDT position failed 3-3. The second vote for Status Quo (keep current landings triggers and fishing mortality target) failed 3-3. | Update the minimum and maximum commercial landings triggers (set two standard deviations above and below the average commercial landings as in the status quo option) using commercial landings from 1994-2011, increase the fishing mortality target from $F_{30\%}$ Spawning Potential Ratio to $F_{35\%}$ Spawning Potential Ratio, and implement adaptive management. |

## 9.4 HABITAT AND WATER QUALITY RECOMMNEDED MANAGEMENT STRATEGY

In reviewing the 2006 Striped Mullet FMP habitat and water quality management recommendations, many have been implemented or are substantially underway. Many of these were also components of the CHPP implementation plan. They include:

Habitat

- CRC has revised dock rules to require review by resource agencies for GP dock applications located over SAV, shell bottom, or PNAs, and where water depth is less than 2 ft mean water level to avoid boating related impacts.
- Although North Carolina legislation has been passed to allow terminal groins to be built in coastal North Carolina, the NCDMF has been in talks with applicants to minimize the adverse impacts to fisheries. In addition, the NCDCM has created standards for beach nourishment projects. These standards include sediment size and moratorium periods to minimize impacts.
- Coast-wide imagery of SAV was taken in 2007/2008 and has been mapped.
- .
- Additional bottom disturbing gear restrictions have been implemented through the bay scallop and oyster fishery management plans to avoid damage to SAV and oysters.
- DENR staff has been cooperating to develop permit conditions for marsh sills to minimize the impacts of vertical shoreline stabilization methods.

Water Quality

- Neuse and Tar-Pamlico NSW nutrient reduction measures have successfully reduced nutrient loading by more than their 30% reduction goals for point source dischargers and agriculture.
- NCDWR revised coastal storm water rules that limit impervious surface and run-off in coastal areas.
- Wetland buffers along coastal streams and rivers have been used to enhance wetlands and improve water quality.

### 9.4.1 Coastal Habitat Protection Plan Actions

There are many actions that natural resource managers can take to sustain and enhance habitat and water quality conditions for striped mullet. High priority needs include:

- Preserving existing coastal wetlands and restoring wetlands
- Protecting PNAs from dredging and water quality degradation
- Protecting and enhancing SAV habitat
- Assessing sediment contamination in NC estuaries and effects on mullet
- Reducing pollutant loading from point and non-point sources

These management needs are currently being addressed through several existing CHPP recommendations (Deaton et al. 2010) and implementation of actions that were approved by the CHPP Steering Committee. Listed below are those CHPP recommendations and implementation actions that could be beneficial for protecting and improving habitat and water quality issues affecting striped mullet. Numbering refers to the CHPP recommendations. Implementation actions are denoted by (I) following the recommendation number.

2.1 Support Strategic Habitat Area assessments by:

a) Coordinating, completing, and maintaining baseline habitat mapping (including seagrass, shell bottom, shoreline, and other bottom types) using the most appropriate technology
b) Selective monitoring of the status of those habitats

Of specific importance for striped mullet are:

- remapping and monitoring SAV in North Carolina to assess change in distribution
- assessing the distribution, concentration, and threat of heavy metals and other toxic contaminants in freshwater and estuarine sediments and identify the areas of greatest concern to focus water quality improvement efforts
- monitoring to determine if additional areas should be designated as Primary Nursery Areas due to their nursery importance to mullet

2.2 Identify, designate, and protect Strategic Habitat Areas.

3.1 Expand habitat restoration in accordance with restoration plan goals, including:
a) Creation of subtidal oyster reef no-take sanctuaries
b) Re-establishment of riparian wetlands and stream hydrology
c) Restoration of SAV habitat and shallow soft bottom nurseries

Of specific importance for striped mullet is protection and restoration of coastal wetlands and SAV.

3.3 Protect habitat from fishing gear effects through improved enforcement establishment of protective buffers around habitats, modified rules, and further restriction of fishing gear where necessary.

Of specific importance for striped mullet is periodic re-examination of areas where trawling, oyster dredging or mechanical harvest is currently allowed to determine if conflicts with habitat protection exist.

3.4 Protect estuarine and public trust shorelines and shallow water habitats by revising shoreline stabilization rules to include consideration of erosion rates and prefer alternatives to vertical shoreline stabilization measures that maintain shallow nursery habitat.

3.7 (I) Develop an interagency policy for marina siting to minimize impacts to ecologically important shallow habitats such as Primary Nursery Areas (PNA), Anadromous Fish Spawning Areas (AFSA), and SAV.

4.1 Reduce point source pollution discharges by:
a) Increasing inspections of wastewater treatment facilities, collection infrastructure, and disposal sites
b) Providing incentives for upgrading all types of discharge treatment systems
c) Developing standards and treatment methods that minimize the threat of endocrine disrupting chemicals on aquatic life.

4.5 Improve strategies throughout the river basins to reduce non-point pollution and minimize cumulative losses of fish habitat through voluntary actions, assistance, and incentives, including:

a) Improved methods to reduce pollution from construction sites, agriculture, and forestry
b) Increased on-site infiltration of storm water
c) Encouraging and providing incentives for low-impact development

4.6 Improve strategies throughout the river basins to reduce non-point pollution and minimize cumulative losses of fish habitat through rule making, including:
a) Increased use of effective vegetated buffers
b) Implementing and assessing coastal storm water rules and modify if justified
c) Modified water quality standards that are adequate to support SAV habitat

4.8 Reduce non-point source pollution from large-scale animal operations

### 9.4.2 Research Recommendations

Along with the management recommendation actions from the 2006 Striped Mullet FMP listed above, there are certain research questions that should be answered to determine the impacts on striped mullet. The Striped Mullet PDT discussed these recommendations and assigned a priority ranking of High, Medium, or Low as a way to determine how critical these needs are.

All recommendations below are from the CHPP (2010):

Habitat

- Identify, research, and designate additional areas as primary nursery areas that may be important to striped mullet, as well as other fisheries (Low).
- Develop and maintain accurate maps and documentation of wetlands, soft bottom, SAVs, and water column (Medium).

Water Quality

- Support research on the causes of hypoxia and anoxia and impacts on striped mullet populations in North Carolina's estuarine waters (Medium).
- Support additional research to document and quantify the influences of significant weather events (including climate change) on water quality and assess impacts on the striped mullet population (Medium).

## 11.3 SUMMARY OF RESEARCH RECOMMENDATIONS

The following research recommendations were compiled to help achieve the Goal and Objectives listed in subsection 4.1.2. The PDT reviewed and prioritized the research recommendations in accordance with the suggestion by the Biological Review Team research priority subcommittee. The AC reviewed the draft research recommendations and provided input to prioritize these recommendations as well. The Management Review Team determined the final ranking. The prioritization of each research recommendation is designated either a high, medium, or low priority. A low ranking does not infer a lack of importance but is either already being addressed by others or provides limited information for aiding in management decisions. A high ranking indicates there is a substantial need, which may be time sensitive in nature, to provide information to help with management decisions.

### 11.3.1 NCDMF Data Gathering

- Increase sampling of the commercial bait mullet cast net fishery to improve the estimates of striped mullet and white mullet harvest (Low).
- Increase the number of age samples from both fisheries-dependent and fisheries-independent sources (Medium).
- Restart fishery-independent cast net sampling (NCDMF Program 121) to improve estimates of the proportion of striped mullet and white mullet in this fishery (Low).
- Initiate a fishery-independent adult striped mullet survey in the Core and Bogue sound areas where approximately 20% of the striped mullet harvest occurs (High).
- Analyze the data from the CRFL recreational cast net and seine survey to better characterize the recreational striped mullet fishery, including the social and economic elements (Medium).

### 11.3.2 Biological

- Improve recreational fisheries statistics provided by the Marine Recreational Information Program (MRIP; formerly MRFSS) or some other program to reliably characterize the magnitude and length and age structure of recreational fisheries losses (High).
- Develop a reliable fisheries-independent index of juvenile abundance (High).
- Investigate how catch-ability of striped mullet by NCDMF Program 146 is affected by variations in salinity and conductivity and expand survey to other coastal rivers and tributaries (Medium).
- Initiate a plankton survey covering all inlets to determine inlet use by striped mullet (High).
- Initiate a tagging program to provide estimates of stock size, *F,* and *M* that are not dependent on assumptions about steepness (High).
- Initiate a study to estimate fecundity and update the current maturity schedule microscopically (Medium).
- Investigate the disappearance of males from the population after age-3 (300mm FL) (Low).
- Initiate an acoustic tagging study to determine spatial and temporal variations in habitat use throughout the state to help provide better indices for stock assessments (Low).
- Initiate a survey to estimate RCGL landings of striped mullet in order to estimate recreational landings, as well as the social and economic elements of the striped mullet fishery (Medium).

### 11.3.3 Education

- Implement public outreach on waste reduction of striped mullet in the commercial and recreational fisheries (Low).

### 11.3.4 Habitat and Water Quality

Specific research recommendations for habitat and water quality from the CHPP (Deaton et al. 2010) can be found in subsection 9.4.2 of the Environmental Factors section of this document. The CHPP is currently undergoing revisions and is expected to be completed in 2015. Updated research recommendations for improving habitat and water quality should be found there once completed.

INFORMATION WILL BE PROVIDED AT THE MEETING.

# N.C. Marine Fisheries Commission
# 2014-2015 Annual Rulemaking Cycle

August 2014

| Time of Year | Action |
|---|---|
| January 2014 | Last opportunity for a new issue to be presented to DMF Rules Advisory Team |
| February 2014 | Second review by DMF Rules Advisory Team |
| January-July 2014 | Fiscal analysis of rules prepared by DMF staff and approved by Office of State Budget and Management |
| August 2014 | MFC considers approval of Notice of Text for Rulemaking |
| October 2014 | Publication of proposed rules in the North Carolina Register |
| October 2014 * | Public hearing(s) held |
| (January) | (Last opportunity for a new issue to be presented to DMF Rules Advisory Team) |
| (February) | (Second review by DMF Rules Advisory Team) |
| February 2015 | MFC considers approval of permanent rules |
| February/March 2015 | New rulebook formatted and published |
| April 1, 2015 | New rulebook available online and for distribution |
| April 15, 2015 | Commercial license sales begin |
| April 2015 | Rules reviewed by Office of Administrative Hearings Rules Review Commission |
| May or June 1, 2015 | Effective date of new rules |
| May or June 1, 2015 | New rulebook supplement available online and for distribution |

* Public hearings for proposed rules are scheduled to be conducted:

- Tuesday, Oct. 28, 6 p.m., DENR Washington Regional Office, 943 Washington Square Mall, Highway 17, Washington, NC 27889; and
- Wednesday, Oct. 29, 6 p.m., DENR Wilmington Regional Office, 127 Cardinal Drive Extension, Wilmington, NC 28405.

**FISCAL IMPACTS OF PROPOSED AMENDMENTS TO THE SHRIMP FISHERY MANAGEMENT PLAN**

**Rule Amendments:** 15A NCAC 03I .0101 DEFINITIONS
15A NCAC 03J .0208 NEW RIVER
15A NCAC 03L .0101 SHRIMP HARVEST RESTRICTIONS
15A NCAC 03L .0103 PROHIBITED NETS, MESH SIZES AND AREAS
15A NCAC 03L .0105 RECREATIONAL SHRIMP LIMITS
15A NCAC 03R .0114 SHRIMP TRAWL PROHIBITED AREAS

**Name of Commission:** N.C. Marine Fisheries Commission

**Agency Contact:**
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**Impact Summary:**
State government: Yes
Local government: No
Federal government: No
Substantial impact: No

**Authority:** 113-134. Rules.
113-182. Regulation of Fishing and Fisheries.
113-221.1. Proclamations; Emergency Review.
143B-289.52. Marine Fisheries Commission – Powers and Duties.

**Necessity:** In accordance with G.S. 113-182.1 (b) and (d), the proposed rule changes (see proposed rule text in the appendix) are necessary to amend and update the N.C. Shrimp Fishery Management Plan to ensure adequate management of the shrimp resource and shrimp fisheries in state waters. Specifically, the rule changes address six separate issues and propose to:

1) Modify 15A NCAC 03I .0101 to improve the existing definition of net mesh length to more clearly define how a mesh length is measured;
2) Modify 15A NCAC 03J .0208 to provide clarity on trawling in the special secondary nursery area in the New River above the NC 172 Bridge and remove proclamation authority to open and close shrimping between August 16 and November 30;
3) Amend 15A NCAC 03L .0101 to clarify proclamation authority for shrimp harvest restrictions and standardize rule language for proclamation authority to match other similar rules;
4) Amend 15A NCAC 03L .0103 to create a 220-foot maximum headrope length for trawl gear used in internal waters where no headrope length limit currently exists;
5) Modify 15A NCAC 03L .0105 to clarify recreational shrimp harvest limits in areas open and otherwise closed to the taking of shrimp as well as increase the

recreational shrimp limit in areas otherwise closed to the taking of shrimp from two quarts to four quarts heads-on or two and one half quarts heads-off;

6) Amend 15A NCAC 03R .0114 to permanently close Shallotte River, lower Calabash River, and the Intracoastal Waterway between the Sunset Beach Bridge and the South Carolina state line to shrimp trawling due to consistently low abundance of shrimp that are of marketable size and to reduce shrimp trawl bycatch.

The anticipated effective date of the proposed rule changes is April 1, 2015.

## 1. Improve the Definition of Net Mesh Length (15A NCAC 03I .0101)

### I. Summary

A rule change is needed in the legal definition of a mesh length to maintain consistency and clarity in the enforcement of rules related to mesh-length specifications. North Carolina Division of Marine Fisheries (NCDMF) staff determined that the current rule does not provide enough detail in how to measure mesh length. Therefore, NCDMF is proposing clarifications to the rule defining mesh length.

### II. Introduction and Purpose of Rule Changes

During the amendment process of the Shrimp Fishery Management Plan Amendment I, NCDMF staff reviewed several rules related to the shrimp fisheries in North Carolina. As part of this review, staff determined that the rule defining mesh length needed clarification. Multiple fishery regulations involve maximum and/or minimum mesh lengths, and the current definition of a mesh length does not adequately describe how a mesh length is measured. Both the public and law enforcement would benefit from clarification of this definition to more easily and consistently follow mesh length-related fishery management measures.

### III. Costs

There are no costs associated with the proposed rule change. The practice of using mesh length as a fisheries management tool nor the implementation of mesh-length rules will not change in a significant way.

### IV. Benefits

Both the public and law enforcement will benefit from the proposed rule change, as the rule defining how mesh length is measured will be more clearly stated and will provide a consistent way to measure mesh length.

## 2. Trawling in the New River Special Secondary Nursery Area Above the NC 172 Bridge (15A NCAC 03J .0208)

### I. Summary

The proposed rule change seeks to clarify the rule used for the management of trawling above the NC 172 Bridge in the New River (Onslow County).

## II. Introduction and Purpose of Rule Changes

The waters upstream of the NC 172 Bridge in the New River were designated by rule as a Special Secondary Nursery Area (SSNA) in 1996. For information purposes, Primary Nursery Areas are those areas in the estuarine system where initial post-larval development takes place and Secondary Nursery Areas are those areas in the estuarine system where later juvenile development takes place (15A NCAC 03I .0101 (4)(f)). Special Secondary Nursery Areas are Secondary Nursery Areas that can be conditionally opened certain times of the year for shrimp and crab trawling at the discretion of the fisheries director.

For this issue, the portion of the SSNA impacted by trawl openings includes the portion of the New River above the NC 172 Bridge up to the marked closure line running from Grey's Point to the opposite bank of the river. The use of otter trawls in the SSNA of the New River was phased out in 2010 as was specified in the 2006 Shrimp Fishery Management Plan, however skimmer trawls may still be used. Those who wished to continue to harvest shrimp in the SSNA with otter trawl gear were allowed a four-year grace period to convert to skimmer trawl gear. Currently skimmer trawl gear is the only shrimp trawl gear allowed in the New River SSNA. While reviewing rules related to shrimp fishing for the Shrimp Fishery Management Plan Amendment I, NCDMF staff determined that the rule for the use of trawl nets in the SSNA in the New River needed to be amended to address the current management of skimmer trawls by proclamation. The proposed rule changes seek to improve the terms of use for trawl nets in the New River SSNA for improved public clarity.

For clarification, otter trawls are nets which have otter boards or doors fastened to the sides. When the net is in motion underwater, the boards pull away from each other resulting in the net opening up. Skimmer trawls are effective in relatively shallow water and are held in place by a frame on three sides and mounted on the vessel just behind the bow. Skimmer trawls are pushed through the water instead of towed behind the vessel like otter trawls.

## III. Costs

There are no costs associated with the proposed rule change. Management of the shrimp fishery in the SSNA of the New River above the NC 172 Bridge will remain unchanged.

## IV. Benefits

There are no quantifiable economic benefits to the proposed rule change, but both the public and law enforcement will benefit from clarification of the rule used for the management of trawling in the SSNA of the New River above the NC 172 Bridge.

## 3. Address Clarity and Consistency in Proclamation Authority of Shrimp Season and Harvest Restrictions (15A NCAC 03L .0101)

## I. Summary

The proposed rule change seeks to clarify proclamation authority for shrimp seasons and harvest restrictions. This rule change is proposed to address rule clarity and improve consistency with other marine fisheries-related rules for proclamation authority and does not change the intent or application of the current rule.

## II. Introduction and Purpose of Rule Changes

The proposed rule change has been put forth as part of an ongoing attempt to standardize rule language granting proclamation authority across North Carolina Marine Fisheries Commission (NCMFC) rules. NCDMF staff has identified that proclamation authority across several rules is often similar in nature; however, the specific rule language stating the proclamation authority often differs greatly from rule to rule. In an attempt to improve consistency across rules and public clarity of proclamation authority, NCDMF seeks to standardize rule language describing proclamation authority when possible. The rule change is not intended to change the scope of the proclamation authority, nor is it being proposed with the intention of changing current management.

## III. Costs

There are no expected costs associated with this proposed rule change. The proposed rule change is for the purposes of clarity and consistency and does not represent a change in authority or current management of shrimping.

## IV. Benefits

This rule change reflects the current proclamation authority to manage shrimping and makes this rule language consistent with other rules granting proclamation authority. This consistency among rules granting proclamation authority aids in public awareness in what type of fisheries management measures may be specified by proclamation.

## 4. Capping Shrimp Trawl Headrope Length in Internal Waters (15A NCAC 03L .0103)

## I. Summary

In order to put a cap on gear capacity as a management tool, the NCMFC seeks to establish a maximum combined headrope length of 220 feet in all internal coastal waters where there are no existing maximum combined headrope requirements (i.e., 90-foot requirement). A two-year phase-out period will be implemented to mitigate the impact on any trawl operations that may be affected by the proposed rule change.

## II. Introduction and Purpose of Rule Changes

The North Carolina shrimp fleet consists of vessels of various sizes and configurations. Roughly 92-percent of North Carolina's commercial shrimp harvest is caught using otter trawls. In North Carolina, the size of a trawl is based on its headrope length. Headrope length is defined as the support structure for the mesh or webbing of a trawl that is nearest to the water surface when in use. Headrope length is measured from the outermost mesh knot at one end of the headrope following along the line to the outermost mesh knot at the opposite end of the headrope (15A NCAC 03I .0101(i)). Currently, it is unlawful to use trawls that have a combined headrope greater than 90 feet in the internal coastal waters of North Carolina, except in the Pamlico Sound and at the mouths of the Pamlico and Neuse rivers (15A NCAC 03L .0103(c)).

In order to put a cap on gear capacity as a management tool, the NCMFC has selected as a preferred management option establishing a maximum combined headrope length of 220 feet per vessel in all internal coastal waters where there are no existing maximum combined headrope requirements (i.e., 90-foot requirement). A phase-out period of two years will be implemented for any vessels that may be using more than 220 feet of combined head rope in internal coastal waters.

### III. Costs

An analysis performed by NCDMF in 2013 examining reported trawl headrope lengths shows there were no fishing operations using more than 220 feet of headrope while trawling in internal waters in North Carolina. Based on this information, there will be no cost related to the proposed rule change for current commercial fishing operations that fish in North Carolina's internal waters.

There has been some anecdotal, unverified information brought forth by a member of the public that one fishing operation has made plans to or has purchased otter trawl gear that will exceed 220 feet in combined headrope length when fished. This may be indicative of increased interest in using trawl gear in access of 220 feet of combined headrope length in internal waters. Based on this information, there may be some future costs associated with this rule change for other fishing operations that would have utilized gear exceeding 220 feet of headrope length in the absence of the proposed rule change. Additionally, there may be some costs to the fishing operation that has purchased or planned to purchase trawl gear that will exceed 220 feet of combined headrope length. However, under the proposed rule changes, there is a two-year phase-out period to allow this operation to obtain a return on their gear investment by allowing the gear to be used for all or almost all of the expected usable lifespan of the gear. Furthermore, this gear will still be allowed for use in Atlantic Ocean shrimp trawling operations and may be modified to be fished in internal waters under the proposed rule change. Finally, future benefits in the form of reduced risk of overharvesting or altering the current shrimp resource allocation will rise in proportion to costs associated with curbing future growth in the use of gear in excess of the proposed limits. For these reasons, the expected potential costs that may occur from the proposed rule change are expected to be minimal.

### IV. Benefits

The proposed rule change will serve as a management tool to cap the capacity of shrimp fishing operations that use otter trawl gear in internal waters. Since larger amounts of gear are able to harvest more of the shrimp resource, capping the capacity at or near current levels will help reduce the risk of overharvest as well as maintain the equity of allocation of shrimp harvest among current participants in the shrimp trawl fishery that occurs in North Carolina's internal waters.

## 5. Increasing the Recreational Shrimp Limit in Areas Closed to the Taking of Shrimp (15A NCAC 03L .0105)

### I. Summary

The proposed rule change seeks to increase the recreational shrimp limit in areas otherwise closed to the taking of shrimp from two quarts to four quarts, heads-on or two and one half

quarts heads-off per person when using a cast net. The rule change also seeks to clarify the recreational limit of shrimp in areas open to the taking of shrimp.

### II. Introduction and Purpose of Rule Changes

Cast netting for shrimp is a popular method to catch shrimp for bait and for personal consumption. In addition, fishermen are allowed to use cast nets in areas otherwise closed to the taking of shrimp, such as nursery areas, areas closed due to small shrimp size and areas closed due to habitat concerns. The NCMFC changed the limit for cast netted shrimp from closed areas from 100 shrimp per person to two quarts of shrimp per person as of June 1, 2013, to enable law enforcement to more safely and efficiently measure a fisherman's catch and enforce this rule.

In response to requests from the public as well as members of the NCMFC, the proposed rule change seeks to increase the recreational shrimp limit in closed areas from two quarts to four quarts heads-on or two and one half courts heads-off per person when using a cast net. The rule change also seeks to clarify the wording for the higher recreational limit of shrimp that is allowed in areas open to the taking of shrimp.

### III. Costs

Costs associated with the proposed rule changes are expected to be minor and unquantifiable. There may be additional shrimp removed from certain waterbodies that would have otherwise been caught by other users of the resource at a later date in commercial or other recreational fishing activities. Additionally, there may be a decrease in sales of shrimp at some seafood retailers and fishing tackle shops, as recreational shrimp fishermen will be able to harvest more shrimp for themselves that otherwise they would have had to purchase. However, there are currently no estimates of how many shrimp are recreationally caught with cast nets in areas otherwise closed to the taking of shrimp, nor are the costs to other users expected to be noteworthy or noticeable.

### III. Benefits

There will be benefits to some recreational shrimpers, as the recreational limit of shrimp in closed areas will increase. This will allow fishermen using cast nets to keep more shrimp for personal consumption or for use as bait, thereby offsetting the cost of purchasing additional quantities of shrimp. Additionally, the proposed rule change will clarify the recreational limit of shrimp in areas open to the taking of shrimp.

## 6. Area Restrictions to Reduce Shrimp Trawl Bycatch in North Carolina's Internal Coastal Waters (15A NCAC 03R .0114)

### I. Summary

The proposed rule change seeks to permanently close shrimp trawling in the lower Calabash River, Shallotte River, and Intracoastal Waterway from the Sunset Beach Bridge to the South Carolina state line. These areas are relatively small in size. While the Intracoastal Waterway does open every year to shrimp trawling, the lower Calabash River and Shallotte River have not been opened to shrimp trawling in recent years due to low abundance of shrimp of marketable

size. The proposed rule change will still allow shrimp trawling in adjacent waters and remove the need for NCDMF to sample these areas for shrimp count size.

## II. Introduction and Purpose of Rule Changes

The Brunswick County coastline stretches for approximately 33 miles and is bound by the Cape Fear River Inlet on the east end and by the Little River Inlet on the west end. Four barrier islands, all of which are densely developed, are separated by five inlets along the coastline. Within this area, the lower Calabash River, Shallotte River, and Intracoastal Waterway from Sunset Beach Bridge to the South Carolina state line may be opened to shrimp trawling if shrimp of marketable size are present. NCDMF periodically samples these areas for shrimp count size to assess if these areas warrant opening for trawling. Lower Calabash and Shallotte rivers have remained closed due to small shrimp size and minimal requests to open these waterbodies by fishermen (one request in the past five years). The Intracoastal Waterway from Sunset Beach Bridge to the South Carolina state line has opened every year but is typically the last area to open in Brunswick County due to the small size of shrimp.

The proposed rule change seeks to permanently close these areas to shrimp trawling. This will remove the need for NCDMF to sample these areas for shrimp, thereby allocating staff time to other biological sampling activities. Additionally, bycatch of unwanted species from shrimp trawls will be permanently reduced in these areas.

## III. Costs

The proposed rule change is expected to create some costs; however, these costs are expected to be minimal and may be offset by fishing activities in waters adjacent to the areas proposed for closure. The areas that are proposed for closure to shrimp trawling make up a minority of the total fishable area in the Intracoastal Waterway along the southern edge of Brunswick County. Furthermore, some of the specified areas often do not open to trawling as shrimp in these areas rarely reach a size large enough to warrant the opening of shrimp trawling (40-50 count shrimp in Brunswick County).

According to the NCDMF trip ticket program, there have been no landings of trawl-caught shrimp recorded from the Shallotte River over the past ten years (2004-2013), as this water body has remained closed due to inadequate abundance of shrimp of marketable size. The NCDMF trip ticket program does not have a water body code specifically for the section of the Intracoastal Waterway from the Sunset Beach Bridge to the South Carolina state line or the lower Calabash River; however, landings may be estimated based on the total landings of shrimp from the Intracoastal Waterway in Brunswick County. The area being proposed for closure to shrimp trawling makes up approximately 17 percent of the entire area included in the trip ticket water body of the “Inland Waterway-Brunswick County”. Over the past ten years (2004-2013), trawl-caught shrimp landings from the “Inland Waterway-Brunswick County” have had an annual ex-vessel value that ranged from $9,356 to $34,789, with a 10-year average value of $22,332. Applying the approximate coverage of the water bodies being examined (17%) to this average value, the estimated annual landings in this area are $3,796 when opened to shrimp trawling.

The estimated average annual cost of the proposed rule change to commercial shrimp fishermen is approximately $3,800. This should be viewed as a conservatively high estimate, as some of the waters proposed for permanent closure often do not open for shrimp trawling each

year due to lack of shrimp of adequate marketable size. Additionally, adjacent waters will still be open to trawling, which is likely to partially offset some of this cost. There are no expected changes in enforcement costs due to the proposed rule change, as the areas will still need to be regularly patrolled to enforce laws in other fisheries.

## IV. Benefits

Prohibiting the use of otter trawl gear is expected to incur an unquantifiable benefit in the specified areas from a reduction in bycatch that is associated with otter trawl gear. Additionally, there will be some opportunity-cost savings for the state through decreased sampling efforts in the areas proposed for permanent closure to shrimp trawling. These areas may currently be opened when NCDMF sampling indicates the presence of shrimp that are of marketable size. Based on sampling effort over the past 12 years, there has been an average of 6 sampling trips to the east of the Sunset Beach Bridge per year and 4 sampling trips to the west of the Sunset Beach Bridge taken per year to test for adequate quantities of marketable-sized shrimp. The area to the west of the Sunset Beach Bridge is proposed for permanent closure and will no longer need to be sampled. Each sampling trip requires three NCDMF staff (one Marine Fisheries Biologist II and two Marine Fisheries Technicians II) to adequately complete and takes approximately four hours. There is an additional one hour of staff time (Marine Fisheries Technician II) required for data processing to log the results of the trip. Therefore each trip takes approximately 13 hours of total staff time. Assuming the midpoint wage of a Marine Fisheries Biologist II with benefits included of $36.03 per hour and Marine Fisheries Technician II with benefits included of $26.71 per hour, it is estimated that opportunity cost of sampling these areas for shrimp is approximately $1,500 per year on average.[1] While this savings will not be fully received monetarily by the state, as staff time will be dedicated elsewhere, the proposed rule change will allow staff to dedicate time to other biological sampling programs and thereby incur a savings in opportunity costs.

[1] Hourly compensation estimates based on the midpoints of the salary ranges for the relevant positions published in the *State of North Carolina Salary Plan* for FY 2013-14 ((http://www.oshr.nc.gov/Guide/CompWebSite/Current%20Salary%20Plan%20Book.pdf) and the Employee Total Compensation Calculator on the website of the North Carolina Office of State Human Resources (http://www.oshr.nc.gov/Reward/benefits/Compensation%20Calculator.htm). The total-compensation calculations assume five years of service in state government for relevant employees working a 2080-hour work year, and the total dollar amount is rounded to the nearest hundred dollars.

## V. Comprehensive Statement of Costs and Benefits

Rule changes associated with the Shrimp Fishery Management Plan Amendment I are expected to have a combined cost and benefit that is relatively low and will not meet the impact threshold of $1 million in aggregate costs and benefits to be considered rule change with a substantial economic impact. Specifically:

1) Modification to 15A NCAC 03I .0101 will improve the existing definition of net mesh length to more clearly define how a mesh length is measured. This rule change will benefit the public and law enforcement by providing a better definition of how mesh length is measure and is not expected to impose any noticeable costs.

2) Modification to 15A NCAC 03J .0208 will improve clarity on trawling specifications in the special secondary nursery area in the New River above the NC 172 Bridge. This rule change will benefit the public and law enforcement through more clear and consistent rule language regarding the management of trawling in the SSNA in the New River and is not expected to impose any noticeable costs.

3) Amendment to 15A NCAC 03L .0101 will benefit the public by clarifying proclamation authority for shrimp harvest restrictions and standardizing rule language for proclamation authority to match other similar rules. This rule change is not expected to impose any noticeable costs, as there is no intended change in authority when compared to current rule.

4) Amendment to 15A NCAC 03L .0103 will create a 220-foot maximum headrope length for trawl gear used in internal waters where no headrope length limit currently exists. This rule change is expected to benefit the public by capping the capacity of current shrimp trawl operations, which will help to preserve the equitable allocation of the shrimp resource among current users and reduce the risk of overharvest of the shrimp resource.

Costs associated with this rule change are expected to be minimal. An analysis of NCDMF commercial license and trip ticket data indicate that there were no fishing operations using in excess of 220 feet of headrope in internal waters. Anecdotal information suggests that one shrimp trawling operation may have purchased or may intend to purchase gear that would be affected by this rule change; however, a phase-out period of two years is being implemented to minimize costs that may occur to this operation. Furthermore, this gear may still be used in the Atlantic Ocean and can be modified to fall within the 220-foot headrope limit, thereby mitigating the impact of any possible costs that the rule may impose. Should this be an indication of increased interest in using gear with a combined headrope length of more than 220 feet in internal waters, there may be some future costs to fishing operations that would have used gear in excess of the proposed limits in the absence of the rule change. Future benefits in the form of reduced risk of overharvesting or altering the current shrimp resource allocation will rise in proportion to costs associated with curbing future growth in the use of gear in excess of the proposed limits.

5) Modification to 15A NCAC 03L .0105 will clarify recreational shrimp harvest limits in areas open and closed to the taking of shrimp as well as increase the recreational shrimp limit in areas otherwise closed to the taking of shrimp from two quarts to four quarts heads-on or two and one half quarts heads-off. This will benefit the participants of this fishery by increasing the

allowed harvest in closed areas, thereby potentially reducing some expenses that may be incurred in otherwise having to purchase shrimp. Participants will also benefit from the improved clarity of the limit of recreational shrimp harvest in areas open to the taking of shrimp. This rule change will incur some costs to other users of the shrimp resource, such as commercial fishermen as well as some seafood retailers and fishing tackle shops that sell shrimp; however, the costs is unquantifiable and is expected to be minimal.

6) Amendment to 15A NCAC 03R .0114 will permanently close Shallotte River, lower Calabash River, and the Intracoastal Waterway between the Sunset Beach Bridge and the South Carolina state line to shrimp trawling due to consistently low abundance of shrimp that are of marketable size and to reduce shrimp-trawl bycatch. The benefits of this rule change will be a permanent reduction in shrimp-trawl bycatch in the specified areas as well as a reduction in opportunity costs to the State due to fewer sampling trips being required in these areas to test the abundance of shrimp of marketable size. The benefit from the reduction in shrimp trawl bycatch is unmeasurable, but the expected reduction in opportunity costs is estimated to be $1,500 annually on average. Costs associated with this rule change are expected to be minimal, as shrimp size in the specified areas is often below that of marketable size. Much of the specified area does not open at all to shrimp trawling for this reason. Based on NCDMF trip ticket data, the annual landings in the areas that are opened to shrimp trawling are estimated to be approximately $3,800. Therefore, the measurable cost associated with this rule change is up to $3,800 annually; however, some of this cost may be offset through increased fishing activity in adjacent waters that will remain open to shrimp trawling.

Table 1. Summary of estimated annual costs and benefits from proposed rule changes.

| Rule | Annual Estimated Cost | Annual Estimated Benefit |
|---|---:|---:|
| 15A NCAC 03I .0101 | None | Unquantified |
| 15A NCAC 03J .0208 | None | Unquantified |
| 15A NCAC 03L .0101 | None | Unquantified |
| 15A NCAC 03L .0103 | Unquantified | Unquantified |
| 15A NCAC 03L .0105 | Unquantified | Unquantified |
| 15A NCAC 03R .0114 | $3,800 (private) | $1,500 (State) |

## Appendix: Proposed Rule Changes

NOTE: CHANGES TO 15A NCAC 03I .0101 INCLUDE BOTH CHANGES FOR THE MANAGEMENT OF SHRIMP AND CHANGES TO FOR-HIRE LICENSE STRUCTURE WHICH ARE CONVERED IN A SEPARATE ANALYSIS.

**15A NCAC 03I .0101 DEFINITIONS**

All definitions set out in G.S. 113, Subchapter IV and the following additional terms apply to this Chapter:

(1) Enforcement and management terms:

(a) Commercial Quota. Total quantity of fish allocated for harvest by commercial fishing operations.

(b) Educational Institution. A college, university or community college accredited by an accrediting agency recognized by the U.S. Department of Education; an Environmental Education Center certified by the N.C. Department of Environment and Natural Resources Office of Environmental Education and Public Affairs; or a zoo or aquarium certified by the Association of Zoos and Aquariums.

(c) Internal Coastal Waters or Internal Waters. All Coastal Fishing Waters except the Atlantic Ocean.

(d) Length of finfish.

(i) Curved fork length. A length determined by measuring along a line tracing the contour of the body from the tip of the upper jaw to the middle of the fork in the caudal (tail) fin.

(ii) Fork length. A length determined by measuring along a straight line the distance from the tip of the snout with the mouth closed to the middle of the fork in the caudal (tail) fin, except that fork length for billfish is measured from the tip of the lower jaw to the middle of the fork of the caudal (tail) fin.

(iii) Pectoral fin curved fork length. A length of a beheaded fish from the dorsal insertion of the pectoral fin to the fork of the tail measured along the contour of the body in a line that runs along the top of the pectoral fin and the top of the caudal keel.

(iv) Total length. A length determined by measuring along a straight line the distance from the tip of the snout with the mouth closed to the tip of the compressed caudal (tail) fin.

(e) Recreational Possession Limit. Restrictions on size, quantity, season, time period, area, means, and methods where take or possession is for a recreational purpose.

(f) Recreational Quota. Total quantity of fish allocated for harvest for a recreational purpose.

(g) Regular Closed Oyster Season. March 31 through October 15, unless amended by the Fisheries Director through proclamation authority.

(h) Scientific Institution. One of the following entities:

(i) An educational institution as defined in this Item;

(ii) A state or federal agency charged with the management of marine or estuarine resources; or

(iii) A professional organization or secondary school working under the direction of, or in compliance with mandates from, the entities listed in Subitems (h)(i) and (ii) of this Item.

(i) Seed Oyster Management Area. An open harvest area that, by reason of poor growth characteristics, predation rates, overcrowding or other factors, experiences poor utilization of oyster populations for direct harvest and sale to licensed dealers and is designated by the Marine Fisheries Commission as a source of seed for public and private oyster culture.

(2) Fishing Activities:

(a) Aquaculture operation. An operation that produces artificially propagated stocks of marine or estuarine resources or obtains such stocks from permitted sources for the purpose of rearing in a controlled environment. A controlled environment provides and maintains throughout the rearing process one or more of the following:

(i) food;

(ii) predator protection;

(iii) salinity;

(iv) temperature controls; or

(v) water circulation,

utilizing technology not found in the natural environment.

(b) Attended. Being in a vessel, in the water or on the shore, and immediately available to work the gear and be within 100 yards of any gear in use by that person at all times. Attended does not include being in a building or structure.

(c) Blue Crab Shedding. The process whereby a blue crab emerges soft from its former hard exoskeleton. A shedding operation is any operation that holds peeler crabs in a controlled environment. A controlled environment provides and maintains throughout the shedding process one or more of the following:

(i) food;

(ii) predator protection;

(iii) salinity;

(iv) temperature controls; or

(v) water circulation,

utilizing technology not found in the natural environment. A shedding operation does not include transporting pink or red-line peeler crabs to a permitted shedding operation.

(d) Depuration. Purification or the removal of adulteration from live oysters, clams, or mussels by any natural or artificially controlled means.

(e) Long Haul Operations. Fishing a seine towed between two vessels.

(f) Peeler Crab. A blue crab that has a soft shell developing under a hard shell and having a white, pink, or red-line or rim on the outer edge of the back fin or flipper.

(g) Possess. Any actual or constructive holding whether under claim of ownership or not.

(h) Recreational Purpose. A fishing activity that is not a commercial fishing operation as defined in G.S. 113-168.

(i) Shellfish marketing from leases and franchises. The harvest of oysters, clams, scallops, or mussels from privately held shellfish bottoms and lawful sale of those shellfish to the public at large or to a licensed shellfish dealer.

(j) Shellfish planting effort on leases and franchises. The process of obtaining authorized cultch materials, seed shellfish, and polluted shellfish stocks and the placement of those materials on privately held shellfish bottoms for increased shellfish production.

(k) Shellfish production on leases and franchises:

(i) The culture of oysters, clams, scallops, or mussels on shellfish leases and franchises from a sublegal harvest size to a marketable size.

(ii) The transplanting (relay) of oysters, clams, scallops or mussels from areas closed due to pollution to shellfish leases and franchises in open waters and the natural cleansing of those shellfish.

(l) Swipe Net Operations. Fishing a seine towed by one vessel.

(m) Transport. Ship, carry, or cause to be carried or moved by public or private carrier by land, sea, or air.

(n) Use. Employ, set, operate, or permit to be operated or employed.

(3) Gear:

(a) Bunt Net. The last encircling net of a long haul or swipe net operation constructed of small mesh webbing. The bunt net is used to form a pen or pound from which the catch is dipped or bailed.

(b) Channel Net. A net used to take shrimp that is anchored or attached to the bottom at both ends or with one end anchored or attached to the bottom and the other end attached to a vessel.

(c) Commercial Fishing Equipment or Gear. All fishing equipment used in Coastal Fishing Waters except:

(i) Cast nets;

(ii) Collapsible crab traps, a trap used for taking crabs with the largest open dimension no larger than 18 inches and that by design is collapsed at all times

when in the water, except when it is being retrieved from or lowered to the bottom;

(iii) Dip nets or scoops having a handle not more than eight feet in length and a hoop or frame to which the net is attached not exceeding 60 inches along the perimeter;

(iv) Gigs or other pointed implements which are propelled by hand, whether or not the implement remains in the hand;

(v) Hand operated rakes no more than 12 inches wide and weighing no more than six pounds and hand operated tongs;

(vi) Hook-and-line and bait-and-line equipment other than multiple-hook or multiple-bait trotline;

(vii) Landing nets used to assist in taking fish when the initial and primary method of taking is by the use of hook and line;

(viii) Minnow traps when no more than two are in use;

(ix) Seines less than 30 feet in length;

(x) Spears, Hawaiian slings or similar devices that propel pointed implements by mechanical means, including elastic tubing or bands, pressurized gas, or similar means.

(d) Corkline. The support structure a net is attached to that is nearest to the water surface when in use. Corkline length is measured from the outer most mesh knot at one end of the corkline following along the line to the outer most mesh knot at the opposite end of the corkline.

(e) Dredge. A device towed by engine power consisting of a frame, tooth bar or smooth bar, and catchbag used in the harvest of oysters, clams, crabs, scallops, or conchs.

(f) Fixed or stationary net. A net anchored or staked to the bottom, or some structure attached to the bottom, at both ends of the net.

(g) Fyke Net. An entrapment net supported by a series of internal or external hoops or frames, with one or more lead or leaders that guide fish to the net mouth. The net has one or more internal funnel-shaped openings with tapered ends directed inward from the mouth, through which fish enter the enclosure. The portion of the net designed to hold or trap fish is completely enclosed in mesh or webbing, except for the openings for fish passage into or out of the net (funnel area).

(h) Gill Net. A net set vertically in the water to capture fish by entanglement of the gills in its mesh as a result of net design, construction, mesh ~~size,~~ length, webbing diameter, or method in which it is used.

(i) Headrope. The support structure for the mesh or webbing of a trawl that is nearest to the water surface when in use. Headrope length is measured from the outer most mesh knot

at one end of the headrope following along the line to the outer most mesh knot at the opposite end of the headrope.

(j) Hoop Net. An entrapment net supported by a series of internal or external hoops or frames. The net has one or more internal funnel-shaped openings with tapered ends directed inward from the mouth, through which fish enter the enclosure. The portion of the net designed to hold or trap the fish is completely enclosed in mesh or webbing, except for the openings for fish passage into or out of the net (funnel area).

(k) Lead. A mesh or webbing structure consisting of nylon, monofilament, plastic, wire, or similar material set vertically in the water and held in place by stakes or anchors to guide fish into an enclosure. Lead length is measured from the outer most end of the lead along the top or bottom line, whichever is longer, to the opposite end of the lead.

(l) Mechanical methods for clamming. Dredges, hydraulic clam dredges, stick rakes and other rakes when towed by engine power, patent tongs, kicking with propellers or deflector plates with or without trawls, and any other method that utilizes mechanical means to harvest clams.

(m) Mechanical methods for oystering. Dredges, patent tongs, stick rakes and other rakes when towed by engine power, and any other method that utilizes mechanical means to harvest oysters.

(n) Mesh Length. The ~~diagonal~~ distance from the inside of one knot to the outside of the ~~other~~ opposite knot, when the net is stretched ~~hand tight.~~hand-tight in a manner that closes the mesh opening.

(o) Pound Net Set. A fish trap consisting of a holding pen, one or more enclosures, lead or leaders, and stakes or anchors used to support the trap. The holding pen, enclosures, and lead(s) are not conical, nor are they supported by hoops or frames.

(p) Purse Gill Nets. Any gill net used to encircle fish when the net is closed by the use of a purse line through rings located along the top or bottom line or elsewhere on such net.

(q) Seine. A net set vertically in the water and pulled by hand or power to capture fish by encirclement and confining fish within itself or against another net, the shore or bank as a result of net design, construction, mesh ~~size,~~ length, webbing diameter, or method in which it is used.

(4) Fish habitat areas. The estuarine and marine areas that support juvenile and adult populations of fish species, as well as forage species utilized in the food chain. Fish habitats as used in this definition, are vital for portions of the entire life cycle, including the early growth and development of fish species. Fish habitats in all Coastal Fishing Waters, as determined through marine and estuarine survey sampling, include:

(a) Anadromous fish nursery areas. Those areas in the riverine and estuarine systems utilized by post-larval and later juvenile anadromous fish.

(b) Anadromous fish spawning areas. Those areas where evidence of spawning of anadromous fish has been documented in Division sampling records through direct observation of spawning, capture of running ripe females, or capture of eggs or early larvae.

(c) Coral:

(i) Fire corals and hydrocorals (Class Hydrozoa);

(ii) Stony corals and black corals (Class Anthozoa, Subclass Scleractinia); or

(iii) Octocorals; Gorgonian corals (Class Anthozoa, Subclass Octocorallia), which include sea fans (Gorgonia sp.), sea whips (Leptogorgia sp. and Lophogorgia sp.), and sea pansies (Renilla sp.).

(d) Intertidal Oyster Bed. A formation, regardless of size or shape, formed of shell and live oysters of varying density.

(e) Live rock. Living marine organisms or an assemblage thereof attached to a hard substrate, excluding mollusk shells, but including dead coral or rock. Living marine organisms associated with hard bottoms, banks, reefs, and live rock include:

(i) Coralline algae (Division Rhodophyta);

(ii) Acetabularia sp., mermaid's fan and cups (Udotea sp.), watercress (Halimeda sp.), green feather, green grape algae (Caulerpa sp.) (Division Chlorophyta);

(iii) Sargassum sp., Dictyopteris sp., Zonaria sp. (Division Phaeophyta);

(iv) Sponges (Phylum Porifera);

(v) Hard and soft corals, sea anemones (Phylum Cnidaria), including fire corals (Class Hydrozoa), and Gorgonians, whip corals, sea pansies, anemones, Solengastrea (Class Anthozoa);

(vi) Bryozoans (Phylum Bryozoa);

(vii) Tube worms (Phylum Annelida), fan worms (Sabellidae), feather duster and Christmas treeworms (Serpulidae), and sand castle worms (Sabellaridae);

(viii) Mussel banks (Phylum Mollusca: Gastropoda); and

(ix) Acorn barnacles (Arthropoda: Crustacea: Semibalanus sp.).

(f) Nursery areas. Areas that for reasons such as food, cover, bottom type, salinity, temperature, and other factors, young finfish and crustaceans spend the major portion of their initial growing season. Primary nursery areas are those areas in the estuarine system where initial post-larval development takes place. These are areas where populations are uniformly early juveniles. Secondary nursery areas are those areas in the estuarine system where later juvenile development takes place. Populations are composed of developing sub-adults of similar size which have migrated from an upstream primary nursery area to the secondary nursery area located in the middle portion of the estuarine system.

(g) Shellfish producing habitats. Historic or existing areas that shellfish, such as clams, oysters, scallops, mussels, and whelks use to reproduce and survive because of such favorable conditions as bottom type, salinity, currents, cover, and cultch. Included are those shellfish producing areas closed to shellfish harvest due to pollution.

(h) Strategic Habitat Areas. Locations of individual fish habitats or systems of habitats that provide exceptional habitat functions or that are particularly at risk due to imminent threats, vulnerability, or rarity.

(i) Submerged aquatic vegetation (SAV) habitat. Submerged lands that:

(i) are vegetated with one or more species of submerged aquatic vegetation including bushy pondweed or southern naiad (Najas guadalupensis), coontail (Ceratophyllum demersum), eelgrass (Zostera marina), horned pondweed (Zannichellia palustris), naiads (Najas spp.), redhead grass (Potamogeton perfoliatus), sago pondweed (Stuckenia pectinata, formerly Potamogeton pectinatus), shoalgrass (Halodule wrightii), slender pondweed (Potamogeton pusillus), water stargrass (Heteranthera dubia), water starwort (Callitriche heterophylla), waterweeds (Elodea spp.), widgeongrass (Ruppia maritima), and wild celery (Vallisneria americana). These areas may be identified by the presence of above-ground leaves, below-ground rhizomes, or reproductive structures associated with one or more SAV species and include the sediment within these areas; or

(ii) have been vegetated by one or more of the species identified in Sub-item (4)(i)(i) of this Rule within the past 10 annual growing seasons and that meet the average physical requirements of water depth (six feet or less), average light availability (secchi depth of one foot or more), and limited wave exposure that characterize the environment suitable for growth of SAV. The past presence of SAV may be demonstrated by aerial photography, SAV survey, map, or other documentation. An extension of the past 10 annual growing seasons criteria may be considered when average environmental conditions are altered by drought, rainfall, or storm force winds.

This habitat occurs in both subtidal and intertidal zones and may occur in isolated patches or cover extensive areas. In defining SAV habitat, the Marine Fisheries Commission recognizes the Aquatic Weed Control Act of 1991 (G.S. 113A-220 et. seq.) and does not intend the submerged aquatic vegetation definition, or this Rule or Rules 03K .0304 and .0404, to apply to or conflict with the non-development control activities authorized by that Act.

(5) Licenses, permits, leases and franchises, and record keeping:

(a) Assignment. Temporary transferal to another person of privileges under a license for which assignment is permitted. The person assigning the license delegates the privileges permitted under the license to be exercised by the assignee, but retains the power to revoke the assignment at any time, and is still the responsible party for the license.

(b) Designee. Any person who is under the direct control of the permittee or who is employed by or under contract to the permittee for the purposes authorized by the permit.

(c) For Hire Vessel. As defined by G.S. 113-174, when the vessel is fishing in state waters or when the vessel originates from or returns to a North Carolina port.

(d) Logbook. Paper forms provided by the Division and electronic data files generated from software provided by the Division for the reporting of fisheries statistics by persons engaged in commercial or recreational fishing or for-hire operators.

~~(d)~~(e) Holder. A person who has been lawfully issued in his or her name a license, permit, franchise, lease, or assignment.

~~(e)~~(f) Land:

(i) For commercial fishing operations, when fish reach the shore or a structure connected to the shore.

(ii) For purposes of trip tickets, when fish reach a licensed seafood dealer, or where the fisherman is the dealer, when the fish reaches the shore or a structure connected to the shore.

(iii) For recreational fishing operations, when fish are retained in possession by the fisherman.

~~(f)~~(g) Licensee. Any person holding a valid license from the Department to take or deal in marine fisheries resources.

~~(g)~~(h) Master. Captain of a vessel or one who commands and has control, authority, or power over a vessel.

~~(h)~~(i) New fish dealer. Any fish dealer making application for a fish dealer license who did not possess a valid dealer license for the previous license year in that name. For purposes of license issuance, adding new categories to an existing fish dealers license does not constitute a new dealer.

~~(i) North Carolina Trip Ticket. Paper forms provided by the Division, and electronic data files generated from software provided by the Division, for the reporting of fisheries statistics that include quantity, method, and location of harvest.~~

(j) Office of the Division. Physical locations of the Division conducting license and permit transactions in Wilmington, Washington, Morehead City, Roanoke Island and Elizabeth City, North Carolina. Other businesses or entities designated by the Secretary to issue Recreational Commercial Gear Licenses or Coastal Recreational Fishing Licenses are not considered Offices of the Division.

(k) Responsible party. Person who coordinates, supervises, or otherwise directs operations of a business entity, such as a corporate officer or executive level supervisor of business operations, and the person responsible for use of the issued license in compliance with applicable statutes and rules.

(l) Tournament Organizer. The person who coordinates, supervises, or otherwise directs a recreational fishing tournament and is the holder of the Recreational Fishing Tournament License.

(m) Transaction. Act of doing business such that fish are sold, offered for sale, exchanged, bartered, distributed, or landed.

(n) Transfer. Permanent transferal to another person of privileges under a license for which transfer is permitted. The person transferring the license retains no rights or interest under the license transferred.

(o) Trip Ticket. Paper forms provided by the Division and electronic data files generated from software provided by the Division for the reporting of fisheries statistics by licensed fish dealers.

*Authority G.S. 113-134; 113-174; 143B-289.52*

**15A NCAC 03J .0208 NEW RIVER**

(a) It is unlawful to use trawl nets except skimmer trawls upstream of the Highway 172 Bridge over New River.

(b) It is unlawful to use ~~trawl nets~~ skimmer trawls upstream of the Highway 172 Bridge over New River from 9:00 P.M. through 5:00 A.M. ~~when opened by proclamation~~ from August 16 through November 30.

*Authority G.S. 113-134; 113-182; 143B-289.52*

**15A NCAC 03L .0101 ~~SEASON~~SHRIMP HARVEST RESTRICTIONS**

(a) It is unlawful to take shrimp ~~with nets~~ until the Fisheries Director, by proclamation, opens the ~~season~~ season.~~in various waters. Proclamations may specify any hours of day or night or both and any other conditions appropriate to management of the fishery. If sampling indicates primarily undersized shrimp or juveniles of any other species of major economic importance, the Fisheries Director may close such waters to shrimping and prohibit the use of nets for any purpose except cast nets as provided in 15A NCAC 3L .0102. Prominent landmarks or other permanent type markers shall be considered when establishing closure lines even if such lines extend beyond the area of concern.~~

(b) The Fisheries Director may, by proclamation, impose any or all of the following restrictions on the taking of shrimp:

(1) specify time;

(2) specify area;

(3) specify means and methods;

(4) specify season;

(5) specify size; and

(6) specify quantity.

*Authority G.S. 113-134; 113-182; 113-221; 143B-289.52*

**15A NCAC 03L .0103 PROHIBITED NETS, MESH ~~SIZES~~ LENGTHS AND AREAS**

(a) It is unlawful to take shrimp with nets with mesh lengths less than the following:

(1) Trawl net - one and one-half inches;

(2) Fixed nets, channel nets, float nets, butterfly nets, and hand seines - one and one-fourth inches; and

(3) Cast net - no restriction.

(b) It is unlawful to take shrimp with a net constructed in such a manner as to contain an inner or outer liner of any mesh ~~size.~~length. Net material used as chafing gear shall be no less than four inches mesh length except that chafing gear with smaller mesh may be used only on the bottom one-half of the tailbag. Such chafing gear shall not be tied in a manner that forms an additional tailbag.

(c) It is unlawful to take shrimp with trawls which have a combined headrope of greater than 90 feet in ~~internal coastal waters except:~~Internal Coastal Waters in the following areas:

(1) ~~Pamlico Sound;~~North of the 35° 46.3000' N latitude line;

(2) Core Sound south of a line beginning at a point 34° 59.7942' N - 76° 14.6514' W on Camp Point; running easterly to a point 34° 58.7853' N - 76° 09.8922' W on Core Banks; to the South Carolina State Line;

~~(2)~~(3) Pamlico River ~~downstream~~ upstream of a line from a point 35° 18.5882' N - 76° 28.9625' W at Pamlico Point; running northerly to a point 35° 22.3741' N - 76° 28.6905' W at Willow Point; and

~~(3)~~(4) Neuse River ~~northeast~~ southwest of a line from a point 34° 58.2000' N - 76° 40.5167' W at Winthrop Point on the eastern shore of the entrance to ~~Adam's Creek~~ Adams Creek; running northerly to a point 35° 01.0744' N - 76° 42.1550' W at Windmill Point at the entrance of Greens Creek at Oriental.

(d) Effective January 1, 2017 it is unlawful to take shrimp with trawls which have a combined headrope of greater than 220 feet in Internal Coastal Waters in the following areas:

(1) Pamlico Sound south of the 35° 46.3000' N latitude line and north of a line beginning at a point 34° 59.7942' N - 76° 14.6514' W on Camp Point; running easterly to a point 34° 58.7853' N - 76° 09.8922' W on Core Banks;

(2) Pamlico River downstream of a line from a point 35° 18.5882' N - 76° 28.9625' W at Pamlico Point; running northerly to a point 35° 22.3741' N - 76° 28.6905' W at Willow Point; and

(3) Neuse River northeast of a line from a point 34° 58.2000' N - 76° 40.5167' W at Winthrop Point on the eastern shore of the entrance to Adams Creek; running northerly to a point 35° 01.0744' N - 76° 42.1550' W at Windmill Point at the entrance of Greens Creek at Oriental.

~~(d)~~(e) It is unlawful to use a shrimp trawl in the areas described in 15A NCAC 03R .0114.

~~(e)~~(f) It is unlawful to use channel nets except as provided in 15A NCAC 03J .0106.

~~(f)~~(g) It is unlawful to use shrimp pots except as provided in 15A NCAC 03J .0301.

~~(g)~~(h) It is unlawful to use a shrimp trawl that does not conform with the federal rule requirements for Turtle Excluder Devices (TED) as specified in 50 CFR Part 222.102 Definitions, 50 CFR Part 223.205 (a) and Part 223.206 (d) Gear Requirements for Trawlers, and 50 CFR Part 223.207 Approved TEDs. Copies of these rules are available via the Code of Federal Regulations posted on the Internet at http://www.gpoaccess.gov/cfr/index.html and at the Division of Marine Fisheries, P.O. Box 769, Morehead City, North Carolina 28557 at no cost.

*Authority G.S. 113-134; 113-182; 143B-289.52*

**15A NCAC 03L .0105 RECREATIONAL SHRIMP LIMITS**

It is unlawful to:

(1) Possess from areas open to the harvest of shrimp more than 48 quarts, heads on or 30 quarts, heads off, of shrimp per person per day or if a vessel is used, per vessel per day for recreational purposes except as provided in 15A NCAC 03O .0303 (e) and (f).

~~(2) Take or possess shrimp from areas closed to the taking of shrimp except two quarts of shrimp per person per day may be taken while fishing in a closed area with a cast net.~~

(2) Take or possess more than four quarts, heads on or two and one-half quarts, heads off, of shrimp per person per day with a cast net from areas closed to the taking of shrimp in accordance with 15A NCAC 03L .0101.

*Authority G.S. 113-134; 113-182; 143B-289.52*

**15A NCAC 03R .0114 SHRIMP TRAWL PROHIBITED AREAS**

The shrimp trawl prohibited areas referenced in ~~15A NCAC 03L .0103(d)~~ 15A NCAC 03L .0103(e) are delineated in the following coastal water areas:

(1) Pungo River - all waters upstream of a line from a point 35° 23.3166' N - 76° 34.4833' W at Wades Point; running ~~westerly~~ easterly to a point 35° 23.6463' N - 76° 31.0003' W on the north shore of the entrance to Abels Bay.

(2) Pamlico River - all waters upstream of a line from a point 35° 20.5108' N - 76° 37.7218' W on the western shore of the entrance to Goose Creek; running northeasterly to a point 35° 23.3166' N - 76° 34.4833' W at Wades Point.

(3) Neuse River - all waters upstream of a line from a point 34° 56.3658' N - 76° 48.7110' W at Cherry Point; running northerly to a point 34° 57.9116' N - 76° 48.2240' W at ~~Wilkerson~~ Wilkinson Point.

(4) Shallotte River - all waters upstream of a line beginning at a point 33° 54.8285' N - 78° 22.3657' W on the west side of Shallotte River; running southeasterly to a point 33° 54.6276' N - 78° 21.7882' W on the east side of the river.

(5) Eastern Channel - all waters of Eastern Channel east and north of a line beginning at a point 33° 52.6734' N - 78° 28.7339' W at Jinks Creek; running southerly to a point 33° 52.5942' N - 78° 28.6759' W at Tubbs Inlet; and south and west of a line beginning at a point 33° 53.6266' N - 78° 26.6262' W; running easterly to a point 33° 53.6501' N - 78° 26.5635' W.

(6) Sunset Beach - all waters of the IWW west of a line beginning at a point 33° 52.9247' N - 78° 30.7041' W on the north end of the Highway 1172 Bridge; running southerly to a point 33° 52.8417' N - 78° 30.6490' W at the south end of the bridge.

(7) Calabash River - all waters west of a line beginning at a point 33° 53.4368' N - 78° 32.9720' W on the north end of the Highway 1164 Bridge; running southerly to a point 33° 53.3534' N - 78° 32.9720' W at the south end of the bridge.

*Authority G.S. 113-134; 113-182; 143B-289.52*

**FISCAL IMPACTS OF PROPOSED AMENDMENTS TO THE N.C. RIVER HERRING FISHERY MANAGEMENT PLAN**

**Rule Amendments:** 15A NCAC 03J .0209 ALBEMARLE SOUND/CHOWAN RIVER RIVER HERRING MANAGEMENT AREAS
15A NCAC 03O .0503 PERMIT CONDITIONS; SPECIFIC
15A NCAC 03M .0101 MUTILATED FINFISH
15A NCAC 03M .0513 RIVER HERRING
15A NCAC 03R .0115 ANADROMOUS FISH SPAWNING AREAS
15A NCAC 03R .0202 RIVER HERRING MANAGEMENT AREAS

**Name of Commission:** N.C. Marine Fisheries Commission

**Agency Contact:**
John Hadley, Fisheries Economics Program Manager
N.C. Division of Marine Fisheries
3441 Arendell Street
Morehead City, NC 28557
(252) 808-8107
john.hadley@ncdenr.gov

**Impact Summary:**
State government: No
Local government: No
Federal government: No
Substantial impact: No

**Authority:** North Carolina General Statues 113-134 (Rules); 113-182 (Regulation of Fishing and Fisheries); 113-221 (Rules)113-221.1 (Proclamations; Emergency Review); 143B-289.52 (Marine Fisheries Commission – Powers and Duties); North Carolina Marine Fisheries Commission Rules 15A NCAC 03O .0501 (Procedures and Requirements to Obtain Permits); 15A NCAC 03O .0502 (Permit Conditions; General); 15A NCAC 03O .0506 (Special Permit Required for Specific Management Purposes); 15A NCAC 03M . 0512 (Compliance with Fishery Management Plans); 15A NCAC .0513 (River Herring)

**Necessity:** In accordance with G.S. 113-182.1 (b) and (d), the proposed rule changes (see proposed rule text in the appendix) are necessary to amend and update the N.C. River Herring Fishery Management Plan (FMP) to ensure adequate management of the river herring resource in state waters. Specifically, the rule changes address two separate issues and propose to:

1) Modify 15A NCAC 03M .0101 and 03M .0513 to prohibit the possession of river herring (alewife and blueback herring) greater than six inches in length aboard a vessel or while engaged in fishing and remove river herring from the Mutilated Finfish rule;

2) Modify 15A NCAC 03J .0209, 03O .0503, and 03R .0115 as well as adopt 03R .0202 to reorganize rule placement for river herring management and address a change in the Anadromous Fish Spawning Areas.

The anticipated effective date of the proposed rule changes is May 1, 2015.

## 1. Possession of River Herring in Coastal Waters (15A NCAC 03M .0101 and 03M .0513)

### I. Summary

The proposed rule changes prohibit the possession of river herring (alewife and blueback herring) greater than six inches in length aboard a vessel or while engaged in fishing and remove river herring from the Mutilated Finfish rule. These rule changes aid in the enforcement of regulations regarding the use of river herring as bait in recreational fishing as well as align rules for river herring possession in coastal and joint waters with those of inland waters. While not quantified, the expected costs created by the proposed rule changes are expected to be minimal.

### II. Introduction and Purpose of Rule Changes

In response to declining populations of river herring (alewife and blue back herring), Amendment 1 to the N.C. River Herring FMP in 2007 implemented a commercial and recreational no-harvest provision in the joint and coastal waters of the state, with a limited discretionary harvest season for commercial fishermen in the spring of each year of up to 7,500 pounds. Both the N.C. Division of Marine Fisheries (NCDMF) and the N.C. Wildlife Resources Commission (NCWRC) have allowed anglers to continue to possess river herring for use as bait as long as they have a receipt from the bait/seafood dealer or tackle shop where purchased. Most, if not all of the river herring legally used for bait comes from other states, but some may be legally harvested during the discretionary harvest season and sold by licensed river herring dealers.

Law enforcement from both agencies indicated that possible enforcement loopholes have been created with the allowance of possession of river herring for bait. These loopholes may include anglers replacing legally purchased river herring with those taken illegally and falsifying receipts to include names of dealers that do not exist or inaccurate amounts purchased. Marine Patrol indicated that although these loopholes may exist in all waters of the state, the majority of the issues likely occur in areas where river herring are more abundant such as the Roanoke and Chowan rivers. In response, the NCWRC adopted two rule amendments that became effective Aug. 1, 2013 prohibiting the possession of river herring greater than six inches while boating on or fishing in inland waters.

The use of live river herring as bait to catch striped bass is popular in the upper portions of the Roanoke River Management Area and the taking of river herring less than six inches was implemented to allow for the use of stunted river herring found in Piedmont reservoirs while protecting anadromous blueback herring and alewife that exceed six inches in length. Stunted reservoir populations of river herring are present in John H. Kerr, Gaston, and Roanoke Rapids reservoirs. Anglers will often use cast nets to capture river herring from these Piedmont reservoirs prior to their fishing trips to use as live bait. The six-inch provision allows stunted river herring to be kept and used by anglers. In addition, a current regulation (15A NCAC 10C .0401 (c)) allows for the sale of river herring less than six inches collected from John H. Kerr Reservoir.

River herring are used as cut-bait in the striped bass fishery in the lower Roanoke River and to a lesser extent in some of the other river systems in the state. In inland waters it is unlawful, while fishing, to change the appearance of fish subject to size limits or daily creel limits or remove the head and/or tail from fish that are regulated by a size limit so that they may not be measured and/or identified. In joint and coastal waters, it is unlawful to possess aboard a

vessel, or while engaged in fishing from the shore or a pier, any species of finfish that is subject to a size or harvest restriction without having head and tail attached (except that mullet, hickory shad, blueback herring, or alewife, when used for bait, can be cut). Allowing river herring to be cut for bait is problematic as it makes it difficult for enforcement to determine the original length of the fish.

The proposed rule changes aim to protect adult anadromous river herring, while still allowing recreational fishermen the flexibility to use river herring for bait that are caught from healthy populations present in the Piedmont reservoirs. In doing so, a loophole is closed that currently facilitates the illegal use of anadromous river herring by allowing possession of such fish with a receipt. Additionally, when fish are cut into pieces for bait, it is very difficult to measure the size or quantity of baitfish in an angler's possession, thereby making it problematic to enforce bag or size limits. Removing river herring from the mutilated finfish rule (15A NCAC 03M .0101) provides law enforcement the ability to better account for size and possession of river herring being used as bait by requiring the fish to remain in a whole condition. Furthermore, the proposed rule changes align the N.C. Marine Fisheries Commission (NCMFC) rules with NCWRC rules for river herring to create a more uniform set of regulations for river herring throughout the coastal, joint, and inland waters of coastal river systems. Also, the proposed rule changes only prohibit the possession of river herring while fishing, thereby not prohibiting the personal consumption of legally harvested river herring regardless of size.

## III. Costs

NCDMF anticipates that costs from the proposed rule changes will be minor. The amount of large river herring that are sold as bait is unknown. However, a 2010 NCDMF survey found that anglers spend an average of $12 on bait per inshore fishing trip[1]. The use of river herring that are larger than six inches or for cut bait mostly occurs in the lower section of the Roanoke River Management Area (RRMA) during the spring striped bass harvest season[2]. In 2009, approximately 25,000 recreational fishing trips landing striped bass occurred in the entire RRMA, with a minor portion of these trips likely occurring in the lower section and using river herring as bait[3]. River herring is the preferred bait of some striped bass anglers, but several substitutes are readily available and used, including hickory and gizzard shad as well as artificial lures. There may be some costs to tackle shops and other bait retailers that sell river herring that are larger than six inches or for cut bait, but bait retailers will still be able to sell river herring six inches or less as well as other types of bait of similar cost, such as hickory shad, gizzard shad, and artificial lures, to anglers. It is likely that anglers will still purchase substitute bait, thereby mitigating any costs that may be imposed to anglers or bait retailers by the proposed rule changes.

[1]Crosson, Scott (July 2010). *A Social and Economic Survey of Recreational Saltwater Anglers in North Carolina.* North Carolina Department of Environment and Natural Resources. Division of Marine Fisheries. http://portal.ncdenr.org/c/document_library/get_file?uuid=b7469160-d5e9-458a-9d16-a5e7b76d7f31&groupId=38337

[2,3] North Carolina Department of Environment and Natural Resources (May 2013). North Carolina Division of Marine Fisheries. *North Carolina Estuarine Striped Bass Fishery Management Plan Amendment I.* *http://portal.ncdenr.org/c/document_library/get_file?uuid=d3fdf967-82d5-4653-8b79-20247c5ed5ad&groupId=38337*

## IV. Benefits

The proposed rule changes are designed to help maintain and rebuild depleted anadromous river herring populations. These changes will eliminate a legal loophole and aid law enforcement in enforcing river herring regulations while still allowing anglers to use river herring under six inches as bait. Additionally, the public will benefit from uniform river herring-possession rules in coastal, joint, and inland waters of coastal river systems in the state that fall under the jurisdiction of NCMFC and/or NCWRC. These rule changes will also maintain the possession of legally obtained river herring of any size for personal consumption.

## 2. River Herring Fishery Management Plan Rule Organization and Boundary Change (15A NCAC 03J .0209, 03O .0503, 03R .0115, and 03R. 0202)

## I. Summary

NCDMF proposes moving the regulations defining the location of the Albemarle Sound/Chowan River River Herring Management Areas from Subchapter 03J to Subchapter 03R within Title 15A of the N.C. Administrative Code for improved organization and public clarity. Additionally, a change to the boundary of the Anadromous Fish Spawning Areas of the Cashie River is needed for rule consistency with boundary changes previously made in a separate fishery management plan.

## II. Introduction and Purpose of Rule Changes

The description and boundaries of the Albemarle Sound/Chowan River River Herring Management Areas were originally placed in 15A NCAC 03J .0209 in 2001. Subchapter 03J of the N.C. Administrative Code contains rules for nets, pots, dredges, and other fishing devices for specific areas. NCDMF staff has identified a more appropriate subchapter for this rule in Subchapter 03R, Section .0200, which contains descriptive boundaries for fishery management areas and already includes the Striped Bass Management Areas, which coincide with River Herring Management Areas. Relocating the description and boundaries of the Albemarle Sound/Chowan River River Herring Management Areas to Subchapter 03R will maintain consistency with how fishery management area rules are organized. All of these areas will be listed together, making them easier for the public to find. The proposed rules also update a cross reference to this rule found in 15A NCAC 03O .0503.

Additionally, NCDMF made a change in the boundary between the Albemarle Sound Management Area and Roanoke River Management Area in the Cashie River for the management of striped bass that became effective June 1, 2013. This change was included in the N.C. Estuarine Striped Bass Fishery Management Plan Amendment 1 as part of an effort to make it easier for the public to identify the boundaries of the two different management areas that have different striped bass regulations. This point is also a boundary for the Anadromous Fish Spawning Areas, which include river herring. Therefore a rule change is needed to maintain consistency among rules but will not result in a change to the management of river herring.

## III. Costs

There are no expected costs associated with the proposed rule changes. NCDMF is proposing these rule changes to improve clarity to the public of the location and content of rules managing river herring. Management of the fishery will not change.

## IV. Benefits

While there are no quantifiable economic benefits to the proposed rule changes, rules for the management of river herring will be better placed, thereby making the rules easier to locate. Additionally, maintaining consistency among rules aids in rule clarity for the benefit of both the public and law enforcement.

## 3. Comprehensive Statement of Costs and Benefits

Rule changes associated with the River Herring Fishery Management Plan are expected to have aggregate costs and benefits well below the impact threshold of $1 million in aggregate costs and benefits meeting the statutory definition of a rule change with a substantial economic impact. Specifically:

1) Modification of 15A NCAC 03M .0101 and 03M .0513 will help maintain and rebuild depleted anadromous river herring populations by eliminating a legal loophole in the possession of adult anadromous river herring as bait and will aid law enforcement in enforcing river herring regulations while still allowing anglers to use river herring under six inches as bait. Additionally, the public will benefit from uniform river herring possession rules in coastal, joint, and inland waters of coastal river systems in the state that fall under the jurisdiction of NCMFC and/or NCWRC.

There may be some costs to tackle shops and other bait retailers that sell river herring larger than six inches or dead river herring to be used as cut bait. The use of river herring as cut bait and/or larger than six inches mostly occurs in the lower section of the Roanoke River Management Area (RRMA) during the spring striped bass harvest season[4]. In 2009, approximately 25,000 recreational fishing trips landing striped bass occurred in the entire RRMA, with a minor portion of these trips likely occurring in the lower section and using river herring bait[5]. The amount of river herring that are sold as bait is unknown, but a 2010 NCDMF survey found that anglers spend an average of $12 on bait per inshore fishing trip[6]. River herring is the preferred bait of some striped bass anglers, however several substitutes are readily available and used, including hickory and gizzard shad as well as artificial lures. There may be some costs to tackle shops and other bait retailers that sell river herring that are larger than six inches or for cut bait, but bait retailers will still be able to sell river herring six inches or

[4,5] North Carolina Department of Environment and Natural Resources (May 2013). North Carolina Division of Marine Fisheries. *North Carolina Estuarine Striped Bass Fishery Management Plan Amendment I.* *http://portal.ncdenr.org/c/document_library/get_file?uuid=d3fdf967-82d5-4653-8b79-20247c5ed5ad&groupId=38337*

[6]Crosson, Scott (July 2010). *A Social and Economic Survey of Recreational Saltwater Anglers in North Carolina.* North Carolina Department of Environment and Natural Resources. Division of Marine Fisheries. http://portal.ncdenr.org/c/document_library/get_file?uuid=b7469160-d5e9-458a-9d16-a5e7b76d7f31&groupId=38337

less, as well as other types of bait of similar cost, such as hickory shad, gizzard shad, and artificial lures, to anglers. It is likely that anglers will still purchase substitute bait, thereby mitigating any costs to anglers or bait retailers that may be imposed by the proposed rule changes.

2) Modification of 15A NCAC 03J .0209, 03O .0503, 03R .0115, and 03R. 0202 will make rules for the management of river herring better placed, thereby making the rules easier to locate. Additionally, maintaining consistency among rules aids in rule clarity for the benefit of both the public and law enforcement. There are no estimated costs for these proposed rule changes.

Table 1. Summary of estimated costs and benefits from proposed rule changes.

| **Rule** | **Estimated Cost** | **Estimated Benefit** |
|---|---|---|
| 15A NCAC 03M .0101 | Unquantified | Unquantified |
| 15A NCAC 03M .0513 | Unquantified | Unquantified |
| 15A NCAC 03J .0209 | None | Unquantified |
| 15A NCAC 03O .0503 | None | Unquantified |
| 15A NCAC 03R .0115 | None | Unquantified |
| 15A NCAC 03R .0202 | None | Unquantified |

## Appendix: Proposed Rule Changes

**15A NCAC 03J .0209 ALBEMARLE SOUND/CHOWAN RIVER RIVER HERRING MANAGEMENT AREAS**

~~(a) The Albemarle Sound Herring Management Area is defined as Albemarle Sound and all its joint water tributaries; Currituck Sound; Roanoke and Croatan sounds and all their joint water tributaries, including Oregon Inlet, north of a line beginning on the west shore at a point 35° 48.5015' N 75° 44.1228' W on Roanoke Marshes Point; running southeasterly to the east shore to a point 35° 44.1710' N 75° 31.0520' W on the north point of Eagles Nest Bay.~~

~~(b) The Chowan River Herring Management Area is defined as that area northwest of a line beginning on the west shore at a point 35° 59.9267' N 76° 41.0313' W on Black Walnut Point; running northeasterly to the east shore to a point 36° 02.2140' N 76° 39.3240' W on Reedy Point, to the North Carolina/Virginia state line; including the Meherrin River.~~

~~(c)~~ It is unlawful to use drift gill nets ~~in the Albemarle Sound and Chowan River river herring management areas~~ with a mesh length less than three inches from January 1 through May ~~15.~~15 in the Albemarle Sound and Chowan River river herring management areas defined in 15A NCAC 03R .0202.

*Authority G.S. 113-134; 113-182; 143B-289.52*

**15A NCAC 03M .0101 MUTILATED FINFISH**

It is unlawful to possess aboard a vessel or while engaged in fishing ~~from the shore or a pier~~ any species of finfish that is subject to a size or harvest restriction without having head and tail attached, except:

(1) mullet when used for bait;

(2) ~~blueback herring,~~ hickory shad ~~and alewife~~ when used for bait provided that not more than two ~~fish~~ hickory shad per ~~boat~~ vessel or fishing operation may be cut for bait at any one time; and

(3) tuna possessed in a commercial fishing operation as provided in 15A NCAC 03M .0520.

*Authority G.S. 113-134; 113-182; 143B-289.52*

**15A NCAC 03M .0513 RIVER HERRING**

It is unlawful to take or possess river herring ~~taken from coastal fishing waters unless the river herring season is open.~~from North Carolina Coastal Fishing Waters. Possession of river herring from sources other than North Carolina Coastal Fishing Waters shall be limited to fish less than or equal to six inches total length aboard a vessel or while engaged in fishing.

*Authority G.S. 113-134; 113-182; 113-221; 143B-289.52*

**15A NCAC 03O .0503 PERMIT CONDITIONS; SPECIFIC**

NOTE: CHANGES TO 15A NCAC 03O .0503 INCLUDE CHANGES FOR THE MANAGEMENT OF RIVER HERRING AND CHANGES TO FOR HIRE LICENSING WHICH ARE CONVERED IN A SEPARATE ANALYSIS.

(a) Horseshoe Crab Biomedical Use Permit:

(1) It is unlawful to use horseshoe crabs for biomedical purposes without first obtaining a permit.

(2) It is unlawful for persons who have been issued a Horseshoe Crab Biomedical Use Permit to fail to submit a report on the use of horseshoe crabs to the Division of Marine Fisheries due on February 1 of each year. Such reports shall be filed on forms provided by the Division and shall include a monthly account of the number of crabs harvested, statement of percent mortality up to the point of release, and a certification that harvested horseshoe crabs are solely used by the biomedical facility and not for other purposes.

(3) It is unlawful for persons who have been issued a Horseshoe Crab Biomedical Use Permit to fail to comply with the Atlantic States Marine Fisheries Commission Interstate Fishery Management Plan for Horseshoe Crab monitoring and tagging requirements for horseshoe crabs. Copies of this plan are available from the Atlantic States Marine Fisheries Commission or the Division of Marine Fisheries' Morehead City Headquarters Office, P.O. Box 769, 3441 Arendell St., Morehead City, North Carolina 28557-0769.

(b) Dealers Permits for Monitoring Fisheries under a Quota/Allocation:

(1) During the commercial season opened by proclamation or rule for the fishery for which a Dealers Permit for Monitoring Fisheries under a Quota/Allocation permit is issued, it is unlawful for the fish dealers issued such permit to fail to:

(A) fax or send via electronic mail by noon daily, on forms provided by the Division, the previous day's landings for the permitted fishery to the dealer contact designated on the permit. Landings for Fridays or Saturdays shall be submitted on the following Monday. If the dealer is unable to fax or electronic mail the required information, the permittee shall call in the previous day's landings to the dealer contact designated on the permit but shall maintain a log furnished by the Division;

(B) submit the required log to the Division upon request or no later than five days after the close of the season for the fishery permitted;

(C) maintain faxes and other related documentation in accordance with 15A NCAC 03I .0114;

(D) contact the dealer contact designated on the permit daily regardless of whether or not a transaction for the fishery for which a dealer is permitted occurred; and

(E) record the permanent dealer identification number on the bill of lading or receipt for each transaction or shipment from the permitted fishery.

(2) Striped Bass Dealer Permit:

(A) It is unlawful for a fish dealer to possess, buy, sell, or offer for sale striped bass taken from the following areas without first obtaining a Striped Bass Dealer Permit validated for the applicable harvest area:

(i) Atlantic Ocean;

(ii) Albemarle Sound Management Area as designated in 15A NCAC 03R .0201; and

(iii) the Joint and Coastal Fishing Waters of the Central/Southern Management Area as designated in 15A NCAC 03R .0201.

(B) No permittee shall possess, buy, sell, or offer for sale striped bass taken from the harvest areas opened by proclamation without having a North Carolina Division of Marine Fisheries issued valid tag for the applicable area affixed through the mouth and gill cover, or, in the case of striped bass imported from other states, a similar tag that is issued for striped bass in the state of origin. North Carolina Division of Marine Fisheries striped bass tags shall not be bought, sold, offered for sale, or transferred. Tags shall be obtained at the North Carolina Division of Marine Fisheries Offices. The Division of Marine Fisheries shall specify the quantity of tags to be issued based on historical striped bass landings. It is unlawful for the permittee to fail to surrender unused tags to the Division upon request.

(3) Albemarle Sound Management Area for River Herring Dealer Permit: It is unlawful to possess, buy, sell, or offer for sale river herring taken from the following area without first obtaining an Albemarle Sound Management Area for River Herring Dealer Permit: Albemarle Sound Management Area for River Herring as defined in ~~15A NCAC 03J .0209.~~15A NCAC 03R .0202.

(4) Atlantic Ocean Flounder Dealer Permit:

(A) It is unlawful for a fish dealer to allow vessels holding a valid License to Land Flounder from the Atlantic Ocean to land more than 100 pounds of flounder from a single transaction at their licensed location during the open season without first obtaining an Atlantic Ocean Flounder Dealer Permit. The licensed location shall be specified on the Atlantic Ocean Flounder Dealer Permit and only one location per permit shall be allowed.

(B) It is unlawful for a fish dealer to possess, buy, sell, or offer for sale more than 100 pounds of flounder from a single transaction from the Atlantic Ocean without first obtaining an Atlantic Ocean Flounder Dealer Permit.

(5) Black Sea Bass North of Cape Hatteras Dealer Permit. It is unlawful for a fish dealer to purchase or possess more than 100 pounds of black sea bass taken from the Atlantic Ocean north of Cape

Hatteras (35° 15.0321' N) per day per commercial fishing operation during the open season unless the dealer has a Black Sea Bass North of Cape Hatteras Dealer Permit.

(c) Blue Crab Shedding Permit: It is unlawful to possess more than 50 blue crabs in a shedding operation without first obtaining a Blue Crab Shedding Permit from the Division of Marine Fisheries.

(d) Permit to Waive the Requirement to Use Turtle Excluder Devices in the Atlantic Ocean:

(1) It is unlawful to trawl for shrimp in the Atlantic Ocean without Turtle Excluder Devices installed in trawls within one nautical mile of the shore from Browns Inlet (34° 35.7000' N latitude) to Rich's Inlet (34° 17.6000' N latitude) without a valid Permit to Waive the Requirement to Use Turtle Excluder Devices in the Atlantic Ocean when allowed by proclamation from April 1 through November 30.

(2) It is unlawful to tow for more than 55 minutes from April 1 through October 31 and 75 minutes from November 1 through November 30 in this area when working under this permit. Tow time begins when the doors enter the water and ends when the doors exit the water.

(3) It is unlawful to fail to empty the contents of each net at the end of each tow.

(4) It is unlawful to refuse to take observers upon request by the Division of Marine Fisheries or the National Marine Fisheries Service.

(5) It is unlawful to fail to report any sea turtle captured. Reports shall be made within 24 hours of the capture to the Marine Patrol Communications Center by phone. All turtles taken incidental to trawling shall be handled and resuscitated in accordance with requirements specified in 50 CFR 223.206, copies of which are available via the Internet at www.nmfs.gov and at the Division of Marine Fisheries, 127 Cardinal Drive Extension, Wilmington, North Carolina 28405.

(e) Pound Net Set Permits. Rule 15A NCAC 03J .0505 sets forth the specific conditions for pound net set permits.

(f) Aquaculture Operations/Collection Permits:

(1) It is unlawful to conduct aquaculture operations utilizing marine and estuarine resources without first securing an Aquaculture Operation Permit from the Fisheries Director.

(2) It is unlawful:

(A) to take marine and estuarine resources from Coastal Fishing Waters for aquaculture purposes without first obtaining an Aquaculture Collection Permit from the Fisheries Director.

(B) to sell, or use for any purpose not related to North Carolina aquaculture, marine and estuarine resources taken under an Aquaculture Collection Permit.

(C) to fail to submit to the Fisheries Director an annual report due on December 1 of each year on the form provided by the Division the amount and disposition of marine and estuarine resources collected under authority of this permit.

(3) Lawfully permitted shellfish relaying activities authorized by 15A NCAC 03K .0103 and .0104 are exempt from requirements to have an Aquaculture Operation or Collection Permit issued by the Fisheries Director.

(4) Aquaculture Operations/Collection Permits shall be issued or renewed on a calendar year basis.

(5) It is unlawful to fail to provide the Division of Marine Fisheries with a listing of all designees acting under an Aquaculture Collection Permit at the time of application.

(g) Scientific or Educational Activity Permit:

(1) It is unlawful for institutions or agencies seeking exemptions from license, rule, proclamation or statutory requirements to collect, hold, culture or exhibit for scientific or educational purposes any marine or estuarine species without first obtaining a Scientific or Educational Activity Permit.

(2) The Scientific or Educational Activity Permit shall only be issued for scientific or educational purposes and for collection methods and possession allowances approved by the Division of Marine Fisheries.

(3) The Scientific or Educational Activity Permit shall only be issued for approved activities conducted by or under the direction of Scientific or Educational institutions as defined in Rule 15A NCAC 03I .0101.

(4) It is unlawful for the responsible party issued a Scientific or Educational Activity Permit to fail to submit a report on collections and, if authorized, sales to the Division of Marine Fisheries due on December 1 of each year unless otherwise specified on the permit. The reports shall be filed on forms provided by the Division. Scientific or Educational Activity permits shall be issued on a calendar year basis.

(5) It is unlawful to sell marine or estuarine species taken under a Scientific or Educational Activity Permit without:

(A) the required license(s) for such sale;

(B) authorization stated on the permit for such sale; and

(C) providing the information required in Rule 15A NCAC 03I .0114 if the sale is to a licensed fish dealer.

(6) It is unlawful to fail to provide the Division of Marine Fisheries a listing of all designees acting under a Scientific or Educational Activity Permit at the time of application.

(7) The permittee or designees utilizing the permit shall call the Division of Marine Fisheries Communications Center at 800-682-2632 or 252-726-7021 not later than 24 hours prior to use of the permit, specifying activities and location.

(h) Under Dock Oyster Culture Permit:

(1) It is unlawful to cultivate oysters in containers under docks for personal consumption without first obtaining an Under Dock Oyster Culture Permit.

(2) An Under Dock Oyster Culture Permit shall be issued only in accordance with provisions set forth in G.S. 113-210(c).

(3) The applicant shall complete and submit an examination, with a minimum of 70 percent correct answers, based on an educational package provided by the Division of Marine Fisheries pursuant to G.S. 113-210(j). The examination demonstrates the applicant's knowledge of:

(A) the application process;

(B) permit criteria;

(C) basic oyster biology and culture techniques;

(D) shellfish harvest area closures due to pollution;

(E) safe handling practices;

(F) permit conditions; and

(G) permit revocation criteria.

(4) Action by an Under Dock Oyster Culture Permit holder to encroach on or usurp the legal rights of the public to access public trust resources in Coastal Fishing Waters shall result in permit revocation.

(i) Atlantic Ocean Striped Bass Commercial Gear Permit:

(1) It is unlawful to take striped bass from the Atlantic Ocean in a commercial fishing operation without first obtaining an Atlantic Ocean Striped Bass Commercial Gear Permit.

(2) It is unlawful to use a single Standard Commercial Fishing License, including assignments, to obtain more than one Atlantic Ocean Striped Bass Commercial Gear Permit during a license year.

(j) Coastal Recreational Fishing License Exemption Permit:

(1) It is unlawful for the responsible party seeking exemption from recreational fishing license requirements for eligible individuals to conduct an organized fishing event held in Joint or Coastal Fishing Waters without first obtaining a Coastal Recreational Fishing License Exemption Permit.

(2) The Coastal Recreational Fishing License Exemption Permit shall only be issued for recreational fishing activity conducted solely for the participation and benefit of one of the following groups of eligible individuals:

(A) individuals with physical or mental limitations;

(B) members of the United States Armed Forces and their dependents, upon presentation of a valid military identification card, for military appreciation;

(C) individuals receiving instruction on recreational fishing techniques and conservation practices from employees of state or federal marine or estuarine resource management agencies, or instructors affiliated with educational institutions; and

(D) disadvantaged youths.

For purposes of this Paragraph, educational institutions include high schools and other secondary educational institutions.

(3) The Coastal Recreational Fishing License Exemption Permit is valid for the date(s), time and physical location of the organized fishing event for which the exemption is granted and the time period shall not exceed one year from the date of issuance.

(4) The Coastal Recreational Fishing License Exemption Permit shall only be issued when all of the following, in addition to the information required in 15A NCAC 03O .0501, is submitted to the Fisheries Director in writing a minimum of 30 days prior to the event:

(A) the name, date(s), time and physical location of the event;

(B) documentation that substantiates local, state, or federal involvement in the organized fishing event, if applicable;

(C) the cost or requirements, if any, for an individual to participate in the event; and

(D) an estimate of the number of participants.

~~(k) For Hire Fishing Permit:~~

~~(1) It is unlawful to operate a For Hire Vessel unless the vessel operator possesses either the For Hire Blanket Coastal Recreational Fishing License (CRFL) for the vessel as provided in 15A NCAC 03O .0112 or a Division of Marine Fisheries For Hire Fishing Permit for the vessel.~~

~~(2) It is unlawful for a For Hire vessel operator to operate under the For Hire Fishing Permit without:~~

~~(A) holding the USCG certification required in 15A NCAC 03O .0501(g)(1);~~

~~(B) having the For Hire Fishing Permit for the vessel or copy thereof in possession and ready at hand for inspection; and~~

~~(C) having current picture identification in possession and ready at hand for inspection.~~

~~(3) It is unlawful for the permittee to fail to notify the Division within five days of any changes to information provided on the permit.~~

~~(4) It is unlawful to fail to display a current For Hire Fishing Permit decal mounted on an exterior surface of the vessel so as to be visible when viewed from the port side while engaged in for hire recreational fishing.~~

~~(5) The For Hire Fishing Permit is valid for one year from the date of issuance.~~

*Authority G.S. 113-134; 113-169.1; 113-169.3; 113-182; 113-210; 143B-289.52*

**15A NCAC 03R .0115 ANADROMOUS FISH SPAWNING AREAS**

The anadromous fish spawning areas as defined in 15A NCAC 03I .0101 and referenced in 15A NCAC 03N .0106 are delineated in the following ~~coastal waters:~~Coastal Fishing Waters:

(1) Currituck Sound Area:

(a) Northwest River - all waters of the Northwest River and its tributaries east of a line beginning on the north shore at a point 36º 30.8374' N - 76º 04.8770' W; running southerly to the south shore to a point 36º 30.7061' N - 76º 04.8916' W.

(b) Tull Bay/Tull Creek - all waters of Tull Bay and its tributaries northeast of a line beginning on the north shore at a point 36º 30.0991' N - 76º 04.8587' W; running southeasterly to the south shore to a point 36º 29.9599' N - 76º 04.7126' W; and south of a line beginning on the west shore at a point 36º 30.9867' N - 76º 02.5868' W; running easterly to the east shore to a point 36º 31.0045' N - 76º 02.3780' W; and west of a line beginning on the north shore at a point 36º 30.8291' N - 76º 02.1329' W; running southwesterly to the south shore to a point 36º 30.1512' N - 76º 02.4982' W.

(2) Albemarle Sound Area:

(a) Big Flatty Creek - all waters of Big Flatty Creek and its tributaries east of a line beginning on the north shore at a point 36º 09.3267' N - 76º 08.2562' W; running southerly to the south shore to a point 36º 08.9730' N - 76º 08.3175' W and north of a line beginning on the west shore at a point 36º 07.9621' N - 76º 07.1818' W; running easterly to the east shore to a point 36º 08.2706' N - 76º 06.2525' W.

(b) Batchelor Bay - west of a line beginning on the north shore at a point 35º 58.2070' N - 76º 42.7267' W; running southeasterly to the south shore to a point 35º 56.5622' N - 76º 41.5506' W.

(c) Bull Bay - southwest of a line beginning on the northwest shore at a point 35º 58.9002' N - 76º 23.9965' W; running southeasterly to the southeast shore at a point 35º 56.7198' N - 76º 18.8964' W.

(3) North River - all waters of the North River and its tributaries east of a line beginning on the north shore at a point 36º 18.7703' N - 75º 58.7384' W; running southerly to the south shore to a point 36º 18.4130' N - 75º 58.7228' W; and north of a line beginning on the west shore at a point 36º 16.9952' N - 75º 57.0758' W; running easterly to the east shore to a point 36º 16.9801' N - 75º 56.6820' W.

(4) Pasquotank River - all waters of the Pasquotank River and its tributaries south of a line beginning on the west shore at a point 36º 18.0768' N - 76º 13.0979' W; running easterly to the east shore along the south side of the Highway 158 Bridge to a point 36º 18.0594' N - 76º 12.9620' W; and northwest of a line beginning on the northeast shore at a point 36º 14.3294' N - 76º 04.7866' W; running southwesterly to the southwest shore to a point 36º 12.8147' N - 76º 07.0465' W.

(5) Pasquotank River Area:

(a) Charles Creek - north of a line beginning on the west shore at a point 36º 17.8090' N - 76º 13.0732' W; running easterly to the east shore to a point 36º 17.8024' N - 76º 13.0407' W.

(b) New Begun Creek - east of a line beginning on the north shore at a point 36º 13.3298' N - 76º 08.2878' W; running southerly to the south shore to a point 36º 13.0286' N - 76º 08.1820' W.

(6) Little River - all waters of the Little River and its tributaries southeast of a line beginning on the west shore at a point 36º 12.5237' N - 76º 16.9418' W; running southeasterly to the east shore to a point 36º 12.2950' N - 76º 17.1405' W; and north of a line beginning on the west shore at a point 36º 09.6537' N - 76º 15.0689' W; running northeast to the east shore to a point 36º 10.2112' N - 76º 14.0287' W.

(7) Perquimans River - all waters of the Perquimans River and its tributaries northeast of a line beginning on the west shore at a point 36º 11.6569' N - 76º 28.0055' W; running southeasterly to the east shore to a point 36º 11.6123' N - 76º 27.9382' W; and northwest of a line beginning on the

southwest shore at a point 36º 11.1512' N - 76º 27.4424' W; running northeasterly to the northeast shore to a point 36º 11.5124' N - 76º 26.7298' W.

(8) Perquimans River Area:

(a) Walter's Creek - northeast of a line beginning on the north shore at a point 36º 11.1305' N - 76º 27.9185' W; running southeasterly to the south shore to a point 36º 11.0224' N - 76º 27.6626' W.

(b) Mill Creek - south of a line beginning on the west shore at a point 36º 11.9766' N - 76º 27.2511' W; running easterly to the east shore to a point 36º 11.9757' N - 76º 27.5752' W.

(9) Yeopim River - all waters of the Yeopim River and its tributaries east of a line beginning on the north shore at a point 36º 05.4526' N - 76º 27.7651' W; running southerly to the south shore to a point on Norcum Point 36º 05.1029' N - 76º 27.7120' W; and west of a line beginning on the north shore at a point 36º 04.7426' N - 76º 24.2537' W; running southwesterly to the south shore to a point 36º 04.1137' N - 76º 24.5366' W.

(10) Yeopim River Area, Yeopim Creek - south of a line beginning on the west shore at a point 36º 04.7206' N - 76º 24.8396' W; running easterly to the east shore to a point 36º 04.7426' N - 76º 24.2536' W.

(11) Edenton Bay - all waters of Edenton Bay and its tributaries west of a line beginning on the north shore at a point 36º 03.3757' N - 76º 36.3629' W; running southerly to the south shore to a point 36º 03.3551' N - 76º 36.3574' W; and north of a line beginning on the west shore at a point 36º 02.1767' N - 76º 38.4058' W; running easterly to the east shore to a point 36º 02.0299' N - 76º 36.0445' W; and east of a line beginning on the west shore at a point 36º 03.2819' N - 76º 37.0138' W; running northeasterly to the east shore to a point 36º 03.4185' N - 76º 36.6783' W.

(12) Chowan River - all waters of the Chowan River and tributaries northwest of a line beginning on the west shore at a point 36º 02.3162' N - 76º 42.4896' W; running northeasterly to the east shore to a point 36º 03.1013' N - 76º 40.8732' W; and south of a line beginning on the west shore at a point 36º 32.6293' N - 76º 55.3564' W; and running to the east shore to a point 36º 32.6284' N - 76º 55.1757' W.

(13) Chowan River Area, Meherrin River - all waters of the Meherrin River and tributaries west of a line beginning on the north shore at a point 36º 25.9937' N - 76º 56.8884' W; running southerly to the south shore to a point 36º 25.7926' N - 76º 56.8966' W; and south of a line beginning on the west shore at a point 36º 32.7867' N - 77º 09.8885' W; running easterly to the east shore to a point 36º 32.7807' N - 77º 09.8565' W.

(14) Cashie River - all waters of the Cashie River and tributaries east of a line beginning on the north shore at a point 35º 54.7865' N - 76º 49.0521' W; running southerly to the south shore at a point 35º 54.6691' N - 76º 49.0553' W; west of a line beginning on the ~~north~~ west shore at a point ~~35º 56.4598' N - 76º 43.8093' W;~~ 35º 56.2934' N - 76º 44.1769' W; running ~~southerly~~ easterly to the north shore to a point on the north shore of an island in the mouth of the river 35º 56.2250' N - 76º

43.9265' W; west of a line beginning on the south shore at a point of an island in the mouth of the river 35º 56.1254' N - 76º 43.9846' W; running southerly to the south shore to a point 35º 56.0650' N - 76º 43.9599' W.

(15) Middle River - all waters of the Middle River southwest of a line beginning on the west shore at a point 35º 55.4000' N - 76º 43.8259' W; running southeasterly to the east shore to a point 35º 55.3977' N - 76º 43.6797' W.

(16) Eastmost River - all waters of the Eastmost River and its tributaries south of a line beginning on the west shore at a point 35º 56.5024' N - 76º 42.4877' W; running westerly to the east shore to a point 35º 56.4070' N - 76º 42.7647' W.

(17) Roanoke River - all waters of the Roanoke River and tributaries south of a line beginning on the west shore at a point 35º 56.5068' N - 76º 41.8858' W; running easterly to the east shore to a point 35º 56.5324' N - 76º 41.5896' W; and southeast of a line beginning on the west shore at a point 36º 12.5264' N - 77º 23.0223' W; running northeasterly to the east shore along the south side of the Highway 258 Bridge to a point 36º 12.5674' N - 77º 22.9724' W.

(18) Roanoke River Area:

(a) Warren Neck Creek - all waters of Warren Neck Creek and its tributaries west of a line beginning on the northwest shore at a point 35º 52.1820' N - 76º 47.4855' W; running southerly to the southeast shore to a point 35º 52.1448' N - 76º 47.4237' W.

(b) Thoroughfare - all waters of the Thoroughfare south of a line beginning on the west shore at a point 35º 54.0510' N - 76º 48.1206' W; running easterly to the east shore to a point 35º 54.0684' N - 76º 48.0613' W; and north of a line beginning on the west shore at a point 35º 53.2842' N - 76º 48.8650' W; running easterly to the east shore to a point 35º 55.2800' N - 76º 48.8077' W.

(c) Devils Gut - all waters of Devils Gut and its tributaries northwest of a line beginning on the west shore at a point 35º 49.5300' N - 76º 54.2209' W; running easterly to the east shore to a point 35º 49.5486' N - 76º 54.1703' W.

(d) Conine Creek - all waters of Conine Creek and its tributaries west of a line beginning on the north shore at a point 35º 52.9752' N - 76º 58.0474' W; running southwesterly to the south shore to a point 35º 52.9776' N - 76º 57.9958' W.

(19) Scuppernong River - all waters of the Scuppernong River and tributaries southeast of a line beginning on the northeast shore at a point 35º 56.7196' N - 76º 18.8964' W; running southwesterly to the southwest shore to a point 35º 56.3351' N - 76º 19.6609' W; and north of a line beginning on the west shore at a point 35º 54.0158' N - 76º 15.4605' W; running easterly to the east shore to a point 35º 54.0406' N - 76º 15.3007' W.

(20) Alligator River - all waters of the Alligator River and tributaries east of a line beginning on the north shore at Cherry Ridge Landing at a point 35º 42.2172' N - 76º 08.4686' W; running southerly to the south shore to a point 35º 42.1327' N - 76º 08.5002' W; and south of a line beginning on the

west shore at a point 35º 57.4252' N - 76º 00.8704' W; running easterly to the east shore to a point 35º 57.5494' N - 75º 56.8268' W.

(21) Alligator River Area, the Frying Pan - all waters of the Frying Pan and its tributaries west of a line beginning on the north shore at a point 35º 46.0777' N - 76º 03.3439' W; running southerly to the south shore to a point 35º 45.6011' N - 76º 03.3692' W.

(22) Neuse River - all waters of the Neuse River and its tributaries northwest of a line beginning on the west shore at a point 35° 08.8723' N - 77° 04.6700' W; running northeasterly to the east shore to a point 35° 09.1032' N - 77° 04.3355' W and southeast of a line at Pitch Kettle Creek beginning on the north shore at a point 35° 16.9793' N - 77° 15.5529' W; running south to the south shore to a point 35° 16.9237' N - 77° 15.5461' W.

(23) Neuse River Area:

(a) Smith Creek - north of a line beginning on the west shore at a point 35° 02.2439' N - 76° 42.3035' W; running easterly to the east shore to a point 35° 02.2392' N - 76° 42.1910' W.

(b) Kershaw Creek - north of a line beginning on the west shore at a point 35° 02.4197' N - 76° 43.7886' W; running easterly to the east shore to a point 35° 02.4218' N - 76° 43.7367' W.

(24) White Oak River - all waters north of a line beginning at a point on the west shore 34° 46.0728' N - 77° 08.9657' W; running easterly to a point on the east shore 34° 46.1431' N - 77° 08.8907' W; running north to the Coastal - Inland ~~waters~~ Fishing Waters boundary line beginning at a point on the west shore 34° 48.1466' N - 77° 11.4711' W; running northeasterly to a point on the east shore 34° 48.1620' N - 77° 11.4244' W.

(25) Cape Fear River - all waters north of a line beginning at a point on the west shore 34° 07.7034' N - 77° 57.3431' W; running easterly to a point on the east shore 34° 08.0518' N - 77° 55.7626' W; running north to the Joint - Inland ~~waters~~ Fishing Waters boundary on the following rivers:

(a) Cape Fear River - at a line beginning at a point on the west shore 34° 24.2628' N - 78° 17.6390' W; running northeasterly along the Lock and Dam ~~# 1~~ No. 1 to a point on the east shore 34° 24.2958' N - 78° 17.5634' W.

(b) Black River - at a line beginning at a point on the north shore 34° 22.0783' N - 78° 04.4123' W; running southeasterly to a point on the south shore 34° 21.9950' N - 78° 04.2864' W.

(c) Northeast Cape Fear River - at a line beginning at a point on the west side 34° 26.5658' N - 77° 50.0871' W; running northeasterly along the southern side of the ~~NC~~ Highway 210 Bridge to a point on the east side 34° 26.6065' N - 77° 49.9955' W.

*Authority G.S. 113-134; 113-182; 113-221; 143B-289.52*

**15A NCAC 03R .0202 RIVER HERRING MANAGEMENT AREAS**

(a) The Albemarle Sound River Herring Management Area referenced in 15A NCAC 03J .0209 is defined as the Coastal and Joint Fishing Waters of Albemarle, Currituck. Roanoke, Croatan and Pamlico sounds and all their joint water tributaries north of a line beginning on the west shore at a point 35° 48.5015' N - 75° 44.1228' W on Roanoke Marshes Point; running southeasterly to the east shore to a point 35° 44.1710' N - 75° 31.0520' W on the north point of Eagles Nest Bay.

(b) The Chowan River River Herring Management Area referenced in 15A NCAC 03J .0209 is defined as the area northwest of a line beginning on the west shore at a point 35° 59.9267' N - 76° 41.0313' W on Black Walnut Point; running northeasterly to the east shore to a point 36° 02.2140' N - 76° 39.3240' W on Reedy Point, to the North Carolina/Virginia state line; including the Meherrin River.

*Authority G.S. 113-134; 113-182; 143B-289.52*

**FISCAL IMPACTS OF PROPOSED AMENDMENTS TO THE N.C. BAY SCALLOP FISHERY MANAGEMENT PLAN**

**Rule Amendments:** 15A NCAC 03K .0111 PERMITS TO USE MECHANICAL METHODS FOR SHELLFISH ON SHELLFISH LEASES OR FRANCHISES
15A NCAC 03K .0206 PERMITS TO USE MECHANICAL METHODS FOR OYSTERS OR CLAMS ON SHELLFISH LEASES OR FRANCHISES
15A NCAC 03K .0303 PERMITS TO USE MECHANICAL METHODS FOR OYSTERS OR CLAMS ON SHELLFISH LEASES OR FRANCHISES REQUIREMENT
15A NCAC 03K .0501 BAY SCALLOP HARVEST MANAGEMENT
15A NCAC 03K .0502 TAKING BAY SCALLOPS AT NIGHT AND ON WEEKENDS
15A NCAC 03K .0507 MARKETING SCALLOPS TAKEN FROM SHELLFISH LEASES OR FRANCHISES
15A NCAC 03K .0508 SCALLOP SEASON AND HARVEST LIMIT EXEMPTION
15A NCAC 03O .0501 PROCEDURES AND REQUIREMENTS TO OBTAIN PERMITS

**Name of Commission:** N.C. Marine Fisheries Commission

**Agency Contact:** John Hadley, Fisheries Economics Program Manager
N.C. Division of Marine Fisheries
3441 Arendell Street
Morehead City, NC 28557
(252) 808-8107
john.hadley@ncdenr.gov

**Impact Summary:**

| | |
|---|---|
| State government: | No |
| Local government: | No |
| Federal government: | No |
| Substantial impact: | No |

**Authority:** North Carolina General Statues 113-134 (Rules); 113-168.4 (Sale of Fish); 113-169.1 (Permits for Gear, Equipment, and Other Specialized Activities Authorized; 113-182 (Regulation of Fishing and Fisheries); 113-201 (Legislative Findings and Declaration of Policy; Authority of Marine Fisheries Commission); 143B-289.52 (Marine Fisheries Commission – Powers and Duties); North Carolina Marine Fisheries Commission Rules 15A NCAC 03I .0101 (Definitions); 03K .0102 (Prohibited Rakes); 03K .0105 (Recreational Harvest of Shellfish); 03K .0501 (Bay Scallop Harvest Management); 03K .0502 Taking Bay Scallops at Night and on Weekends); 03K .0503 (Prohibited Bay Scallop Dredge); 03O .0501 (Procedures and Requirements to Obtain Permits); 03O .0502 (Permit Conditions; General)

**Necessity:** In accordance with G.S. 113-182.1 (b) and (d), the proposed rule changes (see proposed rule text in the appendix) are necessary to amend and update the N.C. Bay Scallop Fishery Management Plan (FMP) to ensure adequate management of the bay scallop resource in state waters. Specifically, the rule changes address two separate issues and propose to:

1) Modify 15A NCAC 03K .0501 to eliminate the open season for bay scallops from August 1 through September 15, adjust the maximum daily commercial harvest possession limit to be consistent with the adaptive management trip limit measures, and clarify proclamation authority of the Fisheries Director to manage bay scallop harvest.

2) Modify 15A NCAC 03K .0501, 03K .0502, and 03O .0501; adopt 03K .0111, 03K .0507, and 03K .0508; and repeal 03K .0206 as well as 03K .0303 to encourage bay scallop aquaculture in North Carolina. Specifically, these rule changes provide exemption for leaseholders and aquaculture operations from the public bottom commercial season, gear, and harvest limits for cultured bay scallops and allow the sale of bay scallops for further grow out.

The anticipated effective date of the proposed rule changes is May 1, 2015.

## 1. Bay Scallop Harvest Management (15A NCAC 03K .0501)

### I. Summary

The proposed rule change seeks to improve the management of the bay scallop fishery and population by removing the August 1 through September 15 season, adjusting the daily commercial harvest possession limit to be consistent with adaptive management trip limit measures, and clarifying proclamation authority in regards to the management of the bay scallop fishery. These measures will help improve public clarity of proclamation authority for the bay scallop fishery, may improve scallop yields and extend the scallop harvest throughout the season in years when the commercial season is opened, and help wild bay scallop populations recover. NCDMF expects costs associated with the rule change to vary from year to year but remain far below the $1 million per year substantial economic impact threshold (potential impacts discussed below).

### II. Introduction and Purpose of Rule Changes

North Carolina's bay scallops are listed as a species of concern in the annual Stock Status Report due to population declines[1]. The current management of the commercial and recreational fisheries for bay scallops includes an adaptive management strategy that opens by region (Pamlico Sound, Core Sound, Back Sound, and Bogue Sound to the state-line with South Carolina). The adaptive management strategy determines whether the season will open, sets the allowable gears, days of the week that the fishery is open, and length of the season based on target abundance levels of bay scallops according to N.C. Division of Marine Fisheries (NCDMF) field sampling (Table 1 and Table 2.)

[1] NCDMF Stock Status Report 2014. http://portal.ncdenr.org/web/mf/2014-stock-status-report.

Table 1. Current adaptive management measures for opening the bay scallop commercial fishery based on progressive triggers derived from NCDMF field sampling.

| Progressive triggers and target | Trip limit | Days open in the week | Allowed gears | Season |
|---|---|---|---|---|
| Less than 50% of target | No allowed harvest | | | |
| 50% or greater and less than 75% of target | 10 bushels per person per day not to exceed 20 bushels per fishing operation | Mon and Wed | By hand, hand rakes, hand tongs, dip net, and scoops | Last Monday in January to April 1st |
| 75% or greater and less than 125% of target | 10 bushels per person per day not to exceed 20 bushels per fishing operation | Mon, Tues, Wed, and Thurs | By hand, hand rakes, hand tongs, dip net, and scoops | Last Monday in January to April 1st |
| 125% or greater of target | 10 bushels per person per day not to exceed 20 bushels per fishing operation | Mon, Tues, Wed, and Thurs | By hand, hand rakes, hand tongs, dip net, and scoops | Last Monday in January to April 1st |
| | 15 bushels per person per day not to exceed 30 bushels per fishing operation | Mon and Wed | Bay scallop dredges as described by rule 15A NCAC 03K. 0503 | Delay opening until first full week in March after hand harvest removes scallops from shallow waters to April 1st |

Table 2. Current adaptive management measures for opening the bay scallop recreational fishery based on progressive triggers derived from NCDMF field sampling.

| Progressive triggers and target | Trip limit | Days open in week | Allowed gears | Season |
|---|---|---|---|---|
| Less than 50% target | No allowed harvest | | | |
| 50% or greater of target | 1 bushel per person per day not to exceed 1 bushel per recreational fishing operation | Thurs, Fri, Sat, and Sun | By hand, hand rakes, hand tongs, dip net, and scoops | Last Monday in January to April 1st |

Seasonal closures for bay scallops are intended to protect a portion of the stock in order to increase biomass and/or potential spawning for the next generation with the least impact to fishermen. This management measure has also been used by NCDMF for bay scallops in order to improve the economic yield to fishermen by opening the season when meat counts (number of scallop adductor meats/pound) are increasing. In bay scallops, adductor meat is the part of the bay scallop that is sold and consumed. Adductor meat weights tend to be lowest during the fall when gonad development is high[2].

[2] Kellogg, R. L. and D. Spitsbergen. 1983. Predicative growth model for the meat weight (adductor muscle) of bay scallops in North Carolina. Grant Number NA81AA-D-00026. Office of Sea Grant, NOAA. U. S. Department of Commerce and North Carolina Department of Administration. UNC Sea Grant Publication UNC-SG-83-6. Raleigh, NC. 44 pp.

Part of the modifications to rule 15A NCAC 03K .0501 will eliminate the August 1 to September 15 commercial and recreational bay scallop season that is allowable under certain circumstances under the current rule . NCDMF has not opened this late-summer bay scallop season since 2003 as a means to improve the yield of the fishery by delaying the harvest to a time when adductor meat yields are higher. The winter-to-early-spring season allows for the completion of spawning and an increase in meat size in order to obtain the highest yield. For this reason, the proposed rule would eliminate the late-summer season and restrict the opening of the bay scallop fishery to the winter-and-early-spring season only.

NCDMF also proposes lowering the commercial harvest limit from a maximum of 20 bushels per person per day or 40 bushels per commercial fishing operation to 15 bushels per person per day or 30 bushels per commercial fishing operation to be consistent with the N.C. Marine Fisheries Commission (NCMFC) selected adaptive management trip limit measures. The proposed rule change regarding bay scallop trip limits does not necessarily change the current management of the bay scallop fishery, but aligns with the selected management of the fishery and removes the ability to raise limits beyond what is being proposed in rule. These measures are designed to help preserve the bay scallop resource as well as prolong the commercial season for bay scallops by helping to extract the bay scallop resource at a slower pace in years of high bay scallop abundance, thereby helping to reduce the diminishing harvest of bay scallops often observed as the season progresses.

Additional rule changes to the proclamation authority for the management of the bay scallop fishery are put forth as part of an ongoing attempt to standardize rule language granting proclamation authority across NCMFC rules. NCDMF staff has identified that proclamation authority across several rules is often similar in nature; however, the specific rule language stating the proclamation authority often differs greatly from rule to rule. In an attempt to improve consistency across rules and public clarity of proclamation authority, NCDMF seeks to standardize rule language describing proclamation authority when possible.

## III. Costs

The proposed rule changes are expected to have variable – but minimal – costs. In many recent years, the bay scallop season has not opened at all due to populations being too low for harvest. In seven of the past ten years (2005 to 2014), no commercial bay scallop landings have been recorded. In two of the three years that the commercial bay scallop season was opened, recorded annual landings were valued at $124,296 and $9,506. In the third year, the landings value is not available for release due to confidentiality requirements as a result of the low number of participants or dealers in the fishery that year.[3] Based on the high variability of landings in the commercial bay scallop fishery, it is very difficult to predict costs stemming from the proposed rule changes with any confidence.

The proposed rules could impose some costs on fishermen in years that the fishery is opened and bay scallops are abundant due to the proposed limits restricting fishermen to five fewer bushels of bay scallops per person per day or 10 fewer bushels of bay scallops per commercial fishing operation per day. The yield of adductor meat per bushel varies, as does the quality of

[3] When the number of participants or dealers in a fishery or area being examined is less than three, landings and value information may not be provided to the general public in order to maintain compliance with N.C. General Statute § 113-170.3.

the meat; however, assuming each bushel of scallops yields five pounds of adductor meat[4] that has an ex-vessel value of approximately $7 per pound[5], each bushel of bay scallops has an ex-vessel value of approximately $35. Based on these estimates, fishermen may face up to $175 per trip in reduced bay scallop landings and/or each fishing operation may face up to $350 per trip in reduced bay scallop landings. This should be viewed as an upper-bound cost estimate, as the season for bay scallops is not opened every year, and when the season is opened, the trip limit has not often been set above 15 bushels per fisherman or 30 bushels per fishing operation. Also, some of these costs may be offset from an extended harvest for commercial bay scallop fishermen and/or by improved prices for bay scallops due to less likelihood of flooding the bay scallop market.

The elimination of the fall season for bay scallops may impose some costs for both commercial and recreational participants by prohibiting fishermen from earning income from bay scallops or recreating by taking bay scallops during this season. While participants in the commercial and recreational fishery may face some costs from the permanent closure of the fall fishery, these costs are expected to be offset by increases in the adductor meat yield per scallop from bay scallops harvested later during the winter season.

### IV. Benefits

This proposed rule change will help improve public clarity of proclamation authority for the bay scallop fishery. Additionally this rule change may improve bay scallop yields and price, extend the bay scallop harvest throughout the season in years when the season is opened, and help wild bay scallop populations recover.

## 2. Private Culture Exemptions for Bay Scallops (15A NCAC 03K .0111, 03K .0206, 03K .0303, 03K .0501, 03K .0502, 03K .0507, 03K .0508, and 03O .0501)

### I. Summary

The proposed rule changes are to modify 15A NCAC 03K .0501, 03K .0502, and 03O .0501; adopt 03K .0111, 03K .0507, and 03K .0508; and repeal 03K .0206 as well as 03K .0303 to introduce new shellfish leaseholder rules to exempt bay scallop harvest from the public commercial season and daily harvest limits, and allow the sale of bay scallop seed for further grow out. NCDMF is proposing these rule changes to promote the aquaculture of bay scallops.

### II. Introduction and Purpose of Rule Changes

NCDMF has observed an increased interest in bay scallop culture in North Carolina in recent years. With wild bay scallop populations being consistently low, fishermen are seeking alternative methods to harvest bay scallops. Commercial culture of bay scallops is administered through the shellfish lease program; however, commercial bay scallop culture is not currently practiced on any North Carolina shellfish leases.

[4] MacKenzie, Jr. , C. 2008. The Bay Scallop, Argopecten irradians, Massachusetts Through North Carolina: Its Biology and the History of Its Habitats and Fisheries. Marine Fisheries Review, 70(3-4), pp. 5-79.

[5] 2013 NCDMF Trip Ticket Program Data.

N.C. Marine Fisheries Commission rules are in place that exempt oysters and clams from season and harvest restrictions in oyster and clam aquaculture operations. Bay scallop aquaculture operations are not exempt from the regular commercial season and daily harvest limits. The lack of exemption limits shellfish leaseholders and franchise owners to only the open commercial public harvest period, which does not open in some years due to low populations of wild bay scallops. One pilot study to culture bay scallops in Core Sound found that bay scallops would likely expire naturally before the harvest season could be opened due to their short lifespan[6]. Shellfish leases and franchises are able to apply for permits to harvest oysters and clams by mechanical harvest methods, but existing rules do not authorize the use of mechanical methods for the harvest of bay scallops.

To address the issue of utilizing mechanical harvest methods on shellfish leases and franchises with bay scallops, NCDMF proposes repealing 15A NCAC 03K .0206 and 03K .0303 and replacing those rules with 03K .0111 and rule changes in 03O .0501 to be inclusive of all shellfish leases and franchises, not just those for oysters and clams. Additionally, NCDMF is proposing to adopt 03K .0508 and amend 03K .0501 and 03K .0502 to exempt bay scallops grown on private bottom from provisions implemented to protect wild bay scallop populations. These rule changes will allow shellfish lease and franchise holders to possess bay scallops outside of the commercial wild-harvest season, on weekends, and in numbers above the wild-harvest commercial limits for both adult and seed specimens. As an additional measure for these exemptions, NCDMF is proposing to adopt 15A NCAC 03K .0507 to require proper documentation of grown bay scallops for law enforcement purposes. It is worth noting that in the absence of the proposed rule changes, bay scallop aquaculture will likely not occur on a commercial scale, as provisions are needed to exempt these cultured scallops from regulations aimed at regulating wild harvest.

## III. Costs

NCDMF expects costs stemming from the proposed rule changes to be minimal. There is little risk to the wild bay scallop population from the cultivation of bay scallops, as there are disease assessment protocols in place for importation of seed shellfish to prevent the spread of disease to both cultivated and wild shellfish populations. Furthermore, NCDMF staff is not aware of incidences of cultivated native species of shellfish in North Carolina or surrounding states negatively impacting wild shellfish populations.

There are currently no commercial aquaculture operations that grow bay scallops outside of experimental test plots. Therefore, rule changes will not affect or impose costs on current shellfish growers. The proposed rule changes do require reporting and documentation for operations that may be interested in commercial-scale growing of bay scallops; however, these requirements are identical to those required for the growing of clams and oysters. Consequently, NCDMF expects the incremental costs of the reporting requirements within the proposed rules to be minor, and shellfish growers will likely be familiar with the process.

For shellfish lease or franchise reporting requirements, upon annual payment for leased public water column or bottom, a lease holder must report the amount of shellfish harvested from a lease as well as the amount of cultch planted if applicable. Additionally, lease holders must

[6] Hooper, M. 2011. Pilot project to investigate the feasibility of bay scallop (*Argopecten irradians*) mariculture in coastal North Carolina. North Carolina Fishery Resource Grant.06-AM-08. North Carolina Sea Grant. Raleigh, NC. 11 pp.

provide buyers of their product with certification that the shellfish were harvested from their lease. The amount of time needed and resulting opportunity cost to meet this reporting requirement will vary among individuals depending on recordkeeping efforts. NCDMF estimates that these reporting requirements will require 10 or fewer hours per year per lease. As an upper estimate of the opportunity cost per operation due to reporting requirements within the proposed rule language, a shellfish grower would incur approximately $195 in opportunity costs per year per lease, assuming only bay scallops were grown on a shellfish lease. This estimate is based on the US Bureau of Labor Statistics 2013 mean hourly wage for farming, fishing, and forestry workers of $13.09 per hour[7] and benefits equivalent to approximately 33% of total compensation[8].

There are currently 242 active public bottom or water column leases in North Carolina. NCDMF expects that the extent to which the aquaculture of bay scallops will be carried out will likely be relatively low in the first five years after implementation, as it will likely take several years to achieve bay scallop growing practices that provide an adequate return on investment for growers. Additionally, bay scallops will likely be grown on leases with other shellfish. Therefore, reporting requirements may be for shellfish other than bay scallops and would fall outside the scope of the proposed rule changes. Therefore, it is difficult to estimate with certainty the total opportunity costs that may be imposed by reporting requirements specifically for cultured bay scallops. The sensitivity analysis presented in Table 3, however, provides what NCDMF expects to be a reasonable range for these opportunity costs. Overall opportunity costs from meeting reporting requirements for leases due to the proposed rule changes are not expected to be above $7,100 annually.

Table 3. Sensitivity analysis of estimated opportunity costs being imposed by reporting requirements in proposed rule changes for the culture of bay scallops.

| Percent of Total Reporting Requirement Stemming from Cultured Bay Scallops | Estimated Opportunity Cost |
|---|---|
| 5% | $2,360 |
| 7.5% | $3,539 |
| 10% | $4,719 |
| 12.5% | $5,899 |
| 15% | $7,079 |

## IV. Benefits

Allowing bay scallops to be harvested on shellfish leases and franchises outside of the public open season, above the daily harvest limits, and with mechanical gear, may benefit shellfish growers economically, encourage production for markets outside of the regular season, take some pressure off the wild stock, and will make the management practice of growing bay scallops consistent with other shellfish species grown on shellfish leases and franchises. It is difficult to quantify the benefits of the proposed rule changes, as commercial bay scallop aquaculture is currently not occurring in North Carolina. NCDMF staff estimate that with the proposed rule changes in place and improved growing practices, it is feasible that bay scallop

[7] United States Department of Labor Bureau of Labor Statistics. May 2013 State Occupational Employment and Wage Estimates North Carolina. http://www.bls.gov/oes/current/oes_nc.htm#45-0000.
[8] United States Department of Labor Bureau of Labor Statistics. Employer Costs for Employee Compensation- March 2014. http://www.bls.gov/news.release/pdf/ecec.pdf.

aquaculture in the state could produce a bay scallop harvest worth tens of thousands of dollars or more annually.

**3. Comprehensive Statement of Costs and Benefits**

Rule changes associated with the Bay Scallop Fishery Management Plan are expected to have aggregate costs and benefits below the impact threshold of $1 million in aggregate costs and benefits considered a rule change with a substantial economic impact. Specifically:

1) Modification of 15A NCAC 03K .0501 helps improve public clarity of proclamation authority for the bay scallop fishery. Additionally this rule change may improve scallop yields and price, extend the bay scallop harvest when the season is opened, and help bay scallop populations recover. Costs associated with this rule change are expected to be variable but relatively minor. Some costs will be imposed in years that the fishery is opened due to fishermen being limited up to five fewer bushels of bay scallops per person per day or 10 fewer bushels of bay scallops per commercial fishing operation, should these bay scallops be caught or able to be caught on commercial trips.

2) Modification of 15A NCAC 03K .0501, 03K .0502, and 03O .0501; adoption of 03K .0111, 03K .0507, and 03K .0508; and repeal of 03K .0206 and 03K .0303 will help encourage the cultivation of bay scallops in North Carolina. This will benefit leaseholders economically, encourage production for markets outside of the regular season, may take some pressure off the wild stock, and will make the management practice of growing bay scallops consistent with other shellfish species grown on shellfish leases and franchises. While the extent to which bay scallops will be cultured after the rule changes are in place is unknown, it is feasible that bay scallop aquaculture in the state could produce bay scallop meat worth tens of thousands of dollars or more annually. There will be no immediate costs incurred by the proposed rule changes, as there are no commercial shellfish production operations currently growing bay scallops. Growers would incur some costs in the future due to reporting requirements for operations growing bay scallops; however, these requirements are identical to those required for the growing of clams and oysters. NCDMF expects overall costs to be $7,100 or less annually.

Table 1. Summary of estimated costs and benefits from proposed rule changes.

| Rule | Estimated Cost | Estimated Benefit |
|---|---|---|
| 15A NCAC 03K .0111 | Unquantified | Unquantified |
| 15A NCAC 03K .0206 | Unquantified | Unquantified |
| 15A NCAC 03K .0303 | Unquantified | Unquantified |
| 15A NCAC 03K .0501 | Unquantified | Unquantified |
| 15A NCAC 03K .0502 | Unquantified | Unquantified |
| 15A NCAC 03K .0507 | Unquantified | Unquantified |
| 15A NCAC 03K .0508 | Up to $7,100 annually | Unquantified |
| 15A NCAC 03O .0501 | Unquantified | Unquantified |

## Appendix: Proposed Rule Changes

**15A NCAC 03K .0111 PERMITS TO USE MECHANICAL METHODS FOR SHELLFISH ON SHELLFISH LEASES OR FRANCHISES**

(a) Permits to Use Mechanical Methods for Shellfish on Shellfish Leases or Franchises shall be issued in compliance with the general rules governing all permits in 15A NCAC 03O .0500. The procedures and requirements for obtaining permits are also found in 15A NCAC 03O .0500.

(b) It is unlawful to harvest shellfish by the use of mechanical methods from shellfish leases or franchises without first obtaining a Permit to Use Mechanical Methods for Shellfish on Shellfish Leases or Franchises.

*Authority G.S. 113-134; 113-169.1; 113-182; 143B-289.52*

15A NCAC 03K .0206 is proposed for repeal as follows:

**15A NCAC 03K .0206 PERMITS TO USE MECHANICAL METHODS FOR OYSTERS OR CLAMS ON SHELLFISH LEASES OR FRANCHISES**

~~(a) Permits to Use Mechanical Methods for Oysters or Clams on Shellfish Leases or Franchises shall be issued in compliance with the general rules governing all permits in 15A NCAC 03O .0500. The procedures and requirements for obtaining permits are also found in 15A NCAC 03O .0500.~~

~~(b) It is unlawful to harvest oysters by the use of mechanical methods from shellfish leases or franchises without first obtaining a Permit to Use Mechanical Methods for Oysters or Clams on Shellfish Leases or Franchises.~~

*Authority G.S. 113-134; 113-182; 143B-289.52*

15A NCAC 03K .0303 is proposed for repeal as follows:

**15A NCAC 03K .0303 PERMITS TO USE MECHANICAL METHODS FOR OYSTERS OR CLAMS ON SHELLFISH LEASES OR FRANCHISES REQUIREMENT**

~~(a) Permits to Use Mechanical Methods for Oysters or Clams on Shellfish Leases or Franchises shall be issued in compliance with the general rules governing all permits in 15A NCAC 03O .0500. The procedures and requirements for obtaining permits are also found in 15A NCAC 03O .0500.~~

~~(b) It is unlawful to harvest hard clams by the use of mechanical methods from shellfish leases or franchises without first obtaining a Permit to Use Mechanical Methods for Oysters or Clams on Shellfish Leases of Franchises.~~

*Authority G.S. 113-134; 113-182; 143B-289.52*

**15A NCAC 03K .0501 BAY ~~SCALLOPS - SEASONS AND~~ SCALLOP HARVEST ~~LIMITS~~ MANAGEMENT**

~~(a) The Fisheries Director may, by proclamation, specify open seasons and methods for the taking of bay scallops during the following periods:~~

~~(1) From the last Monday in January through the last Friday in May; and~~

~~(2) From August 1 through September 15 by hand harvest methods only as described by proclamation.~~

~~(b)~~ The Fisheries Director may, by proclamation, impose any or all of the following restrictions for ~~any~~ commercial or recreational ~~open season:~~bay scallop harvest from public bottom:

(1) ~~Specify number of days;~~ specify time;

(2) ~~Specify areas;~~ specify area;

(3) ~~Specify means and methods which may be employed in the taking;~~ specify means and methods;

(4) ~~Specify time period; and~~ specify open seasons for the taking of bay scallops during the period beginning the last Monday in January and ending the last Friday in May;

(5) specify size; and

~~(5)~~(6) ~~Specify the~~ specify quantity, but shall not exceed possession of more than ~~20~~ 15 standard U.S. bushels per person per day or a total of ~~40~~ 30 standard U.S. bushels in any combined commercial fishing operation per day.

*Authority G.S. 113-134; 113-182; ~~113-221;~~ 113-201; 113-221.1; 143B-289.52*

**15A NCAC 03K .0502 TAKING BAY SCALLOPS AT NIGHT AND ON WEEKENDS**

(a) It is unlawful to take bay scallops between sunset and sunrise, or on Saturdays or Sundays, except as provided in 15A NCAC 03K .0105.

(b) Bay scallops taken on Saturdays or Sundays from shellfish leases or franchises in accordance with G.S. 113-208 are exempt from this Rule.

*Authority G.S. 113-134; 113-182; ~~113-221;~~ 143B-289.52*

**15A NCAC 03K .0507 MARKETING SCALLOPS TAKEN FROM ~~PRIVATE~~ SHELLFISH ~~BOTTOM~~ LEASES OR FRANCHISES**

(a) It is unlawful to sell, purchase or possess scallops during the closed season without the lease or franchise holder delivering to the purchaser or other recipient a certification, on a form provided by the Division, that the scallops were taken from a valid shellfish lease or franchise. Certification forms shall be furnished by the Division to lease and franchise holders upon request.

(b) It is unlawful for lease or franchise holders or their designees to take or possess scallops from public bottom while possessing aboard a vessel scallops taken from shellfish leases or franchises.

*Authority G.S. 113-134; 113-182; 113-201; 143B-289.52*

**15A NCAC 03K .0508 SCALLOP SEASON AND HARVEST LIMIT EXEMPTION**

The following exemptions and restrictions shall apply to the possession, sale, purchase or transport of scallops produced in an aquaculture operation:

(1) Possession and sale of scallops by a scallop aquaculture operation shall be exempt from restrictions set under 15A NCAC 03K .0501, .0504, and .0505.

(2) Purchase and possession of scallops from a scallop aquaculture operation shall be exempt from restrictions set under 15A NCAC 03K .0501, .0504, and .0505.

(3) It is unlawful for a person to possess, sell, purchase, or transport scallops described in Sub-Items (1) and (2) of this Rule unless in compliance with all conditions of the Aquaculture Operation Permit.

*Authority G.S. 113-134; 113-182; 143B-289.52*

**15A NCAC 03O .0501 PROCEDURES AND REQUIREMENTS TO OBTAIN PERMITS**

(a) To obtain any Marine Fisheries permit, the following information is required for proper application from the applicant, a responsible party or person holding a power of attorney:

(1) Full name, physical address, mailing address, date of birth, and signature of the applicant on the application. If the applicant is not appearing before a license agent or the designated Division contact, the applicant's signature on the application shall be notarized;

(2) Unexpired picture identification of applicant, responsible party and, when applicable, person holding a power of attorney. Acceptable forms of picture identification are driver's license, North Carolina Identification card issued by the North Carolina Division of Motor Vehicles, military identification card, resident alien card (green card) or passport or if applying by mail, a copy thereof;

(3) Full names and dates of birth of designees of the applicant who will be acting under the requested permit where that type permit requires listing of designees;

(4) Certification that the applicant and his designees do not have four or more marine or estuarine resource convictions during the previous three years;

(5) For permit applications from business entities:

(A) Business Name;

(B) Type of Business Entity: Corporation, partnership, or sole proprietorship;

(C) Name, address and phone number of responsible party and other identifying information required by this Subchapter or rules related to a specific permit;

(D) For a corporation, current articles of incorporation and a current list of corporate officers when applying for a permit in a corporate name;

(E) For a partnership, if the partnership is established by a written partnership agreement, a current copy of such agreement shall be provided when applying for a permit; and

(F) For business entities, other than corporations, copies of current assumed name statements if filed and copies of current business privilege tax certificates, if applicable; and

(6) Additional information as required for specific permits.

(b) A permittee shall hold a valid Standard or Retired Standard Commercial Fishing License in order to hold a:

(1) Pound Net Permit;

(2) Permit to Waive the Requirement to Use Turtle Excluder Devices in the Atlantic Ocean; or

(3) Atlantic Ocean Striped Bass Commercial Gear Permit.

(c) A permittee and his designees shall hold a valid Standard or Retired Standard Commercial Fishing License with a Shellfish Endorsement or a Shellfish License in order to hold a:

(1) Permit to Transplant Prohibited (Polluted) Shellfish;

(2) Permit to Transplant Oysters from Seed Oyster Management Areas;

(3) Permit to Use Mechanical Methods for ~~Oysters or Clams~~ Shellfish on Shellfish Leases or Franchises;

(4) Permit to Harvest Rangia Clams from Prohibited (Polluted) Areas; or

(5) Depuration Permit.

(d) A permittee shall hold a valid:

(1) Fish Dealer License in the proper category in order to hold Dealer Permits for Monitoring Fisheries Under a Quota/Allocation for that category; and

(2) Standard Commercial Fishing License with a Shellfish Endorsement, Retired Standard Commercial Fishing License with a Shellfish Endorsement or a Shellfish License in order to harvest clams or oysters for depuration.

(e) Aquaculture Operations/Collection Permits:

(1) A permittee shall hold a valid Aquaculture Operation Permit issued by the Fisheries Director to hold an Aquaculture Collection Permit.

(2) The permittee or designees shall hold appropriate licenses from the Division of Marine Fisheries for the species harvested and the gear used under the Aquaculture Collection Permit.

(f) Atlantic Ocean Striped Bass Commercial Gear Permit:

(1) ~~Application for an Atlantic Ocean Striped Bass Commercial Gear Permit must be made prior to November 1 of each year. A person shall declare one of the following gears for an initial Atlantic Ocean Striped Bass Commercial Gear Permit~~ Upon application for an Atlantic Ocean Striped Bass Commercial Gear Permit, a person shall declare one of the following gears for an initial permit and at intervals of three consecutive license years thereafter:

(A) gill net;

(B) trawl; or

(C) beach seine.

For the purpose of this Rule, a beach seine is defined as a swipe net constructed of multi-filament or multi-fiber webbing fished from the ocean beach that is deployed from a vessel launched from the ocean beach where the fishing operation takes place.

Gear declarations are binding on the permittee for three consecutive license years without regard to subsequent annual permit issuance.

(2) A person is not eligible for more than one Atlantic Ocean Striped Bass Commercial Gear Permit regardless of the number of Standard Commercial Fishing Licenses, Retired Standard Commercial Fishing Licenses or assignments held by the person.

~~(3) The annual, nonrefundable permit fee is ten dollars ($10.00).~~

~~(g) For Hire Fishing Permit:~~

~~(1) The permittee shall hold a valid certification from the United States Coast Guard (USCG) that allows carrying six or fewer passengers or a certification from the USCG that allows carrying more than six passengers;~~

~~(2) The permittee shall provide valid documentation papers or current motor boat registration or copies thereof for the vessel engaged as for hire. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted.~~

~~(h)~~(g) Applications submitted without complete and required information shall not be processed until all required information has been submitted. Incomplete applications shall be returned to the applicant with deficiency in the application so noted.

~~(i)~~(h) A permit shall be issued only after the application has been deemed complete by the Division of Marine Fisheries and the applicant certifies to abide by the permit general and specific conditions established under ~~15A NCAC 03J .0501, 03J .0505, 03K .0103, 03K .0104, 03K .0107, 03K .0206, 03K .0303, 03K .0401, 03O .0502, and 03O .0503~~ 15A NCAC 03J .0501, .0505, 03K .0103, .0104, .0107, .0111, .0401, 03O .0502, and .0503 as applicable to the requested permit.

~~(j)~~(i) The Fisheries Director, or his agent may evaluate the following in determining whether to issue, modify or renew a permit:

(1) Potential threats to public health or marine and estuarine resources regulated by the Marine Fisheries Commission;

(2) Applicant's demonstration of a valid justification for the permit and a showing of responsibility as determined by the Fisheries Director;

(3) Applicant's history of habitual fisheries violations evidenced by eight or more violations in 10 years.

~~(k)~~(j) The Division of Marine Fisheries shall notify the applicant in writing of the denial or modification of any permit request and the reasons therefor. The applicant may submit further information, or reasons why the permit should not be denied or modified.

~~(l)~~(k) Permits are valid from the date of issuance through the expiration date printed on the permit. Unless otherwise established by rule, the Fisheries Director may establish the issuance timeframe for specific types and categories of

permits based on season, calendar year, or other period based upon the nature of the activity permitted, the duration of the activity, compliance with federal or state fishery management plans or implementing rules, conflicts with other fisheries or gear usage, or seasons for the species involved. The expiration date shall be specified on the permit.

~~(m)~~(l) For permit renewals, the permittee's signature on the application shall certify all information as true and accurate. Notarization of signature on renewal applications is not required.

~~(n)~~(m) For initial or renewal permits, processing time for permits may be up to 30 days unless otherwise specified in this Chapter.

~~(o)~~(n) It is unlawful for a permit holder to fail to notify the Division of Marine Fisheries within 30 days of a change of name or address.

~~(p)~~(o) It is unlawful for a permit holder to fail to notify the Division of Marine Fisheries of a change of designee prior to use of the permit by that designee.

~~(q)~~(p) Permit applications are available at all Division Offices.

*Authority G.S. 113-134; 113-169.1; 113-169.3; 113-182; 113-210; 143B-289.52*

# Fiscal Impacts of Proposed Rule Changes to the American Eel Fishery Under the NC Interjurisdictional Fishery Management Plan

**Rule Amendments:** 15A NCAC 03J .0301 POTS
15A NCAC 03M .0510 AMERICAN EEL

**Name of Commission:** NC Marine Fisheries Commission

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**Impact Summary:**
State government: No
Local government: No
Federal government: No
Substantial impact: No

**Authority:** G. S. 113-134 (Rules); G.S. 113-173 (Recreational Commercial Gear License); G.S. 113-182 (Regulation of fishing and fisheries); G.S. 113-221.1 (Proclamations; emergency review); G.S. 143B-289.52 (Marine Fisheries Commission – powers and duties)

**Necessity:** As required under the North Carolina Interjurisdictional Fishery Management Plan and in accordance with Addendum III to the Atlantic States Marine Fisheries Commission Fishery Management Plan for American Eel, the proposed rule changes implement a nine-inch minimum size limit, a 25-fish recreational possession limit, and a no-take provision for American eels from September 1 to December 31 unless they are taken with baited pots. Additionally, there will be a minimum mesh size requirement of one-half by one-half-inch mesh for eel pots, allowing for a phase in period until January 1, 2017. Rule changes are proposed to allow state law to align with federal mandates and maintain consistency with rules regulating the American eel fishery in inland waters. Additionally, part of the proposed rule change regarding proclamation authority has been put forth as part of an ongoing attempt to standardize rule language granting proclamation authority throughout NC Marine Fisheries Commission rules.

## I. Summary

The proposed rule changes comply with the North Carolina Interjurisdictional Fishery Management Plan by adopting the required measures in Addendum III to the Atlantic States Marine Fisheries Commission Fishery Management Plan for American Eel and are expected to help rebuild depleted eel stocks as well as clarify proclamation authority. These rule changes are not expected to incur costs independent from federal requirements, as these changes conform to what is required by federal law. These rule changes will initially generate some costs to both the commercial and recreational fishing sectors; however, the commercial sector is expected to experience the majority of these costs. The cost to the recreational fishing sector is not quantified but is likely to be

minor. The upper bound of the estimated cost to the commercial fishing sector is between $374,500 and $409,500 in the first year, however the realized costs from the rule changes is likely to be lower. The rule changes allow the North Carolina commercial and recreational fisheries involving American eels to maintain federal compliance and continue to take place. Over the past five years (2009 to 2013), an average of approximately 70,000 pounds of American eels with an ex-vessel value of $177,000 has been commercially landed annually in North Carolina.

## II. Introduction and Purpose of Rule Changes

American eels are managed by the Atlantic States Marine Fisheries Commission (ASMFC) Interstate Fishery Management Plan (FMP) for American Eel, adopted initially in 2000. The 2012 Benchmark Stock Assessment found that the American eel population in U.S. waters is depleted. The assessment concluded that "[t]he stock is at or near historically low levels due to a combination of historical overfishing, habitat loss, food web alterations, predation, turbine mortality, environmental changes, toxins and contaminants, and disease." (ASMFC, 2013)

Federal law requires the conservation management actions approved through an ASMFC FMP be implemented by the state of North Carolina (US CODE TITLE 16 CHAPTER 71 § 5104 - STATE IMPLEMENTATION OF COASTAL FISHERY MANAGEMENT PLANS)[1] . From the North Carolina perspective, the Fisheries Reform Act of 1997 (S.L. 1997-400) mandates development of state FMPs. American eel is included in the NC Interjurisdictional FMP (IJ FMP). The goal of the IJ FMP is to adopt federal FMPs, consistent with North Carolina law, by reference and implement corresponding fishery regulations in North Carolina in order to maintain compliance or compatibility with approved federal FMPs and amendments, now and in the future. In the case of the American eel fishery, should the state of North Carolina choose to go out of federal compliance, the US Secretary of Commerce may declare a moratorium on the state's fishery (US CODE TITLE 16 CHAPTER 71 § 5106 – SECRETARIAL ACTION)[2].

Addendum III to the ASMFC American Eel FMP was approved for management at the ASMFC American Eel Management Board's August 2013 meeting. This addendum had as its basis a peer-reviewed and board-approved stock assessment. The 2012 American Eel Benchmark Stock Assessment found the stock status of American eel to be depleted and recommended reducing mortality at all life stages, noting that fishing of young-of-the-year (glass eels) and out-migrating silver eels could be particularly detrimental. Addendum III incorporated management measures for each life stage -- glass eel, elver, yellow, and silver eel -- and must be implemented by January 1, 2014.

Addendum III is currently being implemented through temporary suspension of current rules and issuance of proclamation (via rule 15A NCAC 03I .0102 TEMPORARY SUSPENSION OF RULES and 03M .0512 COMPLIANCE WITH FISHERY MANAGEMENT PLANS) for compliance of North Carolina eel fisheries with federal requirements. In addition to meeting federal requirements, rule changes are proposed instead of addressing the management of the eel fishery completely through

[1,2] Text available in the NC Interjurisdictional Fisheries Management Plan at (http://portal.ncdenr.org/c/document_library/get_file?uuid=ea2668aa-71db-4393-b401-2c72a1154b2f&groupId=38337)

proclamation in order to maintain consistency with rule changes for eel pots in inland waters under the jurisdiction of the North Carolina Wildlife Resources Commission (15A NCAC 10C .0404). Also, NCDMF expects that proposed measures in the ASMFC Interstate FMP for American eels will remain in place for several years. Putting long-standing measures into rule benefits the public through improved accessibility and greater awareness of requirements among the regulated community.

Several considerations for rule changes exist. Addendum III requires eel pots to be constructed of one-half by one-half-inch or larger mesh with a three-year phase-in period allowed, during which a four-inch square escape panel of one-half by one-half-inch or larger mesh may be used. North Carolina currently requires this four-inch square escape panel constructed of one-half by one-inch-mesh. Previously, pots could be constructed of any mesh size as long as they had the required escape panel. To comply with ASMFC rules, eel pots must be constructed entirely of one-half by one-half-inch mesh by January 1, 2017. In conjunction with the mesh size requirement, the ASMFC implemented a nine-inch minimum size limit for American eel. This requires North Carolina to raise its minimum size limit from six inches to nine inches and reduce the recreational bag limit from 50 to 25 American eels per person per day effective January 1, 2014. However, party/charter boats are allowed to continue to possess 50 American eels per crew/captain for the purpose of transporting bait and participating in charter operations.

Addendum III also requires a harvest moratorium on eels from gear types other than baited traps and pots or spears annually from September 1 through December 31. Thus, eels cannot be retained from gear types such as fyke nets, pound nets, gill nets, trawls, or any other type of commercial fishing gear during these months. These gear types may still be used for fishing, but the retention of eels from these gear types is not allowed.

Additionally, part of the proposed rule change regarding proclamation authority has been put forth as part of an ongoing attempt to standardize rule language granting proclamation authority throughout NC Marine Fisheries Commission rules. NC Division of Marine Fisheries (NCDMF) staff has identified that proclamation authority across several rules is generally similar in nature; however, the specific rule language stating the proclamation authority often differs greatly from rule to rule. In an attempt to improve consistency across rules and public clarity of proclamation authority, NCDMF seeks to standardize rule language describing proclamation authority when possible. These general rule changes are not intended to alter the scope of the proclamation authority, nor are they being proposed with the intention of changing current management.

## III. Costs

Eel fishermen will face costs from the federally mandated requirements; however, NCDMF does not expect the related proposed rule changes to create costs outside of meeting the minimum federal requirements, as these changes conform to what is required by federal law. The proposed rule change clarifying proclamation authority is not expected to incur any costs, as it not intended to alter the scope of the proclamation authority or management practices.

The annual harvest moratorium on eels from gear types other than baited traps and pots or spears from September 1 through December 31 may incur some minimal costs. This

measure will cause less than a 0.001-percent reduction in eel landings during these months based on commercial landings data; therefore, NCDMF expects these costs to be negligible. These gear types may still be fished but the retention of eels from these gear types would not be allowed.

The increased size limit for eels will generate costs for fishermen, as a larger percentage of the catch will be discarded. The precise extent to which the catch will be decreased is unknown. However NCDMF has estimated the cost based on the value of the entire commercial catch. The commercial eel fishery in North Carolina has incurred landings worth an average of $175,155 over the past five years (2009-2013). Assuming a 10-percent to 30-percent reduction in landings due to the increased size limit, which is seen as a reasonable range by NCDMF staff, the cost to commercial fishermen is estimated to be approximately $17,500 to $52,500 annually.

Decreasing the recreational bag limit from 50 eels to 25 eels is expected to incur minor costs. Some recreational fisheries such as the cobia and striped bass fisheries do utilize eels for bait. The bag limit of 25 eels per person will still allow the use of eels as bait to continue in these fisheries. Additionally, for-hire operations will still be allowed to possess 50 eels per person for the captain and crew.

The majority of the cost of the proposed rule change stems from the new mesh requirement for an eel pot. All pots that have a mesh size of less than one-half by one-half-inch will need to be replaced by January 1, 2017. While the actual number of pots to be replaced is unknown, eel logbook data indicates that the average number of eel pots fished per person from 2009 to 2013 was 204 pots. Over this same time frame there was an average of 25 participants in the eel pot fishery annually. It is estimated that a fully rigged eel pot costs approximately $70 per pot. Assuming that all participants had to replace all eel pots due to the proposed rule change, the estimated cost would be approximately $357,000. This is an upper-bound estimate of cost to fishermen, as it is likely that some of the eel pots will need to be replaced due to damage to the gear in the absence of the proposed rule changes. The rule changes may accelerate the cost of gear replacement forward several years for some industry participants, but it is not likely that all gear will need to be replaced solely to meet the new mesh size requirements. Furthermore, some eel pots may already meet the mesh-size requirements and eel pots that need to be replaced before the required implementation date of January 1, 2017 will likely meet the new mesh standards as fishermen will have had several years of advanced notice of the new mesh size requirements.

## IV. Benefits

The proposed rule changes may help maintain and rebuild American eel populations and improve public clarity of eel regulations by allowing rules to comply with the updated federal requirements as mandated by the ASMFC, which in turn allows North Carolina to maintain compliance with federal mandates (US CODE TITLE 16 CHAPTER 71 § 5104 - STATE IMPLEMENTATION OF COASTAL FISHERY MANAGEMENT PLANS). Aligning rules with federally mandated requirements as well as the eel management rule for inland waters helps the regulated public more clearly understand eel fishery management regulations as well as allows the fishery to continue to take place (US CODE TITLE 16 CHAPTER § 5106 – SECRETARIAL ACTION). Over the past five years (2009 to 2013) an average of approximately 70,000 pounds of American eels with an ex-

vessel value of $177,000 has been commercially landed annually in North Carolina. This fishery along with the use of eels as bait in recreational fisheries could potentially be put in jeopardy should the fisheries management measures outlined in Addendum III to the ASMFC American Eel FMP not be implemented. This is an upper-bound estimate of the benefits of the rule changes, as fishermen could switch to other fisheries if the eel fishery were closed and because there is the possibility that the federal government would not shut down North Carolina's eel fishery in the absence of the proposed rule changes. Also, the clarification of proclamation authority makes this rule language consistent with other rules granting proclamation authority. This consistency among rules granting proclamation authority aids in public awareness of what type of fisheries management measures may be specified by proclamation.

## V. Comprehensive Statement of Costs and Benefits

Rule changes associated with the ASMFC Interstate FMP for American Eel are expected to have a combined cost and benefit that will not meet the statutory threshold for a substantial economic impact of $1 million in aggregate costs and benefits in any given 12-month period.

NCDMF's estimates of the total costs and benefits of the proposed rule changes include:

1) Modification of 15A NCAC 03J .0301 and 15A NCAC 03M .0510 will not impose costs beyond what is required by federal law. The upper-bound estimate of these costs is $374,500 to $409,500 in a single 12-month period. The rule change made outside of federal requirements in 15A NCAC 03J .0301 that clarifies proclamation authority will not impose any costs, as this rule change is not intended to alter the scope of the proclamation authority or management practices. Implementing the proposed rule changes will continue consistency with rules regulating American eel fishing in inland waters as well as maintain federal compliance of the North Carolina American eel fishery, thereby allowing this fishery to continue to occur. This fishery has accounted for an average of approximately 70,000 pounds of American eels with an ex-vessel value of $177,000 annually over the past five years (2009-2013). This is the upper-bound estimate of the benefit of the rule changes. Finally, clarifying rule language aimed at proclamation authority aids in public awareness of what type of fisheries management measures may be specified by proclamation.

Table 1. Summary of estimated costs and benefits from proposed rule changes.

| Rule | Estimated Cost | Estimated Benefit |
|---|---|---|
| 15A NCAC 03J .0301 and 15A NCAC 03M .0510 | $357,000 (upper-bound of cost occurring one time) $17,500 to $52,500 (annual) | $177,000 (upper-bound of benefit occurring annually) |
| Total | $374,500 to $409,500 (upper-bound of cost in a single 12-month period) | $177,000 (upper-bound of benefit occurring annually) |

## VI. Certificate of Federal Requirement

In accordance with requirements outlined in G.S. § 150B-19.1. (g), the proposed rule changes in 15A NCAC 03J .0301 and 15A NCAC 03M .0510 are being put forth to maintain compliance with the ASMFC Interstate FMP for American Eel Addendum III. Federal law requires the conservation management actions approved through an ASMFC FMP be implemented by the state of North Carolina (US CODE TITLE 16 CHAPTER 71 § 5104 - STATE IMPLEMENTATION OF COASTAL FISHERY MANAGEMENT PLANS).

All proposed rule changes regarding the management of the American eel fishery are being put forth as part of this federal requirement other than a change to rule language clarifying proclamation authority in the eel fishery. This measure is not specified in the ASMFC Interstate FMP for American Eel Addendum III. This proposed rule change is being put forth as part of an ongoing attempt to standardize rule language granting proclamation authority throughout NC Marine Fisheries Commission rules. NC Division of Marine Fisheries (NCDMF) staff has identified that proclamation authority across several rules is generally similar in nature; however, the specific rule language stating the proclamation authority often differs greatly from rule to rule. In an attempt to improve consistency across rules and public clarity of proclamation authority, NCDMF seeks to standardize rule language describing proclamation authority when possible. These general rule changes are not intended to alter the scope of the proclamation authority or current management.

## VII. Works Cited

Atlantic States Marine Fisheries Commission (August 2013). *Addendum III to the Fishery Management Plan for American Eel*. http://www.asmfc.org/uploads/file//amEelAddendum_III_Aug2013.pdf.

North Carolina Department of Environment and Natural Resources (June 2008). North Carolina Division of Marine Fisheries. *North Carolina Interjurisdictional Fisheries Management Plan. http://portal.ncdenr.org/c/document_library/get_file?uuid=ea2668aa-71db-4393-b401-2c72a1154b2f&groupId=38337.*

## Appendix: Proposed Rule Changes

NOTE: CHANGES TO 15A NCAC 03J .0301 INCLUDE CHANGES FOR EEL POTS AND CHANGES TO THE MANAGEMENT OF USER CONFLICTS WHICH ARE CONVERED IN A SEPARATE ANALYSIS.

**15A NCAC 03J .0301 POTS**

(a) It is unlawful to use pots except during time periods and in areas specified herein:

(1) In Coastal Fishing Waters from December 1 through May 31, except that all pots shall be removed from ~~internal waters~~ Internal Waters from January 15 through February 7. Fish pots upstream of U.S. 17 Bridge across Chowan River and upstream of a line across the mouth of Roanoke, Cashie, Middle and Eastmost Rivers to the Highway 258 Bridge are exempt from the January 15 through February 7 removal requirement. The Fisheries Director may, by proclamation, reopen various waters to the use of pots after January 19 if it is determined that such waters are free of pots.

(2) From June 1 through November 30, north and east of the Highway 58 Bridge at Emerald Isle:

(A) In areas described in 15A NCAC 03R .0107(a);

(B) To allow for the variable spatial distribution of crustacea and finfish, the Fisheries Director may, by proclamation, specify time periods for or designate the areas described in 15A NCAC 03R .0107(b); or any part thereof, for the use of pots.

(3) From May 1 through November 30 in the Atlantic Ocean and west and south of the Highway 58 Bridge at Emerald Isle in areas and during time periods designated by the Fisheries Director by proclamation.

The Fisheries Director may, by proclamation authority established in 15A NCAC 03L .0201, further restrict the use of pots to take blue crabs.

(b) It is unlawful to use pots:

(1) in any navigation channel marked by State or Federal agencies; or

(2) in any turning basin maintained and marked by the North Carolina Ferry Division.

(c) It is unlawful to use pots in a commercial fishing operation unless each pot is marked by attaching a floating buoy which shall be of solid foam or other solid buoyant material and no less than five inches in diameter and no less than five inches in length. Buoys may be of any color except yellow or hot pink or any combination of colors that include yellow or hot pink. The owner shall always be identified on the attached buoy by using engraved buoys or by engraved metal or plastic tags attached to the buoy. Such identification shall include one of the following:

(1) gear owner's current motorboat registration number; or

(2) gear owner's U.S. vessel documentation name; or

(3) gear owner's last name and initials.

(d) Pots attached to shore or a pier shall be exempt from Subparagraphs (a)(2) and (a)(3) of this Rule.

(e) It is unlawful to use shrimp pots with mesh lengths smaller than one and one-fourth inches stretch or five-eighths-inch bar.

(f) It is unlawful to use ~~eel~~ pots to take eels with mesh ~~sizes~~ lengths smaller than ~~one inch by one-half inch unless such pots contain~~ one-half inch by one-half inch, except until January 1, 2017 eel pots of any mesh length with an escape panel that is at least four inches square with a mesh ~~size~~ length of one inch by one-half inch located in the outside panel of the upper chamber of rectangular pots and in the rear portion of cylindrical ~~pots, except that not more than two eel pots per fishing operation with a mesh of any size may be used to take eels for bait.~~pots are allowed.

(g) It is unlawful to use crab pots in ~~coastal fishing waters~~ Coastal Fishing Waters unless each pot contains no less than two unobstructed escape rings that are at least two and five-sixteenths inches inside diameter and located in the opposite outside panels of the upper chamber of the pot, except the following are exempt from the escape ring requirements:

(1) unbaited pots;

(2) pots baited with a male crab; and

(3) pots set in areas and during time periods described in 15A NCAC 03R .0118.

(h) The Fisheries Director may, by proclamation, exempt the escape ring requirements described in Paragraph (g) of this Rule in order to allow the harvest of mature female crabs and may impose any or all of the following restrictions:

~~(1) specify areas;~~

~~(2) specify time periods; and~~

~~(3) specify means and methods.~~

(1) specify time;

(2) specify areas;

(3) specify means and methods;

(4) specify seasons; and

(5) specify quantity.

(i) It is unlawful to use more than 150 crab pots per vessel in Newport River.

(j) It is unlawful to remove crab pots from the water or remove crabs from crab pots between one hour after sunset and one hour before sunrise.

~~(k) User Conflicts:~~

~~(1) In order to address user conflicts, the Fisheries Director may by proclamation impose any or all of the following restrictions:~~

~~(A) specify areas;~~

~~(B) specify time periods; and~~

~~(C) specify means and methods.~~

~~The Fisheries Director shall hold a public meeting in the affected area before issuance of such proclamation.~~

~~(2) Any person(s) desiring user conflict resolution may make such request in writing addressed to the Director of the Division of Marine Fisheries, P.O. Box 769, 3441 Arendell St., Morehead City, North Carolina 28557-0769. Such requests shall contain the following information:~~

~~(A) a map of the affected area including an inset vicinity map showing the location of the area with detail sufficient to permit on-site identification and location;~~

~~(B) identification of the user conflict causing a need for user conflict resolution;~~

~~(C) recommended solution for resolving user conflict; and~~

~~(D) name and address of the person(s) requesting user conflict resolution.~~

~~(3) Upon the requestor's demonstration of a user conflict to the Fisheries Director and within 90 days of the receipt of the information required in Subparagraph (k)(2) of this Rule, the Fisheries Director shall issue a public notice of intent to address a user conflict. A public meeting shall be held in the area of the user conflict. The requestor shall present his or her request at the public meeting, and other parties affected may participate.~~

~~(4) The Fisheries Director shall deny the request or submit a proclamation that addresses the results of the public meeting to the Marine Fisheries Commission for their approval.~~

~~(5) Proclamations issued under Subparagraph (k)(1) of this Rule shall suspend appropriate rules or portions of rules under 15A NCAC 03R .0107 as specified in the proclamation. The provisions of 15A NCAC 03I .0102 terminating suspension of a rule pending the next Marine Fisheries Commission meeting and requiring review by the Marine Fisheries Commission at the next meeting shall not apply to proclamations issued under Subparagraph (k)(1) of this Rule.~~

~~(l)~~(k) It is unlawful to use pots to take crabs unless the line connecting the pot to the buoy is non-floating.

~~(m)~~(l) It is unlawful to use pots with leads or leaders to take shrimp. For the purpose of this Rule, leads or leaders are defined as any fixed or stationary net or device used to direct fish into any gear used to capture fish. Any device with leads or leaders used to capture fish is not a pot.

*Authority G. S. 113-134; 113-173; 113-182; 113-221.1; 143B-289.52*

**15A NCAC 03M .0510 AMERICAN EEL**

It is unlawful to:

(1) Possess, sell or take American eels less than ~~six~~ nine inches in length; ~~and~~

(2) Possess more than ~~50~~ 25 American eels per person per day for recreational ~~purposes.~~purposes, except the master and each mate of for-hire vessels that hold a valid for-hire license may possess 50 eels each per day; and

(3) Possess American eels from September 1 through December 31 except when taken by baited pots.

*Authority G.S. 113-134; 113-182; 143B-289.52*

**Fiscal Impacts of Proposed Rule Changes to the For-Hire Licensing and Logbook Requirements and to the Atlantic Ocean Striped Bass Commercial Gear Permit Authorized by Statutory Changes in Session Law 2013-360**

**Rule Amendments:** 15A NCAC 03I .0101 DEFINITIONS
15A NCAC 03O .0101 PROCEDURES AND REQUIREMENTS TO OBTAIN LICENSES, ENDORSEMENTS AND COMMERCIAL FISHING VESSEL REGISTRATIONS
15A NCAC 03O .0106 DISPLAY OF LICENSES AND REGISTRATIONS
15A NCAC 03O .0112 FOR HIRE COASTAL RECREATIONAL FISHING
15A NCAC 03O .0501 PROCEDURES AND REQUIREMENTS TO OBTAIN PERMITS
15A NCAC 03O .0503 PERMIT CONDITIONS; SPECIFIC

**Name of Commission:** NC Marine Fisheries Commission

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**Impact Summary:**

| | |
|---|---|
| State government: | Yes |
| Local government: | No |
| Federal government: | No |
| Substantial impact: | No |

**Authority:** Session Law 2013-360, Section 14.8(e), Section 14.8(f) and 14.8(o) [See Appendix 2]

**Necessity:** In accordance with Session Law 2013-360, the proposed rule amendments [See Appendix 1] reflect recent statutory changes affecting for-hire licensing and the Atlantic Ocean Striped Bass Commercial Gear Permit. In order to broaden options for licensees and improve the North Carolina Division of Marine Fisheries (NCDMF) fisheries statistics, these rules propose to eliminate the current For-Hire Permit and blanket licenses and replace them with a captain's for-hire license, a blanket for-hire vessel license, and a non-blanket for-hire vessel license. The proposed rules also implement a for-hire endorsement on the commercial fishing vessel registration, require affirmation of liability coverage and knowledge of U.S. Coast Guard (USCG) safety requirements, and require weekly logbook reporting from for-hire licensees. Additionally, the permit fee for the Atlantic Ocean Striped Bass Commercial Gear Permit is removed from rule and the November 1 deadline to purchase the annual permit is eliminated.

The anticipated effective date of the proposed rule changes is May 1, 2015.

## I. Summary

In an effort to address deficiencies and inequities in the current for-hire licensing structure, the North Carolina General Assembly (NCGA) enacted changes to the state's marine recreational for-hire license to include a Blanket Captains License, a Blanket Vessel License, and a Non-blanket Vessel License. The NCGA incorporated these three new licenses into G.S. 113-168.6 and G.S. 113-174.3 through Session Law 2013-360. Also, statutory changes included the addition of a required affirmation of liability coverage and knowledge of USCG safety requirements by for-hire license holders as well as a weekly logbook requirement to improve recreational catch and effort statistics for the for-hire industry. Rule changes are required to align Marine Fisheries Commission rules with the statutory changes, accommodate weekly logbook reporting, and remove the November 1 deadline for purchasing the annual Atlantic Ocean Striped Bass Commercial Gear Permit. These rule changes are expected to incur a cost of $265,500 initially and $245,500 annually thereafter.

## II. Introduction and Purpose of Rule Changes

In order to establish a system to provide management tools for monitoring the for-hire industry, the Marine Fisheries Commission utilized rule-making authority to establish a provisional no-cost For-Hire Fishery Permit in 2003. Several years after the commission established the permit requirement, the NCGA enacted new laws creating a Coastal Recreational Fishing License (CRFL). The NCGA enacted the new laws, in part, to provide management tools for monitoring recreational anglers. During the 2003 Session, the General Assembly of North Carolina passed a CRFL requirement (G.S. 113-174 *et. seq.*), which became effective January 1, 2007. One of the new laws, G.S. 113-174.3, pertained directly to the optional Blanket For-Hire CRFL, which established fees and removed responsibility for licensure of angling customers from the individual and placed it on the owner or operator of the vessel. Having a database of for-hire participants allowed NCDMF to survey the industry for effort information as part of the For-Hire Survey that NCDMF conducts as a contractor to the National Marine Fisheries Service. The CRFL also satisfied requirements of the National Angler Registry as put forth in the federal Magnusson-Stevens Reauthorization Act of 2006[1] (NOAA, 2007).

A component of the CRFL offered an optional for-hire blanket license covering anglers' licensing requirements as long as they were aboard a properly licensed for-hire boat. The for-hire blanket license was available to USCG-licensed captains who carried six or fewer passengers (guides and charter boats) as well as a separate license for USCG-certified vessels carrying more than six passengers (headboats) and operated by a USCG-licensed captain. The price was $250 for six or fewer passengers and $350 for more than six passengers since the creation of the CRFL in 2007, with nonresidents paying the same fee as residents.

In March of 2011, the NCDMF held three meetings throughout coastal North Carolina with members of the for-hire industry in an effort to get industry feedback on changes to the license structure, logbooks, and other issues the industry may have. Stakeholders informed NCDMF of inequities and inefficiencies in the license design during these for-hire stakeholders meetings. For example, many inshore guides who use more than one vessel in their operation reported that they pay almost twice as much as much-larger headboat operations. This inequity was due to their need to purchase two blanket licenses, one for each vessel, even though they only used

[1] Magunson-Stevens Fishery Conservation and Management Act. As Amended Through January 12, 2007. May 2007. National Oceanic and Atmospheric Administration. National Marine Fisheries Service. http://www.nmfs.noaa.gov/msa2005/docs/MSA_amended_msa%20_20070112_FINAL.pdf

one vessel at a time. The inshore guide operations take out far fewer anglers each trip and in most cases fewer anglers per year, thereby creating an inequity due to the higher angler licensing costs. Some guides also reported limitations in operating other vessels either for a colleague or in the event of a breakdown of their primary vessel. These circumstances created additional costs for guides and/or clients involved in both small and large fishing operations and serve as an example of the inefficiencies inherent in the past structure. There was also general consensus at the stakeholder meetings that nonresidents should pay a higher fee than residents since they do not pay into the state system in ways residents do (property taxes, boat registrations, etc.).

NCDMF drafted recommendations from the series of meetings in the *Summary of the 2011 For-Hire Stakeholders Meetings Report to the Marine Fisheries Commission*[2]*.* The NC Marine Fisheries Commission (NCMFC) agreed with the recommendations, which were then incorporated into NCDMF's request for statutory revisions to the NC General Assembly. The General Assembly adopted these recommendations during the 2013 session in Session Law 2013-360.

Session Law 2013-360 made statutory changes to G.S. 113-168.6 and G.S. 113-174.3 that alter the way for-hire licenses are structured, require certain for-hire operations to obtain Commercial Fishing Vessel Registrations with for-hire endorsements for their vessels, obligate for-hire operators to affirm liability coverage and knowledge of USCG safety requirements, and require participants in the for-hire industry to begin submitting weekly logbooks of catch and effort data.

In an effort to address the deficiencies and inequities in the current for-hire licensing structure, NCDMF proposed changes to the license structure to include a Blanket Captain's License, a Blanket Vessel License, and a Non-blanket Vessel License (Table 1). These three new licenses are incorporated into G.S. 113-174.3. NCDMF recommended eliminating the original For-Hire Blanket CRFL's within the statute. The proposal also included higher nonresident fees. The new licenses are:

1. The Blanket For-Hire Captain's CRFL allows the holder to use any properly licensed vessel in his/her operation while covering the licensing requirements of the anglers. All vessels operated by the holder of a Blanket For-Hire Captain's CRFL must have a Commercial Fishing Vessel Registration with a for-hire endorsement. The Blanket For-Hire Captain's CRFL is intended primarily for the inshore guides who operate multiple vessels. The fee is the same as the former For-Hire Blanket CRFL, but should result in a cost savings to resident guides who operate multiple vessels. Nonresidents will pay more than residents.

2. The Blanket For-Hire Vessel CRFL is very similar to the current Blanket For-Hire CRFL wherein the vessel is licensed and must be operated by a USCG-licensed captain. This license is intended primarily for the headboat industry. There should not be any cost differences to resident headboat owners, but nonresidents will pay more.

3. The Non-Blanket For-Hire Vessel License (note: not a CRFL) is very similar to the current, free for-hire permit, but there is a cost for this license. This license is intended primarily for the dive boat industry that infrequently has divers who wish to spear fish.

[2] Available at http://portal.ncdenr.org/c/document_library/get_file?uuid=a1055e24-5169-4ddb-aa9d-c8cd422ecf9d&groupId=38337

Spear fishermen on a dive boat will have to obtain their own individual CRFL to legally take fish. Guides may seek to purchase this license if they do not wish to cover their anglers' licensing requirements, as is achieved by the other two types of licenses.

Table 1. Summary of the new for-hire licenses, intended use, comments, and fees.

| New License | Intended For | Comments | Resident Fees | Nonresident Fees |
|---|---|---|---|---|
| Blanket For-Hire Captain's CRFL | Guides and charter boat owners with more than one vessel | Allows holder to conduct for-hire operations on any vessel with a CFVR and for-hire endorsement | $250 (<=six passengers) $350 (>six passengers) | $312.50 (<=six passengers) $437.50 (>six passengers) |
| Blanket For-Hire Vessel CRFL | Guides, charter boats and head boats with only one vessel | Allows any USCG-licensed captain to operate a vessel | $250 (<=six passengers) $350 (>six passengers) | $312.50 (<=six passengers) $437.50 (>six passengers) |
| Non-blanket Vessel License | Dive boats | Low-cost license for operators who do not wish to cover their passengers' licensing requirements | $25 | $37.50 |

In order to incorporate new weekly logbook requirements, NCDMF staff felt it necessary to amend 15A NCAC 03I .0101 to define a logbook as well as amend the definition of a trip ticket to clarify the difference between the two forms of documentation. Additionally, a rule change is needed in 15A NCAC 03O .0112 to implement weekly reporting of fishing activity by for-hire licensees. Weekly reporting will lead to more accurate catch, effort, and release information required for finfish stock assessments, allow NCDMF to better monitor catch quotas, and alleviate many of the uncertainties associated with survey and extrapolation data. NCDMF chose weekly reporting as the preferred reporting period over biweekly or monthly reporting, as it will provide more timely catch information and reduce issues associated with recalling catch information of previous trips for captains that may not keep a personal daily catch log. Also, the current federal logbook reporting period is weekly. The improved and timelier catch data offered by weekly reporting will benefit the regulated public by aligning reporting periods for for-hire operations that are involved in both federal- and state-managed fisheries and may help extend the season in fisheries that have allocated recreational fishing quotas, where fisheries may be shut down early due to large uncertainties or long reporting periods for landings data. NCDMF is making efforts to allow flexible reporting methods with the development of paper forms, web reporting, and mobile reporting apps for both tablets and smart phones. NCDMF staff are working to remove any redundancy that may exist with federal reporting requirements.

Other changes to 15A NCAC 03O .0112, as well as to 03O .0101, .0106, .0112, .0501, and .0503, bring rules in line with statutory changes and/or eliminate references to for-hire licenses that no longer exist. Additionally, 15A NCAC 03O .0501 contains changes to the Atlantic Ocean Striped Bass Commercial Gear Permit. These changes remove the cost of the permit fee from rule, as it is now set in statute, and eliminate the November 1 deadline for the purchase of the annual permit. The elimination of the November 1 deadline is intended to allow fishermen more

flexibility in entering the commercial Atlantic Ocean striped bass fishery at any time during the year.

## III. Costs

Rule changes that strictly implement statutory requirements are not expected to incur any costs independent from statute, as these changes simply conform to what is required by law. NCDMF does not expect the proposed rule changes to affect operational costs for issuing a for-hire license or for applicants purchasing a for-hire license. NCDMF will incur operational costs and both NCDMF as well as for-hire operations will incur opportunity costs due to the weekly logbook reporting requirements for for-hire operations. Based on the NCDMF for-hire license records, there were 598 individual for-hire licensees in 2013. Of these licensees, 13 currently undertake weekly logbook reporting due to federal logbook requirements for headboat operations and will be exempt from the NCDMF weekly reporting requirement. Therefore, the proposed rule change requiring weekly reporting will affect 585 individuals. NCDMF estimates that reporting requirements will take approximately thirty minutes a week per for-hire license holder. There will be provisions where a license holder will not need to report should they expect to not partake in for-hire fishing trips for an extended period; therefore, reporting will not be required year-round for all for-hire licensees. This analysis assumes that weekly reporting for approximately eight months of the year leads to an estimated total time expense of 9,360 person-hours annually (16 hours for each affected individual.) Based on the Bureau of Labor Statistics 2013 mean hourly wage for farming, fishing, and forestry workers of $13.09 per hour[3] and benefits equivalent to approximately 33% of total compensation,[4] the estimated opportunity cost stemming from the weekly logbook reporting requirement is approximately $182,500 annually (Table 2).

NCDMF will incur direct costs to implement and run the for-hire logbook program. While not yet in place, NCDMF estimates that additional annual operational costs will include $5,000 for logbook printing, $3,000 for travel and transportation, $10,000 for supplies and postage, and $5,000 for computer and database expenses. In the first year, there will be a one-time cost of $25,000 for web-interface development to implement an online and mobile version of the logbook, along with an annual cost of $5,000 for web-interface maintenance. Additionally, NCDMF will hire a program administrator and data entry clerk to oversee and run the program. The expected cost of these positions (salary with benefits included) is $55,000 for the program administrator and $40,000 for the data entry clerk. Overall, NCDMF estimates the estimated operational costs for the logbook program to be $143,000 the first year and $123,000 annually thereafter. Funding for this program will come from the NCDMF Coastal Angling Program, which is funded through the sales of recreational fishing licenses in the state. Other state or federal funding sources may supplement or supplant funding from the Coastal Angling Program in the future; however, the for-hire logbook program is currently fully funded for the foreseeable future.

The extent to which law enforcement will incur direct or opportunity costs is unknown, as such a program has yet to be implemented in the state on a large scale in for-hire fisheries. This makes estimating costs for law enforcement very difficult to quantify with any certainty. NCDMF expects law enforcement to address initial non-compliance through a written letter to those out of compliance with reporting requirements.

[3] United States Department of Labor Bureau of Labor Statistics. May 2013 State Occupational Employment and Wage Estimates North Carolina. http://www.bls.gov/oes/current/oes_nc.htm#45-0000.
[4] United States Department of Labor Bureau of Labor Statistics. Employer Costs for Employee Compensation- March 2014. http://www.bls.gov/news.release/pdf/ecec.pdf.

Table 2. Estimated cost of weekly logbook reporting requirements.

| | | Initial | Recurring |
|---|---|---|---|
| **Direct Costs** | | | |
| | Logbook Printing | $5,000 | $5,000 |
| | Travel | $3,000 | $3,000 |
| | Supplies and Postage | $10,000 | $10,000 |
| | Computer and Database | $5,000 | $5,000 |
| | Web Interface Development | $25,000 | $5,000 |
| | Program Administrator | $55,000 | $55,000 |
| | Data Entry Clerk | $40,000 | $40,000 |
| | Enforcement Costs | Unquantified | Unquantified |
| | **Total Direct Costs** | **$143,000** | **$123,000** |
| **Opportunity Costs** | | | |
| | Opportunity Cost to Licensees | $182,500 | $182,500 |
| | Enforcement Costs | Unquantified | Unquantified |
| | **Total Opportunity Costs** | **$182,500** | **$182,500** |
| ***Total Costs*** | | ***$325,500*** | ***$305,500*** |

## IV. Benefits

The proposed rule changes implement changes in statute and are expected to improve the licensing process for for-hire fishing operations. They are designed to increase equity of licensing costs between large and small operations as well as provide flexibility to allow for-hire operations to purchase the most suitable license for their business. Furthermore, removing references in rule to the previous for-hire licenses will maintain rule clarity, as statutory changes already eliminated these licenses.

Additionally, the for-hire logbook will improve recreational fishing statistics. NCDMF expects that improved statistical monitoring of for-hire fishing operations will lead to more accurate catch, effort, and release information required for finfish stock assessments, allow NCDMF to better monitor catch quotas, and alleviate many of the areas of uncertainty associated with current survey- and extrapolation-based data. In some years this improved catch information may help extend the fishing season for some species. Additionally, for-hire captains will be able to have access to their personal catch data, which may be used for advertising, business-planning, or personal information purposes.

Finally, removing the fee for the Atlantic Ocean Striped Bass Commercial Gear Permit from rule will reduce redundant rule language as the fee is set and stated in statute. Eliminating the November 1 deadline for purchasing the annual permit will add flexibility for fishermen to participate in the Atlantic Ocean commercial striped bass fishery at any time during the year.

## Appendix 1: Proposed Rule Changes

**15A NCAC 03I .0101 DEFINITIONS**

NOTE: CHANGES TO 15A NCAC 03I .0101 INCLUDE CHANGES FOR THE FOR-HIRE LICENSE AND CHANGES TO THE MANAGEMENT OF SHRIMP WHICH ARE CONVERED IN A SEPARATE ANALYSIS.

All definitions set out in G.S. 113, Subchapter IV and the following additional terms apply to this Chapter:

(1) Enforcement and management terms:

(a) Commercial Quota. Total quantity of fish allocated for harvest by commercial fishing operations.

(b) Educational Institution. A college, university or community college accredited by an accrediting agency recognized by the U.S. Department of Education; an Environmental Education Center certified by the NC Department of Environment and Natural Resources Office of Environmental Education and Public Affairs; or a zoo or aquarium certified by the Association of Zoos and Aquariums.

(c) Internal Coastal Waters or Internal Waters. All Coastal Fishing Waters except the Atlantic Ocean.

(d) Length of finfish.

(i) Curved fork length. A length determined by measuring along a line tracing the contour of the body from the tip of the upper jaw to the middle of the fork in the caudal (tail) fin.

(ii) Fork length. A length determined by measuring along a straight line the distance from the tip of the snout with the mouth closed to the middle of the fork in the caudal (tail) fin, except that fork length for billfish is measured from the tip of the lower jaw to the middle of the fork of the caudal (tail) fin.

(iii) Pectoral fin curved fork length. A length of a beheaded fish from the dorsal insertion of the pectoral fin to the fork of the tail measured along the contour of the body in a line that runs along the top of the pectoral fin and the top of the caudal keel.

(iv) Total length. A length determined by measuring along a straight line the distance from the tip of the snout with the mouth closed to the tip of the compressed caudal (tail) fin.

(e) Recreational Possession Limit. Restrictions on size, quantity, season, time period, area, means, and methods where take or possession is for a recreational purpose.

(f) Recreational Quota. Total quantity of fish allocated for harvest for a recreational purpose.

(g) Regular Closed Oyster Season. March 31 through October 15, unless amended by the Fisheries Director through proclamation authority.

(h) Scientific Institution. One of the following entities:

(i) An educational institution as defined in this Item;

(ii) A state or federal agency charged with the management of marine or estuarine resources; or

(iii) A professional organization or secondary school working under the direction of, or in compliance with mandates from, the entities listed in Subitems (h)(i) and (ii) of this Item.

(i) Seed Oyster Management Area. An open harvest area that, by reason of poor growth characteristics, predation rates, overcrowding or other factors, experiences poor utilization of oyster populations for direct harvest and sale to licensed dealers and is designated by the Marine Fisheries Commission as a source of seed for public and private oyster culture.

(2) Fishing Activities:

(a) Aquaculture operation. An operation that produces artificially propagated stocks of marine or estuarine resources or obtains such stocks from permitted sources for the purpose of rearing in a controlled environment. A controlled environment provides and maintains throughout the rearing process one or more of the following:

(i) food;

(ii) predator protection;

(iii) salinity;

(iv) temperature controls; or

(v) water circulation,

utilizing technology not found in the natural environment.

(b) Attended. Being in a vessel, in the water or on the shore, and immediately available to work the gear and be within 100 yards of any gear in use by that person at all times. Attended does not include being in a building or structure.

(c) Blue Crab Shedding. The process whereby a blue crab emerges soft from its former hard exoskeleton. A shedding operation is any operation that holds peeler crabs in a controlled environment. A controlled environment provides and maintains throughout the shedding process one or more of the following:

(i) food;

(ii) predator protection;

(iii) salinity;

(iv) temperature controls; or

(v) water circulation,

utilizing technology not found in the natural environment. A shedding operation does not include transporting pink or red-line peeler crabs to a permitted shedding operation.

(d) Depuration. Purification or the removal of adulteration from live oysters, clams, or mussels by any natural or artificially controlled means.

(e) Long Haul Operations. Fishing a seine towed between two vessels.

(f) Peeler Crab. A blue crab that has a soft shell developing under a hard shell and having a white, pink, or red-line or rim on the outer edge of the back fin or flipper.

(g) Possess. Any actual or constructive holding whether under claim of ownership or not.

(h) Recreational Purpose. A fishing activity that is not a commercial fishing operation as defined in G.S. 113-168.

(i) Shellfish marketing from leases and franchises. The harvest of oysters, clams, scallops, or mussels from privately held shellfish bottoms and lawful sale of those shellfish to the public at large or to a licensed shellfish dealer.

(j) Shellfish planting effort on leases and franchises. The process of obtaining authorized cultch materials, seed shellfish, and polluted shellfish stocks and the placement of those materials on privately held shellfish bottoms for increased shellfish production.

(k) Shellfish production on leases and franchises:

(i) The culture of oysters, clams, scallops, or mussels on shellfish leases and franchises from a sublegal harvest size to a marketable size.

(ii) The transplanting (relay) of oysters, clams, scallops or mussels from areas closed due to pollution to shellfish leases and franchises in open waters and the natural cleansing of those shellfish.

(l) Swipe Net Operations. Fishing a seine towed by one vessel.

(m) Transport. Ship, carry, or cause to be carried or moved by public or private carrier by land, sea, or air.

(n) Use. Employ, set, operate, or permit to be operated or employed.

(3) Gear:

(a) Bunt Net. The last encircling net of a long haul or swipe net operation constructed of small mesh webbing. The bunt net is used to form a pen or pound from which the catch is dipped or bailed.

(b) Channel Net. A net used to take shrimp that is anchored or attached to the bottom at both ends or with one end anchored or attached to the bottom and the other end attached to a vessel.

(c) Commercial Fishing Equipment or Gear. All fishing equipment used in Coastal Fishing Waters except:

(i) Cast nets;

(ii) Collapsible crab traps, a trap used for taking crabs with the largest open dimension no larger than 18 inches and that by design is collapsed at all times

when in the water, except when it is being retrieved from or lowered to the bottom;

(iii) Dip nets or scoops having a handle not more than eight feet in length and a hoop or frame to which the net is attached not exceeding 60 inches along the perimeter;

(iv) Gigs or other pointed implements which are propelled by hand, whether or not the implement remains in the hand;

(v) Hand operated rakes no more than 12 inches wide and weighing no more than six pounds and hand operated tongs;

(vi) Hook-and-line and bait-and-line equipment other than multiple-hook or multiple-bait trotline;

(vii) Landing nets used to assist in taking fish when the initial and primary method of taking is by the use of hook and line;

(viii) Minnow traps when no more than two are in use;

(ix) Seines less than 30 feet in length;

(x) Spears, Hawaiian slings or similar devices that propel pointed implements by mechanical means, including elastic tubing or bands, pressurized gas, or similar means.

(d) Corkline. The support structure a net is attached to that is nearest to the water surface when in use. Corkline length is measured from the outer most mesh knot at one end of the corkline following along the line to the outer most mesh knot at the opposite end of the corkline.

(e) Dredge. A device towed by engine power consisting of a frame, tooth bar or smooth bar, and catchbag used in the harvest of oysters, clams, crabs, scallops, or conchs.

(f) Fixed or stationary net. A net anchored or staked to the bottom, or some structure attached to the bottom, at both ends of the net.

(g) Fyke Net. An entrapment net supported by a series of internal or external hoops or frames, with one or more lead or leaders that guide fish to the net mouth. The net has one or more internal funnel-shaped openings with tapered ends directed inward from the mouth, through which fish enter the enclosure. The portion of the net designed to hold or trap fish is completely enclosed in mesh or webbing, except for the openings for fish passage into or out of the net (funnel area).

(h) Gill Net. A net set vertically in the water to capture fish by entanglement of the gills in its mesh as a result of net design, construction, mesh ~~size,~~ length, webbing diameter, or method in which it is used.

(i) Headrope. The support structure for the mesh or webbing of a trawl that is nearest to the water surface when in use. Headrope length is measured from the outer most mesh knot

at one end of the headrope following along the line to the outer most mesh knot at the opposite end of the headrope.

(j) Hoop Net. An entrapment net supported by a series of internal or external hoops or frames. The net has one or more internal funnel-shaped openings with tapered ends directed inward from the mouth, through which fish enter the enclosure. The portion of the net designed to hold or trap the fish is completely enclosed in mesh or webbing, except for the openings for fish passage into or out of the net (funnel area).

(k) Lead. A mesh or webbing structure consisting of nylon, monofilament, plastic, wire, or similar material set vertically in the water and held in place by stakes or anchors to guide fish into an enclosure. Lead length is measured from the outer most end of the lead along the top or bottom line, whichever is longer, to the opposite end of the lead.

(l) Mechanical methods for clamming. Dredges, hydraulic clam dredges, stick rakes and other rakes when towed by engine power, patent tongs, kicking with propellers or deflector plates with or without trawls, and any other method that utilizes mechanical means to harvest clams.

(m) Mechanical methods for oystering. Dredges, patent tongs, stick rakes and other rakes when towed by engine power, and any other method that utilizes mechanical means to harvest oysters.

(n) Mesh Length. The ~~diagonal~~ distance from the inside of one knot to the outside of the ~~other~~ opposite knot, when the net is stretched ~~hand-tight.~~hand-tight in a manner that closes the mesh opening.

(o) Pound Net Set. A fish trap consisting of a holding pen, one or more enclosures, lead or leaders, and stakes or anchors used to support the trap. The holding pen, enclosures, and lead(s) are not conical, nor are they supported by hoops or frames.

(p) Purse Gill Nets. Any gill net used to encircle fish when the net is closed by the use of a purse line through rings located along the top or bottom line or elsewhere on such net.

(q) Seine. A net set vertically in the water and pulled by hand or power to capture fish by encirclement and confining fish within itself or against another net, the shore or bank as a result of net design, construction, mesh ~~size,~~ length, webbing diameter, or method in which it is used.

(4) Fish habitat areas. The estuarine and marine areas that support juvenile and adult populations of fish species, as well as forage species utilized in the food chain. Fish habitats as used in this definition, are vital for portions of the entire life cycle, including the early growth and development of fish species. Fish habitats in all Coastal Fishing Waters, as determined through marine and estuarine survey sampling, include:

(a) Anadromous fish nursery areas. Those areas in the riverine and estuarine systems utilized by post-larval and later juvenile anadromous fish.

(b) Anadromous fish spawning areas. Those areas where evidence of spawning of anadromous fish has been documented in Division sampling records through direct observation of spawning, capture of running ripe females, or capture of eggs or early larvae.

(c) Coral:

(i) Fire corals and hydrocorals (Class Hydrozoa);

(ii) Stony corals and black corals (Class Anthozoa, Subclass Scleractinia); or

(iii) Octocorals; Gorgonian corals (Class Anthozoa, Subclass Octocorallia), which include sea fans (Gorgonia sp.), sea whips (Leptogorgia sp. and Lophogorgia sp.), and sea pansies (Renilla sp.).

(d) Intertidal Oyster Bed. A formation, regardless of size or shape, formed of shell and live oysters of varying density.

(e) Live rock. Living marine organisms or an assemblage thereof attached to a hard substrate, excluding mollusk shells, but including dead coral or rock. Living marine organisms associated with hard bottoms, banks, reefs, and live rock include:

(i) Coralline algae (Division Rhodophyta);

(ii) Acetabularia sp., mermaid's fan and cups (Udotea sp.), watercress (Halimeda sp.), green feather, green grape algae (Caulerpa sp.) (Division Chlorophyta);

(iii) Sargassum sp., Dictyopteris sp., Zonaria sp. (Division Phaeophyta);

(iv) Sponges (Phylum Porifera);

(v) Hard and soft corals, sea anemones (Phylum Cnidaria), including fire corals (Class Hydrozoa), and Gorgonians, whip corals, sea pansies, anemones, Solengastrea (Class Anthozoa);

(vi) Bryozoans (Phylum Bryozoa);

(vii) Tube worms (Phylum Annelida), fan worms (Sabellidae), feather duster and Christmas treeworms (Serpulidae), and sand castle worms (Sabellaridae);

(viii) Mussel banks (Phylum Mollusca: Gastropoda); and

(ix) Acorn barnacles (Arthropoda: Crustacea: Semibalanus sp.).

(f) Nursery areas. Areas that for reasons such as food, cover, bottom type, salinity, temperature, and other factors, young finfish and crustaceans spend the major portion of their initial growing season. Primary nursery areas are those areas in the estuarine system where initial post-larval development takes place. These are areas where populations are uniformly early juveniles. Secondary nursery areas are those areas in the estuarine system where later juvenile development takes place. Populations are composed of developing sub-adults of similar size which have migrated from an upstream primary nursery area to the secondary nursery area located in the middle portion of the estuarine system.

(g) Shellfish producing habitats. Historic or existing areas that shellfish, such as clams, oysters, scallops, mussels, and whelks use to reproduce and survive because of such favorable conditions as bottom type, salinity, currents, cover, and cultch. Included are those shellfish producing areas closed to shellfish harvest due to pollution.

(h) Strategic Habitat Areas. Locations of individual fish habitats or systems of habitats that provide exceptional habitat functions or that are particularly at risk due to imminent threats, vulnerability, or rarity.

(i) Submerged aquatic vegetation (SAV) habitat. Submerged lands that:

(i) are vegetated with one or more species of submerged aquatic vegetation including bushy pondweed or southern naiad (Najas guadalupensis), coontail (Ceratophyllum demersum), eelgrass (Zostera marina), horned pondweed (Zannichellia palustris), naiads (Najas spp.), redhead grass (Potamogeton perfoliatus), sago pondweed (Stuckenia pectinata, formerly Potamogeton pectinatus), shoalgrass (Halodule wrightii), slender pondweed (Potamogeton pusillus), water stargrass (Heteranthera dubia), water starwort (Callitriche heterophylla), waterweeds (Elodea spp.), widgeongrass (Ruppia maritima), and wild celery (Vallisneria americana). These areas may be identified by the presence of above-ground leaves, below-ground rhizomes, or reproductive structures associated with one or more SAV species and include the sediment within these areas; or

(ii) have been vegetated by one or more of the species identified in Sub-item (4)(i)(i) of this Rule within the past 10 annual growing seasons and that meet the average physical requirements of water depth (six feet or less), average light availability (secchi depth of one foot or more), and limited wave exposure that characterize the environment suitable for growth of SAV. The past presence of SAV may be demonstrated by aerial photography, SAV survey, map, or other documentation. An extension of the past 10 annual growing seasons criteria may be considered when average environmental conditions are altered by drought, rainfall, or storm force winds.

This habitat occurs in both subtidal and intertidal zones and may occur in isolated patches or cover extensive areas. In defining SAV habitat, the Marine Fisheries Commission recognizes the Aquatic Weed Control Act of 1991 (G.S. 113A-220 et. seq.) and does not intend the submerged aquatic vegetation definition, or this Rule or Rules 03K .0304 and .0404, to apply to or conflict with the non-development control activities authorized by that Act.

(5) Licenses, permits, leases and franchises, and record keeping:

(a) Assignment. Temporary transferal to another person of privileges under a license for which assignment is permitted. The person assigning the license delegates the privileges permitted under the license to be exercised by the assignee, but retains the power to revoke the assignment at any time, and is still the responsible party for the license.

(b) Designee. Any person who is under the direct control of the permittee or who is employed by or under contract to the permittee for the purposes authorized by the permit.

(c) For Hire Vessel. As defined by G.S. 113-174, when the vessel is fishing in state waters or when the vessel originates from or returns to a North Carolina port.

(d) Logbook. Paper forms provided by the Division and electronic data files generated from software provided by the Division for the reporting of fisheries statistics by persons engaged in commercial or recreational fishing or for-hire operators.

~~(d)~~(e) Holder. A person who has been lawfully issued in his or her name a license, permit, franchise, lease, or assignment.

~~(e)~~(f) Land:

(i) For commercial fishing operations, when fish reach the shore or a structure connected to the shore.

(ii) For purposes of trip tickets, when fish reach a licensed seafood dealer, or where the fisherman is the dealer, when the fish reaches the shore or a structure connected to the shore.

(iii) For recreational fishing operations, when fish are retained in possession by the fisherman.

~~(f)~~(g) Licensee. Any person holding a valid license from the Department to take or deal in marine fisheries resources.

~~(g)~~(h) Master. Captain of a vessel or one who commands and has control, authority, or power over a vessel.

~~(h)~~(i) New fish dealer. Any fish dealer making application for a fish dealer license who did not possess a valid dealer license for the previous license year in that name. For purposes of license issuance, adding new categories to an existing fish dealers license does not constitute a new dealer.

~~(i) North Carolina Trip Ticket. Paper forms provided by the Division, and electronic data files generated from software provided by the Division, for the reporting of fisheries statistics that include quantity, method, and location of harvest.~~

(j) Office of the Division. Physical locations of the Division conducting license and permit transactions in Wilmington, Washington, Morehead City, Roanoke Island and Elizabeth City, North Carolina. Other businesses or entities designated by the Secretary to issue Recreational Commercial Gear Licenses or Coastal Recreational Fishing Licenses are not considered Offices of the Division.

(k) Responsible party. Person who coordinates, supervises, or otherwise directs operations of a business entity, such as a corporate officer or executive level supervisor of business operations, and the person responsible for use of the issued license in compliance with applicable statutes and rules.

(l) Tournament Organizer. The person who coordinates, supervises, or otherwise directs a recreational fishing tournament and is the holder of the Recreational Fishing Tournament License.

(m) Transaction. Act of doing business such that fish are sold, offered for sale, exchanged, bartered, distributed, or landed.

(n) Transfer. Permanent transferal to another person of privileges under a license for which transfer is permitted. The person transferring the license retains no rights or interest under the license transferred.

(o) Trip Ticket. Paper forms provided by the Division and electronic data files generated from software provided by the Division for the reporting of fisheries statistics by licensed fish dealers.

*Authority G.S. 113-134; 113-174; 143B-289.52*

**15A NCAC 03O .0101 PROCEDURES AND REQUIREMENTS TO OBTAIN LICENSES, ENDORSEMENTS AND COMMERCIAL FISHING VESSEL REGISTRATIONS**

NOTE: CHANGES TO 15A NCAC 03O .0101 INCLUDE CHANGES FOR THE FOR-HIRE LICENSE AND CHANGES IN OCEAN FISHING PIER LICENSING WHICH ARE CONVERED IN A SEPARATE ANALYSIS.

(a) To obtain any Marine Fisheries licenses, endorsements, commercial fishing vessel registrations except Recreational Fishing Tournament Licenses to Sell Fish and Land or Sell Licenses, the following information is required for the application by the licensee, a responsible party or person holding a power of attorney:

(1) Full name, physical address, mailing address, date of birth, and signature of the licensee on the application. If the licensee is not appearing before a license agent or a representative of the Division, the licensee's signature on the application shall be notarized;

(2) Current picture identification of licensee or responsible party; acceptable forms of picture identification are driver's license, state identification card, military identification card, resident alien card (green card) or passport or if purchased by mail, a copy thereof;

(3) Certification that the applicant does not have four or more marine or estuarine resource violations during the previous three years, except Blanket Coastal Recreational Fishing Licenses;

(4) Valid documentation papers or current motor boat registration or copy thereof when purchasing a commercial fishing vessel registration. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted;

(5) Current articles of incorporation and a current list of corporate officers when purchasing a license or commercial fishing vessel registration in a corporate name. In the case of incorporation of an individual fishing vessel, the name of the master of that vessel shall also be specified. It is unlawful to fail to notify the Morehead City Office of the Division of Marine Fisheries within five days of change of the master specified for that vessel;

(6) An affirmation of liability insurance and that the operator is knowledgeable of United States Coast Guard (USCG) safety requirements for the vessel(s) used in the operation in accordance with G.S. 113-168.6 when purchasing a commercial fishing vessel registration with a for-hire endorsement.

~~(6)~~(7) If a partnership is established by a written partnership agreement, a current copy of such agreement shall be provided when purchasing a license, endorsement or commercial fishing vessel registration in a partnership name;

~~(7)~~(8) For nonresidents, certification of the state of residency;

~~(8)~~(9) In addition to the information required in G.S. 113-169.4, linear length of pier when purchasing an Ocean Fishing Pier License;

~~(9)~~(10) In addition to the information required in G.S. 113-171.1, current aircraft registration and list of operator(s) when purchasing a Spotter Plane License;

~~(10)~~(11) In addition, for fish dealers licenses, the physical address of the established location where business is conducted and, if different, the address where records are kept;

~~(11)~~(12) When purchasing a Fish Dealer License with clam or oyster categories or a consolidated license, the applicant shall provide valid certification as a North Carolina certified shellfish dealer;

~~(12) In addition, for the Ocean Fishing Pier Blanket Coastal Recreation Fishing License, a valid Ocean Fishing Pier License issued in the name of the applicant or copy thereof.~~

(13) In addition, for the ~~For Hire~~ Blanket For-Hire Captain's Coastal Recreational Fishing ~~License,~~ License (CRFL), the applicant shall ~~provide:~~provide a valid certification from the USCG that allows carrying six or fewer passengers or a certification from the USCG that allows carrying more than six passengers; and

~~(A) A valid certification from the United States Coast Guard (USCG) that allows carrying six or fewer passengers or a certification from the USCG that allows carrying more than six passengers; and~~

~~(B) Valid documentation papers or current motor boat registration or copies thereof for the vessel engaged as for hire. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted.~~

(14) In addition, for the Blanket For-Hire Vessel CRFL or the Non-Blanket For-Hire Vessel License, valid documentation papers or current motor boat registration or copies thereof for the vessel engaged as for-hire. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted.

(b) License to Land Flounder from the Atlantic Ocean.

(1) To qualify for a License to Land Flounder from the Atlantic Ocean, the applicant shall:

(A) have landed in North Carolina at least 1,000 pounds of flounder from a single vessel each year from the Atlantic Ocean during any two of the 1992-93, 1993-94, 1994-95 license years for which the person had a vessel that was licensed to land in North Carolina; and

(B) have been licensed under G.S. 113-152 or 113-153 during any two of the 1992-93, 1993-94, or 1994-95 license years; and

(C) hold a valid Standard or Retired Standard Commercial Fishing License or valid Land or Sell License.

(2) It is lawful for a person to hold Licenses to Land Flounder from the Atlantic Ocean equal to the number of vessels that he owns that individually met the eligibility requirements of Parts (b)(1)(A) and (b)(1)(B) of this Rule.

(3) The License to Land Flounder from the Atlantic Ocean is only valid when used on the vessel specified at the time of license issuance.

(4) At the time of issuance, the applicant for the License to Land Flounder from the Atlantic Ocean shall specify the name of the master of the vessel for each License to Land Flounder from the Atlantic Ocean issued.

(5) Applicants for a License to Land Flounder from the Atlantic Ocean shall complete an application form provided by the Division of Marine Fisheries and submit it to the Morehead City Office of the Division of Marine Fisheries for processing.

(6) It is unlawful for the holder of the License to Land Flounder from the Atlantic Ocean to fail to notify the Morehead Office of the Division of Marine Fisheries within five days of change as to the master identified on the license.

(7) Licenses to Land Flounder from the Atlantic Ocean are issued for the current license year and expire on June 30.

(c) To obtain a Recreational Fishing Tournament License to Sell Fish, the tournament organizer shall apply with the Division of Marine Fisheries at least 30 days prior to the starting date of the tournament with the following required information:

(1) Full name, physical address, mailing address, date of birth, signature of the tournament organizer, name of tournament, and dates of tournament on the license application. If the licensee is not appearing before a representative of the Division, the licensee's signature shall be notarized on the application.

(2) Current picture identification of tournament organizer; acceptable forms of picture identification are driver's license, state identification card, military identification card, or passport, or if purchased by mail, a copy thereof.

(d) To obtain a Land or Sell License, the following information is required for a proper application:

(1) Full name, physical address, mailing address, date of birth, and signature of the responsible party or master for the vessel on the license application. If the licensee is not appearing before a

representative of the Division, the licensee's signature on the application shall be notarized on the application;

(2) Current picture identification of responsible party or master; acceptable forms of picture identification are driver's license, state identification card, military identification card, or passport or if applying by mail, a copy thereof;

(3) Valid documentation papers or current motor boat registration or copy thereof when purchasing a commercial fishing vessel registration. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted.

Fees shall be based on the vessel's homeport as it appears on the U.S. Coast Guard documentation papers or the State in which the vessel is registered.

(e) Proof of residency in North Carolina for:

(1) Standard Commercial Fishing License or Retired Standard Commercial Fishing License shall require a notarized certification from the applicant that the applicant is a resident of the State of North Carolina as defined by G.S. 113-130(4); and

(A) a notarized certification from the applicant that a North Carolina State Income Tax Return was filed for the previous calendar or tax year as a North Carolina resident; or

(B) a notarized certification that the applicant was not required to file a North Carolina State Income Tax Return for the previous calendar or tax year; or

(C) military identification, military dependent identification and permanent change of station orders or assignment orders substantiating individual's active duty assignment at a military facility in North Carolina.

(2) All other types of licenses:

(A) North Carolina voter registration card; or

(B) Current North Carolina Driver's License; or

(C) Current North Carolina Certificate of Domicile; or

(D) Current North Carolina Identification Card issued by the North Carolina Division of Motor Vehicles; or

(E) Military identification, military dependent identification and permanent change of station orders or assignment orders substantiating individual's active duty assignment at a military facility in North Carolina.

(f) Applications submitted without complete and required information shall be deemed incomplete and shall not be considered further until resubmitted with all required information.

(g) It is unlawful for a license or registration holder to fail to notify the Division of Marine Fisheries within 30 days of a change of address.

(h) Licenses are available at Offices of the Division or by mail from the Morehead City Office, unless otherwise specified. In addition, Recreational Commercial Gear Licenses are available at Wildlife Service Agents who have been designated as agents of the Department.

(i) To renew any Marine Fisheries licenses, endorsements, and commercial fishing vessel registration, except Recreational Commercial Gear Licenses, the following is required for the renewal application by the licensee, a responsible party or person holding a power of attorney;

(1) The information required in Subparagraphs (a)(4), (a)(5), and (a)(6) of this Rule are only required if a change has occurred since the last issuance of license, endorsement or commercial fishing vessel registration.

(2) Certification that articles of incorporation and list of corporate officers, if incorporated, written partnership agreement, if written partnership, or documentation papers or motor boat registration previously provided for initial license purchase are still valid and current for renewal.

(3) Current and valid state driver's license or state identification picture identification numbers and expiration dates shall be verified on mail license renewal applications or any other electronic license renewal process, otherwise the licensee shall provide a photocopy for renewal by mail or visit a Division License Office and present a current and valid picture identification pursuant to Subparagraph (a)(2) of this Rule.

(4) The licensee's or responsible party's signature on the application shall certify all information as true and accurate. Notarization of signature on renewal applications is not required.

(5) The Division of Marine Fisheries may require current copies of documentation for licenses, endorsements, commercial fishing vessel registration on renewal when necessary to verify inconsistent information or the information cannot be verified by independent sources.

(6) If the linear length of the pier has not changed for the Ocean Fishing Pier License renewal, the responsible party shall certify that the length is accurate; otherwise, a Marine Patrol Officer's signature is required to certify the linear length before the license can be renewed.

(7) Certification that shellfish dealer certification by North Carolina previously provided for issuance of Fish Dealer License with clam or oyster categories or consolidated license is still valid and current for renewal.

*Authority G.S. 113-134; 113-168; 113-168.1-6; 113-169; 113-169.2-5; 113-171.1; 113-174.3; ~~113-174.4;~~ 143B-289.52*

**15A NCAC 03O .0106 DISPLAY OF LICENSES AND REGISTRATIONS**

NOTE: CHANGES TO 15A NCAC 03O .0106 INCLUDE CHANGES FOR THE FOR-HIRE LICENSE AND CHANGES IN OCEAN FISHING PIER LICENSING WHICH ARE CONVERED IN A SEPARATE ANALYSIS.

(a) It is unlawful:

(1) For any person to use a vessel required to be registered under the provisions of G.S. 113-168.6 in a commercial fishing operation without a current commercial fishing vessel registration decal mounted on an exterior surface so as to be plainly visible when viewed from the port side; and

(2) To display any commercial fishing vessel registration decal not issued for the vessel displaying it.

(b) It is unlawful to fail to display any fish dealer's licenses required by G.S. 113-169.3, ocean fishing pier license required by ~~G.S. 113-169.4, or Ocean Fishing Pier Blanket Coastal Recreational Fishing License (CRFL) pursuant to G.S. 113-174.4~~ G.S. 113-169.4 in prominent public view in each location subject to licensing.

(c) It is unlawful to fail to display a current For-Hire License decal on the exterior surface of the vessel so as to be visible when viewed from the port side while engaged in for-hire recreational fishing.

*Authority G.S. 113-168.6; 113-169.3; 113-169.4; ~~113-174.4;~~ 143B-289.52*

**15A NCAC 03O .0112 FOR HIRE COASTAL RECREATIONAL FISHING**

~~(a) It is unlawful to operate a For-Hire Vessel unless the vessel operator possesses either the For-Hire Blanket Coastal Recreational Fishing License (CRFL) for the vessel or a Division of Marine Fisheries For-Hire Fishing Permit for the vessel as provided in 15A NCAC 03O .0503(k).~~

~~(b)~~(a) It is unlawful for a ~~For-Hire Vessel~~ for-hire operator to operate ~~under the For-Hire Blanket CRFL~~ without:

(1) Holding the ~~USCG~~ United States Coast Guard certification required in 15A NCAC 03O .0101(a)(13);

(2) Having ~~the For-Hire Blanket CRFL for the vessel or copy thereof~~ a copy of the for-hire license in possession and ready at hand for inspection; and

(3) Having current picture identification in possession and ready at hand for inspection.

~~(c) It is unlawful for the holder of the For-Hire Blanket CRFL to fail to participate in and provide accurate information as requested by the Division for biological sampling and survey programs.~~

~~(d) It is unlawful to fail to display a current For-Hire Blanket CRFL decal mounted on an exterior surface of the vessel so as to be visible when viewed from the port side while engaged in for-hire recreational fishing.~~

(b) It is unlawful to operate a vessel in a for-hire operation without the vessel having a valid Commercial Fishing Vessel Registration with a for-hire endorsement, a Blanket For-Hire Vessel Coastal Recreational Fishing License or a Non-Blanket For-Hire Vessel License.

(c) It is unlawful for the responsible party of a for-hire license to fail to provide to the Division of Marine Fisheries by Monday of each week a completed for-hire logbook detailing the fishing activity, or a no-activity report, for the previous week. For the purposes of this Paragraph, week is defined as Sunday through Saturday.

*Authority G.S. 113-134; 113-174.3; 143B-289.52*

**15A NCAC 03O .0501 PROCEDURES AND REQUIREMENTS TO OBTAIN PERMITS**

NOTE: CHANGES TO 15A NCAC 03O .0501 INCLUDE CHANGES FOR THE FOR-HIRE LICENSE AND CHANGES IN THE MANAGEMENT OF BAY SCALLOPS WHICH ARE CONVERED IN A SEPARATE ANALYSIS.

(a) To obtain any Marine Fisheries permit, the following information is required for proper application from the applicant, a responsible party or person holding a power of attorney:

(1) Full name, physical address, mailing address, date of birth, and signature of the applicant on the application. If the applicant is not appearing before a license agent or the designated Division contact, the applicant's signature on the application shall be notarized;

(2) Unexpired picture identification of applicant, responsible party and, when applicable, person holding a power of attorney. Acceptable forms of picture identification are driver's license, North Carolina Identification card issued by the North Carolina Division of Motor Vehicles, military identification card, resident alien card (green card) or passport or if applying by mail, a copy thereof;

(3) Full names and dates of birth of designees of the applicant who will be acting under the requested permit where that type permit requires listing of designees;

(4) Certification that the applicant and his designees do not have four or more marine or estuarine resource convictions during the previous three years;

(5) For permit applications from business entities:

(A) Business Name;

(B) Type of Business Entity: Corporation, partnership, or sole proprietorship;

(C) Name, address and phone number of responsible party and other identifying information required by this Subchapter or rules related to a specific permit;

(D) For a corporation, current articles of incorporation and a current list of corporate officers when applying for a permit in a corporate name;

(E) For a partnership, if the partnership is established by a written partnership agreement, a current copy of such agreement shall be provided when applying for a permit; and

(F) For business entities, other than corporations, copies of current assumed name statements if filed and copies of current business privilege tax certificates, if applicable; and

(6) Additional information as required for specific permits.

(b) A permittee shall hold a valid Standard or Retired Standard Commercial Fishing License in order to hold a:

(1) Pound Net Permit;

(2) Permit to Waive the Requirement to Use Turtle Excluder Devices in the Atlantic Ocean; or

(3) Atlantic Ocean Striped Bass Commercial Gear Permit.

(c) A permittee and his designees shall hold a valid Standard or Retired Standard Commercial Fishing License with a Shellfish Endorsement or a Shellfish License in order to hold a:

(1) Permit to Transplant Prohibited (Polluted) Shellfish;

(2) Permit to Transplant Oysters from Seed Oyster Management Areas;

(3) Permit to Use Mechanical Methods for ~~Oysters or Clams~~ Shellfish on Shellfish Leases or Franchises;

(4) Permit to Harvest Rangia Clams from Prohibited (Polluted) Areas; or

(5) Depuration Permit.

(d) A permittee shall hold a valid:

(1) Fish Dealer License in the proper category in order to hold Dealer Permits for Monitoring Fisheries Under a Quota/Allocation for that category; and

(2) Standard Commercial Fishing License with a Shellfish Endorsement, Retired Standard Commercial Fishing License with a Shellfish Endorsement or a Shellfish License in order to harvest clams or oysters for depuration.

(e) Aquaculture Operations/Collection Permits:

(1) A permittee shall hold a valid Aquaculture Operation Permit issued by the Fisheries Director to hold an Aquaculture Collection Permit.

(2) The permittee or designees shall hold appropriate licenses from the Division of Marine Fisheries for the species harvested and the gear used under the Aquaculture Collection Permit.

(f) Atlantic Ocean Striped Bass Commercial Gear Permit:

(1) ~~Application for an Atlantic Ocean Striped Bass Commercial Gear Permit must be made prior to November 1 of each year. A person shall declare one of the following gears for an initial Atlantic Ocean Striped Bass Commercial Gear Permit~~ Upon application for an Atlantic Ocean Striped Bass Commercial Gear Permit, a person shall declare one of the following gears for an initial permit and at intervals of three consecutive license years thereafter:

(A) gill net;

(B) trawl; or

(C) beach seine.

For the purpose of this Rule, a beach seine is defined as a swipe net constructed of multi-filament or multi-fiber webbing fished from the ocean beach that is deployed from a vessel launched from the ocean beach where the fishing operation takes place.

Gear declarations are binding on the permittee for three consecutive license years without regard to subsequent annual permit issuance.

(2) A person is not eligible for more than one Atlantic Ocean Striped Bass Commercial Gear Permit regardless of the number of Standard Commercial Fishing Licenses, Retired Standard Commercial Fishing Licenses or assignments held by the person.

~~(3) The annual, nonrefundable permit fee is ten dollars ($10.00).~~

~~(g) For Hire Fishing Permit:~~

~~(1) The permittee shall hold a valid certification from the United States Coast Guard (USCG) that allows carrying six or fewer passengers or a certification from the USCG that allows carrying more than six passengers;~~

~~(2) The permittee shall provide valid documentation papers or current motor boat registration or copies thereof for the vessel engaged as for hire. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted.~~

~~(h)~~(g) Applications submitted without complete and required information shall not be processed until all required information has been submitted. Incomplete applications shall be returned to the applicant with deficiency in the application so noted.

~~(i)~~(h) A permit shall be issued only after the application has been deemed complete by the Division of Marine Fisheries and the applicant certifies to abide by the permit general and specific conditions established under ~~15A NCAC 03J .0501, 03J .0505, 03K .0103, 03K .0104, 03K .0107, 03K .0206, 03K .0303, 03K .0401, 03O .0502, and 03O .0503~~ 15A NCAC 03J .0501, .0505, 03K .0103, .0104, .0107, .0111, .0401, 03O .0502, and .0503 as applicable to the requested permit.

~~(j)~~(i) The Fisheries Director, or his agent may evaluate the following in determining whether to issue, modify or renew a permit:

(1) Potential threats to public health or marine and estuarine resources regulated by the Marine Fisheries Commission;

(2) Applicant's demonstration of a valid justification for the permit and a showing of responsibility as determined by the Fisheries Director;

(3) Applicant's history of habitual fisheries violations evidenced by eight or more violations in 10 years.

~~(k)~~(j) The Division of Marine Fisheries shall notify the applicant in writing of the denial or modification of any permit request and the reasons therefor. The applicant may submit further information, or reasons why the permit should not be denied or modified.

~~(l)~~(k) Permits are valid from the date of issuance through the expiration date printed on the permit. Unless otherwise established by rule, the Fisheries Director may establish the issuance timeframe for specific types and categories of permits based on season, calendar year, or other period based upon the nature of the activity permitted, the duration of the activity, compliance with federal or state fishery management plans or implementing rules, conflicts with other fisheries or gear usage, or seasons for the species involved. The expiration date shall be specified on the permit.

~~(m)~~(l) For permit renewals, the permittee's signature on the application shall certify all information as true and accurate. Notarization of signature on renewal applications is not required.

~~(n)~~(m) For initial or renewal permits, processing time for permits may be up to 30 days unless otherwise specified in this Chapter.

~~(o)~~(n) It is unlawful for a permit holder to fail to notify the Division of Marine Fisheries within 30 days of a change of name or address.

~~(p)~~(o) It is unlawful for a permit holder to fail to notify the Division of Marine Fisheries of a change of designee prior to use of the permit by that designee.

~~(q)~~(p) Permit applications are available at all Division Offices.

*Authority G.S. 113-134; 113-169.1; 113-169.3; 113-182; 113-210; 143B-289.52*

**15A NCAC 03O .0503 PERMIT CONDITIONS; SPECIFIC**

NOTE: CHANGES TO 15A NCAC 03O .0503 INCLUDE CHANGES FOR THE FOR-HIRE LICENSE AND CHANGES IN THE MANAGEMENT OF RIVER HERRING WHICH ARE CONVERED IN A SEPARATE ANALYSIS.

(a) Horseshoe Crab Biomedical Use Permit:

(1) It is unlawful to use horseshoe crabs for biomedical purposes without first obtaining a permit.

(2) It is unlawful for persons who have been issued a Horseshoe Crab Biomedical Use Permit to fail to submit a report on the use of horseshoe crabs to the Division of Marine Fisheries due on February 1 of each year. Such reports shall be filed on forms provided by the Division and shall include a monthly account of the number of crabs harvested, statement of percent mortality up to the point of release, and a certification that harvested horseshoe crabs are solely used by the biomedical facility and not for other purposes.

(3) It is unlawful for persons who have been issued a Horseshoe Crab Biomedical Use Permit to fail to comply with the Atlantic States Marine Fisheries Commission Interstate Fishery Management Plan for Horseshoe Crab monitoring and tagging requirements for horseshoe crabs. Copies of this plan are available from the Atlantic States Marine Fisheries Commission or the Division of Marine Fisheries' Morehead City Headquarters Office, P.O. Box 769, 3441 Arendell St., Morehead City, North Carolina 28557-0769.

(b) Dealers Permits for Monitoring Fisheries under a Quota/Allocation:

(1) During the commercial season opened by proclamation or rule for the fishery for which a Dealers Permit for Monitoring Fisheries under a Quota/Allocation permit is issued, it is unlawful for the fish dealers issued such permit to fail to:

(A) fax or send via electronic mail by noon daily, on forms provided by the Division, the previous day's landings for the permitted fishery to the dealer contact designated on the permit. Landings for Fridays or Saturdays shall be submitted on the following Monday. If the dealer is unable to fax or electronic mail the required information, the permittee shall call in the previous day's landings to the dealer contact designated on the permit but shall maintain a log furnished by the Division;

(B) submit the required log to the Division upon request or no later than five days after the close of the season for the fishery permitted;

(C) maintain faxes and other related documentation in accordance with 15A NCAC 03I .0114;

(D) contact the dealer contact designated on the permit daily regardless of whether or not a transaction for the fishery for which a dealer is permitted occurred; and

(E) record the permanent dealer identification number on the bill of lading or receipt for each transaction or shipment from the permitted fishery.

(2) Striped Bass Dealer Permit:

(A) It is unlawful for a fish dealer to possess, buy, sell, or offer for sale striped bass taken from the following areas without first obtaining a Striped Bass Dealer Permit validated for the applicable harvest area:

(i) Atlantic Ocean;

(ii) Albemarle Sound Management Area as designated in 15A NCAC 03R .0201; and

(iii) the Joint and Coastal Fishing Waters of the Central/Southern Management Area as designated in 15A NCAC 03R .0201.

(B) No permittee shall possess, buy, sell, or offer for sale striped bass taken from the harvest areas opened by proclamation without having a North Carolina Division of Marine Fisheries issued valid tag for the applicable area affixed through the mouth and gill cover, or, in the case of striped bass imported from other states, a similar tag that is issued for striped bass in the state of origin. North Carolina Division of Marine Fisheries striped bass tags shall not be bought, sold, offered for sale, or transferred. Tags shall be obtained at the North Carolina Division of Marine Fisheries Offices. The Division of Marine Fisheries shall specify the quantity of tags to be issued based on historical striped bass landings. It is unlawful for the permittee to fail to surrender unused tags to the Division upon request.

(3) Albemarle Sound Management Area for River Herring Dealer Permit: It is unlawful to possess, buy, sell, or offer for sale river herring taken from the following area without first obtaining an Albemarle Sound Management Area for River Herring Dealer Permit: Albemarle Sound Management Area for River Herring as defined in ~~15A NCAC 03J .0209.~~15A NCAC 03R .0202.

(4) Atlantic Ocean Flounder Dealer Permit:

(A) It is unlawful for a fish dealer to allow vessels holding a valid License to Land Flounder from the Atlantic Ocean to land more than 100 pounds of flounder from a single transaction at their licensed location during the open season without first obtaining an Atlantic Ocean Flounder Dealer Permit. The licensed location shall be specified on the Atlantic Ocean Flounder Dealer Permit and only one location per permit shall be allowed.

(B) It is unlawful for a fish dealer to possess, buy, sell, or offer for sale more than 100 pounds of flounder from a single transaction from the Atlantic Ocean without first obtaining an Atlantic Ocean Flounder Dealer Permit.

(5) Black Sea Bass North of Cape Hatteras Dealer Permit. It is unlawful for a fish dealer to purchase or possess more than 100 pounds of black sea bass taken from the Atlantic Ocean north of Cape

Hatteras (35° 15.0321' N) per day per commercial fishing operation during the open season unless the dealer has a Black Sea Bass North of Cape Hatteras Dealer Permit.

(c) Blue Crab Shedding Permit: It is unlawful to possess more than 50 blue crabs in a shedding operation without first obtaining a Blue Crab Shedding Permit from the Division of Marine Fisheries.

(d) Permit to Waive the Requirement to Use Turtle Excluder Devices in the Atlantic Ocean:

(1) It is unlawful to trawl for shrimp in the Atlantic Ocean without Turtle Excluder Devices installed in trawls within one nautical mile of the shore from Browns Inlet (34° 35.7000' N latitude) to Rich's Inlet (34° 17.6000' N latitude) without a valid Permit to Waive the Requirement to Use Turtle Excluder Devices in the Atlantic Ocean when allowed by proclamation from April 1 through November 30.

(2) It is unlawful to tow for more than 55 minutes from April 1 through October 31 and 75 minutes from November 1 through November 30 in this area when working under this permit. Tow time begins when the doors enter the water and ends when the doors exit the water.

(3) It is unlawful to fail to empty the contents of each net at the end of each tow.

(4) It is unlawful to refuse to take observers upon request by the Division of Marine Fisheries or the National Marine Fisheries Service.

(5) It is unlawful to fail to report any sea turtle captured. Reports shall be made within 24 hours of the capture to the Marine Patrol Communications Center by phone. All turtles taken incidental to trawling shall be handled and resuscitated in accordance with requirements specified in 50 CFR 223.206, copies of which are available via the Internet at www.nmfs.gov and at the Division of Marine Fisheries, 127 Cardinal Drive Extension, Wilmington, North Carolina 28405.

(e) Pound Net Set Permits. Rule 15A NCAC 03J .0505 sets forth the specific conditions for pound net set permits.

(f) Aquaculture Operations/Collection Permits:

(1) It is unlawful to conduct aquaculture operations utilizing marine and estuarine resources without first securing an Aquaculture Operation Permit from the Fisheries Director.

(2) It is unlawful:

(A) to take marine and estuarine resources from Coastal Fishing Waters for aquaculture purposes without first obtaining an Aquaculture Collection Permit from the Fisheries Director.

(B) to sell, or use for any purpose not related to North Carolina aquaculture, marine and estuarine resources taken under an Aquaculture Collection Permit.

(C) to fail to submit to the Fisheries Director an annual report due on December 1 of each year on the form provided by the Division the amount and disposition of marine and estuarine resources collected under authority of this permit.

(3) Lawfully permitted shellfish relaying activities authorized by 15A NCAC 03K .0103 and .0104 are exempt from requirements to have an Aquaculture Operation or Collection Permit issued by the Fisheries Director.

(4) Aquaculture Operations/Collection Permits shall be issued or renewed on a calendar year basis.

(5) It is unlawful to fail to provide the Division of Marine Fisheries with a listing of all designees acting under an Aquaculture Collection Permit at the time of application.

(g) Scientific or Educational Activity Permit:

(1) It is unlawful for institutions or agencies seeking exemptions from license, rule, proclamation or statutory requirements to collect, hold, culture or exhibit for scientific or educational purposes any marine or estuarine species without first obtaining a Scientific or Educational Activity Permit.

(2) The Scientific or Educational Activity Permit shall only be issued for scientific or educational purposes and for collection methods and possession allowances approved by the Division of Marine Fisheries.

(3) The Scientific or Educational Activity Permit shall only be issued for approved activities conducted by or under the direction of Scientific or Educational institutions as defined in Rule 15A NCAC 03I .0101.

(4) It is unlawful for the responsible party issued a Scientific or Educational Activity Permit to fail to submit a report on collections and, if authorized, sales to the Division of Marine Fisheries due on December 1 of each year unless otherwise specified on the permit. The reports shall be filed on forms provided by the Division. Scientific or Educational Activity permits shall be issued on a calendar year basis.

(5) It is unlawful to sell marine or estuarine species taken under a Scientific or Educational Activity Permit without:

(A) the required license(s) for such sale;

(B) authorization stated on the permit for such sale; and

(C) providing the information required in Rule 15A NCAC 03I .0114 if the sale is to a licensed fish dealer.

(6) It is unlawful to fail to provide the Division of Marine Fisheries a listing of all designees acting under a Scientific or Educational Activity Permit at the time of application.

(7) The permittee or designees utilizing the permit shall call the Division of Marine Fisheries Communications Center at 800-682-2632 or 252-726-7021 not later than 24 hours prior to use of the permit, specifying activities and location.

(h) Under Dock Oyster Culture Permit:

(1) It is unlawful to cultivate oysters in containers under docks for personal consumption without first obtaining an Under Dock Oyster Culture Permit.

(2) An Under Dock Oyster Culture Permit shall be issued only in accordance with provisions set forth in G.S. 113-210(c).

(3) The applicant shall complete and submit an examination, with a minimum of 70 percent correct answers, based on an educational package provided by the Division of Marine Fisheries pursuant to G.S. 113-210(j). The examination demonstrates the applicant's knowledge of:

(A) the application process;

(B) permit criteria;

(C) basic oyster biology and culture techniques;

(D) shellfish harvest area closures due to pollution;

(E) safe handling practices;

(F) permit conditions; and

(G) permit revocation criteria.

(4) Action by an Under Dock Oyster Culture Permit holder to encroach on or usurp the legal rights of the public to access public trust resources in Coastal Fishing Waters shall result in permit revocation.

(i) Atlantic Ocean Striped Bass Commercial Gear Permit:

(1) It is unlawful to take striped bass from the Atlantic Ocean in a commercial fishing operation without first obtaining an Atlantic Ocean Striped Bass Commercial Gear Permit.

(2) It is unlawful to use a single Standard Commercial Fishing License, including assignments, to obtain more than one Atlantic Ocean Striped Bass Commercial Gear Permit during a license year.

(j) Coastal Recreational Fishing License Exemption Permit:

(1) It is unlawful for the responsible party seeking exemption from recreational fishing license requirements for eligible individuals to conduct an organized fishing event held in Joint or Coastal Fishing Waters without first obtaining a Coastal Recreational Fishing License Exemption Permit.

(2) The Coastal Recreational Fishing License Exemption Permit shall only be issued for recreational fishing activity conducted solely for the participation and benefit of one of the following groups of eligible individuals:

(A) individuals with physical or mental limitations;

(B) members of the United States Armed Forces and their dependents, upon presentation of a valid military identification card, for military appreciation;

(C) individuals receiving instruction on recreational fishing techniques and conservation practices from employees of state or federal marine or estuarine resource management agencies, or instructors affiliated with educational institutions; and

(D) disadvantaged youths.

For purposes of this Paragraph, educational institutions include high schools and other secondary educational institutions.

(3) The Coastal Recreational Fishing License Exemption Permit is valid for the date(s), time and physical location of the organized fishing event for which the exemption is granted and the time period shall not exceed one year from the date of issuance.

(4) The Coastal Recreational Fishing License Exemption Permit shall only be issued when all of the following, in addition to the information required in 15A NCAC 03O .0501, is submitted to the Fisheries Director in writing a minimum of 30 days prior to the event:

(A) the name, date(s), time and physical location of the event;

(B) documentation that substantiates local, state, or federal involvement in the organized fishing event, if applicable;

(C) the cost or requirements, if any, for an individual to participate in the event; and

(D) an estimate of the number of participants.

~~(k) For Hire Fishing Permit:~~

~~(1) It is unlawful to operate a For Hire Vessel unless the vessel operator possesses either the For Hire Blanket Coastal Recreational Fishing License (CRFL) for the vessel as provided in 15A NCAC 03O .0112 or a Division of Marine Fisheries For Hire Fishing Permit for the vessel.~~

~~(2) It is unlawful for a For Hire vessel operator to operate under the For Hire Fishing Permit without:~~

~~(A) holding the USCG certification required in 15A NCAC 03O .0501(g)(1);~~

~~(B) having the For Hire Fishing Permit for the vessel or copy thereof in possession and ready at hand for inspection; and~~

~~(C) having current picture identification in possession and ready at hand for inspection.~~

~~(3) It is unlawful for the permittee to fail to notify the Division within five days of any changes to information provided on the permit.~~

~~(4) It is unlawful to fail to display a current For Hire Fishing Permit decal mounted on an exterior surface of the vessel so as to be visible when viewed from the port side while engaged in for hire recreational fishing.~~

~~(5) The For Hire Fishing Permit is valid for one year from the date of issuance.~~

*Authority G.S. 113-134; 113-169.1; 113-169.3; 113-182; 113-210; 143B-289.52*

## Appendix 2: Excerpts from Session Law 2013-360, Section 14.8 (f), 14.8 (e), and 14.8 (o)

"**§ 113-169.1. Permits for gear, equipment, and other specialized activities authorized.**

(a) The Commission may adopt rules to establish permits for gear, equipment, and specialized activities, including commercial fishing operations that do not involve the use of a vessel and transplanting oysters or clams. The Commission may establish a fee for each permit established pursuant to this subsection in an amount that compensates the Division for the administrative costs associated with the permit but that does not exceed one hundred dollars ($100.00) per permit.

(b) The Commission may adopt rules to establish gear specific permits to take striped bass from the Atlantic Ocean and to limit the number and type of these permits that may be issued to a person. The Commission may establish a fee for each permit established pursuant to this subsection in an amount that compensates the Division for the administrative costs associated with the permit but that does not exceed ~~ten dollars ($10.00)~~thirty dollars ($30.00) per permit.

(c) To ensure an orderly transition from one permit year to the next, the Division may issue a permit prior to July 1 of the permit year for which the permit is valid. Revenue that the Division receives for the issuance of a permit prior to the beginning of a permit year shall not revert at the end of the fiscal year in which the revenue is received and shall be credited and available to the Division for the permit year in which the permit is valid."

"**§ 113-174.3. ~~For Hire Blanket CRFL.~~For-Hire Licenses.**

~~(a) License. – A person who operates a for hire boat may purchase a For Hire Blanket CRFL issued by the Division for the for hire boat. A For Hire Blanket CRFL authorizes all individuals on the for hire boat who do not hold a license issued under this Article or Article 25A of this Chapter to engage in recreational fishing in coastal fishing waters that are not joint fishing waters. A For Hire Blanket CRFL does not authorize individuals to engage in recreational fishing in joint fishing waters or inland fishing waters. A For Hire Blanket CRFL is valid for a period of one year from the date of issuance. The fee for a For Hire Blanket CRFL is:~~

~~(1) Two hundred fifty dollars ($250.00) for a vessel that will carry six or fewer passengers.~~

~~(2) Three hundred fifty dollars ($350.00) for a vessel that will carry greater than six passengers.~~

~~(b) Implementation. – Except as provided in this section and G.S. 113-174.2(d), each individual on board a for hire boat engaged in recreational fishing, other than crew members who do not engage in recreational fishing, must hold a license issued under this Article or Article 25A of this Chapter. An owner, operator, or crew member of a for hire boat is not responsible for the licensure of a customer fishing from the boat.~~

(c) License. – It is unlawful for a person to engage in a for-hire operation without having obtained one of the following licenses issued by the Division:

(1) Blanket For-Hire Captain's CRFL. – This license allows individuals properly licensed by the United States Coast Guard to carry passengers on any vessel with a commercial vessel registration with a for-hire endorsement. A Blanket For-Hire Captain's CRFL authorizes all individuals on the for-hire vessel who do not hold a license issued under this Article or Article 25A of this Chapter to engage in recreational fishing in coastal fishing waters that are not joint fishing waters. The resident fees for a Blanket For-Hire Captain's CRFL are two hundred fifty dollars ($250.00) for a vessel carrying six or fewer passengers and three hundred fifty dollars ($350.00) for a vessel carrying more than six passengers. The nonresident fees for a Blanket For-Hire Captain's CRFL are three hundred twelve dollars and fifty cents ($312.50) for a vessel carrying six or fewer passengers and four hundred thirty-seven dollars and fifty cents ($437.50) for a vessel carrying more than six passengers. Any vessel whose operator is licensed under this subdivision and that is engaged in for-hire fishing must obtain a Commercial Fishing Vessel Registration with a for-hire endorsement.

(2) Blanket For-Hire Vessel CRFL. – This license allows any United States Coast Guard licensed operator to carry passengers aboard the licensed vessel. A Blanket For-Hire Vessel CRFL authorizes all individuals on the for-hire vessel who do not hold a license issued under this Article or Article 25A of this Chapter to engage in recreational fishing in coastal fishing waters that are not joint fishing waters. The resident fees for a Blanket For-Hire Vessel CRFL are two hundred fifty dollars ($250.00) for a vessel carrying six or fewer passengers and three

hundred fifty dollars ($350.00) for a vessel carrying more than six passengers. The nonresident fees for a Blanket For-Hire Vessel CRFL are three hundred twelve dollars and fifty cents ($312.50) for a vessel carrying six or fewer passengers and four hundred thirty-seven dollars and fifty cents ($437.50) for a vessel carrying more than six passengers. Any vessel whose operator is licensed under this subdivision and that is engaged in for-hire fishing is not required to obtain a Commercial Fishing Vessel Registration with a for-hire endorsement.

(3) Non-Blanket For-Hire Vessel License. – This license allows any United States Coast Guard licensed operator to carry passengers aboard the licensed vessel. This license does not authorize individuals aboard the vessel to engage in recreational fishing unless they hold an individual CRFL issued under this Article or Article 25A of this Chapter. The fee for the Non-Blanket For-Hire Vessel License is twenty-five dollars ($25.00) for a vessel operated by a resident operator and thirty-seven dollars and fifty cents ($37.50) for a vessel operated by a nonresident operator. Any vessel whose operator is licensed under this subdivision and that is engaged in for-hire fishing is not required to obtain a Commercial Fishing Vessel Registration with a for-hire endorsement.

(d) A license issued under this section does not authorize individuals to engage in recreational fishing in joint fishing waters or inland fishing waters. All for-hire licenses expire on the last day of the license year.

(e) Each individual who obtains a for-hire license shall submit to the Division logbooks summarizing catch and effort statistical data to the Division. The Commission may adopt rules that determine the means and methods to satisfy the requirements of this subsection."

"**§ 113-168.6. Commercial fishing vessel registration.**

(a) As used in this subsection, a North Carolina vessel is a vessel that has its primary situs in the State. A vessel has its primary situs in the State if:

(1) A certificate of number has been issued for the vessel under Article 1 of Chapter 75A of the General Statutes;

(2) A certificate of title has been issued for the vessel under Article 4 of Chapter 75A of the General Statutes; or

(3) A certification of documentation has been issued for the vessel that lists a home port in the State under 46 U.S.C. § 12101, et seq., as amended.

(b) The owner of a vessel used in a commercial fishing operation in the coastal fishing waters of the State or a North Carolina vessel used to land or sell fish in the State shall register the vessel with the Division. It is unlawful to use a vessel that is not registered with the Division in a commercial fishing operation or a for-hire operation in the coastal fishing waters of the State. It is unlawful to use a North Carolina vessel that is not registered with the Division to land or sell fish in the State. No registration is required for a vessel of any length that does not have a motor if the vessel is used only in connection with another vessel that is properly registered.

(b1) The vessel owner at the time of application for registration under subsection (b) of this section shall obtain either a commercial vessel endorsement if the vessel is intended to be used primarily for the harvest of fish for sale, a for-hire endorsement if the vessel is intended to be used primarily for for-hire activities, or both endorsements if the vessel is intended to be engaged in both activities. The owner of a vessel applying for a commercial fishing vessel registration with a for-hire endorsement must affirm liability coverage and knowledge of applicable United States Coast Guard safety requirements.

(c) The annual fee for a commercial fishing vessel registration shall be determined by the length of the vessel and shall be in addition to the fee for other licenses issued under this Article. The length of a vessel shall be determined by measuring the distance between the ends of the vessel along the deck and through the cabin, excluding the sheer. The annual fee for a commercial fishing vessel registration is:

(1) ~~One dollar ($1.00)~~One dollar and twenty-five cents ($1.25) per foot for a vessel not over 18 feet in length.

(2) ~~One dollar and fifty cents ($1.50)~~One dollar and ninety cents ($1.90) per foot for a vessel over 18 feet but not over 38 feet in length.

(3) ~~Three dollars ($3.00)~~Three dollars and seventy-five cents ($3.75) per foot for a vessel over 38 feet but not over 50 feet in length.

(4) ~~Six dollars ($6.00)~~Seven dollars and fifty cents ($7.50) per foot for a vessel over 50 feet in length.

(d) A vessel may be registered at any office of the Division. A commercial fishing vessel registration expires on the last day of the license year.

(e) Within 30 days of the date on which the owner of a registered vessel transfers ownership of the vessel, the new owner of the vessel shall notify the Division of the change in ownership and apply for a replacement commercial fishing vessel registration. An application for a replacement commercial fishing vessel registration shall be accompanied by proof of the transfer of the vessel. The provisions of G.S. 113-168.1(h) apply to a replacement commercial fishing vessel registration."

**Fiscal Impacts of Proposed Rule Changes to the Ocean Fishing Pier License and Ocean Fishing Pier Blanket Coastal Recreational Fishing License to Reflect Statutory Changes Implemented in Session Law 2013-360**

**Rule Amendments:** 15A NCAC 03O .0101 PROCEDURES AND REQUIREMENTS TO OBTAIN LICENSES, ENDORSEMENTS AND COMMERCIAL FISHING VESSEL REGISTRATIONS
15A NCAC 03O .0106 DISPLAY OF LICENSES AND REGISTRATIONS
15A NCAC 03O .0113 OCEAN FISHING PIER BLANKET COASTAL RECREATIONAL FISHING LICENSE

**Name of Commission:** N.C. Marine Fisheries Commission

**Agency Contact:**
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**Impact Summary:**
State government: No
Local government: No
Federal government: No
Substantial impact: No

**Authority:** Session Law 2013-360, Section 14.8(j); § 113-169.4.

**Necessity:** In accordance with Session Law 2013-360, the proposed rule changes combine two separate ocean pier licenses into one Ocean Fishing Pier License with the same net cost as the previous two licenses combined. The rule changes are necessary to remove rule references to the Ocean Fishing Pier Coastal Recreational Fishing License (CRFL), which was eliminated by the recent statutory changes.

## I. Summary

The proposed rule changes eliminate rule references to the Ocean Fishing Pier CRFL to reflect recent legislation and statutory changes combining the Ocean Fishing Pier License with the Ocean Fishing Pier Blanket CRFL into one license at the same net cost of the two previous licenses. These changes are expected to streamline the licensing process for ocean fishing pier operations.

## II. Introduction and Purpose of Rule Changes

Ocean fishing piers open to the public have been required to obtain a license from the North Carolina Division of Marine Fisheries (NCDMF) since the 1997 Fisheries Reform Act. The fee for an Ocean Fishing Pier License was initially set and has remained at

$0.50 per foot of linear length of the pier. Legislation authorizing the CRFL enacted on January 1, 2007 provided for a voluntary Ocean Fishing Pier Blanket CRFL for a cost of $4.00 per foot of linear length of the pier. This license authorized any patron of the pier who did not hold a CRFL to engage in recreational fishing while on the pier. If a pier owner opted not to purchase this license, each patron would need to hold his or her own individual Coastal Recreational Fishing License.

Currently, there are approximately 20 ocean fishing piers along the North Carolina coast open to the public. Each of these piers has been purchasing both the Ocean Fishing Pier License and the Ocean Fishing Pier Blanket CRFL each year, for a combined cost of $4.50 per foot of linear length. The Ocean Fishing Pier License is based on a fiscal year, while the Ocean Fishing Pier Blanket CRFL is effective for one year from date of purchase. The new Ocean Fishing Pier License, authorizing all pier patrons to engage in recreational fishing, will remain on a fiscal year cycle and cost $4.50 per foot of linear length of the pier. Combining these two licenses makes administrative sense as it eliminates one license and aligns the date for renewal. The proposed rule changes reflect the recent statutory changes combining the two pier licenses by eliminating references to the Ocean Fishing Pier Blanket CRFL.

## III. Costs

There are no expected costs associated with the proposed rule changes. The rule changes remove references to the Ocean Fishing Pier Blanket CRFL, which was eliminated as part of Session Law 2013-360. The new Ocean Fishing Pier License combines the privileges and costs associated with the two licenses into one license.

## IV. Benefits

The proposed rule changes are expected to streamline the licensing process for ocean fishing pier operations. Ocean fishing pier operations will need to obtain one license from NCDMF instead of two licenses for their pier. Furthermore, removing references in rule to the Ocean Fishing Pier Blanket CRFL will maintain rule clarity, as this license was eliminated via a statutory change and no longer exists.

## Appendix I: Proposed Rule Changes

NOTE: CHANGES TO 15A NCAC 03O .0101 INCLUDE BOTH CHANGES FOR OCEAN FISHING PIER LICENSING AND CHANGES FOR FOR-HIRE LICENSING WHICH IS CONVERED IN A SEPARATE ANALYSIS.

**15A NCAC 03O .0101 PROCEDURES AND REQUIREMENTS TO OBTAIN LICENSES, ENDORSEMENTS AND COMMERCIAL FISHING VESSEL REGISTRATIONS**

(a) To obtain any Marine Fisheries licenses, endorsements, commercial fishing vessel registrations except Recreational Fishing Tournament Licenses to Sell Fish and Land or Sell Licenses, the following information is required for the application by the licensee, a responsible party or person holding a power of attorney:

(1) Full name, physical address, mailing address, date of birth, and signature of the licensee on the application. If the licensee is not appearing before a license agent or a representative of the Division, the licensee's signature on the application shall be notarized;

(2) Current picture identification of licensee or responsible party; acceptable forms of picture identification are driver's license, state identification card, military identification card, resident alien card (green card) or passport or if purchased by mail, a copy thereof;

(3) Certification that the applicant does not have four or more marine or estuarine resource violations during the previous three years, except Blanket Coastal Recreational Fishing Licenses;

(4) Valid documentation papers or current motor boat registration or copy thereof when purchasing a commercial fishing vessel registration. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted;

(5) Current articles of incorporation and a current list of corporate officers when purchasing a license or commercial fishing vessel registration in a corporate name. In the case of incorporation of an individual fishing vessel, the name of the master of that vessel shall also be specified. It is unlawful to fail to notify the Morehead City Office of the Division of Marine Fisheries within five days of change of the master specified for that vessel;

(6) An affirmation of liability insurance and that the operator is knowledgeable of United States Coast Guard (USCG) safety requirements for the vessel(s) used in the operation in accordance with G.S. 113-168.6 when purchasing a commercial fishing vessel registration with a for-hire endorsement.

~~(6)~~(7) If a partnership is established by a written partnership agreement, a current copy of such agreement shall be provided when purchasing a license, endorsement or commercial fishing vessel registration in a partnership name;

~~(7)~~(8) For nonresidents, certification of the state of residency;

~~(8)~~(9) In addition to the information required in G.S. 113-169.4, linear length of pier when purchasing an Ocean Fishing Pier License;

~~(9)~~(10) In addition to the information required in G.S. 113-171.1, current aircraft registration and list of operator(s) when purchasing a Spotter Plane License;

~~(10)~~(11) In addition, for fish dealers licenses, the physical address of the established location where business is conducted and, if different, the address where records are kept;

~~(11)~~(12) When purchasing a Fish Dealer License with clam or oyster categories or a consolidated license, the applicant shall provide valid certification as a North Carolina certified shellfish dealer;

~~(12) In addition, for the Ocean Fishing Pier Blanket Coastal Recreation Fishing License, a valid Ocean Fishing Pier License issued in the name of the applicant or copy thereof.~~

(13) In addition, for the ~~For-Hire~~ Blanket For-Hire Captain's Coastal Recreational Fishing ~~License,~~ License (CRFL), the applicant shall ~~provide:~~provide a valid certification from the USCG that allows carrying six or fewer passengers or a certification from the USCG that allows carrying more than six passengers; and

~~(A) A valid certification from the United States Coast Guard (USCG) that allows carrying six or fewer passengers or a certification from the USCG that allows carrying more than six passengers; and~~

~~(B) Valid documentation papers or current motor boat registration or copies thereof for the vessel engaged as for-hire. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted.~~

(14) In addition, for the Blanket For-Hire Vessel CRFL or the Non-Blanket For-Hire Vessel License, valid documentation papers or current motor boat registration or copies thereof for the vessel engaged as for-hire. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted.

(b) License to Land Flounder from the Atlantic Ocean.

(1) To qualify for a License to Land Flounder from the Atlantic Ocean, the applicant shall:

(A) have landed in North Carolina at least 1,000 pounds of flounder from a single vessel each year from the Atlantic Ocean during any two of the 1992-93, 1993-94, 1994-95 license years for which the person had a vessel that was licensed to land in North Carolina; and

(B) have been licensed under G.S. 113-152 or 113-153 during any two of the 1992-93, 1993-94, or 1994-95 license years; and

(C) hold a valid Standard or Retired Standard Commercial Fishing License or valid Land or Sell License.

(2) It is lawful for a person to hold Licenses to Land Flounder from the Atlantic Ocean equal to the number of vessels that he owns that individually met the eligibility requirements of Parts (b)(1)(A) and (b)(1)(B) of this Rule.

(3) The License to Land Flounder from the Atlantic Ocean is only valid when used on the vessel specified at the time of license issuance.

(4) At the time of issuance, the applicant for the License to Land Flounder from the Atlantic Ocean shall specify the name of the master of the vessel for each License to Land Flounder from the Atlantic Ocean issued.

(5) Applicants for a License to Land Flounder from the Atlantic Ocean shall complete an application form provided by the Division of Marine Fisheries and submit it to the Morehead City Office of the Division of Marine Fisheries for processing.

(6) It is unlawful for the holder of the License to Land Flounder from the Atlantic Ocean to fail to notify the Morehead Office of the Division of Marine Fisheries within five days of change as to the master identified on the license.

(7) Licenses to Land Flounder from the Atlantic Ocean are issued for the current license year and expire on June 30.

(c) To obtain a Recreational Fishing Tournament License to Sell Fish, the tournament organizer shall apply with the Division of Marine Fisheries at least 30 days prior to the starting date of the tournament with the following required information:

(1) Full name, physical address, mailing address, date of birth, signature of the tournament organizer, name of tournament, and dates of tournament on the license application. If the licensee is not appearing before a representative of the Division, the licensee's signature shall be notarized on the application.

(2) Current picture identification of tournament organizer; acceptable forms of picture identification are driver's license, state identification card, military identification card, or passport, or if purchased by mail, a copy thereof.

(d) To obtain a Land or Sell License, the following information is required for a proper application:

(1) Full name, physical address, mailing address, date of birth, and signature of the responsible party or master for the vessel on the license application. If the licensee is not appearing before a representative of the Division, the licensee's signature on the application shall be notarized on the application;

(2) Current picture identification of responsible party or master; acceptable forms of picture identification are driver's license, state identification card, military identification card, or passport or if applying by mail, a copy thereof;

(3) Valid documentation papers or current motor boat registration or copy thereof when purchasing a commercial fishing vessel registration. If an application for transfer of documentation is pending, a copy of the pending application and a notarized bill of sale may be submitted.

Fees shall be based on the vessel's homeport as it appears on the U.S. Coast Guard documentation papers or the State in which the vessel is registered.

(e) Proof of residency in North Carolina for:

(1) Standard Commercial Fishing License or Retired Standard Commercial Fishing License shall require a notarized certification from the applicant that the applicant is a resident of the State of North Carolina as defined by G.S. 113-130(4); and

(A) a notarized certification from the applicant that a North Carolina State Income Tax Return was filed for the previous calendar or tax year as a North Carolina resident; or

(B) a notarized certification that the applicant was not required to file a North Carolina State Income Tax Return for the previous calendar or tax year; or

(C) military identification, military dependent identification and permanent change of station orders or assignment orders substantiating individual's active duty assignment at a military facility in North Carolina.

(2) All other types of licenses:

(A) North Carolina voter registration card; or

(B) Current North Carolina Driver's License; or

(C) Current North Carolina Certificate of Domicile; or

(D) Current North Carolina Identification Card issued by the North Carolina Division of Motor Vehicles; or

(E) Military identification, military dependent identification and permanent change of station orders or assignment orders substantiating individual's active duty assignment at a military facility in North Carolina.

(f) Applications submitted without complete and required information shall be deemed incomplete and shall not be considered further until resubmitted with all required information.

(g) It is unlawful for a license or registration holder to fail to notify the Division of Marine Fisheries within 30 days of a change of address.

(h) Licenses are available at Offices of the Division or by mail from the Morehead City Office, unless otherwise specified. In addition, Recreational Commercial Gear Licenses are available at Wildlife Service Agents who have been designated as agents of the Department.

(i) To renew any Marine Fisheries licenses, endorsements, and commercial fishing vessel registration, except Recreational Commercial Gear Licenses, the following is required for the renewal application by the licensee, a responsible party or person holding a power of attorney;

(1) The information required in Subparagraphs (a)(4), (a)(5), and (a)(6) of this Rule are only required if a change has occurred since the last issuance of license, endorsement or commercial fishing vessel registration.

(2) Certification that articles of incorporation and list of corporate officers, if incorporated, written partnership agreement, if written partnership, or documentation papers or motor boat registration previously provided for initial license purchase are still valid and current for renewal.

(3) Current and valid state driver's license or state identification picture identification numbers and expiration dates shall be verified on mail license renewal applications or any other electronic license renewal process, otherwise the licensee shall provide a photocopy for renewal by mail or visit a Division License Office and present a current and valid picture identification pursuant to Subparagraph (a)(2) of this Rule.

(4) The licensee's or responsible party's signature on the application shall certify all information as true and accurate. Notarization of signature on renewal applications is not required.

(5) The Division of Marine Fisheries may require current copies of documentation for licenses, endorsements, commercial fishing vessel registration on renewal when necessary to verify inconsistent information or the information cannot be verified by independent sources.

(6) If the linear length of the pier has not changed for the Ocean Fishing Pier License renewal, the responsible party shall certify that the length is accurate; otherwise, a Marine Patrol Officer's signature is required to certify the linear length before the license can be renewed.

(7) Certification that shellfish dealer certification by North Carolina previously provided for issuance of Fish Dealer License with clam or oyster categories or consolidated license is still valid and current for renewal.

*Authority G.S. 113-134; 113-168; 113-168.1-6; 113-169; 113-169.2-5; 113-171.1; 113-174.3; ~~113-174.4;~~ 143B-289.52*

NOTE: CHANGES TO 15A NCAC 03O .0106 INCLUDE BOTH CHANGES FOR OCEAN FISHING PIER LICENSING AND CHANGES FOR FOR-HIRE LICENSING WHICH IS CONVERED IN A SEPARATE ANALYSIS.

**15A NCAC 03O .0106 DISPLAY OF LICENSES AND REGISTRATIONS**

**Fiscal Note for Proposed Rule Changes 15A NCAC 03O .0101, 15A NCAC 03O .0106, and 15A NCAC 03O .0113**

(a) It is unlawful:

(1) For any person to use a vessel required to be registered under the provisions of G.S. 113-168.6 in a commercial fishing operation without a current commercial fishing vessel registration decal mounted on an exterior surface so as to be plainly visible when viewed from the port side; and

(2) To display any commercial fishing vessel registration decal not issued for the vessel displaying it.

(b) It is unlawful to fail to display any fish dealer's licenses required by G.S. 113-169.3, ocean fishing pier license required by ~~G.S. 113-169.4, or Ocean Fishing Pier Blanket Coastal Recreational Fishing License (CRFL) pursuant to G.S. 113-174.4~~ G.S. 113-169.4 in prominent public view in each location subject to licensing.

(c) It is unlawful to fail to display a current For-Hire License decal on the exterior surface of the vessel so as to be visible when viewed from the port side while engaged in for-hire recreational fishing.

*Authority G.S. 113-168.6; 113-169.3; 113-169.4; ~~113-174.4;~~ 143B-289.52*

**15A NCAC 03O .0113 OCEAN FISHING PIER ~~BLANKET COASTAL RECREATIONAL FISHING~~ LICENSE REPORTING REQUIREMENTS**

~~(a) The length of the pier used to determine the license fee for an Ocean Fishing Pier Blanket Coastal Recreational Fishing License shall be obtained from the Ocean Fishing Pier License.~~

~~(b)~~ It is unlawful for the responsible party of the Ocean Fishing Pier ~~Blanket Coastal Recreational Fishing~~ License to fail to provide to the Division by the 10th of each month a daily count of anglers fishing from the licensed pier from the previous month, including a daily count of zero for days when anglers did not fish. The information shall be submitted on a paper form provided by the Division or via electronic mail.

*Authority G.S. 113-134; 113-169.4; 113-174.1; ~~113-174.4;~~ 143B-289.52*

## Appendix II: Excerpt from Session Law 2013-360, Section 14.8 (j):

"**§ 113-169.4. Licensing of ocean fishing piers; fees.**

(a) The owner or operator of an ocean fishing pier within the coastal fishing waters who charges the public a fee to fish in any manner from the pier shall secure a current and valid pier license from the Division. An application for a pier license shall disclose the names of all parties involved in the pier operations, including the owner of the property, owner of the pier if different, and all leasehold or other corporate arrangements, and all persons with a substantial financial interest in the pier.

(b) Within 30 days following a change of ownership of a pier, or a change as to the manager, the manager or new manager shall secure a replacement pier license as provided in G.S. 113-168.1(h).

(c) Pier licenses are issued upon payment of ~~fifty cents (50¢)~~four dollars and fifty cents ($4.50) per linear foot, to the nearest foot, that the pier extends into coastal fishing waters beyond the mean high waterline. The length of the pier shall be measured to include all extensions of the pier.

(d) The manager who secures the pier license shall be the individual with the duty of executive-level supervision of pier operations.

(e) The pier license issued under this section authorizes any individual who does not hold a Coastal Recreational Fishing License under Article 14B or Article 25A of this Chapter to engage in recreational fishing while on the pier."

**Fiscal Impacts of Proposed Rule Changes to 15A NCAC 03J .0301 POTS and 15A NCAC 03I .0122 USER CONFLICT RESOLUTION**

**Name of Commission:** N.C. Marine Fisheries Commission

**Agency Contact:** John Hadley, Fisheries Economics Program Manager
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**Impact Summary:** *De minimis* rule change
State government: No
Local government: No
Federal government: No
Substantial impact: No

**Authority:** G.S. 113-133 (Abolition of Local Coastal Fishing Laws); 113-134 (Rules); 113-181 (Duties and Powers of Department); 113-182 (Regulation of Fishing and Fisheries); 113-221.1 (Proclamations; Emergency Review); 143B-289.52 (Marine Fisheries Commission – Powers and Duties)

**Necessity:** The current user conflict rule in 15 NCAC 03J .0301(j) arose in the context of conflict involving crab pots and has been located in the pots section of that subchapter of the N.C. Administrative Code since it was originally adopted. In practice, the rule is now being used for a variety of user conflicts, involving several different types of gears. Division staff is concerned that the location of the user conflict rule in a section on pots is not the most logical or visible place for the public to locate general information related to user conflicts. The continuing need to use 15A NCAC 03J .0301(j) to address all types of user conflicts validates the relocation of this paragraph of the rule to the General Rules subchapter for improved rule clarity.

## I. Summary

Recent use of the rule addressing user conflict resolution 15A NCAC 03J .0301(j) for a user conflict that did not involve the use of pots has revealed the need to move this paragraph of the rule from the section dealing with pots, dredges, and other fishing devices to the General Rules subchapter of the N.C. Marine Fisheries Commission rules for improved clarity and improved access by the public. The proposed rule changes do not have an anticipated quantifiable cost or benefit. Rule changes are anticipated to become effective April 1, 2015.

## II. Introduction and Purpose of Rule Changes

Managing conflicts between users of public trust resources is a part of managing the resource. The N.C. Department of Environment and Natural Resources is charged with administering the governing statutes and adopting rules in a manner to reconcile as equitably as possible the various competing interests of the people as regards these resources, considering the interests of those whose livelihood depends upon full and wise use of renewable and nonrenewable resources and also the interests of the many whose approach is recreational (G.S. 113-133). The department (G.S. 113-181) and the N.C. Marine Fisheries Commission (G.S. 143B-289.52) are also charged with regulating placement of nets and other sports or commercial fishing apparatus in coastal fishing waters with regard to navigational and recreational safety as well as from a conservational standpoint. Additionally, the inclusion of information on user conflicts is considered necessary for the management of commercially and recreationally important marine or estuarine species of fisheries in the state, and the department is required to provide that information in its fishery management plans (G.S. 113-182.1). As the N.C. Division of Marine Fisheries (NCDMF) is primarily responsible for management of marine and estuarine resources, both in the department and as staff to the commission, the division is the agency primarily responsible for carrying out these mandates concerning fishing activities in coastal fishing waters.

Perhaps the most persistent and ubiquitous gear involved in user conflict issues is crab pots. The N.C. Blue Crab Fishery Management Plan states that crab pot landings have been recorded in North Carolina since 1952 and efforts to resolve user conflicts concerning crab pots have been in place since 1955. The unusually high effort in the crab pot fishery coupled with increases in coastal residency and boat ownership contributed to many conflicts between user groups. These factors led to the delegation of proclamation authority from the N.C. Marine Fisheries Commission to the Fisheries Director to address user conflict issues as a management strategy contained in the N.C. Blue Crab Fishery Management Plan. The regulation was added to the section of the N.C. Administrative Code designated for pots, dredges, and other fishing devices, effective Aug. 1, 2000. Use of this proclamation authority provides a much faster mechanism for implementing measures to alleviate user conflicts. As a result, 15A NCAC 03J .0301 was amended effective Sept. 1, 2005 to make the wording more generic so it could be used to address non-crab pot types of user conflicts. This rule continues to be used today to address user conflicts stemming from the use of multiple types of gear.

As the rule is actually being used for a variety of user conflicts, clarity will be better served by moving the user conflict part of the rule to the General Rules subchapter. User conflicts in general and user conflicts between fishermen and adjacent landowners in particular appear to be increasing. Relatively recent episodes in Carteret County indicate that these fisherman-landowner conflicts may become more frequent. The requirements and procedures set out in the user conflict rule and the Marine Fisheries Commission Mediation Standard Operating Procedure provide specific guidance for careful and deliberate handling of these conflicts. These requirements and procedures are designed to manage disputes in a way that achieves lasting resolution amenable to all parties. The overall goal is to promote cooperation and understanding among user groups, and strengthen North Carolina's commitment to maintaining user diversity and public access to fishing opportunities and fisheries resources. Use of the proposed adopted user

conflict rule including the mediation policy will be the first priority for resolving user conflicts and should be readily accessible to the public.

Additionally, part of the proposed rule change regarding proclamation authority has been put forth as part of an ongoing attempt to standardize rule language granting proclamation authority across North Carolina Marine Fisheries Commission (NCMFC) rules. NCDMF staff has identified that proclamation authority across several rules is often similar in nature; however, the specific rule language stating the proclamation authority often differs greatly from rule to rule. In an attempt to improve consistency across rules and public clarity of proclamation authority, NCDMF seeks to standardize rule language describing proclamation authority when possible. The rule change is not intended to alter the scope of the proclamation authority, nor is it being proposed with the intention of changing current management.

## III. Costs

There are no expected costs associated with the proposed rule changes. These changes are being sought to improve clarity to the public of the location and intended use of rules related to user conflict resolution.

## IV. Benefits

While there are no quantifiable economic benefits to the proposed rule changes, the public is expected to benefit from changes, as the rules related to user conflict resolution will be more easily recognized and clearly stated, especially for conflicts not involving pots.

## Appendix 1: Proposed Amendments

**15A NCAC 03I .0122 USER CONFLICTS**

(a) In order to address user conflicts, the Fisheries Director may, by proclamation, impose any or all of the following restrictions:

(1) specify time;

(2) specify areas;

(3) specify means and methods;

(4) specify seasons; and

(5) specify quantity.

This authority may be used based on the Fisheries Director's own findings or on the basis of a valid request in accordance with Paragraph (b) of this Rule. The Fisheries Director shall hold a public meeting in the area of the user conflict prior to issuance of a proclamation based on his or her own findings.

(b) Request for user conflict resolution:

(1) Any person(s) desiring user conflict resolution may make such request in writing addressed to the Director of the Division of Marine Fisheries, P.O. Box 769, 3441 Arendell St., Morehead City, NC 28557-0769. Such requests shall contain the following information:

(A) a map of the affected area including an inset vicinity map showing the location of the area with detail sufficient to permit on-site identification and location;

(B) identification of the user conflict causing a need for user conflict resolution;

(C) recommended solution for resolving user conflict; and

(D) name and address of the person(s) requesting user conflict resolution.

(2) Within 90 days of the receipt of the information required in Subparagraph (b)(1)of this Rule, the Fisheries Director shall review the information and determine if user conflict resolution is necessary. If user conflict resolution is not necessary, the Fisheries Director shall deny the request. If user conflict resolution is necessary, the Fisheries Director or designee shall hold a public meeting in the area of the user conflict. The requestor shall present his or her request at the public meeting. Other parties affected may participate at the discretion of the Fisheries Director.

(3) Following the public meeting as described in Subparagraph (b)(2), the Fisheries Director shall refer the users in the conflict for mediation or deny the request. If the user conflict cannot be resolved through mediation, the Fisheries Director shall submit for approval a proclamation to the Marine Fisheries Commission that addresses the conflict.

(4) Proclamations issued under this Rule shall suspend appropriate rules or portions of rules under the authority of the Marine Fisheries Commission as specified in the proclamation. The provisions of 15A NCAC 03I .0102 terminating suspension of a rule pending the

next Marine Fisheries Commission meeting and requiring review by the Marine Fisheries Commission at the next meeting shall not apply to proclamations issued under this Rule.

*Authority G. S. 113-134; 113-181; 113-182; 113-221.1; 143B-289.52*

NOTE: CHANGES TO 15A NCAC 03J .0301 INCLUDE BOTH CHANGES FOR USER CONFLICT ISSUES AND CHANGES TO THE MANAGEMENT OF AMERICAN EEL WHICH IS CONVERED IN A SEPARATE ANALYSIS.

**15A NCAC 03J .0301 POTS**

(a) It is unlawful to use pots except during time periods and in areas specified herein:

(1) In Coastal Fishing Waters from December 1 through May 31, except that all pots shall be removed from ~~internal waters~~ Internal Waters from January 15 through February 7. Fish pots upstream of U.S. 17 Bridge across Chowan River and upstream of a line across the mouth of Roanoke, Cashie, Middle and Eastmost Rivers to the Highway 258 Bridge are exempt from the January 15 through February 7 removal requirement. The Fisheries Director may, by proclamation, reopen various waters to the use of pots after January 19 if it is determined that such waters are free of pots.

(2) From June 1 through November 30, north and east of the Highway 58 Bridge at Emerald Isle:

(A) In areas described in 15A NCAC 03R .0107(a);

(B) To allow for the variable spatial distribution of crustacea and finfish, the Fisheries Director may, by proclamation, specify time periods for or designate the areas described in 15A NCAC 03R .0107(b); or any part thereof, for the use of pots.

(3) From May 1 through November 30 in the Atlantic Ocean and west and south of the Highway 58 Bridge at Emerald Isle in areas and during time periods designated by the Fisheries Director by proclamation.

The Fisheries Director may, by proclamation authority established in 15A NCAC 03L .0201, further restrict the use of pots to take blue crabs.

(b) It is unlawful to use pots:

(1) in any navigation channel marked by State or Federal agencies; or

(2) in any turning basin maintained and marked by the North Carolina Ferry Division.

(c) It is unlawful to use pots in a commercial fishing operation unless each pot is marked by attaching a floating buoy which shall be of solid foam or other solid buoyant material and no less than five inches in diameter and no less than five inches in length. Buoys may be of any color except yellow or hot pink or any combination of colors that include yellow or hot pink. The owner shall always be identified on the attached

buoy by using engraved buoys or by engraved metal or plastic tags attached to the buoy. Such identification shall include one of the following:

(1) gear owner's current motorboat registration number; or

(2) gear owner's U.S. vessel documentation name; or

(3) gear owner's last name and initials.

(d) Pots attached to shore or a pier shall be exempt from Subparagraphs (a)(2) and (a)(3) of this Rule.

(e) It is unlawful to use shrimp pots with mesh lengths smaller than one and one-fourth inches stretch or five-eighths-inch bar.

(f) It is unlawful to use ~~eel~~ pots to take eels with mesh ~~sizes~~ lengths smaller than ~~one inch by one half inch unless such pots contain~~ one-half inch by one-half inch, except until January 1, 2017 eel pots of any mesh length with an escape panel that is at least four inches square with a mesh ~~size~~ length of one inch by one-half inch located in the outside panel of the upper chamber of rectangular pots and in the rear portion of cylindrical ~~pots, except that not more than two eel pots per fishing operation with a mesh of any size may be used to take eels for bait.~~pots are allowed.

(g) It is unlawful to use crab pots in ~~coastal fishing waters~~ Coastal Fishing Waters unless each pot contains no less than two unobstructed escape rings that are at least two and five-sixteenths inches inside diameter and located in the opposite outside panels of the upper chamber of the pot, except the following are exempt from the escape ring requirements:

(1) unbaited pots;

(2) pots baited with a male crab; and

(3) pots set in areas and during time periods described in 15A NCAC 03R .0118.

(h) The Fisheries Director may, by proclamation, exempt the escape ring requirements described in Paragraph (g) of this Rule in order to allow the harvest of mature female crabs and may impose any or all of the following restrictions:

~~(1) specify areas;~~

~~(2) specify time periods; and~~

~~(3) specify means and methods.~~

(1) specify time;

(2) specify areas;

(3) specify means and methods;

(4) specify seasons; and

(5) specify quantity.

(i) It is unlawful to use more than 150 crab pots per vessel in Newport River.

(j) It is unlawful to remove crab pots from the water or remove crabs from crab pots between one hour after sunset and one hour before sunrise.

~~(k) User Conflicts:~~

~~(1) In order to address user conflicts, the Fisheries Director may by proclamation impose any or all of the following restrictions:~~

~~(A) specify areas;~~

~~(B) specify time periods; and~~

~~(C) specify means and methods.~~

~~The Fisheries Director shall hold a public meeting in the affected area before issuance of such proclamation.~~

~~(2) Any person(s) desiring user conflict resolution may make such request in writing addressed to the Director of the Division of Marine Fisheries, P.O. Box 769, 3441 Arendell St., Morehead City, North Carolina 28557-0769. Such requests shall contain the following information:~~

~~(A) a map of the affected area including an inset vicinity map showing the location of the area with detail sufficient to permit on-site identification and location;~~

~~(B) identification of the user conflict causing a need for user conflict resolution;~~

~~(C) recommended solution for resolving user conflict; and~~

~~(D) name and address of the person(s) requesting user conflict resolution.~~

~~(3) Upon the requestor's demonstration of a user conflict to the Fisheries Director and within 90 days of the receipt of the information required in Subparagraph (k)(2) of this Rule, the Fisheries Director shall issue a public notice of intent to address a user conflict. A public meeting shall be held in the area of the user conflict. The requestor shall present his or her request at the public meeting, and other parties affected may participate.~~

~~(4) The Fisheries Director shall deny the request or submit a proclamation that addresses the results of the public meeting to the Marine Fisheries Commission for their approval.~~

~~(5) Proclamations issued under Subparagraph (k)(1) of this Rule shall suspend appropriate rules or portions of rules under 15A NCAC 03R .0107 as specified in the proclamation. The provisions of 15A NCAC 03I .0102 terminating suspension of a rule pending the next Marine Fisheries Commission meeting and requiring review by the Marine Fisheries Commission at the next meeting shall not apply to proclamations issued under Subparagraph (k)(1) of this Rule.~~

~~(l)~~(k) It is unlawful to use pots to take crabs unless the line connecting the pot to the buoy is non-floating.

~~(m)~~(l) It is unlawful to use pots with leads or leaders to take shrimp. For the purpose of this Rule, leads or leaders are defined as any fixed or stationary net or device used to direct fish into any gear used to capture fish. Any device with leads or leaders used to capture fish is not a pot.

*Authority G. S. 113-134; 113-173; 113-182; 113-221.1; 143B-289.52*

**Fiscal Note for Proposed Rule Changes 15A NCAC 03I .0122 and 15A NCAC 03J .0301**

**FISCAL IMPACTS OF PROPOSED AMENDMENTS TO RULE 15A NCAC 03J .0207 AND 15A NCAC 03Q .0202**

**CORRECTION OF QUEENS CREEK INLAND/COASTAL BOUNDARY AND NAME UPDATE FOR DUKE ENERGY PROGRESS BRUNSWICK NUCLEAR PLANT INTAKE CANAL**

**Name of Commission:** N.C. Marine Fisheries Commission (MFC)

**Agency Contact:** John Hadley, Socioeconomics Program Manager
N.C. Division of Marine Fisheries (DMF)
3441 Arendell Street
Morehead City, NC 28557
(252) 808-8107
john.hadley@ncdenr.gov

**Impact Summary:** *De minimis* rule change
State Government: No
Local Government: No
Private Impact: No
Substantial Impact: No

**Authority:** G.S. 113-134 (Rules); G.S. 113-182 (Regulation of Fishing and Fisheries); G.S. 143B-289.52 (Marine Fisheries Commission-Powers and Duties); 15 NCAC 03Q .0201 (Specific Classification of Waters); 15 NCAC 03Q .0202 (Descriptive Boundaries for Coastal-Joint-Inland Waters)

**Necessity:** The proposed rule changes seek to correct a set of coordinates delineating Coastal and Inland waters in Queens Creek, Onslow County, as well as an outdated name reference for the Duke Energy Progress Brunswick Nuclear Plant Intake Canal in Brunswick County. It is in the public's and law enforcement's best interest for the N.C. Administrative Code to contain correct rule references and reflect actual DMF operations. Additional changes address an extensive technical change request from the N.C. Rules Review Commission.

## I. Summary

The primary purpose of the rule changes is to correct a set of coordinates delineating Coastal and Inland waters in Queens Creek, Onslow County. The coordinates currently in rule do not properly represent the intended boundary between Coastal and Inland waters at Frazier's Landing within the creek. Thus, the proposed rule changes seek to move the boundary line currently in rule to the intended location at Frazier's Landing. Additionally, with the merger of Progress Energy and Duke Energy utility companies, the formerly named Carolina Power and Light Intake Canal at the Brunswick Nuclear Plant is now named Duke Energy Progress Brunswick Nuclear Plant Intake Canal. Therefore, there is an out of date reference to this canal in rule 15A NCAC 03J .0207 and 03Q .0202. The name of the plant needs to be updated for public clarity purposes. Additional changes address an extensive technical change request from the Rules Review Commission that DMF received when the MFC pursued the above-described rule changes last year. The agency withdrew the rule from the Rules Review Commission's consideration due to inadequate time to address the technical changes. The proposed effective date of these rule changes is April 1, 2015.

## II. Introduction and Purpose of Rule Change

The DMF initiated an effort in the late 1990s to replace the Inland, Joint, and Coastal boundary descriptions in the N.C. Marine Fisheries Commission rule with actual coordinates to better identify and describe the location of those lines. The N.C. Wildlife Resources Commission (WRC) adopted those changes by reference. DMF staff from the fisheries management section worked with geographical information systems (GIS) staff to identify locations of these lines on maps and place the coordinates in rule language. Most of the coordinates were confirmed by field observations of Marine Patrol officers, WRC inspectors, and biological staff from both DMF and WRC. The amended rule with coordinate-based descriptions of the boundary lines became effective Aug. 1, 2004.

A fisherman brought to the attention of DMF that the current coordinates listed in rule do not accurately represent the historical and intended boundary of Coastal and Inland waters in Queens Creek, which are meant to be at Frazier's Landing. The line described in rule is approximately one river mile south of Frazier's Landing. All MFC rulebooks prior to 2004 listed Frazier's Landing as the correct boundary point. Marine Patrol was consulted and it was determined that the Coastal/Inland boundary line had always been at Frazier's Landing and had not been moved when the coordinate-based descriptions were added to the rule in 2004. Therefore, as a practical matter, the line has always been at Frazier's Landing and correcting the coordinates will constitute no change in the intention of the rule or current enforcement practices.

Additionally, with the recent merger of Progress Energy and Duke Energy, the name of the Brunswick Nuclear Plant changed. The old name of the intake canal, Carolina Power and Light Intake Canal, is out of date as referenced in rule 15A NCAC 03J .0207 and 03Q .0202. Rule changes are sought to update the plant's referenced name to Duke Energy Progress Brunswick Nuclear Plant Intake Canal.

Finally, the DMF received an extensive request for technical change to 15A NCAC 03Q .0202 when the MFC pursued the above-described rule changes last year (see Appendix 2.) The agency withdrew the rule from the Rules Review Commission's consideration due to inadequate time to address the technical changes. The requested technical changes include individual items as well as comprehensive changes to bring wording consistency throughout the lengthy rule. The agency did not want to jeopardize the final approval of the other rules in its annual rulemaking cycle due to insufficient time to satisfy all requests of the Rules Review Commission for this individual rule. The agency intends to file notice of text for rulemaking for both rules described in this note as part of its 2014-2015 annual rulemaking cycle. The proposed changes will address the coordinate correction, canal name change and technical request at one time.

## I. Costs

There are no costs associated with the proposed rule changes.

## II. Benefits

While there are no quantifiable economic benefits to the proposed rule change, both the public and law enforcement will benefit from the coordinates listed in rule representing the intended boundary of Coastal and Inland waters in Queens Creek. Additionally, clarity to the public and

law enforcement will be gained by updating the name of the power plant intake canal referenced in rule 15A NCAC 03J .0207 and 03Q .0202.

Appendix 1: Proposed Amendments

**15A NCAC 03J .0207 ~~CAROLINA POWER AND LIGHT~~ DUKE ENERGY PROGRESS BRUNSWICK NUCLEAR PLANT INTAKE CANAL**

It is unlawful to use any commercial fishing equipment in the ~~Carolina Power and Light~~ Duke Energy Progress Brunswick Nuclear Plant Intake Canal between the fish diversion screen and the ~~Carolina Power and Light~~ Duke Energy Progress Brunswick ~~nuclear power plant.~~Nuclear Plant.

*Authority G.S. 113-134; 113-182; 143B-289.52*

NOTE: DUE TO THE LENGTH OF RULE 15A NCAC 03Q .0202, ONLY THE PORTIONS SHOWING THE CANAL NAME CHANGE (BRUNSWICK COUNTY) AND THE COORDINATE CORRECTION (ONSLOW COUNTY) ARE SHOWN HERE. PLEASE SEE THE DMF WEB SITE FOR THE FULL TEXT OF THE PROPOSED RULE, INCLUDING ALL TECHNICAL CHANGES.

**15A NCAC 03Q .0202 DESCRIPTIVE BOUNDARIES FOR COASTAL-JOINT-INLAND WATERS**

Descriptive boundaries for Coastal-Joint-Inland Waters referenced in 15A NCAC 03Q .0201 are as follows:

(1) Beaufort County

(a) Pamlico -Tar River - Inland Waters west and Coastal Waters east of a line beginning at a point on the north shore 35° 32.2167' N - 77° 02.8701' W; running southwesterly along the east side of the railroad bridge to a point on the south shore 35° 32.0267' N - 77° 03.5179' W.

. . .

(4) Brunswick County:

(a) Calabash River And Tributaries - All waters within this waterbody in Brunswick County are designated as Coastal.

(b) Saucepan Creek - All waters within this waterbody are designated as Coastal.

(c) Shallotte River - Inland Waters northwest and Coastal Waters southeast of a line beginning at a point on the south shore 33° 58.3412' N - 78° 23.1948' W; running northeasterly to a point on the north shore 33° 58.3518' N - 78° 23.1816' W.

(i) Mill Dam Branch - All waters within this waterbody are designated as Coastal.

(ii) Squash Creek - All waters within this waterbody are designated as Coastal.

(iii) Mill Pond - All waters within this waterbody are designated as Coastal.

(iv) Charles Branch - Inland Waters north and Coastal Waters south of a line beginning at a point on the west shore 33° 58.6276' N - 78° 21.2919' W; running easterly to a point on the east shore 33° 58.6257' N - 78° 21.2841' W.

(v) Grisset Swamp - All waters within this waterbody are designated as Coastal.

(vi) Little Shallotte River And Tributaries - All waters within this waterbody are designated as Coastal.

(d) Lockwood Folly River - Inland Waters northeast and Coastal Waters southwest of a line beginning at a point on the north shore 34° 00.6550' N - 78° 15.8134' W; running southeasterly along the south side of NC Hwy 211 bridge to a point on the south shore 34° 00.6285' N - 78° 15.7928' W.

(i) Stanberry Creek - All waters within this waterbody are designated as Coastal.

(ii) Pompeys Creek - All waters within this waterbody are designated as Coastal.

(iii) Maple Creek - All waters within this waterbody are designated as Coastal.

(iv) Rubys Creek - All waters within this waterbody are designated as Coastal.

(v) Big Doe Creek - All waters within this waterbody are designated as Coastal.

(vi) Lennons Creek - All waters within this waterbody are designated as Coastal.

(vii) Mercers Mill Pond Creek - Inland Waters north and Coastal Waters south of a line beginning at a point on the west shore 33° 57.7498' N - 78° 12.3532' W; running southeasterly to a point on the east shore 33° 57.7439' N - 78° 12.3440' W.

(e) Elizabeth River - All waters within this waterbody are designated as Coastal.

(i) Ash Creek - All waters within this waterbody are designated as Coastal.

(f) Beaverdam Creek - All waters within this waterbody are designated as Coastal.

(g) Dutchman Creek - All waters within this waterbody are designated as Coastal.

(i) Calf Gully Creek - All waters within this waterbody are designated as Coastal.

(ii) Jumpin Run - All waters within this waterbody are designated as Coastal.

(iii) Fiddlers Creek - All waters within this waterbody are designated as Coastal.

(h) Cape Fear River - Joint Waters north and Coastal Waters south of a line beginning at a point on the western side 34° 13.6953' N - 77° 57.2396' W; running southeasterly along the southern side of US 17-74-76 bridge to a point on the eastern side 34° 13.6214' N - 77° 57.0341' W.

(i) ~~Carolina Power And Light~~ Duke Energy Progress Brunswick Nuclear Plant Intake Canal - All waters within this waterbody are designated as Coastal.

(ii) Walden Creek - All waters within this waterbody are designated as Coastal.

(iii) Orton Creek - Inland Waters west and Coastal Waters east of a line beginning at a point on the north shore 34° 02.8436' N - 77° 56.7498' W; running southerly to a point on the south shore 34° 02.8221' N - 77° 56.7439' W.

(iv) Lilliput Creek - Inland Waters west and Coastal Waters east of a line beginning at a point on the north shore 34° 04.1924' N - 77° 56.5361' W; running southerly to a point on the south shore 34° 04.1487' N - 77° 56.5447' W.

(v) Sandhill Creek - Inland Waters southwest and Coastal Waters northeast of a line beginning at a point on the north shore 34° 06.9584' N - 77° 57.0085' W;

running southeasterly to a point on the south shore 34° 06.9371' N - 77° 56.9943' W.

(vi) Town Creek - Inland Waters west and Coastal Waters east of a line beginning at a point on the north shore 34° 07.7492' N - 77° 57.3445' W; running southerly to a point on the south shore 34° 07.7034' N - 77° 57.3431' W.

(vii) Mallory Creek - Inland Waters west and Coastal Waters east of a line beginning at a point on the north shore 34° 09.9868' N - 77° 58.2023' W; running southerly to a point on the south shore 34° 09.9618' N - 77° 58.2133' W.

(viii) Brunswick River - Joint Waters northwest and Coastal Waters southeast of a line beginning at a point on the south shore 34° 10.7281' N - 77° 57.7793' W; running northeasterly to a point on the north shore 34° 10.9581' N - 77° 57.6452' W.

(A) Alligator Creek - For the southernmost entrance into the Brunswick River: Inland Waters east and Joint Waters west of a line beginning at a point on the south shore 34° 13.5040' N - 77° 58.6331' W; running northwesterly to a point on the north shore 34° 13.5472' N - 77° 58.6628' W. For the northernmost entrance into the Brunswick River: Inland Waters east and Joint Waters west of a line beginning at a point on the south shore 34° 14.4300' N - 77° 59.2346' W; running northerly to a point on the north shore 34° 14.4618' N - 77° 59.2300' W.

(B) Jackeys Creek - Inland Waters west and Joint Waters east of a line beginning at a point on the south shore 34° 11.9400' N - 77° 58.5859' W; running northerly to a point on the north shore 34° 11.9565' N - 77° 58.5859' W.

(C) Sturgeon Creek - Inland Waters west and Joint Waters east of a line beginning at a point on the north shore 34° 14.6761' N - 77° 59.4145' W; running southerly to a point on the south shore 34° 14.6404' N - 77° 59.4058' W.

(ix) Cartwheel Creek - Inland Waters west and Joint Waters east of a line beginning at a point on the north shore 34° 15.7781' N - 77° 59.3852' W; running southerly to a point on the south shore 34° 15.7564' N - 77° 59.3898' W.

(x) Indian Creek - Inland Waters west and Joint Waters east of a line beginning at a point on the north shore 34° 17.0441' N - 78° 00.3662' W; running southwesterly to a point on the south shore 34° 17.0006' N - 78° 00.3977' W.

(xi) Hood Creek - Inland Waters west and Joint Waters east of a line beginning at a point on the north shore 34° 20.3713' N - 78° 04.7492' W; running southwesterly to a point on the south shore 34° 20.3393' N - 78° 04.7373' W.

(xii) Northwest Creek - All waters within this waterbody are designated as Inland.

. . .

(20) Onslow County

(a) Beasleys Creek (Barlow Creek) - All waters within this waterbody are designated as Coastal.

(b) Kings Creek - All waters within this waterbody are designated as Coastal.

(c) Turkey Creek - All waters within this waterbody are designated as Coastal.

(d) Mill Creek - All waters within this waterbody are designated as Coastal.

(e) New River - Inland Waters north and Coastal Waters south of a line beginning at a point on the west shore 34° 45.1654' N - 77° 26.1222' W; running easterly along the southern side of the US Hwy 17 bridge to a point on the east shore 34° 45.2007' N - 77° 25.9790' W.

(i) Wheeler Creek - All waters within this waterbody are designated as Coastal.

(ii) Everett Creek - All waters within this waterbody are designated as Coastal.

(iii) Stones Creek - All waters within this waterbody are designated as Coastal.

(iv) Muddy Creek - All waters within this waterbody are designated as Coastal.

(v) Mill Creek - All waters within this waterbody are designated as Coastal.

(vi) Lewis Creek - All waters within this waterbody are designated as Coastal.

(vii) Southwest Creek - Inland Waters north and Coastal Waters south of a line beginning at a point on the west shore 34° 40.8723' N - 77° 26.2399' W; running northeasterly to a point on the east shore 34° 40.9112' N - 77° 26.1758' W.

(viii) Brinson Creek - Inland Waters west and Coastal Waters east of a line beginning at a point on the north shore 34° 44.0945' N - 77° 26.4335' W; running southerly to a point on the south shore 34° 44.0654' N - 77° 26.4239' W.

(ix) Northeast Creek - Inland Waters northeast and Coastal Waters southwest of a line beginning at a point on the west shore 34° 44.0778' N - 77° 21.2640' W; running southeasterly along the southern side of the railroad bridge to a point on the east shore 34° 44.0446' N - 77° 21.2126' W.

(x) Wallace Creek - Inland Waters east and Coastal Waters west of a line beginning at a point on the north shore 34° 40.9604' N - 77° 21.5698' W; running southwesterly along the western side of the first bridge upstream from the mouth, to a point on the south shore 34° 40.8576' N - 77° 21.4787' W.

(xi) Codels Creek - Inland Waters east and Coastal Waters west of a line beginning at a point on the north shore 34° 38.8845' N - 77° 20.4533' W; running southerly to a point on the south shore 34° 38.8691' N - 77° 20.4515' W.

(xii) French Creek – Inland Waters east and Coastal Waters west of a line beginning at a point on the north shore 34° 38.4059' N - 77° 20.2619' W; running southerly to a point on the south shore 34° 38.2566' N - 77° 20.3233' W.

(xiii) Duck Creek - Inland Waters southwest and Coastal Waters northeast of a line beginning at a point on the north shore 34° 38.0179' N - 77° 20.5169' W; running southwesterly to a point on the south shore 34° 37.9172' N - 77° 20.6520' W.

(f) Freeman (Browns) Creek - All waters within this waterbody are designated as Coastal.

(g) Bear Creek - All waters within this waterbody are designated as Coastal.

(h) Queens Creek - Inland Waters ~~north~~ west and Coastal Waters ~~south~~ east of a line beginning at a point on the ~~west~~ north shore ~~34° 42.1815' N 77° 11.5690' W;~~ 34° 42.5696' N - 77° 11.8550' W; running ~~easterly~~ southerly to a point on the ~~east~~ south shore ~~34° 42.2273' N 77° 11.4193' W.~~ 34° 42.4238' N - 77° 11.8550' W.

(i) Parrotts Swamp - All waters within this waterbody are designated as Coastal.

(i) White Oak River - Inland Waters north and Coastal Waters south of a line beginning at a point on the west shore 34° 48.1466' N - 77° 11.4711' W; running northeasterly to a point on the east shore 34° 48.1620' N - 77° 11.4244' W.

(i) Stevens Creek - All waters within this waterbody are designated as Coastal.

(ii) Holland Mill (Mill Pond) Creek - All waters within this waterbody are designated as Coastal.

(iii) Webbs Creek - Inland Waters northwest and Coastal Waters southeast of a line beginning at a point on the north shore 34° 45.7559' N - 77° 10.1321' W; running southwesterly to a point on the south shore 34° 45.7404' N - 77° 10.1486' W.

(iv) Freemans Creek - Inland Waters west and Coastal Waters east of a line beginning at a point on the north shore 34° 46.9791' N - 77° 10.3935' W; running southerly to a point on the south shore 34° 46.9663' N - 77° 10.3999' W.

(v) Calebs Creek - Inland Waters west and Coastal Waters east of a line beginning at a point on the north shore 34° 48.1354' N - 77° 11.4688' W; running southeasterly to a point on the south shore 34° 48.1192' N - 77° 11.4546' W.

(vi) Grants Creek - All waters within this waterbody are designated as Inland.

(21) Pamlico County

(a) Pamlico River - All waters within this waterbody are designated as Coastal.

. . .

*Authority G.S. 113-132; 113-134; 143B-289.52*

# Eligibility Pool
# Commission Report for 2014-2015
## August 21-22, 2014

**How the Pool Number is Determined:**

Chapter 225, 1998 Session Laws, Section 5.2(f).

(f) Adjustment of SCFL's. The number of SCFL's in the pool of available SCFL's in license years beginning with the 2000-2001 license year is the temporary cap less the number of SCFL's that were issued and renewed during the previous year…

**Role of the Marine Fisheries Commission:**

Chapter 225, 1998 Session Laws, Section 5.2(f).

(f).... The Commission may increase or decrease the number of SCFL's that are issued from the pool of available SCFL's. The Commission may increase the number of SCFL's that are issued from the pool of available SCFL's up to the temporary cap. The Commission may decrease the number of SCFL's but may not refuse to renew a SCFL that is issued during the previous license year and that has not been suspended or revoked. The Commission shall increase or decrease the number of SCFL's that are issued to reflect its determination as to the effort that the fishery can support, based on the best available scientific evidence.

**Temporary Cap:**

The maximum number of SCFL's that can be issued is the number of valid Endorsements to Sell as of June 30, 1999 plus 500 for the first eligibility pool, for a total of 8,896.

**Eligibility Board Pool Determination 2014-2015:**

There are 1,257 SCFL's available through the Eligibility Board for the 2014-2015 license year.

**Attachments:**

2014-2015 Eligibility Pool Determination Calculations

2013-2014 License Sales Report

Licenses Available and Approved Summaries

Eligibility Board Meeting Summary

Eligibility Open Files

# Eligibility Pool Determination Calculations
# For
# 2014-2015 License Year

Determine Total Number of SCFL's Available in 2014-2015 License Year

Total original SCFL's available (Cap)…….8,896
Less total number of SCFL's issued in 2013-2014……..…-6,679
Total number of SCFL's available in the pool for 2014-2015…….. 2,217
Plus the number of SCFL's not renewed in 2012-2013…….. .+ 114
Total number of SCFL's available in the pool for 2014-2015……. ……...2,331
Less total number of approvals through Eligibility Pool (July 1, 1999-June 30, 2014)……..- 1,081
Total number of SCFL's available in the pool for 2014-2015…….. 1,250
Plus total number approved Eligibility applications that were not purchased by June 30, 2014… + 7
**Total SCFL's available for the 2014-2015 license year…… 1,257**

# North Carolina Division of Marine Fisheries
# Licenses Sold Year to Date by License Type
# FY2014 License Year

**Data Run Date : 7/1/2014**

| | |
|---|---|
| **Commercial Fishing Vessel Registration** | **8,284** |
| **Fish Dealer License** | **761** |
| **Land or Sell License** | **83** |
| **License to Land Flounder from Atlantic Ocean** | **157** |
| **NC Resident Shellfish License without SCFL** | **1,428** |
| **Ocean Pier License** | **19** |
| **Recreational Commercial Gear License** | **3,972** |
| **Recreational Fishing Tournament License** | **16** |
| **Retired Standard Commercial Fishing License** | **1,191** |
| **Standard Commercial Fishing License** | **5,488** |
| **TOTAL LICENSES FOR ALL LICENSE TYPES** | **21,399** |

| | |
|---|---|
| **5,488** | **SCFL** |
| **+1,191** | **RSCFL** |
| **6,679** | **Total Number of SCFL's issued for FY2014** |

## Licenses Available from the Eligibility Pool
## Annual Summary

| License Year | Number of Licenses Available |
|---|---|
| 1999-2000 | 500 |
| 2000-2001 | 1,314 |
| 2001-2002 | 1,423 |
| 2002-2003 | 1,458 |
| 2003-2004 | 1,421 |
| 2004-2005 | 1,423 |
| 2005-2006 | 1,536 |
| 2006-2007 | 1,596 |
| 2007-2008 | 1,562 |
| 2008-2009 | 1,557 |
| 2009-2010 | 1,507 |
| 2010-2011 | 1,420 |
| 2011-2012 | 1,375 |
| 2012-2013 | 1,358 |
| 2013-2014 | 1,368 |
| 2014-2015 | 1,257 |

## Licenses Approved and Denied by the Eligibility Pool Board
## Annual Summary

| License Year | Approved | Denied |
|---|---|---|
| 1999-2000 | 166 | 133 |
| 2000-2001 | 110 | 75 |
| 2001-2002 | 46 | 37 |
| 2002-2003 | 38 | 23 |
| 2003-2004 | 56 | 11 |
| 2004-2005 | 35 | 13 |
| 2005-2006 | 31 | 9 |
| 2006-2007 | 32 | 4 |
| 2007-2008 | 49 | 7 |
| 2008-2009 | 83 | 5 |
| 2009-2010 | 109 | 11 |
| 2010-2011 | 63 | 2 |
| 2011-2012 | 68 | 17 |
| 2012-2013 | 99 | 9 |
| 2013-2014 | 96 | 14 |
| **Totals** | **1,081** | **370** |

# Eligibility Pool Board Meeting Summary

| HEARING | APPRVLS | DENIALS | TABLED | TOTALS | INCOMP. | NON- | RESIDENTS | |
|---|---|---|---|---|---|---|---|---|
| DATE | | | ** | REVIEWED | *** | TABLED | APPRV'D | DENIED |
| 5/5/1999 | 2 | 0 | 2 | 4 | | 0 | 0 | 0 |
| 5/19/1999 | 5 | 0 | 1 | 6 | | 0 | 1 | 0 |
| 6/17/1999 | 2 | 5 | 3 | 10 | | 0 | 0 | 0 |
| **7/1/98-6/30/99** | **9** | **5** | **6** | **20** | | **0** | **1** | **0** |
| 7/7/1999 | 12 | 10 | 0 | 22 | | 0 | 3 | 0 |
| 7/8/1999 | 23 | 25 | 0 | 48 | | 0 | 7 | 0 |
| 07/15/1999 MFC | N/A | N/A | N/A | N/A | | N/A | N/A | N/A |
| 8/11/1999 | 18 | 20 | 4 | 42 | | 0 | 3 | 0 |
| 8/27/1999 | 17 | 33 | 0 | 50 | | 0 | 0 | 1 |
| 09/09/1999 MFC | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 9/29/1999 | 18 | 11 | 1 | 30 | | 0 | 0 | 0 |
| 11/3/1999 | 13 | 12 | 4 | 29 | | 1 | 2 | 0 |
| 11/08/1999 MFC | N/A | N/A | N/A | N/A | | N/A | N/A | N/A |
| 1/26/2000 | 9 | 5 | 5 | 19 | | 1 | 1 | 0 |
| 02/18/2000 MFC | N/A | N/A | N/A | N/A | | N/A | N/A | N/A |
| 4/19/2000 | 19 | 6 | 8 | 33 | | 2 | 1 | 0 |
| 5/18/2000 | 18 | 3 | 9 | 30 | | 2 | 0 | 1 |
| 6/7/2000 | 10 | 3 | 2 | 15 | | 1 | 0 | 0 |
| **7/1/99-6/30/00** | **157** | **128** | **33** | **318** | | **7** | **17** | **2** |
| 7/12/2000 | 11 | 1 | 4 | 16 | | 0 | 2 | 0 |
| 7/21/2000 MFC | N/A | N/A | N/A | N/A | | N/A | N/A | N/A |
| 9/20/2000 | 24 | 15 | 7 | 46 | | 0 | 1 | 0 |
| 10/27/2000 | 16 | 8 | 3 | 27 | | 0 | 1 | 0 |
| 12/1/2000 | 5 | 16 | 2 | 23 | | 0 | 0 | 0 |
| 1/24/2001 | 10 | 14 | 3 | 27 | | 0 | 0 | 2 |
| 3/9/2001 | 12 | 12 | 8 | 32 | | 0 | 0 | 0 |
| 4/4/2001 | 32 | 9 | 1 | 42 | | 0 | 0 | 1 |
| **7/1/00-6/30/01** | **110** | **75** | **28** | **213** | | **0** | **4** | **3** |
| 7/26/2001 | 18 | 10 | 2 | 30 | | 1 | 3 | 0 |
| 08/21/2002 MFC | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 11/14/2002 | 12 | 15 | 3 | 30 | | 0 | 2 | 1 |
| 2/21/2002 | 16 | 12 | 2 | 30 | | 0 | 1 | 0 |
| **7/1/01-6/30/02** | **46** | **37** | **7** | **90** | | **1** | **6** | **1** |
| 9/11/2002 | 28 | 14 | 6 | 48 | | 1 | 2 | 0 |
| 08/19/2003 MFC | N/A | N/A | N/A | N/A | | N/A | N/A | N/A |
| 3/5/2003 | 10 | 9 | 1 | 20 | | 0 | 2 | 0 |
| **7/1/02-6/30/03** | **38** | **23** | **7** | **68** | | **1** | **4** | **0** |
| 08/19/2003 MFC | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7/9/2003 | 16 | 3 | 1 | 20 | | 0 | 2 | 0 |
| 11/4/2003 | 17 | 2 | 0 | 19 | | 0 | 3 | 0 |
| 3/19/2004 | 22 | 6 | 0 | 28 | | 0 | 2 | 0 |
| 6/22/2004 * | 1 | 0 | 0 | 1 | | | | |
| **7/1/03-06/30/04** | **56** | **11** | **1** | **68** | | **0** | **7** | **0** |
| 11/1/2004 | 22 | 4 | 1 | 27 | | | | |
| 2/28/2005 | 11 | 2 | 0 | 13 | | 0 | 0 | 1 |
| 4/18/2005 | 2 | 7 | 0 | 9 | | 0 | 0 | 0 |
| **7/1/04-6/30/05** | **35** | **13** | **1** | **49** | | **0** | **0** | **1** |
| 9/27/2005 | 17 | 7 | 1 | 25 | | 0 | 1 | 0 |
| 3/15/2006 | 14 | 2 | 2 | 18 | | 0 | 1 | 0 |
| **7/1/05-6/30/06** | **31** | **9** | **3** | **43** | | **0** | **2** | **0** |
| | | | | | | | | |

| HEARING DATE | APPRVLS | DENIALS | TABLED ** | TOTALS REVIEWED | INCOMP. *** | NON-TABLED | RESIDENTS APPRV'D | RESIDENTS DENIED |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 10/4/2006 | 16 | **3** | **2** | 21 | | **0** | 1 | **0** |
| 3/14/2007 | 16 | 1 | **2** | 19 | | **0** | 1 | **0** |
| **7/1/06-6/30/07** | **32** | **4** | **4** | **40** | | 0 | **2** | **0** |
| 9/10/2007 | 26 | 2 | 4 | 32 | | 0 | **0** | **0** |
| 3/19/2008 | 23 | **5** | **3** | 31 | | **0** | **0** | **0** |
| **7/1/07-6/30/08** | **49** | **7** | **7** | **63** | | **0** | **0** | **0** |
| 9/30/2008 | 39 | 0 | 3 | 42 | | 0 | 4 | 0 |
| 3/24/2009 | 44 | 5 | 1 | 50 | | 0 | 3 | 0 |
| **7/1/08-6/30-09** | **83** | **5** | **4** | **92** | | **0** | **7** | **0** |
| **10/6/2009** | 52 | 6 | 1 | 59 | | 0 | 2 | 1 |
| **3/10/2010** | 36 | 2 | 1 | 39 | | 0 | 1 | 0 |
| **6/2/2010** | 21 | 3 | 0 | 24 | | 0 | 0 | 0 |
| **7/1/09-6/30/10** | **109** | **11** | **2** | **122** | | **0** | **3** | **1** |
| **9/21/2010** | 40 | 2 | 1 | 43 | | 0 | 2 | 0 |
| **3/24/2011** | 23 | 0 | 0 | 23 | | 0 | 4 | 0 |
| **7/1/10-6/30/11** | **63** | **2** | **1** | **66** | | **0** | **6** | **0** |
| **10/4/2011** | 39 | 7 | 0 | 46 | | 0 | 2 | 0 |
| **3/15/2012** | 28 | 10 | 0 | 38 | | 0 | 2 | 0 |
| **1/13/2012*** ** | 1 | 0 | 0 | 0 | | 0 | 0 | 0 |
| **7/1/11-6/30/12** | **68** | **17** | **0** | **85** | | **0** | **4** | **0** |
| **9/12/2012** | 53 | 7 | 3 | 63 | | 0 | 1 | 1 |
| **3/19/2013** | 46 | 2 | 4 | 52 | | 0 | 2 | 0 |
| **7/1/12-6/30/13** | **99** | **9** | **7** | **115** | | **0** | **3** | **1** |
| **9/18/2013** | **56** | **7** | **0** | **63** | | **0** | **2** | **0** |
| **3/19/2014** | **40** | **7** | **1** | **48** | | **0** | **0** | **0** |
| **7/1/13-6/30/14** | **96** | **14** | **1** | **111** | | **0** | **2** | **0** |
| **TOTALS ALL** | **1081** | **370** | **112** | **1452** | | **9** | **68** | **9** |

**TABLED files are presented again at the next Board meeting for a final decision of approval or denial and are then accounted for in the Approved or Denied categories.
TOTALS REVIEWED do not equal total approved or denied because some files are reviewed in multiple meetings (tabled, etc.).
***Special consideration was given for a license that had been revoked and the license was reinstated by the Director.

**Standard Commercial Fishing License Eligibility Pool Office**
**Summary of Open Files beginning July 1, 2014**

| File Description | Total Number of Files |
|---|---|
| To be researched/ready for the next board meeting | 7 |
| New/being processed | 0 |
| Pending responses to letters mailed requesting more information | 7 |
| Incomplete – no response to letters | 11 |
| **Total Open/Pending Applications** | **25** |

# Strategic Habitat Area Nominations for Region 3:

## *The White Oak River Basin in North Carolina*

# Draft

August 2014

By

Christine C. Jensen
North Carolina Division of Marine Fisheries
Morehead City, North Carolina

Lindsey S. Smart
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Raleigh, North Carolina

and

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Wilmington, North Carolina

Presented to the North Carolina Marine Fisheries Commission
August 20-22, 2014

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## ACKNOWLEDGEMENTS

We thank Jessi Baker (DCM), Chip Collier (SAFMC), Brian Conrad (DMF), Andy Haines (DMF), Stephen Taylor (DMF), and Tere Barrett (DMF) for their input during the data preparation and corroboration phases of this project. Ernie Hain (DENR-IT) assisted with map creation. We thank Jeremy Aycock (DENR-IT) for creating web applications of our maps to facilitate more effective corroboration. Marc Hamric, Mike Marshall, and Louis Daniel (DMF) provided additional input based on their local knowledge and extensive experience with the region. Additional contributions came from the DMF Management Review Team, Pat Donovan-Potts (City of Jacksonville), and members of the New River Roundtable. Jimmy Johnson (CHPP coordinator) was also present to ensure coordination of SHA work with other DENR activities. Finally, we thank the regional advisory committee members for laboring through the highly technical meetings needed to fully address the issue of Strategic Habitat Areas in the White Oak River Basin in North Carolina.

## REGIONAL ADVISORY COMMITTEE

| | |
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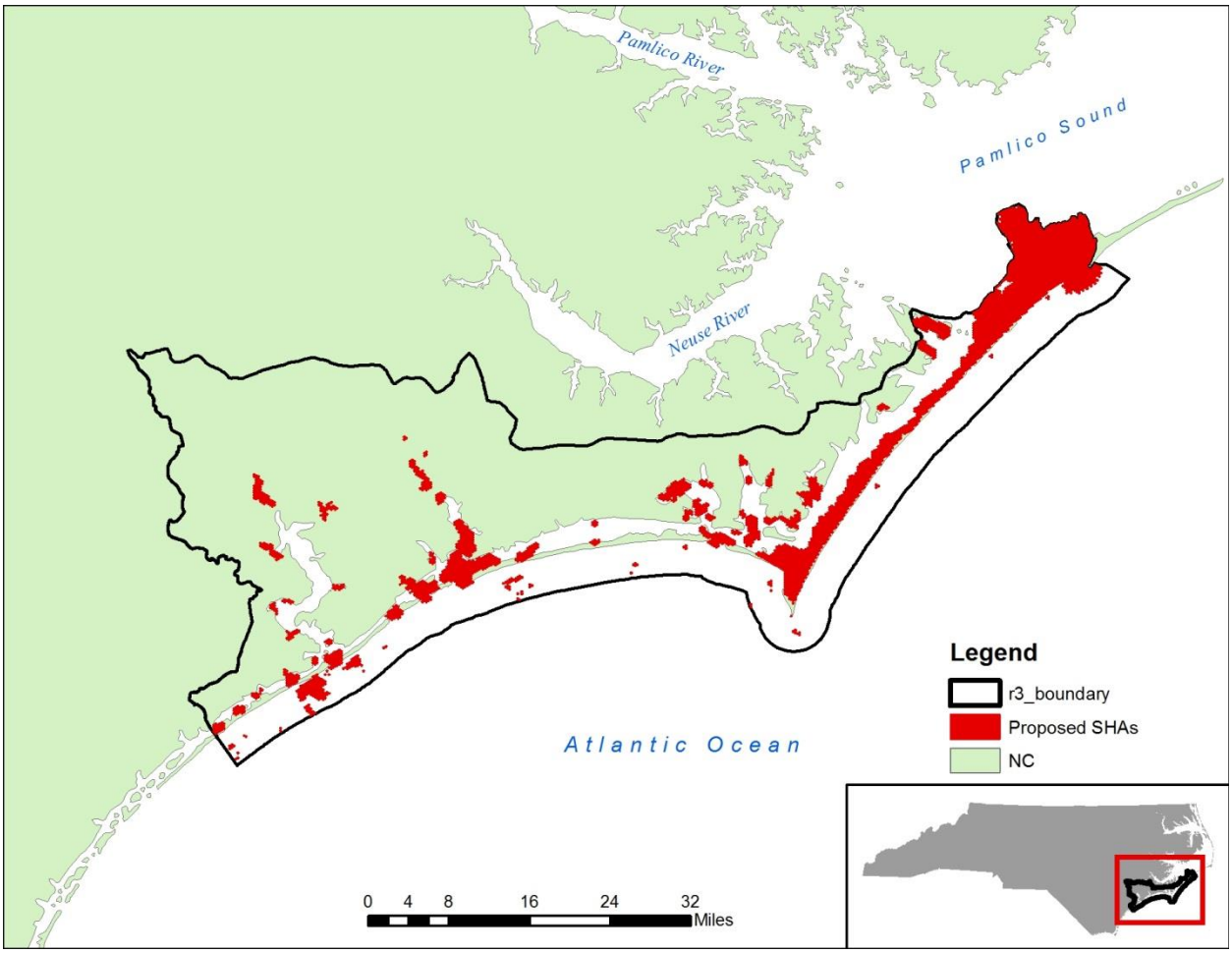
## GLOSSARY OF ACRONYMS

| NAME | Abbreviation |
|---|---|
| CHPP | NC Coastal Habitat Protection Plan |
| DCM | North Carolina Division of Coastal Management |
| DMF | North Carolina Division of Marine Fisheries |
| DOT | North Carolina Department of Transportation |
| DWQ | North Carolina Division of Water Quality |
| DWR | North Carolina Division of Water Resources |
| GIS | Geographic Information System |
| HU | Hydrologic unit |
| MFC | North Carolina Marine Fisheries Commission |
| NHD | National Hydrologic Dataset |
| NOAA | National Oceanographic and Atmospheric Administration |
| NRT | Natural resource targets |
| NWI | National Wetlands Inventory |
| SAV | Submerged aquatic vegetation |
| SGA | Shellfish Growing Area |
| SHA | Strategic Habitat Area |
| SS&RWQ | North Carolina Division of Marine Fisheries – Shellfish Sanitation and Recreational Water Quality section |
| USACE | United States Army Corps of Engineers |
| WRC | North Carolina Wildlife Resources Commission |
| WTP | Water treatment plant |
| WWTP | Waste water treatment plant |

## EXECUTIVE SUMMARY

Strategic Habitat Areas (SHAs) represent priority habitat areas for protection due to their exceptional condition or imminent threat to their ecological functions supporting estuarine and coastal fish and shellfish species. Identification and designation of SHAs is a main goal of the North Carolina Coastal Habitat Protection Plan. The identification of SHAs was conducted in a two-step process: 1) using GIS-based habitat and alteration data in a computerized site-selection analysis and 2) verifying and modifying information based on input from a scientific advisory committee. Division of Marine Fisheries staff and the advisory committee specified representation levels for multiple unique habitat types referred to as natural resource targets. There are also several types of alteration factors that are represented geospatially (i.e., hydrologic alterations, water quality degradation, and physical disturbances). The site selection program Marxan was used to select areas that met representation levels while limiting the selection of highly altered sites. The scientific advisory committee modified the computer results based on their expert knowledge and experience. The resulting SHA nominations encompass 19% of the Region 3 focus area (i.e., riparian targets within 500 m of the shoreline, open waters and the Atlantic Ocean out to 3 nmi). Many of the SHAs overlap with lands that are already managed for conservation or are protected through Primary Nursery Area designations. The SHAs were corroborated with biological data, ecological designations, and specific knowledge of the area (Map 1). The SHA nominations will be incorporated into future conservation and restoration planning efforts.




Map 1. Region 3 SHA Nominations.

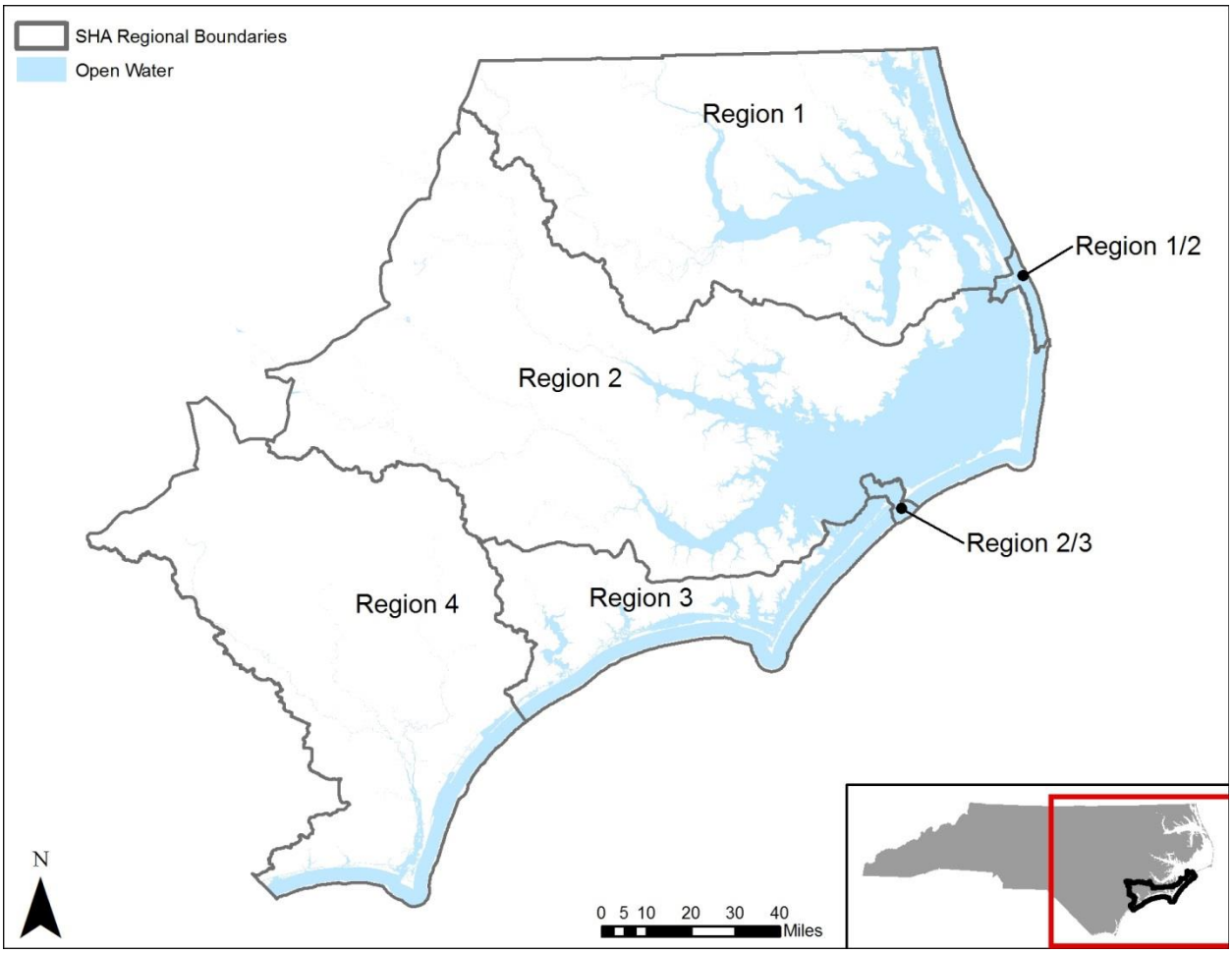
## INTRODUCTION

The identification and designation of Strategic Habitat Areas (SHAs) for marine and coastal fishery species is a critical component in the implementation of North Carolina's approved Coastal Habitat Protection Plan (CHPP). Strategic Habitat Areas were defined in the CHPP as, "specific locations of individual fish habitat or systems of habitats that have been identified to provide exceptional habitat functions or that are particularly at risk due to imminent threats, vulnerability, or rarity" (Street et al. 2005). Criteria for identifying SHAs were developed by an advisory committee of the Marine Fisheries Commission established in summer 2005. The committee developed a scientifically based process for identifying candidate areas for designation using biological data and the consensus of a regional expert panel (regional advisory committee). Their generic process is described in the guidance document entitled, "Process for Identification of Strategic Habitat Areas" (Deaton et al. 2006) that was approved by the Marine Fisheries Commission (MFC).

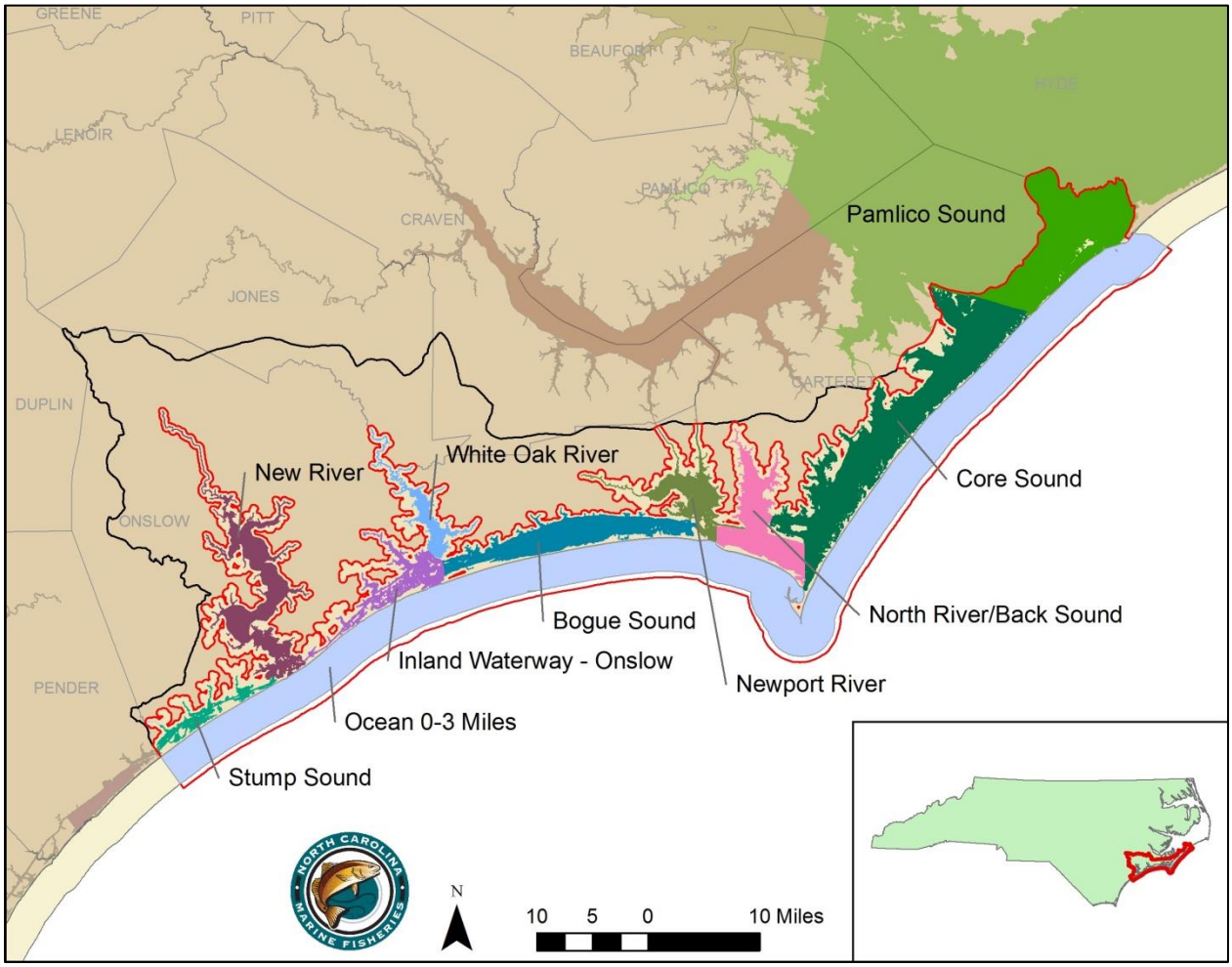
Strategic Habitat Area designations are based on regional analyses that identify optimally placed habitat areas of various ecological condition (exceptional or at risk). Strategic Habitat Areas may include areas that have already been protected by other designations, as well as areas not currently recognized in any way. Thus, areas designated as SHAs will require various site-specific management actions that best address the threats affecting that site. A network of designated SHAs providing habitat connections throughout North Carolina's coastal waters will help ensure that the complex life history needs of all species are met. Once SHAs are designated, resource managers may address priority fish habitat issues and take steps to prevent further alteration of the system as a whole. Thus, the necessary protections for some areas may go above and beyond current measures designed to protect habitat. In addition to regulatory changes, the nomination of SHAs can provide guidance for other conservation projects focused on conservation/acquisition, enhancement, or restoration projects.

The identification of SHAs addresses the continuing degradation and loss of important habitats referenced in the CHPPs (Deaton et al. 2010; Street et al. 2005). Current rules and policies of the resource management agencies fail to adequately address the individually small but cumulatively large alterations of fish habitat for development and associated human activities (Deaton et al. 2010; Street et al. 2005). Eventually, resource management and conservation agencies must address the issue of cumulative impacts in terms of fisheries ecosystem integrity and threshold alteration levels (Deaton et al. 2010). The 2010 CHPP update included a recommendation to develop the tools for addressing cumulative impacts (Deaton et al. 2010). On a regional scale, the concept of managing ecosystems to avoid cumulative impacts is partially addressed by assessing the condition of natural resource targets based on the presence, extent, and influence of multiple alteration factors. Maintaining a healthy ecosystem through focus on Strategic Habitat Areas is based on the interdependent relationship between alteration factors, natural resource targets, and the spatial landscape. Averting threshold levels of cumulative alteration to SHAs could be accomplished with both regulatory and non-regulatory tools.

**Geographic Scope of Region 3**




Map 2. Regional boundaries for Strategic Habitat Area nominations.




Map 3. Major water bodies in region 3.

Region 3 is the smallest of the four SHA regions (Map 2) and includes waters in Carteret and Onslow counties, as well as a small amount of Jones and Craven counties (Map 3). Unlike the other three regions, the entire watershed is contained within the coastal plain and within a single river basin (White Oak River Basin), lacks extensive riverine systems, and consists primarily of estuarine waters and small to moderate sized sounds. Sounds within Region 3 include Stump, Back, Bogue, and Core sounds (Map 3). Major rivers include the New, White Oak, Newport, and North rivers (Map 3). Water flows out of these estuarine rivers and sounds to the ocean through several inlets. The northernmost inlet, Ocracoke Inlet, overlaps with Region 2 where SHAs were already nominated (Map 2); therefore, this area is already included in the SHA network since it was chosen in region 2. The other inlets, Drum, Barden, Beaufort, Bogue, Bear, Browns, and New River inlets separate the islands of Core Banks, Shackleford Island, Bogue Banks, Bear Island, Brown's Island, Onslow Beach, and North Topsail Island and allow critical ingress and egress of fish. Lunar tides are more dominant than wind tides in region 3.

All six habitat types described in the CHPP (Deaton et al. 2010) are present within the region. Compared to the areas north of the White Oak River Basin, water bodies in region 3 are generally smaller and more saline, and intertidal oyster reefs and ocean hard bottom are more abundant. Submerged Aquatic Vegetation (SAV), wetland marsh, and forest are extensive. The majority of the inside waters in this region are classified by the Division of Water Resources (DWR) as shellfish waters (SA waters). There is an abundance of designated Primary Nursery Areas due to the numerous shallow tidal creeks and excellent estuarine nursery conditions. The abundance of healthy and diverse habitats in the White Oak

River Basin supports numerous commercial and recreational fisheries.

Land use in the White Oak River Basin is predominantly forest and federal land (i.e., developed and undeveloped military property, national forest, and national seashore), with lesser acreage of agriculture and residential development (DWQ 2007). Development on the mainland side of Region 3 is concentrated in the towns of Morehead City, Beaufort, Swansboro, Newport, Jacksonville, as well as Marine Corps Base Camp Lejeune. Of the barrier islands, only Bogue Banks and Topsail Island are developed, with the majority of housing supporting seasonal tourism. The other barrier islands are under federal or state ownership. Population in the White Oak River Basin is estimated to be 354,511 by 2020. The New River watershed (i.e., Jacksonville and Camp Lejeune) is the most populated and densely developed. The Down East area of Carteret County, while the least developed area, contains large acreage of agricultural land. The largest areas of undeveloped land in the region are at Cape Lookout National Seashore, Croatan National Forest, and Marine Corps Base Camp Lejeune. In the past two decades, population in the region's communities increased significantly. From 1990 to 2010, Onslow County population increased 22%, and Carteret County population increased 23%. Overall, urban development has increased 65% since 1982 (DWR 2007). As development has increased inland, forestry and agriculture have declined.

The rapid increase in urban development is the greatest threat to fish habitat and resources in this region. Increasing stormwater runoff and loading from point sources can lead to increased bacteria, nutrient, sediment and toxin inputs. DMF's Management Review Team noted increasing shellfish harvest closures as a priority threat throughout the region. Algal blooms and low dissolved oxygen were a concern in New River and Bogue Sound. Degraded nursery conditions due to toxin and nutrient contamination, sedimentation, and altered flow and salinity was also considered a concern overall.

## METHODOLOGY

A guidance document was developed to direct the methods for identifying SHAs (Deaton et al. 2006). The SHA identification process consists of three main phases, each of which requires input from a regional expert panel. The first phase in the SHA process is to identify priority species and habitats, and build a GIS database of existing biological and anthropogenic use data for region 3. The DMF Management Review Team selected priority species for the region based on their importance to both the recreational and commercial fishing industries in the region. Once data is assembled by DMF staff, the regional expert panel for Region 3 reviewed the data to ensure that they have sufficient spatial coverage and are current enough to be included in the SHA selection process. Then the panel examines the priority fish species for the region and suggests the amounts of each biological feature that the final SHA network should include. The second phase of the process is running the site selection software Marxan (Ball et al. 2009) to determine an initial configuration of SHA networks. Once the Marxan modeling is complete, the third phase consists of an expert committee reviewing the Marxan selections and using corroborating information and their own ecological knowledge to modify the boundaries of the SHA network and derive a final network of SHA nominations.

### Identification of Priority Species

The White Oak River Basin is a focal point for the oyster, clam, bay scallop, blue crab, and shrimp fisheries and is an important area for southern flounder, red drum, spotted seatrout, weakfish, spot and an important nursery area for gag and black sea bass. All of these species were considered priority species for region 3 (). The priority species tend to be most abundant in shallow water, and have strong associations with SAV, shell bottom, and wetlands.

The 2010 CHPP states that "The areas that contribute most to the integrity of the system are a category of habitat termed Strategic Habitat Area" (Deaton et al. 2010). In a general sense, the abundance and diversity of habitat such as shallow nursery areas, SAV, and oyster beds is what sustains productivity in region 3. The Region 3 SHA assessment focused on identifying areas that support the fisheries identified as priorities by DMF and those sites that incorporate the aforementioned habitats in their most unaltered state.

Table 1. List of priority species for Strategic Habitat Areas in region 3.

| **Priority Species** |
|---|
| Oysters |
| Hard clams |
| Bay scallops |
| Southern flounder |
| Spot |
| Shrimp |
| Blue crab |
| Spotted seatrout |
| Red Drum |
| Weakfish |
| Shrimp |
| Gag |
| Black Sea Bass |

**Natural Resource Targets**

In this analysis, "Natural resource targets (NRTs)" are defined as the habitats that represent essential or unique components of the fisheries ecosystem. Natural resource targets vary by region and should be chosen to differentiate between habitats that are used differently by fish species. To do this, priority species were grouped into shellfish, winter spawning estuarine fish, summer spawning estuarine fish, and reef fish based on common life history strategies (Table 2). Each NRT was evaluated based on its value to these species' groups. Once identified, the use of NRT by each group of priority species was used to set representation levels (the amount of a habitat to be included in the SHA network). In addition to the importance to priority species, the ability of the NRT to improve water quality was also considered when setting representation levels. After an initial value was set, representation levels were adjusted based on the regional importance of a habitat type, quality of habitat data, and overall amount of habitat in a region. A comprehensive list of NRTs and the chosen representation levels are listed in Table 2.

Table 2. Natural resource targets (NRTs) and representation levels used in the analysis and the importance of each NRT to priority species in region 3.

| Habitat type | Natural resource target | Total acres/mi | Rep level (%) | Importance to priority species | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Shellfish | Winter spawning est. fish | Summer spawning est. fish | Reef fish | Contribution to water quality |
| | | | | oysters, hard clams, bay scallops | southern flounder, spot, shrimp | blue crab, spotted seatrout, red drum, weakfish, shrimp | gag, black sea bass | - |
| **Polygon habitat types (all area values are in acres)** | | | | | | | | |
| Hard bottom | Hard bottom* | 3,839 | - | | | | X | |
| SAV | High salinity SAV | 32,265 | 60 | X | X | X | X | X |
| | Low salinity SAV | 33 | 90 | | X | X | | X |
| Shell bottom | Intertidal shell bottom | 1,357 | 50 | X | X | X | X | X |
| | Subtidal shell bottom | 2,370 | 60 | X | X | X | X | X |
| SAV & shell bottom | SAV & shell bottom | 349 | 60 | X | X | X | X | X |
| Creeks & Rivers | Riverine soft bottom (0-3ft) | 5 | 30 | X | X | X | | |
| | Riverine soft bottom (3-6ft) | 4 | 0 | | X | X | | |
| | Riverine soft bottom (ND) | 331 | 0 | | X | X | | |
| Shallow soft bottom | Palustrine soft bottom (0-3ft) | 12 | 20 | | X | X | | |
| | Palustrine soft bottom (ND) | 215 | 0 | | X | X | | |
| | Estuarine (0-3ft) | 76,823 | 30 | X | X | X | | |
| | Estuarine (3-6ft) | 42,421 | 20 | X | X | X | | |
| | Estuarine (ND) | 10,450 | 10 | X | X | X | | |
| | Marine (0-3ft)* | 4,611 | - | | X | X | | |
| | Marine (3-6ft)* | 4,406 | - | | X | X | | |
| Deep soft bottom | Estuarine (>6ft) | 44,004 | 0 | X | X | | | |
| | Marine (>6ft)* | 242,402 | - | | X | | | |

| Habitat type | Natural resource target | Total acres/mi | Rep level (%) | Importance to priority species | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Shellfish | Winter spawning est. fish | Summer spawning est. fish | Reef fish | Contribution to water quality |
| | | | | oysters, hard clams, bay scallops | southern flounder, spot, shrimp | blue crab, spotted seatrout, red drum, weakfish, shrimp | gag, black sea bass | - |
| Wetland | Emergent | 39,033 | 10 | | X | X | | X |
| | Forested | 23,181 | 10 | | X | X | | X |
| | Shrub/scrub | 10,665 | 0 | | | | | X |
| Low-elevation upland | Low-elevation upland | 7,733 | 10 | | | | | X |
| **TOTAL AREA w/o hard bottom & ocean** | | **546,511** | | | | | | |
| **TOTAL AREA w/ hard bottom & ocean** | | **693,706** | | | | | | |

| **Line habitat types (all distance values are in miles)** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Streams | Streams (low elevation) | 687 | 10 | | X | X | | |
| Low-elevation upland | Non-wetland shoreline | 423 | 10 | | X | X | | |
| Wetland shoreline | Wetland shoreline | 2,274 | 40 | | X | X | | X |
| **TOTAL DISTANCE** | | **3,384** | | | | | | |

*Not included in Marxan calculations

***Hard bottom***

Two types of hard bottom habitats occur in Region 3: estuarine hard bottom and ocean hard bottom. Ocean hard bottom was delineated based on the Southeast Area Monitoring and Assessment Program's reef-dependent fish collections from the 1990s (SEAMAP 2001) and Moser and Taylor (1995). Presence of hard bottom lines was inferred based on the presence reef fish species in trawl samples. The survey coverage and design prevented the creation of polygon features representing hard bottom habitat; therefore, ocean hard bottom is represented as line features. Because of its importance to priority species such as gag and black sea bass and the lack of mapping data documenting hard bottom habitat, all known locations of hard bottom material were selected in the proposed SHA network for region 3 excluding DMF artificial reefs that were created for the purpose of recreational fishing.

***Submerged Aquatic Vegetation (SAV)***

Submerged aquatic vegetation beds were mapped using aerial photography interpretation and transect data interpolation. Source data range in date of acquisition from the early 1980s to the very recent (DWQ 1998; Ferguson and Wood 1994; Noble and Hall 2005) DWQ 2005-2006-2007; DMF 1988-March 2012, unpublished data; APNEP 2011). Furthermore, the distribution of SAV habitat is likely more extensive than aerial observations suggest. For example, the growth of narrow fringing SAV beds and beds growing in organic-stained water is difficult to discern from aerial photography (S. Chappell, DMF and J. Greene, DWQ, personal communication). Because of this, the extent of SAV habitat is likely somewhat underrepresented by the mapping data, particularly in the rivers.

Mapped SAV was further differentiated into low (0-15 ppt) and high salinity (>15 ppt) beds, based on NOAA salinity classifications. Although SAV provides similar ecological services regardless of its location, salinity determines the fish species that are likely to be encountered in an SAV bed. Summertime measurements (which are considered the high salinity period) were used; therefore, the boundary helps capture the fluctuating boundary of both low and high salinity areas. There was very little low-salinity SAV in region 3 (Table 2).

The presence of SAV indicates that water quality in an area is sufficient to support life, providing an implicit way to differentiate between qualities of areas in soft bottom habitats. In the context of other Marxan inputs, a sensitive habitat such as SAV can help distinguish between otherwise similar habitats such as shallow estuarine soft bottom. Because of its regional importance and uniqueness, high salinity SAV targets were set relatively high (60%). Low salinity SAV is also important juvenile habitat for priority species, occupies less area, and is likely underrepresented in the data coverage since it is less visible in aerial photographs; therefore, the representation level was set to 90%.

***Shell bottom***

Shell bottom habitat in Region 3 was based on interpolated transect data collected by the DMF Estuarine Benthic Habitat Mapping Program. The source data ranges from 1988 to 2013, depending on the geographic area. The shell bottom target is defined as areas with at least 30% coverage of shell material (typically oysters) in water generally less than 12 feet deep. Shell bottom is subdivided into intertidal and subtidal by the Bottom Mapping Program.

Other sources of data were incorporated into the shell bottom target, including included cultch planting sites (DMF unpublished data, 2009-2013). The point data for cultch planting sites was converted to an area representing shell bottom based on the amount of cultch deployed (acres = bushels/8500). The additional shell bottom data was classified as subtidal shell bottom. Representation levels were set at 50% for intertidal shell bottom and 60% for subtidal shell bottom because they are regionally important as a fishery resource, serve as fish habitat, and are important for maintaining water quality.

***Low-Elevation Uplands***

Low elevation uplands were included because they are potential sites for marsh migration with sea level rise (Deaton et al. 2010). A 2008 3 m digital elevation model with a vertical accuracy of 25 centimeters (http://ned.usgs.gov/) was used to select areas less than two feet above mean sea level and having a patch size greater than 25 $m^2$. Non-wetland shorelines were also included in this category of uplands. The non-wetland shoreline was derived from North Carolina Division of Coastal Management's estuarine shoreline data (http://portal.ncdenr.org/web/cm/download-spatial-data-maps-oceanfront). A 15-m landward buffer was applied to the shoreline and the resulting data was combined with the uplands derived from the digital elevation model. Only low elevation uplands adjacent to other natural resource targets were retained; all others were eliminated from the dataset.

***Wetlands***

Wetland targets were extracted from the National Wetland Inventory (NWI) where wetlands are classified according to Cowardin et al. (1979). Wetlands of the following types are included in the region 3 analysis were estuarine intertidal emergent, shrub/scrub, and forested wetlands and palustrine emergent, shrub/scrub, and forested wetlands. Only contiguous wetlands within 90 m of a stream or shoreline were included as a target for assessment.

Wetland edge

This target consists of the linear wetland edge as designated in the North Carolina Division of Coastal Management's estuarine shoreline data layer. The wetland edge target does not differentiate between the marsh and forested edges. The inclusion of wetland edge, in addition to riparian/interior wetlands, was intended to capture the important linear ecotone within aquatic systems. Wetland shorelines are important habitat for juveniles of some priority species.

In Region 2, the linear wetland edge features were buffered and converted to polygon features. Unlike the Region 2 analysis, the Region 3 analysis retained the linear wetland edge feature during the alteration weighting calculation. The linear features were retained with the intention of maintaining the integrity of the linear dataset. Because the natural resource target features were linear as were many of the alterations affecting these features, converting the features to polygons created the potential to falsely inflate the alteration or impact within an assessment hexagon.

Non-wetland shoreline

This target consists of the linear non-wetland edge as designated in the North Carolina Division of Coastal Management's estuarine shoreline data layer. The inclusion of non-wetland edge, in addition to the low elevation uplands, was meant to capture the ecotone or transition zone between ecological systems, a potentially important habitat for priority species.

In Region 2, the linear non-wetland edge features were buffered and converted to polygon features. Unlike the Region 2 analysis, the Region 3 analysis retained the linear non-wetland shoreline during the alteration weighting calculations. The linear features were retained with the intention of maintaining the integrity of the linear dataset. Because the natural resource target features were linear as were many of the alterations affecting these features, converting the features to polygons created the potential to falsely inflate the overall alteration or impact within an assessment hexagon.

***Streams***

Small creeks and streams were represented using the National Hydrography Dataset's high resolution data (1:24,000-scale). This dataset represents a connected network of stream channels. The streams were clipped out of the open water features to leave a continuum from linear to polygon water features. The artificial connectors, an artifact needed to maintain the dataset's continuous linear network between features, were removed from the dataset because they did not represent stream habitat (these were not removed in the Region 2 analysis).

There are three basic linear water features (upper, middle, and lower) were created based on elevation (1 arc-second National Elevation Dataset). Stream order was not used because it was not readily available and much of region 3. Three elevation zones were set based on natural breaks occurring from sea level up to the fall line of riverine channels. In future analysis, it may be helpful to include stream orders for linear water features in the middle and upper zones, and a swamp water classification for streams in the lower zone.

***Soft bottom***

Soft bottom or water column habitat was designated as any area without submerged aquatic vegetation, shell bottom, or other structured habitat. This soft bottom habitat was derived using the North Carolina Division of Coastal Management's estuarine shoreline layer, the National Oceanic and Atmospheric Administration's bathymetry contour dataset, and the U.S. Fish and Wildlife's National Wetlands Inventory (NWI) dataset. The DCM estuarine shoreline data (McVerry 2012) was used as the base or boundary for the soft bottom natural resource target because it was recently digitized using high quality aerial imagery. All other structured features were removed from this base layer; this includes submerged aquatic vegetation, shell bottom, and hard bottom. The remaining features were considered soft bottom features.

The soft bottom features were further classified by depth and system. The depth categories included 0-3ft, 3-6ft, and no depth. These distinctions are important because they correspond to major differences in ecological function (i.e., shallow water nurseries). Depth was derived from NOAA's bathymetric dataset (http://nauticalcharts.noaa.gov). The "no depth" category was assigned to channel-like hydrographic features adjoining more open waters, or where the bathymetric charts indicated no data. The soft bottom habitats are also classified into system type using the NWI's wetland polygon dataset and classification system (Cowardin et al. 1979). Any soft bottom habitat that did not have a hydrological connection to riverine or estuarine systems by linear water features was removed from the dataset by applying a 30 meter buffer to determine connectedness of water bodies (i.e., lakes and ponds) to adjacent water features. Soft bottom habitats are classified into riverine, estuarine, palustrine, and marine systems.

- **Riverine** systems were separated from low salinity estuarine systems based on a linear or meandering morphology and a substantial (non-ditched) drainage network upstream.
- **Palustrine** systems included all non-tidal wetlands dominated by trees, shrubs, persistent emergent, and all such tidal wetlands were ocean-derived salinities are below 0.5ppt. Palustrine systems were only included if they were directly adjacent to connected lacustrine, riverine, or estuarine systems.
- **Estuarine** systems included all open waters and intertidal flats between riverine and marine systems. The estuarine system also includes pond-like features surrounded by estuarine wetlands.

- **Marine** systems included the subtidal and intertidal waters of the coastal ocean and inlets.

***Rare or listed species***

Rare or listed species are not included in the Marxan analysis as targets, but are taken into account indirectly through targeting of associated habitats, and during the second phase of the analysis using expert modification. Rare or listed species in this region include Atlantic sturgeon, bottlenose dolphins, and sea turtles. Sturgeon habitat will be indirectly targeted through selection of riverine wetlands, streams, and soft and hard bottom. Green and loggerhead sea turtles are the most common listed species in Region 3. They tend to enter the sounds in the spring as they migrate north for the summer, and leave the sounds in the fall to migrate south for winter. Sea turtles are highly mobile, moving around as they feed opportunistically. Within Region 3, sea turtles are thought to be most abundant in Core Sound, particularly near Cape Lookout but can be found throughout the sounds and lower rivers. Their habitat will be targeted indirectly through deep soft bottom.

**Alteration Factors**

Alteration factors are human activities that impact the marine environment. The alteration factors used in the analysis are listed in Table 3 and described in the sections below. Each factor was evaluated for duplication with other factors.

***Natural Resource Targets -> Alteration Factors***

The natural resource targets for Region 3 were grouped into general habitat categories for the purpose of applying alteration factor ratings. For example, wetland types are affected similarly by ditching and drainage; therefore they form one habitat type for alteration calculations. However, there were linear and polygon wetland and shoreline features. In Region 2, these linear features were converted to narrow polygon features. This conversion was also done for linear stream features. In Region 3, a decision was made to retain the linear features of the natural resource targets. The SHA Advisory Committee decided that the wetland edge linear features themselves were an important structural component of a habitat. The alteration calculations were applied to both polygon and linear features. In order to apply the equations presented in Appendix B, the linear features were converted into narrow polygon features. This conversion was also done for linear water features, unless noted below. The NRT groupings are listed in Table 2 and described below:

- Creeks/rivers – Polygon water column features for riverine hard and soft bottom NRTs. This category represents soft bottom under flowing water conditions.
- SAV – All categories of SAV
- Shell bottom – All categories of shell bottom
- Soft bottom, deep – All categories of estuarine and marine soft bottom >6 feet deep. This category represents soft bottom under standing water conditions.
- Soft bottom, shallow – All categories of estuarine and marine soft bottom <6 feet deep. This category represents soft bottom under standing water conditions.
- Uplands – Line features that were converted to polygons using a buffer 15 meters landward from non-wetland shorelines. The polygon target for low-elevation uplands was included in this basic habitat type for alteration.
- Wetland – Wetland edge was converted to polygons using a buffer 15 meters landward from wetland shorelines. Interior wetlands are polygon features >15 meters from wetland edge.
- Streams – Linear water column features converted to polygons using a 2.5 meter buffer. The size was based on the thinnest polygon water features, usually upper end of creeks or rivers.

Many other factors were considered, but were not included for various reasons. Among them were

2010 DWQ use support ratings, 2006 land cover data, stormwater outfalls, surface water intakes, silviculture operations, and beach nourishment. Their use was excluded for the following reasons:

- DWQ use support ratings were not used because we primarily needed aquatic life use support, which wasn't available in all locations.
- Coastal Change Analysis Program (CCAP) 2010 land cover data was not available until after the total alteration layer was completed.
- Stormwater outfall maps from DWQ and SS&RWQ were incomplete for the region; the DWQ data covers only municipalities and the SS&RWQ data covers only SA water shorelines.
- The GIS data for water intakes was extremely outdated, excludes certain areas and intakes under large minimum thresholds, and the NPDES sites covered major surface water intakes.
- Silviculture/forestry discharge not included because literature review in the CHPP indicated minor effect on habitat and water quality, previous advisory committees felt the alterations to aquatic habitat were minor relative to other threats, and the activity was difficult to represent spatially (Deaton et al. 2010; Uphoff 2008).
- Dredge material disposal on beaches has occurred in the region (Deaton et al. 2010), but was not included in the alteration factors, since it was episodic and less frequent than beaches with long term storm protection projects.

Table 3. Alteration factor weightings used in the Marxan analysis.

| | Hydrology | | | | | | | | Water Quality | | | | | | | | | Physical | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Habitat Groups | Culvert-obstructed areas | Impoundments | Bridge constrictions | Bulkheads | Rip rap | Dredged channels | Ditched/drained | Canals & boat basins | Major NPDES | Minor NPDES | Marinas | Animal operations | Mining discharge | Developed land use | Agricultural land use | Prohibited shellfish harvest* | Piers, docks, bridges | Trawling and dredging (perm open) | Trawling and dredging (temp open) | Mechanical clam harvest |
| Creeks & rivers | 2 | 2 | 1 | 1 | 1 | 1 | - | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | - | - | 1 | 1 |
| SAV | 1 | 1 | 1 | 1 | - | 3 | - | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 3 |
| Shell bottom | 1 | - | 1 | - | - | 3 | - | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | - | 1 | 2 | 3 |
| Shell bottom & SAV | 1 | 1 | 1 | 1 | - | 3 | - | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 3 |
| Deep soft bottom | - | 1 | - | - | - | 1 | - | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | 1 | 1 |
| Shallow soft bottom | - | 1 | - | 2 | 1 | 2 | - | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | - | 1 | 2 | 1 |
| Low-elevation uplands | 1 | 1 | - | 2 | 1 | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - |
| Wetland | 1 | 2 | 1 | 1 | 0 | 1 | 2 | 1 | - | - | 1 | 1 | 1 | 1 | 1 | - | 1 | - | - | - |
| Stream | 2 | 2 | - | 1 | 1 | 1 | 2 | - | 3 | 2 | - | 2 | 1 | 2 | 2 | - | - | - | - | - |
| Wetland edge | 1 | 2 | 1 | 3 | 2 | 1 | 2 | 1 | - | - | 1 | 1 | 1 | 1 | 1 | - | 1 | - | - | - |

* Includes areas closed due to high bacteria levels but excludes areas closed exclusively due to marina and major PDES impacts.

Alteration factors are loosely categorized as affecting hydrology, physical structure of habitat, or water quality. The effect of alteration factors on natural resource targets is represented in various ways:

1. *Overlap of habitat area and alteration footprint* – This was done for alteration features whose effect could be accurately represented by a discrete area. Altered areas for these features were represented as the area of the intersection between the habitats present and alteration. This was done for dredged channels, ditched/drained wetlands, canals and boat basins, prohibited shellfish harvest, bottom disturbing fishing gear, culverts, and impoundments.
2. *Relative impact of the alteration factor to a hydrologic unit* – This was done for alteration factors that were theorized to have watershed-level impacts or if the data collection prevented a discrete area of impact from being delineated. To calculate this, the extent of an alteration factor (whether it be total area or the sum of point counts) is summed across a hydrologic unit and amount is scaled to the maximum value occurring in any hydrologic unit in the region. This includes vertical shoreline stabilization, NPDES, animal operations, marinas, developed and agricultural land use, and mining operations.

***Hydrological Alterations***

Culvert obstructed areas

This factor identifies the stream segments upstream of the first downstream culvert of both documented and possible culvert locations. The culvert data was assembled from various sources, including Collier and Odum (1989), Moser and Terra (1999), and Department of Transportation (2013 data, https://connect.ncdot.gov/resources/gis/pages/gis-data-layers.aspx). Possible culverts were located by creating a point where streams intersected roads with no bridge indicated on the DOT data. Culvert locations were visually verified using a variety of high-resolution aerial imagery sources.

Impoundments

Impounded waters include the watershed upstream from documented dam locations and waterfowl impoundments. The data sources for dam locations were Collier and Odum (1989), Moser and Terra (1999), Department of Transportation (2013 data), Division of Water Resources (2003 data), and USACE obstructions inventory (2009 data). The location of fish passage devices should be included and reviewed by appropriate committee members. Fish passage devices could make previously inaccessible waters partially accessible. Waterfowl impoundments were verified visually using a variety of high-resolution aerial imagery sources.

Bulkheads and RipRap

Shoreline type was extracted from the North Carolina Division of Coastal Management's 2012 estuarine shoreline data (McVerry 2012). Alteration was rated as the ratio of the linear distance of stabilized structures to the linear distance of shoreline within an assessment hexagon. Stabilized structures were defined as "bulkheads" and "riprap". Alteration weight was higher for bulkheads than for riprap because bulkheads have a greater negative impact on the shorelines than riprap.

The DCM survey was based on 2006-2010 county level digital orthophotos from 6 inch and 2 foot resolution. Structure polyline features were generated from the imagery through heads up digitizing, and were digitized at a scale between 1:300 and 1:500 feet. Structure type is based on the presence of commercial, recreational, and erosion control structures and attributed using guidance provided in a N.C. Division of Coastal Management generated methodology entitled "Charting the Estuarine

Environment: A methodology spatially delineating a contiguous, estuarine shoreline of North Carolina."

Dredged channels

This factor includes areas dredged by the U.S. Army Corp of Engineers (USACE) on a regular basis. The source data originated from 2003. This layer does not include channels dredged by the DWR or private channels dredged for deep-water access, though these areas may be included in the canals and boat basins layer.

Ditched/Drained

For wetland polygon features, partially drained wetland areas were derived using the "drained" attribute in the U.S. Fish and Wildlife Service's National Wetlands Inventory dataset. For the linear stream features, the "ditched" classification in the high resolution National Hydrography dataset was used to select all ditched stream linear features.

Canals and boat basins

This alteration factor included very long and straight polygon features (obvious canals for navigation) or relatively short and straight elongate polygons with no upstream hydrology (short, water access canals or boat basins). Some of the delineated boat basins could also overlap with marinas. This file was created by clipping out portions of the Division of Marine Fisheries 24K_jurisdictional_waters that appeared to be excavated canals or boat basins. Some modifications were made by hand to remove areas that were for obviously for drainage instead of navigation when compared with 2012 imagery data.

***Water quality and land use alterations***

NPDES

This factor was derived from NPDES sites locations provided by DWR (2006 data). The impact of NPDES sites is difficult to quantify because the environmental impact of NPDES sites is variable and it is difficult to determine the area of influence for a point source without a detailed hydrologic model. We therefore decided to summarize NPDES sites by hydrologic unit to approximate the measure of alteration. NPDES sites are classified as major or minor based on the amount of discharge allowed per day. Sites discharging more than one million gallons per day were considered major. The number of major or minor NPDES within hydrologic units was then scaled by the maximum number occurring in the region, and the relative amount was used to calculate the relative severity of alteration. Note that major and minor NPDES were given different impact severities relative to habitat types (Table 2).

Marinas

Wildlife Resources Commission and Shellfish Sanitation data on marina locations and slip numbers were combined to make one shapefile of all facilities with > 10 slips. The total number of slips at these facilities were aggregated per hydrologic unit and divided by the amount of shoreline (defined by the NRT wetland and non-wetland shoreline) in each hydrologic unit to create a slips/shoreline metric. This metric was scaled to the maximum value occurring in region 3.

Animal operations

Locations and size of animal operations were obtained for poultry, swine, and cattle operations. Swine and cattle operation information came from DENR's animal operations permits as of January 2013

(Division of Water Resources (DWR), Animal Feeding Operations Unit, available from the DWR website at http://portal.ncdenr.org/web/wq/animal-facility-map). Poultry data was downloaded from the American Environmental Geographic Information System (AEGIS; available at http://www-geography.jsu.edu/, downloaded 08/2013), which contains point locations of animal feeding operations identified through aerial photography. The poultry data were examined; however, there were no poultry operations located within region 3. All animal operations within the region 3 were determined to be swine operations.

The amount of nitrogen runoff generated by each operation was calculated based on accepted values of nitrogen excreted per animal for each type of operation (McNaught et al. 2010). The nitrogen load for all animal operations was totaled for each hydrologic unit and scaled relative to the maximum nitrogen load associated with animal operations in region 3. Each value was expressed as a percent of the maximum nitrogen load per 12-digit hydrologic unit code.

Mining discharge

Mining was included as an alteration factor because mining operations discharge fresh water into adjacent waterways. Freshwater discharge from mining operations is considered to have a low impact on soft bottom, shell bottom, SAV, and water column habitats thus receiving alteration factor rating of 1. Mine inventory data was obtained from the DENR Division of Energy, Mineral, and Land Resources, which was produced in January 2012. Information on which of those mines discharged into adjacent waterways was obtained from DWR; however, it was not possible to determine the amount of discharge each mine produced. Thus, the number of mines in each hydrologic unit (HU) were determined and scaled to the maximum number of discharging mines per HU in the region.

Developed land use

This alteration factor was derived from the National Oceanic and Atmospheric Administration's 2010 C-CAP Southeast Region Land Cover dataset using the open space, low-, medium-, and high-intensity development classifications. The total area of developed land-use within each 12-digit U.S. Geological Survey hydrologic unit (HU) was calculated and scaled to the maximum proportion of developed land use found within a HU in the study region. A greater proportion of developed land within a HU suggests greater nutrient and chemical loadings from non-point development sources.

Agricultural land use

This alteration factor was derived from the National Oceanic and Atmospheric Administration's 2010 C-CAP Southeast Region Land Cover dataset using the cultivated crops and pasture/hay classifications. The total area of agricultural land-use within each 12-digit U.S. Geological Survey hydrologic unit (HU) was calculated and scaled to the maximum proportion of developed land use found within a HU in the study region. A greater proportion of agricultural land within a HU suggests high nutrient and chemical loadings from non-point agricultural sources.

Prohibited shellfish harvest

Areas prohibited to shellfish harvest due to high pathogenic microbe counts or automatic closures around wastewater treatment outfalls and marinas were included to represent non-point source alterations at spatial scales smaller than hydrologic units. The benefit of representing localized impacts was considered more important than minimizing the redundancy of similar alterations (i.e., NPDES, marinas, and developed land-use). In addition, the prohibited areas are documented alterations and not

reliant upon inferred data. Only waters that fall under the category of prohibited harvest are included; conditionally approved harvesting waters were not included because they are considered restorable by DMF. Areas that are closed due to marina buffer rules were removed from this layer to avoid duplication with the marina alteration layer.

***Physical disturbance***

Trawling

The no trawling and dredging layer was created by DMF in accordance with Marine Fisheries Commission rules and provisions of the Shrimp Fisheries Management Plan (DMF 2006). Areas open to trawling or dredging and located in areas greater than 3ft deep were included in this alteration factor. Crab dredging areas were not included as 'no trawl' areas for the SHA process because dredging does not happen frequently or over a wide extent. The bottom disturbing gear factor was rated low in alteration because it represents only potential alteration within a very large area. Data on the frequency of trawling at specific locations is not available.

Mechanical Clam Harvest Areas

Two types of mechanical harvest gear are currently used in North Carolina: the hydraulic escalator dredge and the clam trawl or "clam kicking" vessel. The hydraulic escalator dredge penetrates the bottom to a depth of about four inches and collects clams as they are forced from the bottom by water pressure and conveyed up the escalator aboard the vessel. In clam trawling or "kicking", clams are dislodged from the bottom with prop wash, and a heavily chained trawl with a cage behind the boat collects the clams (DMF 2008). It is accepted that these mechanical harvest methods can negatively impact submerged aquatic vegetation (SAV) and oyster rocks (Peterson et al. 1987), thus, mechanical harvest of clams is allowed only in certain areas (almost exclusively in region 3). In addition, some of these areas are open and closed on a rotational basis of either one or two years (Table 1).

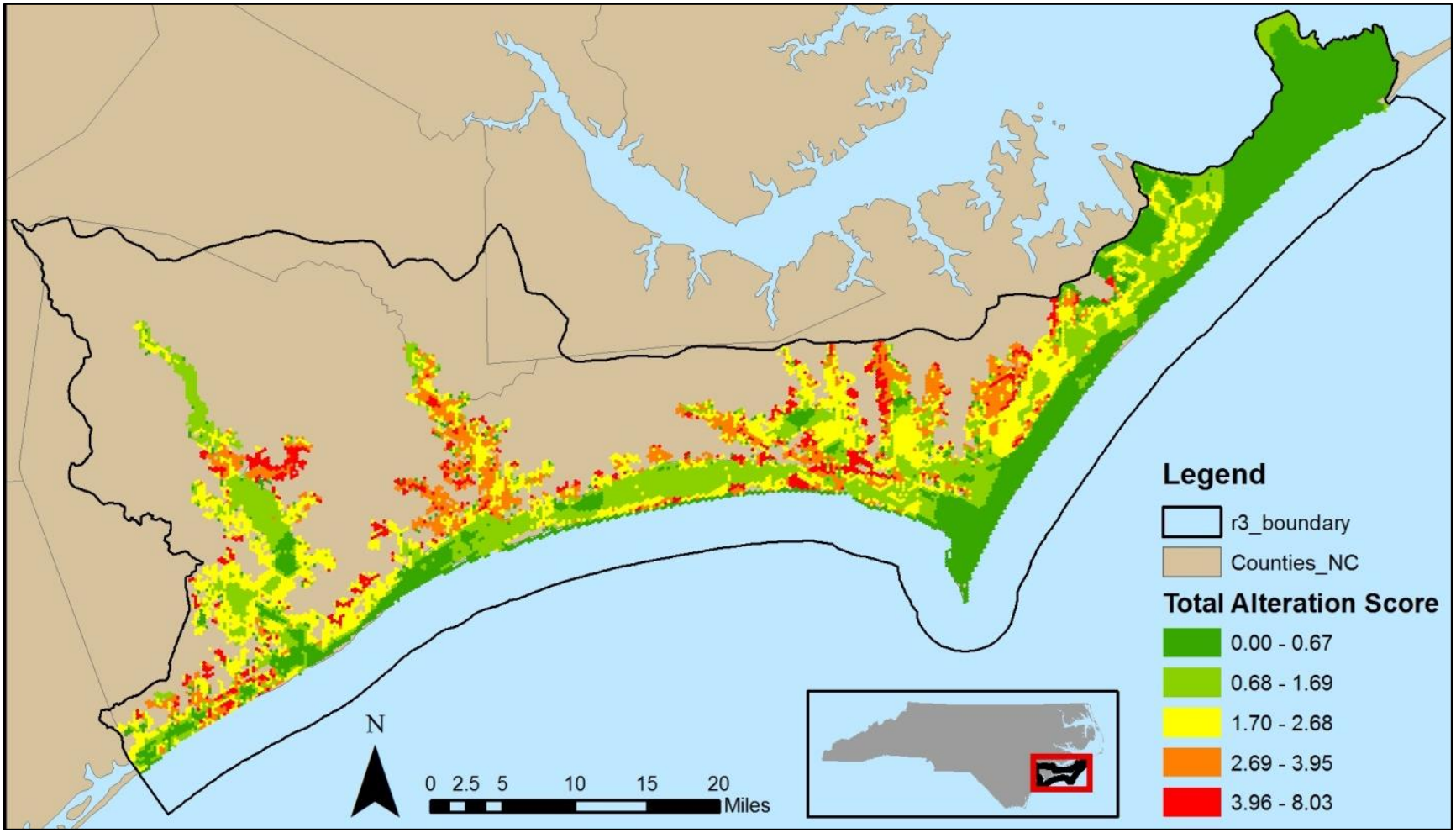
Table 1. Daily mechanical hard clam harvest limits by water body (DMF 2008).

| Waterbody | Daily harvest limits | Additional information |
|---|---|---|
| Southeastern Pamlico Sound | 5,000 clams | Rotates 2 years on and 2 years off with northern Core Sound area. Began in 2001. |
| Northern Core Sound | 5,000 clams | Rotates 2 years on and 2 years off with southeastern Pamlico Sound area. Began in 2001. |
| Core Sound | 5,000 clams | Limit reduced from 6,250 clams per operation in 2001. |
| North River | 3,750 clams | |
| Newport River | 3,750 clams | |
| Bogue Sound | 3,750 clams | |
| White Oak River | 6,250 clams | Rotates one year on and one year off with New River area. |
| New River | 6,250 clams | Rotates one year on and one year off with White Oak River area. |
| ICW Onslow/Pender County area | 6,250 clams | Marker 65 to the BC marker at Banks Channel |

***Total alteration/cumulative impacts***

Each alteration factor was assigned a rating ranging from 0 (no impact) to 3 (high impact) for each habitat type it coincides with (Table 2). Habitat types were condensed to match the major CHPP habitat types. The factor ratings were guided by a modified version of a similar table in the CHPP (Street et al. 2005), which is based on literature reviews and expert opinion. Because multiple factors can contribute to the alteration within a region, we combined the alteration factors into a total alteration rating which quantitatively measure the amount of alteration to each hexagon in the region. Briefly, the alteration score weights the alteration severity by the amount of habitat impacted and combines the severity and impact scores into a total score by weighting the proportion of each habitat present in the hexagon. The alteration score for region 3 was created using a combination of ArcGIS models and R scripts and is described in detail in Appendix B.

Areas in Core Sound were the least altered along with areas in Bogue Sound, Inland Waterway – Onslow, and portions of New River (Map 4). The most altered areas were in near developed areas such as Jacksonville and Morehead City, the White Oak River, and areas in Down East Carteret County near Open Grounds Farm (Map 4).




Map 4. Total alteration scores for region 3. Higher values equate to greater degradation.

**Marxan Analysis**

The site selection software Marxan (Ball and Possingham 2000) was used to identify an initial network of areas to be considered for SHA nomination. The use of Marxan was recommended by a Duke University master's project (Smith 2005) and sequentially adopted as SHA methodology. The site-selection tool makes it possible to systematically consider multiple natural resource targets and various socio-economic factors represented as alterations. The computer program provides a way to select a network of areas (classified by hexagon units) with the least amount of alteration, which is helpful because specific information is not available on maximum tolerable alteration levels and specific minimum habitat sizes needed to maintain functional ecosystems (Stewart et al. 2003). Often, the results of site selection tools are used as a starting point from which to determine boundaries and are not considered a final output (e.g., (Geselbracht et al. 2009). Final SHA nominations incorporate expert scientific knowledge to consider additional biological information and socio-economic factors that may not have been included in the Marxan inputs.

The selection algorithm considers several sources of data and uses an iterative approach to consider multiple network configurations until it finds one that minimizes the area and cost of the network. Marxan allows the user to input data on the distribution of conservation features (NRTs in the SHA process) and to define the desired amount of each conservation feature desired in the final reserve configuration. In addition, Marxan allows the user to input a cost for each planning unit, which can vary based on the process objectives. The SHA process uses the alteration score of a hexagon as the cost under the assumption that alteration is equal to habitat degradation. This framework was designed so that Marxan would select a network of habitat areas that have the least amount of habitat degradation. In addition to the habitat and alteration inputs, Marxan allows the user to input a boundary length modifier (BLM), which controls the length of border allowed by the solution. Raising the BLM increases the cost of spatially disparate solutions, forcing the program to select hexagons that are closer together.

A Marxan analysis consists of a series of runs, each of which represents a solution found by the computer program. A grid of hexagons is laid over GIS habitat and alteration layers. The hexagons in this analysis were 30 acres in area, 432 m in diameter, and 216 m in side length. Each run consists of a specified number of iterations. Each iteration considers a new reserve configuration of hexagons by calculating a cost that is based on the success of the program at meeting its targets, the reserve boundary length and the cost of the area considered. Iterations proceed until the change between iterations is minimal or the maximum number of iterations is reached. The number of runs, iterations and BLM can all be specified in the Marxan settings and should be adjusted to attain an appropriate solution for each analysis. An informal sensitivity analysis was conducted for Region 3 (Appendix E), and it was decided to run each scenario for Region 3 500 times with 1,000,000 iterations per run. The BLM was adjusted to 0.01 in order to produce the most efficient solution in terms of cost and area selected between runs.

Lower BLM values produced solutions that were smaller, spatially isolated clusters with less than three hexagons with the exception of Core Sound. The majority of Core Sound behind Core Banks from Cape Lookout to Ocracoke Inlet was consistently chosen in all sensitivity runs (Appendix E). Higher BLM values produced SHAs that were too large for management and consumed too much area (Appendix E). Areas composed of less than 3 adjacent hexagons were considered too small for management and removed from the solution considered in the corroboration stage with the exception of isolated areas of hard bottom offshore in the ocean.

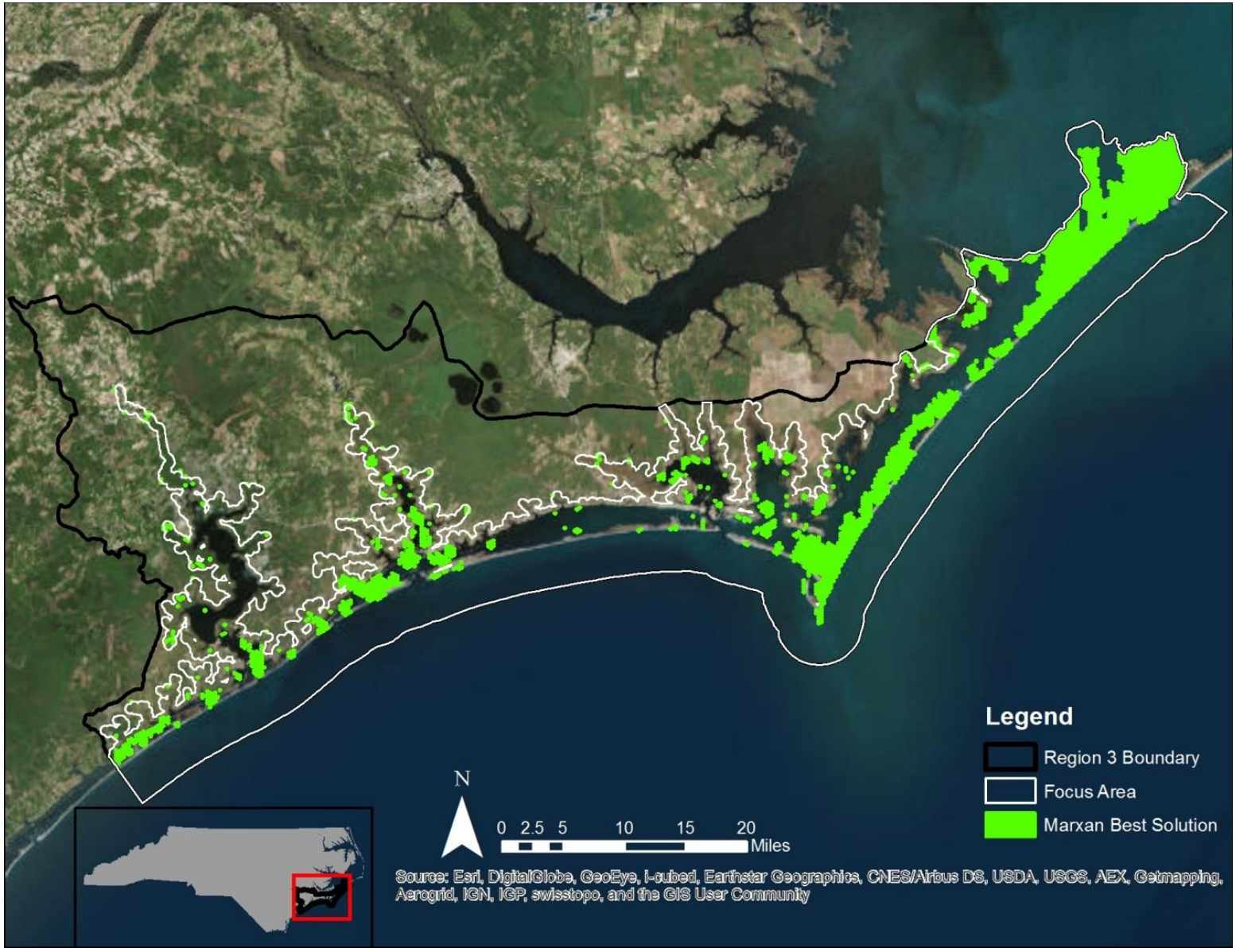
Preliminary Marxan runs were consistently selecting large areas of the ocean with marine soft bottom >6 ft despite the representation level being set at 0%. Hard bottom was removed from the analysis and Marxan was re-run; however, the model continued to select large areas of ocean. Investigation by DMF staff and the advisory committee determined that the most likely cause was that the ocean areas were being selected because the total alteration scores were so much less than those in inside waters and all representation levels were being met for all targets. To solve this problem, the advisory committee decided to remove all hard bottom and marine soft bottom NRTs from the analysis and re-run Marxan with just inside waters. The advisory committee felt that the only areas of the ocean that should be included as a SHA would be known hard bottom locations (except artificial reefs) and areas near inlets. Thus, these areas were added in during the corroboration phase.

Once preliminary areas were identified by Marxan, SHA selections were modified and refined by the advisory committee of regional experts using other known sources of quantitative or qualitative ecological or fishery information and professional knowledge (referred to as corroborating data). Public input is required to finalize identification and nomination of areas for eventual SHA designation.

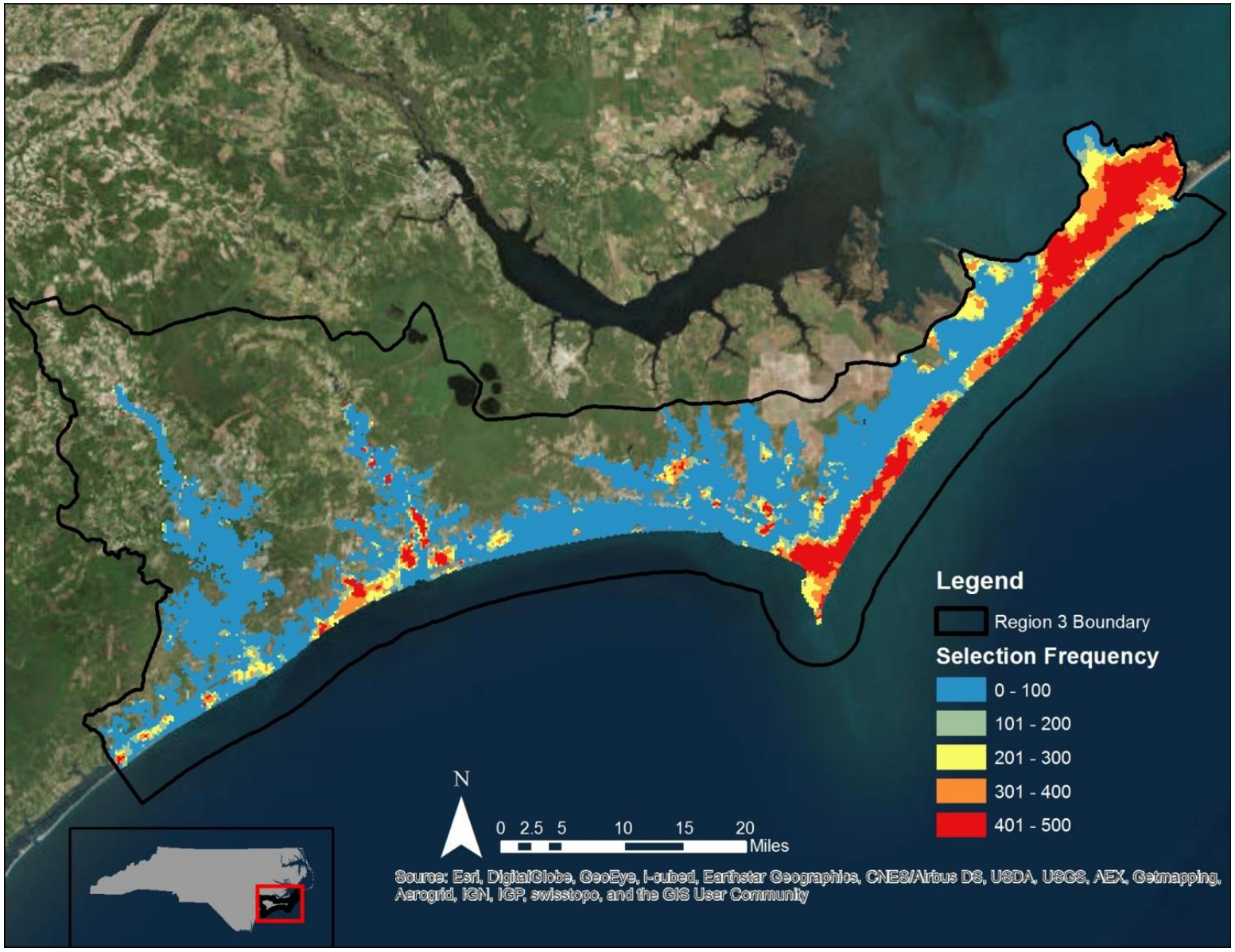
## MARXAN RESULTS

After the natural resource targets and total alteration layer were assembled, Marxan was run at the specified representation levels for targets representing priority fisheries habitats (Table 2). Map 5 depicts the Marxan selections from the best solution with the most efficient BLM. This resulted in a larger number of small SHAs than the advisory committee preferred with some missing from locations that they thought were important. As a result, the advisory committee decided to examine the selection frequencies, since high selection frequencies are an indication that an area was not erroneously chosen (Map 6). The committee felt that using hexagons that were selected at least 300 times out of the 500 runs was a good starting point for corroboration (Map 7).

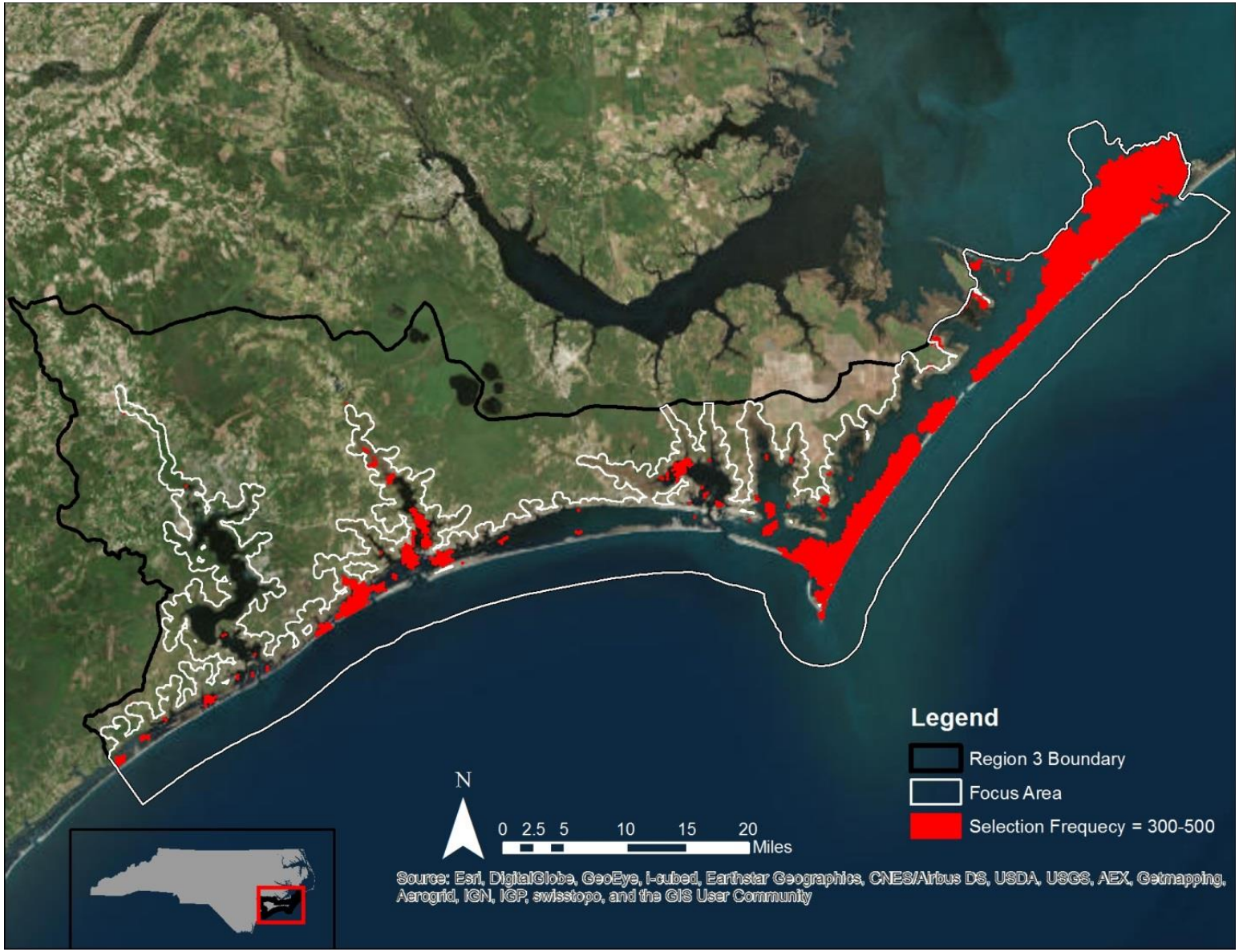
Large areas of Core Sound behind the Core banks were consistently chosen and are known to be ecologically important with large amounts of SAV and very low levels of alteration. Other sizeable areas that were selected were Middle Marsh and North River Marsh in the mouth of North River, the upper area of Newport River, large areas of the White Oak River and Inland Waterway – Onslow; however, almost all of New River was not selected (Map 7). Examination of the habitats mapped in this area showed mostly estuarine soft bottom and wetland habitats, all of which had relatively low representation levels due to their abundance in the region and relative robustness to alterations (Map 15 and Map 16). There were some SAV and relatively little shell bottom habitats with higher total alteration scores other areas with similar habitats (Map 4).




Map 5. Marxan best solution.




Map 6. Marxan selection frequency.




Map 7. Marxan hexagons with a selection frequency of 300-500.

## CORROBORATION

The advisory committee reviewed the initial Marxan selections and made expert modifications as needed. The SHA committee grouped individually selected hexagons into manageable polygons for the corroboration and identification process. Modifications to the Marxan selected SHAs were made using an overlay of selected hexagon polygons on digital imagery. The SHA committee examined maps of both the selection frequency and alteration ratings for guidance during the manual selection phase. For each polygon or group of contiguous hexagons, the SHA committee reviewed data included within each polygon or group to confirm inclusion/exclusion as a SHA in a consistent and data based manner. This included examination of the alteration scores, selection frequencies, amount and type of targets present, habitat diversity and rarity, supporting biological data, existing ecological designations that were not included as NRTs (i.e., Anadromous Fish Spawning Areas, Significant Natural Heritage Areas) and connectivity with adjacent selections and protected areas. Known studies or information from committee members regarding habitat condition and fish utilization of specific areas were also included.

Modifications made were to be based on the following criteria:

- Habitats present – rare, vulnerable, diverse
- Occurrence of ecological designations
- Alteration factors and ratings
- Selection frequency
- Fish data/information available from DMF sampling or other research
- Fish abundance rank
- Water quality impairment status (5 categories)
- Regional importance of a functional area
- Size/isolation/connectivity/shape

The designations and biological data used in this phase of the analysis are listed in Table 4. These data are meant to support computer-selected areas and identify important areas omitted by the Marxan analysis. Examples of omitted areas would be a bay that was rated as altered but still supports fish production or an oyster rock that consistently produces high catches relative to other areas. Ideally, the regional expert panel would have local qualitative knowledge that further supported the area as having high fishery or habitat value. Areas with existing habitat designations that were not selected by Marxan could also indicate areas that should be considered for manual addition to the list of proposed SHAs.

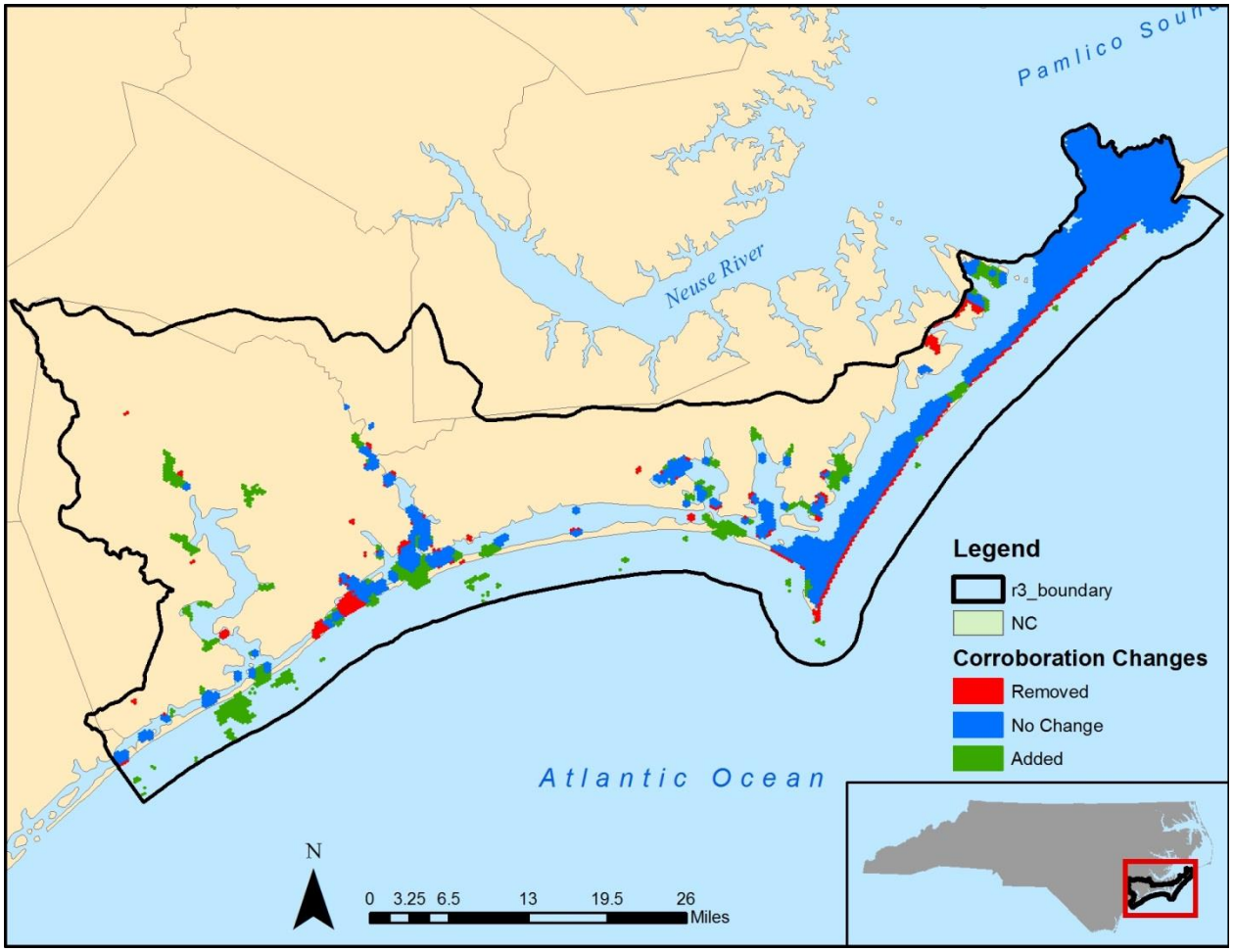
The committee used the data listed above to cut, extend, and/or consolidate Marxan clusters within the focus area. Selected hexagons with fewer than three contiguous hexagons were excluded. A large portion of the corroboration focused on the New River area where Marxan selection frequencies were low, but the area is known for its importance to red drum, spotted seatrout, shrimp, and blue crabs. Consolidations were based on avoiding what the group considered over-represented habitats (e.g., soft bottom >6 ft) and connecting similar contiguous areas or under-represented habitats. Some natural resource targets were also clipped out of Marxan polygons. For example, some estuarine soft bottom areas were removed to prevent over-representation of this resilient habitat.

Where Marxan selections only included a portion of a habitat area (such as half of an SAV bed), the group assessed whether that cutoff point made ecological sense, and if not, extended the SHA boundary to include whole habitat units. Marxan selections that included large amounts of developed low-

elevation uplands were removed (e.g., neighborhoods, shopping malls, etc.). The advisory committee also expanded polygons into some unselected areas that were known to be highly productive for priority species or habitats. The visual assessment was conducted systematically around the region, starting from the southern end at Stump Sound and working north to Ocracoke Inlet. It should be noted that the Ocracoke Inlet area was added by default because that area was already selected as a SHA in the region 2 analysis (DMF 2011). Inlet areas were also added in by default because of their importance to migratory fishes moving in and out of those areas. Modifications made by the advisory committee are displayed in Map 8.

Table 4. Ecological designations and biological data from DENR sampling programs that could be used as an indicator of aquatic habitat condition in Region 3.

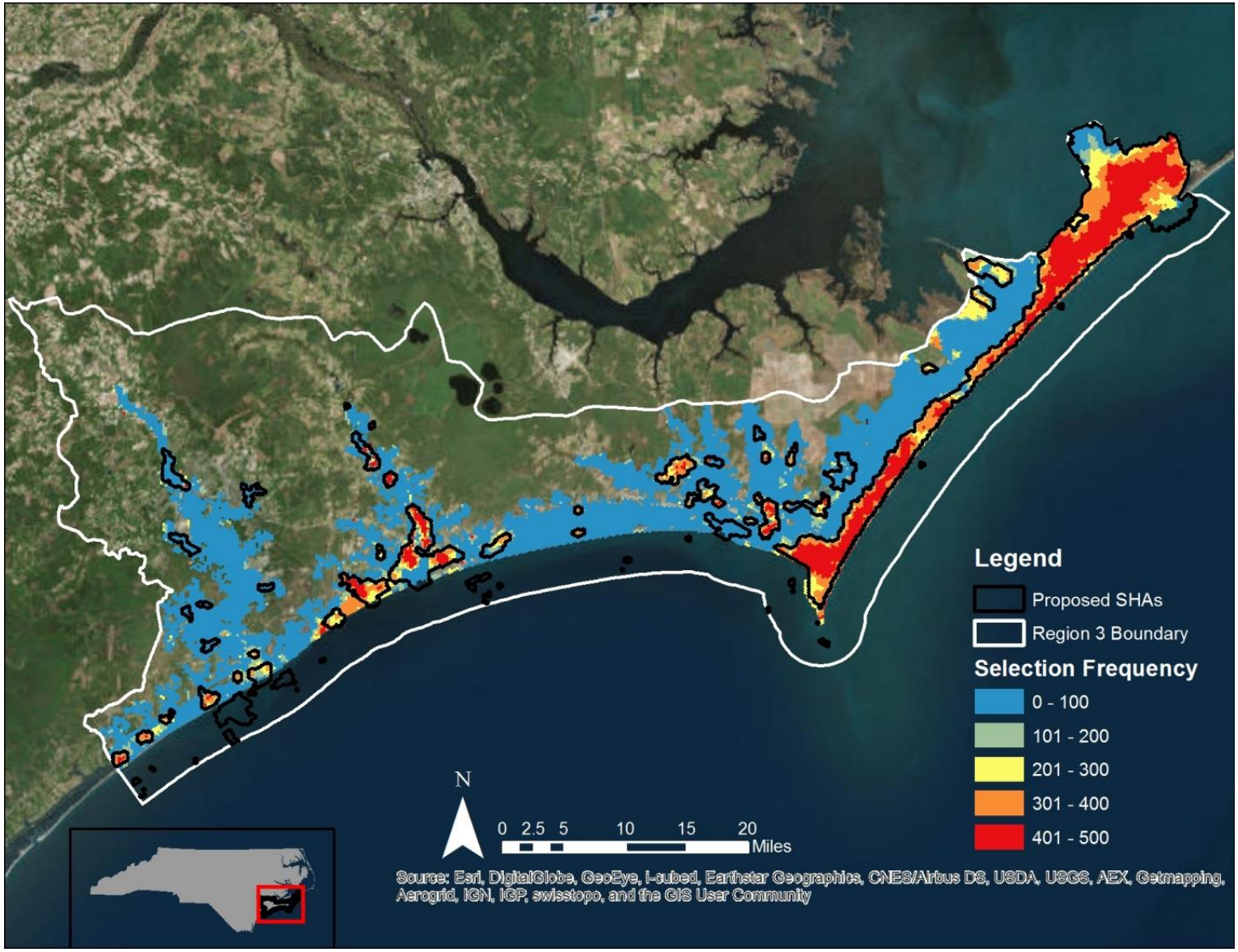
| Type | Description | Source |
|---|---|---|
| Ecological designations | Anadromous Fish Spawning Areas | MFC designation |
| | Blue crab spawning sanctuaries | MFC designation |
| | Estuarine PNAs | MFC designation |
| | Inland PNAs | WRC designation |
| | Open shellfish harvesting waters | DMF - SGA classification |
| | Significant Natural Heritage Areas (aquatic and terrestrial) | Natural Heritage Program designation |
| | Lands managed for conservation | DENR One NC Naturally |
| Species/ productivity data | Use support and biotic indices for fish and invertebrates (freshwater streams only) – index values | DWR |
| | Juvenile estuarine fish | DMF program 120 |
| | Shellfish densities | DMF program 635 |



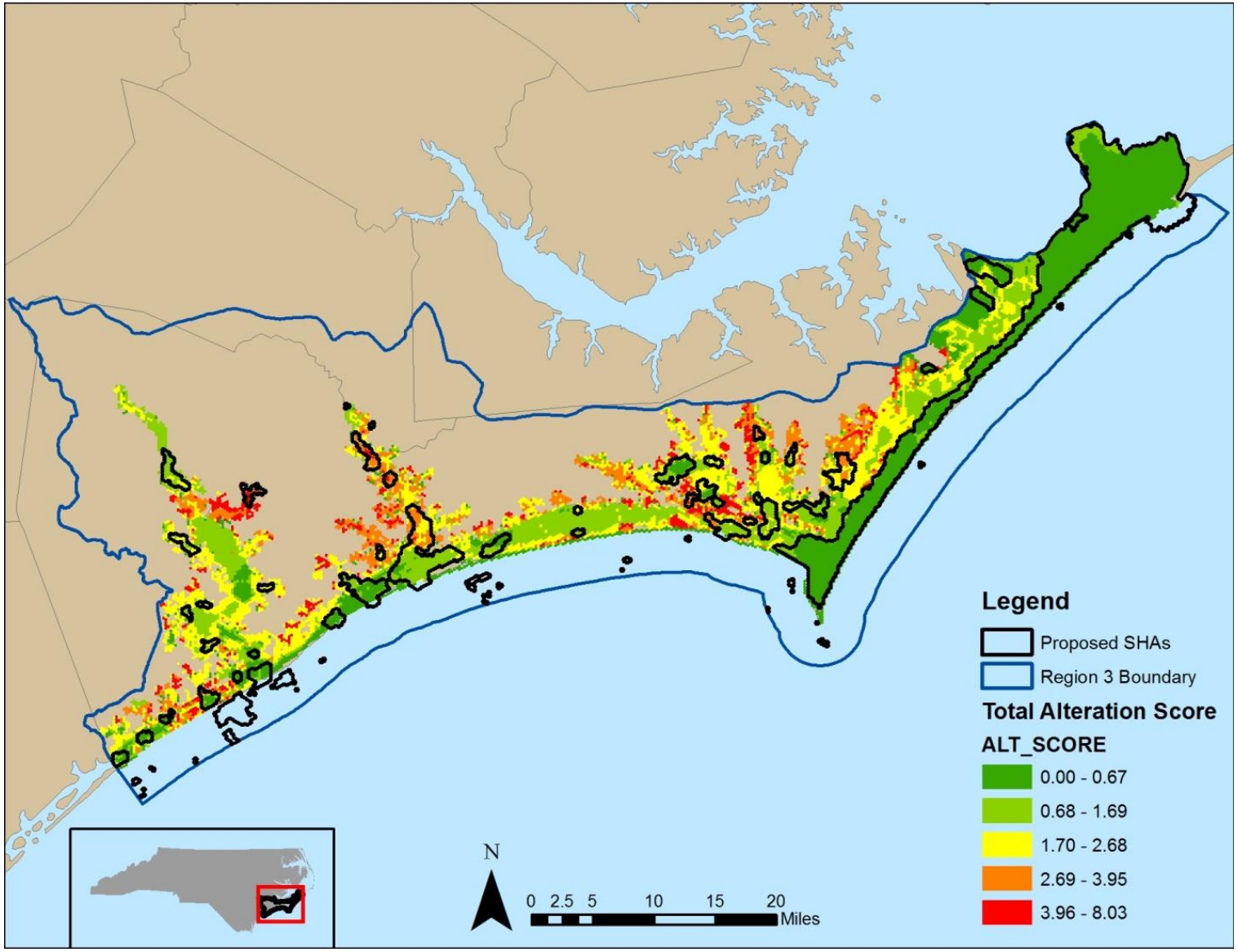

Map 8. Map of corroboration changes made by the advisory committee.

**Post-Corroboration Results**

Following the corroboration phase, there were a total of 71 discrete areas selected for nomination. This comprises 19% of the focus area. Of that selected acreage, 134,547 acres and 1,390 miles of linear features (streams and shoreline) were included in SHAs Table 5. All targets were met or exceeded except for palustrine soft bottom (0-3 ft), which was close at 98% and only a few acres (Table 5). Streams were slightly underrepresented at 94% (Table 5). The total acreage of natural resource targets within each SHA is included in Table 6 and Table 7. Map 9 and Map 10 show the selection frequency and alteration scores of the post-corroboration SHAs. The majority of the areas that were not initially selected by Marxan but were added by the advisory committee had low selection frequency but low to medium alteration scores.



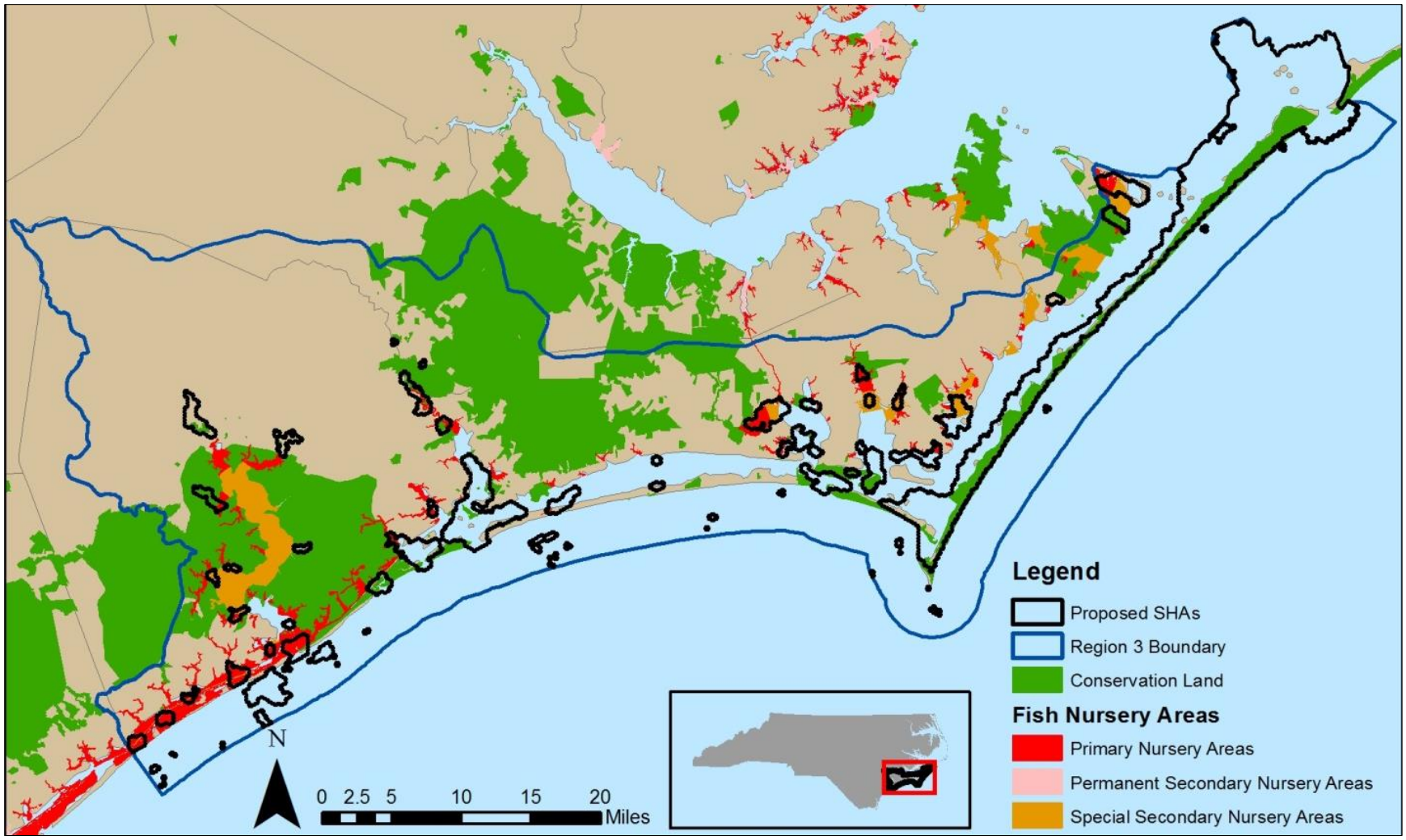

Map 9. SHA nominations after corroboration showing selection frequencies.




Map 10. Alteration score of post-corroboration SHA nominations. Management goals – target lowest scores (green) SHAs for protection/conservation, mid scores (yellow) for protection/enhancement, and highest scores (pink) SHAs for restoration.

The final SHA selections form a network of priority areas for protection and enhancement ranging from the upstream watersheds of the rivers to the grass beds and ebb tide deltas of the Outer Banks. Selections were scattered throughout the area and concentrated along the back side of Core Banks where almost all of the high salinity SAV was selected. The advisory committee considered this appropriate since it is a critical habitat for the majority of the priority species, is a unique habitat feature of North Carolina that is known to contribute significantly to the diversity of fish life in the region, and is a habitat easily lost from physical disturbance (dredging) or water quality degradation. Shell bottom was also set with high representation levels due to their ecological and fishery importance in the area and current low abundance due to historical losses. A large amount of subtidal shell bottom was selected (74%), and approximately 62% of the intertidal oysters.

Region 3 has an abundance of state and federally protected lands bordering coastal waters Map 11. Of the 134,547 acres selected as SHAs, 26% (35,350 acres) already have some level of protection. Twenty percent (26,325 acres) occur on lands managed for conservation (state, federal, local), 5% (6,805 acres) are located in MFC designated PNAs, and 2% (3,056) are in special secondary nursery areas. Some of the larger conservation lands on mainland side are the Croatan National Forest and Marine Corps Base Camp Lejeune. The area from Cape Lookout North is all undeveloped National Seashore. SHAs within protected conservation lands are basically already protected from degradation associated with development. The remaining 74% (99,197 acres) represent SHA nominations of various conditions that are currently vulnerable to land and/or water based threats.




Map 11. Post-corroboration SHA nominations, noting occurrence of state, federal, and private (land trust) conservation lands and MFC designated PNAs.

## FINALIZING STRATEGIC HABITAT AREA POLYGONS

The SHA committee grouped individual selected hexagons into manageable polygons for the corroboration and identification process. The SHA committee also examined maps of both the selection frequency and alteration ratings for guidance during the manual selection phase. For each polygon or cluster of contiguous polygons, the SHA committee reviewed data included within each polygon or cluster to confirm inclusion/exclusion as a SHA in a consistent and data based manner. This included examination of the alteration scores, selection frequencies, habitat diversity and rarity, supporting biological data, and connectivity with adjacent selections and protected area. Tables 5-7 and maps were used to review that information. The tables summarize information within the cluster, whereas the maps show spatially what is within and between the clusters.

Table 5. Representation levels, target acres, and resulting amounts of natural resource targets.

| Habitat type | Natural resource target | Total acres/mi in focus area | Rep level (%) | Target (acres/mi) | Amount selected after corroboration (acres/mi) | % Target |
|---|---|---|---|---|---|---|
| | **Polygon habitat types (all area values are in acres)** | | | | | |
| Hard bottom | Hard bottom* | 3,839 | - | - | 3,577 | - |
| SAV | High salinity SAV | 32,265 | 60 | 19,359 | 25,405 | 131% |
| | Low salinity SAV | 33 | 90 | 30 | 33 | 109% |
| Shell bottom | Intertidal shell bottom | 1,357 | 50 | 679 | 847 | 125% |
| | Subtidal shell bottom | 2,370 | 60 | 1,422 | 1,747 | 123% |
| SAV & shell bottom | SAV & shell bottom | 349 | 60 | 209 | 295 | 141% |
| Creeks & Rivers | Riverine soft bottom (0-3ft) | 5 | 30 | 1 | 5 | 333% |
| | Riverine soft bottom (3-6ft) | 4 | 0 | 0 | 4 | - |
| | Riverine soft bottom (ND) | 331 | 0 | 0 | 210 | - |
| Shallow soft bottom | Palustrine soft bottom (0-3ft) | 12 | 20 | 2 | 2 | 98% |
| | Palustrine soft bottom (ND) | 215 | 0 | 0 | 80 | |
| | Estuarine (0-3ft) | 76,823 | 30 | 23,047 | 32,743 | 142% |
| | Estuarine (3-6ft) | 42,421 | 20 | 8,484 | 15,620 | 184% |
| | Estuarine (ND) | 10,450 | 10 | 1,045 | 5,204 | 498% |
| | Marine (0-3ft)* | 4,611 | - | - | 1,392 | - |
| | Marine (3-6ft)* | 4,406 | - | - | 890 | - |
| Deep soft bottom | Estuarine (>6ft) | 44,004 | 0 | 0 | 17,001 | - |
| | Marine (>6ft)* | 242,402 | - | - | 7,129 | - |
| Wetland | Emergent | 39,033 | 10 | 3,903 | 13,427 | 344% |
| | Forested | 23,181 | 10 | 2,318 | 2,687 | 116% |
| | Shrub/scrub | 10,665 | 0 | 0 | 3,758 | - |
| Low-elevation upland | Low-elevation upland | 7,733 | 10 | 773 | 2,491 | 322% |
| **TOTAL AREA w/o hard bottom & ocean** | | **546,511** | | **61,274** | **134,547** | **220%** |
| **TOTAL AREA w/ hard bottom & ocean** | | **693,706** | | | | |
| | **Line habitat types (all distance values are in miles)** | | | | | |
| Streams | Streams (low elevation) | 687 | 10 | 69 | 64 | 94% |
| Low-elevation upland | Non-wetland shoreline | 423 | 10 | 42 | 89 | 210% |
| Wetland shoreline | Wetland shoreline | 2,274 | 40 | 909 | 1,236 | 136% |
| **TOTAL DISTANCE** | | **3,384** | | **1,021** | **1,390** | **136%** |

*Not included in Marxan calculations

Table 6. Distance (mi) of linear features in each Strategic Habitat Area

| SHA ID | Non Wetland Edge | Stream - Lower | Wetland Edge | Total |
|---|---|---|---|---|
| **6** | 1.4 | | 18.7 | 20.1 |
| **7** | 1.1 | | 14.4 | 15.5 |
| **9** | 0.8 | 0.6 | 2.9 | 4.3 |
| **15** | 2.2 | 7.8 | 15.0 | 25.0 |
| **16** | 0.4 | | 1.4 | 1.8 |
| **18** | 4.8 | 3.4 | 35.9 | 44.0 |
| **20** | 0.3 | | 0.7 | 1.0 |
| **21** | 2.4 | 1.0 | 2.9 | 6.4 |
| **24** | 4.3 | 1.0 | 11.3 | 16.6 |
| **26** | 1.8 | 0.6 | 0.7 | 3.1 |
| **27** | 1.1 | 0.1 | 0.2 | 1.5 |
| **32** | 1.4 | 0.3 | 3.2 | 4.8 |
| **35** | 4.9 | 1.7 | 132.3 | 138.9 |
| **39** | 0.5 | 0.0 | 9.6 | 10.1 |
| **41** | 1.5 | 2.5 | 17.6 | 21.6 |
| **42** | 0.1 | | 7.3 | 7.4 |
| **43** | 0.1 | | | 0.1 |
| **44** | 0.1 | 0.0 | 8.9 | 9.0 |
| **45** | 4.4 | 0.1 | 0.4 | 4.8 |
| **46** | 0.0 | | 0.2 | 0.2 |
| **47** | 18.1 | 4.5 | 322.7 | 345.3 |
| **48** | 0.2 | 0.6 | 9.1 | 9.9 |
| **49** | 0.2 | 0.0 | 5.8 | 6.1 |
| **50** | 0.0 | 0.2 | 100.5 | 100.8 |
| **51** | 4.0 | 0.6 | 12.9 | 17.6 |
| **52** | 0.6 | 3.0 | 14.0 | 17.6 |
| **53** | 0.1 | 2.0 | 33.9 | 36.0 |
| **54** | 0.0 | 6.9 | 8.8 | 15.8 |
| **56** | 0.8 | 0.4 | 5.8 | 7.1 |
| **57** | 0.4 | 1.6 | 10.2 | 12.1 |
| **58** | 1.8 | 1.4 | 19.9 | 23.0 |
| **59** | | | 0.0 | 0.0 |
| **60** | 0.7 | 2.3 | 21.1 | 24.0 |
| **61** | 0.9 | 0.3 | 4.9 | 6.0 |
| **62** | 0.1 | 8.3 | 16.4 | 24.8 |
| **63** | | 1.4 | 4.5 | 5.8 |

| SHA ID | Non Wetland Edge | Stream - Lower | Wetland Edge | Total |
|---|---|---|---|---|
| **64** | | 1.0 | 0.2 | 1.2 |
| **65** | | 0.4 | | 0.4 |
| **66** | 0.2 | 0.4 | 0.3 | 1.0 |
| **68** | 1.0 | 0.5 | 3.1 | 4.6 |
| **69** | 2.1 | 1.0 | 28.8 | 32.0 |
| **71** | 24.0 | 8.5 | 329.9 | 362.4 |

Table 7. Amount of habitat (acres) present in each SHA.

| | | SHA ID | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Habitat Type** | **Natural Resource Target** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| Hard bottom | Hard bottom* | 1 | 1 | 2 | 1 | 1 | | | 234 | | 2,447 |
| SAV | High salinity SAV | | | | | | 2 | 1 | | | |
| | Low salinity SAV | | | | | | | | | | |
| Shell bottom | Intertidal shell bottom | | | | | | 12 | 20 | | | |
| | Subtidal shell bottom | | | | | | 36 | 5 | | 15 | |
| SAV & shell bottom | SAV & shell bottom | | | | | | 1 | | | | |
| Creeks & Rivers | Riverine soft bottom (0-3ft) | | | | | | | | | | |
| | Riverine soft bottom (3-6ft) | | | | | | | | | | |
| | Riverine soft bottom (ND) | | | | | | | | | | |
| Shallow soft bottom | Palustrine soft bottom (0-3ft) | | | | | | 0 | 0 | | | |
| | Palustrine soft bottom (ND) | | | | | | 0 | 0 | | | |
| | Estuarine (0-3ft) | | | | | | 14 | 9 | | 10 | |
| | Estuarine (3-6ft) | | | | | | 183 | 358 | | 231 | |
| | Estuarine (ND) | | | | | | 22 | 13 | | 15 | |
| | Marine (0-3ft)* | | | | | | 86 | 29 | | 8 | |
| | Marine (3-6ft)* | 59 | 29 | 148 | 59 | 59 | | | 192 | | 844 |
| Deep soft bottom | Estuarine (>6ft) | | | | | | | | | | 0 |
| | Marine (>6ft)* | | | | | | | | | | 10 |
| Wetland | Emergent | | | | | | 197 | 127 | | 25 | |
| | Forested | | | | | | 16 | 3 | | 5 | |
| | Shrub/scrub | | | | | | 67 | 38 | | 3 | |
| Low-elevation upland | Low-elevation upland | | | | | | 16 | 23 | | 8 | |
| | TOTAL | 60 | 30 | 150 | 60 | 60 | 652 | 625 | 426 | 321 | 3,300 |

| | | SHA ID | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Habitat Type** | **Natural Resource Target** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** |
| Hard bottom | Hard bottom* | 1 | 1 | 1 | 1 | | | 615 | | 1 | |
| SAV | High salinity SAV | | | | | 1 | 0 | | 10 | | 7 |
| | Low salinity SAV | | | | | | | | | | |
| Shell bottom | Intertidal shell bottom | | | | | 12 | 1 | | 2 | | |
| | Subtidal shell bottom | | | | | 54 | 13 | | | | 9 |
| SAV & shell bottom | SAV & shell bottom | | | | | 2 | | | 0 | | 0 |
| Creeks & Rivers | Riverine soft bottom (0-3ft) | | | | | | | | | | |
| | Riverine soft bottom (3-6ft) | | | | | | | | | | |
| | Riverine soft bottom (ND) | | | | | | | | | | |
| Shallow soft bottom | Palustrine soft bottom (0-3ft) | | | | | 0 | | | | | 0 |
| | Palustrine soft bottom (ND) | | | | | 0 | | | | | 0 |
| | Estuarine (0-3ft) | | | | | 14 | | | 4 | | |
| | Estuarine (3-6ft) | | | | | 511 | 229 | | 335 | | 136 |
| | Estuarine (ND) | | | | | 23 | | | 3 | | 57 |
| | Marine (0-3ft)* | | | | | 39 | 2 | | 98 | | 2 |
| | Marine (3-6ft)* | 29 | 29 | 29 | 29 | | | 285 | 86 | 59 | |
| Deep soft bottom | Estuarine (>6ft) | | | | | | | | 221 | | |
| | Marine (>6ft)* | | | | | | | | 207 | | |
| Wetland | Emergent | | | | | 218 | 6 | | 406 | | 2 |
| | Forested | | | | | 10 | | | | | |
| | Shrub/scrub | | | | | 27 | 1 | | 22 | | 3 |
| Low-elevation upland | Low-elevation upland | | | | | 32 | 3 | | 40 | | 22 |
| | TOTAL | 30 | 30 | 30 | 30 | 943 | 255 | 900 | 1,434 | 60 | 240 |

| | | SHA ID | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Habitat Type** | **Natural Resource Target** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| Hard bottom | Hard bottom* | | 23 | 7 | | 10 | | | 1 | 1 | 1 |
| SAV | High salinity SAV | 125 | | | 0 | | 22 | 71 | | | |
| | Low salinity SAV | | | | | | | | | | |
| Shell bottom | Intertidal shell bottom | 2 | | | 1 | | | | | | |
| | Subtidal shell bottom | | | | 2 | | | | | | |
| SAV & shell bottom | SAV & shell bottom | | | | | | | | | | |
| Creeks & Rivers | Riverine soft bottom (0-3ft) | | | | | | | | | | |
| | Riverine soft bottom (3-6ft) | | | | | | | | | | |
| | Riverine soft bottom (ND) | | | | | | | | | | |
| Shallow soft bottom | Palustrine soft bottom (0-3ft) | 0 | | | | | 0 | | | | |
| | Palustrine soft bottom (ND) | 0 | | | | | 0 | 0 | | | |
| | Estuarine (0-3ft) | 30 | | | 18 | | 15 | 5 | | | |
| | Estuarine (3-6ft) | 95 | | | 208 | | 118 | 78 | | | |
| | Estuarine (ND) | 18 | | | 32 | | 68 | 5 | | | |
| | Marine (0-3ft)* | 6 | | | 55 | | 6 | 2 | | | |
| | Marine (3-6ft)* | | 157 | 22 | 70 | 43 | | | 59 | 29 | 59 |
| Deep soft bottom | Estuarine (>6ft) | | | | 125 | | | | | | |
| | Marine (>6ft)* | | | 1 | 84 | | | | | | |
| Wetland | Emergent | 33 | | | 237 | | 15 | 2 | | | |
| | Forested | 5 | | | 9 | | 0 | 11 | | | |
| | Shrub/scrub | 8 | | | 129 | | 2 | 7 | | | |
| Low-elevation upland | Low-elevation upland | 22 | | | 11 | | 13 | 6 | | | |
| | TOTAL | 341 | 180 | 30 | 981 | 53 | 260 | 187 | 60 | 30 | 60 |

| | | SHA ID | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Habitat Type** | **Natural Resource Target** | **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** |
| Hard bottom | Hard bottom* | 1 | | 1 | 2 | | 182 | 1 | 31 | | 1 |
| SAV | High salinity SAV | | 0 | | | 10 | | | | | |
| | Low salinity SAV | | | | | | | | | | |
| Shell bottom | Intertidal shell bottom | | | | | 135 | | | | 27 | |
| | Subtidal shell bottom | | | | | 43 | | | | 22 | |
| SAV & shell bottom | SAV & shell bottom | | | | | 0 | | | | | |
| Creeks & Rivers | Riverine soft bottom (0-3ft) | | | | | | | | | | |
| | Riverine soft bottom (3-6ft) | | | | | | | | | | |
| | Riverine soft bottom (ND) | | | | | | | | | | |
| Shallow soft bottom | Palustrine soft bottom (0-3ft) | | | | | 0 | | | | | |
| | Palustrine soft bottom (ND) | | 2 | | | 0 | | | | | |
| | Estuarine (0-3ft) | | | | | 18 | | | | | |
| | Estuarine (3-6ft) | | 6 | | | 704 | | | | | |
| | Estuarine (ND) | | | | | 51 | | | | | |
| | Marine (0-3ft)* | | 161 | | | 224 | | | | 225 | |
| | Marine (3-6ft)* | 29 | | 89 | 148 | 23 | 448 | 29 | 89 | | 89 |
| Deep soft bottom | Estuarine (>6ft) | | | | | 157 | | | | | |
| | Marine (>6ft)* | | | | | 94 | | | | | |
| Wetland | Emergent | | 10 | | | 1,164 | | | | 16 | |
| | Forested | | 39 | | | 21 | | | | | |
| | Shrub/scrub | | 29 | | | 22 | | | | | |
| Low-elevation upland | Low-elevation upland | | 9 | | | 37 | | | | 8 | |
| | TOTAL | 30 | 257 | 90 | 150 | 2,703 | 630 | 30 | 120 | 299 | 90 |

| | | SHA ID | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Habitat Type** | **Natural Resource Target** | **41** | **42** | **43** | **44** | **45** | **46** | **47** | **48** | **49** | **50** |
| Hard bottom | Hard bottom* | | | | | 1 | | | | | |
| SAV | High salinity SAV | | 422 | 17 | | | 21 | 1,125 | 37 | 12 | 309 |
| | Low salinity SAV | | | | | | | | | | |
| Shell bottom | Intertidal shell bottom | | 5 | 0 | 18 | 0 | 0 | 166 | 34 | 42 | 146 |
| | Subtidal shell bottom | | | 36 | 14 | 1 | 18 | 886 | 0 | 21 | 89 |
| SAV & shell bottom | SAV & shell bottom | | 3 | | | | 3 | 143 | 4 | 11 | 10 |
| Creeks & Rivers | Riverine soft bottom (0-3ft) | | | | | | | | | | |
| | Riverine soft bottom (3-6ft) | | | | | | | | | | |
| | Riverine soft bottom (ND) | | | | | | | | | | |
| Shallow soft bottom | Palustrine soft bottom (0-3ft) | | | | 0 | | 0 | | | | |
| | Palustrine soft bottom (ND) | 4 | | | 0 | | 0 | 0 | | | |
| | Estuarine (0-3ft) | | | | 2 | 1,070 | 1 | 224 | 42 | | 204 |
| | Estuarine (3-6ft) | 15 | 713 | 135 | 77 | 399 | 159 | 2,167 | 87 | 139 | 991 |
| | Estuarine (ND) | 39 | 1 | 111 | 2 | 222 | 3 | 283 | 14 | 2 | 177 |
| | Marine (0-3ft)* | 135 | 7 | 0 | 17 | 37 | 0 | 2,383 | 10 | 5 | 163 |
| | Marine (3-6ft)* | | | | | 294 | | 0 | | | |
| Deep soft bottom | Estuarine (>6ft) | | | | | 23 | | 327 | | | |
| | Marine (>6ft)* | | | | | 14 | | 207 | | | |
| Wetland | Emergent | 44 | 94 | | 89 | 17 | 0 | 1,357 | 98 | 66 | 283 |
| | Forested | 76 | | | 7 | | 0 | 11 | | 0 | |
| | Shrub/scrub | 452 | 4 | | 15 | 5 | | 68 | 0 | 0 | 1 |
| Low-elevation upland | Low-elevation upland | 38 | 7 | 0 | 20 | 64 | 0 | 342 | 4 | 17 | 2 |
| | TOTAL | 803 | 1,256 | 300 | 262 | 2,148 | 206 | 9,690 | 329 | 317 | 2,374 |

| | | SHA ID | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Habitat Type** | **Natural Resource Target** | **51** | **52** | **53** | **54** | **55** | **56** | **57** | **58** | **59** | **60** |
| Hard bottom | Hard bottom* | | | | | 1 | | | | | |
| SAV | High salinity SAV | 285 | | 23 | | | 10 | 3 | 344 | | |
| | Low salinity SAV | | | | 19 | | | | | | |
| Shell bottom | Intertidal shell bottom | 7 | | 42 | | | 23 | 27 | 2 | | |
| | Subtidal shell bottom | 112 | | 1 | | | | 135 | 94 | 17 | |
| SAV & shell bottom | SAV & shell bottom | 61 | | | | | 3 | 10 | 8 | | |
| Creeks & Rivers | Riverine soft bottom (0-3ft) | | | | | | | | | | 5 |
| | Riverine soft bottom (3-6ft) | | | | | | | | | | 4 |
| | Riverine soft bottom (ND) | | | | | | | | | | 62 |
| Shallow soft bottom | Palustrine soft bottom (0-3ft) | | | | | | | 0 | 0 | | 2 |
| | Palustrine soft bottom (ND) | | 18 | | 0 | | | 0 | 0 | | 46 |
| | Estuarine (0-3ft) | 94 | | 50 | | | 14 | | | | |
| | Estuarine (3-6ft) | 522 | | 389 | | | 200 | 1,428 | 824 | 283 | 27 |
| | Estuarine (ND) | 93 | | 48 | | | 45 | 423 | 608 | | 5 |
| | Marine (0-3ft)* | 25 | 85 | 45 | 164 | | 11 | 7 | 42 | 0 | 2 |
| | Marine (3-6ft)* | | | | | 89 | | | | | |
| Deep soft bottom | Estuarine (>6ft) | | | | | | | | | | |
| | Marine (>6ft)* | | | | | | | | | | |
| Wetland | Emergent | 71 | 4 | 473 | 193 | | 142 | 108 | 227 | 0 | 1 |
| | Forested | 2 | 334 | | 11 | | 3 | 49 | 43 | | 1,007 |
| | Shrub/scrub | 0 | 84 | 14 | 123 | | 6 | 1 | 9 | | 373 |
| Low-elevation upland | Low-elevation upland | 59 | 47 | 7 | 10 | | 8 | 10 | 54 | | 80 |
| | TOTAL | 1,332 | 572 | 1,093 | 521 | 90 | 466 | 2,201 | 2,256 | 300 | 1,612 |

| | | SHA ID | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Habitat Type** | **Natural Resource Target** | **61** | **62** | **63** | **64** | **65** | **66** | **67** | **68** | **69** | **70** | **71** |
| Hard bottom | Hard bottom* | | | | | | | 1 | | | 7 | 1 |
| SAV | High salinity SAV | 4 | | | | | | | 2 | 372 | | 22,169 |
| | Low salinity SAV | | 13 | | | | | | | | | |
| Shell bottom | Intertidal shell bottom | 16 | | 3 | | | | | | | | 105 |
| | Subtidal shell bottom | 30 | | 18 | | | | | | 18 | | 58 |
| SAV & shell bottom | SAV & shell bottom | 2 | | | | | | | | | | 36 |
| Creeks & Rivers | Riverine soft bottom (0-3ft) | | | | | | | | | | | |
| | Riverine soft bottom (3-6ft) | | | | | | | | | | | |
| | Riverine soft bottom (ND) | | 148 | | 0 | | | | | | | |
| Shallow soft bottom | Palustrine soft bottom (0-3ft) | 0 | | | | | 0 | | | | | |
| | Palustrine soft bottom (ND) | 0 | 8 | | 0 | | 0 | | 0 | 0 | | |
| | Estuarine (0-3ft) | | | | | | | | | 28 | | 15,134 |
| | Estuarine (3-6ft) | 264 | | 202 | | | 0 | | 159 | 1,218 | | 19,154 |
| | Estuarine (ND) | | | | | | | | | 414 | | 12,821 |
| | Marine (0-3ft)* | 3 | 16 | 4 | | | 1 | | 15 | 70 | | 1,014 |
| | Marine (3-6ft)* | | | | | | | 89 | | | 64 | 3,271 |
| Deep soft bottom | Estuarine (>6ft) | | | | | | | | | | 3 | 534 |
| | Marine (>6ft)* | | | | | | | | | | 16 | 258 |
| Wetland | Emergent | 83 | 238 | 158 | | | 11 | | 123 | 653 | | 6,436 |
| | Forested | 17 | 130 | | 51 | 41 | 200 | | 423 | 32 | | 130 |
| | Shrub/scrub | 22 | 840 | | 0 | | 3 | | 284 | 35 | | 1,057 |
| Low-elevation upland | Low-elevation upland | 15 | 8 | | 3 | | 14 | | 3 | 15 | | 1,412 |
| | TOTAL | 456 | 1,400 | 385 | 55 | 41 | 230 | 90 | 1,009 | 2,856 | 90 | 83,592 |

## FINAL STRATEGIC HABITAT AREA NOMINATIONS

Strategic Habitat Area units are described below (numbering is not sequential) beginning in Stump Sound and moving up the coast to Ocracoke Inlet. Strategic Habitat Areas with average alteration scores less than 1.0 and selection frequencies greater than 200 (on a scale of 0–500) represent sites with the least extent of alteration and high ecosystem value. In some cases, areas without these criteria were still selected as SHAs due to other outstanding features.

The following is a list of final SHA nominations grouped by area. Map 12 through Map 28 follow showing the location of each SHA.

**Stump Sound**

| **SHA #6** | **Waters Bay** |
|---|---|
| **Description** | Southwestern part of Waters Bay in Stump Sound, tidal flats |
| **Acres** | 708 |
| **Prominent Habitats** | Emergent and shrub/scrub wetlands, estuarine soft bottom 0-3 ft, subtidal shell bottom, non-wetland edge, wetland edge |
| **Ecological Designations** | PNA, SSNA, SNHA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | half impaired and half supporting |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | Bulkheads, canals and boat basins, dredged channels, drained wetlands, development, docks and bridges, prohibited shellfish harvest, trawling (temporarily opened), mechanical clam harvest area |
| **Average Total Alteration Score** | 0.86 |
| **Average Selection Frequency** | 288 |
| **Notes** | SNHA - Surf City Maritime Forest, privately owned, C rating and R rating = moderate |

| SHA #7 | Stump Sound near Morris Landing |
|---|---|
| **Description** | Western portion of Permuda Island, tidal flats |
| **Acres** | 630 |
| **Prominent Habitats** | Emergent wetlands and shrub/scrub wetlands, estuarine soft bottom 0-3 ft, non-wetland edge, wetland edge |
| **Ecological Designations** | PNA, SSNA |
| **Conservation Lands** | Permuda Island Coastal Reserve (state); Stump Sound (NCCF) Preserve (private) |
| **Water Quality Ratings** | mostly impaired |
| **Water Quality Classifications** | ORW, HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | canals and boat basins, dredged channels, drained wetlands, development, trawling (temporarily opened), mechanical clam harvest area |
| **Average Total Alteration Score** | 0.63 |
| **Average Selection Frequency** | 266 |
| **Notes** | |

| SHA # 9 | Stump Sound |
|---|---|
| **Description** | Mouth of Turkey Creek and part of Everett Bay near Thomas Landing |
| **Acres** | 390 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 ft, subtidal shell bottom, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, SSNA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | ORW, SA |
| **Fish Data** | Spot in PGM 120 Core station just south in Everett Bay |
| **Prominent Alterations** | dredged channels, drained wetlands, riprap, development, agriculture, prohibited shellfish harvest, trawling (temporarily opened) |
| **Average Total Alteration Score** | 1.01 |
| **Average Selection Frequency** | 177 |
| **Notes** | SNHA - Turkey Creek Marshes, owned by NCDOA, C rating = moderate, R rating = high |

| SHA #15 | Alligator Bay |
|---|---|
| **Description** | Alligator Bay and the mouth of Mill Creek |
| **Acres** | 1,110 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 ft, subtidal shell bottom, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, SSNA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | ORW, HQW, SA |
| **Fish Data** | pgm 120 (CORE) |
| | spot and shrimp |
| **Prominent Alterations** | canals and boat basins, dredged channels, ditching, drained wetlands, prohibited shellfish harvest, trawling (temporarily opened) |
| **Average Total Alteration Score** | 1.44 |
| **Average Selection Frequency** | 215 |
| **Notes** | Contains two Shellfish/Seed Management Areas |

**New River**

| SHA #16 | Chadwick Bay |
|---|---|
| **Description** | Chadwick Bay and Rose Point |
| **Acres** | 300 |
| **Prominent Habitats** | Estuarine soft bottom 0-3 ft, subtidal shell bottom, non-wetland edge, wetland edge |
| **Ecological Designations** | PNA, SSNA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | pgm 120 |
| | spot and shrimp |
| **Prominent Alterations** | bulkheads, drained wetlands |
| **Average Total Alteration Score** | 0.42 |
| **Average Selection Frequency** | 262 |
| **Notes** | |

| SHA #18 | New River Inlet |
|---|---|
| **Description** | New River Inlet, Wards Channel, Hell Gate Creek |
| **Acres** | 1,590 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 ft, marine soft bottom 0-3 ft and >6 ft, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, SNHA |
| **Conservation Lands** | Camp Lejeune (federal) |
| **Water Quality Ratings** | half impaired and half supporting |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open), trawling (temporarily opened), mechanical clam harvest area |
| **Average Total Alteration Score** | 0.53 |
| **Average Selection Frequency** | 191 |
| **Notes** | SNHA - Camp Lejeune New River Inlet, owned by USDOD, C rating = high, R rating = very high |

| SHA #20 | New River - Traps Bay |
|---|---|
| **Description** | Part of Traps bay west of Corn Landing and Cedar Point |
| **Acres** | 240 |
| **Prominent Habitats** | Estuarine soft bottom 0-3 ft and 0-3 ft, low-elevation uplands, non-wetland edge, wetland edge |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | supporting |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | development |
| **Average Total Alteration Score** | 0.28 |
| **Average Selection Frequency** | 224 |
| **Notes** | SNHA - New River Inlet Bird Nesting Islands, owned by NCWRC, C rating = moderate, R rating = general |

| SHA #21 | Everett Creek |
|---|---|
| **Description** | New River in the mouth of Everett Creek |
| **Acres** | 510 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3, 3-6, and >6 ft, high salinity SAV, low-elevation uplands, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, SSNA |
| **Conservation Lands** | Camp Lejeune (federal) |
| **Water Quality Ratings** | half impaired and half supporting |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | bulkheads, drained wetlands, prohibited shellfish harvest area, trawling (temporarily opened) |
| **Average Total Alteration Score** | 1.96 |
| **Average Selection Frequency** | 7 |
| **Notes** | |

| SHA #26 | New River - Western Stones Bay |
|---|---|
| **Description** | Mouth of Muddy Creek, mouth of Stone's Creek, Stones Landing |
| **Acres** | 360 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3, 3-6, and >6 ft, high salinity SAV, low-elevation uplands, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, SSNA |
| **Conservation Lands** | Camp Lejeune (federal) |
| **Water Quality Ratings** | mostly impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | Core station nearby in Mill Creek<br>shrimp |
| **Prominent Alterations** | drained wetlands, prohibited shellfish harvest, trawling (temporarlity opened) |
| **Average Total Alteration Score** | 1.56 |
| **Average Selection Frequency** | 10 |
| **Notes** | |

| SHA #27 | New River - Northern Stones Bay |
|---|---|
| **Description** | Mouth of Mill Creek, Foys Landing to Catfish Point |
| **Acres** | 270 |
| **Prominent Habitats** | Estuarine soft bottom 0-3 ft, high salinity SAV, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA |
| **Conservation Lands** | Camp Lejeune (federal) |
| **Water Quality Ratings** | mostly supporting |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | Core station nearby in Mill Creek |
| | shrimp |
| **Prominent Alterations** | drained wetlandst, trawling (temporarlity opened) |
| **Average Total Alteration Score** | 2.10 |
| **Average Selection Frequency** | 2 |
| **Notes** | |

| SHA #32 | New River - Frenchs Creek |
|---|---|
| **Description** | Frenchs Creek and mouth of Cowhead Creek |
| **Acres** | 360 |
| **Prominent Habitats** | Forested and shrub/scrub wetlands, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | IPNA, SNHA |
| **Conservation Lands** | Camp Lejeune (federal) |
| **Water Quality Ratings** | unknown |
| **Water Quality Classifications** | NSW |
| **Fish Data** | pgm 120 (CORE) |
| | no priority species |
| **Prominent Alterations** | drained wetlands, major NPDES |
| **Average Total Alteration Score** | 2.27 |
| **Average Selection Frequency** | 2 |
| **Notes** | Camp Lejeune Frenchs Creek Coastal Goldenrod Site, owned by USDOD, C rating = general, R rating = outstanding |

| SHA #41 | New River - Southwest Creek |
|---|---|
| **Description** | flats, braided creek |
| **Acres** | 1,050 |
| **Prominent Habitats** | Emergent, shrub/scrub, and forested wetlands, estuarine soft bottom 3-6 ft, low-elevation uplands, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, SNHA |
| **Conservation Lands** | Camp Lejeune (federal) |
| **Water Quality Ratings** | half impaired and half unknown |
| **Water Quality Classifications** | HQW, NSW |
| **Fish Data** | No |
| **Prominent Alterations** | drained wetlands, development, agriculture, prohibited shellfish harvest |
| **Average Total Alteration Score** | 2.00 |
| **Average Selection Frequency** | 6 |
| **Notes** | SNHA - Camp Lejeune Southwest Creek, owned by USDOD, C rating = moderate, R rating = outstanding |

| SHA #52 | New River - Northeast Creek |
|---|---|
| **Description** | Upper half of Northeast Creek and most of Little Northeast Creek |
| **Acres** | 1,020 |
| **Prominent Habitats** | Forested and shrub/scrub wetlands, low-elevation uplands, wetland edge, streams (low elevation) |
| **Ecological Designations** | AFSA, SNHA |
| **Conservation Lands** | Northeast Creek Park (municipal) |
| **Water Quality Ratings** | unknown |
| **Water Quality Classifications** | NSW |
| **Fish Data** | Core station downstream in PNA<br>none |
| **Prominent Alterations** | bridge constriction, drained wetlands, minor NPDES, mines, development, prohibited shellfish harvest |
| **Average Total Alteration Score** | 3.82 |
| **Average Selection Frequency** | 8 |
| **Notes** | SNHA - Northeast Creek Tidal Forests, privately owned, C rating = moderate, R rating = high |

| SHA #60 | Upper New River |
|---|---|
| **Description** | Upper New River northeast of Jacksonville |
| **Acres** | 2,010 |
| **Prominent Habitats** | Forested and shrub/scrub wetlands, wetland edge, streams (low elevation) |
| **Ecological Designations** | AFSA, SNHA |
| **Conservation Lands** | New River Swamps and Marshes (TNC) Preserve (private), Oakhurst Nature Park (local) |
| **Water Quality Ratings** | mostly not rated and some impaired |
| **Water Quality Classifications** | NSW |
| **Fish Data** | Core station just downstream<br>spot |
| **Prominent Alterations** | minor NPDES, animal operations, development, agriculture, prohibited shellfish harvest |
| **Average Total Alteration Score** | 1.55 |
| **Average Selection Frequency** | 52 |
| **Notes** | SNHA - New River Swamps and Marshes, owned by private, TNC, and local govt, C rating = general, R rating = general |

**Inland Waterway - Onslow**

| SHA #24 | Brown's Inlet |
|---|---|
| **Description** | Brown's Inlet, Banks Channel, ICW |
| **Acres** | 1,110 |
| **Prominent Habitats** | Emergent and shrub/scrub wetlands, estuarine soft bottom 0-3 ft, marine soft bottom 0-3, 3-6, and >6 ft, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, SNHA |
| **Conservation Lands** | Camp Lejeune (federal) |
| **Water Quality Ratings** | half impaired and half supporting |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | dredged channels, drained wetlands |
| **Average Total Alteration Score** | 0.25 |
| **Average Selection Frequency** | 229 |
| **Notes** | SNHA - Camp Lejeune Browns Island, owned by USDOD, C rating = moderate, R rating = very high |

| SHA #35 | Bear Inlet |
|---|---|
| **Description** | Bear Inlet, Sanders Island, Sanders Creek, ICW, Bear Creek, lower Mill Creek, and shores of western Bear Island |
| **Acres** | 3,450 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 ft, intertidal shell bottom, marine soft bottom 0-3 ft, wetland edge |
| **Ecological Designations** | PNA, SNHA |
| **Conservation Lands** | Camp Lejeune (federal), Hammocks Beach (state) |
| **Water Quality Ratings** | half impaired and half supporting |
| **Water Quality Classifications** | ORW, HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | dredged channels, drained wetlands, docks and bridges, prohibited shellfish harvest, trawling (permanently open) |
| **Average Total Alteration Score** | 0.66 |
| **Average Selection Frequency** | 327 |
| **Notes** | SNHA - Camp Lejeune Browns Island, owned by USDOD, C rating = moderate, R rating = very high; SNHA - Hammocks Beach State Park, owned by NCDPR, C rating = outstanding, R rating = outstanding |

| SHA #39 | Queen Creek |
|---|---|
| **Description** | Lower Queen Creek near Parrot Swamp |
| **Acres** | 360 |
| **Prominent Habitats** | Emergent wetlands, intertidal and subtidal shell bottom, wetland edge |
| **Ecological Designations** | PNA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | minor NPDES, mines, development, agriculture, prohibited shellfish harvest |
| **Average Total Alteration Score** | 2.93 |
| **Average Selection Frequency** | 106 |
| **Notes** | |

| SHA #47 | Bogue Inlet |
|---|---|
| **Description** | Bogue Inlet, Dudley Island, Cow Channel, Banks Channel, Burden Channel, Huggins Island, Jones Island, Mouth of Pettiford Creek Bay, and the lower White Oak River up to just north of Cahoon Point and Hancock Point |
| **Acres** | 10,440 |
| **Prominent Habitats** | Emergent wetlands, estuarine 0-3 ft, high salinity SAV, non-wetland edge, wetland edge |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | Hammocks Beach State Park (State), Emerald Isle Woods Park (local), Jones Island Audubon Sanctuary (privately), Croatan National Forest (federal) |
| **Water Quality Ratings** | half impaired and half supporting |
| **Water Quality Classifications** | ORW, HQW, SA |
| **Fish Data** | pgm 120<br>spot |
| **Prominent Alterations** | bridge construction, bulkheads, canals and boat basins, dredged channels, drained wetlands, riprap, minor NPDES, marinas, development, agriculture, docks and bridges, prohibited shellfish harvest, trawling (permanently open), trawling (temporarily open), mechanical clam harvest area |
| **Average Total Alteration Score** | 1.77 |
| **Average Selection Frequency** | 238 |
| **Notes** | SNHA - Hammocks Beach State Park, owned by NCDPR, C rating = outstanding, R rating = outstanding; SNHA - Huggins/Dudley Island, owned by NCDPR, and some areas privately owned, C rating = very high, R rating = very high; SNHA - Emerald Isle/West End Beach, privately owned, C rating = moderate, R rating = very high; SNHA - Emerald Isle Woods, owned by local government, C rating = moderate, R rating = high; SNHA - Bogue Inlet/Bogue Sound Bird Nesting Islands, owned by USDOD, NAS, and some areas privately owned, C rating = moderate, R rating = high; SNHA - Jones Island/White Oak River, owned by NCDPR and some areas privately owned, C rating = general, R rating = high; SNHA - Cedar Point/White Oak River Marshes, owned by USFS, C rating = moderate, R rating = moderate |

**White Oak River**

| SHA #54 | Middle White Oak River |
|---|---|
| **Description** | Where the White Oak River narrows just south of Stella |
| **Acres** | 570 |
| **Prominent Habitats** | Emergent and shrub/scrub wetlands, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, AFSA |
| **Conservation Lands** | White Oak River Game Land (state) |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | pgm 120 (CORE) |
| | low catches |
| **Prominent Alterations** | impoundments, bridge constriction, ditching, drained wetlands, agriculture, prohibited shellfish harvest |
| **Average Total Alteration Score** | 3.39 |
| **Average Selection Frequency** | 224 |
| **Notes** | |

| SHA #62 | Upper White Oak River |
|---|---|
| **Description** | Upper portion of White Oak River from near the mouth of Hunters Creek and Freemans Creek upstream to mouth of Mulberry Creek just downstream of Haywood Landing |
| **Acres** | 1,590 |
| **Prominent Habitats** | Emergent, shrub/scrub, and forested wetlands, riverine soft bottom (ND), wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, AFSA, SNHA |
| **Conservation Lands** | Croatan National Forest (federal), White Oak River Game Land (state) |
| **Water Quality Ratings** | mostly supporting or unknown |
| **Water Quality Classifications** | HQW |
| **Fish Data** | No |
| **Prominent Alterations** | bridge constrictions, ditching, drained wetlands, agriculture, prohibited shellfish harvest |
| **Average Total Alteration Score** | 3.36 |
| **Average Selection Frequency** | 123 |
| **Notes** | SNHA - White Oak River Marshes and Swamps, owned by USFS, NCWRC, and some areas privately owned, C rating = moderate, R rating = outstanding |

| SHA #64 | Holston Creek |
|---|---|
| **Description** | Holston Creek is a tributary to the White Oak River just upstream from SHA #62 |
| **Acres** | 120 |
| **Prominent Habitats** | Forested wetlands, low-elevation uplands, wetland edge, streams (low elevation) |
| **Ecological Designations** | AFSA, SNHA |
| **Conservation Lands** | Croatan National Forest (federal) |
| **Water Quality Ratings** | unknown |
| **Water Quality Classifications** | None |
| **Fish Data** | No |
| **Prominent Alterations** | agriculture |
| **Average Total Alteration Score** | 0.90 |
| **Average Selection Frequency** | 189 |
| **Notes** | SNHA - Holston Creek Natural Area, owned by USFS and some areas privately owned, C rating = high, R rating = very high |

| SHA #65 | Upper White Oak River |
|---|---|
| **Description** | Upper White Oak River just downstream from intersection with Black Swamp Creek |
| **Acres** | 90 |
| **Prominent Habitats** | Forested wetlands, wetland edge, streams (low elevation) |
| **Ecological Designations** | AFSA, IPNA, SNHA |
| **Conservation Lands** | Croatan National Forest (federal) |
| **Water Quality Ratings** | supporting |
| **Water Quality Classifications** | None |
| **Fish Data** | No |
| **Prominent Alterations** | agriculture |
| **Average Total Alteration Score** | 1.04 |
| **Average Selection Frequency** | 251 |
| **Notes** | SNHA - White Oak River Marshes and Swamps, owned by USFS, NCWRC, and some areas privately owned, C rating = moderate, R rating = outstanding |

**Bogue Sound**

| SHA #42 | Bogue Sound |
|---|---|
| **Description** | Mouth of Archer Creek, Piney Island, Long Marsh, and Lovett Island |
| **Acres** | 1,350 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 3-6 ft, high salinity SAV, wetland edge |
| **Ecological Designations** | PNA, SNHA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | mostly supporting |
| **Water Quality Classifications** | ORW, SA |
| **Fish Data** | pgm 120<br>spot and shrimp |
| **Prominent Alterations** | drained wetlands, development, docks and bridges |
| **Average Total Alteration Score** | 0.90 |
| **Average Selection Frequency** | 168 |
| **Notes** | SNHA - Bogue Inlet/Bogue Sound Bird Nesting Islands, owned by USDOD, NAS, and some areas privately owned, C rating = moderate, R rating = high |

| SHA #43 | Bogue Sound near Salter Path |
|---|---|
| **Description** | Bogue Sound near Salter Path and Indian Beach |
| **Acres** | 300 |
| **Prominent Habitats** | Estuarine soft bottom 0-3 and 3-6 ft, high salinity SAV, subtidal shell bottom, non-wetland edge |
| **Ecological Designations** | None |
| **Conservation Lands** | None |
| **Water Quality Ratings** | supporting |
| **Water Quality Classifications** | HQW |
| **Fish Data** | No |
| **Prominent Alterations** | development, trawling (permanently open) |
| **Average Total Alteration Score** | 1.95 |
| **Average Selection Frequency** | 153 |
| **Notes** | |

| SHA #46 | Northern Bogue Sound |
|---|---|
| **Description** | Bogue Sound adjacent to shore between Gales Creek and Jumping Run Creek |
| **Acres** | 210 |
| **Prominent Habitats** | Estuarine soft bottom 0-3 ft, high salinity SAV, subtidal shell bottom, non-wetland edge, wetland edge |
| **Ecological Designations** | None |
| **Conservation Lands** | None |
| **Water Quality Ratings** | mostly impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | dredged channels, development, prohibited shellfish harvest, trawling (permanently open) |
| **Average Total Alteration Score** | 1.55 |
| **Average Selection Frequency** | 151 |
| **Notes** | |

**Newport River**

| SHA #48 | Newport River near HWY 70 |
|---|---|
| **Description** | Marsh area in New River adjacent to HWY 70 between Beafort Channel, Phillips Island, and Gallant Channel |
| **Acres** | 330 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 ft and >6 ft, high salinity SAV, intertidal and subtidal shell bottom, wetland edge, streams (low elevation) |
| **Ecological Designations** | None |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | development, trawling (permanently open) |
| **Average Total Alteration Score** | 1.36 |
| **Average Selection Frequency** | 254 |
| **Notes** | |

| SHA #49 | Morehead City |
|---|---|
| **Description** | Areas near Morehead City including mouth of Calico Creek, mouth of Crab Point Bay, Willis Creek, and Willis Point |
| **Acres** | 450 |
| **Prominent Habitats** | Emergent wetlands, Estuarine soft bottom 0-3 ft, intertidal shell bottom, subtidal shell bottom, low-elevation uplands, wetland edge |
| **Ecological Designations** | PNA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | 3 stations nearby<br>spot |
| **Prominent Alterations** | drained, riprap, major NPDES, development, docks and bridges, prohibited shellfish harvest, trawling (permanently open) |
| **Average Total Alteration Score** | 3.34 |
| **Average Selection Frequency** | 138 |
| **Notes** | |

| SHA #53 | Newport Marshes |
|---|---|
| **Description** | Newport Marshes in the mouth of the Newport Riverincluding marshes near Crab Point |
| **Acres** | 1,110 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 and >6 ft, wetland edge, streams (low elevation) |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | Hay Stack Marsh Preserver (Land Trust) |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | One station nearby |
| | spot |
| **Prominent Alterations** | drained wetlands, riprap, development, trawling (permanently open), mechanical clam harvest area |
| **Average Total Alteration Score** | 1.43 |
| **Average Selection Frequency** | 128 |
| **Notes** | SNHA - Phillips and Annex Islands, privately owned, C rating = moderate, R rating = high |

| SHA #56 | Core Creek |
|---|---|
| **Description** | Mouth of Core Creek and Ware Creek |
| **Acres** | 540 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 and 3-6 ft, intertidal shell bottom, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA |
| **Conservation Lands** | Carteret County Game Land (state) |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | pgm 120 |
| | spot |
| **Prominent Alterations** | dredged channels, drained wetlands, development, docks and bridges, prohibited shellfish harvest, trawling (permanently open), mechanical clam harvest area |
| **Average Total Alteration Score** | 1.83 |
| **Average Selection Frequency** | 66 |
| **Notes** | |

| SHA #57 | Newport River |
|---|---|
| **Description** | Newport River from near Oyster Point, Cross Rock, Lawton Point, Penn Point, Turtle Rock, White Rock, mouth of Harlowe Creek, to just west of Oyster Creek |
| **Acres** | 2,520 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 and 3-6 ft, subtidal shell bottom, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, SSNA |
| **Conservation Lands** | Croatan National Forest (federal) |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | Core station on border |
| | Low catches of priority species |
| **Prominent Alterations** | drained wetlands, development, docks and bridges, prohibited shellfish harvest |
| **Average Total Alteration Score** | 1.02 |
| **Average Selection Frequency** | 271 |
| **Notes** | |

**North River/Back Sound**

| SHA #44 | Carrot Island |
|---|---|
| **Description** | Middle section of Carrot Island |
| **Acres** | 270 |
| **Prominent Habitats** | Emergent and shrub/scrub wetlands, Estuarine 0-3 ft, intertidal and subtidal shell bottom, low-elevation uplands, wetland edge |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | Rachel Carson Estuarine Reserve (state) |
| **Water Quality Ratings** | mostly impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | major NPDES, minor NPDES, development, trawling (permanently open) |
| **Average Total Alteration Score** | 2.24 |
| **Average Selection Frequency** | 136 |
| **Notes** | SNHA - Rachel Carson Estuarine Research Reserve, owned by NCDCM, C rating = very high, R rating = very high |

| SHA #45 | Beaufort Inlet |
|---|---|
| **Description** | Beaufort Inlet, main channel between Radio Island and Fort Macon, and area between Bird Shoal and Shackleford Banks |
| **Acres** | 2,220 |
| **Prominent Habitats** | Estuarine soft bottom 0-3, 3-6, and >6 ft, marine soft bottom >6 ft, non-wetland edge, wetland edge |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | Rachel Carson Estuarine Reserve (state); Cape Lookout National Seashore - Shackleford Banks Wilderness (federal) |
| **Water Quality Ratings** | mostly supporting |
| **Water Quality Classifications** | ORW, HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | dredged channels, major NPDES, minor NPDES, development, trawling (permanently open) |
| **Average Total Alteration Score** | 1.65 |
| **Average Selection Frequency** | 2 |
| **Notes** | SNHA - Fort Macon State Park/Brandt Island, owned by NCPA, NCDPR, C rating = very high, R rating = outstanding; SNHA = Shackleford Banks, owned by USNPS, C rating = outstanding, R rating = very high |

| SHA #50 | Middle Marshes |
|---|---|
| **Description** | Middle marshes, Sheephead Marsh, and North River Marsh to the mouth of Gibbs Creek |
| **Acres** | 2,430 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3, 3-6, and >6 ft, intertidal shell bottom, wetland edge |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | Rachel Carson Estuarine Reserve (state) |
| **Water Quality Ratings** | mostly impaired |
| **Water Quality Classifications** | ORW, HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | minor NPDES, development, trawling (permanently open) |
| **Average Total Alteration Score** | 1.58 |
| **Average Selection Frequency** | 273 |
| **Notes** | SNHA - Rachel Carson Estuarine Research Reserve, owned by NCDCM, C rating = very high, R rating = very high |

| SHA #59 | Lower North River |
|---|---|
| **Description** | Lower North River west of Thomas Creek and South of the HWY 70 bridge |
| **Acres** | 300 |
| **Prominent Habitats** | Estuarine 0-3 ft, subtidal shell bottom, wetland edge |
| **Ecological Designations** | SSNA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | Core station just north |
| | Low catches of priority species |
| **Prominent Alterations** | mechanical clam harvest area |
| **Average Total Alteration Score** | 0.67 |
| **Average Selection Frequency** | 233 |
| **Notes** | |

| SHA #61 | Ward Creek |
|---|---|
| **Description** | Includes the Ward Creek area from the mouth to where the channel narrows |
| **Acres** | 510 |
| **Prominent Habitats** | Emergent and shrub/scrub wetlands, estuarine soft bottom 0-3 ft, subtidal shell bottom, non-wetland edge, wetland edge |
| **Ecological Designations** | PNA, SSNA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | pgm 120 |
| | shrimp |
| **Prominent Alterations** | bridge constrictions, drained wetlands, agriculture, docks and bridges, prohibited shellfish harvest |
| **Average Total Alteration Score** | 2.42 |
| **Average Selection Frequency** | 131 |
| **Notes** | |

| SHA #63 | Upper North River |
|---|---|
| **Description** | Upper North River from just north of Crabbing Creek west to the mouth of Deep Creek and north to where the channel narrows |
| **Acres** | 390 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 ft, subtidal shell bottom, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, SNHA |
| **Conservation Lands** | North River (NCCF) Preserve (private) |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | Core station adjacent upstream |
| | Low catches of priority species |
| **Prominent Alterations** | bridge constrictions, drained wetlands, agriculture, prohibited shellfish harvest |
| **Average Total Alteration Score** | 2.76 |
| **Average Selection Frequency** | 48 |
| **Notes** | SNHA - North River Brackish Marshes, owned by NCCF and some areas privately owned, C rating = moderate, R rating = high |

**Core Sound**

| SHA #51 | The Straits |
|---|---|
| **Description** | The Straits north of Harkers Island and Browns Island from the edge of Lovls Shore and Horse Marsh west to Sleepy Creek including the mouth of Whitehurst Creek |
| **Acres** | 1,650 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3, 3-6, and >6 ft, high salinity SAV, SAV and shell bottom, subtidal shell bottom, non-wetland edge, wetland edge |
| **Ecological Designations** | PNA, SNHA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | mostly supporting |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | pgm 120 |
| | blue crabs, spot, and shrimp |
| **Prominent Alterations** | bulkheads, canals and boat basins, drained, riprap, docks and bridges, trawling (permanently open) |
| **Average Total Alteration Score** | 1.37 |
| **Average Selection Frequency** | 176 |
| **Notes** | SNHA - Browns Island, privately owned, C rating = moderate, R rating = high |

| SHA #58 | Jarrett Bay |
|---|---|
| **Description** | Lower Jarrett Bay, Spit Bay, mouth of Wade Creek, Middens Creek, Davis Island, south to the mouth of Tusk Creek |
| **Acres** | 2,400 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-6 and 3-6 ft, high salinity SAV, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | PNA, AFSA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | ORW, HQW, SA |
| **Fish Data** | pgm 120<br>shrimp |
| **Prominent Alterations** | drained wetlands, mines, agriculture, docks and bridges, trawling (temporarily open), mechanical clam harvest area |
| **Average Total Alteration Score** | 2.38 |
| **Average Selection Frequency** | 43 |
| **Notes** | |

| SHA #66 | Glover Creek |
|---|---|
| **Description** | Area adjacent to HWY 70 near Glover Creek |
| **Acres** | 390 |
| **Prominent Habitats** | Emergent and forested wetlands, low-elevation uplands, wetland edge, streams (low elevation) |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | impaired |
| **Water Quality Classifications** | HQW, SA |
| **Fish Data** | No |
| **Prominent Alterations** | none |
| **Average Total Alteration Score** | 0.08 |
| **Average Selection Frequency** | 252 |
| **Notes** | SNHA - Atlantic Natural Area, owned by USDOD, USFWS, and some areas are privately owned, C rating = outstanding, R rating = outstanding |

| SHA #68 | Lola |
|---|---|
| **Description** | Cedar Island National Wildlife Refuge between Lewis Creek and Island Bay to HWY 12 |
| **Acres** | 1,138 |
| **Prominent Habitats** | Emergent, shrub/scrub, and forested wetlands, estuarine soft bottom 0-3 ft, non-wetland edge, wetland edge, streams (low elevation) |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | Cedar Island National Wildlife Refuge (federal) |
| **Water Quality Ratings** | supporting |
| **Water Quality Classifications** | ORW, HQW, SA, NSW |
| **Fish Data** | Core station in adjacent creek |
| | Blue crabs, spot, and shrimp |
| **Prominent Alterations** | riprap |
| **Average Total Alteration Score** | 0.38 |
| **Average Selection Frequency** | 191 |
| **Notes** | SNHA - Cedar Island Flatwoods and Bays, owned by USFWS, C rating = high, R rating = high |

| SHA #69 | Hog Island |
|---|---|
| **Description** | Northeast part of Cedar Island including Hog Island, nearby marshes, and Back Bay |
| **Acres** | 2,915 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3 and 3-6 ft, high salinity SAV, non-wetland edge, wetland edge |
| **Ecological Designations** | PNA, SSNA, SNHA |
| **Conservation Lands** | None |
| **Water Quality Ratings** | supporting |
| **Water Quality Classifications** | ORW, SA, NSW |
| **Fish Data** | pgm 120 |
| | low catches of priority species |
| **Prominent Alterations** | trawling (temporarily open) |
| **Average Total Alteration Score** | 0.51 |
| **Average Selection Frequency** | 196 |
| **Notes** | SNHA - Cedar Island/North Bay Barrier Strand, owned by USFWS and some areas are privately owned, C rating = high, R rating = high |

| SHA #70 | 3.3 nmi SW of Ocracoke Inlet, NC |
|---|---|
| **Description** | Wrecks, not natural hard bottom |
| **Acres** | 90 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | None |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | NSW |
| **Fish Data** | No |
| **Prominent Alterations** | none |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Wreck of the trawler "ALBATROSS", Wreck of the "MIDGETT". |

| SHA #71 | Core Sound |
|---|---|
| **Description** | Includes SAV and nearby marsh and waters behind Core Banks from Ocracoke Inlet southwest to Cape Lookout including eastern portions of Back Sound and Shackleford Banks, also includes New Drum Inlet and Ophelia Inlet |
| **Acres** | 85,934 |
| **Prominent Habitats** | Emergent wetlands, estuarine soft bottom 0-3, 3-6, and >6 ft, high salinity SAV, non-wetland edge, wetland edge |
| **Ecological Designations** | SNHA, Crab spawning sanctuary |
| **Conservation Lands** | Cape Lookout National Seashore - Shackleford Banks Wilderness (federal); Cape Hatteras National Seashore (federal) |
| **Water Quality Ratings** | supporting |
| **Water Quality Classifications** | ORW, HQW, SA, NSW |
| **Fish Data** | pgm 120 (CORE)<br>low catches of priority species |
| **Prominent Alterations** | mechanical clam harvest area |
| **Average Total Alteration Score** | 0.11 |
| **Average Selection Frequency** | 358 |
| **Notes** | SNHA = Shackleford Banks, owned by USNPS, C rating = outstanding, R rating = very high; SHNA - Core Banks and Portsmouth Island, owned by USNPS and some areas are privately owned, C rating = outstanding, R rating = outstanding; SNHA - Core Sound (Wainwright) Bird Nesting Islands, owned by NAS and some areas privately owned, C rating = moderate, R rating = high; SNHA - Ocracoke Inlet Bird Nesting Islands, owned by NAS and NCWRC, C rating = moderate, R rating = high; SNHA - Ocracoke Island Western End (Sand Flats), owned by USNPS, C rating = very high, R rating = outstanding |

**Atlantic Ocean – Onslow Bight**

| **SHA #1** | **2.7 nmi SE of Surf City, NC** |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 60 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 12/15, High relief (>2.0 m) |

| **SHA #2** | **2.4 nmi SE of Surf City, NC** |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 30 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 12/15, High relief (>2.0 m) |

| SHA #3 | 1.6 nmi SE of Surf City, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 150 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 12/15, Moderate relief (0.5 - 2.0 m) |

| SHA #4 | 2.5 nmi E of Surf City, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 60 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 12/15, Relief unknown |

| SHA #5 | 3.4 nmi S of North Topsail Beach |
|---|---|
| **Description** | Unknown type of hard bottom |
| **Acres** | 60 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | NOAA Data from fish trawl |

| SHA #8 | 4.5 nmi SSW of New River Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 426 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | N/A |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | trawling (permanently open) |
| **Notes** | Reliability = 13/15, High relief (>2.0 m) |

| SHA #10 | 2.7 nmi SW of New River Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 3,300 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | None |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 12/15, High relief (>2.0 m), contains AR-350, SNHA - New River Inlet Outcrop, C rating = unranked, R rating = unranked |

| SHA #11 | 1.3 nmi SW of New River Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 30 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 14/15, Low relief (<0.5 m) |

| SHA #12 | 1.1 nmi SW of New River Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 30 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 14/15, Low relief (<0.5 m) |

| SHA #13 | 0.8 nmi SW of New River Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 30 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | NOAA Data from fish trawl |

| SHA #14 | 2.7 nmi ESE of New River Inlet, NC |
|---|---|
| **Description** | Unknown type of hard bottom |
| **Acres** | 30 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | none |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 9/14, Relief unknown |

| SHA #17 | 1.7 nmi E of New River Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 900 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | None |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Moser and Taylor polygon |

| SHA #19 | 2.8 nmi SSE from Browns Inlet, NC |
|---|---|
| **Description** | Unknown type of hard bottom |
| **Acres** | 60 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | none |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | NOAA Data from two fish trawls, adjacent to SEAMAP hard bottom lines from trawl data |

| SHA #22 | 3.0 nmi S of Cape Lookout, NC |
|---|---|
| **Description** | Wreck and possible obstruction, not natural hard bottom |
| **Acres** | 180 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Obstruction (in western half - not proven) and wreck |

| SHA #23 | West side of Cape Lookout Shoals |
|---|---|
| **Description** | Sunken Buoy |
| **Acres** | 30 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Sunken buoy |

| SHA #25 | 3.7 nmi WSW of Cape Lookout, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 53 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Confirmed as a rock ledge by divers (see NOAA Obstructions Data) |

| SHA #28 | 5.0 nmi ESE of Bogue Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 60 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 14/15, relief unknown |

| SHA #29 | 4.7 nmi ESE of Bogue Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 30 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 12/15, high relief (>2.0 m) |

| SHA #30 | 5.0 nmi ESE of Bogue Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 60 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 14/15, relief unknown |

| SHA #31 | 2.0 nmi WNW of Cape Lookout, NC |
|---|---|
| **Description** | Obstruction, not natural hard bottom |
| **Acres** | 30 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Obstruction on NOAA chart |

| SHA #33 | 5.7 nmi E of Bogue Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 90 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 12/15, relief unknown |

| SHA #34 | 2.5 nmi NW of Cape Lookout, NC |
|---|---|
| **Description** | Obstruction, not natural hard bottom |
| **Acres** | 150 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Obstruction on NOAA chart |

| SHA #36 | 4.1 nmi E of Bogue Inlet, NC |
|---|---|
| **Description** | Likely natural hard bottom |
| **Acres** | 630 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | SNHA |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 9/15, relief unknown, SNHA - Bogue Inlet Outcrop, C rating = unranked, R rating = unranked |

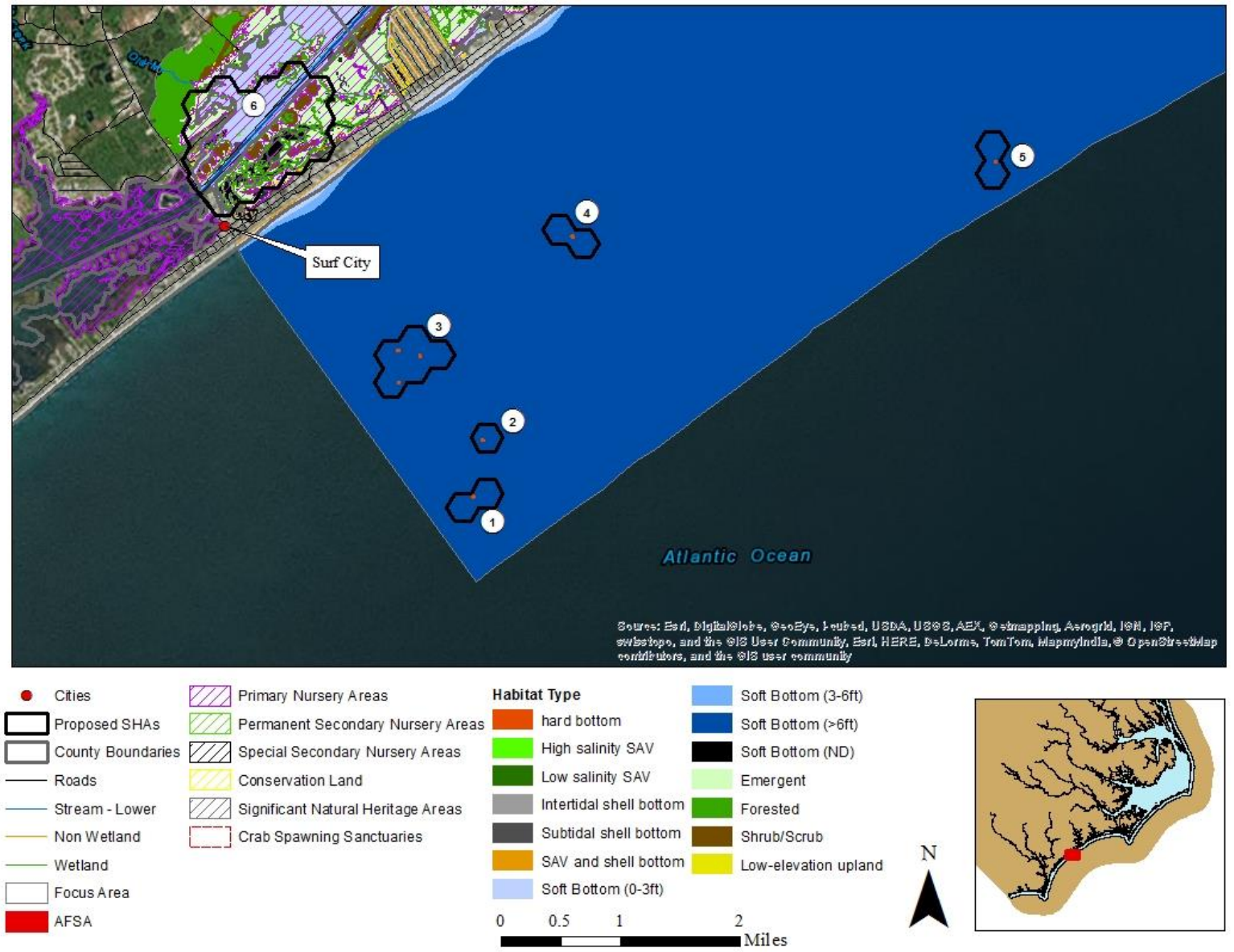
| SHA #37 | 2.8 nmi S of Pine Knoll Shores, NC |
|---|---|
| **Description** | Unknown type of hard bottom |
| **Acres** | 30 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Contains 2 SEAMAP points, one is wrong (says it is AR-320), other is from NOAA shrimp trawl |

| SHA #38 | 2.1 nmi S of Pine Knoll Shores, NC |
|---|---|
| **Description** | Probably nothing |
| **Acres** | 120 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Remove - Probably does not exist. Listed as Atlantic Beach bridge rubble on AR-320. |

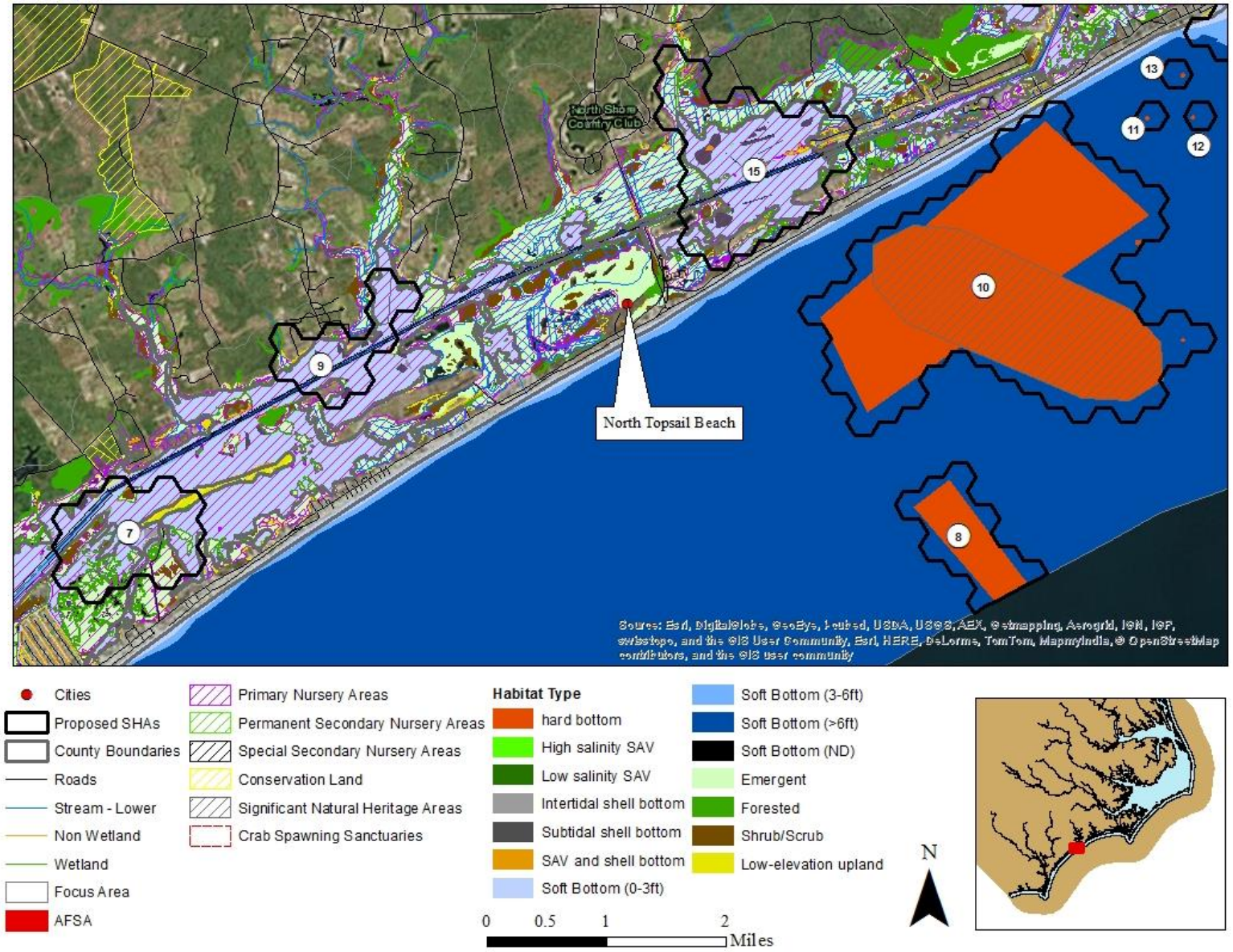
| SHA #40 | 1.2 nmi SE of Atlantic Beach, NC |
|---|---|
| **Description** | Probably nothing |
| **Acres** | 90 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Remove - Probably does not exist. Listed as F-4 aircraft on AR-315. |

| SHA #55 | 6.0 nmi SW of New Drum Inlet, NC |
|---|---|
| **Description** | Unknown type of hard bottom |
| **Acres** | 90 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | NOAA shrimp trawl data |

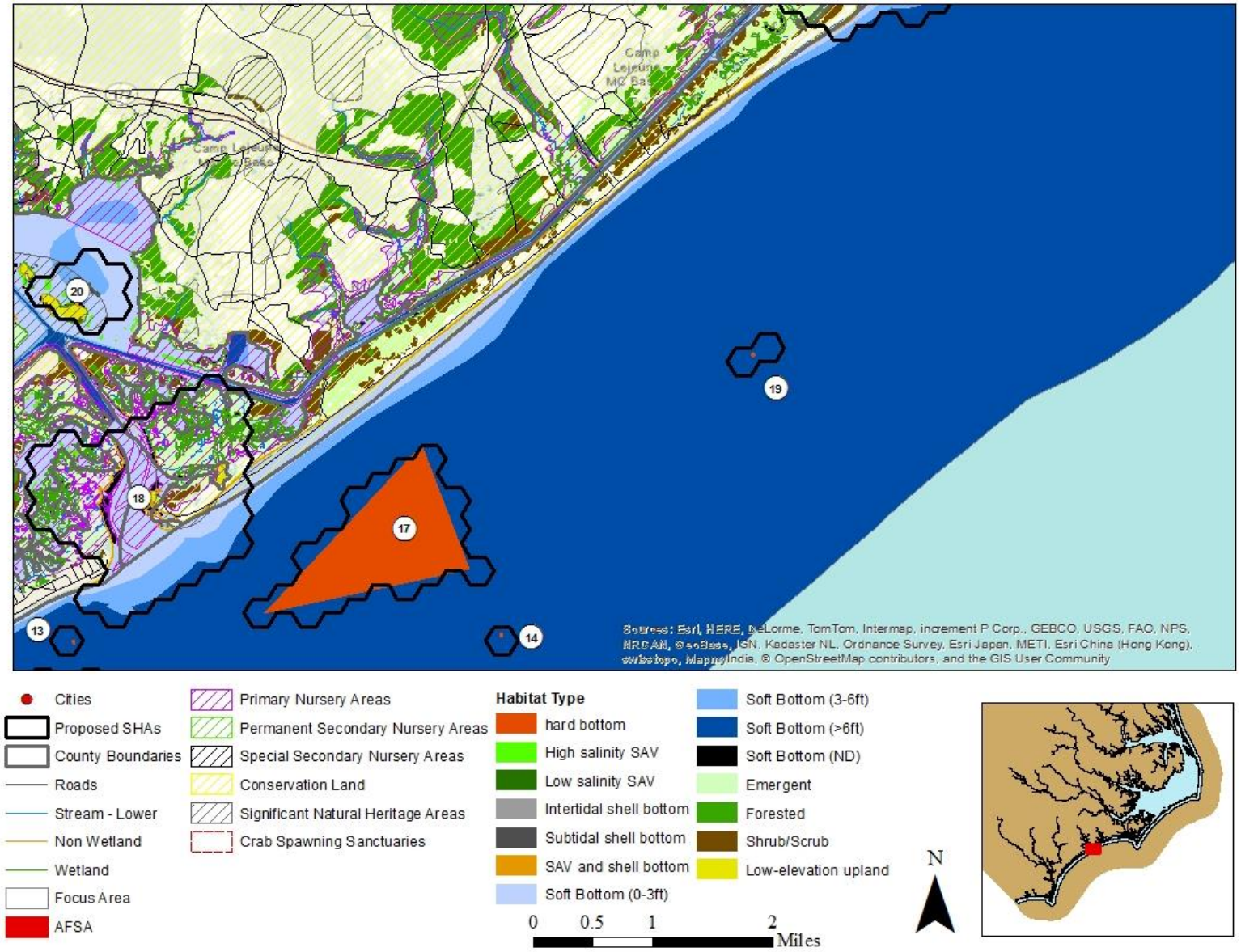
| SHA #67 | 9.0 nmi NE of New Drum Inlet, NC |
|---|---|
| **Description** | Unknown type of hard bottom |
| **Acres** | 90 |
| **Prominent Habitats** | Hard bottom and marine soft bottom >6ft |
| **Ecological Designations** | None |
| **Conservation Lands** | N/A |
| **Water Quality Ratings** | N/A |
| **Water Quality Classifications** | N/A |
| **Fish Data** | No |
| **Prominent Alterations** | trawling (permanently open) |
| **Average Total Alteration Score** | N/A |
| **Average Selection Frequency** | N/A |
| **Notes** | Reliability = 10/15, relief unknown |



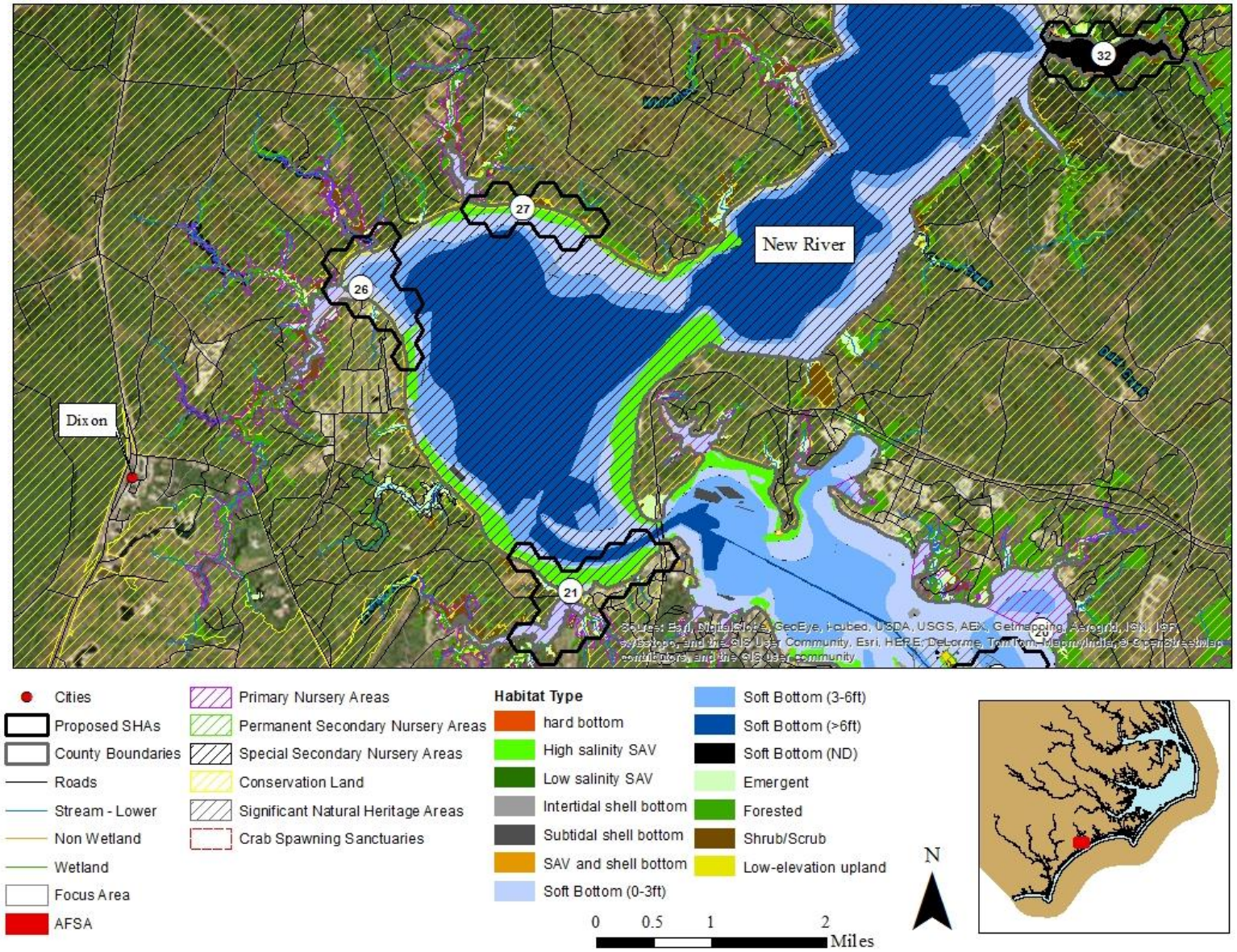

Map 12. Draft SHA nominations, Atlantic Ocean. Shows SHAs 1, 2, 3, 4, 5, and 6.



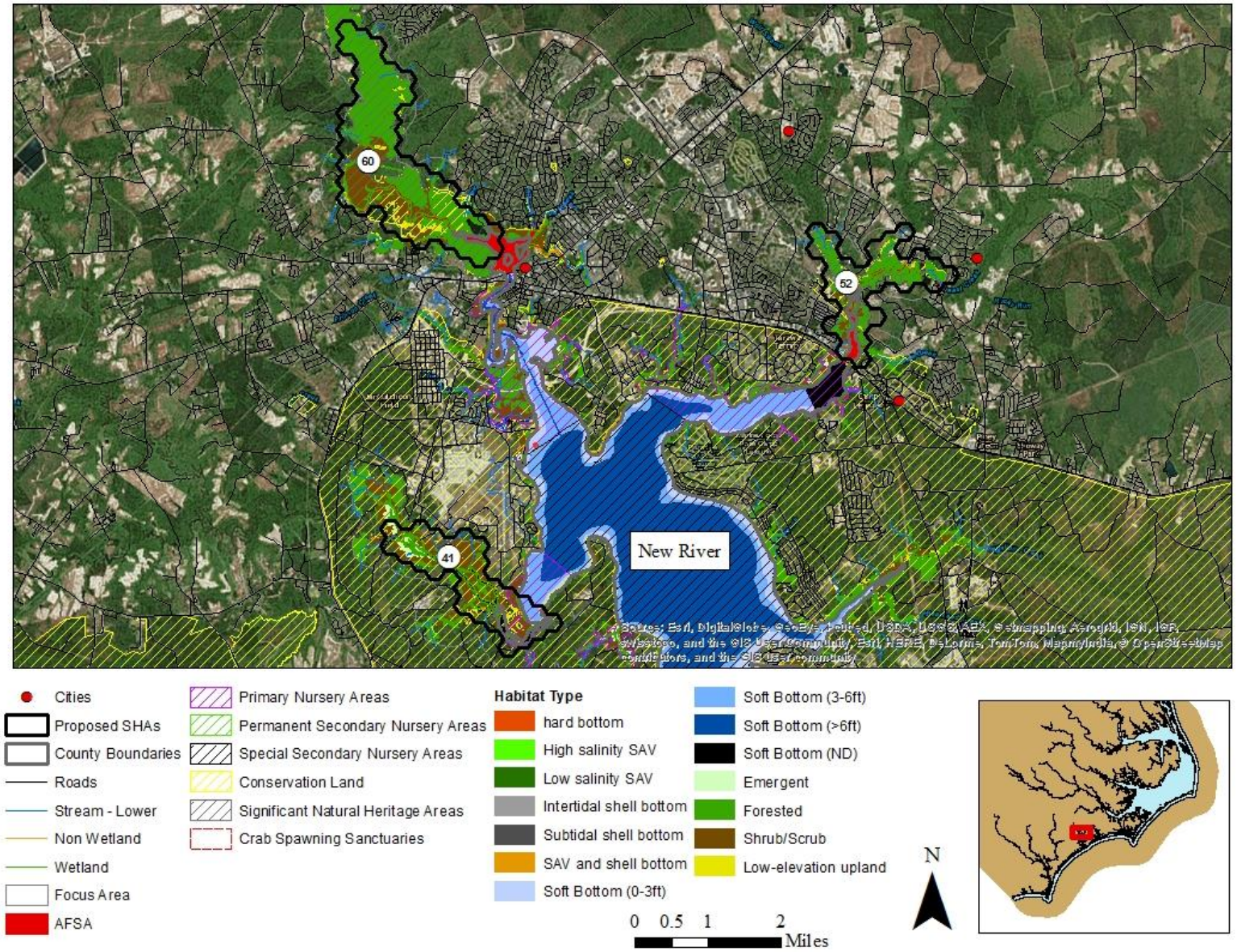

Map 13. Draft SHA nominations, Stump Sound and Atlantic Ocean. Shows SHAs 7, 8, 9, 10, 11, 12, 13, and 15.



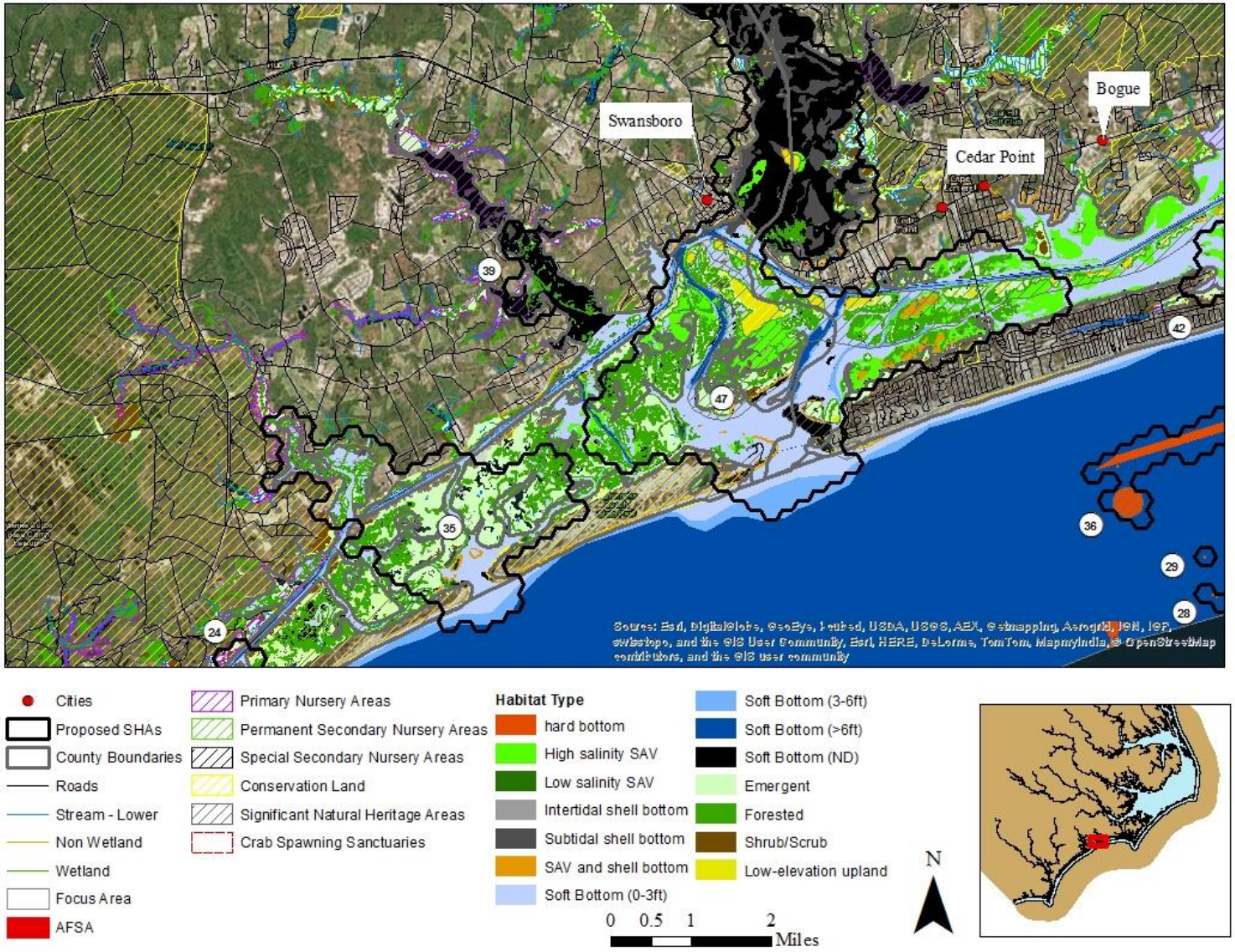

Map 14. Draft SHA nominations, New River Inlet, Intercoastal Waterway – Onslow, and Atlantic Ocean. Shows SHAs 13, 14, 17, 18, 19, and 20.



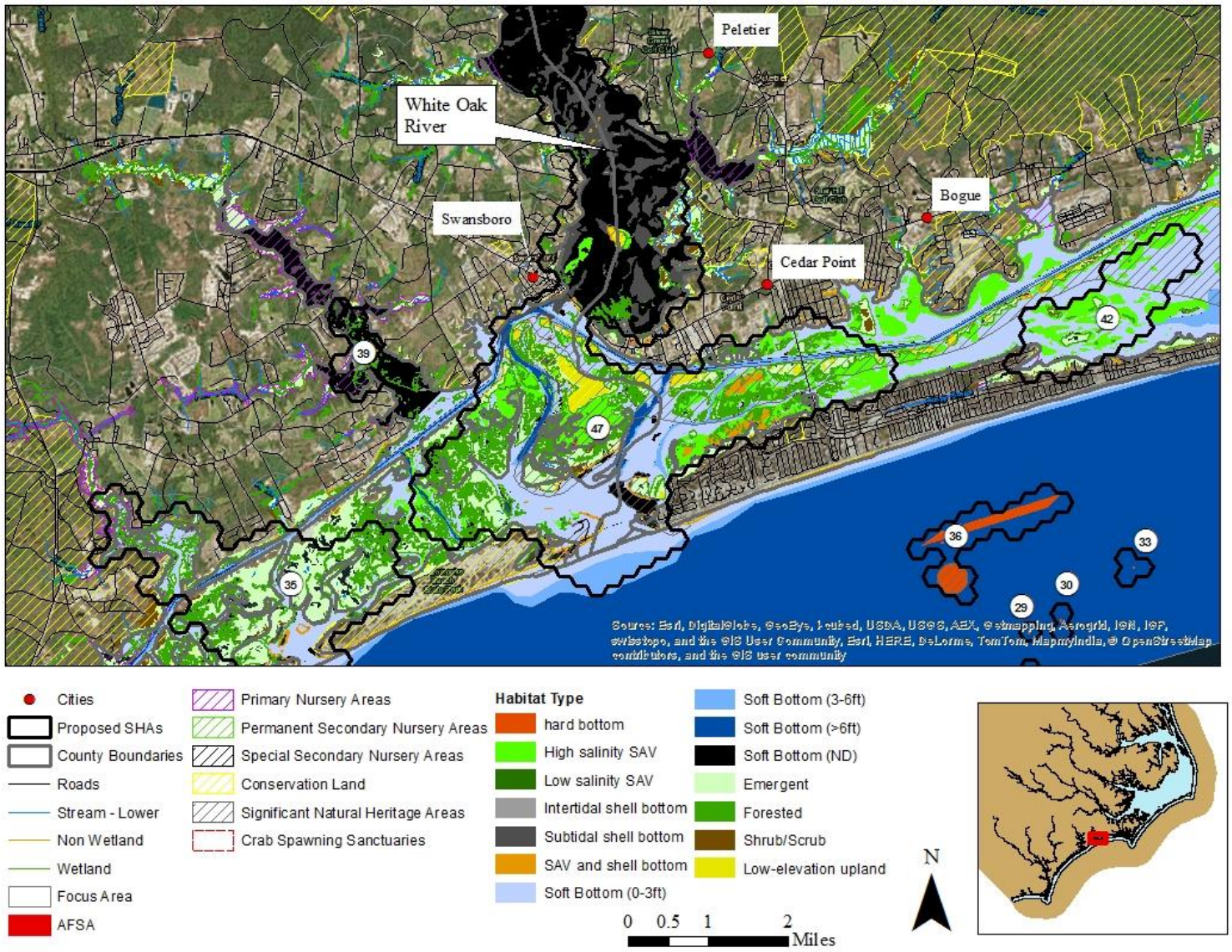

Map 15. Draft SHA nominations, New River. Shows SHAs 21, 26, 27, and 32.



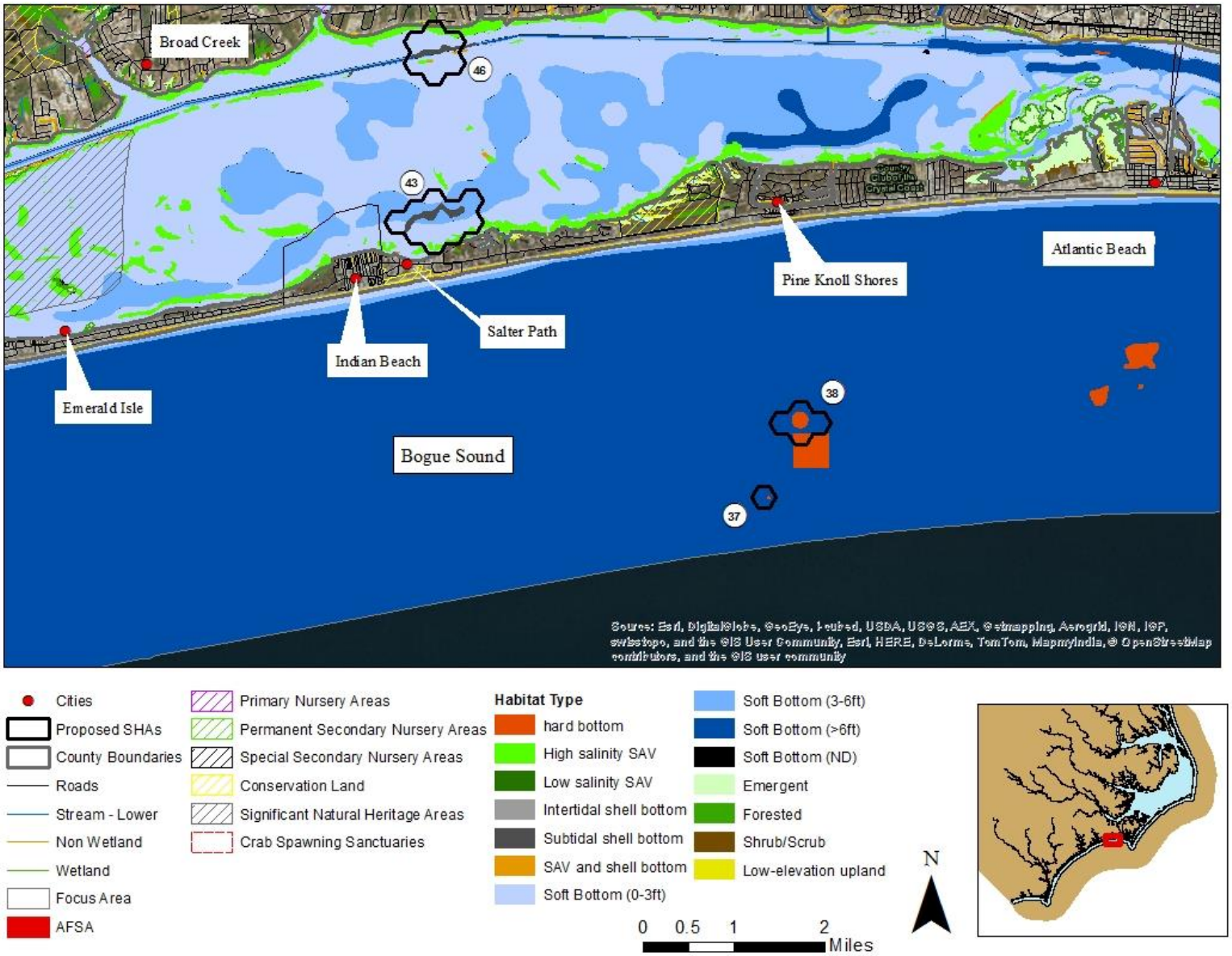

Map 16. Draft SHA nominations, Upper New River. Shows SHAs 41, 52, and 60.



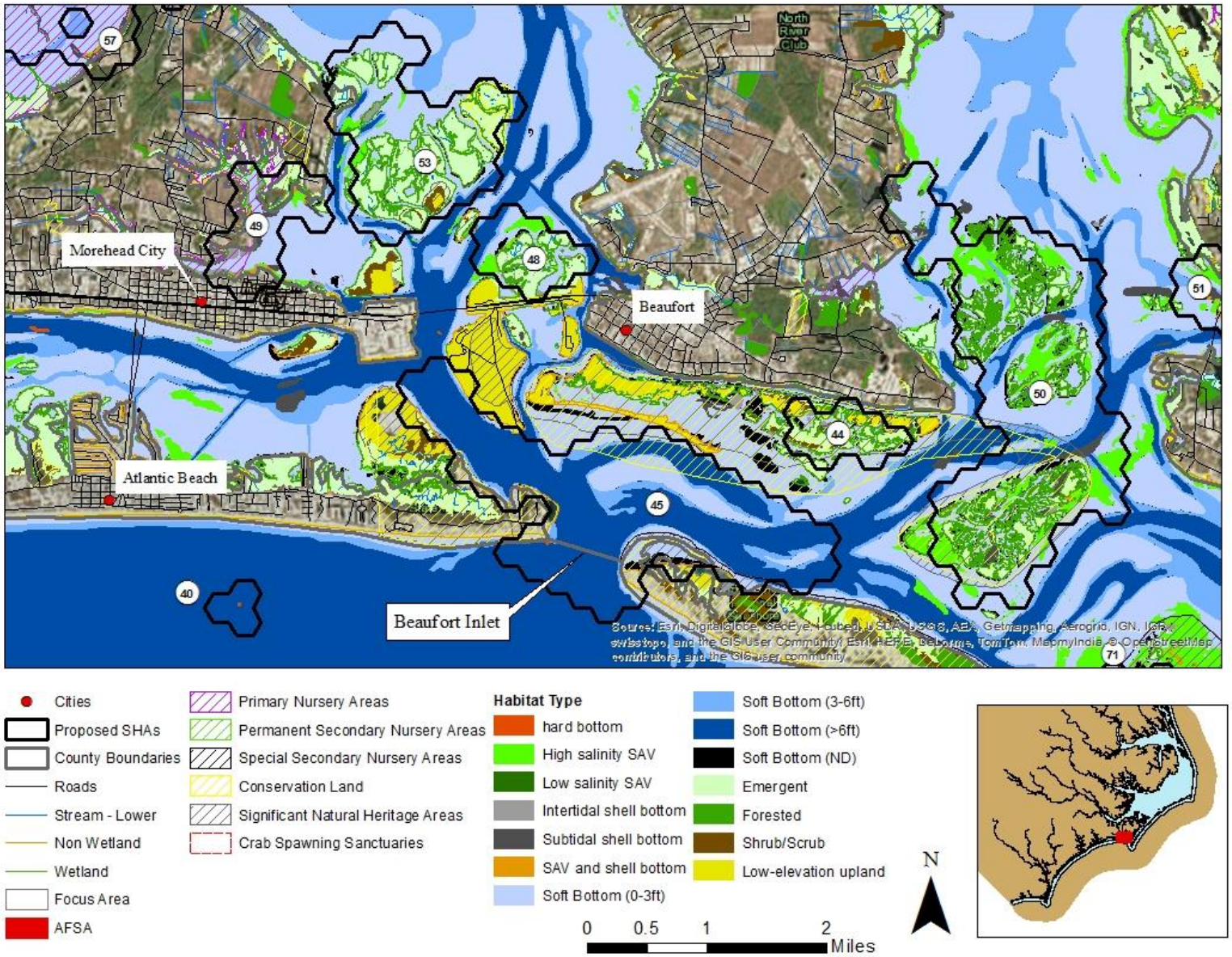

Map 17. Draft SHA nominations, Inland Waterway – Onslow, lower White Oak River, Bear Inlet, Bogue Inlet, and western Bogue Sound. Shows SHAs 28, 29, 35, 36, 39, 42, and 47.



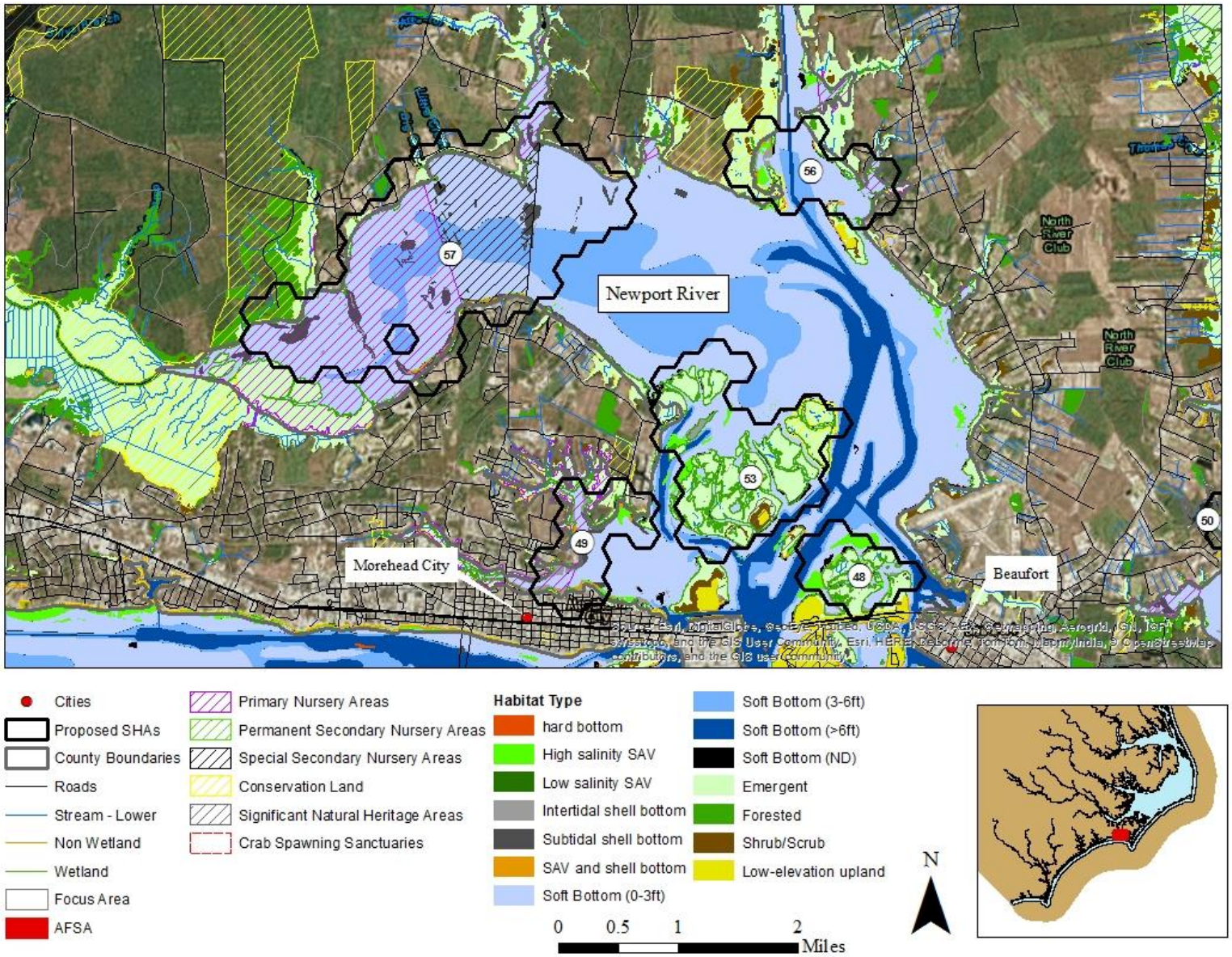

Map 18. Draft SHA nominations, Inland Waterway – Onslow, lower White Oak River, Bogue Inlet, and western Bogue Sound. Shows SHAs 29, 30, 33, 35, 36, 39, 42, and 47.



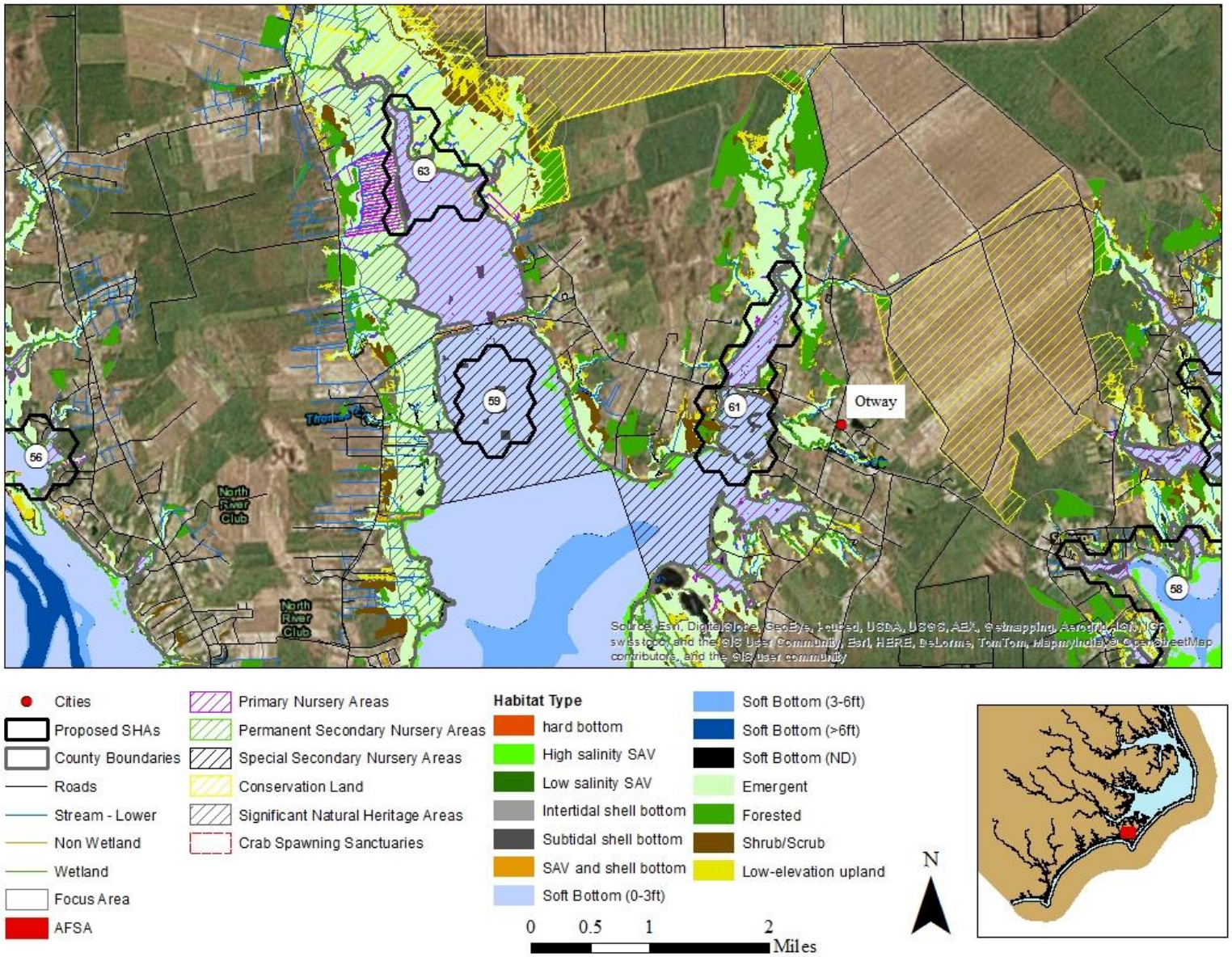

Map 19. Draft SHA nominations, Bogue Sound. Shows SHAs 37, 38, 43, and 46.



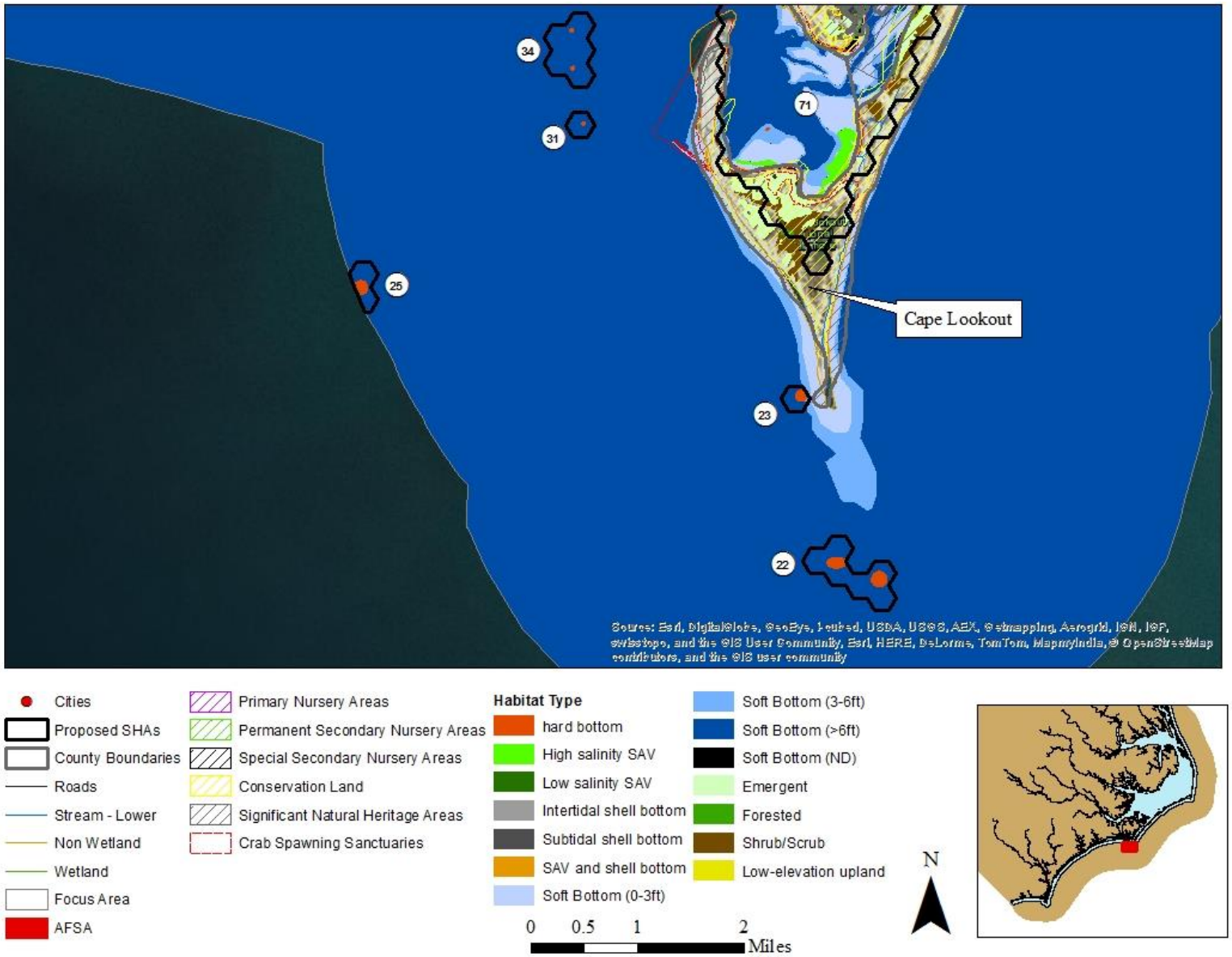

Map 20. Draft SHA nominations, Beaufort Inlet area. Shows SHAs 40, 15, 44, 48, 49, 50, and 53.



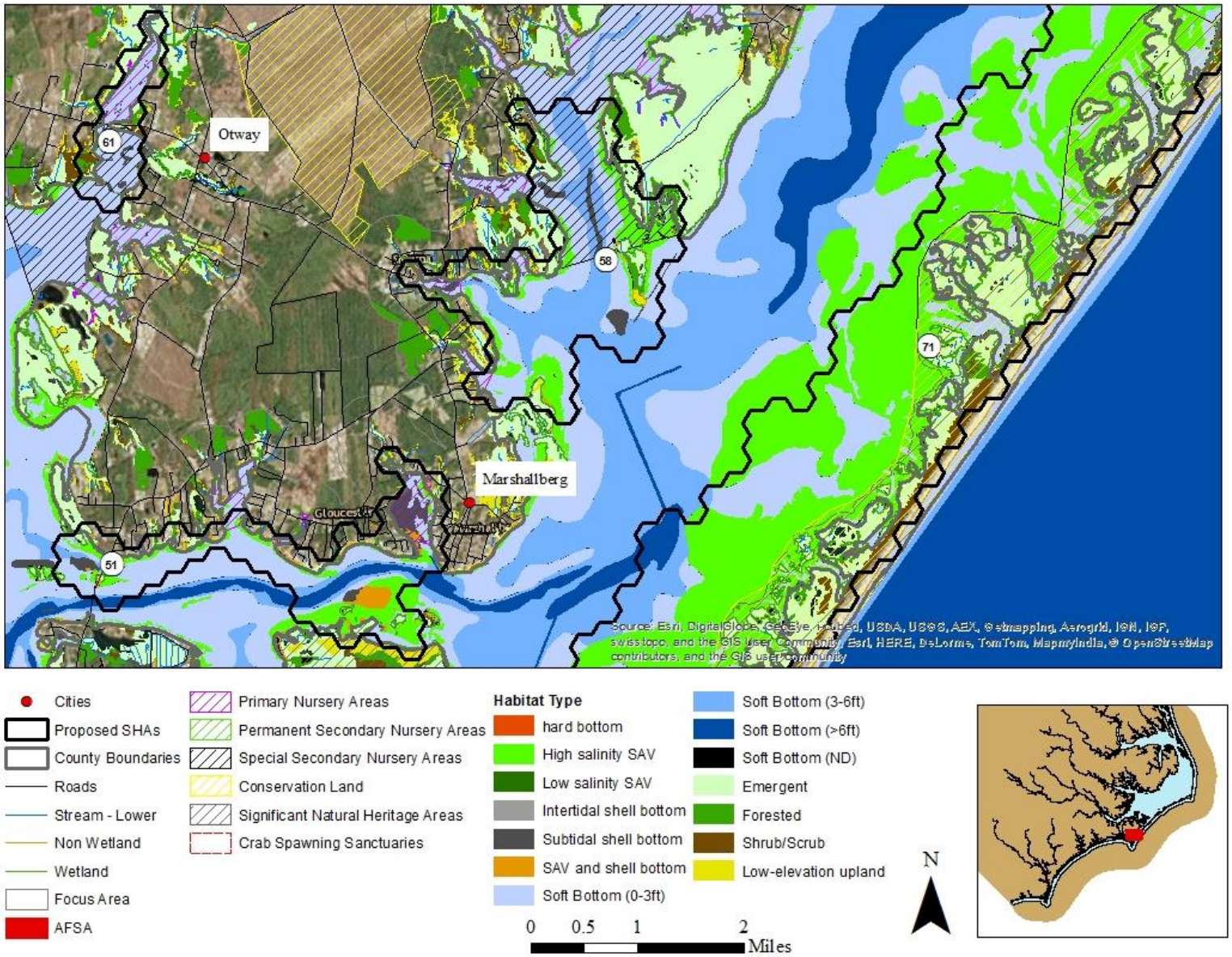

Map 21. Draft SHA nominations, Newport River, Shows SHAs 48, 49, 53, 56, and 57.



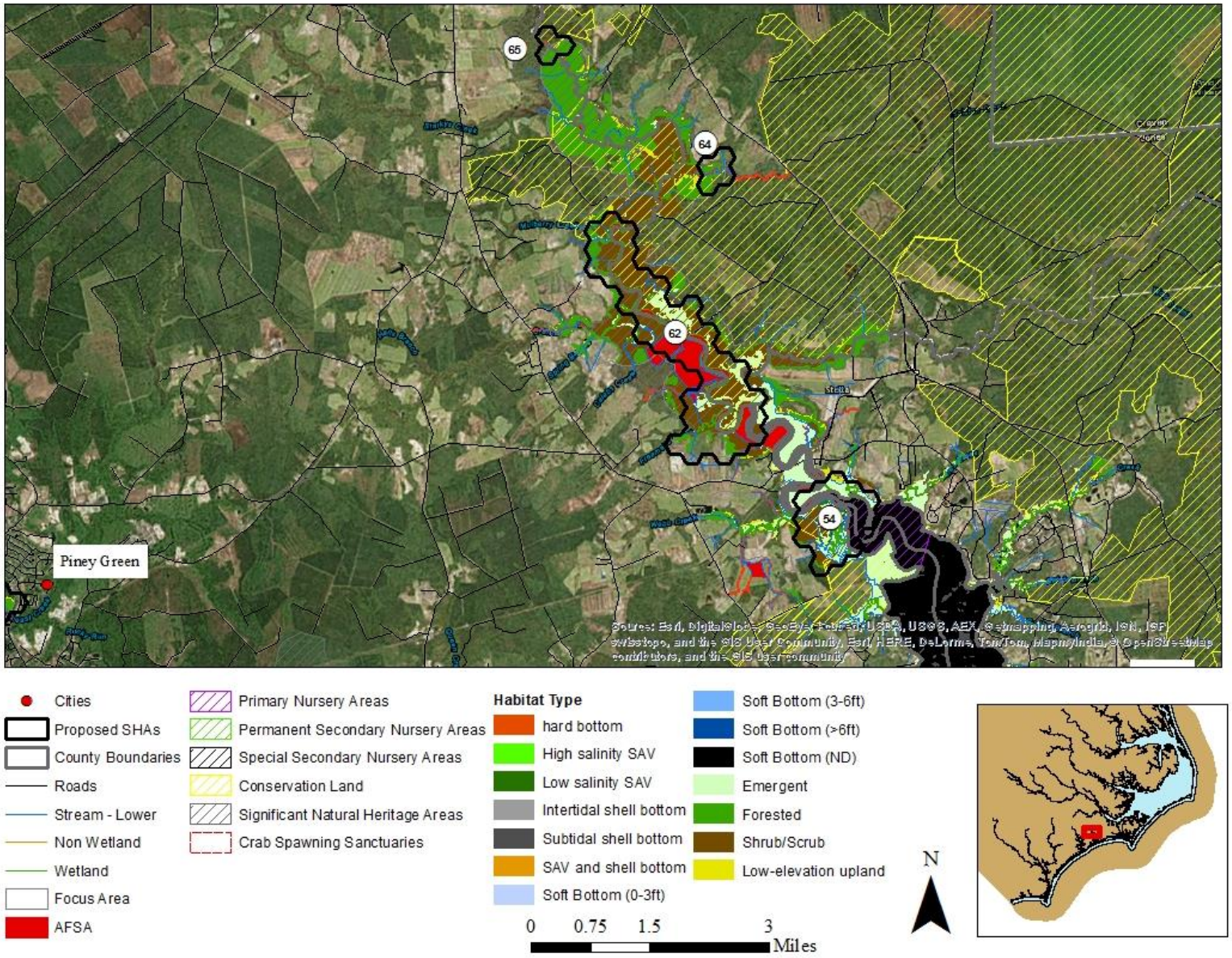

Map 22. Draft SHA nominations, North River. Shows SHAs 59, 61, and 63.



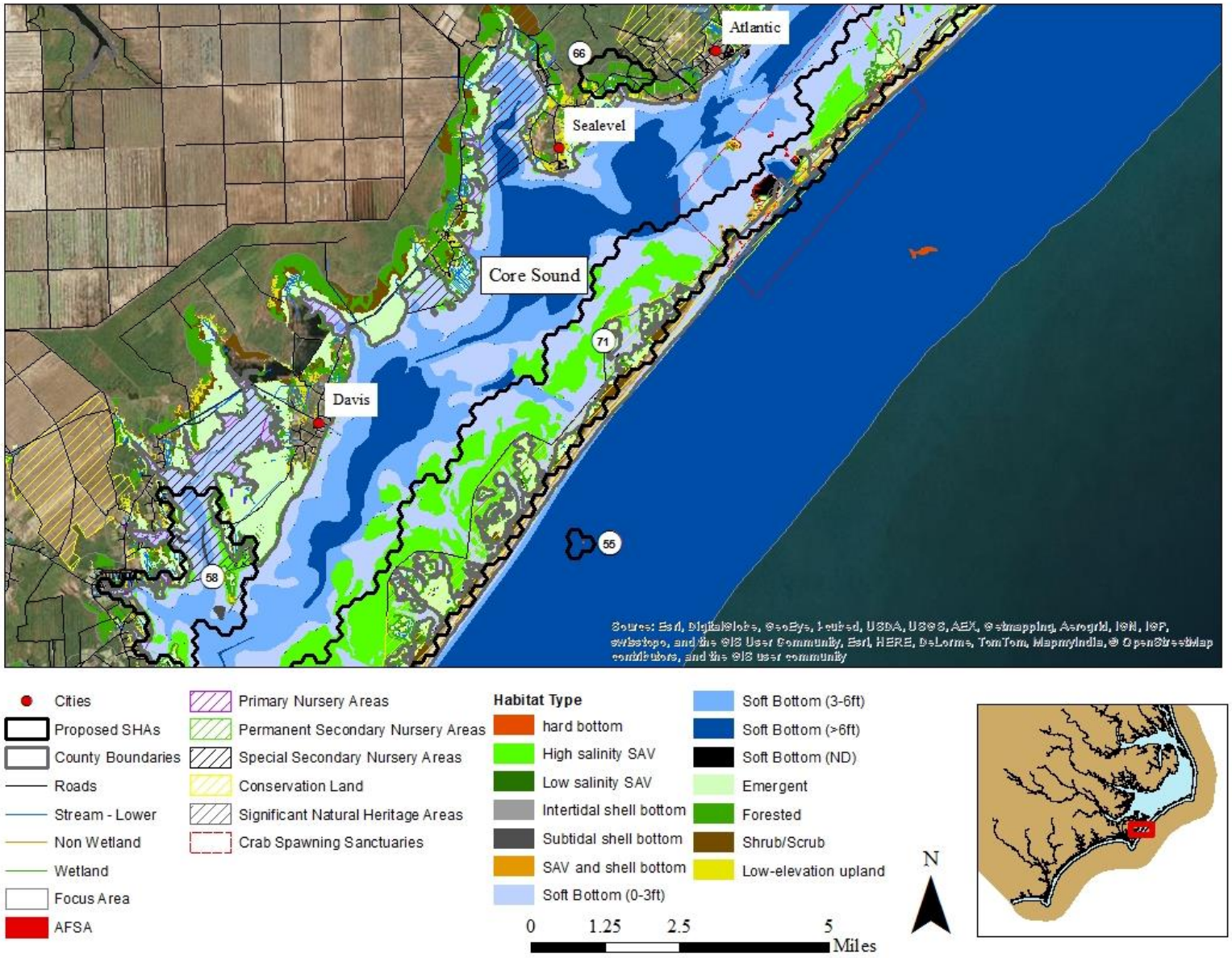

Map 23. Draft SHA nominations, Cape Lookout. Shows SHAs 22, 23, 25, 31, 34, and part of 71.



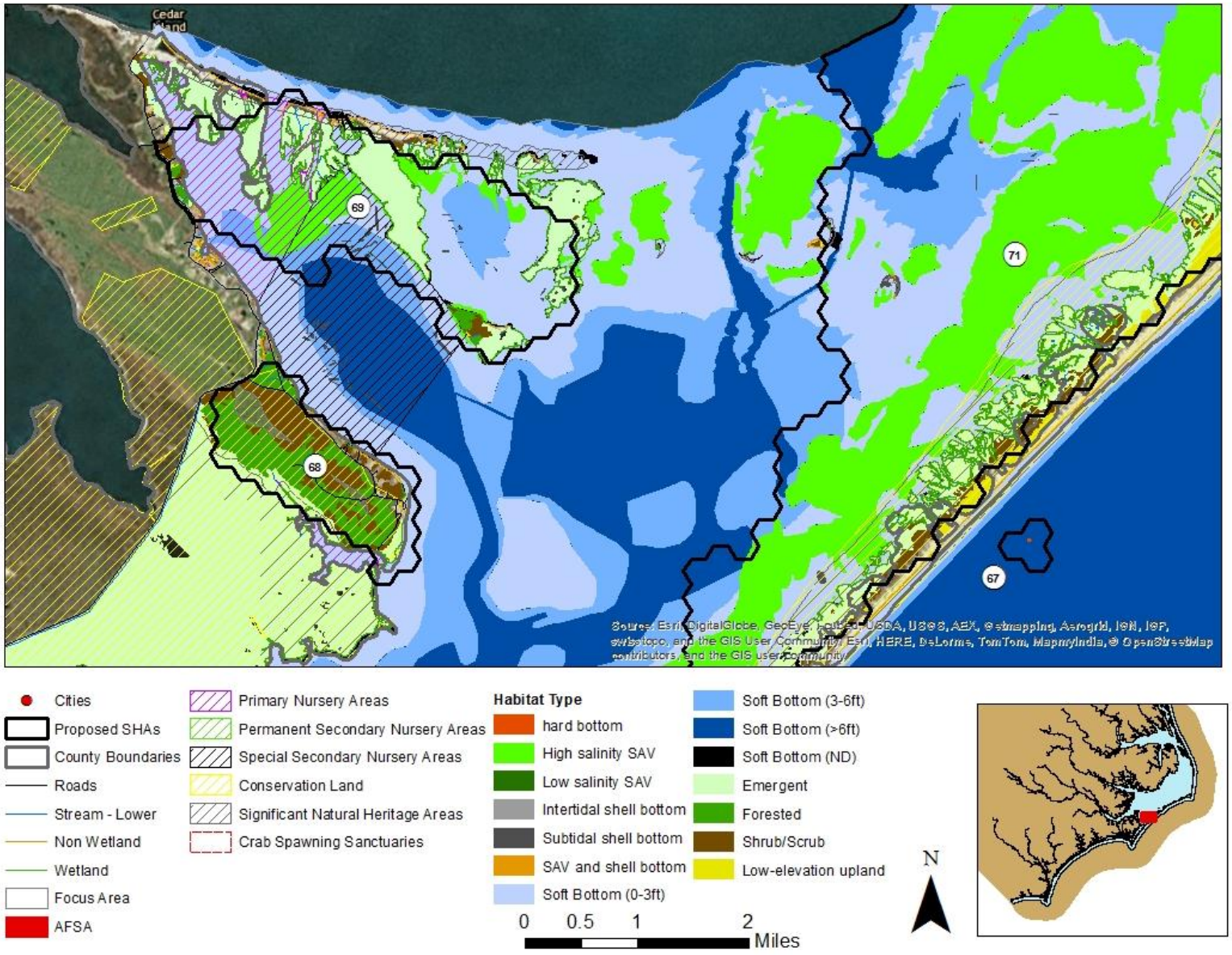

Map 24. Draft SHA nominations, Lower Core Sound and Jarrett Bay. Shows SHAs 51, 58, 61, and middle of 71.



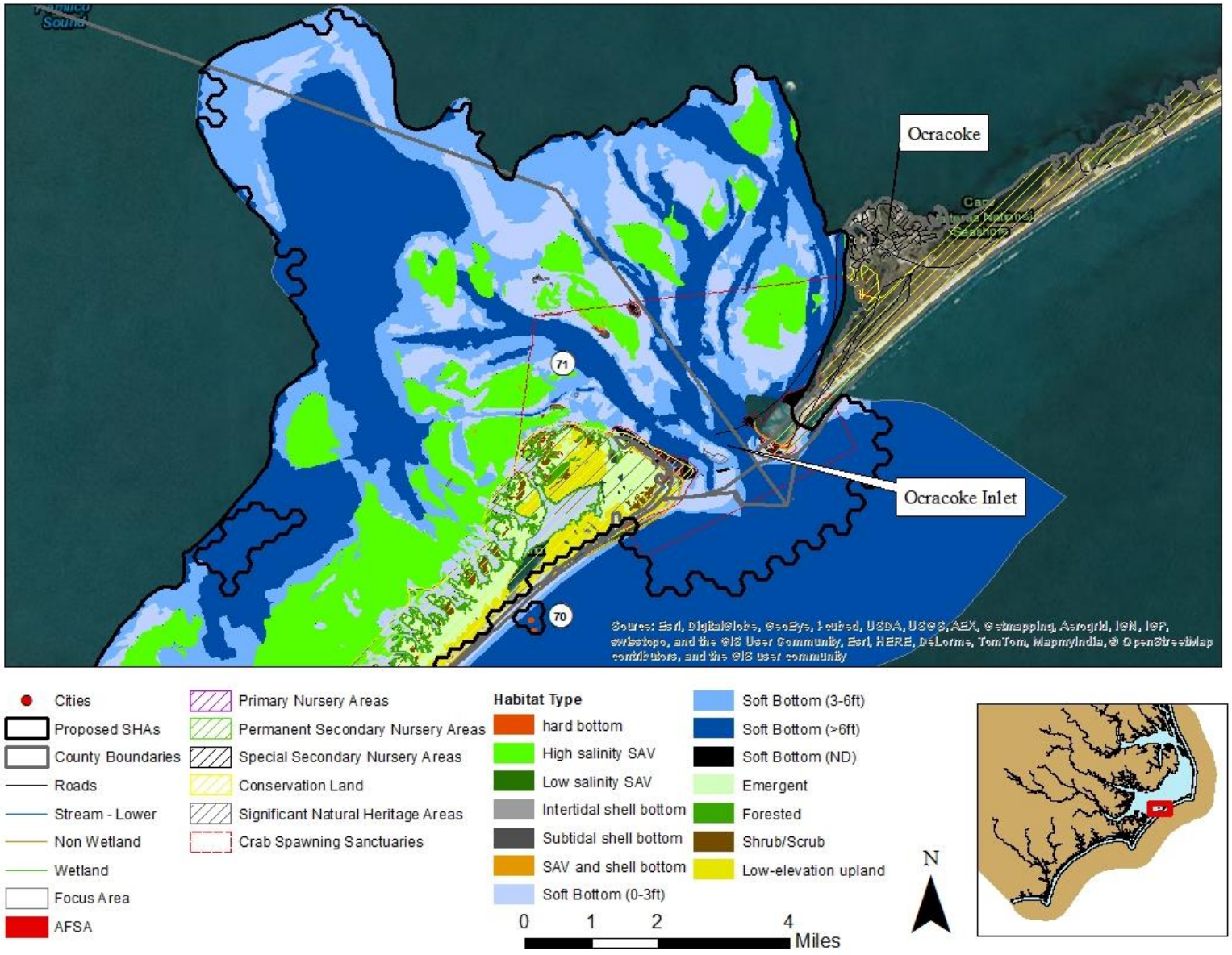

Map 25. Draft SHA nominations, upper White Oak River. Shows SHAs 54, 62, 64, and 65.




Map 26. Draft SHA nominations, middle of Core Sound. Shows SHAs 55, 58, 66, and part of 71.




Map 27. Draft SHA nominations, upper Core Sound entering into Pamlico Sound. Shows SHAs 67, 68, 69, and part of 71.




Map 28. Draft SHA nominations, Ocracoke Inlet. Shows SHAs 70 and upper part of 71.

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## APPENDIX A: DATA/INFORMATION DIRECTORY

[To be completed for final report]

## APPENDIX B: CALCULATING TOTAL ALTERATION

Alteration scores are calculated for each hexagon and take three things into account:

1) **S**everity of an alteration factor/threat to each natural resource target (**S** rating).
2) **E**xtent that an alteration factor/threat affects each natural resource target (**E** rating)
3) **P**ortion of total natural resource targets in hexagon consisting of natural resource target X (**P** rating).

Severity (S) ratings in Table 2 were based on the individual habitat ratings for each threat listed in the threats table of the CHPP (Street et al. 2005, p. 486) and approved by the MFC, CRC, EMC, and DENR in 2004. This rating ranges from 0 (no impact) to 3 (high impact) and estimates the potential impact of each alteration factor for each habitat type. For water-based factors, such as trawling or dredging, the rating in the CHPP (Street et al. 2005, p. 486) was directly applied. For land-based alteration factors (i.e., land use/land cover), an adjusted S rating is applied to all hexagons within a hydrologic unit (HU). This adjusted S rating scales the intensity of activity to the maximum occurring within the region. To do this, first the relative intensity of the alteration is computed for each HU within the region by dividing by the maximum value occurring in the region. These values are then multiplied by the severity ratings given in Table 2 to get the adjusted severity for each particular alteration/habitat combination in each hexagon. An example is shown in table B-1. For example, if the severity rating for agricultural land use on SAV habitats is 2, and the hexagon lies within an HU with 40% cropland coverage where the maximum percent cover in the study area is 50 (0.80 intensity of alteration), the resulting S rating for that hexagon would be 2 x 0.80 = 1.60 (Table B-1).

**Table B-1.** Examples of calculating the adjusted S (severity) value for land-based factors.

| Hexagon | % crop cover | Scaled intensity | Adjusted S in SAV |
|---|---|---|---|
| A | 0 | 0 | 2 x 0 = 0 |
| B | 40 | 0.8 | 2 x 0.8 = 1.60 |
| C | 50 (maximum value) | 1.0 | 2 x 1 = 2 |

Extent (E) ratings were determined by calculating the percent of the habitat within the hexagon that is affected by the factor. For water-based factors, such as dredging, the threat may only overlap with a portion of the habitat present. For land-based alteration factors, the E rating is simply 1 (complete overlap) for hexagons fully within a hydrologic unit.

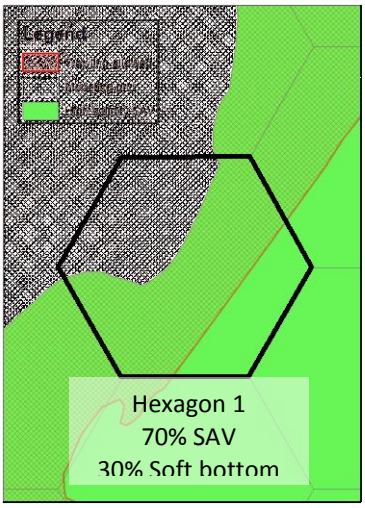



**Figure B-1.** Calculation of E rating for hexagon-based (water-based) alteration factors. Trawling (e.g., trawling, dredging).

Portion (P) ratings are calculated as [Acres of habitat X / Acres of all natural resource targets present within the hexagon].

The total alteration of each habitat in a hexagon with one alteration factor is determined by multiplying S, E and P ratings: **Habitat X weight rating = S x E x P** (Figure B-1).

For example: a hexagon has one alteration factor – trawling, and contains 70 acres of SAV and 30 acres of subtidal soft bottom (Figure B-1, Table B-2). Within the 70 acres of SAV, trawling is allowed over 60% (E=0.6). The S rating of trawling on SAV is 2 (moderate) and the portion of SAV among targets in the hexagon is 70% or 0.7. The final rating for SAV would be S (2) x E (0.6) x P (0.7) = 0.84. Within the 30 acres of soft bottom, trawling is allowed over 100% (E = 1). The portion (P) of the soft bottom among targets in the hexagon is 30% or 0.3. The S rating for trawling on soft bottom is 1. The final rating for soft bottom is S(1) x E(1) x P(0.3) = 0.3. The total alteration of the hexagon would be 1.14 (0.84 + 0.30).

**Table B-2.** Calculation of hexagon alteration with only one alteration factor, but which occurs in some portion of two habitat types. S=severity, E=extent, P=portion

| Hexagon# | Natural Resource Target | Total area (acres) | $S_{trawling}$ | $E_{trawling}$ | P | S x E x P | Total weight |
|---|---|---|---|---|---|---|---|
| Hexagon1 | SAV | 70 | 2 | 0.60 | 0.70 | 0.84 | 1.14 |
| | Soft bottom | 30 | 1 | 1.00 | 0.30 | 0.30 | |

Where more than one factor is present within a hexagon, the weight for each habitat (all factors) is determined by summing the S x E of each factor and multiplying by the percent of that habitat comprising the targets (P). The habitat alterations are summed to obtain one total alteration value for each cell (Table B-3).

**Table B-3.** Example of calculations to determine total alteration level of one hexagon with multiple alterations and habitats occur.

| | | **S x E values** | | | | |
|---|---|---|---|---|---|---|
| **Factor type** | **Factors** | **Soft bottom** | **SAV** | **Wetlands** | **Shell bottom** | **Water lines** |
| **Water-based** | Culverts | 0 | 0 | 2x0.2 | 0 | 2x0.5 |
| | Dams/ impoundments | 0 | 0 | 0 | 0 | 0 |
| | Ditching/drainage/ channelization | 0 | 0 | 2x0.2 | 0 | 0 |
| | Forestry | 0 | 0 | 0 | 0 | 0 |
| | Boating activity | 1x0.4 | 1x0.2 | 0 | 1x0.3 | 0 |
| | Bottom trawling | 1x0.5 | 2x0.5 | 0 | 2x0.2 | 0 |
| | Navigation channels and inlet dredging | 1x0.2 | 2x0.1 | 0 | 2x0.2 | 0 |
| | Clam kicking | 1x0.1 | 0 | 0 | 0 | 0 |
| | Ports | 0 | 0 | 0 | 0 | 0 |
| | Conditionally approved closed | 0 | 0 | 0 | 0 | 0 |
| | Conditionally approved open | 0 | 0 | 0 | 0 | 0 |
| | Permanent closures | 0 | 0 | 0 | 0 | 0 |
| **Land-based** | Construction activities | 0.02 | 0.04 | 0.06 | 0.04 | 0.1 |
| | Cropland | 0.1 | 0.2 | 0.2 | 0.1 | 0.5 |
| | Development | 0.06 | 0.18 | 0.06 | 0.18 | 0.45 |
| Sum | | 1.38 | 1.82 | 1.12 | 1.42 | 2.05 |
| Fraction of targets (P) | | 0.25 | 0.25 | 0.25 | 0.25 | 0.50 |
| Sum x P | | 0.345 | 0.455 | 0.28 | 0.355 | 1.025 |
| **Total alteration for Hexagon 1** | | **2.46** | | | | |

**Processing Details**

For the region 2 analysis, the alteration calculations were completed using a combination of ArcGIS tools and R scripts. This approach was useful because it allowed the alteration scores to be quickly recalculated as changes were made throughout the SHA process. While the processing models and scripts are currently specific to the data found in this region, they could easily be adapted for the analyses in the following regions. Future changes could also include coding the alteration processing to be completely done in ArcGIS using the Python language.

All processing tools and data are provided in the alteration folder. This folder has four subfolders labeled data, docs, output, scripts, and scratch. It also includes the Alteration tools toolbox, which contains all of the ArcGIS tools described below. The process began by building a geodatabase of alteration data layers. Some manipulation was required to create the input layers for the alteration score. Tools were created using ArcGIS ModelBuilder with ArcGIS version 9.3.1. ModelBuilder allows the user to string together multiple tools and then execute them as a single process. The benefit to this approach was that it made the process transparent and easy to repeat.
The first step in creating the alteration score is to create the alterations habitat dataset. This is stored in the field ALT_HABITA in the following steps. Below is a table showing the relationship between NRT types for Region 2 and the habitat types for alteration.

| **Alteration habitat type** | **NRT types** |
|---|---|
| Creeks/rivers | Riverine hard and soft bottom |
| Deep soft bottom | All estuarine and marine soft bottom deeper than 6 feet |
| Interior wetland | All wetlands that are greater than 15 m from a shoreline |
| Riparian wetland | All wetlands within 15 m of a shoreline |
| SAV | Low and high salinity SAV |
| Shallow soft bottom | Soft bottom less than 6 feet in depth |
| Shell bottom | Subtidal and intertidal shell bottom |
| Stream | Polygons 4m in diameter centered on stream lines |
| Upland | Low elevation upland and land within 15 m of a non-wetland shoreline that is not identified as an NRT |

It is assumed that a dataset of NRT habitat types has the ALT_HABITA field populated before the alteration score calculations can begin. Begin by dissolving the NRT polygons by ALT_HABITA to get a feature class of alteration habitats (hereafter referred to as alt_habitat). The following describes the tools provided in the alterations toolbox. It is divided into three toolsets, which are numbered and in all caps below. Tool names are in bold, under the corresponding toolset. In order to run the tools, double click on the name. Right clicking and choosing 'edit' will allow you to see the full process diagram, which can be helpful if things need to be adjusted for future analysis.

***DATA PROCESSING***

These are miscellaneous tools that were used to create some of the inputs to alteration factors. They can be reused if need be but are provided more for convenience. Currently the tools are set to the input and output files that were used in the Region 2 analysis.

Aggregate point features by HU

Assigns the frequency of a point feature to the corresponding hydrologic unit in a polygon feature class of hydrologic units. Needs a HU feature class and the point feature to aggregate. Allows the user to choose the field or fields to aggregate. The output file contains the frequency of these fields and is named to match the names of the input fields the tool aggregates. The model is currently set for the animal operations layer, but it could be used for NPDES or any other point file as well.

Aggregate marinas by HU

Counts the number of slips at marinas in each hydrologic unit and joins the result to a shapefile of

hydrologic units. A marina is defined as a facility with greater than 10 slips. The output is currently a feature class marinas_by_huc2 that is located in the alterations geodatabase under the land_based feature set.

Calculate marinas per shoreline

Calculates the 'marinas per shoreline metric' by calculating the number of slips per linear unit of shoreline for each hydrologic unit and joining it to the hydrologic unit feature class. This tool uses the results of the previous tool (Aggregate marinas by HU) as inputs. The output has the number of slips per meter of shoeline in a HU in the field 'slips_per_m'.

***ALTERATION HABITAT PROCESSING***

These tools are all used in the initial steps of the alteration score calculation to manipulate the input features to make them compatible with the manner in which alteration scores are calculated. For example, the stream lines are converted to small polygons 4 meters in width centered on the stream line to calculate the overlap with most alteration factors. These tools manipulate the alterations habitat feature class, which is created by dissolving the NRT polygons by the field ALT_HABITA. It must have the attribute field 'ALT_HABITA', which contains the habitat type for alteration, for these tools to be effective. While not necessary, it is best to do these in the order they are presented below.

Make streams

*Creates a streams polygon by adding a 2 m buffer to the steam lines in the study area and adds them to the NRT polygons shapefile.*

Inputs: nrt polygons (with ALT_HABITAT attribute)
nrt lines (with field EDGE, one of which is 'Stream')
Output: updated alt_habitat polygon file with "ALT_HABITAT" for the streams polygons labeled "STREAM"

Make riparian wetlands

*This tool identifies and labels wetland areas within 15 m of a wetland shoreline as riparian. Prior to this all ALT_HABITAT was listed as interior wetlands for all wetlands.*

Inputs: nrt lines file, or any file with wetland edges labeled with the attribute 'EDGE= Wetland'
Alt_habitat polygons with all wetlands labeled as 'ALT_HABITA = interior wetlands'
Ouput: updated alt_habitat polygon file with riparian uplands included and labeled as 'Riparian wetland'

Make riparian uplands

*This tool identifies all upland land within 15 m of a non-wetland shoreline not already in the polygon file as upland. THIS NEEDS TO BE RUN LAST.*
Inputs: nrt line shapefile, with the wetland edge labeled as EDGE = Non-wetland
alteration habitat shapefile, all polygons should have a value assigned for ALT_HABITA at this point
Output: updated alteration habitat shapefile with the additional riparian uplands labeled as 'upland'

***EXTENT CALCULATION***

These tools calculate the extent files needed as the inputs for the R scripts. Outputs are saved as DBF tables and currently written to a folder called 'data'. Field maps are given below for all of the output tables. Currently they are organized by the aspect of habitat they affect; therefore, there is a separate tool for land-based, physical, and water-based alterations. This was done for this version because it was thought that the alteration scores were calculated the same way for each group of alterations. This ended up not being true. In future versions, it might make sense to rearrange these for the purpose of alteration score calculation. These tools can be executed from the dialog box (by double clicking on the tool name). At this point, the alterations habitat file is assumed to be named alt_habitat and located in the alteration geodatabase.

Land-based extent

*This tool joins the land-based alterations to a hydrologic unit file to create a master table of alterations by hydrologic unit. Shellfish sanitation areas and wasteponds are kept separate because they are not extrapolated to the hydrologic unit for the purpose of the alteration calculations. It also creates a table giving the amount of each hydrologic unit in each hexagon; which is used to calculate the land-based alteration scores for hexagons that cross hydrologic unit boundaries.*

Inputs:

1. Each land based alteration factor aggregated by HU. All of these are polygon feature classes except for the mines per HU input, which is a geodatabase table.
2. Polygon feature class of wastepond locations
3. Alteration habitats feature class
4. Hexagon boundaries, with hexagon ID
5. Hydrologic unit boundaries

Output: The following tables are output as DBFs:

1. hu_alt_factors_table.dbf: gives the amount of each alteration factor present by hydrologic unit

| | |
|---|---|
| NC_VA_HU | 12 digit hydrologic unit code |
| hu_area | Are of the hydrologic unit in square meters |
| maj_NPDES | Number of major NPDES sites per HU |
| min_NPDES | Number of minor NPDES sites per HU |
| maj_anop | Number of major animal operations sites per HU |
| min_anop | Number of minor animal operations sites per HU |
| dev_prop | Proportion of HU in developed land use |
| agri_prop | Proportion of HU in agriculatural land use |
| mines | Log transformed total area of mining operations in the HU |
| marinas | Number of slips per meter of shoreline for each HU |

2. hu_by_hex.dbf: gives the areas of each hydrologic unit in each hexagon and the max area of a hydrologic unit in each hexagon. This is used to calculate scores for hexagons that cover hydrologic unit boundaries.

| | |
|---|---|
| NC_VA_HU | 12 digit hydrologic unit code |
| hu_area | Are of the hydrologic unit in square meters |
| maj_NPDES | Number of major NPDES sites per HU |

| | |
|---|---|
| min_NPDES | Number of minor NPDES sites per HU |
| maj_anop | Number of major animal operations sites per HU |
| min_anop | Number of minor animal operations sites per HU |
| dev_prop | Proportion of HU in developed land use |
| agri_prop | Proportion of HU in agriculatural land use |
| mines | Log transformed total area of mining operations in the HU |
| marinas | Number of slips per meter of shoreline for each HU |

3. Wasteponds_by_hex_table.dbf: gives the area of waste ponds x habitat intersection for each hexagon

| | |
|---|---|
| ALT_HABITA | Habitat type for alteration |
| ID | Hexagon ID |
| Shape_Leng | ArcGIS generated value for perimeter length |
| Shape_Area | ArcGIS generated value for shape area; area of waste pond/habitat overlap in square meters |

4. shellfish_by_hex.dbf: gives the area of each hexagon that is comprised of closed shellfish waters and the habitats it intersects

| | |
|---|---|
| ALT_HABITA | Habitat type for alteration |
| ID | Hexagon ID |
| Shape_Leng | ArcGIS generated value for perimeter length |
| Shape_Area | ArcGIS generated value for shape area; area of closed shellfish area/habitat overlap in square meters |

Physical conversions extent

*This tool combines the physical alterations into one feature class giving the presence/absence of each alteration and the area affected within each hexagon.*

Inputs:

1. Alterations habitat feature class
2. Hexagons feature class, with hexagons labeled with a unique ID number (ID)
3. Polygon feature classes giving the areas affected by each of the 5 physical conversions:
    a. Upland converted to agriculture
    b. Upland converted to developed
    c. Wetland converted to agriculture
    d. Wetland converted to developed
    e. Trawling

Output:

Conv_by_hex.dbf: Each line represents a unique combination of hexagon, habitat, and alteration. The output is a table gives presence (1) or absence (0) of each alteration factor for each area described in the table. The field Shape_Area gives the area of each polygon overlap feature.

| | |
|---|---|
| ID | Hexagon ID |
| ALT_HABITA | Alteration habitat type |
| wet_dev | Identifies the alteration present. 1 for presence and 0 for |

| | |
|---|---|
| bottom_gea<br>wet_ag<br>up_dev<br>up_ag | absence. |
| Shape_Leng | ArcGIS generated value for perimeter length |
| Shape_Area | ArcGIS generated value for shape area |
| alt_area | Area of alteration/habitat overlap in square meters; should match Shape_Area |

Water-based extent

*Note: this makes the habitat per hexagon and lines per hexagon tables that are used in all of the following R scripts.*

Inputs:

1. Polygon feature classes of the areas affected by water-based alteration factors:
    a. Ditches
    b. Drained wetland areas
    c. Dredged areas
    d. Storm gate obstructed areas
    e. Impounded areas
    f. Culvert obstructed areas
    g. Canals and boat basins
    h. Military areas
2. Line feature classes of areas affected by water-based alteration factors:
    a. Seawalls feature class
    b. Ditch lines feature class
3. Alteration habitats feature class
4. Hexagons feature class
5. NRT lines file

Outputs:

1. hab_alt_by_hex_table.dbf - Each line represents a unique combination of hexagon, habitat, and alteration. The output is a table gives presence (1) or absence (0) of each alteration factor for each area described in the table. The field Shape_Area gives the area of each polygon overlap feature.

| ALT_HABITA | Habitat type for alteration |
|---|---|
| canal_bb<br>culvert<br>impounded<br>lock<br>dredged<br>drained<br>military | Identifies the alteration present. 1 for presence and 0 for absence. |
| ID | Hexagon ID |
| Shape_Area | Area of alteration/habitat combination in $m^2$ |

2. streams_by_hex_table.dbf – gives a list of the streams found in each hexagon, the length of the stream (Shape_leng)

| | |
|---|---|
| ID | Hexagon ID |
| Shape_Leng | Length of stream feature, in meters |
| ID_1 | Repeats the ID for ditches |
| ditch | 1 for ditched streams, 0 otherwise |
| Shape_Le_1 | Length of the ditch, if present |
| Prop_ditch | Proportion of ditched stream in each hexagon |

3. seawalls_by_hex_table.dbf: Gives the amount of seawalls in each hexagon

| | |
|---|---|
| EDGE | Type of line feature; should be Non-wetland for all |
| ID_1 | Hexagon ID |
| Shape_Leng | Length of stream in hexagon, in meters |
| wall_len | Length of seawall in hexagon, in meters |

4. shoreline_by_hex_table.dbf: lists the shorelines found in each hexagon

| | |
|---|---|
| EDGE | Wetland or Non-wetland |
| ID_1 | Hexagon ID |
| Shoreline | Length of shoreline in m |

5. hab_by_hex_table.dbf

| | |
|---|---|
| ALT_HABITA | Habitat type for alteration |
| ID | Hexagon ID |
| Shape_Leng | ArcGIS generated value for perimeter length |
| Shape_Area | ArcGIS generated value for shape area |
| hab_area | Habitat area in $m^2$; should match Shape_Area |

***R Tools for use in calculating alterations***

These take the outputs of the previous steps (in ArcGIS) and use them to combine the severity, extent and portion into the alteration score for each hexagon. There are three separate scripts to calculate the severity x extent ratings: one each for the physical, water-based, and land-based alteration groups. The outputs from these scripts are then combined into the total alteration score in one final script (alteration scores.r). Input and output file locations are in the top portions of all scripts and can be easily changed to match where the data is stored. All scripts require a csv file of the severity ratings in order to calculate the severities for each alteration/habitat combination in each hexagon. This file gives the severity (0-3) for each alteration/habitat combination. Alterations and habitats that do not overlap are assigned a value of 0 for the purpose of calculating the scores. The alteration severity file for region 2 is located at docs/alt_factor_ratings_final.csv. Column names are alteration factors and row names are alteration habitat types. Names are case sensitive and must match those that are in the output tables from the Arc scripts. Columns do not have to be in any particular order; the scripts will select the correct ones.

Each script file has two sections: a top section labeled inputs and a lower portion labeled calculations. In order to use these for different files, it will be necessary to open them and change the directories listed under the inputs section to match the correct file locations. The working directory needs to be set to the alteration folder. The output directory is where the outputs of the script will be placed (currently the folder 'output'). All files except for the csv of habitat severities are outputs of the ArcGIS tools described in the previous sections. Each input section contains a list of the alterations included in each script (found at line 9). In order to add other alterations in future analyses, these lists would need to be amended with the field names of the new alterations. Corresponding columns would need to be added to the alterations by habitat tables (hu_alt_factors.dbf, conv_by_hex.dbf or hab_alt_by_hex_table.dbf) giving the extent of each alteration in each hydrologic unit or hexagon and consistent with their current format. In addition, the severity for new alterations would need to be added to the alteration severity file.

Water based severity extent calculation.r

Input files:

1) Table listing the area-based alterations x habitat combinations per hexagon. Needs to have the fields:
    a. ALT_HABITA – alteration habitat type, must be one of the following: "Creeks/rivers", "Deep soft bottom", "Interior wetland", "Riparian wetland", "SAV" , "Shallow soft bottom", "Shell bottom", "STREAM", "upland"
    b. ID – unique hexagon identifier
    c. Shape_Leng – assigned for each feature class in arcGIS
    d. Shape_Area – assigned for each feature class in arcGIS; area of habitat in each hexagon
    e. alt_area - area of habitat intersection the by alteration factor in each hexagon
    f. Fields for any polygon based alterations considered. Currently I have these:
        i. "canal_bb" "culvert" "impounded" "lock" "dredged" "drained" "military"
        ii. each row gives the presence/absence (1/0) of one specific factor for each hexagon
        iii. each hexagon has multiple rows, one for each habitat type x factor combination

2) Table giving amount of each polygon habitat in each hexagon with the following fields:
    a. ALT_HABITA – alteration habitat type
    b. ID - unique hexagon identifier
    c. Shape_Leng - assigned for each feature class in arcGIS
    d. Shape_Area - assigned for each feature class in arcGIS
    e. hab_area – same as shape area

3) Alteration severity table
    a. Rows – habitat types (ALT_HABITA)
    b. Columns – alterations(must match names used in the alt file, are case sensitive as well
    c. Matrix of alteration x severity makes up the table

4) Raw file for length of seawalls by hexagon
    a. EDGE – identifier giving shoreline type, either "Wetland or "Non-Wetland"
    b. ID_1 – unique hexagon identifier
    c. wall_len – length of seawall in hexagon

5) Length of streams with an amount ditched attribute. Necessary attributes:
    a. ID – hexagon identifier
    b. prop_ditch – proportion of stream ditched per hexagon (calculated in the arc script)

6) Length of shorelines in each hexagon
    a. EDGE – identifier giving shoreline type, either "Wetland or "Non-Wetland"
    b. ID_1 – unique hexagon identifier
    c. Shoreline – length of shoreline

Output: Severity multiplied by extent for all water based factors for each hexagon, in dbf and csv form: wbse.csv and wbse.dbf

Land based severity extent calculations.r

Input files:

1) Table of factors for each hydrologic unit (hu_alt_factors_table.dbf):
    a. NC_VA_HU – 12 digit hydrologic unit ID
    b. hu_area – area of hydrologic unit in meters
    c. Shape_Leng - assigned for each feature class in ArcGIS
    d. Shape_Area - assigned for each feature class in ArcGIS
    e. Currently the *unscaled* values for the affected amount for each HU:
        i. maj_NPDES – number of sites per HU
        ii. min_NPDES – number of sites per hu (includes aquaculture facilities)
        iii. docks - # of slips in marinas per m shoreline for each HU
        iv. maj_anop – number of sites per HU
        v. min_anop – number of sites per HU
        vi. dev_prop – proportion of area of each HU in developed land use class
        vii. agri_prop – proportion of area of each HU in agricultural land use class
        viii. mines – log of the area of mining operations present in each HU
2) Table giving amount of each polygon habitat in each hexagon (.dbf)
    a. ALT_HABITA – alteration habitat type
    b. ID - unique hexagon identifier
    c. Shape_Leng - assigned for each feature class in arcGIS
    d. Shape_Area - assigned for each feature class in arcGIS
    e. hab_area – area of habitat in meters; same as shape area
3) Table identifying which HU a hexagon is in (if a hexagon has more than one HU it will have more than one line):
    a. ID – hexagon ID
    b. NC_VA_HU – hydrologic unit
    c. hu_area – area of hydrologic unit
    d. Shape_Leng - assigned for each feature class in arcGIS
    e. Shape_Area - assigned for each feature class in arcGIS – area of hexagon in corresponding hydrologic unit
    f. FREQUENCY- number of HU's a hexagon intersects
    g. MAX_Shape_ - maximum area of hexagon in one HU
4) Alteration severity table:
    a. Rows – habitat types (ALT_HABITA)

   b. Columns – alterations(must match names used in the alt file, are case sensitive as well
   c. Matrix of alteration x severity makes up the table
5) wasteponds_by_hex_table.dbf - intersection of waste ponds with habitats in the study area
   a. ALT_HABITA – alteration habitat type
   b. ID – hexagon ID
   c. Shape_Leng - assigned for each feature class in arcGIS
   d. Shape_Area - assigned for each feature class in arcGIS (area in meters of the intersection)
6) shellfish_by_hex.dbf – intersection of closed shellfish areas with habitats in the study area
   a. ALT_HABITA – alteration habitat type
   b. ID – hexagon ID
   c. Shape_Leng - assigned for each feature class in arcGIS
   d. Shape_Area - assigned for each feature class in arcGIS (area in meters of the intersection)

Output file: lbse.csv

<u>Physical conversion severity extent calculations.r</u>

Input files:
1) Alteration severity table
2) Physical conversions by hexagon table (conv_by_hex.dbf)
   a. Each row represents a single combination of hexagon, habitat, and alteration. The hexagons are labeled in the field 'ID', the habitat is labeled in the field 'ALT_HABITA', and the alteration is designated by a 1 in the appropriate column. The field Shape_Area gives the area (in square meters) of the overlap for each row. The following alterations are currently included:
      i. wet_dev –wetlands converted to developed land use
      ii. bottom_gea – bottom disturbing gear
      iii. wet_ag – wetlands converted to agricultural land use
      iv. up_dev- uplands converted to developed land use
      v. up_ag- uplands converted to agricultural land use
3) Table giving amount of each polygon habitat in each hexagon (hab_by_hex_table.dbf)
   a. ALT_HABITA – alteration habitat type
   b. ID - unique hexagon identifier
   c. Shape_Leng - assigned for each feature class in arcGIS
   d. Shape_Area - assigned for each feature class in arcGIS
   e. hab_area – area of habitat in meters; same as shape area

Output file: cbse.csv

<u>Alteration scores.r</u>

Combines the output of the previous three scripts to make the overall output
All inputs and outputs go to a folder called data in the working directory
Inputs:
1) wbse.csv – severity by extent for water-based alterations
2) cbse.csv – severity by extent for physical conversions alterations
3) lbse.csv – severity by extent for land-based alterations. Note: this is already aggregated so that

there's one row per hexagon whereas the other two severity by extent files are not.

4) Table giving amount of each polygon habitat in each hexagon (hab_by_hex_table.dbf)
    a. ALT_HABITA – alteration habitat type
    b. ID - unique hexagon identifier
    c. Shape_Leng - assigned for each feature class in arcGIS
    d. Shape_Area - assigned for each feature class in arcGIS
    e. hab_area – same as shape area
5) Length of shorelines in each hexagon ("data/lines_by_hex_table.dbf")
    a. EDGE – identifier giving shoreline type, either "Wetland or "Non-Wetland"
    b. ID_1 – unique hexagon identifier
    c. Shoreline – length of shoreline

Outputs (all of these currently go to the data folder):

1) alt_scores.csv, alt_scores.dbf - combined alteration scores for all hexagons. Includes hexagon ID [ID] and total alteration scores [r2_alt_sco]
2) pu.dat - Input file formatted for Marxan (tab delimited and labeled correctly)
3) ind_scores.dbf - alteration scores broken down by alteration factor by hexagon. One line per hex gives the s x e x p for each alteration factor for each hexagon

# APPENDIX D: PREPARING THE MARXAN FILES

The Marxan documentation and good practices handbook are both comprehensive and can assist in designing and carrying out an analysis. As the documentation is quite thorough, the intent of this appendix is to give specific details about this analysis and not a complete set of instructions for using Marxan. For this analysis, the program was used in its stand-alone form and the input files prepared using ArcGIS, Excel and R. User interfaces such as Zonae Cogito (Watts et al.) are available for users that are less familiar with ArcGIS.

Marxan version 2.4.3 was used for this analysis. There is currently no official user's manual for this version and some differences exist between it and the previous versions. The accompanying README text file explains the major changes. The biggest difference is in the format of the species vs. planning unit file and is described below. Formatting of the input files seems consistent with the formats described in the Marxan with zones handbook (Watts et al. 2008), which was used to cross-reference formatting questions.

Marxan requires four data files and an input file in order to run. They are all text files (either tab or comma delimited) that have been renamed with the extension .dat. The file names can be changed but they must have the correct extension for Marxan to work properly. There are a specific set of column names that are required for each file. They must be present and match the descriptions given in the handbook in order for Marxan to read the input files.

**Species file (spec.dat)**

This contains information on all conservation features in the analysis. It assigns each conservation feature (NRT) a unique numerical id, which is uses to relate to the other Marxan input files, and gives the target amounts (or proportion) for each conservation feature in the final solution, and assigns each conservation feature a species protection factor. In addition, it can contain a name for each conservation feature. For Region 3, this was made in Excel and exported to a csv.

Example species file:

| id | target | name | spf |
|---|---|---|---|
| 1 | 0 | Emergent_wetland | 100 |
| 2 | 0 | Est_shrubscrub_wet | 100 |
| 3 | 0 | Est_soft_bottom_deep | 100 |
| 4 | 100625213.3 | Est_soft_bottom_shallow | 100 |
| 5 | 63340840.9 | Est_soft_bottom_mid | 100 |
| 6 | 994230.1102 | Est_soft_bottom_ND | 100 |
| 7 | 56165054.07 | Forested_wet | 100 |
| 8 | 11604155.83 | Headwater_wet | 100 |

**Planning units file (pu.dat)**

This is a list giving the planning units in the study area, their cost, and their status. Alteration score was used as the cost. We assigned planning units defined as inlets and Region 2 SHA nominations to have a status of '2', which means they must be included in the final solution. Other options for status are to

include a planning unit in the initial solution, or to exclude a planning unit from the final solution. This was created in ArcGIS by joining the alteration score to the planning unit shapefile and exported to a csv.

Example planning unit file:

| id | cost | status |
|---|---|---|
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| 3 | 1.024817 | 0 |
| 4 | 1.160994 | 0 |
| 5 | 0.767445 | 0 |
| 6 | 1.091048 | 0 |
| 7 | 1.115639 | 0 |
| 8 | 0.140693 | 0 |
| 9 | 1.189066 | 0 |
| 10 | 0.737211 | 0 |
| 11 | 1.385543 | 0 |

Boundary file (bound.dat) – This gives the length of the boundary between adjacent files. It is in the format of id1, id2, and amount. For the region 3 analysis it was created in ArcGIS, using the tool 'Make Boundary file' in the SHA tools toolbox. This tool requires a layer file of the planning units as an input. The input layer file must have a field called 'MarxID' and the workspace should be set to the default geodatabase. The tool outputs a DBF file, which can be converted to a csv using Excel.

Example boundary file:

| id1 | id2 | boundary |
|---|---|---|
| 1 | 3 | 440 |
| 1 | 4 | 440 |
| 1 | 19140 | 440 |
| 2 | 3 | 440 |
| 2 | 5 | 440 |
| 2 | 6 | 440 |
| 2 | 19140 | 440 |
| 3 | 4 | 440 |

**Planning units vs. Species file (puvspr.dat)**

This file gives the amount of each conservation feature in each planning unit. Marxan version 2.4.3 differs from previous Marxan in that it will only read the long format, where each combination of planning unit and conservation feature is in a separate row. Previous versions of Marxan were configured to accept this table in the wide format, where each planning unit was a row and the conservation features were the columns. The Marxan software comes with a utility (convert_mtx.exe) to convert records from the long to wide format and vice versa. The file needs to be ordered by the planning unit, and then species ID. This file was made in ArcGIS by intersecting the planning unit with

the polygon (r3_nrt_polygons) and line (r3_nrt_lines) habitat shapefiles. Fish group values were obtained by identifying the value at each hexagon centroid. These three tables were exported as DBFs, concatenated and then sorted by planning unit and then species in Excel.

Example planning unit vs species file.

| Species | pu | amount |
|---|---|---|
| 7 | 1 | 3032.72 |
| 7 | 2 | 34301.95 |
| 7 | 3 | 182339.9 |
| 29 | 3 | 69.95 |
| 32 | 3 | 251.47 |
| 33 | 3 | 583.5 |
| 7 | 4 | 92544.15 |
| 33 | 4 | 818.69 |

**The input file (input.dat)**

Sets the Marxan specifications for the analysis. Marxan comes with an executable called InEdit.exe. that guides the user through all of the Marxan options and generates the input file.

**Marxan resources:**

Watts, M. E., R.R. Stewart, D. Segan, L. Kircher: Using the Zonae Cogito Decision Support System, a Manual.pdf (1288KB)

***Marxan***

Ball, I.R., and H.P. Possingham, 2000. MARXAN (V1.8.2): Marine Reserve Design Using Spatially Explicit Annealing, a Manual.
Game, E.T. and H.S. Grantham, 2008. Marxan User Manual: For Marxan version 1.8.10. University of Queensland, St. Lucia, Queensland, Australia, and Pacific Marine Analysis and Research Association, Vancouver, British Columbia, Canada.

Marxan with Zones
Watts, M.E., C.K. Klein, R. R. Stewart, I. R. Ball, and H. P. Possingham. 2008. Marxan with Zones (V1.0.1): Conservation Zoning using Spatially Explicit Annealing, a Manual.

# APPENDIX E: SENSITIVITY ANALYSIS

Marxan allows the user customize the selection algorithm by adjusting several parameters. In order to ensure a robust analysis, these parameters should be calibrated for each analysis to ensure that Marxan is meeting the objectives of the project (Ardron et al. 2008). Calibration involves running the analysis with a range of values and examining the outputs. Two parameters were examined in this sensitivity analysis: the number of runs and the boundary length modifier (BLM).

**Number of runs**

Marxan is an iterative program that proceeds for a user defined number of runs and returns the best solution it found across all runs. Each run will continue for a user-defined number of iterations, in each of which a different solution is considered. Marxan compares solutions by calculating a score for each potential configuration of reserves. For each run, the program continues to evaluate new solutions until the program ceases to find new solutions with lower scores, or the number of iterations is reached. The assumption behind this is Marxan will find the best solution, or something very close to it, in the user-defined number of runs. There is no guarantee that this solution will be the best solution of all possible for the analysis. As the number of runs is increased, it is more likely that Marxan will find a better solution.

In this analysis the distribution of scores across all Marxan runs for an analysis with 100 runs and an analysis with 500 runs were examined, specifically with respect to the lower scores. The score for each run is given in the Marxan output tables ending in '_sum.txt'.

Upon inspecting the initial solutions with 100 runs, the scores of the best solutions were sometimes much lower than that of the second best solutions, leading to a distribution that is truncated at lower scores (Figure 1). This indicates that Marxan might not be finding the best solution possible, and could, in fact be finding a local minimum instead of a global minimum. The distribution of scores that result from an analysis with 500 runs is more robust among lower scores, indicating that Marxan is finding similar solutions across runs. Marxan is, therefore, more likely converging to the best solution to the problem across all of the runs. Increasing the number of runs only resulted in a moderate increase in processing time. Based on these results, the number of runs was set to 500 for the rest of the analysis.

**Boundary Length Modifier**

Marxan computes an objective score for each potential solution that is the sum of three components: a cost component that sums the cost of the planning units included, a species protection component that computes a penalty for not reaching species representation goals, and a boundary length component that penalizes a solution for being more spread out (having more boundary length). The total score for each run is the sum of all three components; therefore, the components all need to be on a similar scale in order for the solution to consider all three factors in the solution. If the components are not scaled, the program will be selecting solutions based on changes in one component and not the others.

Each component has a parameter that can be adjusted to adjust its scale. The species component is based on a species penalty factor that is assigned to each species. The boundary term is the sum of the boundary length multiplied by a boundary length modifier (BLM), which should be adjusted based on the units of the analysis. The cost can be adjusted by rescaling the units of the cost score. The influence of the three different parameters on the Marxan solutions was examined to ensure that the Marxan analysis was equally considering all three parameters. To assess the contribution of each component to

the final score, scatterplots were created to visualize the relationship between the total score and each component across all 500 runs. Values for the score, cost, boundary length and species penalty were taken from the Marxan summary output table (ending in _sum.txt) created at the end of each analysis. In addition, maps of the best solution and selection frequency were examined to visualize the spatial arrangement of the solutions produced at each setting.

Boundary length factors into the equation by summing the length of the boundary of each solution and multiplying it by a boundary length modifier. The boundary length modifier (BLM) can take on any value and should be adjusted to scale the boundary length to the other terms in the score equation. For example, an analysis in which the boundary lengths are expressed in meters would require a BLM that is one thousandth that of an analysis that expresses the same boundaries in kilometers in order to yield the same scores. The BLM for SHA analysis was originally set to 0.01 based on visual examination of results. This analysis examined the effect of lowering the BLM on the relationship between the overall score and its components, and the spatial configuration of the final solution. BLMs of 0.001 and 0.005 were considered, in addition to the original value of 0.01.

At the initial BLM of 0.01, there was a strong correlation between boundary length and score for each run and no correlation between cost and score (Figure 3). This indicates that the Marxan selections are being driven by differences in boundary length and not in overall cost. The expanses of open water connecting the shorelines of the Neuse and Pamlico River support this conclusion (Figure 2). Decreasing the BLM yielded a solution that was more spatially separated and had more numerous small areas in the solution network. At a BLM of 0.005, the scatterplots indicate that there is a still a tight relationship between the BLM and the total score (Figure 5). Lowering the BLM again to 0.001 the relationship between the score and the BLM is not as strict and there is a positive relationship between the cost and score, indicating that changes in score correlate to changes in cost (Figure 7). As expected, the solution is more fragmented than at higher BLMs. Fragmentation was more pronounced in Pamlico Sound, where the solution produced many isolated areas compose of three or fewer clusters in response to the fish group targets. Shoreline areas remained relatively aggregated; suggesting that the extra boundary length allowed was used to add areas in the sound that were based on the fish targets. The relationship between SPF and total cost indicates that not all representation levels were met in all analyses. Upon further examination, these targets were not far from being met, so it was decided not to base decisions on this factor, as modifications would likely change the representation of habitat types in the proposed SHA network during corroboration.

Based on this information, the advisory committee decided to use the solution with a BLM of 0.01 as the basis for the corroboration phase of the analysis, but to only consider clusters that were greater than 3 hexagons as potential SHAs.

Table 8. Sensitivity runs to calculate an efficiency analysis of the Boundary Length Modifier.

| Run | BLM | Boundary Length | Area (acres) | Cost |
|---|---|---|---|---|
| **1** | 0 | 0 | 88,883 | 835 |
| **2** | 0.00001 | 485,600 | 94,566 | 839 |
| **3** | 0.00005 | 444,223 | 93,577 | 839 |
| **4** | 0.0001 | 411,920 | 95,092 | 829 |
| **5** | 0.0005 | 337,589 | 99,304 | 843 |
| **6** | 0.001 | 300,495 | 98,592 | 847 |
| **7** | 0.005 | 227,373 | 100,765 | 1,031 |
| **8** | 0.01 | 210,307 | 100,284 | 1,262 |
| **9** | 0.05 | 202,579 | 123,221 | 3,619 |
| **10** | 0.1 | 221,583 | 148,139 | 5,660 |
| **11** | 0.5 | 227,012 | 195,628 | 9,291 |

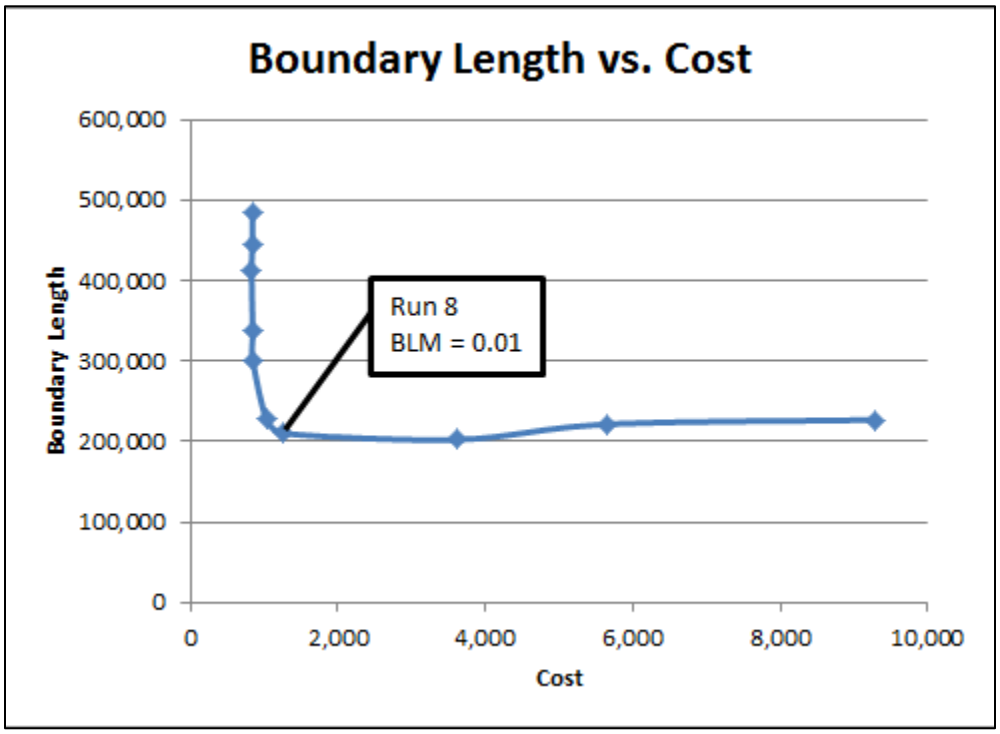



Figure 1. BLM Efficiency analysis results comparing boundary length to cost.

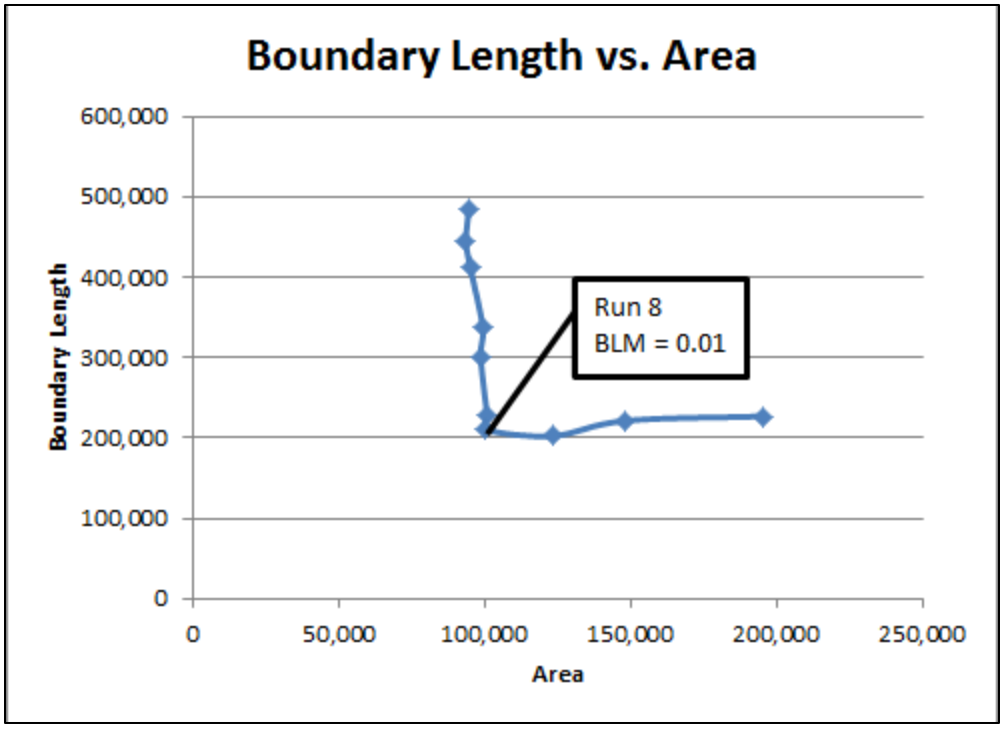
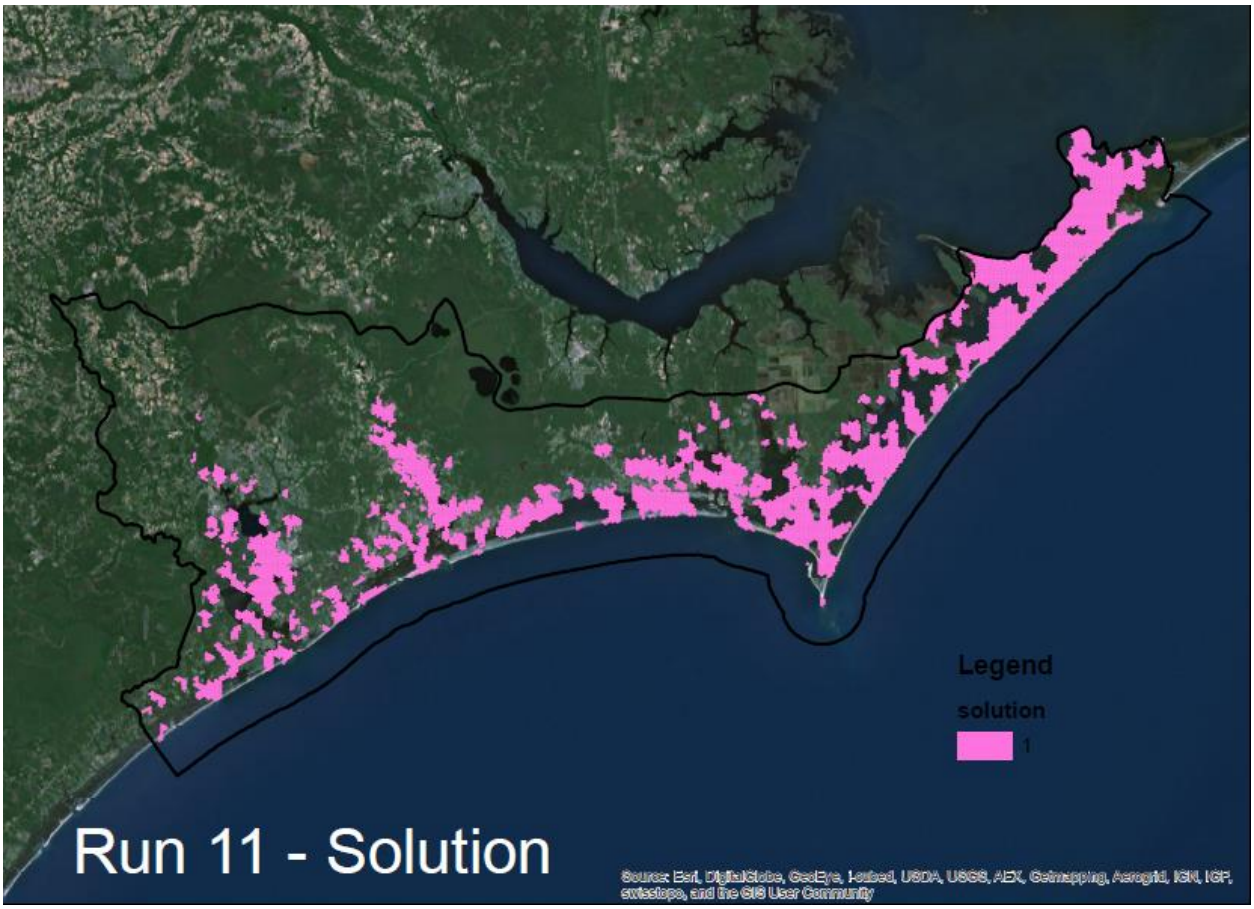



Figure 2. BLM Efficiency analysis results comparing boundary length to area.


Map 29. SHA region 3 sensitivity run 2 with a BLM=0.0001 and 500 runs.




Map 30. SHA region 3 sensitivity run 11 with BLM=0.5 and 500 runs.

## REFERENCE

Ardron, J.A., Possingham, H.P., Klein, C.J. (eds) 2008. Marxan Good Practices Handbook. External review version; 17 May 2008. Pacific Marine Analysis and Research Association, Vancouver, BC, Canada. 155 pages. www.pacmara.org

## APPENDIX F: PUBLIC MEETING COMMENTS

[Insert after public meetings]